



SDMS DocID 2117449

PHIL-21748

**RESIDENTIAL VAPOR INTRUSION STUDY
LONG-TERM REMEDIAL ACTION**

**BUTZ LANDFILL SITE
JACKSON TOWNSHIP
MONROE COUNTY, PENNSYLVANIA**


**EPA WORK ASSIGNMENT NO. 021-RARA-03Q6
PROJECT NUMBER 01060**

**TETRA TECH NUS, INC.
RAC 3 PROGRAM
CONTRACT NUMBER EP-S3-07-04**

**FOR THE
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

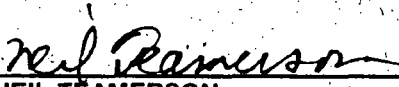
JANUARY 2008

SUBMITTED BY:



**GORDON ARAUJO
ASSISTANT PROJECT MANAGER
TETRA TECH NUS, INC.
KING OF PRUSSIA, PENNSYLVANIA**

APPROVED BY:



**NEIL TEAMERSON
PROJECT MANAGER
TETRA TECH NUS, INC.
KING OF PRUSSIA, PENNSYLVANIA**

TABLE OF CONTENTS

SECTION	PAGE
ACRONYMS	ii
1.0 INTRODUCTION	1-1
2.0 FIELD ACTIVITIES	2-1
2.1 Sub-Slab Soil Vapor Sampling.....	2-1
2.2 Soil Gas Sampling (non-sub-slab residences).....	2-1
2.3 Ambient Background Air Sampling.....	2-2
2.4 Weather Conditions.....	2-2
3.0 RESULTS AND DISCUSSION	3-1
3.1 Ambient Background Air.....	3-2
3.2 Sub-Slab Soil Vapor Sampling Results.....	3-2
3.3 Soil Gas Sampling Results.....	3-3
3.4 Ambient Air Results.....	3-4
3.5 Comparison to Groundwater Concentrations near R07B.....	3-4
4.0 CONCLUSIONS	4-1
4.1 Conclusions.....	4-1
4.2 Recommendations.....	4-2
REFERENCES	R-1
APPENDICES	
A OCCUPIED DWELLING QUESTIONNAIRES	
B FIELD LOG SHEETS	
C EQUIPMENT CALIBRATION LOGS	
D FIELD NOTEBOOK ENTRIES	
E DATA VALIDATION PACKAGES	

TABLES

TABLE	
1	Residential Vapor Intrusion Study Sample Information
2	Vapor Intrusion Study Screening Criteria
3	Residential Vapor Intrusion Study Sample Results Compared to EPA Generic Indoor Air Screening Levels
4	Residential Vapor Intrusion Study Sample Results Compared to EPA Region 3 RBCs for Ambient Air
5	Residential Vapor Intrusion Study Sample Results Compared to PADEP Residential MSCs for Indoor Air Criteria
6	Residential Vapor Intrusion Study Sample Results Compared to Cal/EPA CHHSLs for Residential Land Use

FIGURES

FIGURE	
1	Fall 2007 Vapor Intrusion Sampling
2	Groundwater Well Locations and Designations

ACRONYMS

AMB-BG	ambient background
ATSDR	Agency for Toxic Substances and Disease Registry
Cal/EPA	California Environmental Protection Agency
CHHSL	California Human Health Screening Level
DCE	dichloroethene
EPA	United States Environmental Protection Agency
GAC	granular activated carbon
IA	indoor air
ITRC	Interstate Technology & Regulatory Council
MCL	maximum contaminant level
MSC	medium specific concentration
OA	outdoor air
OSWER	Office of Solid Waste and Emergency Response
PADEP	Pennsylvania Department of Environmental Protection
PCE	tetrachloroethene
RAC	Remedial Action Contract
RBC	risk-based concentration
SG	soil gas
SSD	sub-surface depressurization
SV	soil vapor
TCE	trichloroethene
Tetra Tech	Tetra Tech NUS, Inc.
VI	vapor intrusion
VOC	volatile organic compound

1.0 INTRODUCTION

Tetra Tech NUS, Inc. (Tetra Tech) was tasked by Environmental Protection Agency (EPA) Region 3, under the RAC Program, Contract Number EP-S3-07-04, to conduct a vapor intrusion (VI) investigation at the Butz Landfill Site. The Third Five-Year Review (USEPA, 2006) proposed the VI pathway as a possible issue of concern at the site. As a part of this investigation, six residences were sampled for VI as shown on Figure 1. The findings from this study are discussed in this report.

The goals of collecting sub-slab soil vapor (SV), soil gas (SG), indoor air (IA), and outdoor ambient air (OA) samples were to identify potential and current exposures associated with soil VI and to characterize the nature and extent of subsurface vapor contamination. The results from this investigation were intended to answer the following questions:

- Is there soil vapor contamination in the sub-slab soil?
- At what residential locations is the soil vapor contamination present?
- Do the subsurface vapors cause unacceptable human health risks?

SV, SG, IA, and OA concentrations were compared to EPA Region 3 risk-based concentrations (RBCs) for ambient air screening levels (USEPA, 2007), EPA generic indoor air screening levels for shallow soil gas concentration (USEPA, 2002), Pennsylvania Department of Protection (PADEP) residential medium specific concentrations (MSCs) for indoor air criteria (PADEP, 2004) and the California EPA (Cal/EPA) Human Health Screening Levels (CHHSLs) for indoor air and soil gas (Cal/EPA, 2005) for volatile organic compounds (VOCs). These criteria are summarized in Table 2. Exceedances of the EPA generic indoor air screening levels and the CHHSLs for indoor air criteria were used to trigger further action at the site. This report provides an account of the field activities, the analytical results from the collected soil vapor samples, and the conclusions and recommendations associated with the investigation findings.

2.0 FIELD ACTIVITIES

Sampling for the residential vapor intrusion study occurred on October 23, 24, 25, and 26, 2007. Figure 1 displays the location of each residence sampled during this VI study. Re-sampling of Residence 02 (R02) soil gas was completed on November 19, 2007 because problems were encountered during the October 26, 2007 sampling. The occupied dwelling questionnaires, field log sheets, equipment calibration logs, and field notebook entries are included as Appendices A, B, C and D, respectively. The following summarizes the sampling efforts conducted during the VI investigation.

2.1 Sub-Slab Soil Vapor Sampling

Sub-slab soil vapor samples were collected by drilling a 1/2-inch hole through the 4-inch to 6-inch thick concrete slab located in the basement of each applicable residence. SV samples were collected at R01, R07B, and R06 on October 25, October 23, and October 25, 2007, respectively. A 3/8-inch copper tube was inserted into the 1/2-inch hole and sealed with modeling clay to mitigate short-circuiting of indoor air and to ensure that sampling of sub-slab vapors occurred. A 6-liter Summa™ canister, fitted with a 45-minute regulator, was connected to the copper tubing with polyethylene and Teflon® tubing. Two-liters of sub-slab soil vapor was purged before sampling commenced. At least two SV samples were required to be collected at each residence (Tetra Tech, 2007b). An additional sample was collected for every 333 square feet over the initial two samples for 666 square feet of slab area. Four, equispaced SV samples and singular duplicate samples were collected from R01 and R06 each. Two, equispaced SV samples were collected from R07B. The hole through the concrete slab was sealed with an epoxy packing and covered with a liquid cement.

2.2 Soil Gas Sampling (non-sub-slab residences)

R07, R02, and R03 were sampled on October 23, October 26/November 19, and October 26, 2007, respectively, according to the procedure for residences without slabs (Tetra Tech, 2007b). A Geoprobe® was used to obtain a soil gas sample from a 4-foot depth. A 6-liter Summa™ canister, fitted with an 8-hour regulator, was connected to the Geoprobe® using polyethylene and Teflon® tubing. An indoor air sample was collected within the residence using a 6-liter Summa™ canister fitted with an 8-hour regulator. The IA sample was collected near the primary living areas of the house and away from the laundry room and furnace/utility closet, if possible. Additionally, an OA air sample was collected near the residence using a 6-liter Summa™ canister fitted with an 8-hour regulator. A duplicate SG sample was collected at R03.

The October 26, 2007 Geoprobe® sample at R02 was rejected because inadequate soil gas had been collected in the Summa™ canister. On November 19, 2007, a soil gas sample and duplicate were re-sampled at R02.

2.3 Ambient Background Air Sampling

Ambient background air (AMB-BG) was collected using a 6-liter Summa™ canister that was fitted with an 8-hour regulator. The ambient background sample was collected on October 26, 2006 at a distance of 105-feet from Railroad Drive on the access road to EW-1 (Figure 1).

2.4 Weather Conditions

As noted in Appendix C, the weather was 65°F and sunny on October 23, 2007. On October 24, 2007, sampling activities were postponed because of rain downpours. Sampling resumed on October 25, 2007; the weather was 50°F, overcast, and without rainfall. Around 14:00 on October 26, 2007, steady rain showers were encountered. Since sampling activities had already been initiated, the sampling was allowed to continue until completion. On November 19, 2007, the temperature was 30°F with 6 to 8 inches of snow on the ground. The scheduled Geoprobe® sampling proceeded at R02.

3.0 RESULTS AND DISCUSSION

The results from the VI investigation have been summarized as Table 3, which compares the sample results to EPA generic indoor air screening level for shallow soil gas concentrations at 1×10^{-5} risk. Table 4 compares the sample results to EPA Region 3 RBCs. Table 5 compares the sample results to PADEP residential MSCs for indoor air criteria. Table 6 compares the sample results to CHHSLs for indoor air and soil gas for residential land use.

According to the empirical attenuation factors and reliability assessment presented in the Office of Solid Waste and Emergency Response (OSWER) Draft Subsurface Vapor Intrusion Guidance (USEPA, 2002), a conservative dilution attenuation factor of 10% should be applied to soil gas-to-indoor air samples. The 10% dilution attenuation factor is suitable for shallow soil gas samples (< 5 feet below foundation level) as well as sub-slab samples (i.e., SV and SG samples). This 10% attenuation factor also supports the dilution that occurs due to ventilation of a house, which accounts for the dilution that occurs from outdoor ambient air transmitting into the residence (i.e., OA and AMB-BG samples). The sample data presented in Tables 2, 3, and 4 accounts for the 10% dilution attenuation factor needed for SV, SG, OA, and AMB-BG samples. IA samples do not require a dilution attenuation factor since there is no dilution occurring. For comparison with CHHSLs for shallow soil gas, SG samples do not contain a 10% dilution attenuation factor (Table 6).

R01 had TCE, PCE, and chloroform concentrations that exceeded EPA Region 3 RBCs for ambient air in all soil vapor samples. PCE concentrations at R01 exceeded CHHSLs for indoor air.

R02 had 1,3-butadiene concentrations that exceeded the EPA Region 3 RBC for ambient air, EPA generic indoor air screening level, and PADEP residential MSC for indoor air criteria in all soil gas samples. The EPA Region 3 RBC for ambient air for 1,3-butadiene was also exceeded in sample R02-IA.

R03 had 1,3-butadiene concentrations that exceeded the EPA Region 3 RBC for ambient air, EPA generic indoor air screening level, and PADEP residential MSC for indoor air criteria in all soil gas samples. The EPA Region 3 RBC for ambient air for TCE was also exceeded in the R03 soil gas samples. The EPA Region 3 RBC for ambient air and CHHSL for indoor air for PCE were also exceeded in sample R03-IA.

R06 had TCE and chloroform concentrations that exceeded EPA Region 3 RBCs for soil vapor samples.

The R07A indoor air sample had 1,3-butadiene concentrations that exceeded the EPA Region 3 RBC for ambient air and PADEP residential MSC for indoor air criteria. The EPA Region 3 RBC for ambient air for TCE was also exceeded in the R07A outdoor ambient air and soil gas samples.

R07B had TCE concentrations that exceeded the EPA generic indoor air screening level, EPA Region 3 RBC for ambient air, and CHHSL for indoor air in all soil vapor samples. The TCE value from the PADEP residential MSC for indoor air criteria was not exceeded at R07B.

3.1 Ambient Background Air

No detections were encountered in the AMB-BG sample as presented in Tables 3 through 6 and Appendix E. Therefore, there are no suspected off-site impacts influencing the VI investigation results.

3.2 Sub-Slab Soil Vapor Sampling Results

TCE was the only compound detected above EPA generic indoor air screening levels. The subslab vapor samples collected from R07B, contained TCE at levels greater than the EPA generic indoor air screening level (risk = 1×10^{-5}) of $2.2 \mu\text{g}/\text{m}^3$, the EPA Region 3 RBC of $0.016 \mu\text{g}/\text{m}^3$, and the CHHSL for indoor air of $1.22 \mu\text{g}/\text{m}^3$. After accounting for a 10% dilution attenuation factor, the comparable indoor air concentration for the subslab vapor samples is 2.4 and $9.8 \mu\text{g}/\text{m}^3$ as summarized in Tables 3, 4, and 6.

According to the OSWER, Interstate Technology & Regulatory Council (ITRC), and PADEP vapor intrusion guidance documents (USEPA, 2002; ITRC 2007; PADEP 2004), vapor intrusion should be investigated if VOCs are present within 100 lateral feet of a source. Therefore, groundwater VOC concentrations at groundwater monitoring well RW18, located along Storm Road at R07C, were investigated to determine if TCE at R07B is related to site groundwater contamination. Based on the Sixth-Year Groundwater Monitoring Report (Tetra Tech, 2007c), the depths to water for RW18-B and RW18-A were 6.50 feet and 16.89 feet, respectively. The shallow groundwater table present at RW18, which is downgradient of the landfill, suggests that TCE from landfill contamination may have historically migrated toward R07B. The RW18-A TCE concentration in March 1996 was 430 $\mu\text{g}/\text{L}$. In 2001, pumping at EW-2 started, which has reduced the extent of the TCE plume (Tetra Tech, 2007c). Since February 2001, the groundwater TCE concentration at RW18 has been below 10 $\mu\text{g}/\text{L}$ in zones A and B and was not detected during April 2007 in zones A and B (Tetra Tech, 2007c). Nevertheless, TCE may be entrained in soils above the RW18 screened intervals. The TCE detected in sub-slab vapor samples at R07B may be the result of this entrained TCE in subsurface soils.

The subslab vapor samples collected from R01 contained TCE, PCE, and chloroform at levels greater than EPA Region 3 RBCs (Table 4). PCE from the R01 soil vapor samples also exceeded CHHSL for indoor air value (Table 6). The subslab vapor samples collected from R06 contained concentrations of TCE and chloroform at levels greater than EPA Region 3 RBCs (Table 4). Since PCE, TCE, and chloroform were found at concentrations below the EPA generic indoor air screening levels (81, 2.2, and $11 \mu\text{g}/\text{m}^3$, respectively) and the PADEP residential MSCs for indoor air criteria (36, 12, and $0.44 \mu\text{g}/\text{m}^3$, respectively), PCE, TCE, and chloroform do not present a reasonable concern for the vapor intrusion pathway at R01 and R06.

3.3 Soil Gas Sampling Results

1,3-butadiene was the only compound detected above EPA generic indoor air screening levels. The soil gas samples collected from R02 and R03 contained 1,3-butadiene at levels greater than the EPA generic indoor air screening level (risk = 1×10^{-5}) of $0.87 \mu\text{g}/\text{m}^3$, EPA Region 3 RBC of $0.063 \mu\text{g}/\text{m}^3$, and PADEP residential MSC for indoor air criteria of $0.067 \mu\text{g}/\text{m}^3$. 1,3-butadiene was found in the soil gas samples at $10/1.1 \mu\text{g}/\text{m}^3$ and $10/9.9 \mu\text{g}/\text{m}^3$ (Appendix E) for R02-SG/DUP-04 and R03-SG/DUP-03, respectively. Accounting for a dilution attenuation factor of 10%, the comparable indoor air concentration for the soil gas samples is $1/1.1 \mu\text{g}/\text{m}^3$ and $1/0.99 \mu\text{g}/\text{m}^3$ for R02-SG/DUP-04 and R03-SG/DUP-03, respectively, as summarized in Tables 3, 4, and 5. There was no Cal/EPA screening level listed for 1,3-butadiene (Cal/EPA, 2005)

It is uncertain why 1,3-butadiene is present in subsurface soil gases at the site. According to the Agency for Toxic Substances and Disease Registry (ATSDR), it is not clear exactly what happens to 1,3-butadiene in soil or water (ATSDR, 1993). No reliable methods are available to detect 1,3-butadiene in soil and water media. If 1,3-butadiene were spilled on water or soil, based on its properties, it is expected to evaporate quickly into the air. 1,3-butadiene is not expected to accumulate in plants or fish or to be found in nearby sediments. Also, 1,3-butadiene is not expected to be found in soil or underground water sources, but this is uncertain. Information regarding the amount of time it takes for 1,3-butadiene to break down in soil or in water is not available since these types of studies have not been conducted.

The soil gas samples collected from R03 and R07A contained TCE at levels greater than the EPA Region 3 RBC of $0.016 \mu\text{g}/\text{m}^3$. TCE was found in the soil gas samples at $1.4/1.1 \mu\text{g}/\text{m}^3$ and $0.66 \mu\text{g}/\text{m}^3$ for R03-SG/DUP-03 and R07A-SG, respectively, after accounting for a dilution attenuation factor of 10 percent. Since TCE was found at concentrations below the EPA generic indoor air screening level ($2.2 \mu\text{g}/\text{m}^3$) and the PADEP residential MSCs for indoor air criteria ($12 \mu\text{g}/\text{m}^3$), TCE does not present a reasonable concern for the vapor intrusion pathway at R03 and R07A.

3.4 Ambient Air Results

Indoor and outdoor ambient air samples at R02, R03, and R07A did not contain any compounds that exceeded EPA generic indoor air screening levels (Table 3). However, Table 4 summarizes that the indoor air from R02 and R07A contained 1,3-butadiene at concentrations (0.48 and 0.78 $\mu\text{g}/\text{m}^3$, respectively) that exceeded the EPA Region 3 RBC of 0.063 $\mu\text{g}/\text{m}^3$. 1,3-butadiene was also found to exceed the PADEP residential MSC for indoor air criteria at R07A.

The average amount of 1,3-butadiene in the air is 0.3 parts of 1,3-butadiene per billion parts of air (ppb) in cities and suburban areas. These levels are not expected to cause any health problems. 1,3-butadiene is also present in gasoline vapors at 4 ppb and in small amounts from the exhausts of automobiles (10 ppb). 1,3-butadiene is also found in cigarette smoke and in the smoke of wood fires. Therefore, the presence of 1,3-butadiene at R02 may be attributed to a problem with their kerosene furnace which occasionally vents exhaust into the household. At R07A, household smoking may be a source for 1,3-butadiene. The concentrations of 1,3-butadiene present at R02 and R07A are below the EPA generic indoor air screening level (0.87 $\mu\text{g}/\text{m}^3$) and do not present a reasonable concern for the vapor intrusion pathway.

PCE was found in the R03 indoor air sample at a concentration (1.4 $\mu\text{g}/\text{m}^3$) that exceeded the EPA Region 3 RBCs of 0.313 $\mu\text{g}/\text{m}^3$ and CHHSL of 0.412 $\mu\text{g}/\text{m}^3$. The R07A outdoor ambient air sample contained TCE at a concentration (0.13 $\mu\text{g}/\text{m}^3$) that exceeded the EPA Region 3 RBC of 0.016 $\mu\text{g}/\text{m}^3$. Since PCE and TCE were found at concentrations below the EPA generic indoor air screening levels (81 and 2.2 $\mu\text{g}/\text{m}^3$, respectively) and the PADEP residential MSCs for indoor air criteria (36 and 12 $\mu\text{g}/\text{m}^3$, respectively), PCE and TCE do not present a reasonable concern for the vapor intrusion pathway at R03 and R07A.

3.5 Comparison to Groundwater Concentrations near R07B

Since the vapor intrusion pathway is dependent on soil and groundwater contamination, Tetra Tech queried the historical groundwater sampling results database (1996 through 2007) for sampling results near the residents involved in this study. Specifically, R07B was investigated because of the high levels of TCE found in sub-slab soil vapor samples. Bedrock groundwater monitoring wells R8-B, R2-A, and RW18-B, groundwater extraction well EW-2, and alluvial (till) wells T-2 and T-5 were found to be pertinent to this study since they monitor shallow groundwater immediately upgradient from R07B (Figure 2). Well RW18-B is located within 150 feet of R07B and has a depth to groundwater of 6.50 feet as discussed in Section 3.2. Well RW18-B was found to contain decreasing concentrations of VOCs that are less than 10 $\mu\text{g}/\text{L}$. Well R2-A and EW-2 were found to contain high levels of cis-1,2-dichloroethene (cis-1,2-DCE) and TCE since 1996. Cis-1,2-DCE and TCE levels are typically in excess of EPA maximum contaminant

levels (MCLs), 70 and 5 µg/L, respectively. Well R8-B typically contained VOC concentrations less than 10 µg/L with the exception of TCE, (40 µg/L). Till wells T-2 and T-5 contained less than 10 µg/L of cis-1,2-DCE and TCE each in April 2005. Based on the groundwater results from 1996 through 2007 near R07B, the possibility for contaminated groundwater near R07B cannot be dismissed.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

A review of the vapor intrusion results noted the following items:

- The subslab vapor samples from R07B, located east of the three extraction wells, contained TCE at levels greater than the EPA generic indoor air target level (USEPA, 2002) even after accounting for 10% attenuation. TCE was found in the subslab vapor samples at 24 and 98 $\mu\text{g}/\text{m}^3$ at this home.
- All subslab vapor samples contained TCE at levels ranging from 1.5 to 98 $\mu\text{g}/\text{m}^3$, without accounting for 10% dilution attenuation. All soil gas samples revealed TCE at levels between 2.1 and 6.6 $\mu\text{g}/\text{m}^3$ (including one duplicate), without accounting for 10% dilution attenuation.
- None of the indoor air samples revealed TCE. Homes R02, R03, and R07A were sampled for indoor air.
- TCE was detected at concentrations below the EPA generic screening level and Cal/EPA screening level in the outdoor ambient air sample R07A, after accounting for 10% dilution attenuation.
- No detections were encountered in the AMB-BG sample; therefore, there are no suspected off-site impacts influencing the VI investigation results.
- Groundwater concentrations for cis-1,2-DCE and TCE from well RW18-B, which is within 150 feet of R07B, have not exceeded 10 $\mu\text{g}/\text{L}$ in the past 10 years.
- Based on the groundwater results from 1996 through 207 near R07B, the possibility for contaminated groundwater near R07B cannot be dismissed and the vapor intrusion pathway should be investigated further.
- TCE detected in sub-slab vapor samples at R07B may be the result of historically entrained TCE in sub-surface soils above the RW18 screened intervals.
- The vapor intrusion pathway does not pose a reasonable concern at R01, R02, R03, R06, and R07A to investigate further.

4.2 Recommendations

Tetra Tech recommends the following actions based on the vapor intrusion study sampling results:

- Re-evaluate indoor air quality in the basement and first floor, outdoor ambient air, and subslab soil vapor at R07B.
- Collect air quality samples at the R07C and R08 residences as shown in Figure 1.
- Assess human health risks based on indoor air sampling results for R07B, and for other homes as needed.
- If human health risks are exceeded, install systems that can reduce VOC vapors (i.e., subslab depressurization [SSD] systems) or treat VOC vapors (i.e., carbon filtration systems, such as granular activated carbon [GAC]).

REFERENCES

Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Toxicological profile for 1,3-butadiene. Atlanta, Georgia: U.S. Department of Health and Human Services, Public Health Service.

California Environmental Protection Agency (Cal/EPA), 2005. Use of Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties. Department of Toxic Substances Control. Sacramento, California. January.

Interstate Technology & Regulatory Council (ITRC), 2007. Vapor Intrusion Pathway: A Practical Guideline. VI-1. Washington, D.C.: Interstate Technology & Regulatory Council, Vapor Intrusion Team. Accessed online at <http://www.itrcweb.org/Documents/VI-1.pdf>. January.

Tetra Tech NUS, Inc. (Tetra Tech), 2004. March 2003 Sampling Event (October 2002 - March 2003) Groundwater Monitoring Report Long-Term Remedial Action. King of Prussia, Pennsylvania. August.

Tetra Tech, 2007a. Proposed Scope of Work for Vapor Intrusion Investigation, Butz Landfill Site. King of Prussia, Pennsylvania. July 3.

Tetra Tech, 2007b. Site-Specific Work Plan Addendum for the Vapor intrusion Investigation at the Butz Landfill Site, Jackson Township, Monroe County, Pennsylvania. King of Prussia, Pennsylvania. July 12.

Tetra Tech, 2007c. Sixth Year Sampling Events (January 2006 - April 2007) Groundwater Monitoring Report Long-Term Remedial Action. King of Prussia, Pennsylvania. June.

United States Environmental Protection Agency (USEPA), 2002. OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance). EPA530-D-02-004. November.

USEPA Region 3, 2006. Third Five-Year Review Report for Butz Landfill Superfund Site, Jackson Township, Monroe County, Pennsylvania. Philadelphia, Pennsylvania. September.

USEPA Region 3, 2007. Risk-Based Concentration Table. By Jennifer Hubbard, Technical Support Branch. Philadelphia, Pennsylvania. October 16.

TABLES

TABLE 1

**RESIDENTIAL VAPOR INTRUSTION STUDY SAMPLE INFORMATION
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA**

Resident Location Number	Sub-Slab Soil Vapor Samples	Soil Gas Samples	Indoor Air Samples	Outdoor Ambient Air Samples
R01	5	0	0	0
R02	0	2	1	1
R03	0	2	1	1
R06	5	0	0	0
R07A	0	1	1	1
R07B	2	0	0	0

Note:

All sub-slab soil vapor, soil gas, and outdoor ambient air samples were presented with a 10% dilution attenuation factor.

TABLE 2

**VAPOR INTRUSION STUDY SCREENING CRITERIA
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA**

Volatile Compound	EPA Generic Indoor Air Screening Level for Shallow Soil Gas Concentration (Risk = 1×10^{-5})		EPA Region 3 Risk Based Concentrations (RBCs) for Ambient Air		PADEP Residential Medium Specific Concentrations (MSCs) for Indoor Air Criteria	California EPA Human Health Screening Levels (CHHSLs) for Residential Land use	
						Indoor Air	Shallow Soil Gas
	$\mu\text{g}/\text{m}^3$		$\mu\text{g}/\text{m}^3$		$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	
Vinyl Chloride	28	C	0.072	C	2.4	0.0311	13.3
1,3-Butadiene	0.87	C	0.063	C	0.67		
Trichlorofluoromethane (F11)	7,000	N	730	N	970		
1,1-Dichloroethene	2,000	N	219	N	280		
Trans-1,2-Dichloroethene	700	N	62.05	N	97	73	31,900
Cis-1,2-Dichloroethene	3,500	N	36.5	N	49	36.5	15,900
Chloroform	11	C	0.077	C	0.44 **		
1,1,1-Trichloroethane	22,000	N	5,220	N	2900	2,290	991,000
Carbon Tetrachloride	16	C	0.118	C	1.4 **	0.0579	25.1
1,2-Dichloroethane	9.4	C	0.069	C	0.81	0.116	49.6
Trichloroethene	2.2	C	0.016	C	12 **	1.22	528
Toluene	4,000	N	5,110	N	560	313	135,000
Tetrachloroethene	81	C	0.313	C	36 **	0.412	180
Ethyl Benzene	2,200	N	1,059	N	19	Postponed	Postponed
m&p-Xylene	70,000	N	109.5	N	140	730	317,000
o-Xylene	70,000	N	109.5	N	140	730	315,000
1,1,2,2-Tetrachloroethane	4.2	C	0.031	C	0.36		

† Samples analyzed by EPA laboratory, not Air Toxics, Inc.

* Includes early life

** Compound is identified as having potentially higher indoor air background concentrations than the risk-based targets

J Analyte present. Reported values may not be accurate or precise.

RL Reporting Limit

C Basis: Carcinogenic effects

N Basis: Noncarcinogenic effects

Sources:

California Environmental Protection Agency (Cal/EPA), 2005. Use of Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties.

Department of Toxic Substances Control, Sacramento, California, January.

Pennsylvania Department of Environmental Protection (PADEP), 2004. Land Recycling Program Technical Guidance Manual-Section IV.A.4. Vapor Intrusion into Buildings

from Groundwater and Soil under the Act 2 Statewide Health Standard, 253-0300-100. Bureau of Land Recycling and Waste Management, January 24.

United States Environmental Protection Agency (USEPA) Region 3, 2007. Risk-Based Concentration Table. By Jennifer Hubbard, Technical Support Branch, Philadelphia, Pennsylvania, October 16.

USEPA, 2002. OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance).

TABLE 3

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO EPA GENERIC INDOOR AIR SCREENING LEVELS
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 1 OF 6**

Sample Number: Field QC		EPA Generic Indoor Air Screening Level for Shallow Soil Gas Concentration (Risk = 1×10^{-6})	R01-SV1-20071025 10/25/2007 1.44 0.1	R01-SV2-20071025 10/25/2007 1.44 0.1	R01-SV3-20071025 10/25/2007 1.49 0.1	R01-SV4-20071025 FieldDup of DUP-02-20071025 10/25/2007 1.61 0.1	DUP-02-20071025 FieldDup of R01-SV4-20071025 10/25/2007 1.58 0.1
Volatile Compound	RL	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Vinyl Chloride	0.26	28 C					
1,3-Butadiene	0.22	0.87 C					
Trichlorofluoromethane (F11)	0.56	7,000 N	0.41	0.49	0.52	0.38	0.42
1,1-Dichloroethene	0.40	2,000 N					
Trans-1,2-Dichloroethene	0.40	700 N					
Cis-1,2-Dichloroethene	0.40	3,500 N					
Chloroform	0.49	11 C	0.15		0.14		
1,1,1-Trichloroethane	0.54	22,000 N					
Carbon Tetrachloride	0.63	16 C					
1,2-Dichloroethane	0.40	9.4 C					
Trichloroethene	0.54	2.2 C	0.56	0.54	0.51	0.26	0.18
Toluene	0.38	4,000 N	1.1	0.77	0.84	0.71	0.61
Tetrachloroethene	0.68	81 C	0.63	0.63	1.2	0.4	0.47
Ethyl Benzene	0.43	2,200 N	0.82	0.91	0.9	0.7	0.7
m&p-Xylene	0.43	70,000 N	3.1	3.5	3.5	2.8	2.9
o-Xylene	0.43	70,000 N	1.5	1.7	1.6	1.3	1.4
1,1,2,2-Tetrachloroethane	0.69	4.2 C					

Analyte exceeds EPA Generic Indoor Air Screening Level for Shallow Soil Gas Concentration

- † Samples analyzed by EPA laboratory, not Air Toxics, Inc.
- J Analyte present. Reported values may not be accurate or precise.
- RL Reporting Limit
- C Basis: Carcinogenic effects
- N Basis: Noncarcinogenic effects

Notes:

OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison
Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples

Sources:

United States Environmental Protection Agency (USEPA); 2002. OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface V. Guidance). EPA530-D-02-004. November.

TABLE 3

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO EPA GENERIC INDOOR AIR SCREENING LEVELS
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 2 OF 6**

Sample Number: Field QC:		EPA Generic Indoor Air Screening Level for Shallow Soil Gas Concentration (Risk = 1×10^{-5})	R02-IA-20071026 10/26/2007 1.68	R02-OA-20071026 10/26/2007 1.96 0.1	R02-SG-20071119 † 11/19/2007 5 0.1	DUP-04-20071119 † Field Dup of R02-SG-20071119 11/19/2007 5 0.1
Volatile Compound	RL	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Vinyl Chloride	0.26	28	C			
1,3-Butadiene	0.22	0.87	C	0.48		
Trichlorofluoromethane (F11)	0.56	7,000	N	3.4	0.12	
1,1-Dichloroethene	0.40	2,000	N			
Trans-1,2-Dichloroethene	0.40	700	N			
Cis-1,2-Dichloroethene	0.40	3,500	N			
Chloroform	0.49	11	C			
1,1,1-Trichloroethane	0.54	22,000	N			
Carbon Tetrachloride	0.63	16	C			
1,2-Dichloroethane	0.40	9.4	C			
Trichloroethene	0.54	2.2	C			
Toluene	0.38	4,000	N	2		1.3
Tetrachloroethene	0.68	81	C			1.4
Ethyl Benzene	0.43	2,200	N			
m&p-Xylene	0.43	70,000	N	0.86		
o-Xylene	0.43	70,000	N			
1,1,2,2-Tetrachloroethane	0.69	4.2	C			

† Analyte exceeds EPA Generic Indoor Air Screening Level for Shallow Soil Gas Concentration

- † Samples analyzed by EPA laboratory, not Air Toxics, Inc.
- J Analyte present. Reported values may not be accurate or precise.
- RL Reporting Limit
- C Basis: Carcinogenic effects
- N Basis: Noncarcinogenic effects

Notes:

- OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison
- Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples

Sources:

United States Environmental Protection Agency (USEPA), 2002. OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface V. Guidance). EPA530-D-02-004, November.

TABLE 3

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO EPA GENERIC INDOOR AIR SCREENING LEVELS
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 3 OF 6**

Sample Number Field QC:	EPA Generic Indoor Air Screening Level for Shallow Soil Gas Concentration (Risk = 1×10^{-5})	R03-IA-20071026 10/26/2007 1.68	R03-OA-20071026 10/26/2007 1.64	R03-SG-20071026 FieldDup.of DUP-03-20071026 10/26/2007 1.68	DUP-03-20071026 FieldDup.of R03-SG-20071026 10/26/2007 1.68
Dilution Factor:		1	1	0.1	0.1
Dilution Attenuation Factor:					
Volatle Compound	RL	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Vinyl Chloride	0.26	28 C			
1,3-Butadiene	0.22	0.87 C			0.99
Trichlorofluoromethane (F11)	0.56	7,000 N	4.3	0.13	0.29
1,1-Dichloroethene	0.40	2,000 N			
Trans-1,2-Dichloroethene	0.40	700 N		NA	NA
Cis-1,2-Dichloroethene	0.40	3,500 N			
Chloroform	0.49	11 C			
1,1,1-Trichloroethane	0.54	22,000 N			
Carbon Tetrachloride	0.63	16 C			
1,2-Dichloroethane	0.40	9.4 C			
Trichloroethene	0.54	2.2 C			1.4
Toluene	0.38	4,000 N	6.3		1
Tetrachloroethene	0.68	81 C	1.4		
Ethyl Benzene	0.43	2,200 N			0.48
m&p-Xylene	0.43	70,000 N	1		1.4
o-Xylene	0.43	70,000 N			0.73
1,1,2,2-Tetrachloroethane	0.69	4.2 C			1.2

Analyte exceeds EPA Generic Indoor Air Screening Level for Shallow Soil Gas Concentration

- † Samples analyzed by EPA laboratory, not Air Toxics, Inc.
- J Analyte present. Reported values may not be accurate or precise.
- RL Reporting Limit
- C Basis: Carcinogenic effects
- N Basis: Noncarcinogenic effects

Notes:

OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison
Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples

Sources:

United States Environmental Protection Agency (USEPA), 2002. OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface V. Guidance). EPA530-D-02-004 / November.

TABLE 3

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO EPA GENERIC INDOOR AIR SCREENING LEVELS
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 4 OF 6**

Sample Number: Field QC:		EPA Generic Indoor Air Screening Level for Shallow Soil Gas Concentration: (Risk = 1×10^{-5})	R06-SV1-20071025 10/25/2007 1.44	R06-SV2-20071025 10/25/2007 1.52	R06-SV3-20071025 FieldDup.of DUP-01-20071025 10/25/2007 1.44	DUP-01-20071025 FieldDup.of R06-SV3-20071025 10/25/2007 1.41	R06-SV4-20071025 10/25/2007 1.44
Dilution Factor:			0.1	0.1	0.1	0.1	0.1
Dilution Attenuation Factor:							
Volatile Compound	RL	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Vinyl Chloride	0.26	28	C				
1,3-Butadiene	0.22	0.87	C				
Trichlorofluoromethane (F11)	0.56	7,000	N	1.3	0.72	6	5.6 J
1,1-Dichloroethene	0.40	2,000	N			0.25	0.14
Trans-1,2-Dichloroethene	0.40	700	N				
Cis-1,2-Dichloroethene	0.40	3,500	N				
Chloroform	0.49	11	C		0.1	0.076	0.075
1,1,1-Trichloroethane	0.54	22,000	N				
Carbon Tetrachloride	0.63	16	C				
1,2-Dichloroethane	0.40	9.4	C				
Trichloroethene	0.54	2.2	C	0.4	0.28	0.25	0.15
Toluene	0.38	4,000	N	1.6	1.3	1	4.9
Tetrachloroethene	0.68	81	C	0.13	0.14	0.12	0.15
Ethyl Benzene	0.43	2,200	N	0.94	0.96	0.92	1.3
m&p-Xylene	0.43	70,000	N	3.7	3.7	3.7	5.4
o-Xylene	0.43	70,000	N	1.6	1.8	1.7	2.2
1,1,2,2-Tetrachloroethane	0.69	4.2	C				

Analyte exceeds EPA Generic Indoor Air Screening Level for Shallow Soil Gas Concentration

- T Samples analyzed by EPA laboratory, not Air Toxics, Inc.
- J Analyte present. Reported values may not be accurate or precise.
- RL Reporting Limit
- C Basis: Carcinogenic effects
- N Basis: Noncarcinogenic effects

Notes:

OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison
Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples

Sources:

United States Environmental Protection Agency (USEPA), 2002. OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface V. Guidance). EPA530-D-02-004. November.

TABLE 3
 RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO EPA GENERIC INDOOR AIR SCREENING LEVELS
 BUTZ LANDFILL SITE
 JACKSON TOWNSHIP, PENNSYLVANIA
 PAGE 5 OF 6

Sample Number Field OC:	EPA Generic Indoor Air Screening Level for Shallow Soil Gas Concentration (Risk = 1×10^{-3})	R07A-IA-20071023 10/23/2007	R07A-OA-20071023 10/23/2007	R07A-SG-20071023 10/23/2007
Date Sampled:		1		
Dilution Factor:				
Dilution Attenuation Factor:				
Volatiles Compound	RL	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Vinyl Chloride	0.26	28	0.78	
1,3-Butadiene	0.22	0.87	1.4	
Trichlorofluoromethane (F11)	0.56	7,000		
1,1-Dichloroethene	0.40	2,000		
Trans-1,2-Dichloroethene	0.40	700		
Cis-1,2-Dichloroethene	0.40	3,500		
Chloroform	0.49	11		
1,1,1-Trichloroethane	0.54	22,000		
Carbon Tetrachloride	0.63	16		
1,2-Dichloroethane	0.40	9.4		0.13
Trichloroethane	0.54	2.2	3.9	0.13
Toluene	0.38	4,000		
Tetrachloroethene	0.68	81		
Ethyl Benzene	0.43	2,200	1.1	
m&p-Xylene	0.43	70,000		
o-Xylene	0.43	70,000		
1,1,2,2-Tetrachloroethane	0.69	4.2		

- † Analyte exceeds EPA Generic Indoor Air Screening Level for Shallow Soil Gas Concentration
- ‡ Samples analyzed by EPA laboratory, not Air Toxics, Inc.
- J Analyte present. Reported values may not be accurate or precise.
- RL Reporting Limit
- C Basis: Carcinogenic effects
- N Basis: Noncarcinogenic effects

Notes:
 OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison
 Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples

Sources:
 United States Environmental Protection Agency (USEPA), 2002. OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface V. Guidance). EPA530-D-02-004. November.

TABLE 3

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO EPA GENERIC INDOOR AIR SCREENING LEVELS
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 6 OF 6**

Sample Number: Field QC:		EPA Generic Indoor Air Screening Level for Shallow Soil Gas Concentration (Risk = 1×10^{-5})	R07B-SV1-20071023	R07B-SV2-20071023	AMB-BG-20071026
Date Sampled:			10/23/2007	10/23/2007	10/26/2007
Dilution Factor:			1.46	1.39	2.51
Dilution Attenuation Factor:			0.1	0.1	0.1
Volatle Compound	RL	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Vinyl Chloride	0.26	28	C		
1,3-Butadiene	0.22	0.87	C		
Trichlorofluoromethane (F11)	0.56	7,000	N	0.19 J	0.19 J
1,1-Dichloroethene	0.40	2,000	N		
Trans-1,2-Dichloroethene	0.40	700	N		
Cis-1,2-Dichloroethene	0.40	3,500	N	0.1	
Chloroform	0.49	11	C		0.072
1,1,1-Trichloroethane	0.54	22,000	N		0.23
Carbon Tetrachloride	0.63	16	C		
1,2-Dichloroethane	0.40	9.4	C		
Trichloroethene	0.54	2.2	C	2.4	9.8
Toluene	0.38	4,000	N	3	3.2
Tetrachloroethene	0.68	81	C	0.2	0.21
Ethyl Benzene	0.43	2,200	N	1.3	1.1
m&p-Xylene	0.43	70,000	N	5	4.6
o-Xylene	0.43	70,000	N	2.2	2
1,1,2,2-Tetrachloroethane	0.69	4.2	C		

Analyte exceeds EPA Generic Indoor Air Screening Level for Shallow Soil Gas Concentration

- † Samples analyzed by EPA laboratory, not Air Toxics, Inc.
- J Analyte present. Reported values may not be accurate or precise.
- RL Reporting Limit
- C Basis: Carcinogenic effects
- N Basis: Noncarcinogenic effects

Notes:

- OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison
- Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples

Sources:

- ¹United States Environmental Protection Agency (USEPA), 2002. OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion). EPA530-D-02-004. November.

TABLE 4

RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO EPA REGION 3 RBCs FOR AMBIENT AIR
 BUTZ LANDFILL SITE
 JACKSON TOWNSHIP, PENNSYLVANIA
 PAGE 1 OF 6

Sample Number	Field QC	EPA Region 3 Risk Based Concentrations (RBCs) for Ambient Air	R01-SV1-20071025	R01-SV2-20071025	R01-SV3-20071025	R01-SV4-20071025	DUP-02-20071025
Date Sampled			10/25/2007	10/25/2007	10/25/2007	10/25/2007	10/25/2007
Dilution Factor			1.44	1.44	1.49	1.61	1.58
Dilution Attenuation Factor			0.1	0.1	0.1	0.1	0.1
Volatle Compound	RL	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Vinyl Chloride*	0.26	0.072 C					
1,3-Butadiene	0.22	0.063 C					
Trichlorofluoromethane (F11)	0.56	730 N	0.41	0.49	0.52	0.38	0.42
1,1-Dichloroethene	0.40	219 N					
Trans-1,2-Dichloroethene	0.40	62.05 N					
Cis-1,2-Dichloroethene	0.40	36.5 N					
Chloroform	0.49	0.077 C	0.16		0.14		
1,1,1-Trichloroethane	0.54	5,220 N					
Carbon Tetrachloride	0.63	0.118 C					
1,2-Dichloroethane	0.40	0.069 C					
Trichloroethene	0.54	0.016 C	0.56	0.54	0.51	0.26	0.18
Toluene	0.38	5,110 N	1.1	0.77	0.84	0.71	0.61
Tetrachloroethene	0.68	0.313 C	0.63	0.63	1.2	0.4	0.47
Ethyl Benzene	0.43	1,059 N	0.82	0.91	0.9	0.7	0.7
m,p-Xylene	0.43	109.5 N	3.1	3.5	3.5	2.8	2.9
o-Xylene	0.43	109.5 N	1.5	1.7	1.6	1.3	1.4
1,1,2,2-Tetrachloroethane	0.69	0.031 C					

Analyte exceeds EPA Region 3 RBCs for Ambient Air
 Includes early life

- † Samples analyzed by EPA laboratory, not Air Toxics, Inc.
 J Analyte present. Reported values may not be accurate or precise.
 RL Reporting Limit
 C Basis: Carcinogenic effects
 N Basis: Noncarcinogenic effects

Notes:

OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison
 Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples

Sources:

United States Environmental Protection Agency (USEPA) Region 3, 2007. Risk-Based Concentration Table. By Jennifer Hubbard, Technical Support Branch, Philadelphia, Pennsylvania

TABLE 4

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO EPA REGION 3 RBCs FOR AMBIENT AIR
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 2 OF 6**

Sample Number: Field QC :		EPA Region 3 Risk Based Concentrations (RBCs) for Ambient Air	R02-IA-20071026	R02-OA-20071026	R02-SG-20071119 †	DUP-04-20071119 †
Date Sampled :	10/26/2007		10/26/2007	11/19/2007	11/19/2007	
Dilution Factor :	1.68		1.96	5	5	
Dilution Attenuation Factor :	1		0.1	0.1	0.1	
Volatile Compound	RL	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³
Vinyl Chloride*	0.26	0.072 C				
1,3-Butadiene	0.22	0.063 C	0.48		1	1.1
Trichlorofluoromethane (F11)	0.56	730 N	3.4	0.12		
1,1-Dichloroethene	0.40	219 N				
Trans-1,2-Dichloroethene	0.40	62.05 N				
Cis-1,2-Dichloroethene	0.40	36.5 N				
Chloroform	0.49	0.077 C				
1,1,1-Trichloroethane	0.54	5,220 N				
Carbon Tetrachloride	0.63	0.118 C				
1,2-Dichloroethane	0.40	0.069 C				
Trichloroethene	0.54	0.016 C				
Toluene	0.38	5,110 N	2		1.3	1.4
Tetrachloroethene	0.68	0.313 C				
Ethyl Benzene	0.43	1,059 N				
m&p-Xylene	0.43	109.5 N	0.86			
o-Xylene	0.43	109.5 N				
1,1,2,2-Tetrachloroethane	0.69	0.031 C				

- * Analyte exceeds EPA Region 3 RBCs for Ambient Air
Includes early life
- † Samples analyzed by EPA laboratory, not Air Toxics, Inc.
- J Analyte present. Reported values may not be accurate or precise.
- RL Reporting Limit
- C Basis: Carcinogenic effects
- N Basis: Noncarcinogenic effects

Notes:

OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison.
Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples

Sources:

United States Environmental Protection Agency (USEPA) Region 3, 2007. Risk-Based Concentration Table. By Jennifer Hubbard, Technical Support Branch, Philadelphia, Pennsylvania

TABLE 4

RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO EPA REGION 3 RBCs FOR AMBIENT AIR
 BUTZ LANDFILL SITE
 JACKSON TOWNSHIP, PENNSYLVANIA
 PAGE 3 OF 6

Sample Number :		EPA Region 3 Risk Based Concentrations (RBCs) for Ambient Air	R03-IA-20071026	R03-OA-20071026	R03-SG-20071026	DUP-03-20071026
Field QC :			10/26/2007	10/26/2007	FieldDup.of DUP-03-20071026	FieldDup.of R03-SG-20071026
Date Sampled :			1.68	1.64	1.68	1.68
Dilution Factor :			1	0.1	0.1	0.1
Dilution Attenuation Factor						
Volatile Compound	RL	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Vinyl Chloride*	0.26	0.072 C				
1,3-Butadiene	0.22	0.063 C			1	0.99
Trichlorofluoromethane (F11)	0.56	730 N	4.3	0.13	0.29	0.27
1,1-Dichloroethene	0.40	219 N				
Trans-1,2-Dichloroethene	0.40	62.05 N		NA	NA	
Cis-1,2-Dichloroethene	0.40	36.5 N				
Chloroform	0.49	0.077 C				
1,1,1-Trichloroethane	0.54	5,220 N				
Carbon Tetrachloride	0.63	0.118 C				
1,2-Dichloroethane	0.40	0.069 C				
Trichloroethene	0.54	0.016 C			1.4	1.1
Toluene	0.38	5,110 N	6.3		1	1.1
Tetrachloroethene	0.68	0.313 C	1.4			
Ethyl Benzene	0.43	1,059 N			0.48	0.67
m&p-Xylene	0.43	109.5 N	1		1.4	2.2
o-Xylene	0.43	109.5 N			0.73	1.2
1,1,2,2-Tetrachloroethane	0.69	0.031 C				

Analyte exceeds EPA Region 3 RBCs for Ambient Air.
 Includes early life

- † Samples analyzed by EPA laboratory, not Air Toxics, Inc.
 J Analyte present. Reported values may not be accurate or precise.
 RL Reporting Limit
 C Basis: Carcinogenic effects
 N Basis: Noncarcinogenic effects

Notes:

- OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison.
 Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples

Sources:

United States Environmental Protection Agency (USEPA) Region 3, 2007. Risk-Based Concentration Table. By Jennifer Hubbard, Technical Support Branch, Philadelphia, Pennsylvania

TABLE 4

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO EPA REGION 3 RBCs FOR AMBIENT AIR
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 4 OF 8**

Sample Number: Field QC:		EPA Region 3 Risk Based Concentrations (RBCs) for Ambient Air	R06-SV1-20071025 10/25/2007 1.44 0.1	R06-SV2-20071025 10/25/2007 1.52 0.1	R06-SV3-20071025 FieldDup.of DUP-01-20071025 10/25/2007 1.44 0.1	DUP-01-20071025 FieldDup.of R06-SV3-20071025 10/25/2007 1.41 0.1	R06-SV4-20071025 10/25/2007 1.44 0.1
Volatile Compound	RL	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Vinyl Chloride*	0.26	0.072 C					
1,3-Butadiene	0.22	0.063 C					
Trichlorofluoromethane (F11)	0.56	730 N	1.3	0.72	6	5.6 J	5.5
1,1-Dichloroethene	0.40	219 N			0.25	0.14	
Trans-1,2-Dichloroethene	0.40	62.05 N					
Cis-1,2-Dichloroethene	0.40	36.5 N					
Chloroform	0.49	0.077 C		0.1	0.076	0.075	0.11
1,1,1-Trichloroethane	0.54	5,220 N					
Carbon Tetrachloride	0.63	0.118 C					
1,2-Dichloroethane	0.40	0.069 C					
Trichloroethene	0.54	0.016 C	0.4	0.28	0.25	0.16	0.22
Toluene	0.38	5,110 N	1.6	1.3	1	4.9	2.2
Tetrachloroethene	0.68	0.313 C	0.13	0.14	0.12		0.15
Ethyl Benzene	0.43	1,059 N	0.94	0.96	0.92	1.3	0.99
m&p-Xylene	0.43	109.5 N	3.7	3.7	3.7	5.4	3.9
o-Xylene	0.43	109.5 N	1.6	1.8	1.7	2.2	1.9
1,1,2,2-Tetrachloroethane	0.69	0.031 C					

Analyte exceeds EPA Region 3 RBCs for Ambient Air
Includes early life

- † Samples analyzed by EPA laboratory, not Air Toxics, Inc.
J Analyte present. Reported values may not be accurate or precise.
RL Reporting Limit
C Basis: Carcinogenic effects
N Basis: Noncarcinogenic effects

Notes:

OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison
Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples

Sources:

United States Environmental Protection Agency (USEPA) Region 3, 2007. Risk-Based Concentration Table. By Jennifer Hubbard, Technical Support Branch, Philadelphia, Pennsylvania

TABLE 4

RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO EPA REGION 3 RBCs FOR AMBIENT AIR
 BUTZ LANDFILL SITE
 JACKSON TOWNSHIP, PENNSYLVANIA
 PAGE 5 OF 8

Sample Number: Field QC		EPA Region 3 Risk Based Concentrations (RBCs) for Ambient Air	R07A-IA-20071023 10/23/2007 1.79	R07A-OA-20071023 10/23/2007 1.75 0.1	R07A-SG-20071023 10/23/2007 1.75 0.1
Volatile Compound	RL	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Vinyl Chloride*	0.26	0.072 C			
1,3-Butadiene	0.22	0.063 C	0.76		
Trichlorofluoromethane (F11)	0.56	730 N	1.4 J	0.13 J	0.31 J
1,1-Dichloroethene	0.40	219 N			
Trans-1,2-Dichloroethene	0.40	82.05 N			
Cis-1,2-Dichloroethene	0.40	36.5 N			
Chloroform	0.49	0.077 C			
1,1,1-Trichloroethane	0.54	5,220 N			
Carbon Tetrachloride	0.63	0.118 C			
1,2-Dichloroethane	0.40	0.069 C			
Trichloroethene	0.54	0.016 C		0.13	0.98
Toluene	0.38	5,110 N	3.9	0.13	1.6
Tetrachloroethene	0.68	0.313 C			0.22
Ethyl Benzene	0.43	1,059 N			1.4
m&p-Xylene	0.43	109.5 N	1.1		5.2
o-Xylene	0.43	109.5 N			2.3
1,1,2,2-Tetrachloroethane	0.69	0.031 C			

Analyte exceeds EPA Region 3 RBCs for Ambient Air

* Includes early life

- f Samples analyzed by EPA laboratory, not Air Toxics, Inc.
- J Analyte present. Reported values may not be accurate or precise.
- RL Reporting Limit
- C Basis: Carcinogenic effects
- N Basis: Noncarcinogenic effects

Notes:

- * OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison
- Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples

Sources:

United States Environmental Protection Agency (USEPA) Region 3, 2007. Risk-Based Concentration Table. By Jennifer Hubbard, Technical Support Branch, Philadelphia, Pennsylvania

TABLE 4

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO EPA REGION 3 RBCs FOR AMBIENT AIR
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 6 OF 6**

Sample Number :		EPA Region 3 Risk Based Concentrations (RBCs) for Ambient Air		R07B-SV1-20071023 10/23/2007 1.46 0.1	R07B-SV2-20071023 10/23/2007 1.39 0.1	AMB-BG-20071026 10/26/2007 2.51 0.1
Field QC :		RL	µg/m ³	µg/m ³	µg/m ³	µg/m ³
Date Sampled :						
Dilution Factor :						
Dilution Attenuation Factor :						
Volatile Compound	RL	µg/m ³				
Vinyl Chloride*	0.26	0.072	C			
1,3-Butadiene	0.22	0.063	C			
Trichlorofluoromethane (F11)	0.56	730	N	0.19	J	0.19
1,1-Dichloroethene	0.40	219	N			
Trans-1,2-Dichloroethene	0.40	62.05	N			
Cis-1,2-Dichloroethene	0.40	36.5	N	0.1		
Chloroform	0.49	0.077	C		0.072	
1,1,1-Trichloroethane	0.54	5,220	N		0.23	
Carbon Tetrachloride	0.63	0.118	C			
1,2-Dichloroethane	0.40	0.069	C			
Trichloroethene	0.54	0.016	C	2.4		9.8
Toluene	0.38	5,110	N	3		3.2
Tetrachloroethene	0.68	0.313	C	0.2		0.21
Ethyl Benzene	0.43	1,059	N	1.3		1.1
m&p-Xylene	0.43	109.5	N	5		4.6
o-Xylene	0.43	109.5	N	2.2		2
1,1,2,2-Tetrachloroethane	0.69	0.031	C			

Analyte exceeds EPA Region 3 RBCs for Ambient Air

Includes early life

- † Samples analyzed by EPA laboratory, not Air Toxics, Inc.
- J Analyte present. Reported values may not be accurate or precise.
- RL Reporting Limit
- C Basis: Carcinogenic effects
- N Basis: Noncarcinogenic effects

Notes:

OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison
Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples

Sources:

United States Environmental Protection Agency (USEPA) Region 3, 2007. Risk-Based Concentration Table. By Jennifer Hubbard, Technical Support Branch, Philadelphia, Pennsylvania

TABLE 5

RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO PADEP RESIDENTIAL MSCs FOR INDOOR AIR CRITERIA
 BUTZ LANDFILL SITE
 JACKSON TOWNSHIP, PENNSYLVANIA
 PAGE 1 OF 6

Sample Number	Field QC	PADEP Residential Medium Specific Concentrations (MSCs) for Indoor Air Criteria	R01-SV1-20071025	R01-SV2-20071025	R01-SV3-20071025	R01-SV4-20071025	DUP-02-20071025
Date Sampled			10/25/2007	10/25/2007	10/25/2007	10/25/2007	10/25/2007
Dilution Factor			1.44	1.44	1.49	1.61	1.58
Dilution Attenuation Factor			0.1	0.1	0.1	0.1	0.1
Volatile Compound	RL	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Vinyl Chloride	0.26	2.4					
1,3-Butadiene	0.22	0.67					
Trichlorofluoromethane (F11)	0.56	970	0.41	0.49	0.52	0.38	0.42
1,1-Dichloroethene	0.40	280					
Trans-1,2-Dichloroethene	0.40	97					
Cis-1,2-Dichloroethene	0.40	49					
Chloroform	0.49	0.44 **	0.15		0.14		
1,1,1-Trichloroethane	0.54	2900					
Carbon Tetrachloride	0.63	1.4 **					
1,2-Dichloroethane	0.40	0.81					
Trichloroethene	0.54	12 **	0.56	0.54	0.51	0.26	0.18
Toluene	0.38	560	1.1	0.77	0.84	0.71	0.61
Tetrachloroethene	0.68	36 **	0.63	0.63	1.2	0.4	0.47
Ethyl Benzene	0.43	19	0.82	0.91	0.9	0.7	0.7
m&p-Xylene	0.43	140	3.1	3.5	3.5	2.8	2.9
o-Xylene	0.43	140	1.5	1.7	1.6	1.3	1.4
1,1,2,2-Tetrachloroethane	0.69	0.36					

Analyte exceeds PADEP Residential MSCs for Indoor Air Criteria:

Compound is identified as having potentially higher indoor air background concentrations than the risk-based targets

J Samples analyzed by EPA laboratory, not Air Toxics, Inc.

J Analyte present. Reported values may not be accurate or precise.

RL Reporting Limit

Notes:

OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison
 Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples

Sources:

Pennsylvania Department of Environmental Protection (PADEP), 2004. Land Recycling Program Technical Guidance Manual-Section IV.A.4. Vapor Intrusion into Buildings from Groundwater under the Act 2 Statewide Health Standard. 253-0300-100. Bureau of Land Recycling and Waste Management. January 24.

TABLE 6

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO PADEP RESIDENTIAL MSCs FOR INDOOR AIR CRITERIA
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 2 OF 6**

Sample Number: Field QC:		PADEP Residential Medium Specific Concentrations (MSCs) for Indoor Air Criteria	R02-IA-20071026 10/26/2007 1.68 1	R02-OA-20071026 10/26/2007 1.96 0.1	R02-SG-20071119 † 11/19/2007 5 0.1	DUP-04-20071119 † Field Dup. of R02-SG-20071119 11/19/2007 5 0.1
Volatiles Compound	RL	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³
Vinyl Chloride	0.26	2.4				
1,3-Butadiene	0.22	0.67	0.48			1.1
Trichlorofluoromethane (F11)	0.56	970	3.4	0.12		
1,1-Dichloroethene	0.40	280				
Trans-1,2-Dichloroethene	0.40	97				
Cis-1,2-Dichloroethene	0.40	49				
Chloroform	0.49	0.44 **				
1,1,1-Trichloroethane	0.54	2900				
Carbon Tetrachloride	0.63	1.4 **				
1,2-Dichloroethane	0.40	0.81				
Trichloroethene	0.54	12				
Toluene	0.38	560	2		1.3	1.4
Tetrachloroethene	0.68	36 **				
Ethyl Benzene	0.43	19				
m&p-Xylene	0.43	140	0.86			
o-Xylene	0.43	140				
1,1,2,2-Tetrachloroethane	0.69	0.36				

Analyte exceeds PADEP Residential MSCs for Indoor Air Criteria

** Compound is identified as having potentially higher indoor air background concentrations than the risk-based targets

† Samples analyzed by EPA laboratory, not Air Toxics, Inc.

J Analyte present. Reported values may not be accurate or precise.

RL Reporting Limit

Notes:

OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison
Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples

Sources:

Pennsylvania Department of Environmental Protection (PADEP), 2004. Land Recycling Program Technical Guidance Manual Section IV.A.4. Vapor Intrusion into Buildings from Groundwater under the Act 2 Statewide Health Standard: 253-0300-100. Bureau of Land Recycling and Waste Management. January 24.

TABLE 5

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO PADEP RESIDENTIAL MSCs FOR INDOOR AIR CRITERIA
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 3 OF 6**

Sample Number Field OC	PADEP Residential Medium Specific Concentrations (MSCs) for Indoor Air Criteria	R03-IA-20071026 10/26/2007 1.68	R03-OA-20071026 10/26/2007 1.64	R03-SG-20071026 FieldDup.of DUP-03-20071026 10/26/2007 1.68	DUP-03-20071026 FieldDup.of R03-SG-20071026 10/26/2007 1.68
Dilution Factor		1	0.1	0.1	0.1
Dilution Attenuation Factor					
Volatile Compound	RL	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Vinyl Chloride	0.26	2.4			
1,3-Butadiene	0.22	0.67		1	0.99
Trichlorofluoromethane (F11)	0.56	970	4.3	0.13	0.29
1,1-Dichloroethene	0.40	280			
Trans-1,2-Dichloroethene	0.40	97		NA	NA
Cis-1,2-Dichloroethene	0.40	49			
Chloroform	0.49	0.44 **			
1,1,1-Trichloroethane	0.54	2900			
Carbon Tetrachloride	0.63	1.4 **			
1,2-Dichloroethane	0.40	0.81			
Trichloroethene	0.54	12		1.4	1:1
Toluene	0.38	560	6.3	1	1.1
Tetrachloroethene	0.68	36 **	1.4		
Ethyl Benzene	0.43	19		0.48	0.67
m&p-Xylene	0.43	140	1	1.4	2.2
o-Xylene	0.43	140		0.73	1.2
1,1,2,2-Tetrachloroethane	0.69	0.36			

Analyte exceeds PADEP Residential MSCs for Indoor Air Criteria.

Compound is identified as having potentially higher indoor air background concentrations than the risk-based targets.

† Samples analyzed by EPA laboratory, not Air Toxics, Inc.

J Analyte present. Reported values may not be accurate or precise.

RL Reporting Limit

Notes:

OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison.

Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples.

Sources:

Pennsylvania Department of Environmental Protection (PADEP), 2004. Land Recycling Program Technical Guidance Manual-Section IV.A.4: Vapor Intrusion into Buildings from Groundwater under the Act 2 Statewide Health Standard. 253-0300-100. Bureau of Land Recycling and Waste Management, January 24.

TABLE 5

**RESIDENTIAL VAPOR INTRUSION STUDY, SAMPLE RESULTS COMPARED TO PADEP RESIDENTIAL MSCs FOR INDOOR AIR CRITERIA
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 4 OF 6**

Sample Number: Field QC	PADEP Residential Medium Specific Concentrations (MSCs) for Indoor Air Criteria	R06-SV1-20071025 10/25/2007 1.44 0.1	R06-SV2-20071025 10/25/2007 1.52 0.1	R06-SV3-20071025 FieldDup.of DUP-01-20071025 10/25/2007 1.44 0.1	DUP-01-20071025 FieldDup.of R06-SV3-20071025 10/25/2007 1.41 0.1	R06-SV4-20071025 10/25/2007 1.44 0.1
Volatile Compound	RL	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Vinyl Chloride	0.26	2.4				
1,3-Butadiene	0.22	0.67				
Trichlorofluoromethane (F11)	0.56	970	1.3	0.72	6	5.6 J
1,1-Dichloroethene	0.40	280			0.25	0.14
Trans-1,2-Dichloroethene	0.40	97				
Cis-1,2-Dichloroethene	0.40	49				
Chloroform	0.49	0.44 **		0.1	0.076	0.075
1,1,1-Trichloroethane	0.54	2900				0.11
Carbon Tetrachloride	0.63	1.4 **				
1,2-Dichloroethane	0.40	0.81				
Trichloroethene	0.54	12	0.4	0.28	0.25	0.15
Toluene	0.38	560	1.6	1.3	1	4.9
Tetrachloroethene	0.68	36. **	0.13	0.14	0.12	0.15
Ethyl Benzene	0.43	19	0.94	0.96	0.92	1.3
m&p-Xylene	0.43	140	3.7	3.7	3.7	5.4
o-Xylene	0.43	140	1.6	1.8	1.7	2.2
1,1,2,2-Tetrachloroethane	0.69	0.36				

Analyte exceeds PADEP Residential MSCs for Indoor Air Criteria

** Compound is identified as having potentially higher indoor air background concentrations than the risk-based targets

† Samples analyzed by EPA laboratory, not Air Toxics, Inc.

J Analyte present. Reported values may not be accurate or precise.

RL Reporting Limit

Notes:

OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison
Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples

Sources:

Pennsylvania Department of Environmental Protection (PADEP), 2004. Land Recycling Program Technical Guidance Manual-Section IV.A.4. Vapor Intrusion into Buildings from Groundwater under the Act 2 Statewide Health Standard. 253-0300-100. Bureau of Land Recycling and Waste Management. January 24.

TABLE 5

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO PADEP RESIDENTIAL MSCs FOR INDOOR AIR CRITERIA
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 5 OF 6**

Sample Number: Field OC:		PADEP Residential Medium Specific Concentrations (MSCs) for Indoor Air Criteria	R07A-IA-20071023 10/23/2007 1.79	R07A-OA-20071023 10/23/2007 1.75 0.1	R07A-SG-20071023 10/23/2007 1.75 0.1
Dilution Factor: Dilution Attenuation Factor:					
Volatiles Compound	RL	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Vinyl Chloride	0.26	2.4			
1,3-Butadiene	0.22	0.67	0.78		
Trichlorofluoromethane (F11)	0.56	970	1.4 J	0.13 J	0.31 J
1,1-Dichloroethene	0.40	280			
Trans-1,2-Dichloroethene	0.40	97			
Cis-1,2-Dichloroethene	0.40	49			
Chloroform	0.49	0.44 **			
1,1,1-Trichloroethane	0.54	2900			
Carbon Tetrachloride	0.63	1.4 **			
1,2-Dichloroethane	0.40	0.81			
Trichloroethene	0.54	12		0.13	0.66
Toluene	0.38	560	3.9	0.13	1.6
Tetrachloroethene	0.68	36 **			0.22
Ethyl Benzene	0.43	19			1.4
m&p-Xylene	0.43	140	1.1		5.2
o-Xylene	0.43	140			2.3
1,1,2,2-Tetrachloroethane	0.69	0.36			

Analyte exceeds PADEP Residential MSCs for Indoor Air Criteria

- ** Compound is identified as having potentially higher indoor air background concentrations than the risk-based targets
 † Samples analyzed by EPA laboratory, not Air Toxics, Inc.
 J Analyte present. Reported values may not be accurate or precise.
 RL Reporting Limit

Notes:

OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison.
 Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples.

Sources:

Pennsylvania Department of Environmental Protection (PADEP), 2004. Land Recycling Program Technical Guidance Manual Section IV.A.4. Vapor Intrusion into Buildings from Groundwater under the Act 2 Statewide Health Standard. 253-0300-100. Bureau of Land Recycling and Waste Management. January 24.

TABLE 5

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO PADEP RESIDENTIAL MSCs FOR INDOOR AIR CRITERIA
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 6 OF 6**

Sample Number: Field QC:		PADEP Residential Medium Specific Concentrations (MSCs) for Indoor Air Criteria	R07B-SV1-20071023 10/23/2007 1.46 0.1	R07B-SV2-20071023 10/23/2007 1.39 0.1	AMB-BG-20071026 10/26/2007 2.51 0.1
Date Sampled:					
Dilution Factor:					
Dilution Attenuation Factor:					
Volatile Compound	RL	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Vinyl Chloride	0.26	2.4			
1,3-Butadiene	0.22	0.67			
Trichlorofluoromethane (F11)	0.56	970	0.19 J	0.19 J	
1,1-Dichloroethene	0.40	280			
Trans-1,2-Dichloroethene	0.40	97			
Cis-1,2-Dichloroethene	0.40	49	0.1		
Chloroform	0.49	0.44 **		0.072	
1,1,1-Trichloroethane	0.54	2900		0.23	
Carbon Tetrachloride	0.63	1.4 **			
1,2-Dichloroethane	0.40	0.81			
Trichloroethene	0.54	12	2.4	9.8	
Toluene	0.38	560	3	3.2	
Tetrachloroethene	0.68	36 **	0.2	0.21	
Ethyl Benzene	0.43	19	1.3	1.1	
m&p-Xylene	0.43	140	5	4.6	
o-Xylene	0.43	140	2.2	2	
1,1,2,2-Tetrachloroethane	0.69	0.36			

- Analyte exceeds PADEP Residential MSCs for Indoor Air Criteria
 ** Compound is identified as having potentially higher indoor air background concentrations than the risk-based targets
 † Samples analyzed by EPA laboratory, not Air Toxics, Inc.
 J Analyte present. Reported values may not be accurate or precise.
 RL Reporting Limit

Notes:

OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison
 Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples

Sources:

Pennsylvania Department of Environmental Protection (PADEP), 2004. Land Recycling Program Technical Guidance Manual-Section IV.A.4. Vapor Intrusion into Buildings from Groundwater under the Act 2 Statewide Health Standard. 253-0300-100. Bureau of Land Recycling and Waste Management. January 24.

TABLE 6

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO CalEPA CHHSLs FOR RESIDENTIAL LAND USE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 1 OF 6**

Sample Number :		California EPA Human Health Screening Levels (CHHSLs) for Residential Land Use		R01-SV1-20071025	R01-SV2-20071025	R01-SV3-20071025	R01-SV4-20071025	DUP-02-20071025
Field QC :							FieldDup of DUP-02-20071025	FieldDup of R01-SV4-20071025
Date Sampled :				10/25/2007	10/25/2007	10/25/2007	10/25/2007	10/25/2007
Dilution Factor :				1.44	1.44	1.49	1.61	1.58
Dilution Attenuation Factor :				0.1	0.1	0.1	0.1	0.1
Volatile Compound	RL	Indoor Air	Shallow Soil Gas	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Vinyl Chloride*	0.26	0.0311	13.3					
1,3-Butadiene	0.22							
Trichlorofluoromethane (F11)	0.56			0.41	0.49	0.52	0.38	0.42
1,1-Dichloroethene	0.40							
Trans-1,2-Dichloroethene	0.40	73	31,900					
Cis-1,2-Dichloroethene	0.40	36.5	15,900					
Chloroform	0.49			0.15		0.14		
1,1,1-Trichloroethane	0.54	2,290	991,000					
Carbon Tetrachloride	0.63	0.0579	25.1					
1,2-Dichloroethane	0.40	0.116	49.6					
Trichloroethene	0.54	1.22	528	0.56	0.54	0.51	0.26	0.18
Toluene	0.38	313	135,000	1.1	0.77	0.84	0.71	0.61
Tetrachloroethene	0.68	0.412	180	0.63	0.63	1.2	0.4	0.47
Ethyl Benzene	0.43	Postponed	Postponed	0.82	0.91	0.9	0.7	0.7
m&p-Xylene	0.43	730	317,000	3.1	3.5	3.5	2.8	2.9
o-Xylene	0.43	730	315,000	1.5	1.7	1.6	1.3	1.4
1,1,2,2-Tetrachloroethane	0.69							

Analyte exceeds CalEPA CHHSLs for residential land use

† Samples analyzed by EPA laboratory, not Air Toxics, Inc.

J Analyte present. Reported values may not be accurate or precise.

RL Reporting Limit

Notes:

OA samples have been adjusted for the same attenuation factor, that was used for soil gas samples (10%) to allow for direct comparison

Attenuation factor of 10% applied to SV, OA, and AMB-BG samples

SV: IA, OA, and AMB-BG samples were compared to CHHSLs for Indoor Air

SG samples were compared to CHHSLs for Shallow Soil Gas

Sources:

California Environmental Protection Agency (CalEPA), 2005. Use of Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties

Department of Toxic Substances Control, Sacramento, California, January.

TABLE 6

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO Ca/EPA CHHSLs FOR RESIDENTIAL LAND USE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 2 OF 6**

Sample Number: Field QC		California EPA Human Health Screening Levels (CHHSLs) for Residential Land Use		R02-IA-20071026	R02-OA-20071026	R02-SG-20071119	DUP-04-20071119
Date Sampled				10/26/2007	10/26/2007	11/19/2007	11/19/2007
Dilution Factor				1.68	1.96	5	5
Dilution Attenuation Factor				1	0.1	1	1
Volatile Compound	RL	µg/m ³		µg/m ³	µg/m ³	µg/m ³	µg/m ³
Vinyl Chloride	0.26	0.0311	13.3				
1,3-Butadiene	0.22			0.48		10	11
Trichlorofluoromethane (F11)	0.56			3.4	0.12		
1,1-Dichloroethene	0.40						
Trans-1,2-Dichloroethene	0.40	73	31,900				
Cis-1,2-Dichloroethene	0.40	36.5	15,900				
Chloroform	0.49						
1,1,1-Trichloroethane	0.54	2,290	991,000				
Carbon Tetrachloride	0.63	0.058	25.1				
1,2-Dichloroethane	0.40	0.116	49.6				
Trichloroethene	0.54	1,220	528				
Toluene	0.38	313	135,000	2		13	14
Tetrachloroethene	0.68	0.412	180				
Ethyl Benzene	0.43	Postponed	Postponed				
m&p-Xylene	0.43	730	317,000	0.86			
o-Xylene	0.43	730	315,000				
1,1,2,2-Tetrachloroethane	0.69						

- † Analyte exceeds Ca/EPA CHHSLs for residential land use
- † Samples analyzed by EPA laboratory, not Air Toxics, Inc.
- J Analyte present. Reported values may not be accurate or precise.
- RL Reporting Limit

Notes:

- OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison
- Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples
- SV, IA, OA, and AMB-BG samples were compared to CHHSLs for Indoor Air
- SG samples were compared to CHHSLs for Shallow Soil Gas

Sources:

- California Environmental Protection Agency (Ca/EPA), 2005. Use of Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties. Department of Toxic Substances Control, Sacramento, California, January.

TABLE 6

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO CalEPA CHHSLs FOR RESIDENTIAL LAND USE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 3 OF 6**

Sample Number Field QC		California EPA Human Health Screening Levels (CHHSLs) for Residential Land Use		R03-IA-20071026 10/26/2007	R03-OA-20071026 10/26/2007	R03-SG-20071026 FieldDup of DUP-03-20071026 10/26/2007	DUP-03-20071026 FieldDup of R03-SG-20071026 10/26/2007
Date Sampled		Dilution Factor		1.68	1.64	1.68	1.68
Dilution Attenuation Factor		Indoor Air	Shallow Soil Gas	1	0.1	1	1
Volatile Compound	RL	µg/m ³		µg/m ³	µg/m ³	µg/m ³	µg/m ³
Vinyl Chloride*	0.26	0.0311	13.3				
1,3-Butadiene	0.22					10	9.9
Trichlorofluoromethane (F11)	0.56			4.3	0.13	2.9	2.7
1,1-Dichloroethene	0.40						
Trans-1,2-Dichloroethene	0.40	73	31,900		NA	NA	
Cis-1,2-Dichloroethene	0.40	36.5	15,900				
Chloroform	0.49						
1,1,1-Trichloroethane	0.54	2,290	991,000				
Carbon Tetrachloride	0.63	0.058	25.1				
1,2-Dichloroethane	0.40	0.116	49.6				
Trichloroethane	0.54	1,220	528			14	11
Toluene	0.38	313	135,000	6.3		10	11
Tetrachloroethene	0.68	0.412	180	1.4			
Ethyl Benzene	0.43	Postponed	Postponed			4.8	6.7
m&p-Xylene	0.43	730	317,000	1		14	22
o-Xylene	0.43	730	315,000			7.3	12
1,1,2,2-Tetrachloroethane	0.69						

Analyte exceeds CalEPA CHHSLs for residential land use

- † Samples analyzed by EPA laboratory, not Air Toxics, Inc.
 J Analyte present. Reported values may not be accurate or precise.
 RL Reporting Limit

Notes:

OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison
 Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples
 SV, IA, OA, and AMB-BG samples were compared to CHHSLs for Indoor Air
 SG samples were compared to CHHSLs for Shallow Soil Gas

Sources:

California Environmental Protection Agency (CalEPA), 2005. Use of Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties.
 Department of Toxic Substances Control, Sacramento, California. January.

TABLE 6

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO CalEPA CHHSLs FOR RESIDENTIAL LAND USE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 4 OF 6**

Sample Number: Field QC		California EPA Human Health Screening Levels (CHHSLs) for Residential Land Use		R06-SV1-20071025	R06-SV2-20071025	R06-SV3-20071025	DUP-01-20071025	R06-SV4-20071025
Date Sampled:				10/25/2007	10/25/2007	10/25/2007	10/25/2007	10/25/2007
Dilution Factor:				1.44	1.52	1.44	1.41	1.44
Dilution Attenuation Factor:				0.1	0.1	0.1	0.1	0.1
Volatle Compound	RL	µg/m ³		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³
Vinyl Chloride*	0.26	0.0311	13.3					
1,3-Butadiene	0.22							
Trichlorofluoromethane (F11)	0.56			1.3	0.72	6	5.6 J	5.5
1,1-Dichloroethene*	0.40					0.25	0.14	
Trans-1,2-Dichloroethene	0.40	73	31,900					
Cis-1,2-Dichloroethene	0.40	36.5	15,900					
Chloroform	0.49				0.1	0.076	0.075	0.11
1,1,1-Trichloroethane	0.54	2,290	991,000					
Carbon Tetrachloride	0.63	0.058	25.1					
1,2-Dichloroethane	0.40	0.116	49.6					
Trichloroethene	0.54	1,220	528	0.4	0.28	0.25	0.15	0.22
Toluene	0.38	313	135,000	1.6	1.3	1	4.9	2.2
Tetrachloroethene	0.68	0.412	180	0.13	0.14	0.12		0.15
Ethyl Benzene	0.43	Postponed	Postponed	0.94	0.96	0.92	1.3	0.99
m&p-Xylene	0.43	730	317,000	3.7	3.7	3.7	5.4	3.9
o-Xylene	0.43	730	315,000	1.6	1.8	1.7	2.2	1.9
1,1,2,2-Tetrachloroethane	0.69							

Analyte exceeds CalEPA CHHSLs for residential land use

† Samples analyzed by EPA laboratory, not Air Toxics, Inc.

J Analyte present. Reported values may not be accurate or precise.

RL Reporting Limit

Notes:

OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison.

Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples.

SV, IA, OA† and AMB-BG samples were compared to CHHSLs for Indoor Air.

SG samples were compared to CHHSLs for Shallow Soil Gas.

Sources:

California Environmental Protection Agency (CalEPA), 2005. Use of Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties.

Department of Toxic Substances Control, Sacramento, California, January.

TABLE 6

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO CalEPA CHHSLs FOR RESIDENTIAL LAND USE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 5 OF 6**

Sample Number		California EPA Human Health Screening Levels (CHHSLs) for Residential Land Use		R07A-IA-20071023	R07A-OA-20071023	R07A-SG-20071023
Field QC:				10/23/2007	10/23/2007	10/23/2007
Date Sampled:				1.79	1.75	1.75
Dilution Factor				1	0.1	1
Dilution Attenuation Factor						
Volatile Compound	RL	Indoor Air µg/m ³	Shallow Soil Gas µg/m ³	µg/m ³	µg/m ³	µg/m ³
Vinyl Chloride*	0.26	0.0311	13.3**			
1,3-Butadiene	0.22			0.78		
Trichlorofluoromethane (F11)	0.56			1.4	0.13	3.1
1:1-Dichloroethene	0.40					
Trans-1,2-Dichloroethene	0.40	73	31,900			
Cis-1,2-Dichloroethene	0.40	36.5	15,900			
Chloroform	0.49					
1,1,1-Trichloroethane	0.54	2290	991,000			
Carbon Tetrachloride	0.63	0.0579	25.1			
1,2-Dichloroethane	0.40	0.116	49.6			
Trichloroethene	0.54	1.22	528		0.13	6.6
Toluene	0.38	313	135,000	3.9	0.13	16
Tetrachloroethene	0.68	0.412	180			2.2
Ethyl Benzene	0.43	Postponed	Postponed			14
m&p-Xylene	0.43	730	317,000	1.1		52
o-Xylene	0.43	730	315,000			23
1,1,2,2-Tetrachloroethane	0.69					

Analyte exceeds CalEPA CHHSLs for residential land use

† Samples analyzed by EPA laboratory, not Air Toxics, Inc.

J Analyte present. Reported values may not be accurate or precise.

RL Reporting Limit

Notes:

OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison.

Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples.

SV, IA, OA, and AMB-BG samples were compared to CHHSLs for Indoor Air.

SG samples were compared to CHHSLs for Shallow Soil Gas.

Sources:

California Environmental Protection Agency (CalEPA), 2005. Use of Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties.

Department of Toxic Substances Control, Sacramento, California, January.

TABLE 6

**RESIDENTIAL VAPOR INTRUSION STUDY SAMPLE RESULTS COMPARED TO CaEPA CHHSLs FOR RESIDENTIAL LAND USE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 6 OF 8**

Sample Number: Field QC:		California EPA Human Health Screening Levels (CHHSLs) for Residential Land Use		R07B-SV1-20071023	R07B-SV2-20071023	AMB-BG-20071026
Date Sampled:				10/23/2007	10/23/2007	10/26/2007
Dilution Factor:				1.46	1.39	2.51
Dilution Attenuation Factor:		Indoor Air	Shallow Soil Gas			
Volatile Compound		RL	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
Vinyl Chloride†	0.26	0.0311	13.3			
1,3-Butadiene	0.22					
Trichlorofluoromethane (F11)	0.56			0.19	J	0.19
1,1-Dichloroethene	0.40					
Trans-1,2-Dichloroethene	0.40	73	31,900			
Cis-1,2-Dichloroethene	0.40	36.5	15,900	0.1		
Chloroform	0.49				0.072	
1,1,1-Trichloroethane	0.54	2,290	991,000		0.23	
Carbon Tetrachloride	0.63	0.058	25.1			
1,2-Dichloroethane	0.40	0.116	49.6			
Trichloroethene	0.54	1,220	528	2.4	9.0	
Toluene	0.38	313	135,000	3	3.2	
Tetrachloroethene	0.68	0.412	180	0.2	0.21	
Ethyl Benzene	0.43	Postponed	Postponed	1.3	1.1	
m&p-Xylene	0.43	730	317,000	5	4.6	
o-Xylene	0.43	730	315,000	2.2	2	
1,1,2,2-Tetrachloroethane	0.69					

Analyte exceeds CaEPA CHHSLs for residential land use

† Samples analyzed by EPA laboratory, not Air Toxics, Inc.

J Analyte present. Reported values may not be accurate or precise.

RL Reporting Limit

Notes:

OA samples have been adjusted for the same attenuation factor that was used for soil gas samples (10%) to allow for direct comparison.

Attenuation factor of 10% applied to SG, SV, OA, and AMB-BG samples

SV, IA, OA, and AMB-BG samples were compared to CHHSLs for Indoor Air.

SG samples were compared to CHHSLs for Shallow Soil Gas

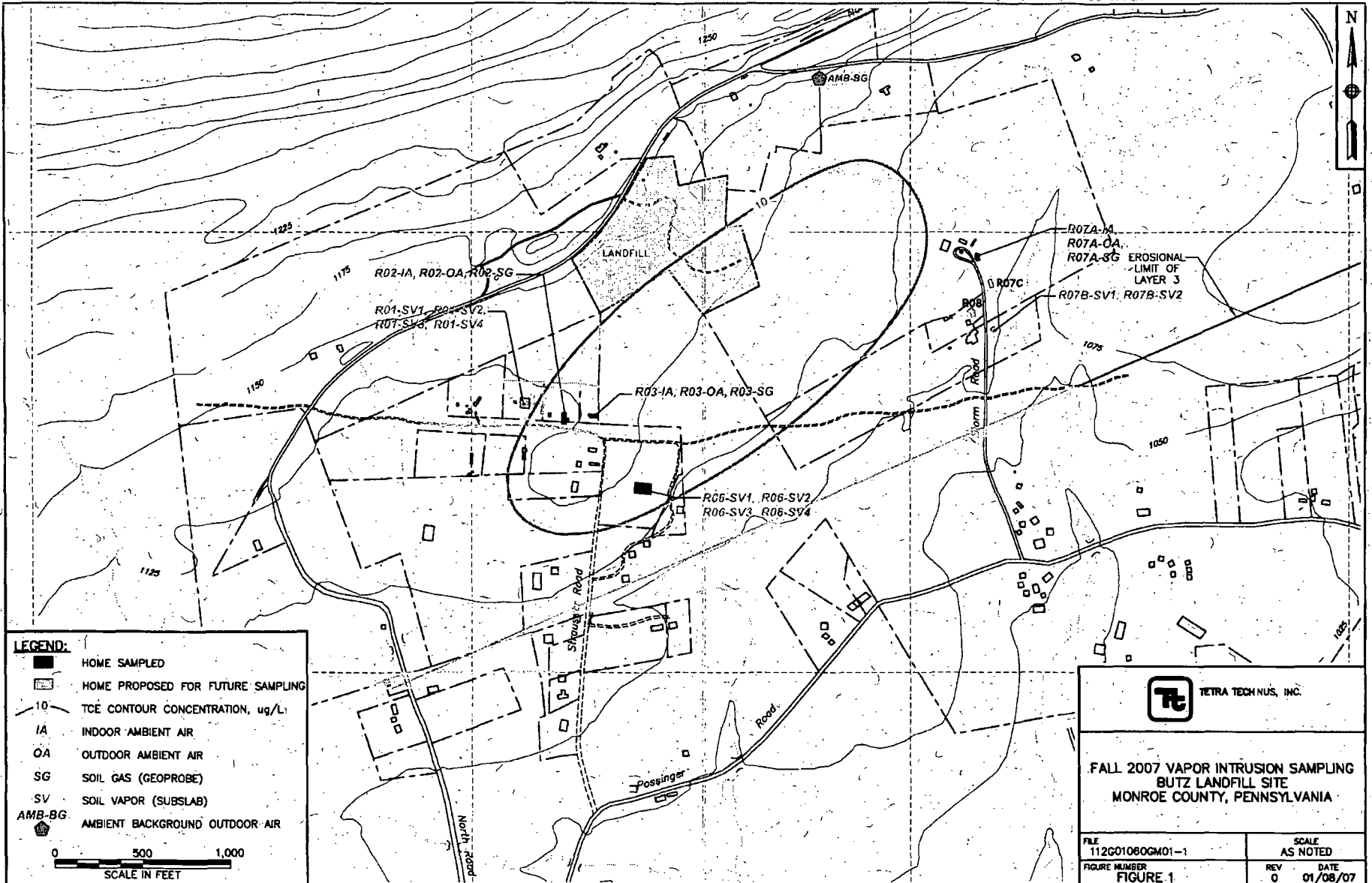
Sources:

California Environmental Protection Agency (CaEPA), 2005. Use of Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties.

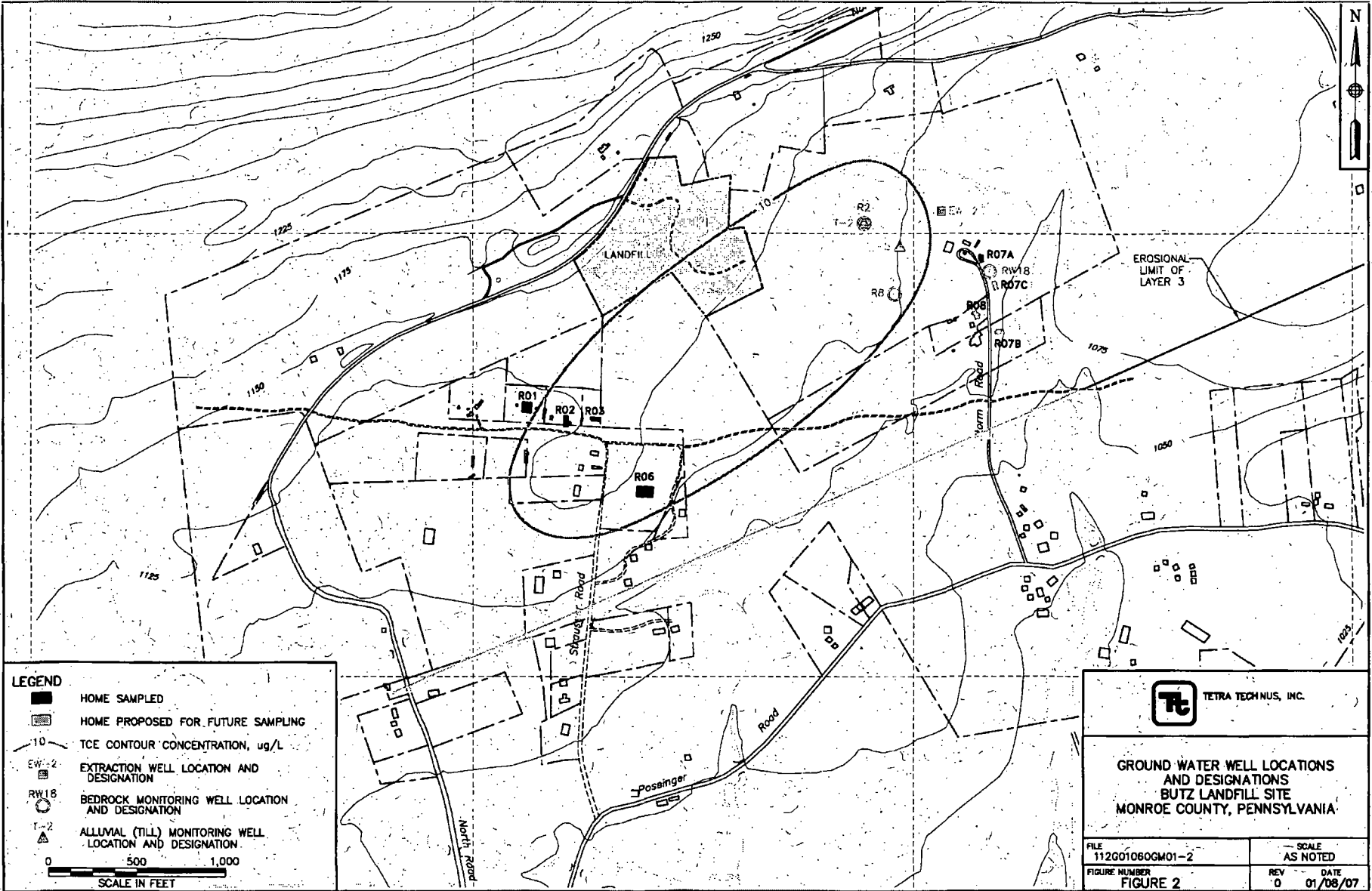
Department of Toxic Substances Control, Sacramento, California. January.

FIGURES

112G01080/1010/11201080GM01-1.DWG 01/08/07 MMS



112G01060/1010/112G01060GM01-2.DWG 01/08/07 MKR



LEGEND

- HOME SAMPLED
- HOME PROPOSED FOR FUTURE SAMPLING
- 10 TCE CONTOUR CONCENTRATION, $\mu\text{g/L}$
- EW-2 EXTRACTION WELL LOCATION AND DESIGNATION
- RW18 BEDROCK MONITORING WELL LOCATION AND DESIGNATION
- T-2 ALLUVIAL (TILL) MONITORING WELL LOCATION AND DESIGNATION

0 500 1,000
SCALE IN FEET

TT TETRA TECHNUS, INC.

**GROUND WATER WELL LOCATIONS AND DESIGNATIONS
BUTZ LANDFILL SITE
MONROE COUNTY, PENNSYLVANIA**

FILE 112G01060GM01-2	SCALE AS NOTED
FIGURE NUMBER FIGURE 2	REV DATE 0 01/08/07

APPENDIX A

OCCUPIED DWELLING QUESTIONNAIRES

CONFIDENTIAL

OCCUPIED DWELLING QUESTIONNAIRE

Indoor Air Assessment Survey

Date: 10/25/07

1. Name: John Delia

Address: P.O. Box 121

Readers, PA 18352

Home Phone: (201) 489-2507 ^{Cell} Work Phone: (201) 803-6923

2. What is the best time to call to speak with you? Anytime ^{Cell} At: ~~Work~~ or Home ?
_{after 7pm}

3. Are you the Owner , Renter , Other (please specify) _____
of this Home/Structure?

4. Total number of occupants/persons at this location? 2
Number of children? 2 Ages? 14, 18

5. How long have you lived at this location? 1.5 yr.

General Home Description

6. Type of Home/Structure (check only one): Single Family Home , Duplex ,
Condominium , Townhouse , Other _____

7. Home/Structure Description: number of floors 1
Basement? Yes No
Crawl Space? Yes No
If Yes, under how much of the house's area? 100%

8. Age of Home/Structure: 1.5 years, Not sure/Unknown

9. General Above-Ground Home/Structure construction (check all that apply):
Wood , Brick , Concrete , Cement block , Other _____

10. Foundation Construction (check all that apply):
Concrete slab
Fieldstone
Concrete block

- Elevation above ground/grade
 Other _____
11. What is the source of your drinking water (check all that apply)?
 Public water supply
 Private well
 Bottled water
 Other please specify _____
12. Do you have a private well for purposes other than drinking?
 Yes No
 If yes, please describe what you use the well for:

13. Do you have a septic system? Yes No Not used Unknown
14. Do you have standing water outside your home (pond, ditch, swale)? Yes No

Basement Description, please check appropriate boxes.
If you do not have a basement go to question 23.

15. Is the basement finished or unfinished ?
16. If finished, how many rooms are in the basement? _____
 How many are used for more than 2 hours/day? _____
17. Is the basement floor (check all that apply) concrete , tile , carpeted , dirt , other (describe) _____?
18. Are the basement walls poured concrete , cement block , stone , wood , brick , other _____?
19. Does the basement have a moisture problem (check one only)?
 Yes, frequently (3 or more times/yr)
 Yes, occasionally (1-2 times/yr)
 Yes, rarely (less than 1 time/yr)
 No
20. Does the basement ever flood (check one only)?
 Yes, frequently (3 or more times/yr)
 Yes, occasionally (1-2 times/yr)
 Yes, rarely (less than 1 time/yr)
 No
21. Does the basement have any of the following? (check all that apply) Floor cracks ,
 Wall cracks , Sump , Floor drain , Other hole/opening in floor
 (describe) _____

*Damp → high humidity
 85-90%*

22. Are any of the following used or stored in the basement (check all that apply)
 Paint Paint stripper/remover Paint thinner
 Metal degreaser/cleaner Gasoline Diesel fuel Solvents Glue
 Laundry spot removers Drain cleaners Pesticides
23. Have you recently (within the last six months) done any painting or remodeling in your home? Yes No
 If yes, please specify what was done, where in the home, and what month:

24. Have you installed new carpeting in your home within the last year? Yes No
 If yes, when and where? _____
25. Do you regularly use or work in a dry cleaning service (check only one box)?
 Yes, use dry-cleaning regularly (at least weekly)
 Yes, use dry-cleaning infrequently (monthly or less)
 Yes, work at a dry cleaning service
 No
26. Does anyone in your home use solvents at work?
 Yes If yes, how many persons _____
 No If no, go to question 28
27. If yes for question 26 above, are the work clothes washed at home? Yes No
28. Where is the washer/dryer located?
 Basement
 Upstairs utility room
 Kitchen
 Garage
 Use a Laundromat
 Other, please specify _____
29. If you have a dryer, is it vented to the outdoors? Yes No
30. What type(s) of home heating do you have (check all that apply)
 Fuel type: Gas , Oil , Electric , Wood , Coal , Other _____
 Heat conveyance system: Forced hot air
 Forced hot water
 Steam
 Radiant floor heat
 Wood stove
 Coal furnace
 Fireplace
 Other electric baseboard

31. Do you have air conditioning? Yes No . If yes, please check the appropriate type(s)
 Central air conditioning
 Window air conditioning unit(s) *wall units*
 Other , please specify _____
32. Do you use any of the following? Room fans , Ceiling fans , Attic fan
 Do you ventilate using the fan-only mode of your central air conditioning or forced air heating system? Yes No
33. Has your home had termite or other pesticide treatment: Yes No Unknown
 If yes, please specify type of pest controlled, _____
 and approximate date of service _____
34. Water Heater Type: Gas , Electric , By furnace , Other

 Water heater location: Basement , Upstairs utility room , Garage , Other (please describe) _____
35. What type of cooking appliance do you have? Electric , Gas , Other

36. Is there a stove exhaust hood present? Yes No
 Does it vent to the outdoors? Yes No
37. Smoking in Home:
 None Rare (only guests) , Moderate (residents light smokers) ,
 Heavy (at least one heavy smoker in household)
38. If yes to above, what do they smoke?
 Cigarettes Cigars
 Pipe Other
39. Do you regularly use air fresheners? Yes No
40. Does anyone in the home have indoor home hobbies of crafts involving: None
 Heating , soldering , welding , model glues , paint , spray paint,
 wood finishing , Other Please specify what type of hobby: _____
41. General family/home use of consumer products (please circle appropriate): Assume that
 Never = never used, Hardly ever = less than once/month, Occasionally = about
 once/month, Regularly = about once/week, and Often = more than once/week.

Product	Frequency of Use				
	Never	Hardly ever	Occasionally	Regularly	Often
Spray-on deodorant	Never				

Aerosol deodorizers	Never	Hardly ever	Occasionally	Regularly	Often
Insecticides	Never	Hardly ever	Occasionally	Regularly	Often
Disinfectants	Never	Hardly ever	Occasionally	Regularly	Often

(Question 41, continued)

Product	Frequency of Use				
Window cleaners	Never	Hardly ever	Occasionally	Regularly	Often
Spray-on oven cleaners	Never	Hardly ever	Occasionally	Regularly	Often
Nail polish remover	Never	Hardly ever	Occasionally	Regularly	Often
Hair sprays	Never	Hardly ever	Occasionally	Regularly	Often

42. Please check weekly household cleaning practices:

- Dusting
- Dry sweeping
- Vacuuming
- Polishing (furniture, etc)
- Washing/waxing floors
- Other

43. Other comments: _____

only at home half of the week

OCCUPIED DWELLING QUESTIONNAIRE

Indoor Air Assessment Survey

Date: 10/26/07

1. Name: Robert + Kiyoko P. Kelly

Address: P.O. Box 61 Stratford Ca.

Reeders, PA 18352

Home Phone: (484) 892-4110 ^{Cell} Work Phone: (570) 656-0529

2. What is the best time to call to speak with you? 10-2 At: ^{Cell} Work or Home

3. Are you the Owner , Renter , Other (please specify) _____
of this Home/Structure?

4. Total number of occupants/persons at this location? 5
Number of children? 3 Ages? 17, 16, 11

5. How long have you lived at this location? 14

General Home Description

6. Type of Home/Structure (check only one): Single Family Home , Duplex ,
Condominium , Townhouse , Other

7. Home/Structure Description: number of floors 1
Basement? Yes No
Crawl Space? Yes No
If Yes, under how much of the house's area? _____%

8. Age of Home/Structure: 39 years, Not sure/Unknown

9. General Above-Ground Home/Structure construction (check all that apply):
Wood , Brick , Concrete , Cement block , Other

10. Foundation Construction (check all that apply):
Concrete slab
Fieldstone
Concrete block

Elevation above ground/grade

Other _____

11. What is the source of your drinking water (check all that apply)?

Public water supply

Private well

Bottled water

Other please specify _____

12. Do you have a private well for purposes other than drinking?

Yes No

If yes, please describe what you use the well for:

not used for anything

13. Do you have a septic system? Yes No Not used Unknown

14. Do you have standing water outside your home (pond, ditch, swale)? Yes No

Basement Description, please check appropriate boxes.

If you do not have a basement go to question 23.

15. Is the basement finished or unfinished ?

16. If finished, how many rooms are in the basement? _____

How many are used for more than 2 hours/day? _____

17. Is the basement floor (check all that apply) concrete , tile , carpeted , dirt , other (describe) _____?

18. Are the basement walls poured concrete , cement block , stone , wood , brick , other ?

19. Does the basement have a moisture problem (check one only)?

Yes, frequently (3 or more times/yr)

Yes, occasionally (1-2 times/yr)

Yes, rarely (less than 1 time/yr)

No

20. Does the basement ever flood (check one only)?

Yes, frequently (3 or more times/yr)

Yes, occasionally (1-2 times/yr)

Yes, rarely (less than 1 time/yr)

No

21. Does the basement have any of the following? (check all that apply) Floor cracks ,

Wall cracks , Sump , Floor drain , Other hole/opening in floor

(describe) _____

22. Are any of the following used or stored in the ^{porch} basement (check all that apply)
 Paint Paint stripper/remover Paint thinner
^{Kitchen} Metal degreaser/cleaner Gasoline Diesel fuel Solvents Glue
 Laundry spot removers Drain cleaners Pesticides ^{Kerosene}
23. Have you recently (within the last six months) done any painting or remodeling in your home? Yes No
 If yes, please specify what was done, where in the home, and what month:

24. Have you installed new carpeting in your home within the last year? Yes No
 If yes, when and where? _____
25. Do you regularly use or work in a dry cleaning service (check only one box)?
 Yes, use dry-cleaning regularly (at least weekly)
 Yes, use dry-cleaning infrequently (monthly or less)
 Yes, work at a dry cleaning service
 No
26. Does anyone in your home use solvents at work?
 Yes If yes, how many persons _____
 No If no, go to question 28.
27. If yes for question 26 above, are the work clothes washed at home? Yes No
28. Where is the washer/dryer located?
 Basement
 Upstairs utility room
 Kitchen
 Garage
 Use a Laundromat
 Other, please specify _____
29. If you have a dryer, is it vented to the outdoors? Yes No
30. What type(s) of home heating do you have (check all that apply)
 Fuel type: Gas , Oil , Electric , Wood , Coal , Other Kerosene
 Heat conveyance system: Forced hot air
 Forced hot water
 Steam
 Radiant floor heat
 Wood stove
 Coal furnace
 Fireplace
 Other _____

31. Do you have air conditioning? Yes No . If yes, please check the appropriate type(s)
 Central air conditioning
 Window air conditioning unit(s)
 Other , please specify _____
32. Do you use any of the following? Room fans , Ceiling fans , Attic fan
 Do you ventilate using the fan-only mode of your central air conditioning or forced air heating system? Yes No
33. Has your home had termite or other pesticide treatment: Yes No Unknown
 If yes, please specify type of pest controlled, _____
 and approximate date of service _____
34. Water Heater Type: Gas , Electric , By furnace , Other
 Kerosene *Sometimes kerosene vapors*
 Water heater location: Basement , Upstairs utility room , Garage , Other (please describe) *Bathroom*
35. What type of cooking appliance do you have? Electric , Gas , Other
36. Is there a stove exhaust hood present? Yes No
 Does it vent to the outdoors? Yes No
37. Smoking in Home:
 None Rare (only guests) , Moderate (residents light smokers) ,
 Heavy (at least one heavy smoker in household)
38. If yes to above, what do they smoke?
 Cigarettes Cigars
 Pipe Other
39. Do you regularly use air fresheners? Yes No
40. Does anyone in the home have indoor home hobbies of crafts involving: None
 Heating , soldering , welding , model glues , paint , spray paint,
 wood finishing , Other Please specify what type of hobby: _____
41. General family/home use of consumer products (please circle appropriate): Assume that
 Never = never used, Hardly ever = less than once/month, Occasionally = about
 once/month, Regularly = about once/week, and Often = more than once/week.

Product _____ Frequency of Use _____

Spray-on deodorant

Never

Hardly ever

Occasionally

Regularly

Often

Aerosol deodorizers	Never	Hardly ever	Occasionally	<u>Regularly</u>	Often
Insecticides	Never	<u>Hardly ever</u>	Occasionally	Regularly	Often
Disinfectants	Never	Hardly ever	Occasionally	<u>Regularly</u>	Often

(Question 41, continued)

<u>Product</u>	<u>Frequency of Use</u>				
Window cleaners	Never	Hardly ever	<u>Occasionally</u>	Regularly	Often
Spray-on oven cleaners	Never	<u>Hardly ever</u>	Occasionally	Regularly	Often
Nail-polish remover	<u>Never</u>	Hardly ever	Occasionally	Regularly	Often
Hair sprays	Never	Hardly ever	Occasionally	Regularly	<u>Often</u>

42. Please check weekly household cleaning practices:

- Dusting
- Dry sweeping
- Vacuuming
- Polishing (furniture, etc)
- Washing/waxing floors
- Other _____

43. Other comments: _____

have dry cleaning bags in the past.

135

OCCUPIED DWELLING QUESTIONNAIRE

Indoor Air Assessment Survey

Date: 10/26/07

- Name: Douglas + Sherry Jacoby
Address: P.O. Box 273
Reading, PA 18352
Home Phone: (570) 629 3883 Work Phone: N/A
- What is the best time to call to speak with you? 8-5 At: Work or Home
- Are you the Owner , Renter , Other (please specify) _____ of this Home/Structure?
- Total number of occupants/persons at this location? 2
Number of children? 2 Ages? 4, 12
- How long have you lived at this location? 32

General Home Description

- Type of Home/Structure (check only one): Single Family Home , Duplex , Condominium , Townhouse , Other
- Home/Structure Description: number of floors 1
Basement? Yes No
Crawl Space? Yes No
If Yes, under how much of the house's area? 100 %
- Age of Home/Structure: 8 years, Not sure/Unknown
- General Above-Ground Home/Structure construction (check all that apply):
Wood , Brick , Concrete , Cement block , Other
- Foundation Construction (check all that apply):
Concrete slab
Fieldstone pillars to mobile home
Concrete block

- Eleva above ground/grade
 Other _____
11. What is the source of your drinking water (check all that apply)?
 Public water supply
 Private well
 Bottled water
 Other please specify _____
12. Do you have a private well for purposes other than drinking?
 Yes No
 If yes, please describe what you use the well
 for: _____
13. Do you have a septic system? Yes No Not used Unknown
14. Do you have standing water outside your home (pond, ditch, swale)? Yes No

Basement Description, please check appropriate boxes.
If you do not have a basement go to question 23.

15. Is the basement finished or unfinished ?
16. If finished, how many rooms are in the basement? _____
 How many are used for more than 2 hours/day? _____
17. Is the basement floor (check all that apply) concrete , tile , carpeted , dirt ,
 other (describe) _____?
18. Are the basement walls poured concrete , cement block , stone , wood , brick ,
 other (describe) _____?
19. Does the basement have a moisture problem (check one only)?
 Yes, frequently (3 or more times/yr)
 Yes, occasionally (1-2 times/yr)
 Yes, rarely (less than 1 time/yr)
 No
20. Does the basement ever flood (check one only)?
 Yes, frequently (3 or more times/yr)
 Yes, occasionally (1-2 times/yr)
 Yes, rarely (less than 1 time/yr)
 No
21. Does the basement have any of the following? (check all that apply) Floor cracks ,
 Wall cracks , Sump , Floor drain , Other hole/opening in floor
 (describe) _____

22. Are any of the following used or stored in the basement (check all that apply)
 Paint Paint stripper/remover Paint thinner
 Metal degreaser/cleaner Gasoline Diesel fuel Solvents Glue
 Laundry spot removers Drain cleaners Pesticides
23. Have you recently (within the last six months) done any painting or remodeling in your home? Yes No
 If yes, please specify what was done, where in the home, and what month:

24. Have you installed new carpeting in your home within the last year? Yes No
 If yes, when and where? _____
25. Do you regularly use or work in a dry cleaning service (check only one box)?
 Yes, use dry-cleaning regularly (at least weekly)
 Yes, use dry-cleaning infrequently (monthly or less)
 Yes, work at a dry cleaning service
 No
26. Does anyone in your home use solvents at work?
 Yes If yes, how many persons 1
 No If no, go to question 28
27. If yes for question 26 above, are the work clothes washed at home? Yes No
28. Where is the washer/dryer located?
 Basement
 Upstairs utility room
 Kitchen
 Garage
 Use a Laundromat
 Other, please specify _____
29. If you have a dryer, is it vented to the outdoors? Yes No
30. What type(s) of home heating do you have (check all that apply)
 Fuel type: Gas , Oil , Electric , Wood , Coal , Other Boiler
 Heat conveyance system:
 Forced hot air
 Forced hot water
 Steam
 Radiant floor heat
 Wood stove
 Coal furnace
 Fireplace
 Other _____

31. Do you have air conditioning? Yes No . If yes, please check the appropriate type(s)
 Central air conditioning
 Window air conditioning unit(s)
 Other , please specify _____
32. Do you use any of the following? Room fans , Ceiling fans , Attic fan
 Do you ventilate using the fan-only mode of your central air conditioning or forced air heating system? Yes No
33. Has your home had termite or other pesticide treatment: Yes No Unknown
 If yes, please specify type of pest controlled, _____
 and approximate date of service _____
34. Water Heater Type: Gas , Electric , By furnace , Other

 Water heater location: Basement , Upstairs utility room , Garage , Other (please describe) _____
35. What type of cooking appliance do you have? Electric , Gas , Other

36. Is there a stove exhaust hood present? Yes No
 Does it vent to the outdoors? Yes No
37. Smoking in Home:
 None Rare (only guests) , Moderate (residents light smokers) ,
 Heavy (at least one heavy smoker in household)
38. If yes to above, what do they smoke?
 Cigarettes Cigars
 Pipe Other
39. Do you regularly use air fresheners? Yes No
40. Does anyone in the home have indoor home hobbies of crafts involving: None
 Heating , soldering , welding , model glues , paint , spray paint,
 wood finishing , Other Please specify what type of hobby: _____

41. General family/home use of consumer products (please circle appropriate): Assume that
 Never = never used, Hardly ever = less than once/month, Occasionally = about
 once/month, Regularly = about once/week, and Often = more than once/week.

Product	Frequency of Use				
Spray-on deodorant	Never	Hardly ever	Occasionally	Regularly	Often

Aerosol deodorizers	<u>Never</u>	Hardly ever	Occasionally	Regularly	Often
Insecticides	Never	<u>Hardly ever</u>	Occasionally	Regularly	Often
Disinfectants	<u>Never</u>	Hardly ever	Occasionally	Regularly	Often

(Question 41, continued)

Product	Frequency of Use				
Window cleaners	<u>Never</u>	Hardly ever	Occasionally	Regularly	Often
Spray-on oven cleaners	Never	<u>Hardly ever</u>	Occasionally	Regularly	Often
Nail polish remover	<u>Never</u>	Hardly ever	Occasionally	Regularly	Often
Hair sprays	Never	Hardly ever	Occasionally	<u>Regularly</u>	Often

42. Please check weekly household cleaning practices:

- Dusting
- Dry sweeping
- Vacuuming
- Polishing (furniture, etc)
- Washing/waxing floors
- Other _____

43. Other comments: _____

OCCUPIED DWELLING QUESTIONNAIRE

Indoor Air Assessment Survey

Date: 10/25/07

1. Name: Ed Strauser
Address: RR 3 Box 3324
Stroudsburg, PA 18360
Home Phone: 570 620 9023 ^{Cell} Work Phone: 570 242 0236
2. What is the best time to call to speak with you? Anytime At: ^{Cell} Work or Home ?
3. Are you the Owner , Renter , Other (please specify) _____
of this Home/Structure?
4. Total number of occupants/persons at this location? 3
Number of children? 0 Ages? _____
5. How long have you lived at this location? 17

General Home Description

6. Type of Home/Structure (check only one): Single Family Home , Duplex ,
Condominium , Townhouse , Other
7. Home/Structure Description: number of floors 1
Basement? Yes No
Crawl Space? Yes No
If Yes, under how much of the house's area? 100%
8. Age of Home/Structure: 7 years, Not sure/Unknown
9. General Above-Ground Home/Structure construction (check all that apply):
Wood , Brick , Concrete , Cement block , Other
10. Foundation Construction (check all that apply):
Concrete slab
Fieldstone
Concrete block

- Elevation above ground/grade
- Other _____
11. What is the source of your drinking water (check all that apply)?
 Public water supply
 Private well
 Bottled water
 Other please specify _____
12. Do you have a private well for purposes other than drinking?
 Yes No
 If yes, please describe what you use the well for: _____
13. Do you have a septic system? Yes No Not used Unknown
14. Do you have standing water outside your home (pond, ditch, swale)? Yes No

Basement Description, please check appropriate boxes.
 If you do not have a basement go to question 23.

15. Is the basement finished or unfinished ? *half finished / half woodwork only*
16. If finished, how many rooms are in the basement? 1
 How many are used for more than 2 hours/day? 0
17. Is the basement floor (check all that apply) concrete , tile , carpeted , dirt ,
 other (describe) hardwood over concrete?
18. Are the basement walls poured concrete , cement block , stone , wood , brick ,
 other
19. Does the basement have a moisture problem (check one only)?
 Yes, frequently (3 or more times/yr)
 Yes, occasionally (1-2 times/yr)
 Yes, rarely (less than 1 time/yr)
 No
20. Does the basement ever flood (check one only)?
 Yes, frequently (3 or more times/yr)
 Yes, occasionally (1-2 times/yr)
 Yes, rarely (less than 1 time/yr)
 No
21. Does the basement have any of the following? (check all that apply) Floor cracks ,
 Wall cracks , Sump , Floor drain , Other hole/opening in floor
 (describe) _____

22. Are any of the following used or stored in the basement (check all that apply)
 Paint Paint stripper/remover Paint thinner ^{wal} Glue
 Metal degreaser/cleaner Gasoline Diesel fuel Solvents
 Laundry spot removers Drain cleaners Pesticides
23. Have you recently (within the last six months) done any painting or remodeling in your home? Yes No
 If yes, please specify what was done, where in the home, and what month:
paint by in kitchen (1st floor) in late early (June 2007)
later 2007
24. Have you installed new carpeting in your home within the last year? Yes No
 If yes, when and where? _____
25. Do you regularly use or work in a dry cleaning service (check only one box)?
 Yes, use dry-cleaning regularly (at least weekly)
 Yes, use dry-cleaning infrequently (monthly or less)
 Yes, work at a dry cleaning service
 No
26. Does anyone in your home use solvents at work?
 Yes If yes, how many persons _____
 No If no, go to question 28
27. If yes for question 26 above, are the work clothes washed at home? Yes No
28. Where is the washer/dryer located?
 Basement
 Upstairs utility room
 Kitchen
 Garage
 Use a Laundromat
 Other, please specify _____
29. If you have a dryer, is it vented to the outdoors? Yes No
30. What type(s) of home heating do you have (check all that apply)
 Fuel type: Gas , Oil , Electric , Wood , Coal , Other propane
 Heat conveyance system: Forced hot air
 Forced hot water
 Steam
 Radiant floor heat
 Wood stove
 Coal furnace
 Fireplace
 Other _____

31. Do you have air conditioning? Yes No . If yes, please check the appropriate type(s)
 Central air conditioning
 Window air conditioning unit(s)
 Other , please specify _____
32. Do you use any of the following? Room fans , Ceiling fans , Attic fan
 Do you ventilate using the fan-only mode of your central air conditioning or forced air heating system? Yes No
33. Has your home had termite or other pesticide treatment: Yes No Unknown
 If yes, please specify type of pest controlled, _____
 and approximate date of service _____
34. Water Heater Type: Gas , Electric , By furnace , Other

 Water heater location: Basement , Upstairs utility room , Garage , Other (please describe) _____
35. What type of cooking appliance do you have? Electric , Gas , Other

36. Is there a stove exhaust hood present? Yes No
 Does it vent to the outdoors? Yes No
37. Smoking in Home: *very rare*
 None , Rare (only guests) , Moderate (residents light smokers) ,
 Heavy (at least one heavy smoker in household)
38. If yes to above, what do they smoke?
 Cigarettes Cigars
 Pipe Other
39. Do you regularly use air fresheners? Yes No
40. Does anyone in the home have indoor home hobbies of crafts involving: None
 Heating , soldering , welding , model glues , paint , spray paint,
 wood finishing , Other Please specify what type of hobby: _____
in June 2007 - cabinet finishing
41. General family/home use of consumer products (please circle appropriate): Assume that
 Never = never used, Hardly ever = less than once/month, Occasionally = about
 once/month, Regularly = about once/week, and Often = more than once/week.

Product	Frequency of Use
Spray-on deodorant	Never <input checked="" type="radio"/> Hardly ever <input type="radio"/> Occasionally <input type="radio"/> Regularly <input type="radio"/> Often <input type="radio"/>

Aerosol deodorizers	Never	Hardly ever	Occasionally	Regularly	Often
Insecticides	Never	Hardly ever	Occasionally	Regularly	Often
Disinfectants	Never	Hardly ever	Occasionally	Regularly	Often

(Question 41, continued)

Product	Frequency of Use				
Window cleaners	Never	Hardly ever	Occasionally	Regularly	Often
Spray-on oven cleaners	Never	Hardly ever	Occasionally	Regularly	Often
Nail polish remover	Never	Hardly ever	Occasionally	Regularly	Often
Hair sprays	Never	Hardly ever	Occasionally	Regularly	Often

42. Please check weekly household cleaning practices:

- Dusting
- Dry sweeping
- Vacuuming
- Polishing (furniture, etc.)
- Washing/waxing floors
- Other

43. Other comments: _____

CGA { *gasoline generator stored in basement
paint, spray paint, + lacquer thinner in basement.*

NOEA

OCCUPIED DWELLING QUESTIONNAIRE

Indoor Air Assessment Survey

Date: 10/23/07

1. Name: Tim Rinker
 Address: RD 3 Box 3311-A
Stroudsburg, PA 18360
 Home Phone: ⁽⁵⁷⁰⁾ 629 2925 Cell ⁽⁵⁷⁰⁾ 269 6983 Work Phone: 269 6983
2. What is the best time to call to speak with you? Anytime At: Work or Home
3. Are you the Owner , Renter , Other (please specify) _____ of this Home/Structure?
4. Total number of occupants/persons at this location? 3
 Number of children? 0 Ages? _____
5. How long have you lived at this location? 20

General Home Description

6. Type of Home/Structure (check only one): Single Family Home , Duplex , Condominium , Townhouse , Other
7. Home/Structure Description: number of floors 2
 Basement? Yes No
 Crawl Space? Yes No
 If Yes, under how much of the house's area? 70%
8. Age of Home/Structure: 200 years, Not sure/Unknown
9. General Above-Ground Home/Structure construction (check all that apply):
 Wood , Brick , Concrete , Cement block , Other
10. Foundation Construction (check all that apply):
 Concrete slab
 Fieldstone dry
 Concrete block

Eleva above ground/grade

Other _____

11. What is the source of your drinking water (check all that apply)?

Public water supply

Private well

Bottled water

Other please specify _____

12. Do you have a private well for purposes other than drinking?

Yes No

If yes, please describe what you use the well

for: _____

13. Do you have a septic system? Yes No Not used Unknown

14. Do you have standing water outside your home (pond, ditch, swale)? Yes No

Basement Description, please check appropriate boxes.

If you do not have a basement go to question 23.

15. Is the basement finished or unfinished ?

16. If finished, how many rooms are in the basement? _____

How many are used for more than 2 hours/day? _____

17. Is the basement floor (check all that apply) concrete , tile , carpeted , dirt , other (describe) _____?

18. Are the basement walls poured concrete , cement block , stone , wood , brick , other _____?

19. Does the basement have a moisture problem (check one only)?

Yes, frequently (3 or more times/yr)

Yes, occasionally (1-2 times/yr)

Yes, rarely (less than 1 time/yr)

No

20. Does the basement ever flood (check one only)?

Yes, frequently (3 or more times/yr)

Yes, occasionally (1-2 times/yr)

Yes, rarely (less than 1 time/yr)

No

21. Does the basement have any of the following? (check all that apply) Floor cracks ,

Wall cracks , Sump , Floor drain , Other hole/opening in floor

(describe) _____

22. Are any of the following used or stored in the basement (check all that apply)
 Paint Paint stripper/remover Paint thinner
 Metal degreaser/cleaner Gasoline Diesel fuel Solvents Glue
 Laundry spot removers Drain cleaners Pesticides
23. Have you recently (within the last six months) done any painting or remodeling in your home? Yes No
 If yes, please specify what was done, where in the home, and what month:

24. Have you installed new carpeting in your home within the last year? Yes No
 If yes, when and where? _____
25. Do you regularly use or work in a dry cleaning service (check only one box)?
 Yes, use dry-cleaning regularly (at least weekly)
 Yes, use dry-cleaning infrequently (monthly or less)
 Yes, work at a dry cleaning service
 No
26. Does anyone in your home use solvents at work?
 Yes If yes, how many persons _____
 No If no, go to question 28
27. If yes for question 26 above, are the work clothes washed at home? Yes No
28. Where is the washer/dryer located?
 Basement
 Upstairs utility room
 Kitchen *N/A*
 Garage
 Use a Laundromat
 Other, please specify _____
29. If you have a dryer, is it vented to the outdoors? Yes No *N/A*
30. What type(s) of home heating do you have (check all that apply)
 Fuel type: Gas , Oil , Electric , Wood , Coal , Other _____
 Heat conveyance system: Forced hot air
 Forced hot water
 Steam
 Radiant floor heat
 Wood stove
 Coal furnace
 Fireplace
 Other baseboard

31. Do you have air conditioning? Yes No . If yes, please check the appropriate type(s)
 Central air conditioning
 Window air conditioning unit(s)
 Other , please specify _____
32. Do you use any of the following? Room fans , Ceiling fans , Attic fan
 Do you ventilate using the fan-only mode of your central air conditioning or forced air heating system? Yes No *N/A*
33. Has your home had termite or other pesticide treatment: Yes No Unknown
 If yes, please specify type of pest controlled, *mice*
 and approximate date of service *no problem source*
34. Water Heater Type: Gas , Electric , By furnace , Other
 Water heater location: Basement , Upstairs utility room , Garage , Other (please describe) *1st floor*
35. What type of cooking appliance do you have? Electric , Gas , Other
36. Is there a stove exhaust hood present? Yes No
 Does it vent to the outdoors? Yes No *N/A*
37. Smoking in Home:
 None , Rare (only guests) , Moderate (residents light smokers) ,
 Heavy (at least one heavy smoker in household)
38. If yes to above, what do they smoke?
 Cigarettes , Cigars
 Pipe , Other
39. Do you regularly use air fresheners? Yes No
40. Does anyone in the home have indoor home hobbies of crafts involving: None
 Heating , soldering , welding , model glues , paint , spray paint,
 wood finishing , Other Please specify what type of hobby: _____
41. General family/home use of consumer products (please circle appropriate): Assume that
 Never = never used, Hardly ever = less than once/month, Occasionally = about
 once/month, Regularly = about once/week, and Often = more than once/week.

Product	Frequency of Use				
	Never	Hardly ever	Occasionally	Regularly	Often
Spray-on deodorant			Occasionally		

Aerosol deodorizers	Never	Hardly ever	Occasionally	Regularly	Often
Insecticides	Never	Hardly ever	Occasionally	Regularly	Often
Disinfectants	Never	Hardly ever	Occasionally	Regularly	Often

(Question 41, continued)

Product	Frequency of Use				
Window cleaners	Never	Hardly ever	Occasionally	Regularly	Often
Spray-on oven cleaners	Never	Hardly ever	Occasionally	Regularly	Often
Nail polish remover	Never	Hardly ever	Occasionally	Regularly	Often
Hair sprays	Never	Hardly ever	Occasionally	Regularly	Often

42. Please check weekly household cleaning practices:

- Dusting
- Dry sweeping
- Vacuuming
- Polishing (furniture, etc)
- Washing/waxing floors
- Other

43. Other comments: 4 med lysol plug ins (Spicy ~ 10 min's)
occasionally

10/23/07

OCCUPIED DWELLING QUESTIONNAIRE

Indoor Air Assessment Survey

Date: 10/23/2007

1. Name: Tim Rinker Attw: Stephanie Shay

Address: RD 3 Box 3311

Stroudsburg, PA 18360

Home Phone: ⁽⁵⁷⁰⁾ 619-6374 Work Phone: Tim - (570) 629-2925

2. What is the best time to call to speak with you? m+w mon At: Work or Home

3. Are you the Owner , Renter , Other (please specify) Tim Stephanie
of this Home/Structure?

4. Total number of occupants/persons at this location? 3
Number of children? 1 Ages? 3

5. How long have you lived at this location? 7

General Home Description

6. Type of Home/Structure (check only one): Single Family Home Duplex
Condominium , Townhouse , Other

7. Home/Structure Description: number of floors 2
Basement? Yes No
Crawl Space? Yes No
If Yes, under how much of the house's area? 100 %

8. Age of Home/Structure: 60 years, Not sure/Unknown

9. General Above-Ground Home/Structure construction (check all that apply):
Wood , Brick , Concrete , Cement block , Other

10. Foundation Construction (check all that apply):
Concrete slab
Fieldstone
Concrete block

- Elevation above ground/grade
- Other _____
11. What is the source of your drinking water (check all that apply)?
 Public water supply
 Private well
 Bottled water
 Other please specify _____
12. Do you have a private well for purposes other than drinking?
 Yes No
 If yes, please describe what you use the well for: _____
13. Do you have a septic system? Yes No Not used Unknown
14. Do you have standing water outside your home (pond, ditch, swale)? Yes No

Basement Description, please check appropriate boxes.
 If you do not have a basement go to question 23.

15. Is the basement finished or unfinished
16. If finished, how many rooms are in the basement? _____
 How many are used for more than 2 hours/day? _____
17. Is the basement floor (check all that apply) concrete , tile , carpeted , dirt ,
 other (describe) _____?
18. Are the basement walls poured concrete , cement block , stone , wood , brick ,
 other _____?
19. Does the basement have a moisture problem (check one only)?
 Yes, frequently (3 or more times/yr)
 Yes, occasionally (1-2 times/yr)
 Yes, rarely (less than 1 time/yr)
 No
20. Does the basement ever flood (check one only)?
 Yes, frequently (3 or more times/yr)
 Yes, occasionally (1-2 times/yr)
 Yes, rarely (less than 1 time/yr) during heavy rainfall
 No
21. Does the basement have any of the following? (check all that apply) Floor cracks
 Wall cracks , Sump , Floor drain , Other hole/opening in floor
 (describe) _____
 ↑ small opening by stairs

22. Are any of the following used or stored in the basement (check all that apply)
 Paint Paint stripper/remover Paint thinner
 Metal degreaser/cleaner Gasoline Diesel fuel Solvents Glue
 Laundry spot removers Drain cleaners Pesticides *Kerosene*
23. Have you recently (within the last six months) done any painting or remodeling in your home? Yes No
 If yes, please specify what was done, where in the home, and what month:

24. Have you installed new carpeting in your home within the last year? Yes No
 If yes, when and where? _____
25. Do you regularly use or work in a dry cleaning service (check only one box)?
 Yes, use dry-cleaning regularly (at least weekly)
 Yes, use dry-cleaning infrequently (monthly or less)
 Yes, work at a dry cleaning service
 No
26. Does anyone in your home use solvents at work?
 Yes If yes, how many persons _____
 No If no, go to question 28
27. If yes for question 26 above, are the work clothes washed at home? Yes No
28. Where is the washer/dryer located?
 Basement
 Upstairs utility room
 Kitchen
 Garage
 Use a Laundromat
 Other, please specify _____
29. If you have a dryer, is it vented to the outdoors? Yes No
30. What type(s) of home heating do you have (check all that apply)
 Fuel type: Gas , Oil , Electric , Wood , Coal , Other *Kerosene*
 Heat conveyance system: Forced hot air
 Forced hot water
 Steam
 Radiant floor heat
 Wood stove
 Coal furnace
 Fireplace
 Other *Kerosene heater*

31. Do you have air conditioning? Yes No . If yes, please check the appropriate type(s)
 Central air conditioning
 Window air conditioning unit(s)
 Other , please specify _____
32. Do you use any of the following? Room fans , Ceiling fans , Attic fan
 Do you ventilate using the fan-only mode of your central air conditioning or forced air heating system? Yes No
33. Has your home had termite or other pesticide treatment: Yes No Unknown
 If yes, please specify type of pest controlled, ants & mice
 and approximate date of service June 2007
34. Water Heater Type: Gas , Electric , By furnace , Other
 Water heater location: Basement , Upstairs utility room , Garage , Other (please describe) _____
35. What type of cooking appliance do you have? Electric , Gas , Other
36. Is there a stove exhaust hood present? Yes No
 Does it vent to the outdoors? Yes No
37. Smoking in Home:
 None , Rare (only guests) , Moderate (residents light smokers) ,
 Heavy (at least one heavy smoker in household)
38. If yes to above, what do they smoke?
 Cigarettes Cigars
 Pipe Other
39. Do you regularly use air fresheners? Yes No Fabreze
40. Does anyone in the home have indoor home hobbies of crafts involving: None
 Heating , soldering , welding , model glues , paint , spray paint,
 wood finishing , Other Please specify what type of hobby: _____
41. General family/home use of consumer products (please circle appropriate): Assume that
 Never = never used, Hardly ever = less than once/month, Occasionally = about
 once/month, Regularly = about once/week, and Often = more than once/week.

Product	Frequency of Use				
Spray-on deodorant	Never	Hardly ever	Occasionally	Regularly	Often

Aerosol deodorizers	<u>Never</u>	Hardly ever	Occasionally	Regularly	Often
Insecticides	<u>Never</u>	Hardly ever	Occasionally	Regularly	Often
Disinfectants	Never	Hardly ever	Occasionally	Regularly	<u>Often</u>

(Question 41, continued)

Product	Frequency of Use				
Window cleaners	Never	Hardly ever	Occasionally	Regularly	<u>Often</u>
Spray-on oven cleaners	Never	<u>Hardly ever</u>	Occasionally	Regularly	Often
Nail polish remover	Never	Hardly ever	<u>Occasionally</u>	Regularly	Often
Hair sprays	Never	Hardly ever	Occasionally	<u>Regularly</u>	Often

42. Please check weekly household cleaning practices:

- Dusting
- Dry sweeping
- Vacuuming
- Polishing (furniture, etc)
- Washing/waxing floors
- Other _____

43. Other comments: _____

APPENDIX B
FIELD LOG SHEETS

Butz # 01060
Tuesday, October 23, 2007
weather 65°F, sunny


0740 Gordon Arango (GA) and Chuck Meyer (CM) from TRMS arrive at the treatment plant
GA + CM unload vehicles and prepare for sampling

0815 GA calls Jacoby + Young
Jacoby schedules for 10/24 @ 9am
Young did not answer - left VM

0820 John Mellow (JM) from PADEP arrives at the treatment plant
JM is going to the West house with us

0835 GA, CM, JM go to Riker house for sampling.

0900 GA, CM, JM meet w/ st. Tim Riker and look at the 3 houses on the property
GA and CM identify resident guest areas.

 10/23/07

Butz # 01060
0930 CM installs Geyser in Tim Riker's yard

0950 Bruce Rendell (BR) from EPA arrives

1010 RO7-IA-20071023

1022 RO7-SG-20071023

1039 RO7-OA-20071023

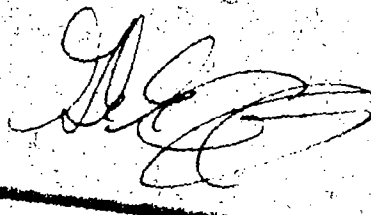
1045 ~~GA~~ Neil Tevenson (NT) from TRMS arrives at Riker house where GA, CM, JM were leaving to go to treatment plant.

1055 Len Zelinka (LZ) from PADEP arrives at treatment plant.

1100 CM runs to pick up wanted equipment.

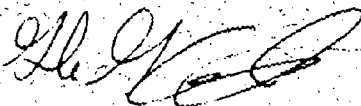
1200 LZ leaves the site.

1230 JM, NT, LZ leave the site.
GA + CM go to lunch

 10/23/07

Batch # 01060


- 1300 GA and CM arrive at Rubber
Hanes again. Prepare
Sampling at Stephanie Shay's Rental
- 1330 CM drills first hole for Substab vapor
- 1405 ROT-SU1-20071023
- 1435 ROT-SU2-20071023
- 1450 GA + CM check on ROT-SG, IA, OA
GA + CM take measurements to the
location of each sample
- 1045 GA + CM leave Rubber Hanes
- samples are finished
- 1715 GA and CM leave treatment plant
after packing up and charging
equipment for tomorrow.

 10/23/07

Batch # 01060


Wednesday, October 24, 2007
weather 60°F, rain/drizzle

- 0730 Chuck Meyer (CM) and Gordon
Arayo (GA) from TFDMS arrive
at the treatment building
GA + CM prepare for sampling
- 0815 Megan Ritchie (MR) from TFDMS
arrives at the treatment plant
GA calls Neil Teason about
Soil gas sampling today.
- Neil says to reschedule
- 0830 GA, CM, + MR package 10/23/07
Rubber Hanes samples (5)
- 0845 GA packs up to leave for Valmont
- 0950 CM leaves site to get ice for packaging
samples. MR sets up Form II Lite
for air samples (R3836) and system
samples (36A13)
- 1015 MR pours trip blanks.
- 1020 GA leaves the site
- 1125 CM and MR collect EWI samples
+ TEL yds.

 10/24/07

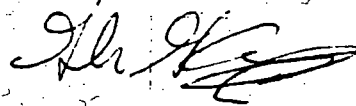
Buzz # 01060

- 1050 CM and MR collect EW2 sample
for TEL VOCs
- 1052 CM and MR collect EW3 sample
for TEL VOCs
- 1055 CM and MR collect effluent
(EFF) and duplicate (DUP) sample
for trace TEL VOC
Begin packaging samples
- 1145 CM and MR collect ambient air
sample at treatment system (A0)
- 1150 CM and MR collect air sample from
A2 and Dup.
- 1200 CM and MR collect air sample
from A2.
- 1205 CM and MR collect air sample
from A3.
- 1215 MR completed labels and TRICKS
in Forms 11 Lite
- 1230 CM and MR package air samples
- 1300 CM and MR complete
packaging and paperwork
and load up sample coolers
and boxes for shipment

 10/24/07

Buzz # 01060

- 1315 CM and MR head offsite
to get lunch
- 1350 CM and MR arrive back
onsite and begin to
clean up and prepare
equipment for tomorrow
- 1430 GA calls with word that
we are not going to
sample this afternoon
CM gets info from
him on sample IDs
and times for Forms
2 Lite
- 1445 MR completes Form 2 Lite
- 1500 MR leaves site to drop
samples CM calls GA
he is on his way back
- 1550 GA drives back on-site

 10/24/07

Butz #01060

1605 GA looks at ballist. for fluorescent light
120V @ 80 Amps
Class P

863905W

for use w/ any two F40WT12/RS
or F30WT12/RS

400 MA Cans ~~or w/ any~~ ^{GA}

~~two by combination of~~ ^{GA}

~~F416T9/RS, F412T9~~ ^{GA}

1615 GA + CM leave site for hardware store
- pick up ballist.

1635 GA + CM arrive back on-site
GA + CM install new ballist.

1720 GA completes install of
ballast lights are working

1735 GA and CM leave the site.

 10/24/07

Butz #01060

Thursday, October 25, 2007

weather: 50°F, overcast, no rain yet.

0730 Gochari Arago (GA) and Chuck Mayo (CM)
from TFWUS arrive on-site.

GA + CM prepare for sampling
CM calibrates PID

0755 TB-01-20071025

0805 GA and CM arrive at Strausser
residence.

GA + CM meet Ed Strausser and
look at basement

basement + 1,400 sq ft \Rightarrow 4 samplers needed
GA + CM mobilize for sampling

0835 GA + CM start drilling and setting
up for soil sampling

0900 GA conducts resident questionnaire with
Ed Strausser

CM continues building sampling
apparatus

 10/25/07

Butz # 01060

0928 R06-SV1-20071025

0929 R06-SV2-20071025

Note: See sample log sheets for more info.

1000 R06-SV3-20071025

(1400) DUP-01-20071025

of R06-SV3-20071025

1013 R06-SV4-20071025

1100 GA meets with John Delia

1130 GA returns to Strauss' home

1200 GA + CM finish at Strauss' home.
GA + CM leave for lunch

1230 GA + CM return for lunch

GA + CM go to hardware store + tractor
plant for equipment + supplies1400 GA + CM arrive at ROI - Delia's house
- prepare for sampling +
mobilize

John Delia 10/25/07

Butz # 01060

1445 ROI-SUMP 20071025

House ROI had a sump pump
with water. This water
was sampled.

See sample logs for more information...

1526 ROI-SV1-20071025

1533 ROI-SV2-20071025

1537 ROI-SV3-20071025

1544 ROI-SV4-20071025

(1530) DUP-02-20071025

of ROI-SV4-20071025

1635 GA goes over the questionnaire with
John Delia

1725 GA + CM leave Delia's house

1730 GA + CM package samples for shipment

1915 GA + CM leave for FedEx in Allentown

2100 GA + CM return to site to check
on cleanliness of site.
GA + CM depart the site.

John Delia 10/25/07

Butz #01060

Friday, October 26, 2007
weather 50°F, overcast

0725 Gordon Araujo (GA) and Chuck Meyer (CM)
from TAMU arrive on-site
GA + CM prepare for sampling

0755 GA goes to Pichell & Jacoby house
for indoor air sampling
CM continues preparing for sampling

0800 GA at Jacoby home

0805 R03-IA-20071026

0810 GA conducts Questionnaire

0820 GA at Pichell home

0822 R02-IA-20071026

0825 GA conducts Questionnaire

0850 GA makes copies of sampling form
at the hotel.

0905 GA returns to Treatment Plant

0910 GA + CM drive to Pichell home
for sampling

0945 R02-OA-20071026

Outdoor ambient air @ Pichell's

0953 R03-OA-20071026

Outdoor ambient air @ Jacoby's

1004 R02-SG-20071026

Geoprobe at Pichell's

1035 GA + CM notice moisture in taller
bags when ^{start} purging
at Jacoby geoprobe location

1045 R03-SG-20071026

Geoprobe at Jacoby's

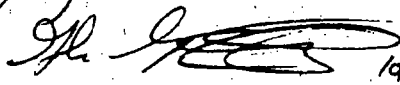
Duplicate sample also taken

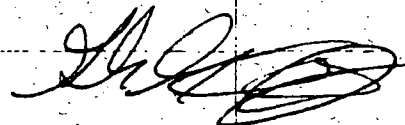
(1100) Dup-03-20071026

1050 GA + CM drive to EW-1 access
road.

1059 AMB-06-20071026

Ambient Background Sample


10/26/07


10/26/07

Butz

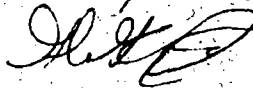
GA # 01060

- 1100 GA + CM investigate recent excavation / road grading activities near EW-1
- Stone piles placed across the access road to EW-1
 - Path across wetland re-established from access road on Railroad Dr. to access road on Rinker property.
 - Path from access road to field on Rinker property near created
 - Yellow backhoe / front end loader was noticed at mobile home on Rinker property. (the sister's house)
 - pictures of the paths + loader were taken for record
 - stone on Rinker side of access road was dug into the wetland by EW-2

1200 GA + CM return rental equipment

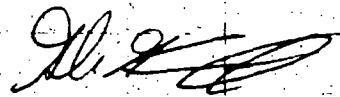
1230 GA + CM go to lunch

1330 GA + CM return from lunch and replace resident packs at EW-1, 2, 3

 10/26/07

Butz # 01060

- 1440 GA + CM finish replacing the resident packs
GA + CM load up equipment from treatment plant.
- 1530 GA + CM leave the treatment yard.
GA locks + alarms the building.
GA + CM drive to Pichell/Jacoby
- RO2-SG-20071026 is not pulling air → regulator only reads - 28" Hg
- NOTE: @ 1400 it started raining
1415 starting showers.
- 1645 The rain starts to pick up - harder rain.
- 1655 GA calls Neil Teason ^(at) about rain + geoprobe not functioning at Pichell home.

 10/25/07

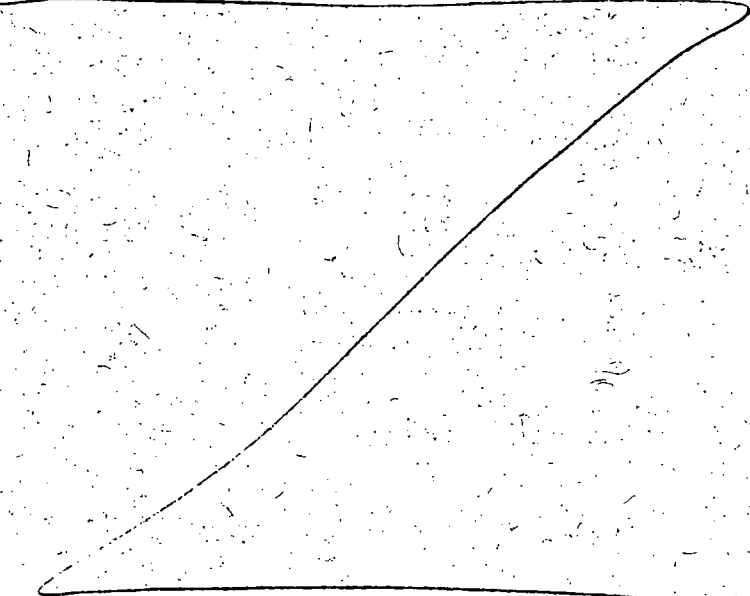
Bull # 01060

NT states that we should discontinue
the Geoprobe sampling and continue
the ambient air sampling.
- only Pitbull geoprobe was discontinued

1815 GA+CM remove geoprobe at Pitbull
house.

1830 GA+CM finish up and remove
other sampling equipment

1905 GA+CM leave the site.



10/26/07

Butz # 01060

Friday, November 19, 2007

Weather: 35°F, snow

0820 Gordon Arango (GA) and Chuck Meyer (CM) from TAMS arrive on-site.

GA and CM prepare for sampling at Powell home (RO2)

0840 CM drives geoprobe in to 4 inches for soil gas sampling

GA calibrates PID

GA + CM prepare tubing for sampling

0900 CM purges 2 L of air from soil

0907 RO2-SG-20071119


DUP-04-20071119

Initial PID from purge = 0 + 0

Initial regulator pressures:

RO2-SG → -29 psig

DUP-04 → -29 psig

 11/19/07

Butz # 01060

0940 CM checks on air canisters
- flow is good, pressure decreased

1030 CM checks on air canisters
- Same as before

1150 GA + CM check on air canisters
- regulator pressure gauge has changed significantly but the Summa canister gauge has not moved much

1300 GA and CM go for lunch and baggies for water sampling

1315 TB-20070119

1317 ~~TB-2007~~^{GA 4/19/07} TB-LO-20071119

1328 EW-01-20071119


1330 EW-02-20071119

1332 EW-03-20071119

1336 EFF-LO-20071119

(1400) DUP-01-20071119

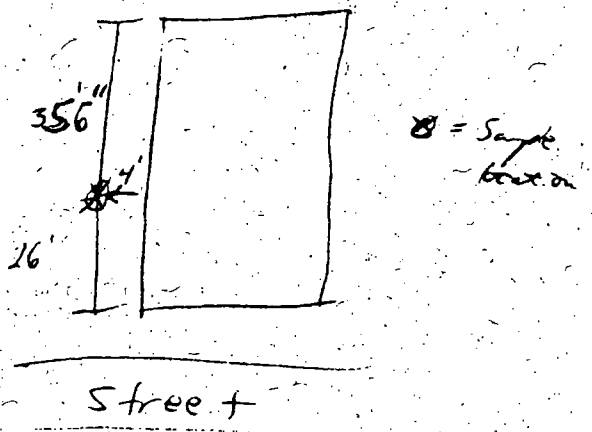
of EFF-LO-20071119

 11/19/07

butz # 01060

- 1345 GA + CM conduct O&M checklist
- 1445 GA + CM check on Air Controller
- 1645 GA calls Megan Ritchie (MR) from
Thullis about air controller
- different readings between
regulator and tank
- MR says to get samples & document
in by back the problems.

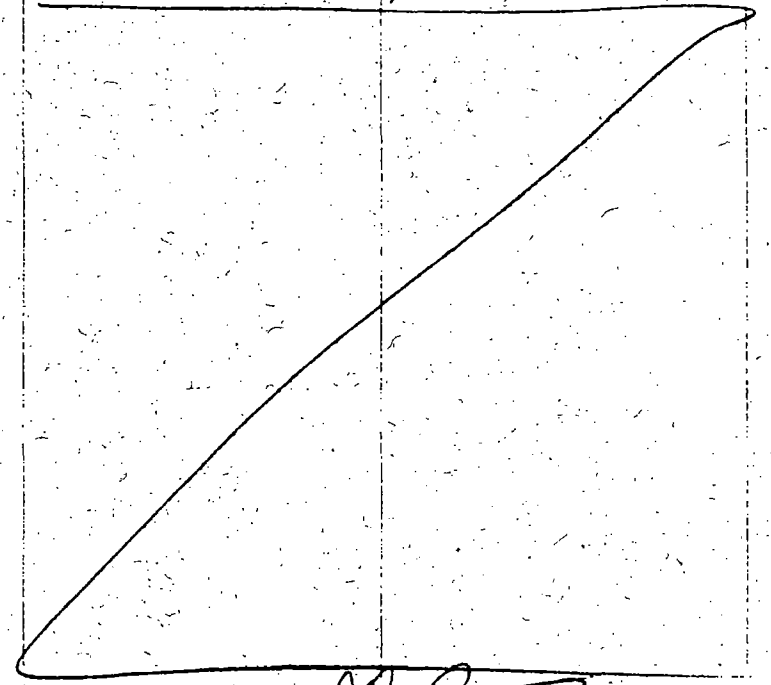
1725 Sample location shown below



MR = Sample location
11/19/07

butz # 01060

- 1433 End Sample collection
- 1734 PID reading = 0
- 1740 GA and CM pack up to leave the site.
- 1800 GA and CM depart from site.



11/19/07

APPENDIX C

EQUIPMENT CALIBRATION LOGS



Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME: Butt INSTRUMENT NAME/MODEL: PhotoVue 2020
SITE NAME: Butt MANUFACTURER: Pekin Elmer
PROJECT No.: 112601060 SERIAL NUMBER: ED-HJ-332

Pre-Cal

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
10/23/07	EO-H5-SR	Chad Meyer	0.0	100	0.0	0.0	0182-02	ISO butylac 100ppm
			100		105	100		
10/25/07	"	"	0.0		0.0	0.0	018202	ISO butylac 100ppm
			100		103	100		
10/26/07	"	"	0.0		0.0	0.0		
			100.0		96.9	100		ISO butylac 100ppm



Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME: Bat 3

INSTRUMENT NAME/MODEL: PhAvar 2020

SITE NAME: Bat 3

MANUFACTURER: Perkin Elmer

PROJECT No.: IR 01060

SERIAL NUMBER: EID-MF-335

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
11/19/07		Edu Arayo	0	0	0	0	00187-02	
			100	100	107	100		

APPENDIX D
FIELD NOTEBOOK ENTRIES



Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

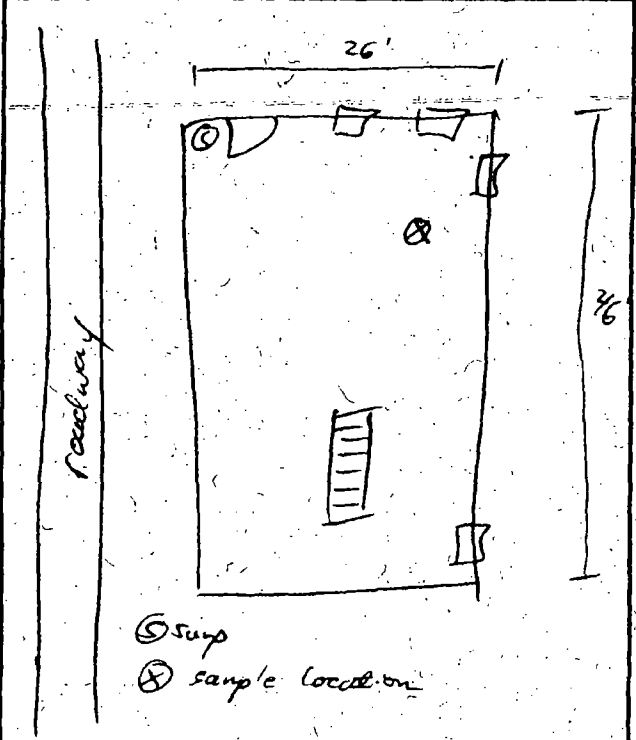
Project Site Name: Butz Sample ID Number: RA-SV1-20071025
 Project Number: 112601060 Sampled By: Corden Aronoff
 Sample Location: Delia Chula Meyer

DESCRIPTION OF SAMPLE LOCATION	
Indoor Location: <u>Delia</u> Basement: <input checked="" type="checkbox"/> yes / no Room size (ftxft): <u>46' x 26'</u> Floor material: <input checked="" type="checkbox"/> concrete / wood / dirt / other Slab Thickness (ft): <u>6"</u> Visible Cracks: <input checked="" type="checkbox"/> yes / no Subslab Material: dirt / <input checked="" type="checkbox"/> gravel	Outdoor Location: <u>N/A</u> Depth to Water (ft): _____ Soil type: _____ Odor: _____ Color: _____

PROBE INSTALLATION	LOCATION SKETCH
--------------------	-----------------

PROBE INSTALLATION: Sub Slab

Date: 10/25/07
 Method: N/A
 Diameter: 3/8 inch or 1/2 inch
 Depth: 6"
 Packing Material: N/A
 Initial PID Reading: 26.6, 3.0, 10.5
 Post PID Reading: 2.9



PURGE

Date: 10/25/07
 Time: 15:20
 Rate: 1 L/min
 Volume: 2 L

SAMPLE COLLECTION

Start Time: 1526 End Time: 1640
 Starting Pressure: -31 psig End Pressure: -3 pseg
 Rate: 111 mL/min
 Volume: 26 L
 Canister Descriptik: 6 L Summa

OBSERVATIONS / NOTES:

regulator start pressure = > -30 psig
 regulator end pressure = -5 psig

Signature(s):



Project Site Name: Butz Sample ID Number: ROI-SV2-20071025
 Project Number: 112G01060 Sampled By: Gordon Arango
 Sample Location: Delia Club Regis

DESCRIPTION OF SAMPLE LOCATION	
Indoor Location: <u>Delia</u> Basement: <input checked="" type="checkbox"/> yes / <input type="checkbox"/> no Room size (ftxft): <u>46' x 26'</u> Floor material: <input checked="" type="checkbox"/> concrete / <input type="checkbox"/> wood / <input type="checkbox"/> dirt / other Slab Thickness (ft): <u>6"</u> Visible Cracks: <input checked="" type="checkbox"/> yes / <input type="checkbox"/> no Subslab Material: <input checked="" type="checkbox"/> dirt / <input type="checkbox"/> gravel	Outdoor Location: <u>N/A</u> Depth to Water (ft): _____ Soil type: _____ Odor: _____ Color: _____

PROBE INSTALLATION	LOCATION SKETCH
Sub Slab Date: <u>10/25/07</u> Method: <u>N/A</u> Diameter: <u>3/8 inch</u> <u>1/2 inch</u> Depth: <u>6"</u> Packing Material: <u>N/A</u> Initial PID Reading: <u>27.5, 8.6, 6.6</u> Post PID Reading: <u>0</u>	<p>⑤ Sump ④ sample location</p>

PURGE
Date: <u>10/25/07</u> Time: <u>1528</u> Rate: <u>1.2 L/min</u> Volume: <u>2 L</u>

SAMPLE COLLECTION
Start Time: <u>1533</u> End Time: <u>1656</u> Starting Pressure: <u>-31 psig</u> End Pressure: <u>2.5</u> Rate: <u>1.1 L/min</u> Volume: <u>26 L</u> Canister Descriptic: <u>6 L Summa</u>

OBSERVATIONS / NOTES:

regulator start pressure = 7-30 psig
 regulator end pressure = -4.5

radon piping installed. No vent for 18hr.

Signature(s):



Project Site Name: But 2 Sample ID Number: 01-SV3-20071025
 Project Number: 112 G01060 Sampled By: Gordon Arango
 Sample Location: Delta Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: Delta

Basement: yes no

Room size (ftxft): 46' x 26'

Floor material: concrete wood / dirt / other

Slab Thickness (ft): 6"

Visible Cracks: yes no

Subslab Material: dirt / gravel

Outdoor

Location: N/A

Depth to Water (ft): _____

Soil type: _____

Odor: _____

Color: _____

PROBE INSTALLATION Sub Slab

Date: 10/25/07

Method: N/A

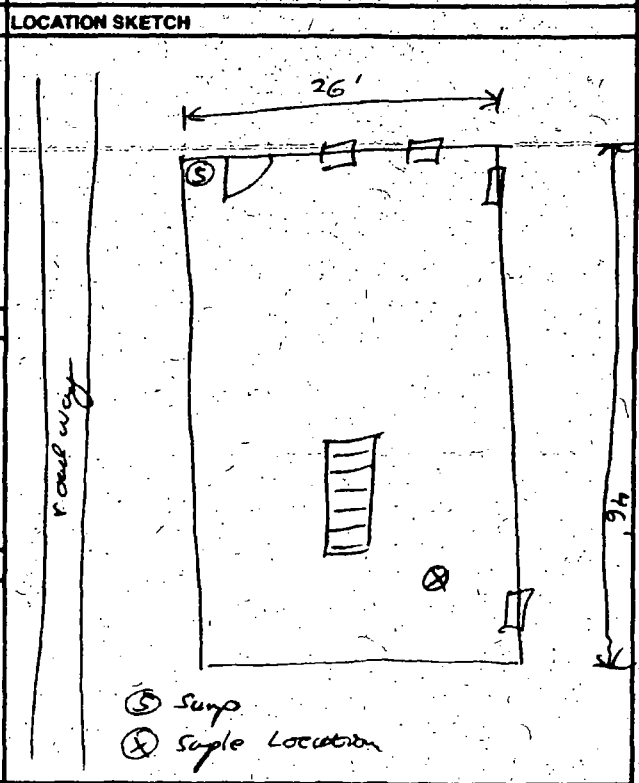
Diameter: 3/8 inch GSA 1/2 inch

Depth: 6"

Packing Material: N/A

Initial PID Reading: 18.2, 8.2, 6.3

Post PID Reading: 6.2



PURGE

Date: 10/25/07

Time: 1535

Rate: 1 L/min

Volume: 2 L

SAMPLE COLLECTION

Start Time: 1537 End Time: 1657

Starting Pressure: -3 psig End Pressure: -1.5

Rate: 111 mL/min

Volume: < 6 L

Canister Descript: 6 L Summa

OBSERVATIONS / NOTES:

regulator start pressure = -15 psig
 regulator end pressure = -4.5

Signature(s): [Signature]



Project Site Name: Butz Sample ID Number: R01-SV4-20071025
 Project Number: 112601060 Sampled By: Gordon Arango
 Sample Location: Delia Cheryl Meyer

DESCRIPTION OF SAMPLE LOCATION	
Indoor Location: <u>Delia</u> Basement: <input checked="" type="checkbox"/> yes <input type="checkbox"/> no Room size (ftxft): <u>46' x 26'</u> Floor material: <input checked="" type="checkbox"/> concrete / wood / dirt / other Slab Thickness (ft): <u>6"</u> Visible Cracks: <input checked="" type="checkbox"/> yes <input type="checkbox"/> no Subslab Material: dirt <input checked="" type="checkbox"/> gravel	Outdoor Location: <u>N/A</u> Depth to Water (ft): _____ Soil type: _____ Odor: _____ Color: _____

PROBE INSTALLATION	LOCATION SKETCH
Date: <u>10/25/07</u> Method: <u>N/A</u> Diameter: <u>3/8 inch GSA 1/2 inch</u> Depth: <u>6"</u> Packing Material: <u>N/A</u> Initial PID Reading: <u>36.8, 10.5, 10.2</u> Post PID Reading: <u>10.6</u>	<p>26'</p> <p>46'</p> <p>Road way</p> <p>Ⓢ Sump</p> <p>ⓧ sample location</p>
PURGE Date: <u>10/25/07</u> Time: <u>1538</u> Rate: <u>1 L/min</u> Volume: <u>2 L</u>	
SAMPLE COLLECTION Start Time: <u>1544</u> End Time: <u>1650</u> Starting Pressure: <u>-31 psig</u> End Pressure: <u>-6</u> Rate: <u>1 L/min</u> Volume: <u><6 L</u> Canister Description: <u>6 L Summa</u>	

OBSERVATIONS / NOTES:

regulator start pressure = -31 psig
 regulator end pressure = -6 psig

Signature(s):



Project Site Name: budz Sample ID Number: DUP-02-20071025
 Project Number: 112 G01060 Sampled By: Carsten Arango
 Sample Location: Delia's House Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION	
Indoor Location: <u>Delia</u> Basement: <input checked="" type="checkbox"/> yes / no Room size (ftxft): <u>46' x 26'</u> Floor material: <u>concrete/wood/dirt/other</u> Slab Thickness (ft): <u>6"</u> Visible Cracks: <input checked="" type="checkbox"/> yes / no Subslab Material: <u>dirt/gravel</u>	Outdoor Location: <u>N/A</u> Depth to Water (ft): _____ Soil type: _____ Odor: _____ Color: _____

PROBE INSTALLATION	LOCATION SKETCH
Date: <u>10/25/07</u> Method: <u>N/A</u> Diameter: <u>3/8 inch GA 1/2 inch</u> Depth: <u>6"</u> Packing Material: <u>N/A</u> Initial PID Reading: <u>36.8, 10.5, 10.2</u> Post PID Reading: <u>10.6</u>	
PURGE Date: <u>10/25/07</u> Time: <u>15:38</u> Rate: <u>1 L/min</u> Volume: <u>2 L</u>	
SAMPLE COLLECTION Start Time: <u>1530</u> End Time: <u>1636 GA</u> Starting Pressure: <u>-31 psig</u> End Pressure: <u>-5</u> Rate: <u>1.0 mL/min</u> Volume: <u>26 L</u> Canister Descriptk: <u>6 L Summa</u>	

OBSERVATIONS / NOTES:

regulator start pressure -
 regulator end pressure = -5

Dup of RO1-SV4-20071025

Signature(s): [Signature]



Project Site Name: Budz Sample ID Number: R02-IA-20071026
 Project Number: 112601060 Sampled By: Guidon Arango
 Sample Location: Pickell Home Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor

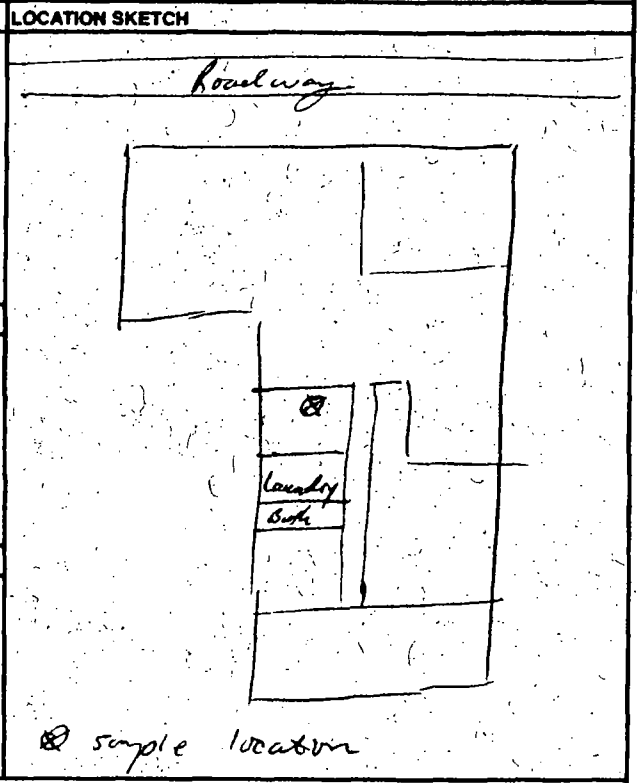
Location: Pickell
 Basement: yes / no
 Room size (sqft): N/A
 Floor material: concrete / wood / dirt / other
 Slab Thickness (ft): N/A
 Visible Cracks: yes / no
 Subslab Material: dirt / gravel

Outdoor

Location: Pickell Home
 Depth to Water (ft): unknown
 Soil type: N/A
 Odor: N/A
 Color: N/A

PROBE INSTALLATION

Date: N/A
 Method: N/A
 Diameter: 3/8 inch GGA
 Depth: N/A
 Packing Material: N/A
 Initial PID Reading: N/A
 Post PID Reading: N/A



PURGE

Date: N/A
 Time: N/A
 Rate: N/A
 Volume: N/A

SAMPLE COLLECTION

Start Time: 0822 End Time: 1644
 Starting Pressure: -31 psig End Pressure: -2 psig
 Rate: 1160 L/min
 Volume: 26 L
 Canister Descript: 6 L Summa

OBSERVATIONS / NOTES:

regulator start pressure 7-39 psig
 regulator end pressure -8 psig

Signature(s): [Signature]



Project Site Name: Gate Sample ID Number: 102-0A-207102G
 Project Number: 12G01060 Sampled By: Gordon Arango
 Sample Location: Pickel Home Cluck Meyer

DESCRIPTION OF SAMPLE LOCATION

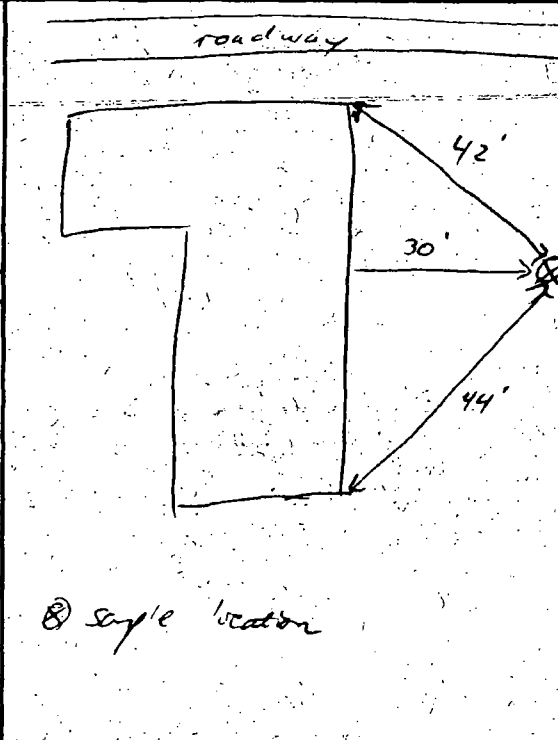
Indoor N/A
 Location: _____
 Basement: yes / no _____
 Room size (fbft): _____
 Floor material: concrete / wood / dirt / other _____
 Slab Thickness (ft): _____
 Visible Cracks: yes / no _____
 Subslab Material: dirt / gravel _____

Outdoor
 Location: Pickel Home
 Depth to Water (ft): unknown
 Soil type: N/A
 Odor: N/A
 Color: N/A

PROBE INSTALLATION

Date: 10/25/07 N/A
 Method: Geo Probe
 Diameter: 3/8 inch CGA
 Depth: 4 feet
 Packing Material: N/A
 Initial PID Reading: _____
 Post PID Reading: _____

LOCATION SKETCH



PURGE

Date: 10/25/07 N/A
 Time: _____
 Rate: 1.2/min CGA
 Volume: 6 L

SAMPLE COLLECTION

Start Time: 0945 End Time: 1841
 Starting Pressure: -30 psig End Pressure: -105 psig
 Rate: 111 mL/min
 Volume: 6 L
 Canister Descript: 6 L Summa

OBSERVATIONS / NOTES:

regulator start pressure 7-30 psig
 regulator end pressure

Signature(s): [Signature]



Project Site Name: Burt Sample ID Number: R02-SG-20071026
 Project Number: 112601060 Sampled By: Gordon Araujo
 Sample Location: P. Shell Home Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION	
Indoor	Outdoor
Location: <u>N/A</u>	Location: <u>P. shell home</u>
Basement: yes / no	Depth to Water (ft): <u>unknown</u>
Room size (ftxft):	Soil type: <u>N/A</u>
Floor material: concrete / wood / dirt / other	Odor: <u>N/A</u>
Slab Thickness (ft):	Color: <u>N/A</u>
Visible Cracks: yes / no	
Subslab Material: dirt / gravel	

PROBE INSTALLATION	LOCATION SKETCH
Date: <u>10/25/07</u>	
Method: <u>Geo probe</u>	
Diameter: <u>3/8 inch</u>	
Depth: <u>4 feet</u>	
Packing Material: <u>N/A</u>	
Initial PID Reading: <u>5.8, 4.1</u>	
Post PID Reading:	

PURGE
Date: <u>10/25/07</u>
Time: <u>0950</u>
Rate: <u>1 L/min</u>
Volume: <u>2 L</u>

SAMPLE COLLECTION
Start Time: <u>1004</u> End Time: <u>1315</u>
Starting Pressure: <u>-30 psig</u> End Pressure: <u>-27 psig</u>
Rate: <u>1 L/min</u>
Volume: <u>26 L</u>
Canister Descripti: <u>6 L Summa</u>

OBSERVATIONS / NOTES:

regulator start pressure
 regulator end pressure

Signature(s):



Project Site Name: butz Sample ID Number: ROZ-SG-2007119
 Project Number: 152G01060 Sampled By: Gordon Araujo
 Sample Location: Pickell home Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION	
Indoor Location: <u>n/a</u> Basement: <u>yes / no</u> Room size (sqft): _____ Floor material: <u>concrete / wood / dirt / other</u> Slab Thickness (ft): _____ Visible Cracks: <u>yes / no</u> Subslab Material: <u>dirt / gravel</u>	Outdoor Location: <u>Pickell home</u> Depth to Water (ft): <u>n/a</u> Soil type: <u>unknown</u> Odor: <u>none</u> Color: <u>brown</u>

PROBE INSTALLATION	LOCATION SKETCH
Date: <u>11/19/07</u> Method: <u>Gasprobe</u> Diameter: <u>3/8 inch</u> Depth: <u>4 feet</u> Packing Material: <u>n/a</u> Initial PID Reading: <u>0.0</u> Post PID Reading: <u>0</u>	

PURGE
Date: <u>11/19/07</u> Time: <u>0900</u> Rate: <u>1 L/min</u> Volume: <u>2 L</u>

SAMPLE COLLECTION
Start Time: <u>0907</u> End Time: <u>1733</u> Starting Pressure: <u>-29</u> End Pressure: <u>-23</u> Rate: <u>11 mL/min</u> <u>8 hour regulator</u> Volume: <u>27 L</u> Canister Descript: <u>6 L Summa</u>

OBSERVATIONS / NOTES:

Duplicate sample: DUP-04-2007119

Signature(s):



Project Site Name: Butz Sample ID Number: R03-IA-20071026
 Project Number: 112601060 Sampled By: Carolee Aron
 Sample Location: Jacob's Home Chad Meyer

DESCRIPTION OF SAMPLE LOCATION	
Indoor Location: <u>Jacob's</u> Basement: yes (no) <input checked="" type="radio"/> Room size (sqft): <u>N/A</u> Floor material: concrete / wood (dirt) / other <u>(dirt)</u> Slab Thickness (ft): <u>N/A</u> Visible Cracks: yes/no <u>N/A</u> Subslab Material: (dirt) / gravel <u>(dirt)</u>	Outdoor Location: <u>at Jacob's Home</u> Depth to Water (ft): <u>unknown</u> Soil type: <u>N/A</u> Odor: <u>N/A</u> Color: <u>N/A</u>

PROBE INSTALLATION	LOCATION SKETCH
Date: <u>N/A</u> Method: _____ Diameter: <u>3/8 inch</u> Depth: _____ Packing Material: _____ Initial PID Reading: _____ Post PID Reading: _____	<p>Kitchen/utility</p> <p>Living Room</p> <p>Sample location</p> <p>Jacob's</p>

PURGE
Date: <u>N/A</u> Time: _____ Rate: _____ Volume: _____

SAMPLE COLLECTION
Start Time: <u>0805</u> End Time: <u>1634</u> Starting Pressure: <u>-31 psig</u> End Pressure: <u>-6.5 psig</u> Rate: <u>151 mL/min</u> Volume: <u>26 L</u> Canister Descriptk: <u>6 L Summa</u>

OBSERVATIONS / NOTES:

Regulator start pressure > -30 psig
 regulator on pressure -6 psig

Signature(s): [Signature]



Project Site Name: Site Sample ID Number: R03-DA-20071026
 Project Number: 112601060 Sampled By: Godwin Asay
 Sample Location: Jacobys Home Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

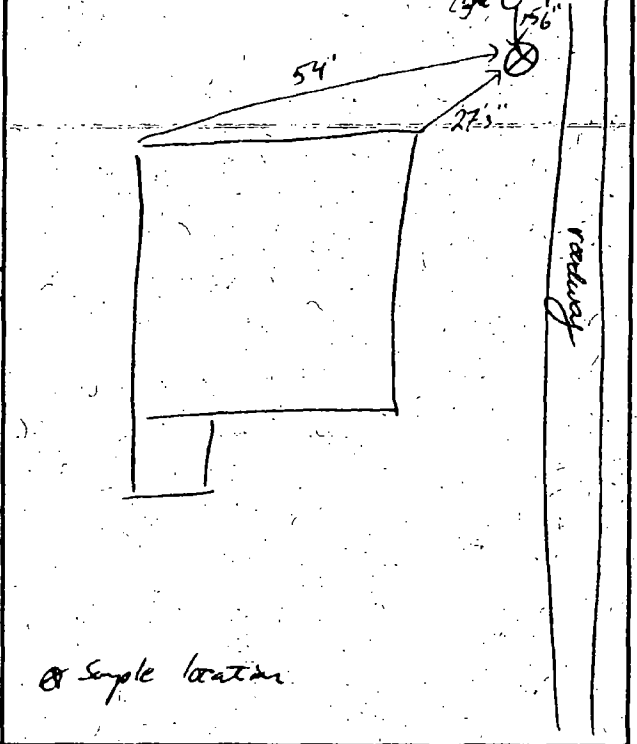
Indoor
 Location: N/A
 Basement: yes / no
 Room size (sqft):
 Floor material: concrete / wood / dirt / other
 Slab Thickness (ft):
 Visible Cracks: yes / no
 Subslab Material: dirt / gravel

Outdoor
 Location: Jacobys home
 Depth to Water (ft): unkn
 Soil type: N/A
 Odor: N/A
 Color: N/A

PROBE INSTALLATION

Date: N/A
 Method:
 Diameter: 3/8 inch
 Depth:
 Packing Material:
 Initial PID Reading:
 Post PID Reading:

LOCATION SKETCH



PURGE

Date: N/A
 Time:
 Rate:
 Volume:

SAMPLE COLLECTION

Start Time: 0953 End Time: 1839
 Starting Pressure: +31 psig End Pressure: -65 psig
 Rate: 111 mL/min
 Volume: <6L
 Canister Descriptic: 6 L Summa

OBSERVATIONS / NOTES:

regulator start pressure -29.5 psig
 regulator end pressure

Signature(s):



Project Site Name: <u>Batz</u>	Sample ID Number: <u>R03-SG-20071026</u>
Project Number: <u>1126-01060</u>	Sampled By: <u>Coelin Araujo</u>
Sample Location: <u>Fordoy Home</u>	<u>Chuck Meyer</u>

DESCRIPTION OF SAMPLE LOCATION	
Indoor Location: <u>N/A</u> Basement: <u>yes / no</u> Room size (sqft): _____ Floor material: <u>concrete / wood / dirt / other</u> Slab Thickness (ft): _____ Visible Cracks: <u>yes / no</u> Subslab Material: <u>dirt / gravel</u>	Outdoor Location: <u>Fordoy A. ^{Est} Home</u> Depth to Water (ft): <u>unknown</u> Soil type: <u>fill</u> Odor: <u>none</u> Color: <u>brown</u>

PROBE INSTALLATION	LOCATION SKETCH
Date: <u>10/25/07</u> Method: <u>Geoprobe</u> Diameter: <u>3/8 inch</u> Depth: <u>4 feet</u> Packing Material: <u>N/A</u> Initial PID Reading: <u>10.2, 9.8</u> Post PID Reading: _____	

PURGE
Date: <u>10/25/07</u> Time: <u>1034</u> Rate: <u>1 L/min</u> Volume: <u>2 L</u>

SAMPLE COLLECTION
Start Time: <u>1045</u> End Time: <u>1838</u> Starting Pressure: <u>-31 psig</u> End Pressure: <u>-7 psig</u> Rate: <u>1.11 mL/min</u> Volume: <u>26 L</u> Canister Descriptk: <u>6 L Summa</u>

OBSERVATIONS / NOTES:
<p>regulator start pressure -29 psig</p> <p>regulator end pressure</p> <p>moisture noticed in taller bags</p>

Signature(s):



Project Site Name: Unit 2 Sample ID Number: DUP-03-20071026
 Project Number: 112601060 Sampled By: Geeta Arang
 Sample Location: Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION	
Indoor: <u>U/A</u>	Outdoor
Location: _____	Location: <u>Tuesday Home</u>
Basement: <u>yes / no</u>	Depth to Water (ft): <u>unknown</u>
Room size (ft ²): _____	Soil type: <u>F-11</u>
Floor material: <u>concrete / wood / dirt / other</u>	Odor: <u>none</u>
Slab Thickness (ft): _____	Color: <u>gray</u>
Visible Cracks: <u>yes / no</u>	
Subslab Material: <u>dirt / gravel</u>	

PROBE INSTALLATION	LOCATION SKETCH
Date: <u>10/25/07</u>	
Method: <u>SPRINKLER Geoprobe</u>	
Diameter: <u>3/8 inch</u>	
Depth: <u>7 feet</u>	
Packing Material: <u>A/A</u>	
Initial PID Reading: _____	
Post PID Reading: _____	
PURGE	
Date: <u>10/25/07</u>	
Time: <u>10:34</u>	
Rate: <u>5 L/min</u>	
Volume: <u>2 L</u>	
SAMPLE COLLECTION	
Start Time: <u>1:00</u> End Time: <u>1:53</u>	
Starting Pressure: <u>-31 psig</u> End Pressure: <u>-7 psig</u>	
Rate: <u>11 mL/min</u>	
Volume: <u>56 L</u>	
Canister Descriptr: <u>6 L Summa</u>	

OBSERVATIONS / NOTES:

regulator start pressure - 30 psig
 regulator end pressure

moisture noticed in taller grass

Dup of R03-SG-20071026

Signature(s): [Signature]



Project Site Name: Betz Sample ID Number: ROG-SV1-20071025
 Project Number: 112601060 Sampled By: Gordon Arango
 Sample Location: Strousser Home Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

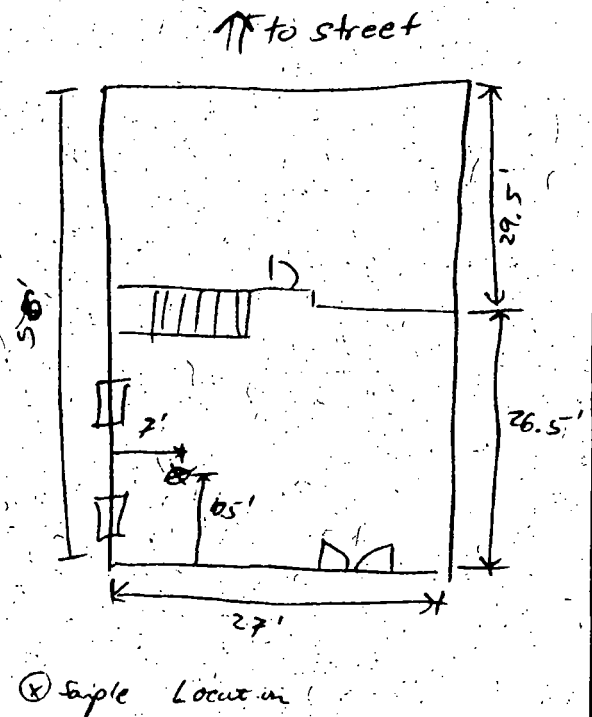
Indoor
 Location: Strousser
 Basement: yes no
 Room size (fudt): 27' x 27'
 Floor material: concrete wood / dirt / other
 Slab Thickness (ft): 6 inches
 Visible Cracks: yes no expansion joints (filled)
 Subslab Material: dirt (gravel)

Outdoor
 Location: (N/A)
 Depth to Water (ft): _____
 Soil type: _____
 Odor: _____
 Color: _____

PROBE INSTALLATION Sub Slab

Date: 10/25/07
 Method: N/A
 Diameter: 3/8 inch GA 1/2 inch
 Depth: 6"
 Packing Material: N/A
 Initial PID Reading: 8.3 3.5, 6.3
 Post PID Reading: 3.1

LOCATION SKETCH



PURGE

Date: 10/25/07
 Time: 0910
 Rate: 1 L/min
 Volume: 2 L

SAMPLE COLLECTION

Start Time: 0928 End Time: 1054
 Starting Pressure: -30 psig End Pressure: -2.5 psig
 Rate: 111 mL/min
 Volume: 66 L
 Canister Descriptk: 6 L Summa

OBSERVATIONS / NOTES:

regulator start pressure = > -30 psig
 regulator end pressure = -2.5 psig

Carbon Pipe installed but no vent

Signature(s): [Signature]



Project Site Name: Box 2 Sample ID Number: R06-SV2-20071025
 Project Number: 112601060 Sampled By: Gordon Arujo
 Sample Location: Strasser Home Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

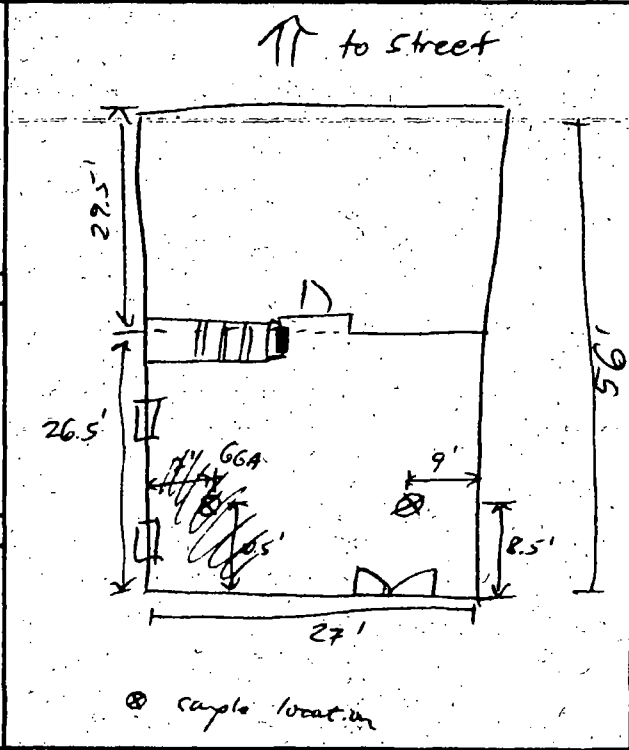
Indoor
 Location: Strasser
 Basement: yes no
 Room size (ft²): 27' x 27'
 Floor material: concrete / wood / dirt / other
 Slab Thickness (ft): 6 inches
 Visible Cracks: yes no expansion joints (filled)
 Subslab Material: dirt gravel

Outdoor
 Location: N/A
 Depth to Water (ft): _____
 Soil type: _____
 Odor: _____
 Color: _____

PROBE INSTALLATION Sub Slab

Date: 10/25/07
 Method: N/A
 Diameter: 3/8 inch G6A 1/2 inch
 Depth: 6 inches
 Packing Material: N/A
 Initial PID Reading: 16.2, 2.1, 6.1
 Post PID Reading: 0.0

LOCATION SKETCH



PURGE

Date: 10/25/07
 Time: 0920
 Rate: 1 L/min
 Volume: 2 L

SAMPLE COLLECTION

Start Time: 0929 End Time: 1039
 Starting Pressure: -30 psig End Pressure: -4.5 psig
 Rate: 114 mL/min
 Volume: 6.6 L
 Canister Description: 6 L Summa

OBSERVATIONS / NOTES:

regulator start pressure = -30 psig
 regulator end pressure = -5 psig

Signature(s): [Handwritten Signature]



Project Site Name: Brite Sample ID Number: R06-SV3-20071025
 Project Number: 112601060 Sampled By: Gordon Arayz / Chuck Meyer
 Sample Location: Strauser

DESCRIPTION OF SAMPLE LOCATION	
Indoor Location: <u>Strauser</u> Basement: <input checked="" type="checkbox"/> yes / <input type="checkbox"/> no Room size (ftxft): <u>30' x 27'</u> Floor material: <input checked="" type="checkbox"/> concrete / <input type="checkbox"/> wood / dirt / other Slab Thickness (R): <u>6 inches</u> Visible Cracks: yes / <input checked="" type="checkbox"/> no <u>expansion joint (filled)</u> Subslab Material: dirt / <input checked="" type="checkbox"/> gravel	Outdoor Location: <u>N/A</u> Depth to Water (ft): _____ Soil type: _____ Odor: _____ Color: _____

PROBE INSTALLATION	LOCATION SKETCH
Date: <u>10/25/07</u> Method: <u>N/A</u> Diameter: <u>3/8 inch GGA 1/2 inch</u> Depth: _____ Packing Material: <u>N/A</u> Initial PID Reading: <u>83 GGA 9.7, 2.6, 9.2</u> Post PID Reading: <u>0.0</u>	

PURGE
Date: <u>10/25/07</u> Time: <u>0952</u> Rate: <u>1 L/min</u> Volume: <u>2 L</u>

SAMPLE COLLECTION
Start Time: <u>1000</u> End Time: <u>1125</u> Starting Pressure: <u>-31 psia</u> End Pressure: <u>-31 psia</u> Rate: <u>111 mL/min</u> Volume: <u>26L</u> Canister Descript: <u>6 L Summa</u>

OBSERVATIONS / NOTES:
<p>Regulator start pressure = <u>-29.5 psia</u> Regulator end pressure = <u>-31.0 psia</u> -4.0</p> <p>VIP -01 with an assigned time 1400 was collected at this location</p> <p>Signature(s): <u>[Signature]</u></p>



Project Site Name: butte Sample ID Number: DUP-01-20071025
 Project Number: 112601060 Sampled By: Gordon Arroyo
 Sample Location: Strausser Home Chico Mexico

DESCRIPTION OF SAMPLE LOCATION

Indoor	Outdoor
Location: <u>Strausser</u>	Location: <u>n/a</u>
Basement: <u>yes</u> / no	Depth to Water (ft): _____
Room size (ftxft): <u>30' x 27'</u>	Soil type: _____
Floor material: <u>concrete</u> / wood / dirt / other	Odor: _____
Slab Thickness (ft): <u>6"</u>	Color: _____
Visible Cracks: yes <u>(no)</u> expansion joints (filled)	
Subslab Material: dirt <u>(gravel)</u>	

PROBE INSTALLATION	LOCATION SKETCH
Date: <u>10/25/07</u>	
Method: <u>n/a</u>	
Diameter: <u>3/8 inch GAT</u> / 1/2 inch	
Depth: <u>6"</u>	
Packing Material: <u>n/a</u>	
Initial PID Reading: <u>9.7, 2.6, 9.2</u>	
Post PID Reading: <u>0.0</u>	

PURGE

Date: 10/25/07
 Time: 0952
 Rate: 1 L/min
 Volume: 2 L

SAMPLE COLLECTION

Start Time: 1400 End Time: 1525
 Starting Pressure: -31 psig End Pressure: 24 psig
 Rate: 111 mL/min
 Volume: 6 GL
 Canister Descriptic: 6 L Summa

OBSERVATIONS / NOTES:

regulator start pressure = -29.5 psig
 regulator end pressure = 2.5 psig
4 (66)

Duplicate of RO6-SU3-20071025

Signature(s): Gh Arroyo



Project Site Name: <u>Bird</u>	Sample ID Number: <u>R06-SV4-20071025</u>
Project Number: <u>112601060</u>	Sampled By: <u>Gordon Araujo</u>
Sample Location: <u>Strausser</u>	<u>Chuck Meyer</u>

DESCRIPTION OF SAMPLE LOCATION	
Indoor	Outdoor
Location: <u>Strausser</u>	Location: <u>N/A</u>
Basement: <u>yes</u> /no	Depth to Water (ft):
Room size (ftxft): <u>30x27</u>	Soil type:
Floor material: <u>concrete</u> /wood/dirt/other	Odor:
Slab Thickness (ft): <u>6 inches</u>	Color:
Visible Cracks: <u>yes</u> (<u>no</u>) <u>expansion joints (filled)</u>	
Subslab Material: dirt (<u>gravel</u>)	

PROBE INSTALLATION	LOCATION SKETCH
Sub Slab	
Date: <u>10/25/07</u>	
Method: <u>N/A</u>	
Diameter: <u>3/8 inch GA - 1/2 inch</u>	
Depth:	
Packing Material: <u>N/A</u>	
Initial PID Reading: <u>15.3, 8.0, 9.3</u>	
Post PID Reading: <u>1.6</u>	

PURGE
Date: <u>10/25/07</u>
Time: <u>1008</u>
Rate: <u>1 L/min</u>
Volume: <u>2 L</u>

SAMPLE COLLECTION
Start Time: <u>1013</u> End Time: <u>1135</u>
Starting Pressure: <u>-30.5 psig</u> End Pressure: <u>-3.5</u>
Rate: <u>111 mL/min</u>
Volume: <u>126 L</u>
Canister Descriptic: <u>6 L Summa</u>

OBSERVATIONS / NOTES:

Regular start pressure = -30 psig
 Regular end pressure = -35

Signature:



Project Site Name: Buzz Sample ID Number: R07-SG-20071023
 Project Number: 112001060 Sampled By: Gordon Arayo
 Sample Location: Tim Rinker's House Chuck Meyer

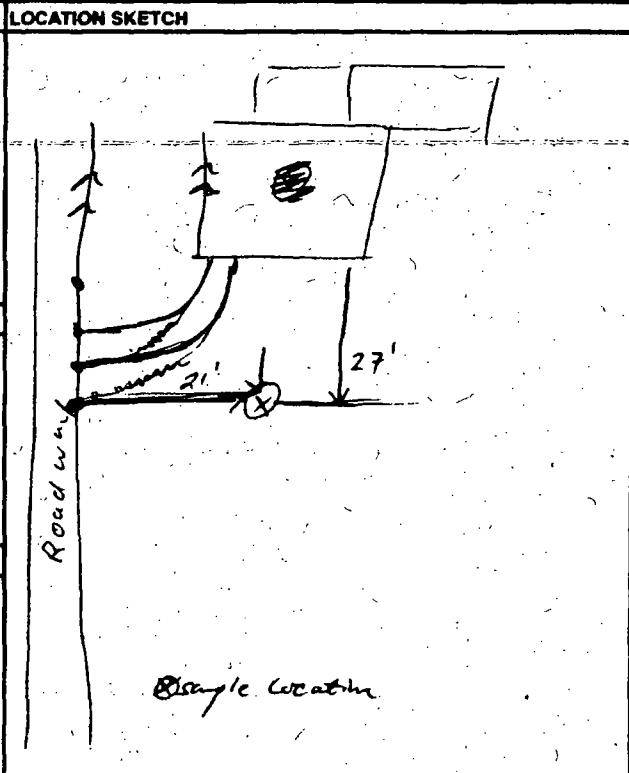
DESCRIPTION OF SAMPLE LOCATION

Indoor N/A
 Location: _____
 Basement: yes / no _____
 Room size (fxdt): _____
 Floor material: concrete / wood / dirt / other _____
 Slab Thickness (ft): _____
 Visible Cracks: yes / no _____
 Subslab Material: dirt / gravel _____

Outdoor
 Location: front yard
 Depth to Water (ft): N/A
 Soil type: silty sand → fill
 Odor: none
 Color: brown

PROBE INSTALLATION

Date: 10/23/07
 Method: Geoprobe w/ slide hammer
 Diameter: 3/8 inch
 Depth: 4 feet
 Packing Material: none
 Initial PID Reading: 0
 Post PID Reading: 0



PURGE

Date: 10/23/07
 Time: 10:12
 Rate: 1.25 L/min
 Volume: 2 L

SAMPLE COLLECTION

Start Time: 1022 End Time: 1822
 Starting Pressure: -30 End Pressure: -6.5
 Rate: 11.5 mL/min
 Volume: 5520 mL
 Canister Descriptk: 6 L Summa #12700

OBSERVATIONS / NOTES:

regulator start pressure = -27.5
 regulator end pressure = -5

Signature(s): [Signature]



Project Site Name: Butz Sample ID Number: R07-IA-20071023
 Project Number: 112601060 Sampled By: Gordon Arango
 Sample Location: Tim Rinker's House Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor sub. at G.V. Living Room Outdoor: N/A
 Location: Tim Rinker's House (GSA) Location: _____
 Basement: yes (no) Depth to Water (ft): _____
 Room size (ftxft): 8 x 10 Soil type: _____
 Floor material: concrete / wood / dirt / other N/A Odor: _____
 Slab Thickness (ft): N/A Color: _____
 Visible Cracks: yes / no
 Subslab Material: dirt / gravel N/A

PROBE INSTALLATION N/A **LOCATION SKETCH**

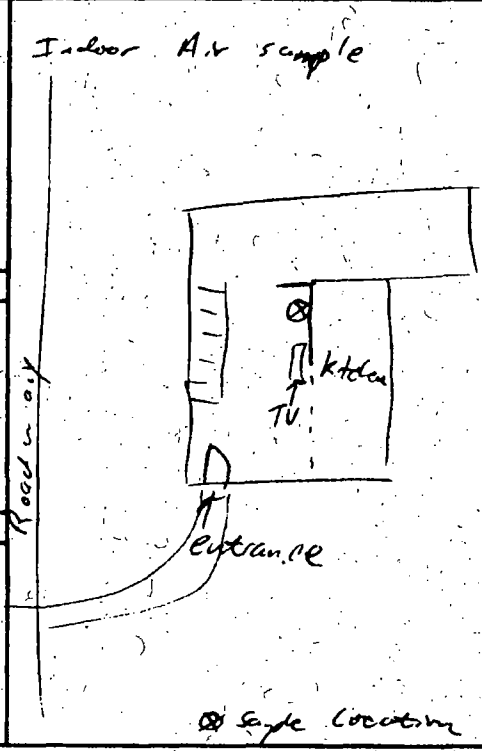
Date: _____
 Method: _____
 Diameter: 3/8 inch
 Depth: _____
 Packing Material: _____
 Initial PID Reading: _____
 Post PID Reading: _____

PURGE N/A

Date: _____
 Time: _____
 Rate: _____
 Volume: _____

SAMPLE COLLECTION

Start Time: 1010 End Time: 1810
 Starting Pressure: -30 End Pressure: -7
 Rate: 11.5 mL/min
 Volume: 5520 mL
 Canister Description: 6 L Summa # 25305



OBSERVATIONS / NOTES:

regulator start pressure = -29.0
 regulator end pressure = -7.0

Signature(s): [Handwritten Signature]



Project Site Name: Butz Sample ID Number: RO7-0A-20071023
 Project Number: 112601060 Sampled By: _____
 Sample Location: Tim Riker's House

DESCRIPTION OF SAMPLE LOCATION

Indoor

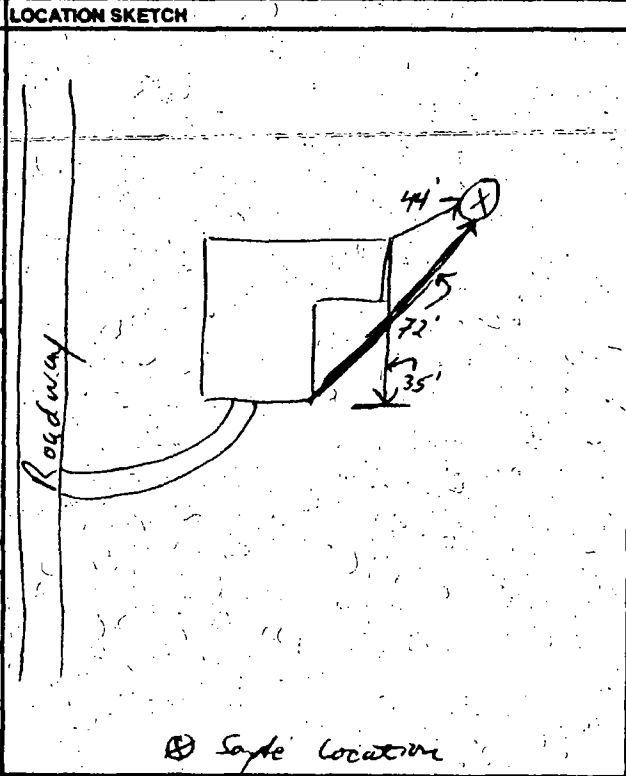
Location: N/A
 Basement: yes / no
 Room size (ftxft): _____
 Floor material: concrete / wood / dirt / other
 Slab Thickness (ft): _____
 Visible Cracks: yes / no
 Subslab Material: dirt / gravel

Outdoor

Location: Tim Riker's Home
 Depth to Water (ft): unknown
 Soil type: n/a
 Odor: N/A
 Color: N/A

PROBE INSTALLATION

Date: N/A
 Method: _____
 Diameter: 3/8 inch
 Depth: _____
 Packing Material: _____
 Initial PID Reading: _____
 Post PID Reading: _____



PURGE

Date: N/A
 Time: _____
 Rate: _____
 Volume: _____

SAMPLE COLLECTION

Start Time: 1039 End Time: 1839
 Starting Pressure: -30 End Pressure: -7
 Rate: 11.5 mL/min
 Volume: 5520
 Canister Descriptk: 6 L Summa # 3946

OBSERVATIONS / NOTES:

Regulator start pressure - -31 (approximate)
 Regulator end pressure: -8.5

Signature(s): [Signature]



Project Site Name: Butz Sample ID Number: R07-SV1-2007023
 Project Number: 112601060 Sampled By: Caroline Arayo
 Sample Location: Stephanie Shay's Rental -> Tom Ricker -> Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor
 Location: Basement
 Basement: yes no
 Room size (ftxft): 28 x 26 = 728 - side room (7F)
 Floor material: concrete / wood / dirt / other
 Slab Thickness (ft): 4 inches
 Visible Cracks: yes no
 Subslab Material: dirt / gravel

Outdoor N/A
 Location: _____
 Depth to Water (ft): _____
 Soil type: _____
 Odor: _____
 Color: _____

4
28
26

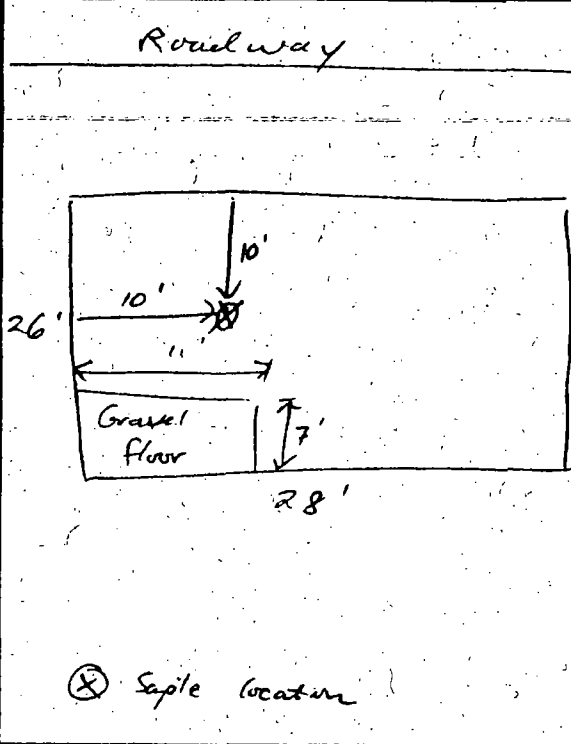
188
56

228

PROBE INSTALLATION

Date: 10/23/07
 Method: N/A
 Diameter: 3/8 inch
 Depth: 4 inches
 Packing Material: N/A
 Initial PID Reading: 3.9 - 4.6
 Post PID Reading: 0

LOCATION SKETCH



PURGE

Date: 10/23/07
 Time: 1400
 Rate: 2 L/min
 Volume: 2L

SAMPLE COLLECTION

Start Time: 1405 End Time: 1613
 Starting Pressure: -29.5 End Pressure: -3.5
 Rate: 111 mL/min
 Volume: N/A
 Canister Descript: 6 L Summa # 4230

OBSERVATIONS / NOTES:

regulator start pressure = -30
 regulator end pressure = -4

Signature(s):



Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Project Site Name: Bute Sample ID Number: AMB-BG-20071026
 Project Number: 112601060 Sampled By: Carla Arango
 Sample Location: _____ Chick Meyer

DESCRIPTION OF SAMPLE LOCATION	
Indoor Location: <u>N/A</u> Basement: <u>yes / no</u> Room size (ftxft): _____ Floor material: <u>concrete / wood / dirt / other</u> Slab Thickness (ft): _____ Visible Cracks: <u>yes / no</u> Subslab Material: <u>dirt / gravel</u>	Outdoor Location: <u>Access Road to EW-1</u> Depth to Water (ft): <u>unknown</u> Soil type: <u>CL</u> Odor: <u>none</u> Color: <u>gray</u>

PROBE INSTALLATION	LOCATION SKETCH
Date: <u>N/A</u> Method: _____ Diameter: <u>3/8 inch</u> Depth: _____ Packing Material: _____ Initial PID Reading: _____ Post PID Reading: _____	
PURGE Date: <u>N/A</u> Time: _____ Rate: _____ Volume: _____	
SAMPLE COLLECTION Start Time: <u>1059</u> End Time: <u>1858</u> Starting Pressure: <u>-3 psig</u> End Pressure: <u>-15 psig</u> Rate: <u>111 mL/min</u> Volume: <u>26 L</u> Canister Descript: <u>6 L Summa</u>	

OBSERVATIONS / NOTES:
 regulator skirt pressure -29.5 psig

Signature(s): [Signature]



Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Project Site Name: Butz Sample ID Number: 107-OA-20071023
 Project Number: 112G01060 Sampled By: _____
 Sample Location: Tim Rinker's House

DESCRIPTION OF SAMPLE LOCATION

Indoor: N/A

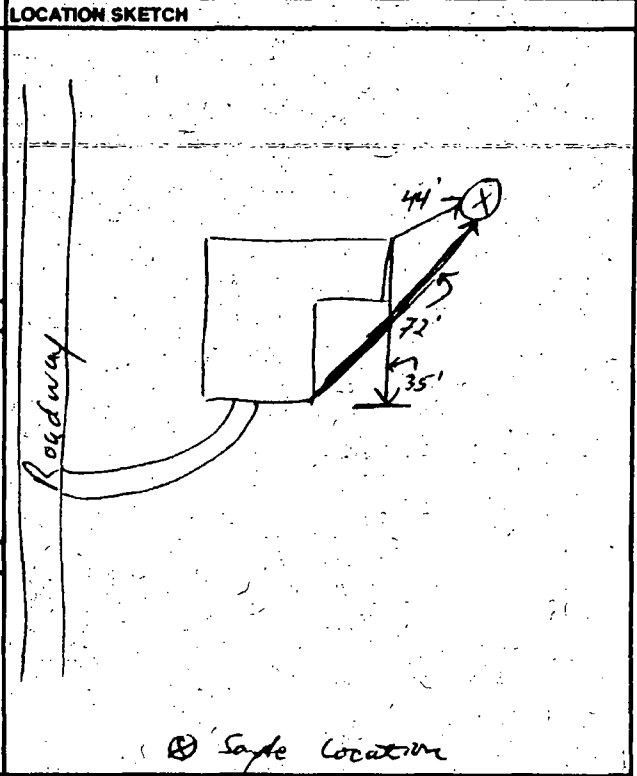
Location: _____
 Basement: yes / no _____
 Room size (sqft): _____
 Floor material: concrete / wood / dirt / other _____
 Slab Thickness (ft): _____
 Visible Cracks: yes / no _____
 Subslab Material: dirt / gravel _____

Outdoor

Location: Tim Rinker's home
 Depth to Water (ft): unknown
 Soil type: N/A
 Odor: N/A
 Color: N/A

PROBE INSTALLATION

Date: _____
 Method: _____
 Diameter: 3/8 inch
 Depth: _____
 Packing Material: _____
 Initial PID Reading: _____
 Post PID Reading: _____



PURGE

Date: _____
 Time: _____
 Rate: _____
 Volume: _____

SAMPLE COLLECTION

Start Time: 1039 End Time: 1839
 Starting Pressure: -30 End Pressure: -7
 Rate: 11.5 mL/min
 Volume: 5520
 Canister Descriptk: 6 L Summa # 3946

OBSERVATIONS / NOTES:

Regulator start pressure - -31 (approximate)
 Regulator end pressure - -8.5

Signature(s): [Signature]



Project Site Name: Butz Sample ID Number: R07-SV1-2007023
 Project Number: 112G01060 Sampled By: Caroline Arago
 Sample Location: Stephan's Shays Rental → Tim Arker Charles Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor
 Location: Basement
 Basement: yes no
 Room size (l x w): 28 x 26 = 728 - room (FF)
 Floor material: concrete wood dirt / other
 Slab Thickness (ft): 4 inches Total Area = 651 sq ft
 Visible Cracks: yes no
 Subslab Material: dirt gravel

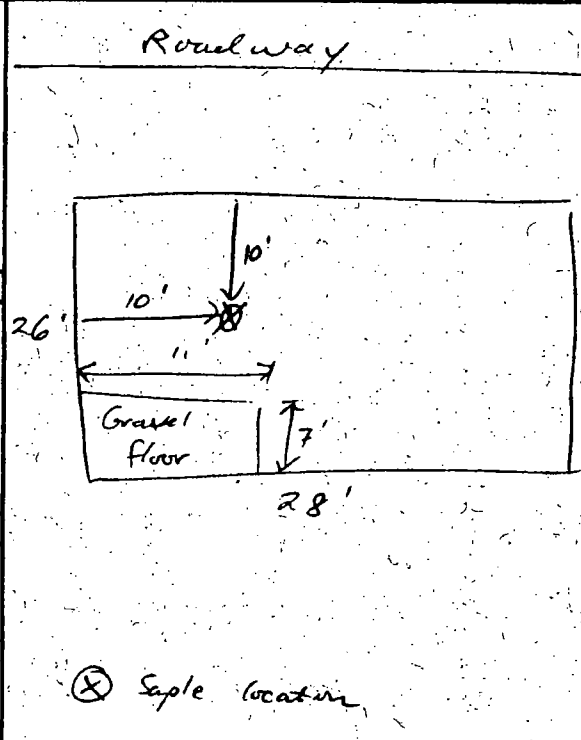
Outdoor N/A
 Location: _____
 Depth to Water (ft): _____
 Soil type: _____
 Odor: _____
 Color: _____

4
28
26
168
56
728

PROBE INSTALLATION

Date: N/A 10/23/07
 Method: N/A
 Diameter: 3/8 inch
 Depth: 4 inches
 Packing Material: N/A
 Initial PID Reading: 3.9 - 4.6
 Post PID Reading: 0

LOCATION SKETCH



PURGE

Date: 10/23/07
 Time: 1400
 Rate: 2 L/min
 Volume: 2L

SAMPLE COLLECTION

Start Time: 1405 End Time: 1613
 Starting Pressure: -29.5 End Pressure: -3.5
 Rate: 111 mL/min
 Volume: N/A
 Canister Descriptk: 6 L Summa # 4230

OBSERVATIONS / NOTES:

regulator start pressure = -30
 regulator end pressure = -4

Signature(s): [Signature]



Project Site Name: Bld 2 Sample ID Number: ROT-SV2-20071023
 Project Number: 112601060 Sampled By: Gordon Arago
 Sample Location: Stephanie Shay & Restroom - Tom Risher Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION	
Indoor Location: <u>Basement</u> Basement: <input checked="" type="checkbox"/> yes <input type="checkbox"/> no - <u>77 sq ft side room</u> Room size (ftxft): <u>28 x 26 => 651 sq ft</u> Floor material: <input checked="" type="checkbox"/> concrete <input type="checkbox"/> wood <input type="checkbox"/> dirt / other Slab Thickness (ft): <u>5 inches</u> Visible Cracks: <input checked="" type="checkbox"/> yes <input type="checkbox"/> no Subslab Material: <input checked="" type="checkbox"/> dirt <input type="checkbox"/> gravel	Outdoor Location: <u>N/A</u> Depth to Water (ft): _____ Soil type: _____ Odor: _____ Color: _____

PROBE INSTALLATION	LOCATION SKETCH
Date: <u>N/A</u> <u>10/23/07</u> Method: <u>N/A</u> Diameter: <u>3/8 inch</u> Depth: <u>5'</u> Packing Material: <u>N/A</u> Initial PID Reading: <u>2.8, 4.7, 3.5</u> Post PID Reading: <u>2.0</u>	<u>Roadway</u>

PURGE
Date: <u>10/23/07</u> Time: <u>1430</u> Rate: <u>2 L/min</u> Volume: <u>2 L</u>

SAMPLE COLLECTION
Start Time: <u>1435</u> End Time: <u>1631</u> Starting Pressure: <u>-29</u> End Pressure: <u>-2</u> Rate: <u>111 mL/min</u> Volume: <u>N/A</u> Canister Descript: <u>6 L Summa # 10794</u>

OBSERVATIONS / NOTES:
 Regulator start pressure = -28.5
 Regulator end pressure = -3.5

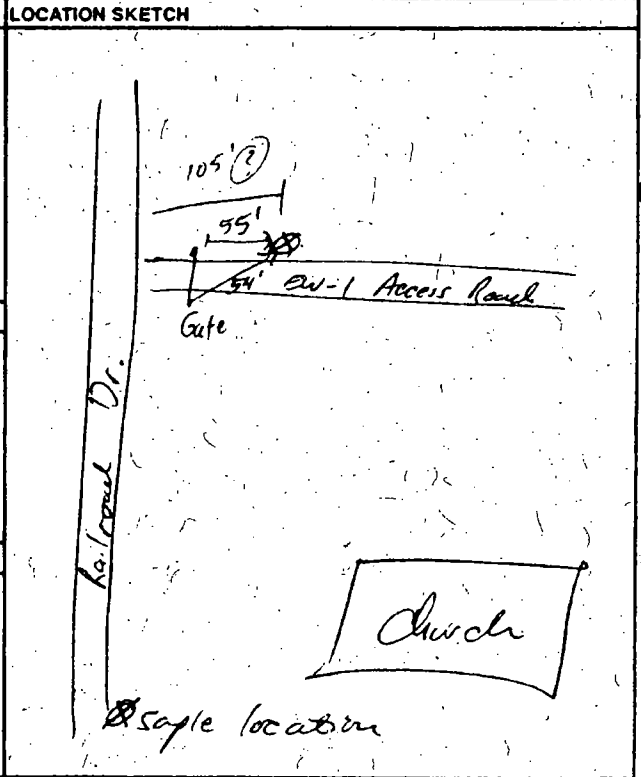
Signature(s): [Signature]



Project Site Name: <u>Bute</u>	Sample ID Number: <u>AMB-BG-20071026</u>
Project Number: <u>112601060</u>	Sampled By: <u>Gordon Arango</u>
Sample Location: _____	<u>Charles Meyer</u>

DESCRIPTION OF SAMPLE LOCATION	
Indoor: <u>N/A</u>	Outdoor: _____
Location: _____	Location: <u>Access Road to EW-1</u>
Basement: yes / no	Depth to Water (ft): <u>unknown</u>
Room size (ftxft): _____	Soil type: <u>4.11</u>
Floor material: concrete / wood / dirt / other	Odor: <u>none</u>
Slab Thickness (ft): _____	Color: <u>Brown</u>
Visible Cracks: yes / no	
Subslab Material: dirt / gravel	

PROBE INSTALLATION
Date: <u>N/A</u>
Method: _____
Diameter: <u>3/8 inch</u>
Depth: _____
Packing Material: _____
Initial PID Reading: _____
Post PID Reading: _____



PURGE
Date: <u>N/A</u>
Time: _____
Rate: _____
Volume: _____

SAMPLE COLLECTION	
Start Time: <u>11059</u>	End Time: <u>1858</u>
Starting Pressure: <u>-31 psig</u>	End Pressure: <u>-15 psig</u>
Rate: <u>111 mL/min</u>	
Volume: <u>26 L</u>	
Canister Descript: <u>6 L Summa</u>	

OBSERVATIONS / NOTES:
<u>regulator skirt pressure -29.5 psig</u>
Signature(s): <u>[Signature]</u>

APPENDIX E

DATA VALIDATION PACKAGES



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

DATE : November 15, 2007
SUBJECT: Region III Data QA Review
FROM : Khin Cho Thaung *KCT*
Region III ESAT PO (3EA20)
TO : Romuald Roman
Regional Program Manager (3HS22)

Attached is the organic data validation report for the Butz Landfill site (Case#: 36934; SDG#: COC28) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2743.

Attachment

cc: Megan Ritchie (TTNUS)

TO File: 0007 TDF# 1119

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE

Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597

DATE: November 14, 2007

SUBJECT: Level M3 Organic Data Validation for Case 36934
SDG: C0C28
Site: Butz Landfill

FROM: Shilpa Udani SA
Organic Data Reviewer

Mahboobeh Mecanic
Senior Oversight Chemist

TO: Khin-Cho Thaug
ESAT Region 3 Project Officer

OVERVIEW

Case 36934, Sample Delivery Group (SDG) C0C28, consisted of one (1) aqueous sample and one (1) trip blank submitted to ChemTech Consulting Group (CHEM) for trace volatile analysis. Samples were analyzed according to Contract Laboratory Program (CLP) Statement of Work (SOW) SOM01.2 through Routine Analytical Services (RAS) program.

SUMMARY

Data were validated according to the Region III Modifications to the National Functional Guidelines for Organic Data Review, Level M3. Areas that may impact data usability are listed below.

MAJOR PROBLEM

- Response Factors (RRFs) were less than 0.05 for acetone and 2-butanone and less than 0.005 for 1,4-dioxane in the initial and continuing calibrations. The associated positive result for acetone in sample C0C28 was qualified "L" on the Data Summary Form (DSF). The quantitation limits for these compounds in affected samples were rejected and qualified "R" on the DSFs.

MINOR PROBLEMS

- 1,4-Dioxane exceeded fifty percent Difference (%D > 50%) in the continuing calibration performed on 11/02/07 at 17:46. The "UJ" qualifier for this outlier in both samples was superseded by "R" on the DSFs.

- Sample C0C28 had a recovery of Deuterated Monitoring Compound (DMC) 1,4-dioxane-d8 outside the lower Quality Control (QC) limit. The "UL" qualifier for 1,4-dioxane, the only compound associated with this DMC, was superseded by "R" on the DSFs.

NOTES

- Sample C0C29 had recoveries of DMCs chloroethane-d5 and toluene-d8 outside the upper QC limit. The sample results associated with these DMCs were non-detects; therefore, no data were qualified based on these outliers.
- Storage blank (VHBLK01) and method blank (VBLK02) had recoveries of DMC 1,4-dioxane-d8 outside the lower control limit. No data were qualified based on these QC samples outliers.
- No positive result was reported in the analyses of trip, method and storage blanks associated with this data set.
- Tentatively Identified Compound (TIC) were reviewed during data validation. No compounds were detected other than an unknown in sample C0C29. The TIC Form I for this sample is included in Appendix E.

All data for Case 36934, SDG C0C28, were reviewed in accordance with Region III Modifications to the National Functional Guidelines for Organic Data Review, September 1994.

ATTACHMENTS

- 1) Appendix A Glossary of Data Qualifier Terms
- 2) Appendix B Data Summary Forms
- 3) Appendix C Chain-of-Custody Records
- 4) Appendix D Laboratory Case Narrative
- 5) Appendix E Tentatively Identified Compounds (TICs)

DCN: 36934 - C0C28

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (ORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of compounds)

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

NO CODE = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unusable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

N = Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

NJ = Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.

Q = No analytical result.

Appendix B

Data Summary Forms

DATA SUMMARY FORM: Trace Volatiles

Case #: 36934

SDG: C0C28

Number of Soil Samples: 0

Site:

BUTZ LANDFILL

Number of Water Samples: 2

Lab:

CHEM

Sample Number:		C0C28		C0C29							
Sampling Location:		R01-SUMP-20071025		TB-01-20071025							
Field QC:				Trip Blank							
Matrix:		Water		Water							
Units:		ug/L		ug/L							
Date Sampled:		10/25/2007		10/25/2007							
Time Sampled:		14:45		07:55							
pH:		1		1							
Dilution Factor:		1.0		1.0							
Trace Volatile Compound	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Dichlorodifluoromethane	0.50										
Chloromethane	0.50										
Vinyl chloride	0.50										
Bromomethane	0.50										
Chloroethane	0.50										
Trichlorofluoromethane	0.50										
*1,1-Dichloroethene	0.50										
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50										
Acetone	5.0	19	L		R						
Carbon disulfide	0.50										
Methyl acetate	0.50										
*Methylene chloride	0.50										
trans-1,2-Dichloroethene	0.50										
Methyl tert-butyl ether	0.50										
1,1-Dichloroethane	0.50										
cis-1,2-Dichloroethene	0.50										
*2-Butanone	5.0		R		R						
Bromochloromethane	0.50										
Chloroform	0.50										
*1,1,1-Trichloroethane	0.50										
Cyclohexane	0.50										
*Carbon tetrachloride	0.50										
*Benzene	0.50										
*1,2-Dichloroethane	0.50										
1,4-Dioxane	20		R		R						
Trichloroethene	0.50										
Methylcyclohexane	0.50										
*1,2-Dichloropropane	0.50										
Bromodichloromethane	0.50										
cis-1,3-Dichloropropene	0.50										
4-Methyl-2-pentanone	5.0										
*Toluene	0.50										
trans-1,3-Dichloropropene	0.50										
1,1,2-Trichloroethane	0.50										

DATA SUMMARY FORM: Trace Volatiles

Case #: 36934

SDG : C0C28

Site :

BUTZ LANDFILL

Lab :

CHEM

Sample Number :		C0C28	C0C29								
Sampling Location :		R01-SUMP- 20071025	TB-01- 20071025								
Field QC :			Trip Blank								
Matrix :		Water	Water								
Units :		ug/L	ug/L								
Date Sampled :		10/25/2007	10/25/2007								
Time Sampled :		14:45	07:55								
pH :		1	1								
Dilution Factor :		1.0	1.0								
Trace Volatile Compound	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
*Tetrachloroethene	0.50										
2-Hexanone	5.0										
Dibromochloromethane	0.50										
1,2-Dibromoethane	0.50										
*Chlorobenzene	0.50										
*Ethylbenzene	0.50										
o-Xylene	0.50										
m,p-Xylene	0.80										
*Styrene	0.50										
Bromoform	0.50										
Isopropylbenzene	0.50										
1,1,2,2-Tetrachloroethane	0.80										
*1,3-Dichlorobenzene	0.50										
*1,4-Dichlorobenzene	0.50										
1,2-Dichlorobenzene	0.50										
1,2-Dibromo-3-chloropropane	0.50										
1,2,4-Trichlorobenzene	0.50										
1,2,3-Trichlorobenzene	0.50										

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

Appendix C
Chain-of-Custody Records

U.S. EPA Region III Analytical Request Form

Revision 10.06

215 10 11-07

ASQAB USE ONLY		
RAS#	CT4078	Analytical TAT
DAS#		14
NSF#		

36934

Date: 10/5/2007		Site Activity: RA	
Site Name: Butz Landfill Site		Street Address: RD#5, TWP. RT. 601	
City: Jackson Township	State: PA	Latitude: 41 02' 37"	Longitude: 75 18' 10"
Program: Superfund	Acct. #: 2008.T 03N 302DD2C 03Q6 RA/02	CERCLIS #: PAD981034705	
Site ID:	Spill ID:	Operable Unit: 02	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	Title: Site-specific Work Plan Addendum, Vapor Intrusion Investigation		Date Approved: 7/12/2007
EPA Project Leader: Romuald Roman 3HS22	Phone#: 215-814-3212	Cell Phone #:	E-mail: Roman.Romuald@epa.gov
Request Preparer: Megan Ritchie	Phone#: 610-382-1527	Cell Phone #:	E-mail: megan.ritchie@tetrattech.com
Site Leader: Neil Teamerson	Phone#: 610-382-1531	Cell Phone #:	E-mail: neil.teamerson@tetrattech.com
Contractor: TrNUS		EPA CO/PO: Andy Blaney	
#Samples 3	Matrix: water-non potable	Parameter: TCL VOA Trace	Method: SOM01.2 Trace <i>26916</i>
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 10/23/2007	Ship Date To: 10/25/2007	Org. Validation Level M3	Inorg. Validation Level
Unvalidated Data Requested: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes If Yes, TAT Needed: <input type="checkbox"/> 14days <input type="checkbox"/> 7days <input type="checkbox"/> 72hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 24hrs <input type="checkbox"/> Other (Specify)			
Validated Data Package Due: <input type="checkbox"/> 42 days <input type="checkbox"/> 30 days <input checked="" type="checkbox"/> 21days <input type="checkbox"/> 14 days <input type="checkbox"/> Other (Specify) <i>14/7</i>			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached tables for compound list and detection limits. Gordon Araujo Tetra Tech NUS, Inc. 234 Mall Boulevard, Suite 260 King of Prussia, PA 19475 610-382-1168			

FORM ARF- 10/06

Revision 1.1



**USEPA Contract Laboratory Program
Organic Traffic Report & Chain of Custody Record**

Case No: 36934
DAS No: R

Region: 3 Project Code: CT4078 Account Code: CERCLIS ID: PAD981034705 Spill ID: Q6 Site Name/State: Butz (36934)/PA Project Leader: Neil Teamerson Action: Remedial Action Sampling Co: Tetra Tech NUS, Inc.	Date Shipped: 10/25/2007 Carrier Name: FedEx Airbill: 8631 3042 0288 Shipped to: ChemTech Consulting Group 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Chain of Custody Record</th> <th>Sampler Signature: <i>[Signature]</i></th> </tr> <tr> <th>Relinquished By</th> <th>(Date / Time)</th> <th>Received By (Date / Time)</th> </tr> <tr> <td>1 <i>[Signature]</i></td> <td>10/25/07 20:10</td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> </tr> </table>	Chain of Custody Record		Sampler Signature: <i>[Signature]</i>	Relinquished By	(Date / Time)	Received By (Date / Time)	1 <i>[Signature]</i>	10/25/07 20:10		2			3			4		
Chain of Custody Record		Sampler Signature: <i>[Signature]</i>																		
Relinquished By	(Date / Time)	Received By (Date / Time)																		
1 <i>[Signature]</i>	10/25/07 20:10																			
2																				
3																				
4																				

ORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME	INORGANIC SAMPLE No.	QC Type
COC28	Ground Water/ Gordon Araujo	L/G	CLP TVOA (14)	3-664675 (HCL), 3-664676 (HCL), 3-664677 (HCL) (3)	R01-SUMP-20071025	S: 10/25/2007 14:45		
COC29	Ground Water/ Gordon Araujo	L/G	CLP TVOA (14)	3-664678 (HCL), 3-664679 (HCL), 3-664680 (HCL) (3)	TB-01-20071025	S: 10/25/2007 7:55		Trip Blank

Shipment for Case Complete? Y	Sample(s) to be used for laboratory GC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? <input type="checkbox"/>
CLP TVOA = CLP TCL Trace Volatiles			

TR Number: 3-501121265-102507-0003

REGION COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr, Fairfax, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4202

Appendix D

Laboratory Case Narrative

SDG NARRATIVE

LAB NAME : CHEMTECH CONSULTING GROUP
CASE# 36934
SDG# C0C28
CONTRACT# EPW05037
LAB CODE: CHEM
CHEMTECH PROJECT # Y5053
MODIFICATION REF. NUMBER: NA

LAB SAMPLE NO.	EPA SAMPLE NO
Y5053-01	C0C28
Y5053-02	C0C29
Y5053-11	VHBLK01

2 samples were delivered to the laboratory intact on 10/26/2007.

The test requested on the Chain of Custody was Trace Volatile Organic by Method SOM01.2.

Samples for Volatile Organic analyses were transferred unopened to the Volatile Laboratory. Removable physical sample tags were not provided. The temperature of the samples was 4 degrees C.

Trace Volatiles:

The analyses for Trace Volatile Organics were performed on instrument MSVOAF using GC column RTX624 which is 75 meters, 0.53 mm ID. The stationary phase is 6% cyanopropylphenyl and 94% dimethyl polysiloxane. The Purge Trap was supplied by Supelco, VOCARB 3000. The contents of the trap are Carbopack B, 10 cm/Carboxen-1000, 6 cm/Carboxen-1001, 1 cm.

Surrogate recoveries were not within QC limits for the followings:

Chloroethane-d5 for the samples C0C29;

Toluene-d8 for the samples C0C29;

1,4-Dioxane-d8 for the samples VBLK02, C0C28, VHBLK01;

Instrument Performance Check met requirements.

Retention Times met requirements.

Internal Standard Areas met requirements.

Holding Times were met.

1,4-Dioxane and 1,4-Dioxane-d8 did not meet the criteria for Minimum RRF and %RSD and also did not meet the criteria for %D in continuing calibration (VSTD00507). At lower concentration, the response of this compound is poor.

Blank analysis did not indicate the presence of any possible laboratory contamination.

Manual integration's were performed for the following:

Sample ID	File ID	Parameter	Review By	Review On	Supervised By	Supervised On	Reason
0.5 PPB ICC VSTD0.501	VF008746.D	2-Butanone	margaret	11/1/2007 5:04:18 PM	mohammad	11/2/2007 9:00:41 AM	Peak Integrated by Software incorrectly
0.5 PPB ICC VSTD0.501	VF008746.D	Cyclohexane	margaret	11/1/2007 5:04:18 PM	mohammad	11/2/2007 9:00:41 AM	Peak Integrated by Software incorrectly
0.5 PPB ICC VSTD0.501	VF008746.D	Chloromethane	margaret	11/1/2007 5:04:18 PM	mohammad	11/2/2007 9:00:41 AM	Peak Integrated by Software incorrectly
0.5 PPB ICC VSTD0.501	VF008746.D	Bromomethane	margaret	11/1/2007 5:04:18 PM	mohammad	11/2/2007 9:00:41 AM	Peak Integrated by Software incorrectly
0.5 PPB ICC VSTD0.501	VF008746.D	cis-1,2-Dichloroethene	margaret	11/1/2007 5:04:18 PM	mohammad	11/2/2007 9:00:41 AM	Peak Integrated by Software incorrectly
1 PPB ICC VSTD00102	VF008747.D	1,2,3-Trichlorobenzene	margaret	11/1/2007 5:04:23 PM	mohammad	11/2/2007 9:00:45 AM	Peak Integrated by Software incorrectly
1 PPB ICC VSTD00102	VF008747.D	Ethylbenzene	margaret	11/1/2007 5:04:23 PM	mohammad	11/2/2007 9:00:45 AM	Peak Integrated by Software incorrectly
1 PPB ICC VSTD00102	VF008747.D	1,2-Dichlorobenzene-d4	margaret	11/1/2007 5:04:23 PM	mohammad	11/2/2007 9:00:45 AM	Peak Integrated by Software incorrectly
1 PPB ICC VSTD00102	VF008747.D	1,3-Dichlorobenzene	margaret	11/1/2007 5:04:23 PM	mohammad	11/2/2007 9:00:45 AM	Peak Integrated by Software incorrectly
1 PPB ICC VSTD00102	VF008747.D	Methylcyclohexane	margaret	11/1/2007 5:04:23 PM	mohammad	11/2/2007 9:00:45 AM	Peak Integrated by Software incorrectly
1 PPB ICC VSTD00102	VF008747.D	trans-1,3-Dichloropropene-d4	margaret	11/1/2007 5:04:23 PM	mohammad	11/2/2007 9:00:45 AM	Peak Integrated by Software

CHEMTECH

3 of 4

							incorrectly
1 PPB ICC VSTD00102	VF008747.D	1,2-Dichloropropane	margaret	11/1/2007 5:04:23 PM	mohammad	11/2/2007 9:00:45 AM	Peak Integrated by Software incorrectly

Sample ID	File ID	Parameter	Review By	Review On	Supervised By	Supervised On	Reason
1 PPB ICC VSTD00102	VF008747.D	Vinyl Chloride-d3	margaret	11/1/2007 5:04:23 PM	mohammad	11/2/2007 9:00:45 AM	Peak Integrated by Software incorrectly
1 PPB ICC VSTD00102	VF008747.D	Chloroethane	margaret	11/1/2007 5:04:23 PM	mohammad	11/2/2007 9:00:45 AM	Peak Integrated by Software incorrectly
1 PPB ICC VSTD00102	VF008747.D	Methyl Acetate	margaret	11/1/2007 5:04:23 PM	mohammad	11/2/2007 9:00:45 AM	Peak Integrated by Software incorrectly
5 PPB ICC VSTD00503	VF008748.D	Chloromethane	margaret	11/1/2007 5:04:28 PM	mohammad	11/2/2007 9:00:49 AM	Peak Integrated by Software incorrectly
5 PPB ICC VSTD00503	VF008748.D	1,4-Dichlorobenzene	margaret	11/1/2007 5:04:28 PM	mohammad	11/2/2007 9:00:49 AM	Peak Integrated by Software incorrectly
10 PPB ICC VSTD01004	VF008749.D	Chloromethane	margaret	11/1/2007 5:04:31 PM	mohammad	11/2/2007 9:00:53 AM	Peak Integrated by Software incorrectly
10 PPB ICC VSTD01004	VF008749.D	1,4-Dioxane	margaret	11/1/2007 5:04:31 PM	mohammad	11/2/2007 9:00:53 AM	Peak Integrated by Software incorrectly
10 PPB ICC VSTD01004	VF008749.D	1,4-Dichlorobenzene	margaret	11/1/2007 5:04:31 PM	mohammad	11/2/2007 9:00:53 AM	Peak Integrated by Software incorrectly
20 PPB ICC VSTD02005	VF008750.D	1,2-Dibromo-3-chloropropane	margaret	11/1/2007 5:04:35 PM	mohammad	11/2/2007 9:00:57 AM	Peak Integrated by Software incorrectly
20 PPB ICC VSTD02005	VF008750.D	Chloromethane	margaret	11/1/2007 5:04:35 PM	mohammad	11/2/2007 9:00:57 AM	Peak Integrated by Software incorrectly
20 PPB ICC VSTD02005	VF008750.D	Chloroethane-d5	margaret	11/1/2007 5:04:35 PM	mohammad	11/2/2007 9:00:57 AM	Peak Integrated by Software incorrectly
20 PPB ICC VSTD02005	VF008750.D	1,4-Dioxane-d8	margaret	11/1/2007 5:04:35 PM	mohammad	11/2/2007 9:00:57 AM	Peak Integrated by Software incorrectly

Sample ID	File ID	Parameter	Review By	Review On	Supervised By	Supervised On	Reason
5 PPB.CCV VSTD00506	VF008753.D	Chloromethane	tatyana	11/5/2007 1:52:05 PM	Kedar	11/5/2007 5:20:39 PM	Peak Integrated by Software incorrectly
5 PPB.CCV VSTD00506	VF008753.D	Bromomethane	tatyana	11/5/2007 1:52:05 PM	Kedar	11/5/2007 5:20:39 PM	Peak Integrated by Software incorrectly
5 PPB.CCV VSTD00506	VF008753.D	1,4-Dichlorobenzene	tatyana	11/5/2007 1:52:05 PM	Kedar	11/5/2007 5:20:39 PM	Peak Integrated by Software incorrectly
5 PPB.CCV VSTD00507	VF008760.D	Chloromethane	tatyana	11/5/2007 1:52:11 PM	Kedar	11/5/2007 5:20:51 PM	Peak Integrated by Software incorrectly

Calculation :

Concentration in ug/L = $\frac{(Ax) (Is) (DF)}{(Ais) (RRF) (Vo)}$

Where,

Ax = Area of the characteristic ion (EICP) for the compound to be measured.

Ais = Area of the characteristic ion (EICP) for the internal standard.

Is = Amount of internal standard added in ng.

RRF = Mean Relative Response Factor from the initial calibration standard.

Vo = Total volume of water purged, in mL.

DF = Dilution Factor.

I certify that this Sample Data Package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy Sample Data Package and in the electronic data deliverable has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature Mildred V. Reyes

Name: Mildred V. Reyes

Date: 11/8/07

Title: QC Manager

Appendix E

Tentatively Identified Compounds (TICs)

1J - FORM I VOA-TIC
 VOLATILE ORGANICS ANALYSIS DATA SHEET
 TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

C0C29

Lab Name: Chemtech Contract: EPW05037
 Lab Code: CHEM Case No.: 36934 Mod. Ref No.: _____ SDG No.: C0C28
 Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: Y5053-02
 Sample wt/vol: 25.0 (g/mL) mL Lab File ID: VF008757.D
 Level: (TRACE or LOW/MED) TRACE Date Received: 10/26/2007
 % Moisture: not dec. Date Analyzed: 11/02/2007
 GC Column: RTX624 ID: 0.53 (mm) Dilution Factor: 1.0
 Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)
 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L Purge Volume: 25 (mL)

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01.		unknown1.48	1.48	3.5	J
02.					
03.					
04.					
05.					
06.					
07.					
08.					
09.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					
	¹ E966796	Total Alkanes	N/A		

¹EPA-designated Registry Number.

SOM1.2 (5/2005)

00025

AR301202



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

DATE : November 29, 2007
SUBJECT: Region III Data QA Review
FROM : Khin Cho Thaung *KCT*
Region III ESAT PO (3EA20)
TO: Romuald Roman
Regional Program Manager (3HS22)

Attached is the organic data validation report for the Butz Landfill site (DAS # R32837; SDG#: R07-1A-20071023) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2743.

Attachment

cc: Megan Ritchie (Tetra Tech)

TO File: 0007 TDF# 1134

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE

DATE: November 26, 2007

SUBJECT: Organic Data Validation for DAS R32837 (Level M3)
SDG: R07-1A-20071023
Site: Butz Landfill

FROM: Kenneth W. Curry *KWC*
Senior Data Reviewer

Mahboobeh Mecanic *MM*
Senior Oversight Chemist

TO: Khin-Cho Thaug
ESAT Region 3 Project Officer

OVERVIEW

DAS R32837, Sample Delivery Group (SDG) R07-1A-20071023, from the Butz Landfill site consisted of fifteen (15) Summa air canister samples analyzed for selected volatile compounds by Air Toxics Limited (AIR TOXICS). The sample set contained two (2) field duplicate pairs. The Summa canister samples were analyzed following Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air through the Delivery of Analytical Services (DAS) program.

SUMMARY

Data were validated according to Region III Modifications to the National Functional Guidelines for Organic Data Review, Level M3. Areas of concern are listed below.

MINOR PROBLEM

- Several compounds failed precision criteria [Percent Relative Standard Deviation (%RSD) and/or Percent Difference (%D)] in the initial and/or continuing calibrations. Trichlorofluoromethane (F11) had a %D greater than twenty-five percent (>25%) in the continuing calibration analyzed 10/31/07 at 10:24. The positive results for this compound in affected samples were qualified "J" on the Data Summary Forms (DSFs). No imprecisions exceeded fifty percent (%RSD or %D >50%); therefore, no quantitation limits were qualified based on calibration outliers.

NOTES

- Results were reported by the laboratory in units of ppbv (volume/unit volume) and $\mu\text{g}/\text{M}^3$. Results were reported on the DSFs in both units by the reviewer.
- No Tentatively Identified Compounds (TICs) were reported by the laboratory for this data set. TICs are not required by method TO-15. Several unidentified peaks were present in the chromatograms for these samples.

- The method blanks were free of contamination. Therefore, no data were qualified based on blank contamination.
- Case data contained canister clean-up certifications but no chromatograms to demonstrate canister cleanliness.
- Dilution factors reported on the DSFs are based on canister initial and final pressures. The RLs are elevated in these samples because of these dilutions.
- All Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD) recoveries and Relative Percent Differences (RPDs) were within control limits.
- All RPDs in the laboratory duplicate analysis of sample DUP-02-20071025 were within control limits.
- Results for field duplicate pairs, samples DUP-01-20071025/R06-SV3-20071025 and DUP-02-20071025/R01-SV4-20071025, were not comparable for several compounds in both field duplicate pairs.

All data for DAS R32837, SDG R07-1A-20071023, were reviewed in accordance with the National Functional Guidelines for Evaluating Organic Analyses with Modification for use within Region III.

ATTACHMENTS

- 1) Appendix A Glossary of Data Qualifier Terms
- 2) Appendix B Data Summary Forms
- 3) Appendix C Chain of Custody Records
- 4) Appendix D Laboratory Case Narrative

DCN: R32837TO15.wpd

Appendix A

Glossary of Data Qualifiers

GLOSSARY OF DATA QUALIFIER CODES (ORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of compounds)

- U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.
- NO CODE = Confirmed identification.
- B = Not detected substantially above the level reported in laboratory or field blanks.
- R = Unusable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
- N = Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

- J = Analyte present. Reported value may not be accurate or precise.
- K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- UJ = Not detected, quantitation limit may be inaccurate or imprecise.
- UL = Not detected, quantitation limit is probably higher.

OTHER CODES

NJ = Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.

Q = No analytical result.

Appendix B

Data Summary Forms

DATA SUMMARY FORM: VOLATILES (in PPBV)

Case #: R32837

SDG: R07-1A-20071023

Number of SUMMA air canister samples: 15

Site:

Butz Landfill

Lab:

Air Toxics

Sample Number	R07-IA-20071023	R07-OA-20071023	R07-SG-20071023	R07-SV1-20071023	R07-SV2-20071023						
Sampling Location	R07-IA-20071023	R07-OA-20071023	R07-SG-20071023	R07-SV1-20071023	R07-SV2-20071023						
Laboratory ID#	0710819-01A	0710819-02A	0710819-03A	0710819-04A	0710819-05A						
Field QC											
Matrix	Air	Air	Air	Air	Air						
Units	ppbv	ppbv	ppbv	ppbv	ppbv						
Date Sampled	10/23/2007	10/23/2007	10/23/2007	10/23/2007	10/23/2007						
Time Sampled	18:10	18:39	18:22	18:13	18:31						
Dilution Factor	1.79	1.75	1.75	1.48	1.39						
Volatile Compound	RL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Vinyl Chloride	0.10										
1,3-Butadiene	0.10	0.35									
Trichlorofluoromethane (F11)	0.10	0.25	J	0.24	J	0.55	J	0.35	J	0.35	J
1,1-Dichloroethene	0.10										
Trans-1,2-Dichloroethene	0.10										
Cis-1,2-Dichloroethene	0.10							0.28			
Chloroform	0.10									0.15	
1,1,1-Trichloroethane	0.10									0.42	
Carbon Tetrachloride	0.10										
1,2-Dichloroethane	0.10			0.25		1.2		4.5		18	
Trichloroethene	0.10										
Toluene	0.10	1.0		0.36		4.2		7.9		8.5	
Tetrachloroethene	0.10					0.32		0.29		0.32	
Ethyl Benzene	0.10					3.2		3.0		2.8	
m&o-Xylene	0.10	0.25				12		11		10	
o-Xylene	0.10					5.2		6.1		4.8	
1,1,2,2-Tetrachloroethane	0.10										

RL = Reporting Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits multiply the RL by the Dilution Factor

DATA SUMMARY FORM: VOLATILES (in PPBV)

Case #: R32837

SDG: R07-1A-20071023

Site

Butz Landfill

Lab

Air Toxics

Sample Number :	DUP-01-20071025	DUP-02-20071025	R01-SV1-20071025	R01-SV2-20071025	R01-SV3-20071025						
Sampling Location :	DUP-01-20071025	DUP-02-20071025	R01-SV1-20071025	R01-SV2-20071025	R01-SV3-20071025						
Laboratory ID#:	0710619-06A	0710619-07A	0710619-08A	0710619-09A	0710619-10A						
Field QC:	Field Dup. of R06-SV3-20071025	Field Dup. of R01-SV4-20071025									
Matrix :	Air	Air	Air	Air	Air						
Units :	ppbv	ppbv	ppbv	ppbv	ppbv						
Date Sampled :	10/25/2007	10/25/2007	10/25/2007	10/25/2007	10/25/2007						
Time Sampled :	15:25	16:38	15:40	16:56	16:57						
Dilution Factor :	1.41	1.58	1.44	1.44	1.49						
Volatile Compound	RL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Vinyl Chloride	0.10										
1,3-Butadiene	0.10										
Trichlorofluoromethane (F11)	0.10	10	J	0.75		0.72		0.87		0.94	
1,1-Dichloroethene	0.10	0.36									
Trans-1,2-Dichloroethene	0.10										
Cis-1,2-Dichloroethene	0.10										
Chloroform	0.10	0.15				0.30				0.28	
1,1,1-Trichloroethane	0.10										
Carbon Tetrachloride	0.10										
1,2-Dichloroethane	0.10										
Trichloroethene	0.10	0.29		0.34		1.0		1.0		0.95	
Toluene	0.10	13		1.8		3.0		2.0		2.2	
Tetrachloroethene	0.10			0.69		0.93		0.93		1.7	
Ethyl Benzene	0.10	3.1		1.8		1.9		2.1		2.1	
m&p-Xylene	0.10	12		6.6		7.1		8.0		8.1	
o-Xylene	0.10	5.1		3.1		3.4		3.8		3.7	
1,1,2,2-Tetrachloroethane	0.10										

RL = Reporting Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits multiply the RL by the Dilution Factor

DATA SUMMARY FORM: VOLATILES (In PPBV)

Case #: R32837

SDG: R07-1A-20071023

Site:

Butz Landfill

Lab:

Air Toxics

Sample Number:	R01-SV4-20071025	R06-SV1-20071025	R06-SV2-20071025	R06-SV3-20071025	R06-SV4-20071025						
Sampling Location:	R01-SV4-20071025	R06-SV1-20071025	R06-SV2-20071025	R06-SV3-20071025	R06-SV4-20071025						
Laboratory ID#:	0710819-11A	0710819-12A	0710819-13A	0710819-14A	0710819-15A						
Field QC:	Field Dup. of DUP-02-20071025			Field Dup. of DUP-01-20071025							
Matrix:	Air	Air	Air	Air	Air						
Units:	ppbv	ppbv	ppbv	ppbv	ppbv						
Date Sampled:	10/25/2007	10/25/2007	10/25/2007	10/25/2007	10/25/2007						
Time Sampled:	18:50	10:54	10:39	11:25	11:35						
Dilution Factor:	1.61	1.44	1.52	1.44	1.44						
Volatiles Compound	RL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Vinyl Chloride	0.10										
1,3-Butadiene	0.10										
Trichlorofluoromethane (F11)	0.10	0.68		2.4		1.3		1.1		9.8	
1,1-Dichloroethane	0.10							0.62			
Trans-1,2-Dichloroethene	0.10										
Cis-1,2-Dichloroethene	0.10										
Chloroform	0.10					0.21		0.16		0.22	
1,1,1-Trichloroethane	0.10										
Carbon Tetrachloride	0.10										
1,2-Dichloroethane	0.10										
Trichloroethene	0.10	0.48		0.74		0.53		0.47		0.41	
Toluene	0.10	1.9		4.3		3.4		2.8		5.9	
Tetrachloroethene	0.10	0.59		0.19		0.21		0.18		0.22	
Ethyl Benzene	0.10	1.8		2.2		2.2		2.1		2.3	
m&p-Xylene	0.10	6.4		8.4		8.6		6.6		9.0	
o-Xylene	0.10	3.0		3.8		4.1		4.0		4.3	
1,1,2,2-Tetrachloroethane	0.10										

RL = Reporting Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits multiply the RL by the Dilution Factor

DATA SUMMARY FORM: VOLATILES (ug/M3)

Case #: R32837

SDG: R07-1A-20071023

Number of SUMMA air canister samples: 15

Site:

Butz Landfill

Lab:

Air Toxics

Sample Number:	R07-1A-20071023	R07-OA-20071023	R07-SG-20071023	R07-SV1-20071023	R07-SV2-20071023						
Sampling Location:	R07-1A-20071023	R07-OA-20071023	R07-SG-20071023	R07-SV1-20071023	R07-SV2-20071023						
Laboratory ID#:	0710619-01A	0710619-02A	0710619-03A	0710619-04A	0710619-05A						
Field QC:											
Matrix:	Air	Air	Air	Air	Air						
Units:	ug/M3	ug/M3	ug/M3	ug/M3	ug/M3						
Date Sampled:	10/23/2007	10/23/2007	10/23/2007	10/23/2007	10/23/2007						
Time Sampled:	18:10	18:39	18:22	18:13	16:31						
Dilution Factor:	1.78	1.75	1.75	1.46	1.39						
Volatile Compound	RL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Vinyl Chloride	0.26										
1,3-Butadiene	0.22	0.78									
Trichlorofluoromethane (F11)	0.58	1.4	J	1.3	J	3.1	J	1.9	J	1.9	J
1,1-Dichloroethene	0.40										
Trans-1,2-Dichloroethene	0.40										
Cis-1,2-Dichloroethene	0.40							1.0			
Chloroform	0.49									0.72	
1,1,1-Trichloroethane	0.54									2.3	
Carbon Tetrachloride	0.63										
1,2-Dichloroethane	0.40										
Trichloroethene	0.54			1.3		6.6		24		98	
Toluene	0.38	3.9		1.3		16		30		32	
Tetrachloroethene	0.68					2.2		2.0		2.1	
Ethyl Benzene	0.43					14		13		11	
m&p-Xylene	0.43	1.1				52		50		46	
o-Xylene	0.43					23		22		20	
1,1,2,2-Tetrachloroethane	0.69										

RL = Reporting Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits multiply the RL by the Dilution Factor

DATA SUMMARY FORM: VOLATILES (ug/M3)

Case #: R32837

SDG: R07-1A-20071023

Site:

Butz Landfill

Lab:

Air Toxics

Sample Number	DUP-01-20071025	DUP-02-20071025	R01-SV1-20071025	R01-SV2-20071025	R01-SV3-20071025						
Sampling Location	DUP-01-20071025	DUP-02-20071025	R01-SV1-20071025	R01-SV2-20071025	R01-SV3-20071025						
Laboratory ID#	0710819-06A	0710819-07A	0710819-08A	0710819-09A	0710819-10A						
Field QC:	Field Dup. of R06-SV3-20071025	Field Dup. of R01-SV4-20071025									
Matrix:	Air	Air	Air	Air	Air						
Units:	ug/M3	ug/M3	ug/M3	ug/M3	ug/M3						
Date Sampled:	10/25/2007	10/25/2007	10/25/2007	10/25/2007	10/25/2007						
Time Sampled:	15:25	16:36	15:40	16:56	16:57						
Dilution Factor:	1.41	1.58	1.44	1.44	1.48						
Volatiles Compound	RL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Vinyl Chloride	0.26										
1,3-Butadiene	0.22										
Trichlorofluoromethane (F11)	0.56	56	J	4.2		4.1		4.9		5.2	
1,1-Dichloroethane	0.40	1.4									
Trans-1,2-Dichloroethane	0.40										
Cis-1,2-Dichloroethane	0.40										
Chloroform	0.49	0.75				1.5				1.4	
1,1,1-Trichloroethane	0.54										
Carbon Tetrachloride	0.63										
1,2-Dichloroethane	0.40										
Trichloroethene	0.54	1.5		1.8		5.6		5.4		5.1	
Toluene	0.38	49		6.1		11		7.7		8.4	
Tetrachloroethene	0.88			4.7		8.3		8.3		12	
Ethyl Benzene	0.43	13		7.0		8.2		9.1		9.0	
m&p-Xylene	0.43	54		29		31		35		35	
o-Xylene	0.43	22		14		15		17		16	
1,1,2,2-Tetrachloroethane	0.69										

RL = Reporting Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits multiply the RL by the Dilution Factor

DATA SUMMARY FORM: VOLATILES (ug/M3)

Case #: R32837
 Site:
 Lab:

SDG: R07-1A-20071023
 Butz Landfill
 Air Toxics

Sample Number :	R01-SV4-20071025	R06-SV1-20071025	R06-SV2-20071025	R08-SV3-20071025	R06-SV4-20071025						
Sampling Location :	R01-SV4-20071025	R06-SV1-20071025	R06-SV2-20071025	R06-SV3-20071025	R06-SV4-20071025						
Laboratory ID#:	0710619-11A	0710619-12A	0710619-13A	0710619-14A	0710619-15A						
Field QC :	Field Dup. of DUP-02-20071025			Field Dup. of DUP-01-20071025							
Matrix :	Air	Air	Air	Air	Air						
Units :	ug/M3	ug/M3	ug/M3	ug/M3	ug/M3						
Date Sampled :	10/25/2007	10/25/2007	10/25/2007	10/25/2007	10/25/2007						
Time Sampled :	16:50	10:54	10:39	11:25	11:35						
Dilution Factor :	1.61	1.44	1.52	1.44	1.44						
Volatle Compound	RL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Vinyl Chloride	0.26										
1,3-Butadiene	0.22										
Trichlorofluoromethane (F11)	0.56	3.8		13		7.2		60		55	
1,1-Dichloroethene	0.40							2.5			
Trans-1,2-Dichloroethene	0.40										
Cis-1,2-Dichloroethene	0.40										
Chloroform	0.49					1.0		0.76		1.1	
1,1,1-Trichloroethane	0.54										
Carbon Tetrachloride	0.63										
1,2-Dichloroethane	0.40										
Trichloroethene	0.54	2.6		4.0		2.8		2.5		2.2	
Toluene	0.38	7.1		16		13		10		22	
Tetrachloroethene	0.68	4.0		1.3		1.4		1.2		1.5	
Ethyl Benzene	0.43	7.0		9.4		9.6		9.2		9.9	
m&p-Xylene	0.43	28		37		37		37		39	
o-Xylene	0.43	13		16		18		17		19	
1,1,2,2-Tetrachloroethane	0.69										

RL = Reporting Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits multiply the RL by the Dilution Factor

Appendix C

Chain of Custody (COC) Records

**EPA USEPA Contract Laboratory Program
Generic Chain of Custody**

Reference Case: **R**
Client No: R32837

Region: 3	Date Shipped: 10/24/2007	Chain of Custody Record	Sampler Signature: <i>[Signature]</i>
Project Code:	Carrier Name: FedEx		Relinquished By (Date / Time)
Account Code: 2008 T 03N 302DD2C 03Q6 RA 02	Airbill: 8626 9924 2449	1 <i>[Signature]</i> 10/24/07 16:00	
CERCLIS ID: PAD981034705	Shipped to: Air Toxics Ltd. 180-B Blue Ravine Rd. Folsom CA 95630 (800) 985-5955	2	
Spill ID: Q6		3	
Site Name/State: Butz Landfill (R32837)/PA		4	
Project Leader: Neil Teamerson			
Action: Remedial Action			
Sampling Co: Tetra Tech NUS, Inc.			

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No/ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
R07-IA-20071 023	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-664625 (Not preserved) (1)	R07-IA-20071023	S: 10/23/2007 10:10 E: 10/23/2007 18:10	-
R07-OA-2007 1023	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-664626 (Not preserved) (1)	R07-OA-20071023	S: 10/23/2007 10:39 E: 10/23/2007 18:39	-
R07-SG-2007 1023	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-664627 (Not preserved) (1)	R07-SG-20071023	S: 10/23/2007 10:22 E: 10/23/2007 18:22	-
R07-SV1-200 71023	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-664628 (Not preserved) (1)	R07-SV1-20071023	S: 10/23/2007 14:05 E: 10/23/2007 16:13	-
R07-SV2-200 71023	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-664629 (Not preserved) (1)	R07-SV2-20071023	S: 10/23/2007 14:35 E: 10/23/2007 16:31	-

3 (66A)

Shipment for Case Complete? <input type="checkbox"/> N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s): <i>[Signature]</i>	Chain of Custody Seal Number:
Analysis Key: VOCs = Volatiles (Air)	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Inad? <input type="checkbox"/>

TR Number: 3-501121265-102407-0001

REGION COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send C Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Drive, Fairfax, VA 20151-3819; Phone 703/818-4200; Fax 703/818-



**USEPA Contract Laboratory Program
Generic Chain of Custody**

Reference Case:

Client No: R32837

R

Region: 3	Date Shipped: 10/25/2007	Chain of Custody Record	Sampler Signature: <i>[Signature]</i>
Project Code:	Carrier Name: FedEx		Relinquished By: <i>[Signature]</i> (Date / Time): 10/25/07 20:00
Account Code: 2008 T 03N 302DD2C 03Q6 RA 02	Airbill: 8831 3042 0277	1	
CERCLUS ID: PAD981034705	Shipped to: Air Toxics Ltd. 180-B Blue Ravine Rd. Folsom CA 95630 (800) 985-5955	2	
Spill ID: Q6		3	
Site Name/State: Butz Landfill (R32837)/PA		4	
Project Leader: Neil Teamerson			
Action: Remedial Action			
Sampling Co: Tetra Tech NUS, Inc.			

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No/ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
DUP-01-2007-1025	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-664665 (Not preserved) (1)	DUP-01-20071025	S: 10/25/2007 14:00 E: 10/25/2007 15:25	Dup of R06-SV3-20071025
DUP-02-2007-1025	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-664666 (Not preserved) (1)	DUP-02-20071025	S: 10/25/2007 15:30 E: 10/25/2007 16:36	Dup of R01-SV4-20071025
R01-SV1-20071025	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-664667 (Not preserved) (1)	R01-SV1-20071025	S: 10/25/2007 15:26 E: 10/25/2007 15:40	-
R01-SV2-20071025	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-664668 (Not preserved) (1)	R01-SV2-20071025	S: 10/25/2007 15:33 E: 10/25/2007 16:56	-
R01-SV3-20071025	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-664669 (Not preserved) (1)	R01-SV3-20071025	S: 10/25/2007 15:37 E: 10/25/2007 16:57	-
R01-SV4-20071025	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-664670 (Not preserved) (1)	R01-SV4-20071025	S: 10/25/2007 15:44 E: 10/25/2007 16:50	-
R06-SV1-20071025	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-664671 (Not preserved) (1)	R06-SV1-20071025	S: 10/25/2007 9:28 E: 10/25/2007 10:54	-
R06-SV2-20071025	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-664672 (Not preserved) (1)	R06-SV2-20071025	S: 10/25/2007 9:29 E: 10/25/2007 10:39	-
R06-SV3-20071025	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-664673 (Not preserved) (1)	R06-SV3-20071025	S: 10/25/2007 10:00 E: 10/25/2007 11:25	-
R06-SV4-20071025	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-664674 (Not preserved) (1)	R06-SV4-20071025	S: 10/25/2007 10:13 E: 10/25/2007 11:35	-

Shipment for Case Complete? <input type="checkbox"/> N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s): <i>[Signature]</i>	Chain of Custody Seal Number:
Analysis Key: VOCs = Volatiles (Air)	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? <input checked="" type="checkbox"/>

TR Number: 3-501121265-102507-0002

REGION COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Comments to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4201

U.S. EPA Region III Analytical Request Form

Revision 10.06

ASQAB USE ONLY		
RASH:		Analytical TAT
DASH:	R32837	14
NSM:		

Date: 10/5/2007		Site Activity: RA	
Site Name: Butz Landfill Site		Street Address: RD#5, TWP. RT. 601	
City: Jackson Township	State: PA	Latitude: 41 02' 37"	Longitude: 75 18' 10"
Program: Superfund	Acct. #: 2008 T 03N 302DD2C 03Q6 RA 02	CERCLIS #: PAD981034705	
Site ID:	Spill ID:	Operable Unit: 02	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Site-specific Work Plan Addendum, Vapor Intrusion Investigation	Date Approved: 7/12/2007
EPA Project Leader: Romuald Roman 3HS22	Phone#: 215-814-3212	Cell Phone #:	E-mail: Roman.Romuald@epa.gov
Request Preparer: Megan Ritchie	Phone#: 610-382-1527	Cell Phone #:	E-mail: megan.ritchie@tetrattech.com
Site Leader: Neil Teamerson	Phone#: 610-382-1531	Cell Phone #:	E-mail: neil.teamerson@tetrattech.com
Contractor: TiNUS		EPA CO/PO: Andy Blaney	
#Samples: 23	Matrix: air	Parameter: VOA	Method: TO-15 26 BBS
#Samples:	Matrix:	Parameter:	Method:
#Samples:	Matrix:	Parameter:	Method:
#Samples:	Matrix:	Parameter:	Method:
#Samples:	Matrix:	Parameter:	Method:
#Samples:	Matrix:	Parameter:	Method:
#Samples:	Matrix:	Parameter:	Method:
#Samples:	Matrix:	Parameter:	Method:
Ship Date From: 10/23/2007	Ship Date To: 10/25/2007	Org. Validation Level M3	Inorg. Validation Level
Unvalidated Data Requested: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes. If Yes, TAT Needed: <input type="checkbox"/> 14days <input type="checkbox"/> 7days <input type="checkbox"/> 72hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 24hrs <input type="checkbox"/> Other (Specify)			
Validated Data Package Due: <input type="checkbox"/> 42 days <input type="checkbox"/> 30 days <input checked="" type="checkbox"/> 21days <input type="checkbox"/> 14 days <input type="checkbox"/> Other (Specify) 14/7			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached tables for compound list and detection limits. *****Need 6-liter summa canisters and ten 45 minute restrictors and twenty 8-hour regulators.*****			
Gordon Araujo Tetra Tech NUS, Inc. 234 Mall Boulevard, Suite 260 King of Prussia, PA 19475 610-382-1168			

R32837

11/9/2007 11:20:50AM

Compound Listing

Modified TO-15-LL (Sh)-EPA.3 (Hazel Township)

CAS Number	Compound	Detection Limit ppbv	Type
67-66-3	Chloroform ✓	0.10	
71-55-6	1,1,1-Trichloroethane ✓	0.10	
56-23-5	Carbon Tetrachloride ✓	0.10	
75-01-4	Vinyl Chloride ✓	0.10	
106-99-0	1,3-Butadiene ✓	0.10	
75-69-4	Freon 11 ✓	0.10	
75-35-4	1,1-Dichloroethene ✓	0.10	
156-60-5	trans-1,2-Dichloroethene ✓	0.10	
156-59-2	cis-1,2-Dichloroethene ✓	0.10	
107-06-2	1,2-Dichloroethane ✓	0.10	
79-01-6	Trichloroethene ✓	0.10	
108-88-3	Toluene ✓	0.10	
127-18-4	Tetrachloroethene ✓	0.10	
100-41-4	Ethyl Benzene ✓	0.10	
108-38-3	m,p-Xylene ✓	0.10	
95-47-6	o-Xylene ✓	0.10	
79-34-5	1,1,2,2-Tetrachloroethane ✓	0.10	
17060-07-0	1,2-Dichloroethane-d4		
2037-26-5	Toluene-d8		
460-00-4	4-Bromofluorobenzene		

John
Kwedar/ESC/R3/USEPA/US
11/07/2007 09:48 AM

To "Bryanna Langley" <b.langley@airtoxics.com>
cc Elizabeth Holman/DC/USEPA/US@EPA
bcc
Subject Re: Butz Landfill Site Project

Bryanna:

Note received from the sampler:

"We are going to recollect sample R02-SG-20071026. The laboratory can cancel that sample analysis. They were unable to pull any air."

John Kwedar
Client Services Team-ASQAB
EPA Region III
701 Mapes Road
Ft. Meade, MD 20755-5350
410-305-3021(voice)
410-305-3095(fax)
kwedar.john@epa.gov

"Bryanna Langley" <b.langley@airtoxics.com>



"Bryanna Langley"
<b.langley@airtoxics.com>
11/05/2007 04:14 PM

To John Kwedar/ESC/R3/USEPA/US@EPA
cc Elizabeth Holman/DC/USEPA/US@EPA
Subject Butz Landfill Site Project

Hi John,

I hope this email finds you doing well. I wanted to let you know that one of the samples we received on October 30th for project R32837 had significant vacuum remaining in the canister. Sample R02-SG-20071026 had a receipt vacuum of 27.5" Hg, and there is no indication it is a trip/field blank. With a vacuum of 27.5" Hg, the dilution factor applied will be approximately 16.08 after pressurization to 5 psi. Would you like us to proceed with analysis on this sample?

Thank you for your help!

Best regards,

Bryanna Langley
Eastern Region Project Manager

Air Toxics, Ltd.
A Woman-Owned Small Business
180-B Blue Ravine Rd
Folsom, CA 95630

b.langley@airtoxics.com
916-985-1000 x 1027
800-985-5955 x 1027
916-605-3327

Laboratory Services Since 1989
always air, always accurate

CONFIDENTIALITY NOTICE: This communication and any accompanying document(s) are confidential and privileged. They are intended for the sole use of the addressee. If you receive this transmission in error, you are advised that any disclosure, copying, distribution, or the taking of any action in reliance upon the communication is strictly prohibited. If you have received this communication in error, please contact our IS Department at its Internet address or by telephone at (916) 985-1000. Thank you.

TARGET COMPOUND LIST WITH REQUIRED DETECTION LIMITS
VALMONT TCE SITE
HAZLE TOWNSHIP, LUZERNE COUNTY, PENNSYLVANIA

Chemical	CAS Number	Molecular Weight (grams)	Method TO-15 Required DL (ppbv) ¹	Method TO-15 Required DL (calculated) (ug/m ³) ²	Region III Ambient Air RBC (ug/m ³) ³	Generic Risk-based Screening Levels for Indoor Air (ug/m ³) ⁴	Generic Risk-based Screening Levels for Shallow Soil Gas (ug/m ³) ⁴
1,1,1-Trichloroethane	71-55-6	133.4	0.5	2.73E+00	1.02E+02	2.20E+03	2.20E+04
1,1,2,2-Tetrachloroethane	79-34-5	167.9	0.5	3.43E+00	3.13E+02	4.20E+02	4.20E+01
1,1-Dichloroethane	75-35-4	97	0.5	1.98E+00	2.19E+01	2.00E+02	2.00E+03
1,2-Dichloroethane	107-06-2	99	0.5	2.02E+00	2.02E+02	8.40E+02	8.40E+01
1,3-Butadiene	106-99-0	54.09	0.5	1.11E+00	6.28E+01	8.70E+02	6.70E+02
Carbon tetrachloride	58-23-5	153.8	0.5	3.15E+00	3.38E+02	1.60E+03	3.00E+03
Chloroform	67-66-3	119	0.5	2.43E+00	7.70E+02	1.10E+01	1.10E+00
cis-1,2-Dichloroethane*	158-59-2	98.94	0.5	1.98E+00	3.65E+00	3.50E+01	3.50E+02
Ethylbenzene	100-41-4	108	0.5	2.17E+00	1.08E+02	2.20E+00	2.20E+01
Tetrachloroethene	127-18-4	165.8	0.5	3.39E+00	3.45E+01	8.30E+02	8.10E+00
Toluene	108-88-3	92	0.5	1.88E+00	5.11E+02	4.00E+02	4.00E+03
trans-1,2-Dichloroethene	158-80-5	98.94	0.5	1.98E+00	6.21E+00	7.00E+01	7.00E+02
Trichloroethene	79-01-6	131.4	0.5	2.69E+00	1.57E+01	2.50E+02	2.50E+01
Trichlorofluoromethane	75-89-4	137.37	0.5	2.81E+00	7.30E+01	7.00E+02	7.00E+03
Vinyl chloride	75-01-4	62.5	0.5	1.28E+00	7.20E+02	2.80E+04	2.80E+00
Xylenes (total)	1330-20-7	106.2	0.5	2.17E+00	1.10E+01	7.00E+03	7.00E+04

¹ Detection Limits from EPA Compendium Method TO-15, January 1999.

² Detection Limits in ug/cm³ calculated from the following equation where 24.45 = molar volume of air in liters at normal temperature and pressure conditions (i.e., 25C and 760 torr): Ug/m³ = ppbv x MW (grams) / 24.45

³ Region III Risk-based Concentrations, April 2007. RBCs that are based on noncancer effects were adjusted from a HQ of 1.0 to a HQ of 0.1 to protect against the possibility of additive toxic effects from multiple chemicals.

⁴ OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, Table 2c, November 2002. The shallow soil gas values include a soil gas to indoor air attenuation factor of 0.1.

Shaded values are not to be used for comparison.

* The value for total 1,2-Dichloroethene was used as a surrogate for cis-1,2-Dichloroethene.

REQUIRED QUANTITATION LIMITS FOR SUMP WATER SAMPLES

Chemical	CAS Number	SOM01.1 Trace (ug/L)
1,1,1-Trichloroethane	71-55-6	0.5
1,1,2,2-Tetrachloroethane	79-34-5	0.5
1,1-Dichloroethane	75-35-4	0.5
1,2-Dichloroethane	107-06-2	0.5
1,3-Butadiene	106-99-0	0.5
Carbon tetrachloride	58-23-5	0.5
Chloroform	67-66-3	0.5
cis-1,2-Dichloroethene	158-59-2	0.5
Ethylbenzene	100-41-4	0.5
Tetrachloroethene	127-18-4	0.5
Toluene	108-88-3	0.5
trans-1,2-Dichloroethene	158-80-5	0.5
Trichloroethene	79-01-6	0.5
Trichlorofluoromethane	75-89-4	0.5
Vinyl chloride	75-01-4	0.5
Xylenes (total)	1330-20-7	0.5

Appendix D

Laboratory Case Narrative



AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0710619

Work Order Summary

CLIENT: Mr. John Kwedar
US EPA Region III
701 Mapes Rd.
Mail Drop 3ES20
Ft. Meade, MD 20755-5350

PHONE: 410-305-3021

FAX: 410-305-3095

DATE RECEIVED: 10/25/2007

DATE COMPLETED: 11/06/2007

BILL TO: Ms. Mary Ann Keith
US EPA
Financial Management Center (D143-02)
Durham, NC 27711

P.O. # EP07W002460

PROJECT # R32837 R07-IA-20071023

CONTACT: Bryanna Langley

<u>FRACTION#</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC/PRES.</u>
01A	R07-IA-20071023	Modified TO-15	7.5 "Hg
02A	R07-OA-20071023	Modified TO-15	7.0 "Hg
03A	R07-SG-20071023	Modified TO-15	7.0 "Hg
04A	R07-SV1-20071023	Modified TO-15	2.5 "Hg
05A	R07-SV2-20071027	Modified TO-15	1.0 "Hg
06A	DUP-01-20071025	Modified TO-15	1.5 "Hg
07A	DUP-02-20071025	Modified TO-15	4.5 "Hg
07AA	DUP-02-20071025 Lab Duplicate	Modified TO-15	4.5 "Hg
08A	R01-SV1-20071025	Modified TO-15	2.0 "Hg
09A	R01-SV2-20071025	Modified TO-15	2.0 "Hg
10A	R01-SV3-20071025	Modified TO-15	3.0 "Hg
11A	R01-SV4-20071025	Modified TO-15	5.0 "Hg
12A	R06-SV1-20071025	Modified TO-15	2.0 "Hg
13A	R06-SV2-20071025	Modified TO-15	3.5 "Hg
14A	R06-SV3-20071025	Modified TO-15	2.0 "Hg
15A	R06-SV4-20071025	Modified TO-15	2.0 "Hg
16A	Lab Blank	Modified TO-15	NA

Continued on next page

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020



AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0710619

Work Order Summary

CLIENT: Mr. John Kwedar
US EPA Region III
701 Mapes Rd.
Mail Drop 3ES20
Ft. Meade, MD 20755-5350

BILL TO: Ms. Mary Ann Keith
US EPA
Financial Management Center (D143-02)
Durham, NC 27711

PHONE: 410-305-3021
FAX: 410-305-3095
DATE RECEIVED: 10/25/2007
DATE COMPLETED: 11/06/2007

P.O. # EP07W002460
PROJECT # R32837 R07-IA-20071023
CONTACT: Bryanna Langley

<u>FRACTION #</u>	<u>NAME</u>
16B	Lab Blank
17A	CCV
17B	CCV
18A	LCS
18AA	LCS
18B	LCS
18BB	LCS

<u>TEST</u>	<u>RECEIPT VAC/PRES</u>
Modified TO-15	NA
Modified TO-15	NA
Modified TO-15	NA
Modified TO-15	NA
Modified TO-15	NA
Modified TO-15	NA
Modified TO-15	NA

CERTIFIED BY: *Sandra D. Furrer*
Laboratory Director

DATE: 11/07/07

Certification numbers: CA NELAP - 02110CA, LA NELAP/LELAP - AI 30763, NJ NELAP - CA004, NY NELAP - 11291, UT NELAP - 9166389892

Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act, Accreditation number: E87680, Effective date: 07/01/07, Expiration date: 06/30/08
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

This report shall not be reproduced, except in full, without the written approval of Air Toxics Ltd.

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified TO-15
US EPA
Workorder# 0710619

LUMEN
DATA VALIDATED

Fifteen 6 Liter Summa Canister (100% Certified) samples were received on October 25, 2007. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode. The method involves concentrating up to 1.0 liter of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

<u>Requirement</u>	<u>TO-15</u>	<u>ATL Modifications</u>
ICAL %RSD acceptance criteria	+/- 30% RSD with 2 compounds allowed out to < 40% RSD	30% RSD with 4 compounds allowed out to < 40% RSD
Daily Calibration	+/- 30% Difference	<= 30% Difference with four allowed out up to <=40%.; flag and narrate outliers
Blank and standards	Zero air	Nitrogen
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases
Sample collection media	Summa canister	ATL recommends use of summa canisters to insure data defensibility, but will report results from Tedlar bags at client request

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).



AN ENVIRONMENTAL ANALYTICAL LABORATORY

- J - Estimated value.
- E - Exceeds instrument calibration range.
- S - Saturated peak.
- Q - Exceeds quality control limits.
- U - Compound analyzed for but not detected above the reporting limit.
- UJ - Non-detected compound associated with low bias in the CCV
- N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

- a-File was requantified
- b-File was quantified by a second column and detector
- r1-File was requantified for the purpose of reissue

Table 1

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Extracted	Sample	Date Analyzed	Sample Extract	Sample Condition
					Holding Time (Days)		Holding Time (Days)	
R07-IA-20071023	0710619-01A	10/23/2007	10/25/2007	NA	8	10/31/2007	NA	Good
R07-OA-20071023	0710619-02A	10/23/2007	10/25/2007	NA	8	10/31/2007	NA	Good
R07-SG-20071023	0710619-03A	10/23/2007	10/25/2007	NA	8	10/31/2007	NA	Good
R07-SV1-20071023	0710619-04A	10/23/2007	10/25/2007	NA	8	10/31/2007	NA	Good
R07-SV2-20071027	0710619-05A	10/23/2007	10/25/2007	NA	8	10/31/2007	NA	Good
DUP-01-20071025	0710619-06A	10/25/2007	10/25/2007	NA	7	11/ 1/2007	NA	Good
DUP-02-20071025	0710619-07A	10/25/2007	10/25/2007	NA	7	11/ 1/2007	NA	Good
DUP-02-20071025 Lab Du	0710619-07AA	10/25/2007	10/25/2007	NA	7	11/ 1/2007	NA	Good
R01-SV1-20071025	0710619-08A	10/25/2007	10/25/2007	NA	7	11/ 1/2007	NA	Good
R01-SV2-20071025	0710619-09A	10/25/2007	10/25/2007	NA	7	11/ 1/2007	NA	Good
R01-SV3-20071025	0710619-10A	10/25/2007	10/25/2007	NA	7	11/ 1/2007	NA	Good
R01-SV4-20071025	0710619-11A	10/25/2007	10/25/2007	NA	7	11/ 1/2007	NA	Good
R06-SV1-20071025	0710619-12A	10/25/2007	10/25/2007	NA	7	11/ 1/2007	NA	Good
R06-SV2-20071025	0710619-13A	10/25/2007	10/25/2007	NA	7	11/ 1/2007	NA	Good
R06-SV3-20071025	0710619-14A	10/25/2007	10/25/2007	NA	7	11/ 1/2007	NA	Good
R06-SV4-20071025	0710619-15A	10/25/2007	10/25/2007	NA	7	11/ 1/2007	NA	Good
Lab Blank	0710619-16A	NA	NA	NA	NA	10/31/2007	NA	Good
Lab Blank	0710619-16B	NA	NA	NA	NA	11/ 1/2007	NA	Good
CCV	0710619-17A	NA	NA	NA	NA	10/31/2007	NA	Good
CCV	0710619-17B	NA	NA	NA	NA	11/ 1/2007	NA	Good
LCS	0710619-18A	NA	NA	NA	NA	10/31/2007	NA	Good
LCSD	0710619-18AA	NA	NA	NA	NA	10/31/2007	NA	Good
LCS	0710619-18B	NA	NA	NA	NA	11/ 1/2007	NA	Good
LCSD	0710619-18BB	NA	NA	NA	NA	11/ 1/2007	NA	Good

0005



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

DATE : November 29, 2007
SUBJECT: Region III Data QA Review
FROM : Khin Cho Thaung *KCT*
Region III ESAT PO (3EA20)
TO: Romuald Roman
Regional Program Manager (3HS22)

Attached is the organic data validation report for the Butz Landfill site (DAS# R32837; SDG # AMB-BG-20071026) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2743.

Attachment:

cc: Neil Teamerson (Tetra Tech)

TO File: 0007 TDF# 1138

ANALYTICAL SERVICES AND QUALITY ASSURANCE BRANCH
OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE

DATE: November 26, 2007

SUBJECT: Organic Data Validation for DAS R32837 (Level M3)
SDG: AMB-BG-20071026
Site: Butz Landfill

FROM: Kenneth W. Curry *KWC*
Senior Data Reviewer

Mahboobeh Mecanic *MM*
Senior Oversight Chemist

TO: Khin-Cho Thaug
ESAT Region 3 Project Officer

OVERVIEW

DAS R32837, Sample Delivery Group (SDG) AMB-BG-20071026, from the Butz Landfill site consisted of seven (7) Summa air canister samples analyzed for selected volatile compounds by Air Toxics Limited (AIR TOXICS). The sample set contained one (1) field duplicate pair. The Summa canister samples were analyzed following Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air through the Delivery of Analytical Services (DAS) program.

SUMMARY

Data were validated according to Region III Modifications to the National Functional Guidelines for Organic Data Review, Level M3. No problems were detected during the validation of these data.

NOTES

- Several compounds failed precision criteria [Percent Relative Standard Deviation (%RSD) and/or Percent Difference (%D)] in the initial and/or continuing calibrations. These compounds were not part of the requested Target Compound List (TCL). No data were qualified based on calibration outliers.
- Results were reported by the laboratory in units of ppbv (volume/unit volume) and $\mu\text{g}/\text{M}^3$. Results were reported on the DSFs in both units by the reviewer.
- No Tentatively Identified Compounds (TICs) were reported by the laboratory for this data set. TICs are not required by method TO-15. Several unidentified peaks were present in the chromatograms for these samples.
- The Reporting Limits (RLs) reported on the DSFs by the reviewer are based on the lowest calibration standards.
- Sample R02-SG-20071026, listed on the Chain of Custody (COC) record, was cancelled due to significant vacuum remaining in the canister upon laboratory receipt.

- The method blanks were free of contamination. Therefore, no data were qualified based on blank contamination.
- Case data contained canister clean-up certifications but no chromatograms documenting canister cleanliness were included in the data package.
- Dilution factors reported on the DSFs are based on canister initial and final pressures. The RLs are elevated in these samples because of these dilutions.
- All Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicate (LCSD) recoveries and Relative Percent Differences (RPDs) were within control limits.
- All RPDs in the laboratory duplicate analysis of sample DUP-02-20071025 were within control limits with the exception of carbon tetrachloride and tetrachloroethene.
- Results for field duplicate pairs, samples DUP-03-20071026/R03-SG-20071026, were comparable.

All data for DAS R32837, SDG AMB-BG-20071023, were reviewed in accordance with the National Functional Guidelines for Evaluating Organic Analyses with Modification for use within Region III.

ATTACHMENTS

- 1) Appendix A Glossary of Data Qualifier Terms
- 2) Appendix B Data Summary Forms
- 3) Appendix C Chain of Custody Records
- 4) Appendix D Laboratory Case Narrative

DCN: R32837ATO15.wpd

Appendix A

Glossary of Data Qualifiers

GLOSSARY OF DATA QUALIFIER CODES (ORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of compounds)

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

NO CODE = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unusable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

N = Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

NJ = Qualitative identification questionable due to poor resolution. Presumptively present at approximate quantity.

Q = No analytical result.

Appendix B

Data Summary Forms

DATA SUMMARY FORM: VOLATILES (In PPBV)

Case #: R32837

SDG: AMB-BG-20071026

Number of SUMMA air canister samples: 7

Site:

Butz Landfill

Lab:

Air Toxics

Sample Number	AMB-BG-20071016	DUP-03-20071026	R02-IA-20071026	R02-OA-20071026	R03-IA-20071026						
Sampling Location	AMB-BG-20071016	DUP-03-20071026	R02-IA-20071026	R02-OA-20071026	R03-IA-20071026						
Laboratory ID#	0710741-01A	0710741-02A	0710741-03A	0710741-04A	0710741-06A						
Field QC		Field Dup. of R03-SG-20071026									
Matrix	Air	Air	Air	Air	Air						
Units	ppbv	ppbv	ppbv	ppbv	ppbv						
Date Sampled	10/26/2007	10/26/2007	10/26/2007	10/26/2007	10/26/2007						
Time Sampled	18:58	19:53	18:44	18:41	16:34						
Dilution Factor	2.51	1.68	1.68	1.96	1.68						
Volatiles Compound	RL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Vinyl Chloride	0.10										
1,3-Butadiene	0.10			4.5		0.22					
Trichlorofluoromethane (F11)	0.10			0.48		0.61		0.20		0.77	
1,1-Dichloroethene	0.10										
Trans-1,2-Dichloroethene	0.10										
Cis-1,2-Dichloroethene	0.10										
Chloroform	0.10										
1,1,1-Trichloroethane	0.10										
Carbon Tetrachloride	0.10										
1,2-Dichloroethane	0.10										
Trichloroethene	0.10			2.1							
Toluene	0.10			2.8		0.53				1.7	
Tetrachloroethene	0.10									0.21	
Ethyl Benzene	0.10			1.5							
m&p-Xylene	0.10			5.2		0.20				0.24	
o-Xylene	0.10			2.7							
1,1,2,2-Tetrachloroethane	0.10										

RL = Reporting Limit

To calculate sample quantitation limits multiply the RL by the Dilution Factor

DATA SUMMARY FORM: VOLATILES (in PPBV)

Case #: R32837

SDG: AMB-BG-20071026

Site:

Butz Landfill

Lab:

Air Toxics

Sample Number:	R03-OA-20071026	R03-SG-20071026									
Sampling Location:	R03-OA-20071026	R03-SG-20071026									
Laboratory ID#:	0710741-07A	0710741-08A									
Field QC:		Field Dup. of DUP-03-20071026									
Matrix:	Air	Air									
Units:	ppbv	ppbv									
Date Sampled:	10/26/2007	10/26/2007									
Time Sampled:	18:39	18:38									
Dilution Factor:	1.64	1.68									
Volatile Compound	RL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Vinyl Chloride	0.10										
1,3-Butadiene	0.10			4.8							
Trichlorofluoromethane (F11)	0.10	0.23		0.51							
1,1-Dichloroethene	0.10										
Trans-1,2-Dichloroethene	0.10										
Cis-1,2-Dichloroethene	0.10										
Chloroform	0.10										
1,1,1-Trichloroethane	0.10										
Carbon Tetrachloride	0.10										
1,2-Dichloroethane	0.10										
Trichloroethene	0.10			2.6							
Toluene	0.10			2.7							
Tetrachloroethene	0.10										
Ethyl Benzene	0.10			1.1							
m&p-Xylene	0.10			3.3							
o-Xylene	0.10			1.7							
1,1,2-Tetrachloroethane	0.10										

RL = Reporting Limit

To calculate sample quantitation limits multiply the RL by the Dilution Factor

DATA SUMMARY FORM: VOLATILES (ug/M3)

Case #: R32837

SDG: AMB-BG-20071026

Number of SUMMA air canister samples: 7

Site:

Butz Landfill

Lab:

Air Toxics

Sample Number	AMB-BG-20071016	DUP-03-20071026	R02-IA-20071026	R02-OA-20071026	R03-IA-20071026						
Sampling Location	AMB-BG-20071016	DUP-03-20071026	R02-IA-20071026	R02-OA-20071026	R03-IA-20071026						
Laboratory ID#	0710741-01A	0710741-02A	0710741-03A	0710741-04A	0710741-06A						
Field QC		Field Dup. of R03-SG-20071026									
Matrix	Air	Air	Air	Air	Air						
Units	ug/M3	ug/M3	ug/M3	ug/M3	ug/M3						
Date Sampled	10/26/2007	10/26/2007	10/26/2007	10/26/2007	10/26/2007						
Time Sampled	18:58	19:53	16:44	18:41	16:34						
Dilution Factor	2.51	1.68	1.68	1.96	1.68						
Volatile Compound	RL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Vinyl Chloride	0.26										
1,3-Butadiene	0.22			9.9		0.48					
Trichlorofluoromethane (F11)	0.56			2.7		3.4		1.2		4.3	
1,1-Dichloroethene	0.40										
Trans-1,2-Dichloroethene	0.40										
Cis-1,2-Dichloroethene	0.40										
Chloroform	0.49										
1,1,1-Trichloroethane	0.54										
Carbon Tetrachloride	0.63										
1,2-Dichloroethane	0.40										
Trichloroethane	0.54			11							
Toluene	0.38			11		2.0				6.3	
Tetrachloroethene	0.68									1.4	
Ethyl Benzene	0.43			6.7							
m,p-Xylene	0.43			22		0.86				1.0	
o-Xylene	0.43			12							
1,1,2,2-Tetrachloroethane	0.69										

RL = Reporting Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits multiply the RL by the Dilution Factor

DATA SUMMARY FORM: VOLATILES (ug/M3)

Case #: R32837

SDG: AMB-BG-20071026

Site:

Butz Landfill

Lab:

Air Toxics

Sample Number		R03-OA-20071026		R03-SG-20071026							
Sampling Location		R03-OA-20071026		R03-SG-20071026							
Laboratory ID#		0710741-07A		0710741-08A							
Field QC:				Field Dup. of DUP-03-20071026							
Matrix:		Air		Air							
Units:		ug/M3		ug/M3							
Date Sampled:		10/26/2007		10/26/2007							
Time Sampled:		18:39		18:38							
Dilution Factor:		1.64		1.68							
Volatiles Compound	RL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Vinyl Chloride	0.28										
1,3-Butadiene	0.22			.10							
Trichlorofluoromethane (F11)	0.68	1.3		2.9							
1,1-Dichloroethene	0.40										
cis-1,2-Dichloroethene	0.40										
Chloroform	0.49										
1,1,1-Trichloroethane	0.54										
Carbon Tetrachloride	0.63										
1,2-Dichloroethane	0.40										
Trichloroethene	0.54			.14							
Toluene	0.38			.10							
Tetrachloroethene	0.68										
Ethyl Benzene	0.43			4.8							
m&p-Xylene	0.43			.14							
o-Xylene	0.43			7.3							
1,1,2,2-Tetrachloroethane	0.69										

RL = Reporting Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits multiply the RL by the Dilution Factor

Appendix C

Chain of Custody (COC) Records

EPA USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case:

R

Client No: R32837

Region: 3	Date Shipped: 10/29/2007	Chain of Custody Record	Sampler Signature: <i>[Signature]</i>
Project Code:	Carrier Name: FedEx		Relinquished By (Date / Time)
Account Code: 2008 T 03N 302DD2C 03Q6 RA 02	Airbill: 8631 3042 0369	1 <i>[Signature]</i> 10/27/07 16:00	
CERCLIS ID: PAD981034705	Shipped to: Air Toxics Ltd. 180-B Blue Ravine Road Folsom CA 95630 (800) 985-5955	2	
Split ID: Q6		3	
Site Name/State: Butz Landfill (R32837)/PA		4	
Project Leader: Neil Teamerson			
Action: Remedial Action			
Sampling Co: Tetra Tech NUS, Inc.			

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME	QC Type
AMB-BG-20071026	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-986 (Not preserved) (1)	AMB-BG-20071026	S: 10/26/2007 10:59 E: 10/26/2007 18:58 ✓	
DUP-03-20071026	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-987 (Not preserved) (1)	DUP-03-20071026	S: 10/26/2007 11:00 E: 10/26/2007 19:53 ✓	Dup of R03-SG-20071026
R02-IA-20071026	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-988 (Not preserved) (1)	R02-IA-20071026	S: 10/26/2007 8:22 E: 10/26/2007 16:44 ✓	
R02-OA-20071026	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-989 (Not preserved) (1)	R02-OA-20071026	S: 10/26/2007 9:45 E: 10/26/2007 18:41 ✓	
R02-SG-20071026	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-990 (Not preserved) (1)	R02-SG-20071026	S: 10/26/2007 10:04 E: 10/26/2007 17:15 ✓	X cancelled
R03-IA-20071026	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-991 (Not preserved) (1)	R03-IA-20071026	S: 10/26/2007 8:05 E: 10/26/2007 18:34 ✓	
R03-OA-20071026	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-992 (Not preserved) (1)	R03-OA-20071026	S: 10/26/2007 9:53 E: 10/26/2007 18:39 ✓	
R03-SG-20071026	Soil Gas/ Gordon Araujo	L/C	VOCs (21)	3-993 (Not preserved) (1)	R03-SG-20071026	S: 10/26/2007 10:45 E: 10/26/2007 18:38 ✓	

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key: VOCs = Volatiles (Air)	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment load? _____

TR Number: 3-554606131-102907-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Fairfax, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4600

REGION COPY

F2V5.1.047 1 of 1

U.S. EPA Region III Analytical Request Form

Revision 10.06

ASQAB USE ONLY		
RAS#		Analytical TAT
DAS#	R32837	14
NSE#		

Date: 10/5/2007		Site Activity: RA	
Site Name: Butz Landfill Site		Street Address: RD#5, TWP. RT. 601	
City: Jackson Township	State: PA	Latitude: 41 02' 37"	Longitude: 75 18' 10"
Program: Superfund	Acct. #: 2008 T 03N 302DD2C 03Q6 RA 02	CERCLIS #: PAD981034705	
Site ID:	Spill ID:	Operable Unit: 02	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Site-specific Work Plan Addendum, Vapor Intrusion Investigation	
		Date Approved: 7/12/2007	
EPA Project Leader: Romuald Roman 3HS22	Phone#: 215-814-3212	Cell Phone #:	E-mail: Roman.Romuald@epa.gov
Request Preparer: Megan Ritchie	Phone#: 610-382-1527	Cell Phone #:	E-mail: megan.ritchie@tetrattech.com
Site Leader: Neil Teamerson	Phone#: 610-382-1531	Cell Phone #:	E-mail: neil.teamerson@tetrattech.com
Contractor: TtNUS		EPA CO/PO: Andy Blaney	
#Samples: 23	Matrix: air	Parameter: VOA	Method: TO-15 26 BB5
#Samples:	Matrix:	Parameter:	Method:
#Samples:	Matrix:	Parameter:	Method:
#Samples:	Matrix:	Parameter:	Method:
#Samples:	Matrix:	Parameter:	Method:
#Samples:	Matrix:	Parameter:	Method:
#Samples:	Matrix:	Parameter:	Method:
#Samples:	Matrix:	Parameter:	Method:
Ship Date From: 10/23/2007	Ship Date To: 10/25/2007	Org. Validation Level M3	Inorg. Validation Level
Unvalidated Data Requested: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes If Yes, TAT Needed: <input type="checkbox"/> 14days <input type="checkbox"/> 7days <input type="checkbox"/> 72hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 24hrs <input type="checkbox"/> Other (Specify)			
Validated Data Package Due: <input type="checkbox"/> 42 days <input type="checkbox"/> 30 days <input checked="" type="checkbox"/> 21days <input type="checkbox"/> 14 days <input type="checkbox"/> Other (Specify) 11/7			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached tables for compound list and detection limits. *****Need 6-liter summa canisters and ten 45 minute restrictors and twenty 8-hour regulators.*****			
Gordon Araujo Tetra Tech NUS, Inc. 234 Mall Boulevard, Suite 260 King of Prussia, PA 19475 610-382-1168			

FORM ARE 10/06

Revision 1.1

Appendix D

Laboratory Case Narrative



AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0710741

Work Order Summary

CLIENT: Mr. John Kwedar
US EPA Region III
701 Mapes Rd.
Mail Drop 3ES20
Ft. Meade, MD 20755-5350
PHONE: 410-305-3021
FAX: 410-305-3095
DATE RECEIVED: 10/30/2007
DATE COMPLETED: 11/12/2007

BILL TO: Ms. Mary Ann Keith
US EPA
Financial Management Center (D143-02)
Durham, NC 27711
P.O. # EP07W002460
PROJECT # R32837/AMB-BG-20071026
CONTACT: Bryanna Langley

Table with 4 columns: FRACTION #, NAME, TEST, RECEIPT VAC/PRES. Rows include fractions 01A through 11AA with corresponding test names and mercury levels.

CERTIFIED BY: [Signature]
Laboratory Director

DATE: 11/12/07

Certification numbers: CA NELAP - 02110CA, LA NELAP/LELAP - AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act.
Accreditation number: E87680, Effective date: 07/01/07, Expiration date: 06/30/08
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards
This report shall not be reproduced, except in full, without the written approval of Air Toxics Ltd.
180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified TO-15
US EPA
Workorder# 0710741

LUMEN
 DATA VALIDATED

Eight 6 Liter Summa Canister (100% Certified) samples were received on October 30, 2007. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode. The method involves concentrating up to 1.0 liter of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

<i>Requirement</i>	<i>TO-15</i>	<i>ATL Modifications</i>
ICAL %RSD acceptance criteria	+/- 30% RSD with 2 compounds allowed out to < 40% RSD	30% RSD with 4 compounds allowed out to < 40% RSD
Daily Calibration	+/- 30% Difference	<= 30% Difference with four allowed out up to <=40%; flag and narrate outliers
Blank and standards	Zero air	Nitrogen
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases
Sample collection media	Summa canister	ATL recommends use of summa canisters to insure data defensibility, but will report results from Tedlar bags at client request

Receiving Notes

Sample R02-SG-20071026 was received with significant vacuum remaining in the canister. The client was notified and requested the sample be cancelled.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not



AN ENVIRONMENTAL ANALYTICAL LABORATORY

performed).

- J - Estimated value.
- E - Exceeds instrument calibration range.
- S - Saturated peak.
- Q - Exceeds quality control limits.
- U - Compound analyzed for but not detected above the reporting limit.
- UJ- Non-detected compound associated with low bias in the CCV
- N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

- a-File was requantified
- b-File was quantified by a second column and detector
- r1-File was requantified for the purpose of reissue

Table 1

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Extracted	Sample	Date Analyzed	Sample Extract	Sample Condition
					Holding Time (Days)		Holding Time (Days)	
AMB-BG-20071026	0710741-01A	10/26/2007	10/30/2007	NA	10	11/ 5/2007	NA	Good
DUP-03-20071026	0710741-02A	10/26/2007	10/30/2007	NA	10	11/ 5/2007	NA	Good
R02-IA-20071026	0710741-03A	10/26/2007	10/30/2007	NA	10	11/ 5/2007	NA	Good
R02-OA-20071026	0710741-04A	10/26/2007	10/30/2007	NA	10	11/ 5/2007	NA	Good
R03-IA-20071026	0710741-06A	10/26/2007	10/30/2007	NA	10	11/ 5/2007	NA	Good
R03-OA-20071026	0710741-07A	10/26/2007	10/30/2007	NA	10	11/ 5/2007	NA	Good
R03-SG-20071026	0710741-08A	10/26/2007	10/30/2007	NA	10	11/ 5/2007	NA	Good
R03-SG-20071026 Lab Du	0710741-08AA	10/26/2007	10/30/2007	NA	10	11/ 5/2007	NA	Good
Lab Blank	0710741-09A	NA	NA	NA	NA	11/ 5/2007	NA	Good
CCV	0710741-10A	NA	NA	NA	NA	11/ 5/2007	NA	Good
LCS	0710741-11A	NA	NA	NA	NA	11/ 5/2007	NA	Good
LCSD	0710741-11AA	NA	NA	NA	NA	11/ 5/2007	NA	Good

0004



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350



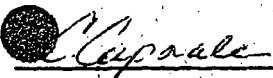
Final Analytical Report

Site Name.....	Butz Landfill
Sample Collection Date(s).....	11/19/07 17:26- 11/19/07 17:33
Contact.....	Romuald Roman
Report Date.....	12/11/07 13:49
Project #.....	DAS R32852
Work Orders.....	0711017

Analyses included in this report:

VOCs by TO-15 (ESAT)

Approved for Release



OASQA Representative

0711017 FINAL

12 11 07 1349

Page 1 of 17

AR301247



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350



Site Name: Butz Landfill

Project #: DAS R32852

Report Narrative

The two samples were received at high vacuum and cannot be withdrawn with enough volume as is. These samples were pressurized and analyzed at five-fold (5X) dilution. Consequently, the quantitation limits for all compounds are elevated.

0711017 FINAL 12 11 07 1349

Page 2 of 17



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350



Site Name: Butz Landfill

Project #: DAS R32852

ANALYTICAL REPORT FOR SAMPLES

Station ID	Laboratory ID	Matrix	Date Sampled	Date Received
DUP-04-20071119	0711017-01	Air	11/19/07 17:26	11/21/07 12:00
R02-SG-20071119	0711017-02	Air	11/19/07 17:33	11/21/07 12:00



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350



Site Name: Butz Landfill

Project #: DAS R32852

EPA USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case
Client No: R32852
SDG No: L

Form with sections: Data Shipped, Carrier Name, Airbill, Shipped to, Chain of Custody Record, Sample Signature, For Lab Use Only.

Table with columns: SAMPLE No., METHOD SAMPLES, CONC TYPE, ANALYSES TURBIDIMETER, TAG No./ PRESERVATIVE Series, STATION LOCATION, SAMPLE COLLECT DATE/TIME, FOR LAB USE ONLY Sample Condition Or Receipt.

Form with sections: Shipment to Date, Compliance, Samples to be used for laboratory QC, Additional Sample Signatures, Coded Temperature, Chain of Custody Seal Number, Analysis Key, Concentration, Type/Designator, Container, Custody Seal Intact?, Shipment Intact?

TR Number: 3-554606131-112007-0001

LABORATORY COPY

PA provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Beale, CSC 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/918-4200; Fax 703/918-4602



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350



Site Name: Butz Landfill

Project #: DAS R32852

Lab ID: 0711017-01

Station ID: DUP-04-20071119

Batch: BL70401

Sample Type: Air

Date Collected: 11/19/2007

Volatile Organic Compounds

Targets

Analyte	Result ppbv	Analyte Qualifiers	Quantitation		Prepared	Analyzed	Method/SOP#
			Limit	Dilution			
Propylene	61.6		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Dichlorodifluoromethane	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Dichlorotetrafluoroethane	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Chloromethane	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Vinyl chloride	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
1,3-Butadiene	4.5		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Bromomethane	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Chloroethane	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Ethanol	8.8	J, L	2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Trichlorofluoromethane	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Isopropyl alcohol	U	UL	2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Acetone	33.0		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
1,1-Dichloroethene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Freon 113	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Methylene Chloride	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Carbon disulfide	8.8	J	2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Methyl tert-Butyl Ether	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
trans-1,2-Dichloroethene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
1,1-Dichloroethane	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Vinyl acetate	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Hexane	2.0	J	2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
2-Butanone	4.8		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
cis-1,2-Dichloroethene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Ethyl Acetate	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Chloroform	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Tetrahydrofuran	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
1,1,1-Trichloroethane	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
1,2-Dichloroethane	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Cyclohexane	1.0	J	2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Carbon Tetrachloride	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Benzene	2.0	J	2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Heptane	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Trichloroethene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
1,2-Dichloropropane	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
1,4-Dioxane	U	UL	2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350



Site Name: Butz Landfill

Project #: DAS R32852

Lab ID: 0711017-01

Station ID: DUP-04-20071119

Batch: BL70401

Sample Type: Air

Date Collected: 11/19/2007

Volatile Organic Compounds
Targets (Continued)

Analyte	Result ppbv	Analyte Qualifiers	Quantitation		Prepared	Analyzed	Method/SOP#
			Limit	Dilution			
Bromodichloromethane	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
4-Methyl-2-pentanone	U	UL	2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
cis-1,3-Dichloropropene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
trans-1,3-Dichloropropene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Toluene	3.6		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
1,1,2-Trichloroethane	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
2-Hexanone	U	UL	2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Dibromochloromethane	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Tetrachloroethene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
1,2-Dibromoethane (EDB)	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Chlorobenzene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Ethylbenzene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
m,p-Xylene	U		5.0	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Styrene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
o-Xylene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Bromoform	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
1,1,2,2-Tetrachloroethane	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
4-Ethyltoluene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
1,3,5-Trimethylbenzene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
1,2,4-Trimethylbenzene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
1,3-Dichlorobenzene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Benzyl chloride	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
1,4-Dichlorobenzene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
1,2-Dichlorobenzene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
1,2,4-Trichlorobenzene	U		2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230
Hexachlorobutadiene	U	UL	2.5	5	11/28/07	11/28/07 19:49	TO-15A/R3QA230

Surrogates

Analyte	Result ppbv	Analyte Qualifiers	%Recovery		Prepared	Analyzed	Method/SOP#
			%Recovery	Limits			
Surrogate: Bromochlorobenzene	8.77		88 %	80-120	11/28/07	11/28/07 19:49	TO-15A/R3QA230

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350



Site Name: Butz Landfill

Project #: DAS R32852

Lab ID: 0711017-02

Station ID: R02-SG-20071119

Batch: BL70401

Date Collected: 11/19/2007

Sample Type: Air

Volatile Organic Compounds

Targets

Analyte	Result ppbv	Analyte Qualifiers	Quantitation		Prepared	Analyzed	Method/SOP#
			Limit	Dilution			
Propylene	62.0		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Dichlorodifluoromethane	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Dichlorotetrafluoroethane	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Chloromethane	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Vinyl chloride	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
1,3-Butadiene	4.4		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Bromomethane	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Chloroethane	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
anol	6.4	J	2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Dichlorofluoromethane	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Isopropyl alcohol	U	UL	2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Acetone	35.7		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
1,1-Dichloroethene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Freon 113	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Methylene Chloride	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Carbon disulfide	11.9	J	2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Methyl tert-Butyl Ether	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
trans-1,2-Dichloroethene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
1,1-Dichloroethane	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Vinyl acetate	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Hexane	2.0	J	2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
2-Butanone	5.0		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
cis-1,2-Dichloroethene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Ethyl Acetate	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Chloroform	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Tetrahydrofuran	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
1,1,1-Trichloroethane	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
1,2-Dichloroethane	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Cyclohexane	2.0	J	2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Carbon Tetrachloride	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Benzene	2.0	J	2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
otane	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Trichloroethene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
1,2-Dichloropropane	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
1,4-Dioxane	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Site Name: Butz Landfill

Project #: DAS R32852

Lab ID: 0711017-02

Station ID: R02-SG-20071119

Batch: BL70401

Sample Type: Air

Date Collected: 11/19/2007

Volatile Organic Compounds
Targets (Continued)

Analyte	Result ppbv	Analyte Qualifiers	Quantitation		Prepared	Analyzed	Method/SOP#
			Limit	Dilution			
Bromodichloromethane	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
4-Methyl-2-pentanone	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
cis-1,3-Dichloropropene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
trans-1,3-Dichloropropene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Toluene	3.5		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
1,1,2-Trichloroethane	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
2-Hexanone	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Dibromochloromethane	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Tetrachloroethene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
1,2-Dibromoethane (EDB)	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Chlorobenzene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Ethylbenzene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
m,p-Xylene	U		5.0	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Styrene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
o-Xylene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Bromoform	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
1,1,2,2-Tetrachloroethane	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
4-Ethyltoluene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
1,3,5-Trimethylbenzene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
1,2,4-Trimethylbenzene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
1,3-Dichlorobenzene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Benzyl chloride	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
1,4-Dichlorobenzene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
1,2-Dichlorobenzene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
1,2,4-Trichlorobenzene	U		2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230
Hexachlorobutadiene	U	UL	2.5	5	11/28/07	11/29/07 01:25	TO-15A/R3QA230

Surrogates

Analyte	Result ppbv	Analyte Qualifiers	%Recovery		Prepared	Analyzed	Method/SOP#
			%Recovery	Limits			
Surrogate: Bromofluorobenzene	8.37		84 %	80-120	11/28/07	11/29/07 01:25	TO-15A/R3QA230



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350



Site Name: Butz Landfill

Project #: DAS R32852

Lab ID: 0711017-01

Station ID: DUP-04-20071119

Sample Type: Air

Date Collected: 11/19/2007

Tentatively Identified Compound (TIC) Report

CAS Number	Compound	Result ppbv	Analyte Qualifiers	Retention Time	Analyzed	Method/SOP#
115-11-7	1-Propene, 2-methyl-	28.0	T	5.57	11/28/07 19:49	TO-15A/R3QA230
NA	unknown (01)	8.0	T	7.88	11/28/07 19:49	TO-15A/R3QA230



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350



Site Name: Butz Landfill

Project #: DAS R32852

Lab ID: 0711017-02

Station ID: R02-SG-20071119

Sample Type: Air

Date Collected: 11/19/2007

Tentatively Identified Compound (TIC) Report

CAS Number	Compound	Result ppbv	Analyte Qualifiers	Retention Time	Analyzed	Method/SOP#
115-11-7	1-Propene, 2-methyl-	32.0	T	5.56	11/29/07 01:25	TO-15A/R3QA230
NA	unknown (01)	8.0	T	7.88	11/29/07 01:25	TO-15A/R3QA230



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350



Site Name: Butz Landfill

Project #: DAS R32852

QC Data
Volatile Organic Compounds - Quality Control

Table with columns: Analyte, Result, Quantitation (Limit, Units), Spike Level, Source Result, %REC (Limits), RPD (Limit), Notes

Batch BL70401 - *** DEFAULT PREP ***

Blank (BL70401-BLK1)

Prepared: 11/28/07 08:31 Analyzed: 11/28/07 13:35

Main data table listing various chemical compounds (e.g., Propylene, Dichlorodifluoromethane, etc.) with their respective results (U), limits (0.5), units (ppbv), and notes (UJ, UL).



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350



Site Name: Butz Landfill

Project #: DAS R32852

QC Data
Volatile Organic Compounds - Quality Control

Table with columns: Analyte, Result, Quantitation (Limit, Units), Spike Level, Source Result, %REC, %REC Limits, RPD, RPD Limit, Notes

Batch BL70401 - *** DEFAULT PREP ***

Blank (BL70401-BLK1)

Prepared: 11/28/07 08:31 Analyzed: 11/28/07 13:35

Table listing various chemical compounds (Chlorobenzene, Ethylbenzene, m,p-Xylene, Styrene, o-Xylene, Bromoform, etc.) with their respective results (U), limits (0.5), and units (ppbv).

LCS (BL70401-BS1)

Prepared: 11/28/07 08:31 Analyzed: 11/28/07 21:55

Table listing various chemical compounds (Propylene, Dichlorodifluoromethane, Dichlorotetrafluoroethane, Chloromethane, Vinyl chloride, 1,3-Butadiene, Bromomethane, Chloroethane, Ethanol, Trichlorofluoromethane, Isopropyl alcohol, Acetone, 1,1-Dichloroethene, Freon 113, Methylene Chloride, Carbon disulfide, Methyl tert-Butyl Ether, trans-1,2-Dichloroethene, 1,1-Dichloroethane, Vinyl acetate, Hexane, 2-Butanone, cis-1,2-Dichloroethene, Methyl Acetate, Bromoform, Tetrahydrofuran) with their results, limits, and units.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center

Office of Analytical Services and Quality Assurance

701 Mapes Road

Fort Meade, Maryland 20755-5350



Site Name: Butz Landfill

Project #: DAS R32852

QC Data
Volatile Organic Compounds - Quality Control

Table with 11 columns: Analyte, Result, Quantitation Limit, Units, Spike Level, Source Result, %REC, %REC Limits, RPD, RPD Limit, Notes

Batch BL70401 - *** DEFAULT PREP ***

LCS (BL70401-BS1)

Prepared: 11/28/07 08:31 Analyzed: 11/28/07 21:55

Main data table listing various chemical compounds (e.g., 1,1,1-Trichloroethane, 1,2-Dichloroethane, Cyclohexane) with their corresponding results, units, spike levels, source results, and recovery percentages.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350



Site Name: Butz Landfill

Project #: DAS R32852

QC Data
Volatile Organic Compounds - Quality Control

Analyte	Quantitation		Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
	Result	Limit Units							

Batch BL70401 - *** DEFAULT PREP ***

Matrix Spike (BL70401-MSI) Source: 0711017-01RE1 Prepared: 11/28/07 08:31 Analyzed: 11/28/07 20:31

Propylene	19.7100	ppbv	10.000	12.3100	74	70-130			
Dichlorodifluoromethane	7.54000	"	10.000	U	75	70-130			
Dichlorotetrafluoroethane	7.85000	"	10.000	U	78	70-130			
Chloromethane	8.50000	"	10.000	U	85	70-130			
Vinyl chloride	8.23000	"	10.000	U	82	70-130			
1,3-Butadiene	9.20000	"	10.000	0.890000	83	70-130			
Bromomethane	8.50000	"	10.000	U	85	70-130			
Chloroethane	8.95000	"	10.000	U	90	70-130			
Ethanol	11.9600	"	10.000	1.77000	102	70-130			
Trichlorofluoromethane	7.67000	"	10.000	U	77	70-130			
Isopropyl alcohol	6.28000	"	10.000	U	63	70-130			
Acetone	15.1900	"	10.000	6.60000	86	70-130			
1,1-Dichloroethene	8.45000	"	10.000	U	84	70-130			
on H13	8.50000	"	10.000	U	85	70-130			
ethylene Chloride	8.68000	"	10.000	U	87	70-130			
Carbon disulfide	10.6800	"	10.000	1.76000	89	70-130			
Methyl tert-Butyl Ether	10.0000	"	10.000	U	100	70-130			
trans-1,2-Dichloroethene	8.81000	"	10.000	U	88	70-130			
1,1-Dichloroethane	9.32000	"	10.000	U	93	70-130			
Vinyl acetate	10.6800	"	10.000	U	107	70-130			
Hexane	9.83000	"	10.000	0.430000	94	70-130			
2-Butanone	10.8900	"	10.000	0.970000	99	70-130			
cis-1,2-Dichloroethene	9.40000	"	10.000	U	94	70-130			
Ethyl Acetate	9.98000	"	10.000	U	100	70-130			
Chloroform	8.86000	"	10.000	U	89	70-130			
Tetrahydrofuran	10.3800	"	10.000	U	104	70-130			
1,1,1-Trichloroethane	8.47000	"	10.000	U	85	70-130			
1,2-Dichloroethane	9.18000	"	10.000	U	92	70-130			
Cyclohexane	10.4700	"	10.000	0.220000	102	70-130			
Carbon Tetrachloride	8.67000	"	10.000	U	87	70-130			
Benzene	10.8900	"	10.000	0.390000	105	70-130			
Heptane	10.2300	"	10.000	U	102	70-130			
Trichloroethene	9.88000	"	10.000	U	99	70-130			
1,2-Dichloropropane	10.7400	"	10.000	U	107	70-130			
1,4-Dioxane	9.71000	"	10.000	U	97	70-130			
Bromodichloromethane	9.49000	"	10.000	U	95	70-130			
4-Methyl-2-pentanone	9.68000	"	10.000	U	97	70-130			
cis-1,3-Dichloropropene	10.6100	"	10.000	U	106	70-130			
trans-1,3-Dichloropropene	10.4700	"	10.000	U	105	70-130			
Toluene	11.5800	"	10.000	0.720000	109	70-130			
1,1,2-Trichloroethane	10.5100	"	10.000	U	105	70-130			
2-Hexanone	10.3200	"	10.000	U	103	70-130			
Bromochloromethane	9.88000	"	10.000	U	99	70-130			
1,2-Dichloroethene	10.0000	"	10.000	U	100	70-130			
1,2-Dibromoethane (EDB)	10.9300	"	10.000	U	109	70-130			



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350



Site Name: Butz Landfill

Project #: DAS R32852

QC Data
Volatile Organic Compounds - Quality Control

Table with columns: Analyte, Result, Quantitation (Limit, Units), Spike Level, Source Result, %REC, %REC Limits, RPD, RPD Limit, Notes

Batch BL70401 - *** DEFAULT PREP ***

Matrix Spike (BL70401-MS1) Source: 0711017-01RE1 Prepared: 11/28/07 08:31 Analyzed: 11/28/07 20:31

Table listing various compounds like Chlorobenzene, Ethylbenzene, m,p-Xylene, Styrene, o-Xylene, Bromoform, etc., with their respective results and RPD values.

Matrix Spike Dup (BL70401-MSD1) Source: 0711017-01RE1 Prepared: 11/28/07 08:31 Analyzed: 11/28/07 21:12

Table listing various compounds like Propylene, Dichlorodifluoromethane, Dichlorotetrafluoroethane, Chloromethane, Vinyl chloride, 1,3-Butadiene, Bromomethane, Chloroethane, Ethanol, Trichlorofluoromethane, Isopropyl alcohol, Acetone, 1,1-Dichloroethene, Freon 113, Methylene Chloride, Carbon disulfide, Methyl tert-Butyl Ether, trans-1,2-Dichloroethene, 1,1-Dichloroethane, Vinyl acetate, Hexane, Methyl acetone, 1,2-Dichloroethene, Ethyl Acetate, Chloroform, Tetrahydrofuran, with their respective results and RPD values.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350



Site Name: Butz Landfill

Project #: DAS R32852

QC Data
Volatile Organic Compounds - Quality Control

Analyte	Quantitation		Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
	Result	Limit Units							
Batch BL70401 - *** DEFAULT PREP ***									
Matrix Spike Dup (BL70401-MSD1)									
Source: 0711017-01RE1 Prepared: 11/28/07 08:31 Analyzed: 11/28/07 21:12									
1,1,1-Trichloroethane	8.28000	ppbv	10.000	U	83	70-130	2	25	
1,2-Dichloroethane	8.82000		10.000	U	88	70-130	4	25	
Cyclohexane	10.2100		10.000	0.220000	100	70-130	3	25	
Carbon Tetrachloride	8.43000		10.000	U	84	70-130	3	25	
Benzene	10.8100		10.000	0.390000	104	70-130	0.8	25	
Heptane	9.96000		10.000	U	100	70-130	3	25	
Trichloroethene	9.76000		10.000	U	98	70-130	1	25	
1,2-Dichloropropane	10.6600		10.000	U	107	70-130	0.7	25	
1,4-Dioxane	6.65000		10.000	U	66	70-130	37	25	A
Bromodichloromethane	9.25000		10.000	U	92	70-130	3	25	
4-Methyl-2-pentanone	6.55000		10.000	U	66	70-130	39	25	A
cis-1,3-Dichloropropene	10.2100		10.000	U	102	70-130	4	25	
trans-1,3-Dichloropropene	9.93000		10.000	U	99	70-130	5	25	
Toluene	11.7100		10.000	0.720000	110	70-130	1	25	
1,2-Trichloroethane	10.5100		10.000	U	105	70-130	0	25	
Hexanone	5.38000		10.000	U	54	70-130	63	25	A
Dibromochloromethane	9.79000		10.000	U	98	70-130	0.9	25	
Tetrachloroethene	10.0100		10.000	U	100	70-130	0.1	25	
1,2-Dibromoethane (EDB)	10.6900		10.000	U	107	70-130	2	25	
Chlorobenzene	10.3800		10.000	U	104	70-130	0.2	25	
Ethylbenzene	10.5900		10.000	U	106	70-130	0.7	25	
m,p-Xylene	20.4400		20.000	U	102	70-130	2	25	
Styrene	10.9400		10.000	U	109	70-130	1	25	
o-Xylene	10.1000		10.000	U	101	70-130	1	25	
Bromoform	9.63000		10.000	U	96	70-130	3	25	
1,1,2,2-Tetrachloroethane	9.58000		10.000	U	96	70-130	12	25	
4-Ethyltoluene	10.2600		10.000	U	103	70-130	5	25	
1,3,5-Trimethylbenzene	9.36000		10.000	U	94	70-130	10	25	
1,2,4-Trimethylbenzene	9.02000		10.000	U	90	70-130	17	25	
1,3-Dichlorobenzene	9.92000		10.000	U	99	70-130	6	25	
Benzyl chloride	8.00000		10.000	U	80	70-130	30	25	A
1,4-Dichlorobenzene	9.82000		10.000	U	98	70-130	7	25	
1,2-Dichlorobenzene	8.61000		10.000	U	86	70-130	20	25	
1,2,4-Trichlorobenzene	7.54000		10.000	U	75	70-130	30	25	A
Hexachlorobutadiene	5.94000		10.000	U	59	70-130	41	25	A
Surrogate: Bromofluorobenzene	9.40		10.000		94	70-120			

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 3 Environmental Science Center
Office of Analytical Services and Quality Assurance
701 Mapes Road
Fort Meade, Maryland 20755-5350

Site Name: **Butz Landfill**

Project #: **DAS R32852**

Notes and Definitions

- UL The analyte was not detected. The quantitation limit is probably higher due to indications of a low bias.
- UJ The analyte was not detected at or above the quantitation limit. The quantitation limit is an estimate.
- T Tentatively Identified Compound. Identified as a result of a library search using the EPA/NIST Mass Spectral Library. Standards were not used to verify the identity and quantity of the compound. The reported value is an estimate.
- L The identification of the analyte is acceptable; the reported value may be biased low. The actual value is expected to be greater than the reported value.
- J The identification of the analyte is acceptable; the reported value is an estimate.
- A Quality control value is outside acceptance limits.
- NR Not Reported
- RPD Relative Percent Difference
- U Analyte included in the analysis, but not detected at or above the quantitation limit.

Quantitation Limit: The lowest concentration of an analyte that can be reliably measured within specified limits of precision and accuracy for a specific laboratory analytical method and that takes into account analytical adjustments made during sample preparation and analysis.

SOLID SAMPLE RESULTS - REPORTING PROTOCOL: Solid samples where % Solids (percent dry wt at 105 degrees C) has been performed, are analyzed wet and converted to a dry weight result for reporting purposes. This is routine for organics and most inorganic analyses. When metals and mercury analyses are requested, solid samples are routinely analyzed and reported on a dry weight basis. Solid samples for metals/mercury are prepared for analysis by an initial drying at 60 degree C and homogenization before digestion. Oil-type samples will be analyzed and reported on a wet weight basis for all analyses because of the nature of the sample. Any exceptions to the protocol will be noted with a qualifier

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103

SUBJECT: Review of Residential Vapor Intrusion Study: Butz Landfill

FROM: Jennifer Hubbard, Toxicologist
Technical Support Branch (3HS41)

TO: Rom Roman, RPM
Western PA and MD Remedial Branch (3HS22)

DATE: 2/14/2008

I have reviewed the above document with particular attention to human health risk assessment issues. The following comments are offered.

The report states that VOCs in well RW18B are "less than 10 ug/L." If these were non-detects with a detection limit of 10 ug/L, that is not sufficient to detect down to the MCLs for these chemicals, and cannot be used to rule out vapor intrusion. If there were detections below 10 ug/L, the actual data should be reported and discussed.

The data summary Tables 2 through 6 used "adjusted concentrations," i.e., the concentrations shown were 10X lower than actually reported by the lab for soil gas, soil vapor, and outdoor air samples. I do not agree with adjusting the outdoor concentrations by a factor of 10. Furthermore, while 0.1 has been the default attenuation factor for modeling indoor air concentrations from subslab vapor, it is not appropriate to change the concentrations themselves on the table. Users of this document could be confused and misled, and if one wishes to consider different attenuation factors, it is more difficult to do so. The concentrations should be reported unadjusted, and any attenuation factors should be shown and discussed separately.

The document compares concentrations to a variety of possible standards. In my opinion, the Region 3 RBCs are of the greatest relevance for human health risk. The noncarcinogens, however, should have been screened at an HQ of 0.1, not 1, to account for additive effects.

If one considers undiluted concentrations and compares them to the RBCs for air at an HQ of 0.1 or cancer risk of 1E-6, the following chemicals of potential concern are identified:

R01, soil vapor: TCE, PCE, xylenes, chloroform

R02, soil gas: 1,3-butadiene, benzene

R02, indoor air: 1,3-butadiene

R03, soil gas: 1,3-butadiene, TCE, xylenes

R03, indoor air: PCE

R06, soil vapor: chloroform, TCE, xylenes, PCE

R07A, soil gas: TCE, PCE, xylenes

R07A, indoor air: 1,3-butadiene
R07A, outdoor air: TCE
R07B, soil vapor: chloroform, TCE, PCE, xylenes

These concentrations can then be used in a risk assessment assuming 24 hr/day exposure for 30 years, 350 days/yr, to potential residents.

TCE is difficult to assess, because of the current debate in the scientific community over the appropriate cancer toxicity values. Considering EPA's draft assessments as well as assessments by California and New York, it appears that the acceptable range of TCE concentrations (considering both cancer and noncancer effects) is likely to be within the 1-10 $\mu\text{g}/\text{m}^3$ range.

R01: TCE and PCE were detected in soil vapor. Even if there were no attenuation between subslab vapor and indoor air, the concentrations would not be expected to exceed levels of concern, unless the most stringent TCE Inhalation Unit Risk (IUR) is applied. (The maximum TCE concentration in this soil vapor is $5.6 \mu\text{g}/\text{m}^3$.) Ordinarily, attenuation would be expected. EPA has traditionally used a 10-fold default (0.1), and there have been discussions in the scientific community that a 50-fold factor (0.02) may represent more of the population. Because attenuation is building-specific, and because no indoor air samples were collected at this house, it is difficult to make definitive statements for this house, but it is likely that the risks are within the acceptable range based on the soil vapor alone. There is, however, another concern. A sump was present at R01. The water sample did not yield chemicals of potential concern. However, such chemicals may already have volatilized into the air. Because this is a preferential flow path, the lack of indoor air results makes it even more difficult to reach definitive conclusions about the indoor air quality at this residence.

R02: Chlorinated ethenes and ethanes were not detected in the air or soil gas associated with this house. While the amount of 1,3-butadiene in the soil gas could be of concern if it were not attenuated, indoor air was taken from this house, confirming that the 1,3-butadiene concentrations had attenuated 20-fold and that risks were within the acceptable range. The draft report opines that the chemicals identified in R02 samples do not appear to be site related; there is some merit in this, although the finding of 1,3-butadiene in the soil gas makes it more difficult to dismiss.

R03: TCE was detected in soil gas, and PCE in indoor air. If unattenuated, the 1,3-butadiene in soil gas would exceed acceptable risks, and the TCE concentration of $14 \mu\text{g}/\text{m}^3$ would exceed the likely acceptable range of 1-10 $\mu\text{g}/\text{m}^3$. However, attenuation is expected. The indoor air samples show no 1,3-butadiene or TCE, and the PCE concentration in indoor air is within the acceptable range.

R06: TCE and PCE were detected in soil vapor. Even if there were no attenuation between subslab vapor and indoor air, the concentrations would not be expected to exceed levels of concern, unless the most stringent TCE IUR is applied. (The maximum

TCE concentration in this soil vapor is 4 ug/m^3 .) However, attenuation generally is expected. Because attenuation is building-specific, and because no indoor air samples were collected at this house, it is difficult to make definitive statements for this house, but it is likely that the risks are within the acceptable range.

R07A: TCE and PCE were detected in soil gas. Even if there were no attenuation between subslab vapor and indoor air, the concentrations would not be expected to exceed levels of concern, unless the most stringent TCE IUR is applied. (The maximum TCE concentration in this soil vapor is 6.6 ug/m^3 .) However, attenuation is expected, and PCE and TCE were not detected in indoor air. Indoor air concentrations were in the acceptable range. TCE was also detected in outdoor air at this location, at 1.3 ug/m^3 .

R07B: TCE and PCE were detected in soil gas. If unattenuated, the TCE concentration of 98 ug/m^3 would likely be of concern. Attenuation would have to be at least 10-fold to bring these concentrations into the acceptable range. While attenuation of at least 10-fold is generally expected, no indoor air samples were taken from this location.

While the draft report dismisses vapor intrusion concerns at R01, R02, R03, R06, and R07A, I would not venture that far. Rather, I find that unacceptable risks from vapor intrusion are unlikely under current conditions in R02, R03, R06, and R07A. However, because chlorinated ethenes were found in the soil gas or vapor, because conditions can change over time, and because indoor air samples were not taken in some of these houses, it may be prudent to monitor some of these houses occasionally over time (perhaps during five-year reviews). The soil-gas concentrations at R03 and the presence of the sump at R01 make them leading candidates for future sampling, although I would not rule out R06 and R07A.

I agree with the recommendations in Section 4.2 of the report, which include more immediate sampling at and near R07B. The EPA hydrogeologist has also recommended sampling at R01 and R06, and this appears prudent as well, particularly given the sump at R01. If any other houses have sumps or similar preferential flow paths, sampling of indoor air and sumps would be recommended in those houses as well.

If you have any questions concerning this review, please call me at x3328.

cc: Eric Johnson (3HS41)
Bruce Rundell (3HS41)