McDaniel | Lambert, Inc.
Health and Environmental Relati

June 3, 2008

Administrator Whitney Newland
Estate of Crandal Mackey
C/O Weldon & Hass
205 East Anapamu Street
Santa Barbara, CA 93101

Subject: Human Health Risk Assessment for Call Mac Transportation at 461 McGraw Avenue, Livermore, Ca.

Dear Mr. Newland,
Per your request, McDaniel Lambert, Inc. has conducted an evaluation of the potential human health risks from soil gas in the vicinity of a proposed commercial building currently being considered for construction on the former Call Mac Transportation at 461 McGraw Avenue., Livermore, CA (the Property). This health evaluation focuses on the potential exposures of employees working in the proposed building to chemical vapors in indoor air resulting from the subsurface migration of volatile organic compounds (VOCs) detected in soil gas. Since the soil gas samples used in this analysis were collected, extensive remediation of impacted soil and ground water have taken place. This means that pre-excavation soil gas samples used in this assessment represent historic worst-case conditions.

The exposures and associated risks were developed using the reasonable maximum exposure approach promulgated by Cal/EPA and USEPA. These assumptions were made in accordance with regulatory guidance (Cal/EPA 1994, USEPA 1989) and best professional judgment. Potential health risks were estimated by combining site-specific information and the maximum concentrations of VOCs detected in soil gas. The health evaluation concludes that the potential cancer risk to employees and other commercial users of the proposed commercial building are at the low end of the USEPA acceptable risk management range of 1×10^{-7} to 1×10^{-4}, and are below the California Proposition 65 risk management point of departure of 1×10^{-5} (or 1 in 100,000). The total noncancer hazard is well below the target value of 1.0.

1. Background

The Property is located at 461 McGraw Avenue., Livermore, CA (Figure 1). The site is currently vacant, but formerly was used by Call Mac Transportation Company as a truck and trailer storage yard. The Property is zoned commercial, and future use will remain commercial/industrial. As described in Section 2, contamination, primarily PCE in soil

gas and groundwater, was detected in environmental assessments conducted at the Property (see Figure 2, Site Map).

No buildings currently occupy the Property. A new commercial service building is proposed for construction that, in addition to parking, will occupy a significant portion of the Property (Figure 3). This 35,976 square foot commercial service building will include 12 individual units separated by removable dry-wall demising walls. Each unit will have a roll-up door, and future use is assumed to be as a small commercial office/warehouse. The smallest unit in the building is 1,998 square feet. This evaluation was conducted to address the potential health risks to future tenants from residual contamination remaining below the proposed commercial service building. It was requested that McDaniel Lambert conduct a health risk assessment to determine if the soil gas concentrations of VOCs, particularly PCE and benzene, would present a health risk to such tenants. Although extensive PCE soil and groundwater remediation has occurred at the Property, no further soil gas sampling is planned, therefore this health risk assessment was conducted using worst-case pre-remediation soil gas concentrations.

2. Environmental Investigations and Results

Since 1995, several environmental investigations have been conducted on the Property. McDaniel Lambert has not reviewed any of the investigation reports or data prior to 2007, but has reviewed a summary of the findings over this time period. In 1995 Remediation Risk Management (RRM) removed a 12,000-gallon diesel underground storage tank (UST) from the northern portion of the Property. Between 1995 and the end of 2007, removal of above ground storage tanks, drums, vehicles, various surface features, and excavation of impacted soil occurred. An extensive review of these activities can be found in several Environmental Investigation Services (EIS) reports including *Soil Removal and Site Investigation Report* and *Historical Review Report (October 31, 2007).* During several of these activities chemicals of potential concern (COPCs) in soil were remediated to levels acceptable to the oversight agency, the Alameda County Environmental Health (ACEH). Based on recent agency letters and EIS reports, direct contact with residual COPC concentrations in soil does not appear to be a significant concern for future commercial use of the Property.

Based on an historic review of the Property, EIS prepared a *Soil Gas Survey Workplan* (November 2, 2007) which was approved by the ACEH. This limited soil gas survey indicated the presence of VOCs (including PCE and benzene) in shallow soil gas. These results were described in the EIS report *Site Investigation Results and Workplan for Further Site Investigation* (December 3, 2007). Based on these preliminary soil gas results, additional more extensive soil gas sampling was conducted in December 2007 (EIS January 14, 2008). Twenty soil gas samples from 4 feet below ground surface (bgs) were collected from the central portion of the Property (see Figure 2), plus two deeper samples collected 8 feet bgs in the two locations where the highest ground water PCE concentrations were found. PCE was detected in 20/22 soil gas probes at concentrations ranging from 45 to 40,000 ug/m^3. PCE soil gas samples from six of the 4-foot deep probes exceeded the commercial/industrial California Human Health Screening Levels

(CHHSLs, Cal/EPA 2005a). Exceedances of CHSSLs do not necessarily indicate a health risk to future commercial users, but indicate that further evaluation is warranted.

The locations where elevated soil gas concentrations were detected did not coincide with elevated soil VOC concentrations. However, the pattern of PCE distribution in soil gas closely followed PCE groundwater impacts, suggesting that the source of PCE in soil gas is the groundwater plume. In late 2007 32 groundwater samples from borings B-7 through B-36 were collected. PCE was detected at concentrations ranging from 0.86 to 1,800 ug/L. The vertical extent of groundwater impacts also was assessed, with PCE groundwater concentrations below the MCL of 5 ug/L at 28 feet bgs on the western side of the plume (EIS January 18, 2008 and February 5, 2008).

EIS developed a remedial approach to reduce the overall mass of PCE in groundwater and address areas where elevated PCE concentrations were detected in soil gas. Approximately 1,550 cubic yards of unsaturated soil in areas showing the highest concentrations of PCE in soil gas were removed (see Figure 2). Three five-foot wide and up to 120 feet long intersecting trenches were excavated to a depth of 20 feet bgs. A total of approximately 444,000 gallons of groundwater were extracted from the trenches and treated through a carbon vessel before discharge to a sanitary sewer (EIS April 18, 2008). Based on the latest post-remediation groundwater monitoring results, EIS has concluded that these remediation activities have significantly reduced the overall mass of PCE in the groundwater (EIS June 3, 2008). As previously mentioned, no further soil gas sampling is planned.

3. Selection of Chemicals of Potential Concern

Chemicals of potential concern for the Property were selected by determining which chemicals detected in environmental media had the potential to adversely impact human health. The COPCs were identified based on the results of field sampling efforts; data included in the COPC selection process are the EIS soil gas data collected in December 2007. Only soil gas data was analyzed for COPCs. The future use of the Property is as a commercial service building, and most of the Property will be covered with asphalt (parking), the concrete foundation, the building, and managed landscaping, therefore tenants are unlikely to have direct contact with soil, and the potential health effects from this exposure pathway were not evaluated. For the soil gas COPC selection, all samples collected in 2007 and 2008 were included in this risk evaluation. The laboratory data sheets associated with the December 2007 sampling effort are included as Attachment 1 and the analytical results are summarized in Table 1.

Any chemical detected in soil gas was included as a soil gas COPC (as per Cal/EPA guidance) for further consideration in the health evaluation. As shown in Table 1, soil gas COPCs are: benzene, ethylbenzene, toluene, total xylenes, acetone, 2-butanone, carbon disulfide, chloroform, 4-ethyltoluene, hexane, 2-hexanone, isopropyl alcohol, methylene chloride, styrene, tetrachloroethene, trichloroethene, trichlorofluoromethane, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene.

4. Conceptual Exposure Model

The USEPA (1989) defines an exposure pathway as "the course a chemical or pollutant takes from the source to the organism exposed." A complete exposure pathway requires four key elements: chemical sources; migration routes (i.e., environmental transport); potentially exposed human receptors; and routes of exposure to impacted media (e.g., inhalation of chemicals in air). All four factors are required for a complete exposure pathway; if any one factor is missing, the pathway is considered incomplete. Because an incomplete pathway does not pose a potential health hazard, incomplete exposure pathways were not included in this health evaluation.

Current and future use of the property will remain commercial/industrial. Therefore, the potential property user, representing the receptor with the greatest potential exposures, was evaluated – commercial/industrial employees (adults) who occupy the new building. Because direct contact with soil is very unlikely, and groundwater from the Property is not used for domestic purposes, potential routes of COPC exposure evaluated for commercial workers are limited to the inhalation of chemicals in indoor air resulting from subsurface vapor migration (as measured by soil gas).

4. Exposure Evaluation

Calculation of Concentrations of Chemicals in Air

Indoor Air Chemical Concentrations

Volatile chemicals in the subsurface can enter indoor air through vapor migration. In this health evaluation, the USEPA's 2004 modification of the Advanced Soil Gas Model (SG ADV, Version 3.1) of the Johnson-Ettinger model (USEPA 2003) for vapor intrusion into indoor air was used to estimate the concentrations of VOCs in indoor air.[1] The model predicts the theoretical indoor air concentrations of a chemical based on the diffusion and advection of chemicals through soil and the building floor (e.g. concrete slab) and indoor air mixing processes. As shown in Table 2 below, default soil and building parameters recommended by USEPA (2003) and/or Cal/EPA (2005b and c) were used, as appropriate, to ensure conservativeness. Specifically, in the absence of site-specific information, the model conservatively assumes that soil at the site is the most permeable – sand. Parameters specific to the proposed building were used (personal communication – John G. Mahoney, Antrium Construction); these included an enclosed ground floor space height of 20 feet, and the dimensions of the smallest unit within the proposed building (27 feet by 74 feet). The foundation crack to total area ratio (0.005), the air exchange rate (1/hour), and average vapor flow rates (9.3 L/minute) are those recommended by Cal/EPA (2005b and c).

To ensure that the health evaluation is conservative, and in accordance with Cal/EPA guidance for future construction, the maximum soil gas concentrations at the Property were used to model indoor air concentrations. Because the entire site will be covered by either the building or pavement/concrete, the maximum soil gas concentration was

[1]Advanced Soil Gas Model (USEPA 2003; model last modified February 2004, available online http://www.epa.gov/oswer/riskevaluation/airmodel/johnson_ettinger.htm), edited to include California EPA toxicity factors; DTSC provides a modified screening level model (http://www.dtsc.ca.gov/AssessingRisk/JE_Models.cfm)

evaluated whether or not it is within the footprint of the proposed building. In order to ensure that potential health risks were evaluated based on maximum indoor air concentrations, for locations where the maximum soil gas concentration occurred at 8 feet bgs, the maximum 4-foot result was also evaluated (see Table 3). The resulting indoor air concentrations for the Property are presented in Table 2, and the associated J&E Model runs included in Attachment 2.

Table 2: Parameters Used in Johnson-Ettinger Vapor Intrusion Modeling – Soil Gas

Parameter (units)	Commercial Value	Source
Depth below grade to bottom of enclosed space floor (cm)	9	Cal/EPA (2005b)
Depth below grade to top of contamination (cm)	121.9 (4 feet) to 243.8 (8 feet)	Maximum detection sampling depth
Average soil temperature (°C)	22	Cal/EPA (2005b)
Layer A soil type for soil vapor permeability	S (sand)	Cal/EPA (2005b)
Layer A thickness (cm)	19 (soil around 9cm slab and 10cm gravel)	Cal/EPA (2005b)
Layer A SCS soil type	S (sand)	Cal/EPA (2005b)
Layer A soil dry bulk density (g/cm^3)	1.66	Sand default (Table B6)
Layer A soil total porosity, unitless	0.375	Sand default (Table B6)
Layer A soil water-filled porosity, (cm^3/cm^3)	0.054	Sand default (Table B6)
Layer B thickness (cm)	Depth to contamination – Layer A	Depth to detection being evaluated
Layer B soil type	S (sand)	Cal/EPA (2005b)
Layer B soil dry bulk density (g/cm^3)	1.66	Sand default (Table B6)
Layer B soil total porosity, unitless	0.375	Sand default (Table B6)
Layer B soil water-filled porosity, (cm^3/cm^3)	0.054	Sand default (Table B6)
Enclosed floor space length (cm)	822 (27 feet)	New Building Design Specification
Enclosed floor space width (cm)	2255 (74 feet)	New Building Design Specification
Enclosed space height (cm)	609 (20 feet)	New Building Design Specification
Crack-to-total area ratio	0.0050	Cal/EPA (2005c)
Soil-building pressure differential ($g/cm\text{-}s^2$)	40	Cal/EPA (2005b)
Indoor air exchange rate (1/hour)	1	Cal/EPA (2005b)
Average vapor flow rate into building (L/minute)	9.3	Scaled default rate proportionally to building size (Cal/EPA 2005c)

Table 3: Indoor Air Representative Concentrations

Chemical	Soil Gas Max Concentration ug/m^3	Soil Gas Max Commercial Indoor Vapor ug/m^3	Depth (feet)	4-foot Soil Gas Max Concentration ug/m^3	4-foot Commercial Indoor Vapor ug/m^3
BTEX					
Benzene	4.90E+01	**1.02E-02**	8	2.50E+01	7.41E-03
Ethylbenzene	1.50E+02	**4.16E-02**	4		
Toluene	1.80E+04	**5.31E+00**	4		
Xylenes (total)	6.10E+02	**1.71E-01**	4		
VOCs					
Acetone	1.20E+04	**4.02E+00**	4		
2-Butanone	2.20E+01	4.34E-02	8	1.60E+02	**4.58E-02**
Carbon disulfide	7.30E+01	**1.66E-02**	8	2.80E+01	8.84E-03
Chloroform	2.20E+02	**5.01E-02**	8	3.00E+01	9.48E-03
*4-Ethyltoluene**	*6.30E+00*	***1.77E-03***	4		
Hexane	3.50E+02	**1.08E-01**	8	5.60E+01	2.15E-02
2-Hexanone	3.70E+00	NV	8	2.90E+00	NV
Isopropyl alcohol	4.30E+03	**1.33E+00**	4		
Methylene chloride	1.40E+02	**4.38E-02**	4		
Styrene	2.60E+01	4.74E-03	8	2.40E+01	**6.50E-03**
Tetrachloroethene	4.00E+04	**7.35E+00**	8	2.40E+04	6.54E+00
Trichloroethene	2.10E+01	**5.96E-03**	4		
Trichlorofluoromethane	1.10E+03	**3.25E-01**	4		
1,2,4-Trimethylbenzene	8.70E+00	**2.19E-03**	4		
1,3,5-Trimethylbenzene	2.70E+00	**6.76E-04**	4		

Bold text identifies maximum indoor air concentration.
**Chemical information for p-xylene used as a surrogate for 4-ethyltoluene.*

Indoor air vapor concentrations also can be estimated from groundwater COPC concentrations. While only historic soil gas data area available for the Property, post-remediation groundwater data area available. To ensure that the health evaluation is conservative, particularly since no indoor air measurements can be taken for *future* construction, potential indoor air concentrations of PCE, the primary COPC, were also estimated based on these groundwater data. EIS conducted the most recent groundwater sampling in May 2008, and 320 ug/L of PCE was detected in groundwater collected from MW-6 (EIS June 3, 2008). USEPA's 2004 modification of the Advanced Groundwater Model (SG ADV, Version 3.1) of the Johnson-Ettinger model (USEPA 2003) for vapor intrusion into indoor air was used to estimate the concentrations of PCE in indoor air. As for the soil gas model, default soil and building parameters recommended by USEPA (2003) and/or Cal/EPA (2005b and c) were used, as appropriate, to ensure conservativeness. The depth below grade to groundwater collected from MW-6 in May 2008 was 15.7 feet, and the soil was conservatively assumed to be comprised of sand. The resulting estimated indoor air PCE vapor concentration is 13.9 ug/m^3, which exceeds the maximum indoor air estimates based on soil gas (7.3 ug/m^3). The associated J&E Model run included in Attachment 3.

Table 4: Parameters Used in Johnson-Ettinger Vapor Intrusion Modeling - Groundwater

Parameter (units)	Commercial Value	Source
Depth below grade to bottom of enclosed space floor (cm)	9	Cal/EPA (2005b)
Depth below grade to water table (cm)	478 (15.7 feet)	Maximum detection groundwater depth
Soil stratum directly above water table	B	Cal/EPA (2005b)
Soil type directly above water table	S (sand)	Cal/EPA (2005b)
Layer A soil type for soil vapor permeability	S (sand)	Cal/EPA (2005b)
Layer A thickness (cm)	19 (soil around 9cm slab and 10cm gravel)	Cal/EPA (2005b)
Layer A SCS soil type	S (sand)	Cal/EPA (2005b)
Layer A soil dry bulk density (g/cm^3)	1.66	Sand default (Table B6)
Layer A soil total porosity, unitless	0.375	Sand default (Table B6)
Layer A soil water-filled porosity, (cm^3/cm^3)	0.054	Sand default (Table B6)
Layer B thickness (cm)	Depth to contamination – Layer A	Depth to detection being evaluated
Layer B soil type	S (sand)	Cal/EPA (2005b)
Layer B soil dry bulk density (g/cm^3)	1.66	Sand default (Table B6)
Layer B soil total porosity, unitless	0.375	Sand default (Table B6)
Layer B soil water-filled porosity, (cm^3/cm^3)	0.054	Sand default (Table B6)
Enclosed floor space length (cm)	822 (27 feet)	New Building Design Specification
Enclosed floor space width (cm)	2255 (74 feet)	New Building Design Specification
Enclosed space height (cm)	609 (20 feet)	New Building Design Specification
Crack-to-total area ratio	0.0050	Cal/EPA (2005c)
Soil-building pressure differential ($g/cm\text{-}s^2$)	40	Cal/EPA (2005b)
Indoor air exchange rate (1/hour)	1	Cal/EPA (2005b)
Average vapor flow rate into building (L/minute)	9.3	Scaled default rate proportionally to building size (Cal/EPA 2005c)

Exposure Quantification

As described above, indoor air exposure was based on maximum soil gas concentrations. The pathway-specific exposure estimate calculations are described below.

Air Exposure – Inhalation of Indoor Air Vapors

Equation 6-16 from the USEPA risk assessment guidelines (USEPA 1989) was used to quantify the intake of each COPC from the inhalation pathway:

$$(I_a) = (InhR)(C_a)(ET)(EF)(ED) / (BW)(AT)$$

where

I_a	=	intake from inhalation of COPC in air (mg/kg-d)
C_a	=	concentration of COPC in air (mg/m^3) – particulate or vapor
InhR	=	inhalation rate (m^3/h)
ET	=	exposure time (h/d)
EF	=	exposure frequency (d/y)
ED	=	exposure duration (y)
BW	=	body weight (kg)
AT	=	averaging time (d), ED x 365d/y (noncarcinogens); 70y x 365d/y (carcinogens)

The COPC concentrations in indoor air were calculated using soil gas concentrations estimated by the Johnson-Ettinger soil gas model, as discussed above. For all employees, the inhalation rate was assumed to be the standard value for adults – 0.83 m^3/hour (USEPA 2002). Employees were assumed to have an indoor exposure time of eight hours per day and an outdoor exposure time of two hours per day (site-specific assumption), for 250 days per year (USEPA 2002). The exposure duration was 25 years and body weight was 70 kg (USEPA 2002). The resulting indoor air inhalation intake factors for commercial users are 2.33E-02 and 6.52E-02 m^3/kg-d, respectively for carcinogens and noncarcinogens.

5. Dose-Response Evaluation

In accordance with Cal/EPA's suggested hierarchy of sources to identify dose-response values (Cal/EPA 1992), relevant carcinogenic and noncarcinogenic dose-response values were obtained from the following sources (in descending order of preference):

- OEHHA Toxicity Criteria Database (Cal/EPA 2008);
- Other California EPA sources, such as toxicity values used in the development of the CHHSLs (Cal/EPA 2005b) and chronic inhalation exposure reference levels (2007)
- Integrated Risk Information System (IRIS) database (USEPA 2008)
- USEPA Region IX Preliminary Remediation Goals (USEPA 2004a)

The criteria used in this health evaluation are summarized in Table 5.

6. Risk Characterization

Human health risk evaluations calculate two different values to evaluate potential health impacts: the Hazard Index (HI) and the Incremental Lifetime Cancer Risk (ILCR). For noncancer hazards, the potential for harmful effects from exposure to multiple chemicals is assessed by summing the HQs, with the resulting sum designated the *Hazard Index* (HI).

The risk that is acceptable is very much dependent on site-specific characteristics that include: the number of people potentially exposed, the likelihood of exposure, the chemicals driving the risk, the future use(s) of the Property, and the decisions of local

risk managers. The acceptable risk levels, and the results for future commercial employees at the Property, are described below.

Acceptable Non-Cancer Hazard

The USEPA directive, Role of the Baseline Risk Evaluation in Superfund Remedy Selection Decisions (USEPA 1991) states that action is generally not warranted at a site when the cumulative non-carcinogenic HI is less than 1.0. The level of concern increases as the HI increases above unity, although the two are not linearly related (USEPA 1989).

Acceptable Cancer Risk

The ILCR is compared to a range of acceptable probabilities to determine whether the potential risk poses an unacceptable health threat. According to the revised National Contingency Plan (USEPA 1990), carcinogenic risks from exposures to chemicals are considered to be unacceptable at a level greater than 1×10^{-4} (1 in 10,000), whereas risks less than 1×10^{-7} (1 in 10,000,000) are considered to be of minimal concern. Action may or may not be necessary in the risk range of 10^{-7} to 10^{-4}. The USEPA directive, Role of the Baseline Risk Evaluation in Superfund Remedy Selection Decisions (USEPA 1991) states that action is generally not warranted at a site when the cumulative carcinogenic risk for current and future land use is less than 1×10^{-4}. The USEPA uses a potential excess individual lifetime cancer risk of 1×10^{-6} (1 in 1,000,000) as a point of departure for risk management actions. As a risk management policy, the Cal/EPA generally uses 1×10^{-5} (1 in 100,000) as its significant risk level, particularly for commercial properties, this is also the California Proposition 65 point of departure.

Results

Tables 6 and 7 present the HIs and ILCRs each COPC (resulting from the soil gas data), and the totals are summarized below. Because the reasonable maximum exposure (RME) approach was used to quantify potential health risks, if the RME values are below acceptable limits, then all other, lesser exposures related to the receptors are below these limits (USEPA 1989).

Table 8. Summary of Noncancer Hazards and Cancer Risks to Commercial Employees in the Building Addition

Media	Noncancer Hazard	Cancer Risk*
Soil Gas	0.05 (91% PCE)	3.6E-06 (99% PCE)

*3.6E-06 = 0.0000036 = 3.6 excess cancers per million employees exposed.

The risk estimates for the primary COPC, PCE, based on maximum groundwater concentrations detected in the post-remediation sampling conducted in May 2008 are slightly higher, with a noncancer hazard of 0.09 and a cancer risk of 6.7×10^{-6}.

7. Conclusions and Recommendations

This human health risk evaluation looked at the potential cancer risks and noncancer hazards to commercial/industrial employees from COPCs detected in soil gas at the Property. The exposures and associated risks detailed in this evaluation were developed

using the reasonable maximum exposure approach promulgated by Cal/EPA and USEPA, along with site-specific information and conservative assumptions. These assumptions were made in accordance with regulatory guidance (Cal/EPA 1994; USEPA 1989), past uses, building plans, current zoning for the property, and best professional judgment. Based on environmental data from the Property, only potential exposure to chemicals in indoor air (via soil gas) were considered. Commercial/industrial employees are unlikely to have direct contact with contaminated soil (the Property is covered with asphalt, concrete or buildings, or small patches of maintained landscaping), so direct soil contact pathways were not assessed. Similarly it is our understanding that shallow groundwater at the Property will not be used for consumption or other purposes. Based on environmental data at the Property, specifically soil gas data, the exposure route of primary concern is the migration of volatile chemicals from the subsurface into indoor air. Soil gas data collected prior to extensive soil and groundwater remediation was used in this assessment, and the most conservative soil parameters were used in the model to estimate indoor air concentrations of VOCs. It is therefore likely that the risk results are conservative and may overestimate the risk from indoor air exposure. Post-remediation groundwater concentrations result in slightly higher indoor air PCE concentrations. These differences are not significant from a human health risk perspective, and likely reflect the uncertainties inherent in modeling indoor air vapor concentrations from environmental media, as opposed to being able to directly measure them.

Table 8 shows that the estimated total noncancer hazard pre-remediation is well below the level of concern of 1.0 for commercial users of the Property. This is also true for the risk estimates for PCE based on recent groundwater data. The estimated total cancer risk to commercial/industrial employees in the new building addition based on pre-remediation soil gas concentrations is at the low end of the $1x10^{-4}$ (1 in 10,000) to $1x10^{-7}$ (1 in 10,000,000) acceptable risk management range stipulated by the USEPA (1990). Cancer risks are below the California Proposition 65 point of departure of $1x10^{-5}$ (10 in 100,000). This is also true for the risk estimates for PCE based on recent groundwater data.

Major conclusions reached in this evaluation include:

- Nearly all of the Property will be covered by asphalt, concrete, buildings, or maintained landscaping making direct contact with soil highly unlikely, therefore no direct contact exposure pathways were assessed.
- Soil gas COPC concentrations collected prior to extensive remediation efforts were used in the indoor air assessment and therefore the results of this assessment are conservative and may overestimate the risk from indoor air.
- Recent groundwater PCE concentrations were also used to assess indoor air risk and produced slightly higher risks than those using soil gas concentrations. These risks were still within the acceptable risk management range.
- The total noncancer hazard posed to commercial employees in the proposed building by chemicals in soil gas are well below the USEPA level of concern.
- The total cancer risk posed to commercial employees in the proposed building by chemicals in soil gas are within the USEPA acceptable risk management range of

$1x10^{-7}$ to $1x10^{-4}$, and are well below the California Proposition 65 risk management point of departure (1×10^{-5}).

- The Property should be safe for the proposed commercial use.

If you need any additional information regarding the health risk evaluations, or assistance communicating these results to interested parties, please contact either myself or Becky Countway.

Sincerely,

Charles Lambert, Ph.D., DABT

FIGURES

TABLES

ATTACHMENTS

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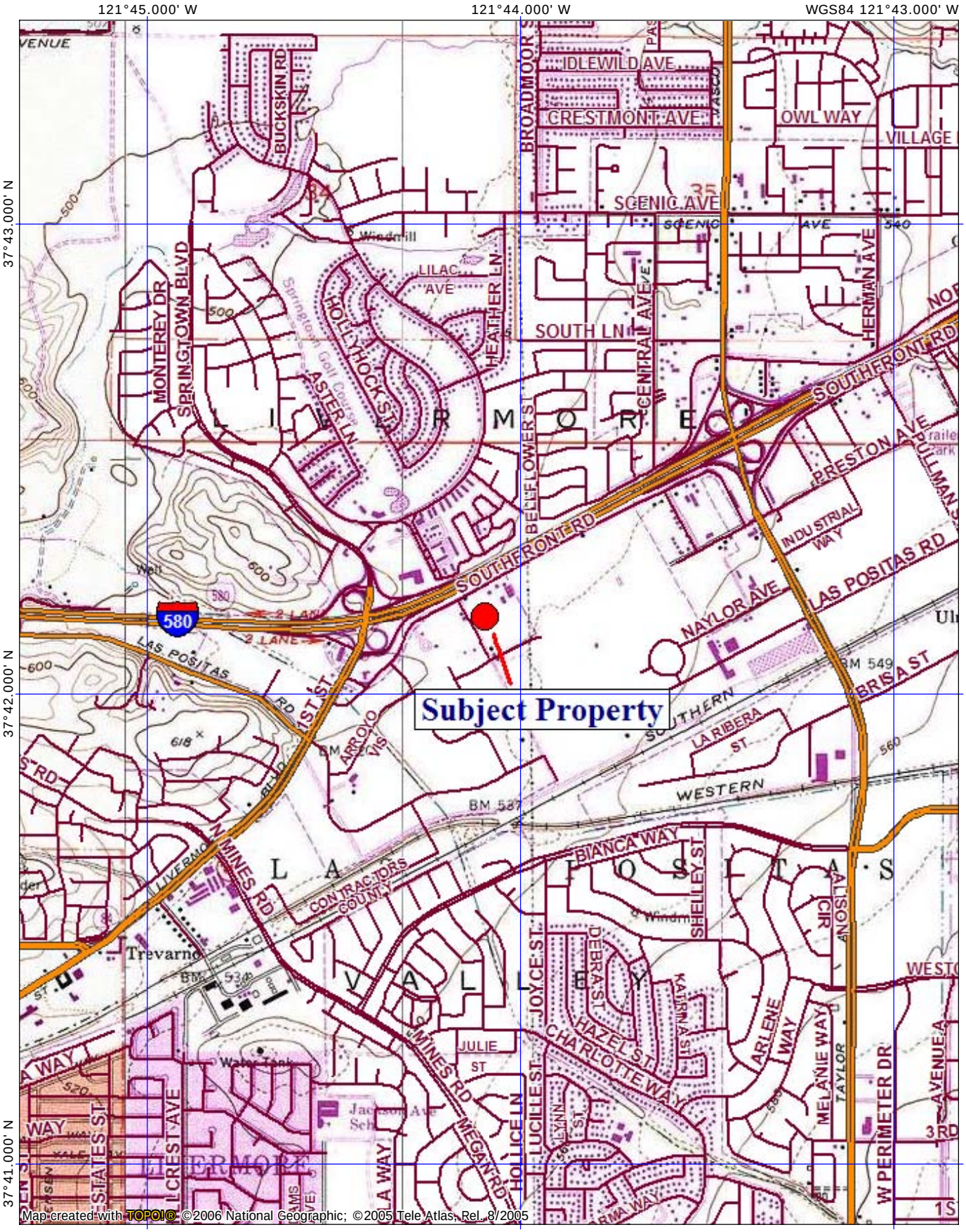
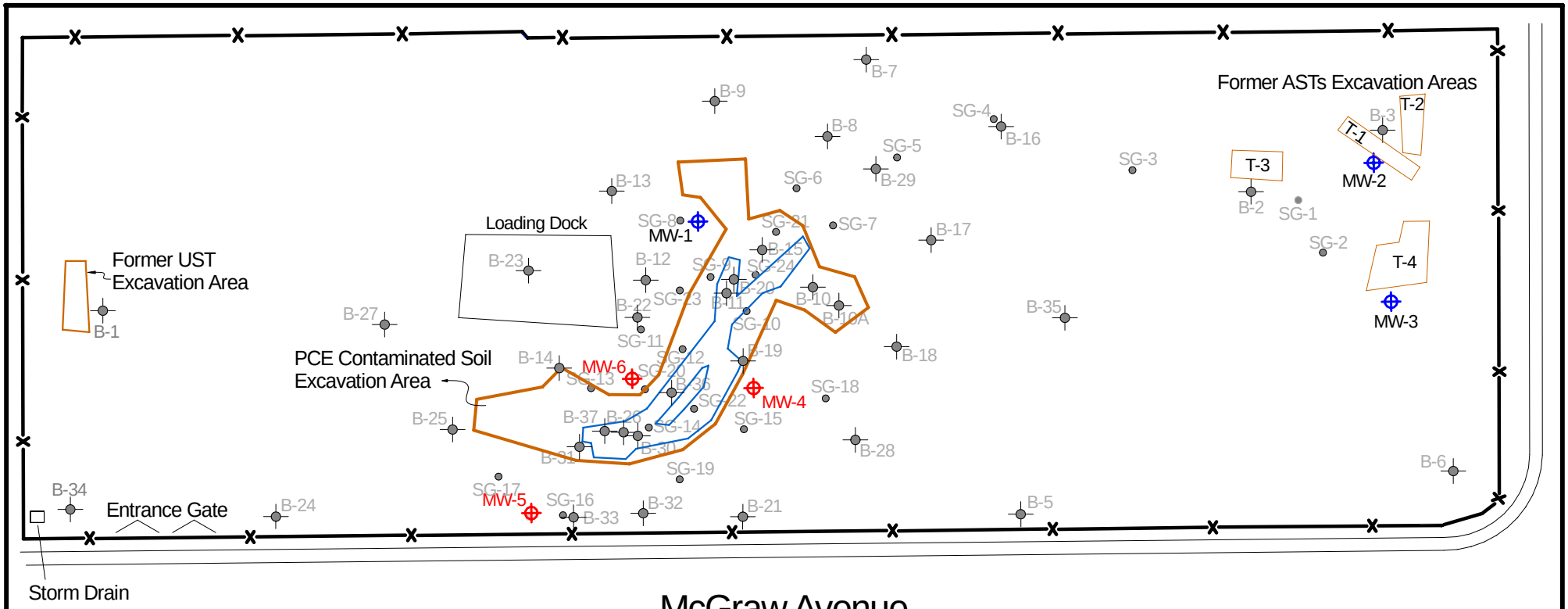
Figures

Figure 1 : Site Location Map





N

Scale:
1" = 60'

0 60

LEGEND

- Groundwater Capture Trench
- B-26 — Previous Soil Boring Location
- SG-3 — Previous Soil Gas Sample Location
- MW-3 — Monitoring Well Location
- MW-5 — Monitoring Wells installed on February 28, 2008
- Fence / Property Line

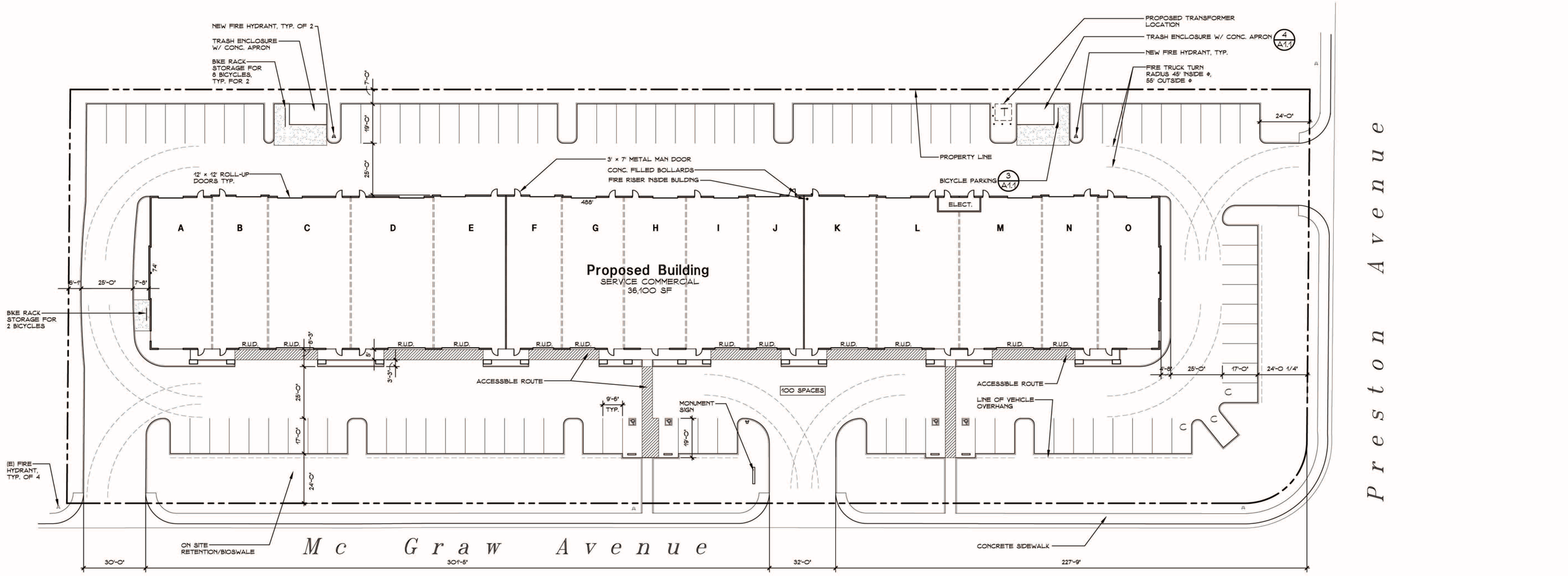
Environmental Investigation Services, Inc.
170 Knowles Drive, Suite 212, Los Gatos, California 95032
Phone: (408) 871-1470 Fax: (408) 871-1520

Project Number 717-4

April 09, 2008

Figure 2

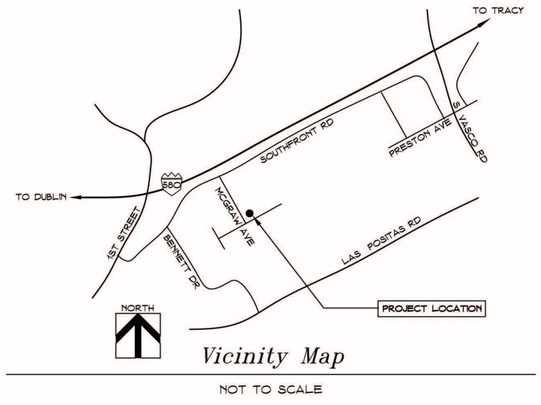
Site Map
461 McGraw Avenue
Livermore, California



Site Plan

1" = 20'

NORTH



Vicinity Map

NOT TO SCALE

APPLICANT

ANTRIM, HIRST, MAHONEY, LLC
1635-A CHESTNUT ST.
LIVERMORE, CA
(925) 426-2444 PH
(925) 426-0371 FX

PROJECT TEAM

ARCHITECT
PERKINS, WILLIAMS, & COTTERILL ARCHITECTS
10690 WHITE ROCK ROAD SUITE 300
RANCHO CORDOVA, CALIFORNIA 95670
(916) 851-1400 PH (916) 851-1408 FX

LANDSCAPE ARCHITECT
GARTH RUFFNER
4120 DOUGLAS BLVD. #306-301
ROSEVILLE, CA 95746
(916) 797-2576 PH (916) 797-2577

PROJECT DATA

A.P.N.:	099-0040-005-02
ADDRESS:	461 MCGRAW AVE.
ZONING:	COMMERCIAL SERVICE (CS)
SITE AREA:	±2.75 AC. (120,000 S.F.)
BUILDING AREA:	36,400 S.F.
FAR:	30%
REQUIRED PARKING:	
COMMERCIAL SERVICE (1/400 S.F.)	91 SPACES
TOTAL PARKING PROVIDED:	100 SPACES
DISABLED SPACES:	4 SPACES
REGULAR SPACES:	96 SPACES
BICYCLE PARKING:	(7) RACKS
PARKING RATIO:	1 : 364 S.F.

DRAWING INDEX

PERKINS, WILLIAMS & COTTERILL
A·R·C·H·I·T·E·C·T·S
10690 WHITE ROCK RD. STE.300 RANCHO CORDOVA, CA 95670
916-851-1400 FAX 916-851-1408
pwcarch@pwcarchitects.com

ANTRIM HIRST MAHONEY, LLC
DEVELOPMENT COMPANY
1635 Chestnut Street - A
Livermore, CA 94551
(925) 484-5555, phone
(925) 426-0371, fax

Site Plan

Project: 461 MCGRAW AVENUE

Job No. 27750 ***Date:*** 5-16-07

Scale: AS NOTED

A1

461 McGraw Avenue
Commercial Service Building
Livermore, California

Figure 3: Proposed Commercial Service Building

Tables

Table 1
Soil Vapor Chemical of Potential Concern Selection Summary -
Pre-remediation Soil Gas Sampling Results

Chemical	Matrix	Frequency Detects / Total	Percent Detects	NonDetects Min – Max	Detects Min – Max	COPC?	Rationale
BTEX							
Benzene	soil gas	19 / 22	86 %	1.6 - 1.6	2.3 - 49	Yes	
Ethylbenzene	soil gas	3 / 22	14 %	1.7 - 1.7	4.2 - 150	Yes	
Toluene	soil gas	22 / 22	100 %	-	2.5 - 18000	Yes	
Xylenes (total)	soil gas	21 / 22	95 %	2.2 - 2.2	4.7 - 610	Yes	
Volatile Organic Compounds (VOCs)							
Acetone	soil gas	22 / 22	100 %	-	11 - 12000	Yes	
Benzyl chloride	soil gas	0 / 22	0 %	2.9 - 2.9	-	No	Never detected
Bromodichloromethane	soil gas	0 / 22	0 %	3.4 - 3.4	-	No	Never detected
Bromoform	soil gas	0 / 22	0 %	5.2 - 5.2	-	No	Never detected
Bromomethane	soil gas	0 / 22	0 %	1.9 - 1.9	-	No	Never detected
1,3-Butadiene	soil gas	0 / 22	0 %	1.1 - 1.1	-	No	Never detected
2-Butanone	soil gas	13 / 22	59 %	1.5 - 1.5	4.0 - 22	Yes	
Carbon disulfide	soil gas	11 / 22	50 %	1.6 - 1.6	2.3 - 73	Yes	
Carbon tetrachloride	soil gas	0 / 22	0 %	3.2 - 3.2	-	No	Never detected
Chlorobenzene	soil gas	0 / 22	0 %	2.3 - 2.3	-	No	Never detected
Chloroethane	soil gas	0 / 22	0 %	1.3 - 1.3	-	No	Never detected
Chloroform	soil gas	2 / 22	9 %	2.4 - 2.4	30 - 220	Yes	
Chloromethane	soil gas	0 / 22	0 %	1.0 - 1.0	-	No	Never detected
Dibromochloromethane	soil gas	0 / 22	0 %	4.3 - 4.3	-	No	Never detected
1,2-Dibromoethane	soil gas	0 / 22	0 %	3.8 - 3.8	-	No	Never detected
1,2-Dichlorobenzene	soil gas	0 / 22	0 %	3.0 - 3.0	-	No	Never detected
1,3-Dichlorobenzene	soil gas	0 / 22	0 %	3.0 - 3.0	-	No	Never detected
1,4-Dichlorobenzene	soil gas	0 / 22	0 %	3.0 - 3.0	-	No	Never detected
Dichlorodifluoromethane	soil gas	0 / 22	0 %	2.5 - 2.5	-	No	Never detected
1,1-Dichloroethane	soil gas	0 / 22	0 %	2.0 - 2.0	-	No	Never detected
1,2-Dichloroethane	soil gas	0 / 22	0 %	2.0 - 2.0	-	No	Never detected
1,1-Dichloroethene	soil gas	0 / 22	0 %	2.0 - 2.0	-	No	Never detected
cis-1,2-Dichloroethene	soil gas	0 / 22	0 %	2.0 - 2.0	-	No	Never detected
trans-1,2-Dichloroethene	soil gas	0 / 22	0 %	2.0 - 2.0	-	No	Never detected
1,2-Dichloropropane	soil gas	0 / 22	0 %	2.3 - 2.3	-	No	Never detected
cis-1,3-Dichloropropene	soil gas	0 / 22	0 %	2.3 - 2.3	-	No	Never detected
1,2-Dichloro-1,1,2,2-tetraflouroethane	soil gas	0 / 22	0 %	2.5 - 2.5	-	No	Never detected
4-Ethyltoluene	soil gas	2 / 22	9 %	2.5 - 2.5	5.2 - 6.3	Yes	
Ethyl acetate	soil gas	0 / 22	0 %	1.8 - 1.8	-	No	Never detected
Hexane	soil gas	4 / 22	18 %	3.5 - 3.5	30 - 350	Yes	
2-Hexanone	soil gas	2 / 22	9 %	2.0 - 2.0	2.9 - 3.7	Yes	
Isopropyl alcohol	soil gas	4 / 22	18 %	16 - 16.0	17 - 4300	Yes	
Methylene chloride	soil gas	2 / 22	9 %	3.6 - 3.6	34 - 140	Yes	
4-Methyl-2-pentanone	soil gas	0 / 22	0 %	2.0 - 2.0	-	No	Never detected
Methyl tert-butyl ether	soil gas	0 / 22	0 %	1.8 - 1.8	-	No	Never detected
Styrene	soil gas	3 / 22	14 %	2.1 - 2.1	19 - 26	Yes	
1,1,1,2-Tetrachloroethane	soil gas	0 / 22	0 %	3.4 - 3.4	-	No	Never detected
1,1,2,2-Tetrachloroethane	soil gas	0 / 22	0 %	3.4 - 3.4	-	No	Never detected
Tetrachloroethene	soil gas	20 / 22	91 %	3.4 - 3.4	16 - 40000	Yes	
Tetrahydrofuran	soil gas	0 / 22	0 %	1.5 - 1.5	-	No	Never detected

Table 1
Soil Vapor Chemical of Potential Concern Selection Summary -
Pre-remediation Soil Gas Sampling Results

Chemical	Matrix	Frequency Detects / Total	Percent Detects	NonDetects Min – Max	Detects Min – Max	COPC?	Rationale
1,2,4-Trichlorobenzene	soil gas	0 / 22	0 %	3.6 - 3.6	-	No	Never detected
1,1,1-Trichloroethane	soil gas	0 / 22	0 %	2.7 - 2.7	-	No	Never detected
1,1,2-Trichloroethane	soil gas	0 / 22	0 %	2.7 - 2.7	-	No	Never detected
Trichloroethene	soil gas	3 / 22	14 %	2.7 - 2.7	12 - 21	Yes	
Trichlorofluoroethane	soil gas	0 / 22	0 %	2.5 - 2.5	-	No	Never detected
Trichlorofluoromethane	soil gas	19 / 22	86 %	2.5 - 2.5	3 - 1100	Yes	
1,1,2-Trichlorotrifluoroethane	soil gas	0 / 22	0 %	3.8 - 3.8	-	N0	Never detected
1,2,4-Trimethylbenzene	soil gas	4 / 22	18 %	2.5 - 2.5	2.6 - 8.7	Yes	
1,3,5-Trimethylbenzene	soil gas	1 / 22	5 %	2.5 - 2.5	2.7 - 2.7	Yes	
Vinyl acetate	soil gas	0 / 22	0 %	1.8 - 1.8	-	No	Never detected
Vinyl chloride	soil gas	0 / 22	0 %	1.3 - 1.3	-	No	Never detected
Polycyclic Aromatic Hydrocarbons (PAHs)							
Naphthalene	soil gas	0 / 22	0 %	2.6 - 2.6	-	No	Never detected
Semiolatile Organic Compounds (SVOCs)							
1,4-Dioxane	soil gas	0 / 22	0 %	1.80 - 1.80	-	No	Never detected
Hexachlorobutadiene	soil gas	0 / 22	0 %	5.30 - 5.30	-	No	Never detected

Notes:
NA = Not Apllicable
Concentrations are in ug/m^3.

Table 5
Chemicals of Potential Concern Toxicity Criteria

CHEMICAL	Cancer Slope Factors (CSF)		Noncancer Reference Doses (RfD)	
	Inhalation CSF $(mg/kg\text{-}day)^{-1}$	Source	Inhalation RfD (mg/kg-day)	Source
BTEX				
Benzene	1.02E-01	Cal/EPA	1.71E-02	Cal/EPA
Ethylbenzene	8.70E-03	Cal/EPA	5.71E-01	Cal/EPA
Toluene	NC		8.57E-02	Cal/EPA
Xylenes (total)	NC		2.00E-01	Cal/EPA
VOCs				
Acetone	NC		9.00E-01	r
2-Butanone	NC		1.43E+00	IRIS
Carbon disulfide	NC		2.00E-01	IRIS
Chloroform	1.86E-02	Cal/EPA	8.57E-02	Cal/EPA
4-Ethyltoluene	NC		*2.86E-02*	*Xylenes (total) (IRIS)*
Hexane	NC		2.00E-01	IRIS
2-Hexanone	NC		NC	
Isopropyl alcohol	NC		NC	
Methylene chloride	3.50E-03	Cal/EPA	1.14E-01	Cal/EPA
Styrene	NC		2.57E-01	Cal/EPA
Tetrachloroethene	2.07E-02	Cal/EPA	1.00E-02	Cal/EPA (Ch REL)
Trichloroethene	7.00E-03	Cal/EPA	1.71E-01	Cal/EPA
Trichlorofluoromethane	NC		2.00E-01	USEPA Region IX (Heast)
1,2,4-Trimethylbenzene	NC		1.70E-03	USEPA Region IX (PPRTV)
1,3,5-Trimethylbenzene	NC		1.70E-03	USEPA Region IX (PPRTV)

NA = Not Applicable
NC = No Criteria
Not Avail = Not Available

Sources:
Cal/EPA = California Office of Environmental Health Hazard Assessment (OHHEA) Toxicity Criteria Database (Cal/EPA 2008)
OEHHA = Human-Exposure-Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil (Cal/E
IRIS = USEPA's Integrated Risk Information System (http://www.epa.gov/iris/) (USEPA 2008)
USEPA Region IX = Region IX PRGs (2004a)
  Heast = Health effects summary tables as cited by USEPA Region IX PRGs
  NCEA = USEPA's National Center for Environmental Assessment as cited by USEPA Region IX PRGs
  PPRTV = Provisional Peer Reviewed Toxicity Values as cited by USEPA Region IX PRGs
TPHCWG = Total Petroleum Hydrocarbon Work Group (1997)
r = route extrapolation
Italics indicate criteria for surrogate compound applied: "Ace" = acenaphthene, "Fluoranth" = fluoranthene, and "Anth" - anthracene.

Table 6
Cancer Risk - Soil Gas

CHEMICAL	Commercial Users Indoor Employee
BTEX	
Benzene	2.403E-08
Ethylbenzene	8.433E-09
Toluene	NC
Xylenes (total)	NC
VOCs	
Acetone	NC
2-Butanone	NC
Carbon disulfide	NC
Chloroform	2.165E-08
4-Ethyltoluene	NC
Hexane	NC
2-Hexanone	NV
Isopropyl alcohol	NC
Methylene chloride	3.568E-09
Styrene	NC
Tetrachloroethene	3.536E-06
Trichloroethene	9.714E-10
Trichlorofluoromethane	NC
1,2,4-Trimethylbenzene	NC
1,3,5-Trimethylbenzene	NC
TOTAL:	**3.59E-06**

Notes:
NA = Not Applicable
NC = No Criteria
NV = No Value

Table 7
Noncancer Hazard - Soil Gas

CHEMICAL	Commercial Users Indoor Employee
BTEX	
Benzene	3.867E-05
Ethylbenzene	4.750E-06
Toluene	4.043E-03
Xylenes (total)	5.579E-05
VOCs	
Acetone	2.917E-04
2-Butanone	2.092E-06
Carbon disulfide	5.421E-06
Chloroform	3.812E-05
4-Ethyltoluene	4.033E-06
Hexane	3.524E-05
2-Hexanone	NV
Isopropyl alcohol	NC
Methylene chloride	2.498E-05
Styrene	1.648E-06
Tetrachloroethene	4.794E-02
Trichloroethene	2.267E-06
Trichlorofluoromethane	1.059E-04
1,2,4-Trimethylbenzene	8.389E-05
1,3,5-Trimethylbenzene	2.595E-05
TOTAL:	**5.3E-02**

Notes:
NA = Not Applicable
NC = No Criteria
NV = No Value

Attachments

Attachment 1

Torrent
LABORATORY, INC.

December 26, 2007

Peter Littman
Environmental Investigation Services
170 Knowles Drive,Suite 212
Los Gatos, CA 95032

TEL: (408) 871-1470
FAX (408) 871-1520

RE: 717-3F

Order No.: 0712077

Dear Peter Littman:

Torrent Laboratory, Inc. received 4 samples on 12/14/2007 for the analyses presented in the following report.

All data for associated QC met EPA or laboratory specification(s) except where noted in the case narrative.

Torrent Laboratory, Inc, is certified by the State of California, ELAP #1991. If you have any questions regarding these tests results, please feel free to contact the Project Management Team at (408)263-5258;ext: 204.

Sincerely,

Laboratory Director

12/26/07
Date

TORRENT LABORATORY, INC.

483 Sinclair Frontage Road * Milpitas, CA * Phone: (408) 2635258 * Fax: (408) 263-8293
Visit us ar www.torrentlab.com email: analysis@torrentlab.com

Report Prepaired For: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported: 12/26/2007

Summary Report

SG-6 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712077-001A**

Parameter	Preped	Analyzed	Result	RL	Unit
2-Butanone (MEK)	12/19/2007	12/19/2007	40	1.5	µg/m³
Acetone	12/19/2007	12/19/2007	8900	950	µg/m³
Benzene	12/19/2007	12/19/2007	15	1.6	µg/m³
Ethyl Benzene	12/19/2007	12/19/2007	150	1.7	µg/m³
m,p-Xylene	12/19/2007	12/19/2007	490	2.0	µg/m³
o-xylene	12/19/2007	12/19/2007	120	2.2	µg/m³
Styrene	12/19/2007	12/19/2007	19	2.1	µg/m³
Tetrachloroethene	12/19/2007	12/19/2007	100	3.4	µg/m³
Toluene	12/19/2007	12/19/2007	18000	190	µg/m³
Trichlorofluoromethane	12/19/2007	12/19/2007	34	2.5	µg/m³

SG-5 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712077-002A**

Parameter	Preped	Analyzed	Result	RL	Unit
2-Butanone (MEK)	12/19/2007	12/19/2007	72	1.5	µg/m³
Acetone	12/19/2007	12/19/2007	12000	950	µg/m³
Benzene	12/19/2007	12/19/2007	25	1.6	µg/m³
Ethyl Benzene	12/19/2007	12/19/2007	120	1.7	µg/m³
m,p-Xylene	12/19/2007	12/19/2007	460	2.0	µg/m³
o-xylene	12/19/2007	12/19/2007	130	2.2	µg/m³
Styrene	12/19/2007	12/19/2007	24	2.1	µg/m³
Tetrachloroethene	12/19/2007	12/19/2007	130	3.4	µg/m³
Toluene	12/19/2007	12/19/2007	12000	190	µg/m³
Trichlorofluoromethane	12/19/2007	12/19/2007	3.6	2.5	µg/m³

SG-9 @ 8' **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712077-003A**

Parameter	Preped	Analyzed	Result	RL	Unit
2-Butanone (MEK)	12/19/2007	12/19/2007	13	1.5	µg/m³
2-Hexanone	12/19/2007	12/19/2007	3.7	2.0	µg/m³
Acetone	12/19/2007	12/19/2007	58	9.5	µg/m³
Benzene	12/19/2007	12/19/2007	14	1.6	µg/m³
Carbon Disulfide	12/19/2007	12/19/2007	2.3	1.6	µg/m³
m,p-Xylene	12/19/2007	12/19/2007	7.9	2.0	µg/m³

TORRENT LABORATORY, INC.

483 Sinclair Frontage Road * Milpitas, CA * Phone: (408) 2635258 * Fax: (408) 263-8293
Visit us ar www.torrentlab.com email: analysis@torrentlab.com

Report Prepaired For: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported: 12/26/2007

Summary Report

SG-9 @ 8' **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712077-003A**

Parameter	Preped	Analyzed	Result	RL	Unit
o-xylene	12/19/2007	12/19/2007	2.6	2.2	µg/m³
Tetrachloroethene	12/19/2007	12/19/2007	40000	340	µg/m³
Toluene	12/19/2007	12/19/2007	12	1.9	µg/m³
Trichloroethene	12/19/2007	12/19/2007	17	2.7	µg/m³
Trichlorofluoromethane	12/19/2007	12/19/2007	220	2.5	µg/m³

SG-8 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712077-004A**

Parameter	Preped	Analyzed	Result	RL	Unit
2-Butanone (MEK)	12/19/2007	12/19/2007	11	1.5	µg/m³
2-Hexanone	12/19/2007	12/19/2007	2.9	2.0	µg/m³
Acetone	12/19/2007	12/19/2007	52	9.5	µg/m³
Benzene	12/19/2007	12/19/2007	19	1.6	µg/m³
Ethyl Benzene	12/19/2007	12/19/2007	4.2	1.7	µg/m³
Isopropanol	12/19/2007	12/19/2007	17	16	µg/m³
m,p-Xylene	12/19/2007	12/19/2007	12	2.0	µg/m³
o-xylene	12/19/2007	12/19/2007	3.5	2.2	µg/m³
Tetrachloroethene	12/19/2007	12/19/2007	45	3.4	µg/m³
Toluene	12/19/2007	12/19/2007	18	1.9	µg/m³
Trichlorofluoromethane	12/19/2007	12/19/2007	17	2.5	µg/m³

TORRENT LABORATORY, INC.

483 Sinclair Frontage Road • Milpitas, CA • Phone: (408) 263-5258 • Fax: (408) 263-8293

Visit us at www.torrentlab.com email: analysis@torrentlab.com

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported: 12/26/2007

Client Sample ID: SG-6
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 10:10:00 AM

Lab Sample ID: 0712077-001
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/19/2007	1.99	1	2.0	ND	µg/m³	R14846
1,1,1,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,1-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1,2,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,2-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2,4-Trichlorobenzene	TO-15	12/19/2007	3.56	1	3.6	ND	µg/m³	R14846
1,2,4-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/19/2007	3.84	1	3.8	ND	µg/m³	R14846
1,2-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,2-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2-Dichloropropane	TO-15	12/19/2007	2.31	1	2.3	ND	µg/m³	R14846
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/19/2007	3.13	1	3.1	ND	µg/m³	R14846
1,3,5-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
1,3-Butadiene	TO-15	12/19/2007	1.11	1	1.1	ND	µg/m³	R14846
1,3-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dioxane	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
2-Butanone (MEK)	TO-15	12/19/2007	1.48	1	1.5	40	µg/m³	R14846
2-Hexanone	TO-15	12/19/2007	2.05	1	2.0	ND	µg/m³	R14846
4-Ethyl Toluene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
4-Methyl-2-Pentanone (MIBK)	TO-15	12/19/2007	2.05	1	2.0	ND	µg/m³	R14846
Acetone	TO-15	12/19/2007	9.52	100	950	8900	µg/m³	R14846
Benzene	TO-15	12/19/2007	1.6	1	1.6	15	µg/m³	R14846
Benzyl Chloride	TO-15	12/19/2007	2.88	1	2.9	ND	µg/m³	R14846
Bromodichloromethane	TO-15	12/19/2007	3.35	1	3.4	ND	µg/m³	R14846
Bromoform	TO-15	12/19/2007	5.17	1	5.2	ND	µg/m³	R14846
Bromomethane	TO-15	12/19/2007	1.94	1	1.9	ND	µg/m³	R14846
Carbon Disulfide	TO-15	12/19/2007	1.56	1	1.6	ND	µg/m³	R14846
Carbon Tetrachloride	TO-15	12/19/2007	3.15	1	3.2	ND	µg/m³	R14846
Chlorobenzene	TO-15	12/19/2007	2.3	1	2.3	ND	µg/m³	R14846
Chloroethane	TO-15	12/19/2007	1.32	1	1.3	ND	µg/m³	R14846
Chloroform	TO-15	12/19/2007	2.44	1	2.4	ND	µg/m³	R14846
Chloromethane	TO-15	12/19/2007	1.04	1	1.0	ND	µg/m³	R14846
cis-1,2-dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported: 12/26/2007

Client Sample ID: SG-6
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 10:10:00 AM

Lab Sample ID: 0712077-001
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
cis-1,3-Dichloropropene	TO-15	12/19/2007	2.27	1	2.3	ND	µg/m³	R14846
Dibromochloromethane	TO-15	12/19/2007	4.26	1	4.3	ND	µg/m³	R14846
Dichlorodifluoromethane	TO-15	12/19/2007	2.48	1	2.5	ND	µg/m³	R14846
Ethyl Acetate	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
Ethyl Benzene	TO-15	12/19/2007	1.67	1	1.7	150	µg/m³	R14846
Freon 113	TO-15	12/19/2007	3.83	1	3.8	ND	µg/m³	R14846
Hexachlorobutadiene	TO-15	12/19/2007	5.34	1	5.3	ND	µg/m³	R14846
Hexane	TO-15	12/19/2007	3.52	1	3.5	ND	µg/m³	R14846
Isopropanol	TO-15	12/19/2007	16.4	1	16	ND	µg/m³	R14846
m,p-Xylene	TO-15	12/19/2007	2.05	1	2.0	490	µg/m³	R14846
Methylene Chloride	TO-15	12/19/2007	3.61	1	3.6	ND	µg/m³	R14846
MTBE	TO-15	12/19/2007	1.81	1	1.8	ND	µg/m³	R14846
Naphthalene	TO-15	12/19/2007	2.62	1	2.6	ND	µg/m³	R14846
o-xylene	TO-15	12/19/2007	2.17	1	2.2	120	µg/m³	R14846
Styrene	TO-15	12/19/2007	2.13	1	2.1	19	µg/m³	R14846
Tetrachloroethene	TO-15	12/19/2007	3.39	1	3.4	100	µg/m³	R14846
Tetrahydrofuran	TO-15	12/19/2007	1.48	1	1.5	ND	µg/m³	R14846
Toluene	TO-15	12/19/2007	1.89	100	190	18000	µg/m³	R14846
trans-1,2-Dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846
Trichloroethene	TO-15	12/19/2007	2.69	1	2.7	ND	µg/m³	R14846
Trichlorofluoromethane	TO-15	12/19/2007	2.48	1	2.5	34	µg/m³	R14846
Vinyl Acetate	TO-15	12/19/2007	1.76	1	1.8	ND	µg/m³	R14846
Vinyl Chloride	TO-15	12/19/2007	1.28	1	1.3	ND	µg/m³	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/19/2007	0	100	50-150	89.1	%REC	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/19/2007	0	1	50-150	109	%REC	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported: 12/26/2007

Client Sample ID: SG-5
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 10:20:00 AM

Lab Sample ID: 0712077-002
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/19/2007	1.99	1	2.0	ND	µg/m³	R14846
1,1,1,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,1-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1,2,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,2-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2,4-Trichlorobenzene	TO-15	12/19/2007	3.56	1	3.6	ND	µg/m³	R14846
1,2,4-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/19/2007	3.84	1	3.8	ND	µg/m³	R14846
1,2-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,2-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2-Dichloropropane	TO-15	12/19/2007	2.31	1	2.3	ND	µg/m³	R14846
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/19/2007	3.13	1	3.1	ND	µg/m³	R14846
1,3,5-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
1,3-Butadiene	TO-15	12/19/2007	1.11	1	1.1	ND	µg/m³	R14846
1,3-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dioxane	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
2-Butanone (MEK)	TO-15	12/19/2007	1.48	1	1.5	72	µg/m³	R14846
2-Hexanone	TO-15	12/19/2007	2.05	1	2.0	ND	µg/m³	R14846
4-Ethyl Toluene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
4-Methyl-2-Pentanone (MIBK)	TO-15	12/19/2007	2.05	1	2.0	ND	µg/m³	R14846
Acetone	TO-15	12/19/2007	9.52	100	950	12000	µg/m³	R14846
Benzene	TO-15	12/19/2007	1.6	1	1.6	25	µg/m³	R14846
Benzyl Chloride	TO-15	12/19/2007	2.88	1	2.9	ND	µg/m³	R14846
Bromodichloromethane	TO-15	12/19/2007	3.35	1	3.4	ND	µg/m³	R14846
Bromoform	TO-15	12/19/2007	5.17	1	5.2	ND	µg/m³	R14846
Bromomethane	TO-15	12/19/2007	1.94	1	1.9	ND	µg/m³	R14846
Carbon Disulfide	TO-15	12/19/2007	1.56	1	1.6	ND	µg/m³	R14846
Carbon Tetrachloride	TO-15	12/19/2007	3.15	1	3.2	ND	µg/m³	R14846
Chlorobenzene	TO-15	12/19/2007	2.3	1	2.3	ND	µg/m³	R14846
Chloroethane	TO-15	12/19/2007	1.32	1	1.3	ND	µg/m³	R14846
Chloroform	TO-15	12/19/2007	2.44	1	2.4	ND	µg/m³	R14846
Chloromethane	TO-15	12/19/2007	1.04	1	1.0	ND	µg/m³	R14846
cis-1,2-dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846
cis-1,3-Dichloropropene	TO-15	12/19/2007	2.27	1	2.3	ND	µg/m³	R14846
Dibromochloromethane	TO-15	12/19/2007	4.26	1	4.3	ND	µg/m³	R14846
Dichlorodifluoromethane	TO-15	12/19/2007	2.48	1	2.5	ND	µg/m³	R14846
Ethyl Acetate	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
Ethyl Benzene	TO-15	12/19/2007	1.67	1	1.7	120	µg/m³	R14846
Freon 113	TO-15	12/19/2007	3.83	1	3.8	ND	µg/m³	R14846
Hexachlorobutadiene	TO-15	12/19/2007	5.34	1	5.3	ND	µg/m³	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported: 12/26/2007

Client Sample ID: SG-5
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 10:20:00 AM

Lab Sample ID: 0712077-002
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/19/2007	3.52	1	3.5	ND	µg/m³	R14846
Isopropanol	TO-15	12/19/2007	16.4	1	16	ND	µg/m³	R14846
m,p-Xylene	TO-15	12/19/2007	2.05	1	2.0	460	µg/m³	R14846
Methylene Chloride	TO-15	12/19/2007	3.61	1	3.6	ND	µg/m³	R14846
MTBE	TO-15	12/19/2007	1.81	1	1.8	ND	µg/m³	R14846
Naphthalene	TO-15	12/19/2007	2.62	1	2.6	ND	µg/m³	R14846
o-xylene	TO-15	12/19/2007	2.17	1	2.2	130	µg/m³	R14846
Styrene	TO-15	12/19/2007	2.13	1	2.1	24	µg/m³	R14846
Tetrachloroethene	TO-15	12/19/2007	3.39	1	3.4	130	µg/m³	R14846
Tetrahydrofuran	TO-15	12/19/2007	1.48	1	1.5	ND	µg/m³	R14846
Toluene	TO-15	12/19/2007	1.89	100	190	12000	µg/m³	R14846
trans-1,2-Dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846
Trichloroethene	TO-15	12/19/2007	2.69	1	2.7	ND	µg/m³	R14846
Trichlorofluoromethane	TO-15	12/19/2007	2.48	1	2.5	3.6	µg/m³	R14846
Vinyl Acetate	TO-15	12/19/2007	1.76	1	1.8	ND	µg/m³	R14846
Vinyl Chloride	TO-15	12/19/2007	1.28	1	1.3	ND	µg/m³	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/19/2007	0	100	50-150	88.6	%REC	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/19/2007	0	1	50-150	104	%REC	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported: 12/26/2007

Client Sample ID: SG-9 @ 8'
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 11:02:00 AM

Lab Sample ID: 0712077-003
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/19/2007	1.99	1	2.0	ND	µg/m³	R14846
1,1,1,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,1-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1,2,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,2-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2,4-Trichlorobenzene	TO-15	12/19/2007	3.56	1	3.6	ND	µg/m³	R14846
1,2,4-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/19/2007	3.84	1	3.8	ND	µg/m³	R14846
1,2-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,2-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2-Dichloropropane	TO-15	12/19/2007	2.31	1	2.3	ND	µg/m³	R14846
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/19/2007	3.13	1	3.1	ND	µg/m³	R14846
1,3,5-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
1,3-Butadiene	TO-15	12/19/2007	1.11	1	1.1	ND	µg/m³	R14846
1,3-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dioxane	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
2-Butanone (MEK)	TO-15	12/19/2007	1.48	1	1.5	13	µg/m³	R14846
2-Hexanone	TO-15	12/19/2007	2.05	1	2.0	3.7	µg/m³	R14846
4-Ethyl Toluene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
4-Methyl-2-Pentanone (MIBK)	TO-15	12/19/2007	2.05	1	2.0	ND	µg/m³	R14846
Acetone	TO-15	12/19/2007	9.52	1	9.5	58	µg/m³	R14846
Benzene	TO-15	12/19/2007	1.6	1	1.6	14	µg/m³	R14846
Benzyl Chloride	TO-15	12/19/2007	2.88	1	2.9	ND	µg/m³	R14846
Bromodichloromethane	TO-15	12/19/2007	3.35	1	3.4	ND	µg/m³	R14846
Bromoform	TO-15	12/19/2007	5.17	1	5.2	ND	µg/m³	R14846
Bromomethane	TO-15	12/19/2007	1.94	1	1.9	ND	µg/m³	R14846
Carbon Disulfide	TO-15	12/19/2007	1.56	1	1.6	2.3	µg/m³	R14846
Carbon Tetrachloride	TO-15	12/19/2007	3.15	1	3.2	ND	µg/m³	R14846
Chlorobenzene	TO-15	12/19/2007	2.3	1	2.3	ND	µg/m³	R14846
Chloroethane	TO-15	12/19/2007	1.32	1	1.3	ND	µg/m³	R14846
Chloroform	TO-15	12/19/2007	2.44	1	2.4	ND	µg/m³	R14846
Chloromethane	TO-15	12/19/2007	1.04	1	1.0	ND	µg/m³	R14846
cis-1,2-dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846
cis-1,3-Dichloropropene	TO-15	12/19/2007	2.27	1	2.3	ND	µg/m³	R14846
Dibromochloromethane	TO-15	12/19/2007	4.26	1	4.3	ND	µg/m³	R14846
Dichlorodifluoromethane	TO-15	12/19/2007	2.48	1	2.5	ND	µg/m³	R14846
Ethyl Acetate	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
Ethyl Benzene	TO-15	12/19/2007	1.67	1	1.7	ND	µg/m³	R14846
Freon 113	TO-15	12/19/2007	3.83	1	3.8	ND	µg/m³	R14846
Hexachlorobutadiene	TO-15	12/19/2007	5.34	1	5.3	ND	µg/m³	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported: 12/26/2007

Client Sample ID: SG-9 @ 8'
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 11:02:00 AM

Lab Sample ID: 0712077-003
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/19/2007	3.52	1	3.5	ND	µg/m³	R14846
Isopropanol	TO-15	12/19/2007	16.4	1	16	ND	µg/m³	R14846
m,p-Xylene	TO-15	12/19/2007	2.05	1	2.0	7.9	µg/m³	R14846
Methylene Chloride	TO-15	12/19/2007	3.61	1	3.6	ND	µg/m³	R14846
MTBE	TO-15	12/19/2007	1.81	1	1.8	ND	µg/m³	R14846
Naphthalene	TO-15	12/19/2007	2.62	1	2.6	ND	µg/m³	R14846
o-xylene	TO-15	12/19/2007	2.17	1	2.2	2.6	µg/m³	R14846
Styrene	TO-15	12/19/2007	2.13	1	2.1	ND	µg/m³	R14846
Tetrachloroethene	TO-15	12/19/2007	3.39	100	340	40000	µg/m³	R14846
Tetrahydrofuran	TO-15	12/19/2007	1.48	1	1.5	ND	µg/m³	R14846
Toluene	TO-15	12/19/2007	1.89	1	1.9	12	µg/m³	R14846
trans-1,2-Dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846
Trichloroethene	TO-15	12/19/2007	2.69	1	2.7	17	µg/m³	R14846
Trichlorofluoromethane	TO-15	12/19/2007	2.48	1	2.5	220	µg/m³	R14846
Vinyl Acetate	TO-15	12/19/2007	1.76	1	1.8	ND	µg/m³	R14846
Vinyl Chloride	TO-15	12/19/2007	1.28	1	1.3	ND	µg/m³	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/19/2007	0	100	50-150	90.0	%REC	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/19/2007	0	1	50-150	91.2	%REC	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported: 12/26/2007

Client Sample ID: SG-8
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 11:15:00 AM

Lab Sample ID: 0712077-004
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/19/2007	1.99	1	2.0	ND	µg/m³	R14846
1,1,1,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,1-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1,2,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,2-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2,4-Trichlorobenzene	TO-15	12/19/2007	3.56	1	3.6	ND	µg/m³	R14846
1,2,4-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/19/2007	3.84	1	3.8	ND	µg/m³	R14846
1,2-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,2-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2-Dichloropropane	TO-15	12/19/2007	2.31	1	2.3	ND	µg/m³	R14846
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/19/2007	3.13	1	3.1	ND	µg/m³	R14846
1,3,5-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
1,3-Butadiene	TO-15	12/19/2007	1.11	1	1.1	ND	µg/m³	R14846
1,3-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dioxane	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
2-Butanone (MEK)	TO-15	12/19/2007	1.48	1	1.5	11	µg/m³	R14846
2-Hexanone	TO-15	12/19/2007	2.05	1	2.0	2.9	µg/m³	R14846
4-Ethyl Toluene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
4-Methyl-2-Pentanone (MIBK)	TO-15	12/19/2007	2.05	1	2.0	ND	µg/m³	R14846
Acetone	TO-15	12/19/2007	9.52	1	9.5	52	µg/m³	R14846
Benzene	TO-15	12/19/2007	1.6	1	1.6	19	µg/m³	R14846
Benzyl Chloride	TO-15	12/19/2007	2.88	1	2.9	ND	µg/m³	R14846
Bromodichloromethane	TO-15	12/19/2007	3.35	1	3.4	ND	µg/m³	R14846
Bromoform	TO-15	12/19/2007	5.17	1	5.2	ND	µg/m³	R14846
Bromomethane	TO-15	12/19/2007	1.94	1	1.9	ND	µg/m³	R14846
Carbon Disulfide	TO-15	12/19/2007	1.56	1	1.6	ND	µg/m³	R14846
Carbon Tetrachloride	TO-15	12/19/2007	3.15	1	3.2	ND	µg/m³	R14846
Chlorobenzene	TO-15	12/19/2007	2.3	1	2.3	ND	µg/m³	R14846
Chloroethane	TO-15	12/19/2007	1.32	1	1.3	ND	µg/m³	R14846
Chloroform	TO-15	12/19/2007	2.44	1	2.4	ND	µg/m³	R14846
Chloromethane	TO-15	12/19/2007	1.04	1	1.0	ND	µg/m³	R14846
cis-1,2-dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846
cis-1,3-Dichloropropene	TO-15	12/19/2007	2.27	1	2.3	ND	µg/m³	R14846
Dibromochloromethane	TO-15	12/19/2007	4.26	1	4.3	ND	µg/m³	R14846
Dichlorodifluoromethane	TO-15	12/19/2007	2.48	1	2.5	ND	µg/m³	R14846
Ethyl Acetate	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
Ethyl Benzene	TO-15	12/19/2007	1.67	1	1.7	4.2	µg/m³	R14846
Freon 113	TO-15	12/19/2007	3.83	1	3.8	ND	µg/m³	R14846
Hexachlorobutadiene	TO-15	12/19/2007	5.34	1	5.3	ND	µg/m³	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported: 12/26/2007

Client Sample ID: SG-8
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 11:15:00 AM

Lab Sample ID: 0712077-004
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/19/2007	3.52	1	3.5	ND	µg/m³	R14846
Isopropanol	TO-15	12/19/2007	16.4	1	16	17	µg/m³	R14846
m,p-Xylene	TO-15	12/19/2007	2.05	1	2.0	12	µg/m³	R14846
Methylene Chloride	TO-15	12/19/2007	3.61	1	3.6	ND	µg/m³	R14846
MTBE	TO-15	12/19/2007	1.81	1	1.8	ND	µg/m³	R14846
Naphthalene	TO-15	12/19/2007	2.62	1	2.6	ND	µg/m³	R14846
o-xylene	TO-15	12/19/2007	2.17	1	2.2	3.5	µg/m³	R14846
Styrene	TO-15	12/19/2007	2.13	1	2.1	ND	µg/m³	R14846
Tetrachloroethene	TO-15	12/19/2007	3.39	1	3.4	45	µg/m³	R14846
Tetrahydrofuran	TO-15	12/19/2007	1.48	1	1.5	ND	µg/m³	R14846
Toluene	TO-15	12/19/2007	1.89	1	1.9	18	µg/m³	R14846
trans-1,2-Dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846
Trichloroethene	TO-15	12/19/2007	2.69	1	2.7	ND	µg/m³	R14846
Trichlorofluoromethane	TO-15	12/19/2007	2.48	1	2.5	17	µg/m³	R14846
Vinyl Acetate	TO-15	12/19/2007	1.76	1	1.8	ND	µg/m³	R14846
Vinyl Chloride	TO-15	12/19/2007	1.28	1	1.3	ND	µg/m³	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/19/2007	0	1	50-150	92.8	%REC	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Definitions, legends and Notes

Note	Description
ug/kg	Microgram per kilogram (ppb, part per billion).
ug/L	Microgram per liter (ppb, part per billion).
mg/kg	Milligram per kilogram (ppm, part per million).
mg/L	Milligram per liter (ppm, part per million).
LCS/LCSD	Laboratory control sample/laboratory control sample duplicate.
MDL	Method detection limit.
MRL	Modified reporting limit. When sample is subject to dilution, reporting limit times dilution factor yields MRL.
MS/MSD	Matrix spike/matrix spike duplicate.
N/A	Not applicable.
ND	Not detected at or above detection limit.
NR	Not reported.
QC	Quality Control.
RL	Reporting limit.
% RPD	Percent relative difference.
a	pH was measured immediately upon the receipt of the sample, but it was still done outside the holding time.
sub	Analyzed by subcontracting laboratory, Lab Certificate #

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

CLIENT: Environmental Investigation Services
Work Order: 0712077
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID **MB** SampType: **MBLK** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/19/2007** RunNo: **14846**
Client ID: **ZZZZZ** Batch ID: **R14846** TestNo: **TO-15** Analysis Date: **12/19/2007** SeqNo: **214422**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1 - Dichloroethene	ND	0.50									
1,1,1,2-Tetrachloroethane	ND	0.50									
1,1,1-Trichloroethane	ND	0.50									
1,1,2,2-Tetrachloroethane	ND	0.50									
1,1,2-Trichloroethane	ND	0.50									
1,1-Dichloroethane	ND	0.50									
1,2,4-Trichlorobenzene	ND	0.50									
1,2,4-Trimethylbenzene	ND	0.50									
1,2-Dibromoethane(Ethylene dibromide	ND	0.50									
1,2-Dichlorobenzene	ND	0.50									
1,2-Dichloroethane	ND	0.50									
1,2-Dichloropropane	ND	0.50									
1,2-dichlorotetrafluoroethane(F114)	ND	0.50									
1,3,5-Trimethylbenzene	ND	0.50									
1,3-Butadiene	ND	0.50									
1,3-Dichlorobenzene	ND	0.50									
1,4-Dichlorobenzene	ND	0.50									
1,4-Dioxane	ND	0.50									
2-Butanone (MEK)	ND	0.50									
2-Hexanone	ND	0.50									
4-Ethyl Toluene	ND	0.50									
4-Methyl-2-Pentanone (MIBK)	ND	0.50									
Acetone	ND	4.0									
Benzene	ND	0.50									
Benzyl Chloride	ND	0.50									
Bromodichloromethane	ND	0.50									
Bromoform	ND	0.50									
Bromomethane	ND	0.50									
Carbon Disulfide	ND	0.50									
Carbon Tetrachloride	ND	0.50									

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712077
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID **MB**	SampType: **MBLK**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **12/19/2007**	RunNo: **14846**
Client ID: **ZZZZZ**	Batch ID: **R14846**	TestNo: **TO-15**		Analysis Date: **12/19/2007**	SeqNo: **214422**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chlorobenzene	ND	0.50									
Chloroethane	ND	0.50									
Chloroform	ND	0.50									
Chloromethane	ND	0.50									
cis-1,2-dichloroethene	ND	0.50									
cis-1,3-Dichloropropene	ND	0.50									
Dibromochloromethane	ND	0.50									
Dichlorodifluoromethane	ND	0.50									
Ethyl Acetate	ND	0.50									
Ethyl Benzene	ND	0.50									
Freon 113	ND	0.50									
Hexachlorobutadiene	ND	0.50									
Hexane	ND	1.0									
Isopropanol	ND	4.0									
m,p-Xylene	ND	0.50									
Methylene Chloride	ND	1.0									
MTBE	ND	0.50									
Naphthalene	ND	5.0									
o-xylene	ND	0.50									
Styrene	ND	0.50									
Tetrachloroethene	ND	0.50									
Tetrahydrofuran	ND	0.50									
Toluene	ND	0.50									
trans-1,2-Dichloroethene	ND	0.50									
Trichloroethene	ND	0.50									
Trichlorofluoromethane	ND	0.50									
Vinyl Acetate	ND	0.50									
Vinyl Chloride	ND	0.50									
Surr: 4-Bromofluorobenzene	19.85	0	20	0	99.2	65	135				

Qualifiers:

E	Value above quantitation range	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712077
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID **LCS**	SampType: **LCS**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **12/18/2007**	RunNo: **14846**
Client ID: **ZZZZZ**	Batch ID: **R14846**	TestNo: **TO-15**		Analysis Date: **12/18/2007**	SeqNo: **214423**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1 - Dichloroethene	20.58	0.50	20	0	103	65	135				
1,1,1,2-Tetrachloroethane	21.35	0.50	20	0	107	65	135				
1,1,1-Trichloroethane	19.38	0.50	20	0	96.9	65	135				
1,1,2,2-Tetrachloroethane	20.78	0.50	20	0	104	65	135				
1,1,2-Trichloroethane	21.57	0.50	20	0	108	65	135				
1,1-Dichloroethane	20.30	0.50	20	0	102	65	135				
1,2,4-Trichlorobenzene	18.11	0.50	20	0	90.6	65	135				
1,2,4-Trimethylbenzene	19.74	0.50	20	0	98.7	65	135				
1,2-Dibromoethane(Ethylene dibromide	20.22	0.50	20	0	101	65	135				
1,2-Dichlorobenzene	19.39	0.50	20	0	97.0	65	135				
1,2-Dichloroethane	21.70	0.50	20	0	108	65	135				
1,2-Dichloropropane	21.37	0.50	20	0	107	65	135				
1,2-dichlorotetrafluoroethane(F114)	15.30	0.50	20	0	76.5	65	135				
1,3,5-Trimethylbenzene	20.58	0.50	20	0	103	65	135				
1,3-Butadiene	20.64	0.50	20	0	103	65	135				
1,3-Dichlorobenzene	19.27	0.50	20	0	96.4	65	135				
1,4-Dichlorobenzene	19.27	0.50	20	0	96.4	65	135				
1,4-Dioxane	22.38	0.50	20	0	112	65	135				
2-Butanone (MEK)	21.93	0.50	20	0	110	65	135				
2-Hexanone	22.95	0.50	20	0	115	65	135				
4-Ethyl Toluene	20.90	0.50	20	0	104	65	135				
4-Methyl-2-Pentanone (MIBK)	22.26	0.50	20	0	111	65	135				
Acetone	23.19	4.0	20	0	116	65	135				
Benzene	20.12	0.50	20	0	101	65	135				
Benzyl Chloride	19.92	0.50	20	0	99.6	65	135				
Bromodichloromethane	21.52	0.50	20	0	108	65	135				
Bromoform	21.61	0.50	20	0	108	65	135				
Bromomethane	19.61	0.50	20	0	98.0	65	135				
Carbon Disulfide	20.97	0.50	20	0	105	65	135				
Carbon Tetrachloride	18.99	0.50	20	0	95.0	65	135				
Chlorobenzene	21.64	0.50	20	0	108	65	135				

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712077
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID **LCS**	SampType: **LCS**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **12/18/2007**	RunNo: **14846**
Client ID: **ZZZZZ**	Batch ID: **R14846**	TestNo: **TO-15**		Analysis Date: **12/18/2007**	SeqNo: **214423**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloroethane	19.54	0.50	20	0	97.7	65	135				
Chloroform	19.35	0.50	20	0	96.8	65	135				
Chloromethane	21.09	0.50	20	0	105	65	135				
cis-1,2-dichloroethene	19.46	0.50	20	0	97.3	65	135				
cis-1,3-Dichloropropene	20.96	0.50	20	0	105	65	135				
Dibromochloromethane	21.27	0.50	20	0	106	65	135				
Ethyl Acetate	21.61	0.50	20	0	108	65	135				
Ethyl Benzene	20.20	0.50	20	0	101	65	135				
Freon 113	19.28	0.50	20	0	96.4	65	135				
Hexachlorobutadiene	16.93	0.50	20	0	84.6	65	135				
Hexane	20.21	1.0	20	0	101	65	135				
Isopropanol	21.59	4.0	20	0	108	65	135				
m,p-Xylene	41.21	0.50	40	0	103	65	135				
Methylene Chloride	21.19	1.0	20	0	106	65	135				
MTBE	20.51	0.50	20	0	103	65	135				
Naphthalene	17.83	5.0	20	0	89.2	65	135				
o-xylene	20.88	0.50	20	0	104	65	135				
Styrene	20.52	0.50	20	0	103	65	135				
Tetrachloroethene	20.79	0.50	20	0	104	65	135				
Toluene	20.78	0.50	20	0	104	65	135				
trans-1,2-Dichloroethene	19.65	0.50	20	0	98.2	65	135				
Trichloroethene	20.84	0.50	20	0	104	65	135				
Trichlorofluoromethane	20.91	0.50	20	0	105	65	135				
Vinyl Acetate	21.90	0.50	20	0	110	65	135				
Vinyl Chloride	20.14	0.50	20	0	101	65	135				
Surr: 4-Bromofluorobenzene	19.36	0	20	0	96.8	65	135				

Sample ID **LCSD**	SampType: **LCSD**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **12/19/2007**	RunNo: **14846**
Client ID: **ZZZZZ**	Batch ID: **R14846**	TestNo: **TO-15**		Analysis Date: **12/19/2007**	SeqNo: **214424**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

E	Value above quantitation range	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712077
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID **LCSD**	SampType: **LCSD**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **12/19/2007**	RunNo: **14846**
Client ID: **ZZZZZ**	Batch ID: **R14846**	TestNo: **TO-15**		Analysis Date: **12/19/2007**	SeqNo: **214424**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1 - Dichloroethene	20.00	0.50	20	0	100	65	135	20.58	2.86	30	
1,1,1,2-Tetrachloroethane	21.15	0.50	20	0	106	65	135	21.35	0.941	30	
1,1,1-Trichloroethane	20.05	0.50	20	0	100	65	135	19.38	3.40	30	
1,1,2,2-Tetrachloroethane	20.46	0.50	20	0	102	65	135	20.78	1.55	30	
1,1,2-Trichloroethane	21.21	0.50	20	0	106	65	135	21.57	1.68	30	
1,1-Dichloroethane	19.59	0.50	20	0	98.0	65	135	20.3	3.56	30	
1,2,4-Trichlorobenzene	17.85	0.50	20	0	89.2	65	135	18.11	1.45	30	
1,2,4-Trimethylbenzene	20.17	0.50	20	0	101	65	135	19.74	2.15	30	
1,2-Dibromoethane(Ethylene dibromide	20.57	0.50	20	0	103	65	135	20.22	1.72	30	
1,2-Dichlorobenzene	19.03	0.50	20	0	95.2	65	135	19.39	1.87	30	
1,2-Dichloroethane	22.23	0.50	20	0	111	65	135	21.7	2.41	30	
1,2-Dichloropropane	20.18	0.50	20	0	101	65	135	21.37	5.73	30	
1,2-dichlorotetrafluoroethane(F114)	17.03	0.50	20	0	85.2	65	135	15.3	10.7	30	
1,3,5-Trimethylbenzene	20.58	0.50	20	0	103	65	135	20.58	0	30	
1,3-Butadiene	19.75	0.50	20	0	98.8	65	135	20.64	4.41	30	
1,3-Dichlorobenzene	19.63	0.50	20	0	98.2	65	135	19.27	1.85	30	
1,4-Dichlorobenzene	19.63	0.50	20	0	98.2	65	135	19.27	1.85	30	
1,4-Dioxane	23.22	0.50	20	0	116	65	135	22.38	3.68	30	
2-Butanone (MEK)	20.95	0.50	20	0	105	65	135	21.93	4.57	30	
2-Hexanone	21.77	0.50	20	0	109	65	135	22.95	5.28	30	
4-Ethyl Toluene	20.60	0.50	20	0	103	65	135	20.9	1.45	30	
4-Methyl-2-Pentanone (MIBK)	22.71	0.50	20	0	114	65	135	22.26	2.00	30	
Acetone	21.93	4.0	20	0	110	65	135	23.19	5.59	30	
Benzene	19.58	0.50	20	0	97.9	65	135	20.12	2.72	30	
Benzyl Chloride	20.09	0.50	20	0	100	65	135	19.92	0.850	30	
Bromodichloromethane	22.38	0.50	20	0	112	65	135	21.52	3.92	30	
Bromoform	21.70	0.50	20	0	108	65	135	21.61	0.416	30	
Bromomethane	19.43	0.50	20	0	97.2	65	135	19.61	0.922	30	
Carbon Disulfide	19.87	0.50	20	0	99.4	65	135	20.97	5.39	30	
Carbon Tetrachloride	19.66	0.50	20	0	98.3	65	135	18.99	3.47	30	
Chlorobenzene	21.10	0.50	20	0	106	65	135	21.64	2.53	30	

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712077
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID **LCSD**	SampType: **LCSD**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **12/19/2007**	RunNo: **14846**
Client ID: **ZZZZZ**	Batch ID: **R14846**	TestNo: **TO-15**		Analysis Date: **12/19/2007**	SeqNo: **214424**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloroethane	15.37	0.50	20	0	76.8	65	135	19.54	23.9	30	
Chloroform	19.39	0.50	20	0	97.0	65	135	19.35	0.207	30	
Chloromethane	22.67	0.50	20	0	113	65	135	21.09	7.22	30	
cis-1,2-dichloroethene	19.71	0.50	20	0	98.6	65	135	19.46	1.28	30	
cis-1,3-Dichloropropene	22.11	0.50	20	0	111	65	135	20.96	5.34	30	
Dibromochloromethane	21.00	0.50	20	0	105	65	135	21.27	1.28	30	
Ethyl Acetate	20.75	0.50	20	0	104	65	135	21.61	4.06	30	
Ethyl Benzene	20.35	0.50	20	0	102	65	135	20.2	0.740	30	
Freon 113	20.15	0.50	20	0	101	65	135	19.28	4.41	30	
Hexachlorobutadiene	17.06	0.50	20	0	85.3	65	135	16.93	0.765	30	
Hexane	19.98	1.0	20	0	99.9	65	135	20.21	1.14	30	
Isopropanol	22.18	4.0	20	0	111	65	135	21.59	2.70	30	
m,p-Xylene	39.86	0.50	40	0	99.7	65	135	41.21	3.33	30	
Methylene Chloride	19.80	1.0	20	0	99.0	65	135	21.19	6.78	30	
MTBE	20.32	0.50	20	0	102	65	135	20.51	0.931	30	
Naphthalene	17.94	5.0	20	0	89.7	65	135	17.83	0.615	30	
o-xylene	19.86	0.50	20	0	99.3	65	135	20.88	5.01	30	
Styrene	20.46	0.50	20	0	102	65	135	20.52	0.293	30	
Tetrachloroethene	20.57	0.50	20	0	103	65	135	20.79	1.06	30	
Toluene	22.21	0.50	20	0	111	65	135	20.78	6.65	30	
trans-1,2-Dichloroethene	19.12	0.50	20	0	95.6	65	135	19.65	2.73	30	
Trichloroethene	21.18	0.50	20	0	106	65	135	20.84	1.62	30	
Trichlorofluoromethane	20.11	0.50	20	0	101	65	135	20.91	3.90	30	
Vinyl Acetate	20.96	0.50	20	0	105	65	135	21.9	4.39	30	
Vinyl Chloride	19.16	0.50	20	0	95.8	65	135	20.14	4.99	30	
Surr: 4-Bromofluorobenzene	19.80	0	20	0	99.0	65	135	0	0	30	

Qualifiers:

E	Value above quantitation range	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery limits

Torrent LABORATORY, INC.

483 Sinclair Frontage Road
Milpitas, CA 95035
Phone: 408.263.5258
FAX: 408.263.8293
www.torrentlab.com

CHAIN OF CUSTODY

• NOTE: SHADED AREAS ARE FOR TORRENT LAB USE ONLY •

LAB WORK ORDER NO: 0712077

Company Name: Environmental Investigation Services	Location of Sampling: 461 McGraw Ave. Livermore, CA
Address: 170 Knowles Drive Suite 212	Purpose:
City: Los Gatos State: CA Zip Code: 95032	Special Instructions / Comments:
Telephone: 408 871 1470 FAX: 408 871 5520	
REPORT TO: Peter Littmann SAMPLER: Paninder + Em	P.O. #: 717-3F EMAIL: plittman@eis1.net

TURNAROUND TIME:
☐ 10 Work Days ☐ 3 Work Days ☐ Noon - Nxt Day
☐ 7 Work Days ☐ 2 Work Days ☐ 2 - 8 Hours
☒ 5 Work Days ☐ 1 Work Day ☐ Other

SAMPLE TYPE:
☐ Storm Water ☒ Air
☐ Waste Water ☐ Other
☐ Ground Water
☐ Soil

REPORT FORMAT:
☐ QC Level IV
☒ EDF
☒ Excel / EDD

ANALYSIS REQUESTED

LAB ID	CLIENT'S SAMPLE I.D.	DATE / TIME SAMPLED	MATRIX	# OF CONT	CONT TYPE	EPA 8260B Full List / EPA 8260B 8010 List	THP gas / BTEX / Oxygenates / MTBE	THP Diesel / Motor Oil / Si-Gel	Pesticide - 8081	PCB - 8082	Metals / CAM - 17 / LUFT 5 / 7 Metals	8270 Full List / PAHs Only	TO-15		REMARKS
	~~SG-7~~ EAS		~~Gas~~	~~1~~	~~Summa~~	X									
01A	SG-6	10:10 12/14/07	Gas	1	Summa	X							X		
02A	SG-5	10:20 12/14/07	"	1	"	X							X		
03A	SG-9@8'	11:02 12/14/07	"	1	"	X							X		
04A	SG-8	11:15 12/14/07	"	1	"	X							X		

	Relinquished By:	Print:	Date:	Time:	Received By:	Print:	Date:	Time:
1		PANINDHAR	12/14	12:45			12/14	1:15
2		Allen Littmann	12/14	1:56	Raj Kaur		12/14/07	1:55 p.m

Were Samples Received in Good Condition? ☐ Yes ☐ NO Samples on Ice? ☐ Yes ☐ NO Method of Shipment _____ Sample seals intact? ☐ Yes ☐ NO ☐ N/A

NOTE: Samples are discarded by the laboratory 30 days from date of receipt unless other arrangements are made.

Page ____ of ____

Log In By: NPD Date: 12/17 Log In Reviewed By: _____ Date: _____

TORRENT LAB

Torrent
LABORATORY, INC.

December 27, 2007

Peter Littman
Environmental Investigation Services
170 Knowles Drive,Suite 212
Los Gatos, CA 95032

TEL: (408) 871-1470
FAX (408) 871-1520

RE: 717-3F /461 McGraw Ave, Livermore CA

Order No.: 0712078

Dear Peter Littman:

Torrent Laboratory, Inc. received 10 samples on 12/17/2007 for the analyses presented in the following report.

All data for associated QC met EPA or laboratory specification(s) except where noted in the case narrative.

Torrent Laboratory, Inc, is certified by the State of California, ELAP #1991. If you have any questions regarding these tests results, please feel free to contact the Project Management Team at (408)263-5258;ext: 204.

Sincerely,

Laboratory Director

12/27/07
Date

TORRENT LABORATORY, INC.

483 Sinclair Frontage Road * Milpitas, CA * Phone: (408) 2635258 * Fax: (408) 263-8293
Visit us ar www.torrentlab.com email: analysis@torrentlab.com

Report Prepaired For: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Summary Report

SG-9@4'A **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712078-001A**

Parameter	Preped	Analyzed	Result	RL	Unit
2-Butanone (MEK)	12/19/2007	12/19/2007	6.1	1.5	µg/m³
Acetone	12/19/2007	12/19/2007	150	9.5	µg/m³
Benzene	12/19/2007	12/19/2007	1.9	1.6	µg/m³
Carbon Disulfide	12/19/2007	12/19/2007	5.2	1.6	µg/m³
Isopropanol	12/20/2007	12/20/2007	4300	330	µg/m³
m,p-Xylene	12/19/2007	12/19/2007	15	2.0	µg/m³
o-xylene	12/19/2007	12/19/2007	3.8	2.2	µg/m³
Tetrachloroethene	12/20/2007	12/20/2007	3100	68	µg/m³
Toluene	12/19/2007	12/19/2007	6.9	1.9	µg/m³
Trichlorofluoromethane	12/19/2007	12/19/2007	58	2.5	µg/m³

SG-7B **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712078-002A**

Parameter	Preped	Analyzed	Result	RL	Unit
Acetone	12/19/2007	12/19/2007	140	9.5	µg/m³
Benzene	12/19/2007	12/19/2007	5.8	1.6	µg/m³
Carbon Disulfide	12/19/2007	12/19/2007	2.7	1.6	µg/m³
m,p-Xylene	12/19/2007	12/19/2007	10	2.0	µg/m³
o-xylene	12/19/2007	12/19/2007	2.5	2.2	µg/m³
Tetrachloroethene	12/19/2007	12/19/2007	73	3.4	µg/m³
Toluene	12/19/2007	12/19/2007	14	1.9	µg/m³
Trichlorofluoromethane	12/19/2007	12/19/2007	250	2.5	µg/m³

SG-22 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712078-003A**

Parameter	Preped	Analyzed	Result	RL	Unit
1,2,4-Trimethylbenzene	12/19/2007	12/19/2007	8.7	2.5	µg/m³
1,3,5-Trimethylbenzene	12/19/2007	12/19/2007	2.7	2.5	µg/m³
4-Ethyl Toluene	12/19/2007	12/19/2007	6.3	2.5	µg/m³
Acetone	12/19/2007	12/19/2007	86	9.5	µg/m³
Benzene	12/19/2007	12/19/2007	2.8	1.6	µg/m³
Carbon Disulfide	12/19/2007	12/19/2007	15	1.6	µg/m³
m,p-Xylene	12/19/2007	12/19/2007	12	2.0	µg/m³
o-xylene	12/19/2007	12/19/2007	3.8	2.2	µg/m³

TORRENT LABORATORY, INC.

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Report Prepaired For: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Summary Report

SG-22 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712078-003A**

Parameter	Preped	Analyzed	Result	RL	Unit
Tetrachloroethene	12/20/2007	12/20/2007	24000	3400	µg/m³
Toluene	12/19/2007	12/19/2007	9.4	1.9	µg/m³
Trichloroethene	12/19/2007	12/19/2007	12	2.7	µg/m³
Trichlorofluoromethane	12/19/2007	12/19/2007	500	2.5	µg/m³

SG-24 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712078-004A**

Parameter	Preped	Analyzed	Result	RL	Unit
1,2,4-Trimethylbenzene	12/19/2007	12/19/2007	6.5	2.5	µg/m³
4-Ethyl Toluene	12/19/2007	12/19/2007	5.2	2.5	µg/m³
Acetone	12/19/2007	12/19/2007	55	9.5	µg/m³
Benzene	12/19/2007	12/19/2007	7.8	1.6	µg/m³
Carbon Disulfide	12/19/2007	12/19/2007	28	1.6	µg/m³
Hexane	12/19/2007	12/19/2007	56	3.5	µg/m³
m,p-Xylene	12/19/2007	12/19/2007	12	2.0	µg/m³
o-xylene	12/19/2007	12/19/2007	3.6	2.2	µg/m³
Tetrachloroethene	12/19/2007	12/19/2007	250	3.4	µg/m³
Toluene	12/19/2007	12/19/2007	28	1.9	µg/m³
Trichlorofluoromethane	12/19/2007	12/19/2007	270	2.5	µg/m³

SG-23 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712078-005A**

Parameter	Preped	Analyzed	Result	RL	Unit
2-Butanone (MEK)	12/20/2007	12/20/2007	6.8	1.5	µg/m³
Acetone	12/20/2007	12/20/2007	72	9.5	µg/m³
Benzene	12/20/2007	12/20/2007	3.3	1.6	µg/m³
Carbon Disulfide	12/20/2007	12/20/2007	8.0	1.6	µg/m³
m,p-Xylene	12/20/2007	12/20/2007	8.9	2.0	µg/m³
o-xylene	12/20/2007	12/20/2007	2.4	2.2	µg/m³
Tetrachloroethene	12/20/2007	12/20/2007	330	3.4	µg/m³
Toluene	12/20/2007	12/20/2007	12	1.9	µg/m³
Trichlorofluoromethane	12/20/2007	12/20/2007	350	2.5	µg/m³

TORRENT LABORATORY, INC.

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Report Prepaired For: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Summary Report

SG-17 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712078-006A**

Parameter	Preped	Analyzed	Result	RL	Unit
Acetone	12/20/2007	12/20/2007	36	9.5	µg/m³
Tetrachloroethene	12/20/2007	12/20/2007	120	3.4	µg/m³
Toluene	12/20/2007	12/20/2007	5.5	1.9	µg/m³
Trichlorofluoromethane	12/20/2007	12/20/2007	3.4	2.5	µg/m³

SG-16 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712078-007A**

Parameter	Preped	Analyzed	Result	RL	Unit
Acetone	12/20/2007	12/20/2007	83	9.5	µg/m³
Benzene	12/20/2007	12/20/2007	3.3	1.6	µg/m³
Carbon Disulfide	12/20/2007	12/20/2007	5.8	1.6	µg/m³
m,p-Xylene	12/20/2007	12/20/2007	8.4	2.0	µg/m³
o-xylene	12/20/2007	12/20/2007	2.3	2.2	µg/m³
Tetrachloroethene	12/20/2007	12/20/2007	110	3.4	µg/m³
Toluene	12/20/2007	12/20/2007	9.7	1.9	µg/m³
Trichlorofluoromethane	12/20/2007	12/20/2007	14	2.5	µg/m³

SG-19 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712078-008A**

Parameter	Preped	Analyzed	Result	RL	Unit
2-Butanone (MEK)	12/20/2007	12/20/2007	4.0	1.5	µg/m³
Acetone	12/20/2007	12/20/2007	87	9.5	µg/m³
Benzene	12/20/2007	12/20/2007	2.6	1.6	µg/m³
Carbon Disulfide	12/20/2007	12/20/2007	4.8	1.6	µg/m³
m,p-Xylene	12/20/2007	12/20/2007	8.3	2.0	µg/m³
Tetrachloroethene	12/20/2007	12/20/2007	59	3.4	µg/m³
Toluene	12/20/2007	12/20/2007	8.9	1.9	µg/m³
Trichlorofluoromethane	12/20/2007	12/20/2007	10	2.5	µg/m³

SG-14@4' **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712078-009A**

Parameter	Preped	Analyzed	Result	RL	Unit
2-Butanone (MEK)	12/21/2007	12/21/2007	160	4.4	µg/m³
Acetone	12/21/2007	12/21/2007	190	28	µg/m³
Carbon Disulfide	12/21/2007	12/21/2007	9.5	4.6	µg/m³

TORRENT LABORATORY, INC.

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Report Prepaired For: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Summary Report

SG-14@4' **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712078-009A**

Parameter	Preped	Analyzed	Result	RL	Unit
Chloroform	12/21/2007	12/21/2007	30	7.2	µg/m³
Hexane	12/21/2007	12/21/2007	37	10	µg/m³
m,p-Xylene	12/21/2007	12/21/2007	20	6.1	µg/m³
Methylene Chloride	12/21/2007	12/21/2007	140	11	µg/m³
Tetrachloroethene	12/21/2007	12/21/2007	1300	10	µg/m³
Toluene	12/21/2007	12/21/2007	15	5.6	µg/m³
Trichlorofluoromethane	12/21/2007	12/21/2007	23	7.3	µg/m³

SG-14@8'A **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712078-010A**

Parameter	Preped	Analyzed	Result	RL	Unit
2-Butanone (MEK)	12/20/2007	12/20/2007	220	5.4	µg/m³
Acetone	12/21/2007	12/21/2007	920	350	µg/m³
Benzene	12/20/2007	12/20/2007	49	5.9	µg/m³
Carbon Disulfide	12/20/2007	12/20/2007	73	5.7	µg/m³
Chloroform	12/20/2007	12/20/2007	220	8.9	µg/m³
Hexane	12/20/2007	12/20/2007	350	13	µg/m³
m,p-Xylene	12/20/2007	12/20/2007	43	7.5	µg/m³
o-xylene	12/20/2007	12/20/2007	13	7.9	µg/m³
Styrene	12/20/2007	12/20/2007	26	7.8	µg/m³
Tetrachloroethene	12/21/2007	12/21/2007	4400	120	µg/m³
Toluene	12/20/2007	12/20/2007	74	6.9	µg/m³

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Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-9@4'A
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 9:45:00 AM

Lab Sample ID: 0712078-001
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/19/2007	1.99	1	2.0	ND	µg/m³	R14846
1,1,1,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,1-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1,2,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,2-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2,4-Trichlorobenzene	TO-15	12/19/2007	3.56	1	3.6	ND	µg/m³	R14846
1,2,4-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/19/2007	3.84	1	3.8	ND	µg/m³	R14846
1,2-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,2-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2-Dichloropropane	TO-15	12/19/2007	2.31	1	2.3	ND	µg/m³	R14846
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/19/2007	3.13	1	3.1	ND	µg/m³	R14846
1,3,5-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
1,3-Butadiene	TO-15	12/19/2007	1.11	1	1.1	ND	µg/m³	R14846
1,3-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dioxane	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
2-Butanone (MEK)	TO-15	12/19/2007	1.48	1	1.5	6.1	µg/m³	R14846
2-Hexanone	TO-15	12/19/2007	2.05	1	2.0	ND	µg/m³	R14846
4-Ethyl Toluene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
4-Methyl-2-Pentanone (MIBK)	TO-15	12/19/2007	2.05	1	2.0	ND	µg/m³	R14846
Acetone	TO-15	12/19/2007	9.52	1	9.5	150	µg/m³	R14846
Benzene	TO-15	12/19/2007	1.6	1	1.6	1.9	µg/m³	R14846
Benzyl Chloride	TO-15	12/19/2007	2.88	1	2.9	ND	µg/m³	R14846
Bromodichloromethane	TO-15	12/19/2007	3.35	1	3.4	ND	µg/m³	R14846
Bromoform	TO-15	12/19/2007	5.17	1	5.2	ND	µg/m³	R14846
Bromomethane	TO-15	12/19/2007	1.94	1	1.9	ND	µg/m³	R14846
Carbon Disulfide	TO-15	12/19/2007	1.56	1	1.6	5.2	µg/m³	R14846
Carbon Tetrachloride	TO-15	12/19/2007	3.15	1	3.2	ND	µg/m³	R14846
Chlorobenzene	TO-15	12/19/2007	2.3	1	2.3	ND	µg/m³	R14846
Chloroethane	TO-15	12/19/2007	1.32	1	1.3	ND	µg/m³	R14846
Chloroform	TO-15	12/19/2007	2.44	1	2.4	ND	µg/m³	R14846
Chloromethane	TO-15	12/19/2007	1.04	1	1.0	ND	µg/m³	R14846
cis-1,2-dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-9@4'A
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 9:45:00 AM

Lab Sample ID: 0712078-001
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
cis-1,3-Dichloropropene	TO-15	12/19/2007	2.27	1	2.3	ND	µg/m³	R14846
Dibromochloromethane	TO-15	12/19/2007	4.26	1	4.3	ND	µg/m³	R14846
Dichlorodifluoromethane	TO-15	12/19/2007	2.48	1	2.5	ND	µg/m³	R14846
Ethyl Acetate	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
Ethyl Benzene	TO-15	12/19/2007	1.67	1	1.7	ND	µg/m³	R14846
Freon 113	TO-15	12/19/2007	3.83	1	3.8	ND	µg/m³	R14846
Hexachlorobutadiene	TO-15	12/19/2007	5.34	1	5.3	ND	µg/m³	R14846
Hexane	TO-15	12/19/2007	3.52	1	3.5	ND	µg/m³	R14846
Isopropanol	TO-15	12/20/2007	16.4	20	330	4300	µg/m³	R14857
m,p-Xylene	TO-15	12/19/2007	2.05	1	2.0	15	µg/m³	R14846
Methylene Chloride	TO-15	12/19/2007	3.61	1	3.6	ND	µg/m³	R14846
MTBE	TO-15	12/19/2007	1.81	1	1.8	ND	µg/m³	R14846
Naphthalene	TO-15	12/19/2007	2.62	1	2.6	ND	µg/m³	R14846
o-xylene	TO-15	12/19/2007	2.17	1	2.2	3.8	µg/m³	R14846
Styrene	TO-15	12/19/2007	2.13	1	2.1	ND	µg/m³	R14846
Tetrachloroethene	TO-15	12/20/2007	3.39	20	68	3100	µg/m³	R14857
Tetrahydrofuran	TO-15	12/19/2007	1.48	1	1.5	ND	µg/m³	R14846
Toluene	TO-15	12/19/2007	1.89	1	1.9	6.9	µg/m³	R14846
trans-1,2-Dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846
Trichloroethene	TO-15	12/19/2007	2.69	1	2.7	ND	µg/m³	R14846
Trichlorofluoromethane	TO-15	12/19/2007	2.48	1	2.5	58	µg/m³	R14846
Vinyl Acetate	TO-15	12/19/2007	1.76	1	1.8	ND	µg/m³	R14846
Vinyl Chloride	TO-15	12/19/2007	1.28	1	1.3	ND	µg/m³	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/19/2007	0	1	50-150	91.0	%REC	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/20/2007	0	20	65-135	98.1	%REC	R14857

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-7B
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 9:55:00 AM

Lab Sample ID: 0712078-002
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/19/2007	1.99	1	2.0	ND	µg/m³	R14846
1,1,1,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,1-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1,2,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,2-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2,4-Trichlorobenzene	TO-15	12/19/2007	3.56	1	3.6	ND	µg/m³	R14846
1,2,4-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/19/2007	3.84	1	3.8	ND	µg/m³	R14846
1,2-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,2-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2-Dichloropropane	TO-15	12/19/2007	2.31	1	2.3	ND	µg/m³	R14846
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/19/2007	3.13	1	3.1	ND	µg/m³	R14846
1,3,5-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
1,3-Butadiene	TO-15	12/19/2007	1.11	1	1.1	ND	µg/m³	R14846
1,3-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dioxane	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
2-Butanone (MEK)	TO-15	12/19/2007	1.48	1	1.5	ND	µg/m³	R14846
2-Hexanone	TO-15	12/19/2007	2.05	1	2.0	ND	µg/m³	R14846
4-Ethyl Toluene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
4-Methyl-2-Pentanone (MIBK)	TO-15	12/19/2007	2.05	1	2.0	ND	µg/m³	R14846
Acetone	TO-15	12/19/2007	9.52	1	9.5	140	µg/m³	R14846
Benzene	TO-15	12/19/2007	1.6	1	1.6	5.8	µg/m³	R14846
Benzyl Chloride	TO-15	12/19/2007	2.88	1	2.9	ND	µg/m³	R14846
Bromodichloromethane	TO-15	12/19/2007	3.35	1	3.4	ND	µg/m³	R14846
Bromoform	TO-15	12/19/2007	5.17	1	5.2	ND	µg/m³	R14846
Bromomethane	TO-15	12/19/2007	1.94	1	1.9	ND	µg/m³	R14846
Carbon Disulfide	TO-15	12/19/2007	1.56	1	1.6	2.7	µg/m³	R14846
Carbon Tetrachloride	TO-15	12/19/2007	3.15	1	3.2	ND	µg/m³	R14846
Chlorobenzene	TO-15	12/19/2007	2.3	1	2.3	ND	µg/m³	R14846
Chloroethane	TO-15	12/19/2007	1.32	1	1.3	ND	µg/m³	R14846
Chloroform	TO-15	12/19/2007	2.44	1	2.4	ND	µg/m³	R14846
Chloromethane	TO-15	12/19/2007	1.04	1	1.0	ND	µg/m³	R14846
cis-1,2-dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846
cis-1,3-Dichloropropene	TO-15	12/19/2007	2.27	1	2.3	ND	µg/m³	R14846
Dibromochloromethane	TO-15	12/19/2007	4.26	1	4.3	ND	µg/m³	R14846
Dichlorodifluoromethane	TO-15	12/19/2007	2.48	1	2.5	ND	µg/m³	R14846
Ethyl Acetate	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
Ethyl Benzene	TO-15	12/19/2007	1.67	1	1.7	ND	µg/m³	R14846
Freon 113	TO-15	12/19/2007	3.83	1	3.8	ND	µg/m³	R14846
Hexachlorobutadiene	TO-15	12/19/2007	5.34	1	5.3	ND	µg/m³	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-7B
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 9:55:00 AM

Lab Sample ID: 0712078-002
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/19/2007	3.52	1	3.5	ND	µg/m³	R14846
Isopropanol	TO-15	12/19/2007	16.4	1	16	ND	µg/m³	R14846
m,p-Xylene	TO-15	12/19/2007	2.05	1	2.0	10	µg/m³	R14846
Methylene Chloride	TO-15	12/19/2007	3.61	1	3.6	ND	µg/m³	R14846
MTBE	TO-15	12/19/2007	1.81	1	1.8	ND	µg/m³	R14846
Naphthalene	TO-15	12/19/2007	2.62	1	2.6	ND	µg/m³	R14846
o-xylene	TO-15	12/19/2007	2.17	1	2.2	2.5	µg/m³	R14846
Styrene	TO-15	12/19/2007	2.13	1	2.1	ND	µg/m³	R14846
Tetrachloroethene	TO-15	12/19/2007	3.39	1	3.4	73	µg/m³	R14846
Tetrahydrofuran	TO-15	12/19/2007	1.48	1	1.5	ND	µg/m³	R14846
Toluene	TO-15	12/19/2007	1.89	1	1.9	14	µg/m³	R14846
trans-1,2-Dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846
Trichloroethene	TO-15	12/19/2007	2.69	1	2.7	ND	µg/m³	R14846
Trichlorofluoromethane	TO-15	12/19/2007	2.48	1	2.5	250	µg/m³	R14846
Vinyl Acetate	TO-15	12/19/2007	1.76	1	1.8	ND	µg/m³	R14846
Vinyl Chloride	TO-15	12/19/2007	1.28	1	1.3	ND	µg/m³	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/19/2007	0	1	50-150	89.9	%REC	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-22
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 10:25:00 AM

Lab Sample ID: 0712078-003
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/19/2007	1.99	1	2.0	ND	µg/m³	R14846
1,1,1,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,1-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1,2,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,2-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2,4-Trichlorobenzene	TO-15	12/19/2007	3.56	1	3.6	ND	µg/m³	R14846
1,2,4-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	8.7	µg/m³	R14846
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/19/2007	3.84	1	3.8	ND	µg/m³	R14846
1,2-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,2-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2-Dichloropropane	TO-15	12/19/2007	2.31	1	2.3	ND	µg/m³	R14846
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/19/2007	3.13	1	3.1	ND	µg/m³	R14846
1,3,5-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	2.7	µg/m³	R14846
1,3-Butadiene	TO-15	12/19/2007	1.11	1	1.1	ND	µg/m³	R14846
1,3-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dioxane	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
2-Butanone (MEK)	TO-15	12/19/2007	1.48	1	1.5	ND	µg/m³	R14846
2-Hexanone	TO-15	12/19/2007	2.05	1	2.0	ND	µg/m³	R14846
4-Ethyl Toluene	TO-15	12/19/2007	2.46	1	2.5	6.3	µg/m³	R14846
4-Methyl-2-Pentanone (MIBK)	TO-15	12/19/2007	2.05	1	2.0	ND	µg/m³	R14846
Acetone	TO-15	12/19/2007	9.52	1	9.5	86	µg/m³	R14846
Benzene	TO-15	12/19/2007	1.6	1	1.6	2.8	µg/m³	R14846
Benzyl Chloride	TO-15	12/19/2007	2.88	1	2.9	ND	µg/m³	R14846
Bromodichloromethane	TO-15	12/19/2007	3.35	1	3.4	ND	µg/m³	R14846
Bromoform	TO-15	12/19/2007	5.17	1	5.2	ND	µg/m³	R14846
Bromomethane	TO-15	12/19/2007	1.94	1	1.9	ND	µg/m³	R14846
Carbon Disulfide	TO-15	12/19/2007	1.56	1	1.6	15	µg/m³	R14846
Carbon Tetrachloride	TO-15	12/19/2007	3.15	1	3.2	ND	µg/m³	R14846
Chlorobenzene	TO-15	12/19/2007	2.3	1	2.3	ND	µg/m³	R14846
Chloroethane	TO-15	12/19/2007	1.32	1	1.3	ND	µg/m³	R14846
Chloroform	TO-15	12/19/2007	2.44	1	2.4	ND	µg/m³	R14846
Chloromethane	TO-15	12/19/2007	1.04	1	1.0	ND	µg/m³	R14846
cis-1,2-dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846
cis-1,3-Dichloropropene	TO-15	12/19/2007	2.27	1	2.3	ND	µg/m³	R14846
Dibromochloromethane	TO-15	12/19/2007	4.26	1	4.3	ND	µg/m³	R14846
Dichlorodifluoromethane	TO-15	12/19/2007	2.48	1	2.5	ND	µg/m³	R14846
Ethyl Acetate	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
Ethyl Benzene	TO-15	12/19/2007	1.67	1	1.7	ND	µg/m³	R14846
Freon 113	TO-15	12/19/2007	3.83	1	3.8	ND	µg/m³	R14846
Hexachlorobutadiene	TO-15	12/19/2007	5.34	1	5.3	ND	µg/m³	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-22
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 10:25:00 AM

Lab Sample ID: 0712078-003
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/19/2007	3.52	1	3.5	ND	µg/m³	R14846
Isopropanol	TO-15	12/19/2007	16.4	1	16	ND	µg/m³	R14846
m,p-Xylene	TO-15	12/19/2007	2.05	1	2.0	12	µg/m³	R14846
Methylene Chloride	TO-15	12/19/2007	3.61	1	3.6	ND	µg/m³	R14846
MTBE	TO-15	12/19/2007	1.81	1	1.8	ND	µg/m³	R14846
Naphthalene	TO-15	12/19/2007	2.62	1	2.6	ND	µg/m³	R14846
o-xylene	TO-15	12/19/2007	2.17	1	2.2	3.8	µg/m³	R14846
Styrene	TO-15	12/19/2007	2.13	1	2.1	ND	µg/m³	R14846
Tetrachloroethene	TO-15	12/20/2007	3.39	1000	3400	24000	µg/m³	R14857
Tetrahydrofuran	TO-15	12/19/2007	1.48	1	1.5	ND	µg/m³	R14846
Toluene	TO-15	12/19/2007	1.89	1	1.9	9.4	µg/m³	R14846
trans-1,2-Dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846
Trichloroethene	TO-15	12/19/2007	2.69	1	2.7	12	µg/m³	R14846
Trichlorofluoromethane	TO-15	12/19/2007	2.48	1	2.5	500	µg/m³	R14846
Vinyl Acetate	TO-15	12/19/2007	1.76	1	1.8	ND	µg/m³	R14846
Vinyl Chloride	TO-15	12/19/2007	1.28	1	1.3	ND	µg/m³	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/20/2007	0	1000	65-135	97.1	%REC	R14857
Surr: 4-Bromofluorobenzene	TO-15	12/19/2007	0	1	50-150	92.8	%REC	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-24
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 10:31:00 AM

Lab Sample ID: 0712078-004
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/19/2007	1.99	1	2.0	ND	µg/m³	R14846
1,1,1,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,1-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1,2,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,2-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2,4-Trichlorobenzene	TO-15	12/19/2007	3.56	1	3.6	ND	µg/m³	R14846
1,2,4-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	6.5	µg/m³	R14846
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/19/2007	3.84	1	3.8	ND	µg/m³	R14846
1,2-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,2-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2-Dichloropropane	TO-15	12/19/2007	2.31	1	2.3	ND	µg/m³	R14846
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/19/2007	3.13	1	3.1	ND	µg/m³	R14846
1,3,5-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
1,3-Butadiene	TO-15	12/19/2007	1.11	1	1.1	ND	µg/m³	R14846
1,3-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dioxane	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
2-Butanone (MEK)	TO-15	12/19/2007	1.48	1	1.5	ND	µg/m³	R14846
2-Hexanone	TO-15	12/19/2007	2.05	1	2.0	ND	µg/m³	R14846
4-Ethyl Toluene	TO-15	12/19/2007	2.46	1	2.5	5.2	µg/m³	R14846
4-Methyl-2-Pentanone (MIBK)	TO-15	12/19/2007	2.05	1	2.0	ND	µg/m³	R14846
Acetone	TO-15	12/19/2007	9.52	1	9.5	55	µg/m³	R14846
Benzene	TO-15	12/19/2007	1.6	1	1.6	7.8	µg/m³	R14846
Benzyl Chloride	TO-15	12/19/2007	2.88	1	2.9	ND	µg/m³	R14846
Bromodichloromethane	TO-15	12/19/2007	3.35	1	3.4	ND	µg/m³	R14846
Bromoform	TO-15	12/19/2007	5.17	1	5.2	ND	µg/m³	R14846
Bromomethane	TO-15	12/19/2007	1.94	1	1.9	ND	µg/m³	R14846
Carbon Disulfide	TO-15	12/19/2007	1.56	1	1.6	28	µg/m³	R14846
Carbon Tetrachloride	TO-15	12/19/2007	3.15	1	3.2	ND	µg/m³	R14846
Chlorobenzene	TO-15	12/19/2007	2.3	1	2.3	ND	µg/m³	R14846
Chloroethane	TO-15	12/19/2007	1.32	1	1.3	ND	µg/m³	R14846
Chloroform	TO-15	12/19/2007	2.44	1	2.4	ND	µg/m³	R14846
Chloromethane	TO-15	12/19/2007	1.04	1	1.0	ND	µg/m³	R14846
cis-1,2-dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846
cis-1,3-Dichloropropene	TO-15	12/19/2007	2.27	1	2.3	ND	µg/m³	R14846
Dibromochloromethane	TO-15	12/19/2007	4.26	1	4.3	ND	µg/m³	R14846
Dichlorodifluoromethane	TO-15	12/19/2007	2.48	1	2.5	ND	µg/m³	R14846
Ethyl Acetate	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
Ethyl Benzene	TO-15	12/19/2007	1.67	1	1.7	ND	µg/m³	R14846
Freon 113	TO-15	12/19/2007	3.83	1	3.8	ND	µg/m³	R14846
Hexachlorobutadiene	TO-15	12/19/2007	5.34	1	5.3	ND	µg/m³	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-24
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 10:31:00 AM

Lab Sample ID: 0712078-004
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/19/2007	3.52	1	3.5	56	µg/m³	R14846
Isopropanol	TO-15	12/19/2007	16.4	1	16	ND	µg/m³	R14846
m,p-Xylene	TO-15	12/19/2007	2.05	1	2.0	12	µg/m³	R14846
Methylene Chloride	TO-15	12/19/2007	3.61	1	3.6	ND	µg/m³	R14846
MTBE	TO-15	12/19/2007	1.81	1	1.8	ND	µg/m³	R14846
Naphthalene	TO-15	12/19/2007	2.62	1	2.6	ND	µg/m³	R14846
o-xylene	TO-15	12/19/2007	2.17	1	2.2	3.6	µg/m³	R14846
Styrene	TO-15	12/19/2007	2.13	1	2.1	ND	µg/m³	R14846
Tetrachloroethene	TO-15	12/19/2007	3.39	1	3.4	250	µg/m³	R14846
Tetrahydrofuran	TO-15	12/19/2007	1.48	1	1.5	ND	µg/m³	R14846
Toluene	TO-15	12/19/2007	1.89	1	1.9	28	µg/m³	R14846
trans-1,2-Dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846
Trichloroethene	TO-15	12/19/2007	2.69	1	2.7	ND	µg/m³	R14846
Trichlorofluoromethane	TO-15	12/19/2007	2.48	1	2.5	270	µg/m³	R14846
Vinyl Acetate	TO-15	12/19/2007	1.76	1	1.8	ND	µg/m³	R14846
Vinyl Chloride	TO-15	12/19/2007	1.28	1	1.3	ND	µg/m³	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/19/2007	0	1	50-150	89.2	%REC	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-23
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 10:55:00 AM

Lab Sample ID: 0712078-005
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/20/2007	1.99	1	2.0	ND	µg/m³	R14846
1,1,1,2-Tetrachloroethane	TO-15	12/20/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,1-Trichloroethane	TO-15	12/20/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1,2,2-Tetrachloroethane	TO-15	12/20/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,2-Trichloroethane	TO-15	12/20/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1-Dichloroethane	TO-15	12/20/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2,4-Trichlorobenzene	TO-15	12/20/2007	3.56	1	3.6	ND	µg/m³	R14846
1,2,4-Trimethylbenzene	TO-15	12/20/2007	2.46	1	2.5	ND	µg/m³	R14846
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/20/2007	3.84	1	3.8	ND	µg/m³	R14846
1,2-Dichlorobenzene	TO-15	12/20/2007	3.01	1	3.0	ND	µg/m³	R14846
1,2-Dichloroethane	TO-15	12/20/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2-Dichloropropane	TO-15	12/20/2007	2.31	1	2.3	ND	µg/m³	R14846
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/20/2007	3.13	1	3.1	ND	µg/m³	R14846
1,3,5-Trimethylbenzene	TO-15	12/20/2007	2.46	1	2.5	ND	µg/m³	R14846
1,3-Butadiene	TO-15	12/20/2007	1.11	1	1.1	ND	µg/m³	R14846
1,3-Dichlorobenzene	TO-15	12/20/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dichlorobenzene	TO-15	12/20/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dioxane	TO-15	12/20/2007	1.8	1	1.8	ND	µg/m³	R14846
2-Butanone (MEK)	TO-15	12/20/2007	1.48	1	1.5	6.8	µg/m³	R14846
2-Hexanone	TO-15	12/20/2007	2.05	1	2.0	ND	µg/m³	R14846
4-Ethyl Toluene	TO-15	12/20/2007	2.46	1	2.5	ND	µg/m³	R14846
4-Methyl-2-Pentanone (MIBK)	TO-15	12/20/2007	2.05	1	2.0	ND	µg/m³	R14846
Acetone	TO-15	12/20/2007	9.52	1	9.5	72	µg/m³	R14846
Benzene	TO-15	12/20/2007	1.6	1	1.6	3.3	µg/m³	R14846
Benzyl Chloride	TO-15	12/20/2007	2.88	1	2.9	ND	µg/m³	R14846
Bromodichloromethane	TO-15	12/20/2007	3.35	1	3.4	ND	µg/m³	R14846
Bromoform	TO-15	12/20/2007	5.17	1	5.2	ND	µg/m³	R14846
Bromomethane	TO-15	12/20/2007	1.94	1	1.9	ND	µg/m³	R14846
Carbon Disulfide	TO-15	12/20/2007	1.56	1	1.6	8.0	µg/m³	R14846
Carbon Tetrachloride	TO-15	12/20/2007	3.15	1	3.2	ND	µg/m³	R14846
Chlorobenzene	TO-15	12/20/2007	2.3	1	2.3	ND	µg/m³	R14846
Chloroethane	TO-15	12/20/2007	1.32	1	1.3	ND	µg/m³	R14846
Chloroform	TO-15	12/20/2007	2.44	1	2.4	ND	µg/m³	R14846
Chloromethane	TO-15	12/20/2007	1.04	1	1.0	ND	µg/m³	R14846
cis-1,2-dichloroethene	TO-15	12/20/2007	1.98	1	2.0	ND	µg/m³	R14846
cis-1,3-Dichloropropene	TO-15	12/20/2007	2.27	1	2.3	ND	µg/m³	R14846
Dibromochloromethane	TO-15	12/20/2007	4.26	1	4.3	ND	µg/m³	R14846
Dichlorodifluoromethane	TO-15	12/20/2007	2.48	1	2.5	ND	µg/m³	R14846
Ethyl Acetate	TO-15	12/20/2007	1.8	1	1.8	ND	µg/m³	R14846
Ethyl Benzene	TO-15	12/20/2007	1.67	1	1.7	ND	µg/m³	R14846
Freon 113	TO-15	12/20/2007	3.83	1	3.8	ND	µg/m³	R14846
Hexachlorobutadiene	TO-15	12/20/2007	5.34	1	5.3	ND	µg/m³	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-23
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 10:55:00 AM

Lab Sample ID: 0712078-005
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/20/2007	3.52	1	3.5	ND	µg/m³	R14846
Isopropanol	TO-15	12/20/2007	16.4	1	16	ND	µg/m³	R14846
m,p-Xylene	TO-15	12/20/2007	2.05	1	2.0	8.9	µg/m³	R14846
Methylene Chloride	TO-15	12/20/2007	3.61	1	3.6	ND	µg/m³	R14846
MTBE	TO-15	12/20/2007	1.81	1	1.8	ND	µg/m³	R14846
Naphthalene	TO-15	12/20/2007	2.62	1	2.6	ND	µg/m³	R14846
o-xylene	TO-15	12/20/2007	2.17	1	2.2	2.4	µg/m³	R14846
Styrene	TO-15	12/20/2007	2.13	1	2.1	ND	µg/m³	R14846
Tetrachloroethene	TO-15	12/20/2007	3.39	1	3.4	330	µg/m³	R14846
Tetrahydrofuran	TO-15	12/20/2007	1.48	1	1.5	ND	µg/m³	R14846
Toluene	TO-15	12/20/2007	1.89	1	1.9	12	µg/m³	R14846
trans-1,2-Dichloroethene	TO-15	12/20/2007	1.98	1	2.0	ND	µg/m³	R14846
Trichloroethene	TO-15	12/20/2007	2.69	1	2.7	ND	µg/m³	R14846
Trichlorofluoromethane	TO-15	12/20/2007	2.48	1	2.5	350	µg/m³	R14846
Vinyl Acetate	TO-15	12/20/2007	1.76	1	1.8	ND	µg/m³	R14846
Vinyl Chloride	TO-15	12/20/2007	1.28	1	1.3	ND	µg/m³	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/20/2007	0	1	50-150	88.9	%REC	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-17
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 11:20:00 AM

Lab Sample ID: 0712078-006
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/20/2007	1.99	1	2.0	ND	µg/m³	R14846
1,1,1,2-Tetrachloroethane	TO-15	12/20/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,1-Trichloroethane	TO-15	12/20/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1,2,2-Tetrachloroethane	TO-15	12/20/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,2-Trichloroethane	TO-15	12/20/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1-Dichloroethane	TO-15	12/20/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2,4-Trichlorobenzene	TO-15	12/20/2007	3.56	1	3.6	ND	µg/m³	R14846
1,2,4-Trimethylbenzene	TO-15	12/20/2007	2.46	1	2.5	ND	µg/m³	R14846
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/20/2007	3.84	1	3.8	ND	µg/m³	R14846
1,2-Dichlorobenzene	TO-15	12/20/2007	3.01	1	3.0	ND	µg/m³	R14846
1,2-Dichloroethane	TO-15	12/20/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2-Dichloropropane	TO-15	12/20/2007	2.31	1	2.3	ND	µg/m³	R14846
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/20/2007	3.13	1	3.1	ND	µg/m³	R14846
1,3,5-Trimethylbenzene	TO-15	12/20/2007	2.46	1	2.5	ND	µg/m³	R14846
1,3-Butadiene	TO-15	12/20/2007	1.11	1	1.1	ND	µg/m³	R14846
1,3-Dichlorobenzene	TO-15	12/20/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dichlorobenzene	TO-15	12/20/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dioxane	TO-15	12/20/2007	1.8	1	1.8	ND	µg/m³	R14846
2-Butanone (MEK)	TO-15	12/20/2007	1.48	1	1.5	ND	µg/m³	R14846
2-Hexanone	TO-15	12/20/2007	2.05	1	2.0	ND	µg/m³	R14846
4-Ethyl Toluene	TO-15	12/20/2007	2.46	1	2.5	ND	µg/m³	R14846
4-Methyl-2-Pentanone (MIBK)	TO-15	12/20/2007	2.05	1	2.0	ND	µg/m³	R14846
Acetone	TO-15	12/20/2007	9.52	1	9.5	36	µg/m³	R14846
Benzene	TO-15	12/20/2007	1.6	1	1.6	ND	µg/m³	R14846
Benzyl Chloride	TO-15	12/20/2007	2.88	1	2.9	ND	µg/m³	R14846
Bromodichloromethane	TO-15	12/20/2007	3.35	1	3.4	ND	µg/m³	R14846
Bromoform	TO-15	12/20/2007	5.17	1	5.2	ND	µg/m³	R14846
Bromomethane	TO-15	12/20/2007	1.94	1	1.9	ND	µg/m³	R14846
Carbon Disulfide	TO-15	12/20/2007	1.56	1	1.6	ND	µg/m³	R14846
Carbon Tetrachloride	TO-15	12/20/2007	3.15	1	3.2	ND	µg/m³	R14846
Chlorobenzene	TO-15	12/20/2007	2.3	1	2.3	ND	µg/m³	R14846
Chloroethane	TO-15	12/20/2007	1.32	1	1.3	ND	µg/m³	R14846
Chloroform	TO-15	12/20/2007	2.44	1	2.4	ND	µg/m³	R14846
Chloromethane	TO-15	12/20/2007	1.04	1	1.0	ND	µg/m³	R14846
cis-1,2-dichloroethene	TO-15	12/20/2007	1.98	1	2.0	ND	µg/m³	R14846
cis-1,3-Dichloropropene	TO-15	12/20/2007	2.27	1	2.3	ND	µg/m³	R14846
Dibromochloromethane	TO-15	12/20/2007	4.26	1	4.3	ND	µg/m³	R14846
Dichlorodifluoromethane	TO-15	12/20/2007	2.48	1	2.5	ND	µg/m³	R14846
Ethyl Acetate	TO-15	12/20/2007	1.8	1	1.8	ND	µg/m³	R14846
Ethyl Benzene	TO-15	12/20/2007	1.67	1	1.7	ND	µg/m³	R14846
Freon 113	TO-15	12/20/2007	3.83	1	3.8	ND	µg/m³	R14846
Hexachlorobutadiene	TO-15	12/20/2007	5.34	1	5.3	ND	µg/m³	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-17
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 11:20:00 AM

Lab Sample ID: 0712078-006
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/20/2007	3.52	1	3.5	ND	µg/m³	R14846
Isopropanol	TO-15	12/20/2007	16.4	1	16	ND	µg/m³	R14846
m,p-Xylene	TO-15	12/20/2007	2.05	1	2.0	ND	µg/m³	R14846
Methylene Chloride	TO-15	12/20/2007	3.61	1	3.6	ND	µg/m³	R14846
MTBE	TO-15	12/20/2007	1.81	1	1.8	ND	µg/m³	R14846
Naphthalene	TO-15	12/20/2007	2.62	1	2.6	ND	µg/m³	R14846
o-xylene	TO-15	12/20/2007	2.17	1	2.2	ND	µg/m³	R14846
Styrene	TO-15	12/20/2007	2.13	1	2.1	ND	µg/m³	R14846
Tetrachloroethene	TO-15	12/20/2007	3.39	1	3.4	120	µg/m³	R14846
Tetrahydrofuran	TO-15	12/20/2007	1.48	1	1.5	ND	µg/m³	R14846
Toluene	TO-15	12/20/2007	1.89	1	1.9	5.5	µg/m³	R14846
trans-1,2-Dichloroethene	TO-15	12/20/2007	1.98	1	2.0	ND	µg/m³	R14846
Trichloroethene	TO-15	12/20/2007	2.69	1	2.7	ND	µg/m³	R14846
Trichlorofluoromethane	TO-15	12/20/2007	2.48	1	2.5	3.4	µg/m³	R14846
Vinyl Acetate	TO-15	12/20/2007	1.76	1	1.8	ND	µg/m³	R14846
Vinyl Chloride	TO-15	12/20/2007	1.28	1	1.3	ND	µg/m³	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/20/2007	0	1	50-150	113	%REC	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-16
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 11:34:00 AM

Lab Sample ID: 0712078-007
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/20/2007	1.99	1	2.0	ND	µg/m³	R14857
1,1,1,2-Tetrachloroethane	TO-15	12/20/2007	3.44	1	3.4	ND	µg/m³	R14857
1,1,1-Trichloroethane	TO-15	12/20/2007	2.73	1	2.7	ND	µg/m³	R14857
1,1,2,2-Tetrachloroethane	TO-15	12/20/2007	3.44	1	3.4	ND	µg/m³	R14857
1,1,2-Trichloroethane	TO-15	12/20/2007	2.73	1	2.7	ND	µg/m³	R14857
1,1-Dichloroethane	TO-15	12/20/2007	2.03	1	2.0	ND	µg/m³	R14857
1,2,4-Trichlorobenzene	TO-15	12/20/2007	3.56	1	3.6	ND	µg/m³	R14857
1,2,4-Trimethylbenzene	TO-15	12/20/2007	2.46	1	2.5	ND	µg/m³	R14857
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/20/2007	3.84	1	3.8	ND	µg/m³	R14857
1,2-Dichlorobenzene	TO-15	12/20/2007	3.01	1	3.0	ND	µg/m³	R14857
1,2-Dichloroethane	TO-15	12/20/2007	2.03	1	2.0	ND	µg/m³	R14857
1,2-Dichloropropane	TO-15	12/20/2007	2.31	1	2.3	ND	µg/m³	R14857
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/20/2007	3.13	1	3.1	ND	µg/m³	R14857
1,3,5-Trimethylbenzene	TO-15	12/20/2007	2.46	1	2.5	ND	µg/m³	R14857
1,3-Butadiene	TO-15	12/20/2007	1.11	1	1.1	ND	µg/m³	R14857
1,3-Dichlorobenzene	TO-15	12/20/2007	3.01	1	3.0	ND	µg/m³	R14857
1,4-Dichlorobenzene	TO-15	12/20/2007	3.01	1	3.0	ND	µg/m³	R14857
1,4-Dioxane	TO-15	12/20/2007	1.8	1	1.8	ND	µg/m³	R14857
2-Butanone (MEK)	TO-15	12/20/2007	1.48	1	1.5	ND	µg/m³	R14857
2-Hexanone	TO-15	12/20/2007	2.05	1	2.0	ND	µg/m³	R14857
4-Ethyl Toluene	TO-15	12/20/2007	2.46	1	2.5	ND	µg/m³	R14857
4-Methyl-2-Pentanone (MIBK)	TO-15	12/20/2007	2.05	1	2.0	ND	µg/m³	R14857
Acetone	TO-15	12/20/2007	9.52	1	9.5	83	µg/m³	R14857
Benzene	TO-15	12/20/2007	1.6	1	1.6	3.3	µg/m³	R14857
Benzyl Chloride	TO-15	12/20/2007	2.88	1	2.9	ND	µg/m³	R14857
Bromodichloromethane	TO-15	12/20/2007	3.35	1	3.4	ND	µg/m³	R14857
Bromoform	TO-15	12/20/2007	5.17	1	5.2	ND	µg/m³	R14857
Bromomethane	TO-15	12/20/2007	1.94	1	1.9	ND	µg/m³	R14857
Carbon Disulfide	TO-15	12/20/2007	1.56	1	1.6	5.8	µg/m³	R14857
Carbon Tetrachloride	TO-15	12/20/2007	3.15	1	3.2	ND	µg/m³	R14857
Chlorobenzene	TO-15	12/20/2007	2.3	1	2.3	ND	µg/m³	R14857
Chloroethane	TO-15	12/20/2007	1.32	1	1.3	ND	µg/m³	R14857
Chloroform	TO-15	12/20/2007	2.44	1	2.4	ND	µg/m³	R14857
Chloromethane	TO-15	12/20/2007	1.04	1	1.0	ND	µg/m³	R14857
cis-1,2-dichloroethene	TO-15	12/20/2007	1.98	1	2.0	ND	µg/m³	R14857
cis-1,3-Dichloropropene	TO-15	12/20/2007	2.27	1	2.3	ND	µg/m³	R14857
Dibromochloromethane	TO-15	12/20/2007	4.26	1	4.3	ND	µg/m³	R14857
Dichlorodifluoromethane	TO-15	12/20/2007	2.48	1	2.5	ND	µg/m³	R14857
Ethyl Acetate	TO-15	12/20/2007	1.8	1	1.8	ND	µg/m³	R14857
Ethyl Benzene	TO-15	12/20/2007	1.67	1	1.7	ND	µg/m³	R14857
Freon 113	TO-15	12/20/2007	3.83	1	3.8	ND	µg/m³	R14857
Hexachlorobutadiene	TO-15	12/20/2007	5.34	1	5.3	ND	µg/m³	R14857

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-16
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 11:34:00 AM

Lab Sample ID: 0712078-007
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/20/2007	3.52	1	3.5	ND	µg/m³	R14857
Isopropanol	TO-15	12/20/2007	16.4	1	16	ND	µg/m³	R14857
m,p-Xylene	TO-15	12/20/2007	2.05	1	2.0	8.4	µg/m³	R14857
Methylene Chloride	TO-15	12/20/2007	3.61	1	3.6	ND	µg/m³	R14857
MTBE	TO-15	12/20/2007	1.81	1	1.8	ND	µg/m³	R14857
Naphthalene	TO-15	12/20/2007	2.62	1	2.6	ND	µg/m³	R14857
o-xylene	TO-15	12/20/2007	2.17	1	2.2	2.3	µg/m³	R14857
Styrene	TO-15	12/20/2007	2.13	1	2.1	ND	µg/m³	R14857
Tetrachloroethene	TO-15	12/20/2007	3.39	1	3.4	110	µg/m³	R14857
Tetrahydrofuran	TO-15	12/20/2007	1.48	1	1.5	ND	µg/m³	R14857
Toluene	TO-15	12/20/2007	1.89	1	1.9	9.7	µg/m³	R14857
trans-1,2-Dichloroethene	TO-15	12/20/2007	1.98	1	2.0	ND	µg/m³	R14857
Trichloroethene	TO-15	12/20/2007	2.69	1	2.7	ND	µg/m³	R14857
Trichlorofluoromethane	TO-15	12/20/2007	2.48	1	2.5	14	µg/m³	R14857
Vinyl Acetate	TO-15	12/20/2007	1.76	1	1.8	ND	µg/m³	R14857
Vinyl Chloride	TO-15	12/20/2007	1.28	1	1.3	ND	µg/m³	R14857
Surr: 4-Bromofluorobenzene	TO-15	12/20/2007	0	1	65-135	98.3	%REC	R14857

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-19
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 11:35:00 AM

Lab Sample ID: 0712078-008
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/20/2007	1.99	1	2.0	ND	µg/m³	R14857
1,1,1,2-Tetrachloroethane	TO-15	12/20/2007	3.44	1	3.4	ND	µg/m³	R14857
1,1,1-Trichloroethane	TO-15	12/20/2007	2.73	1	2.7	ND	µg/m³	R14857
1,1,2,2-Tetrachloroethane	TO-15	12/20/2007	3.44	1	3.4	ND	µg/m³	R14857
1,1,2-Trichloroethane	TO-15	12/20/2007	2.73	1	2.7	ND	µg/m³	R14857
1,1-Dichloroethane	TO-15	12/20/2007	2.03	1	2.0	ND	µg/m³	R14857
1,2,4-Trichlorobenzene	TO-15	12/20/2007	3.56	1	3.6	ND	µg/m³	R14857
1,2,4-Trimethylbenzene	TO-15	12/20/2007	2.46	1	2.5	ND	µg/m³	R14857
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/20/2007	3.84	1	3.8	ND	µg/m³	R14857
1,2-Dichlorobenzene	TO-15	12/20/2007	3.01	1	3.0	ND	µg/m³	R14857
1,2-Dichloroethane	TO-15	12/20/2007	2.03	1	2.0	ND	µg/m³	R14857
1,2-Dichloropropane	TO-15	12/20/2007	2.31	1	2.3	ND	µg/m³	R14857
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/20/2007	3.13	1	3.1	ND	µg/m³	R14857
1,3,5-Trimethylbenzene	TO-15	12/20/2007	2.46	1	2.5	ND	µg/m³	R14857
1,3-Butadiene	TO-15	12/20/2007	1.11	1	1.1	ND	µg/m³	R14857
1,3-Dichlorobenzene	TO-15	12/20/2007	3.01	1	3.0	ND	µg/m³	R14857
1,4-Dichlorobenzene	TO-15	12/20/2007	3.01	1	3.0	ND	µg/m³	R14857
1,4-Dioxane	TO-15	12/20/2007	1.8	1	1.8	ND	µg/m³	R14857
2-Butanone (MEK)	TO-15	12/20/2007	1.48	1	1.5	4.0	µg/m³	R14857
2-Hexanone	TO-15	12/20/2007	2.05	1	2.0	ND	µg/m³	R14857
4-Ethyl Toluene	TO-15	12/20/2007	2.46	1	2.5	ND	µg/m³	R14857
4-Methyl-2-Pentanone (MIBK)	TO-15	12/20/2007	2.05	1	2.0	ND	µg/m³	R14857
Acetone	TO-15	12/20/2007	9.52	1	9.5	87	µg/m³	R14857
Benzene	TO-15	12/20/2007	1.6	1	1.6	2.6	µg/m³	R14857
Benzyl Chloride	TO-15	12/20/2007	2.88	1	2.9	ND	µg/m³	R14857
Bromodichloromethane	TO-15	12/20/2007	3.35	1	3.4	ND	µg/m³	R14857
Bromoform	TO-15	12/20/2007	5.17	1	5.2	ND	µg/m³	R14857
Bromomethane	TO-15	12/20/2007	1.94	1	1.9	ND	µg/m³	R14857
Carbon Disulfide	TO-15	12/20/2007	1.56	1	1.6	4.8	µg/m³	R14857
Carbon Tetrachloride	TO-15	12/20/2007	3.15	1	3.2	ND	µg/m³	R14857
Chlorobenzene	TO-15	12/20/2007	2.3	1	2.3	ND	µg/m³	R14857
Chloroethane	TO-15	12/20/2007	1.32	1	1.3	ND	µg/m³	R14857
Chloroform	TO-15	12/20/2007	2.44	1	2.4	ND	µg/m³	R14857
Chloromethane	TO-15	12/20/2007	1.04	1	1.0	ND	µg/m³	R14857
cis-1,2-dichloroethene	TO-15	12/20/2007	1.98	1	2.0	ND	µg/m³	R14857
cis-1,3-Dichloropropene	TO-15	12/20/2007	2.27	1	2.3	ND	µg/m³	R14857
Dibromochloromethane	TO-15	12/20/2007	4.26	1	4.3	ND	µg/m³	R14857
Dichlorodifluoromethane	TO-15	12/20/2007	2.48	1	2.5	ND	µg/m³	R14857
Ethyl Acetate	TO-15	12/20/2007	1.8	1	1.8	ND	µg/m³	R14857
Ethyl Benzene	TO-15	12/20/2007	1.67	1	1.7	ND	µg/m³	R14857
Freon 113	TO-15	12/20/2007	3.83	1	3.8	ND	µg/m³	R14857
Hexachlorobutadiene	TO-15	12/20/2007	5.34	1	5.3	ND	µg/m³	R14857

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-19
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 11:35:00 AM

Lab Sample ID: 0712078-008
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/20/2007	3.52	1	3.5	ND	µg/m³	R14857
Isopropanol	TO-15	12/20/2007	16.4	1	16	ND	µg/m³	R14857
m,p-Xylene	TO-15	12/20/2007	2.05	1	2.0	8.3	µg/m³	R14857
Methylene Chloride	TO-15	12/20/2007	3.61	1	3.6	ND	µg/m³	R14857
MTBE	TO-15	12/20/2007	1.81	1	1.8	ND	µg/m³	R14857
Naphthalene	TO-15	12/20/2007	2.62	1	2.6	ND	µg/m³	R14857
o-xylene	TO-15	12/20/2007	2.17	1	2.2	ND	µg/m³	R14857
Styrene	TO-15	12/20/2007	2.13	1	2.1	ND	µg/m³	R14857
Tetrachloroethene	TO-15	12/20/2007	3.39	1	3.4	59	µg/m³	R14857
Tetrahydrofuran	TO-15	12/20/2007	1.48	1	1.5	ND	µg/m³	R14857
Toluene	TO-15	12/20/2007	1.89	1	1.9	8.9	µg/m³	R14857
trans-1,2-Dichloroethene	TO-15	12/20/2007	1.98	1	2.0	ND	µg/m³	R14857
Trichloroethene	TO-15	12/20/2007	2.69	1	2.7	ND	µg/m³	R14857
Trichlorofluoromethane	TO-15	12/20/2007	2.48	1	2.5	10	µg/m³	R14857
Vinyl Acetate	TO-15	12/20/2007	1.76	1	1.8	ND	µg/m³	R14857
Vinyl Chloride	TO-15	12/20/2007	1.28	1	1.3	ND	µg/m³	R14857
Surr: 4-Bromofluorobenzene	TO-15	12/20/2007	0	1	65-135	96.2	%REC	R14857

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-14@4'
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 10:22:00 AM

Lab Sample ID: 0712078-009
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/21/2007	1.99	2.96	5.9	ND	µg/m³	R14857
1,1,1,2-Tetrachloroethane	TO-15	12/21/2007	3.44	2.96	10	ND	µg/m³	R14857
1,1,1-Trichloroethane	TO-15	12/21/2007	2.73	2.96	8.1	ND	µg/m³	R14857
1,1,2,2-Tetrachloroethane	TO-15	12/21/2007	3.44	2.96	10	ND	µg/m³	R14857
1,1,2-Trichloroethane	TO-15	12/21/2007	2.73	2.96	8.1	ND	µg/m³	R14857
1,1-Dichloroethane	TO-15	12/21/2007	2.03	2.96	6.0	ND	µg/m³	R14857
1,2,4-Trichlorobenzene	TO-15	12/21/2007	3.56	2.96	11	ND	µg/m³	R14857
1,2,4-Trimethylbenzene	TO-15	12/21/2007	2.46	2.96	7.3	ND	µg/m³	R14857
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/21/2007	3.84	2.96	11	ND	µg/m³	R14857
1,2-Dichlorobenzene	TO-15	12/21/2007	3.01	2.96	8.9	ND	µg/m³	R14857
1,2-Dichloroethane	TO-15	12/21/2007	2.03	2.96	6.0	ND	µg/m³	R14857
1,2-Dichloropropane	TO-15	12/21/2007	2.31	2.96	6.8	ND	µg/m³	R14857
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/21/2007	3.13	2.96	9.3	ND	µg/m³	R14857
1,3,5-Trimethylbenzene	TO-15	12/21/2007	2.46	2.96	7.3	ND	µg/m³	R14857
1,3-Butadiene	TO-15	12/21/2007	1.11	2.96	3.3	ND	µg/m³	R14857
1,3-Dichlorobenzene	TO-15	12/21/2007	3.01	2.96	8.9	ND	µg/m³	R14857
1,4-Dichlorobenzene	TO-15	12/21/2007	3.01	2.96	8.9	ND	µg/m³	R14857
1,4-Dioxane	TO-15	12/21/2007	1.8	2.96	5.3	ND	µg/m³	R14857
2-Butanone (MEK)	TO-15	12/21/2007	1.48	2.96	4.4	160	µg/m³	R14857
2-Hexanone	TO-15	12/21/2007	2.05	2.96	6.1	ND	µg/m³	R14857
4-Ethyl Toluene	TO-15	12/21/2007	2.46	2.96	7.3	ND	µg/m³	R14857
4-Methyl-2-Pentanone (MIBK)	TO-15	12/21/2007	2.05	2.96	6.1	ND	µg/m³	R14857
Acetone	TO-15	12/21/2007	9.52	2.96	28	190	µg/m³	R14857
Benzene	TO-15	12/21/2007	1.6	2.96	4.7	ND	µg/m³	R14857
Benzyl Chloride	TO-15	12/21/2007	2.88	2.96	8.5	ND	µg/m³	R14857
Bromodichloromethane	TO-15	12/21/2007	3.35	2.96	9.9	ND	µg/m³	R14857
Bromoform	TO-15	12/21/2007	5.17	2.96	15	ND	µg/m³	R14857
Bromomethane	TO-15	12/21/2007	1.94	2.96	5.7	ND	µg/m³	R14857
Carbon Disulfide	TO-15	12/21/2007	1.56	2.96	4.6	9.5	µg/m³	R14857
Carbon Tetrachloride	TO-15	12/21/2007	3.15	2.96	9.3	ND	µg/m³	R14857
Chlorobenzene	TO-15	12/21/2007	2.3	2.96	6.8	ND	µg/m³	R14857
Chloroethane	TO-15	12/21/2007	1.32	2.96	3.9	ND	µg/m³	R14857
Chloroform	TO-15	12/21/2007	2.44	2.96	7.2	30	µg/m³	R14857
Chloromethane	TO-15	12/21/2007	1.04	2.96	3.1	ND	µg/m³	R14857
cis-1,2-dichloroethene	TO-15	12/21/2007	1.98	2.96	5.9	ND	µg/m³	R14857
cis-1,3-Dichloropropene	TO-15	12/21/2007	2.27	2.96	6.7	ND	µg/m³	R14857
Dibromochloromethane	TO-15	12/21/2007	4.26	2.96	13	ND	µg/m³	R14857
Dichlorodifluoromethane	TO-15	12/21/2007	2.48	2.96	7.3	ND	µg/m³	R14857
Ethyl Acetate	TO-15	12/21/2007	1.8	2.96	5.3	ND	µg/m³	R14857
Ethyl Benzene	TO-15	12/21/2007	1.67	2.96	4.9	ND	µg/m³	R14857
Freon 113	TO-15	12/21/2007	3.83	2.96	11	ND	µg/m³	R14857
Hexachlorobutadiene	TO-15	12/21/2007	5.34	2.96	16	ND	µg/m³	R14857

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-14@4'
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 10:22:00 AM

Lab Sample ID: 0712078-009
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/21/2007	3.52	2.96	10	37	µg/m³	R14857
Isopropanol	TO-15	12/21/2007	16.4	2.96	49	ND	µg/m³	R14857
m,p-Xylene	TO-15	12/21/2007	2.05	2.96	6.1	20	µg/m³	R14857
Methylene Chloride	TO-15	12/21/2007	3.61	2.96	11	140	µg/m³	R14857
MTBE	TO-15	12/21/2007	1.81	2.96	5.4	ND	µg/m³	R14857
Naphthalene	TO-15	12/21/2007	2.62	2.96	7.8	ND	µg/m³	R14857
o-xylene	TO-15	12/21/2007	2.17	2.96	6.4	ND	µg/m³	R14857
Styrene	TO-15	12/21/2007	2.13	2.96	6.3	ND	µg/m³	R14857
Tetrachloroethene	TO-15	12/21/2007	3.39	2.96	10	1300	µg/m³	R14857
Tetrahydrofuran	TO-15	12/21/2007	1.48	2.96	4.4	ND	µg/m³	R14857
Toluene	TO-15	12/21/2007	1.89	2.96	5.6	15	µg/m³	R14857
trans-1,2-Dichloroethene	TO-15	12/21/2007	1.98	2.96	5.9	ND	µg/m³	R14857
Trichloroethene	TO-15	12/21/2007	2.69	2.96	8.0	ND	µg/m³	R14857
Trichlorofluoromethane	TO-15	12/21/2007	2.48	2.96	7.3	23	µg/m³	R14857
Vinyl Acetate	TO-15	12/21/2007	1.76	2.96	5.2	ND	µg/m³	R14857
Vinyl Chloride	TO-15	12/21/2007	1.28	2.96	3.8	ND	µg/m³	R14857
Surr: 4-Bromofluorobenzene	TO-15	12/21/2007	0	2.96	65-135	79.7	%REC	R14857

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-14@8'A
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 10:08:00 AM

Lab Sample ID: 0712078-010
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/20/2007	1.99	3.66	7.3	ND	µg/m³	R14857
1,1,1,2-Tetrachloroethane	TO-15	12/20/2007	3.44	3.66	13	ND	µg/m³	R14857
1,1,1-Trichloroethane	TO-15	12/20/2007	2.73	3.66	10	ND	µg/m³	R14857
1,1,2,2-Tetrachloroethane	TO-15	12/20/2007	3.44	3.66	13	ND	µg/m³	R14857
1,1,2-Trichloroethane	TO-15	12/20/2007	2.73	3.66	10	ND	µg/m³	R14857
1,1-Dichloroethane	TO-15	12/20/2007	2.03	3.66	7.4	ND	µg/m³	R14857
1,2,4-Trichlorobenzene	TO-15	12/20/2007	3.56	3.66	13	ND	µg/m³	R14857
1,2,4-Trimethylbenzene	TO-15	12/20/2007	2.46	3.66	9.0	ND	µg/m³	R14857
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/20/2007	3.84	3.66	14	ND	µg/m³	R14857
1,2-Dichlorobenzene	TO-15	12/20/2007	3.01	3.66	11	ND	µg/m³	R14857
1,2-Dichloroethane	TO-15	12/20/2007	2.03	3.66	7.4	ND	µg/m³	R14857
1,2-Dichloropropane	TO-15	12/20/2007	2.31	3.66	8.5	ND	µg/m³	R14857
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/20/2007	3.13	3.66	11	ND	µg/m³	R14857
1,3,5-Trimethylbenzene	TO-15	12/20/2007	2.46	3.66	9.0	ND	µg/m³	R14857
1,3-Butadiene	TO-15	12/20/2007	1.11	3.66	4.1	ND	µg/m³	R14857
1,3-Dichlorobenzene	TO-15	12/20/2007	3.01	3.66	11	ND	µg/m³	R14857
1,4-Dichlorobenzene	TO-15	12/20/2007	3.01	3.66	11	ND	µg/m³	R14857
1,4-Dioxane	TO-15	12/20/2007	1.8	3.66	6.6	ND	µg/m³	R14857
2-Butanone (MEK)	TO-15	12/20/2007	1.48	3.66	5.4	220	µg/m³	R14857
2-Hexanone	TO-15	12/20/2007	2.05	3.66	7.5	ND	µg/m³	R14857
4-Ethyl Toluene	TO-15	12/20/2007	2.46	3.66	9.0	ND	µg/m³	R14857
4-Methyl-2-Pentanone (MIBK)	TO-15	12/20/2007	2.05	3.66	7.5	ND	µg/m³	R14857
Acetone	TO-15	12/21/2007	9.52	36.6	350	920	µg/m³	R14857
Benzene	TO-15	12/20/2007	1.6	3.66	5.9	49	µg/m³	R14857
Benzyl Chloride	TO-15	12/20/2007	2.88	3.66	11	ND	µg/m³	R14857
Bromodichloromethane	TO-15	12/20/2007	3.35	3.66	12	ND	µg/m³	R14857
Bromoform	TO-15	12/20/2007	5.17	3.66	19	ND	µg/m³	R14857
Bromomethane	TO-15	12/20/2007	1.94	3.66	7.1	ND	µg/m³	R14857
Carbon Disulfide	TO-15	12/20/2007	1.56	3.66	5.7	73	µg/m³	R14857
Carbon Tetrachloride	TO-15	12/20/2007	3.15	3.66	12	ND	µg/m³	R14857
Chlorobenzene	TO-15	12/20/2007	2.3	3.66	8.4	ND	µg/m³	R14857
Chloroethane	TO-15	12/20/2007	1.32	3.66	4.8	ND	µg/m³	R14857
Chloroform	TO-15	12/20/2007	2.44	3.66	8.9	220	µg/m³	R14857
Chloromethane	TO-15	12/20/2007	1.04	3.66	3.8	ND	µg/m³	R14857
cis-1,2-dichloroethene	TO-15	12/20/2007	1.98	3.66	7.2	ND	µg/m³	R14857
cis-1,3-Dichloropropene	TO-15	12/20/2007	2.27	3.66	8.3	ND	µg/m³	R14857
Dibromochloromethane	TO-15	12/20/2007	4.26	3.66	16	ND	µg/m³	R14857
Dichlorodifluoromethane	TO-15	12/20/2007	2.48	3.66	9.1	ND	µg/m³	R14857
Ethyl Acetate	TO-15	12/20/2007	1.8	3.66	6.6	ND	µg/m³	R14857
Ethyl Benzene	TO-15	12/20/2007	1.67	3.66	6.1	ND	µg/m³	R14857
Freon 113	TO-15	12/20/2007	3.83	3.66	14	ND	µg/m³	R14857
Hexachlorobutadiene	TO-15	12/20/2007	5.34	3.66	20	ND	µg/m³	R14857

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/17/2007
Date Reported: 12/27/2007

Client Sample ID: SG-14@8'A
Sample Location: 461 McGraw Ave
Sample Matrix: AIR
Date/Time Sampled 12/15/2007 10:08:00 AM

Lab Sample ID: 0712078-010
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/20/2007	3.52	3.66	13	350	µg/m³	R14857
Isopropanol	TO-15	12/20/2007	16.4	3.66	60	ND	µg/m³	R14857
m,p-Xylene	TO-15	12/20/2007	2.05	3.66	7.5	43	µg/m³	R14857
Methylene Chloride	TO-15	12/20/2007	3.61	3.66	13	ND	µg/m³	R14857
MTBE	TO-15	12/20/2007	1.81	3.66	6.6	ND	µg/m³	R14857
Naphthalene	TO-15	12/20/2007	2.62	3.66	9.6	ND	µg/m³	R14857
o-xylene	TO-15	12/20/2007	2.17	3.66	7.9	13	µg/m³	R14857
Styrene	TO-15	12/20/2007	2.13	3.66	7.8	26	µg/m³	R14857
Tetrachloroethene	TO-15	12/21/2007	3.39	36.6	120	4400	µg/m³	R14857
Tetrahydrofuran	TO-15	12/20/2007	1.48	3.66	5.4	ND	µg/m³	R14857
Toluene	TO-15	12/20/2007	1.89	3.66	6.9	74	µg/m³	R14857
trans-1,2-Dichloroethene	TO-15	12/20/2007	1.98	3.66	7.2	ND	µg/m³	R14857
Trichloroethene	TO-15	12/20/2007	2.69	3.66	9.8	ND	µg/m³	R14857
Trichlorofluoromethane	TO-15	12/20/2007	2.48	3.66	9.1	ND	µg/m³	R14857
Vinyl Acetate	TO-15	12/20/2007	1.76	3.66	6.4	ND	µg/m³	R14857
Vinyl Chloride	TO-15	12/20/2007	1.28	3.66	4.7	ND	µg/m³	R14857
Surr: 4-Bromofluorobenzene	TO-15	12/21/2007	0	36.6	65-135	85.8	%REC	R14857
Surr: 4-Bromofluorobenzene	TO-15	12/20/2007	0	3.66	65-135	95.4	%REC	R14857

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Definitions, legends and Notes

Note	Description
ug/kg	Microgram per kilogram (ppb, part per billion).
ug/L	Microgram per liter (ppb, part per billion).
mg/kg	Milligram per kilogram (ppm, part per million).
mg/L	Milligram per liter (ppm, part per million).
LCS/LCSD	Laboratory control sample/laboratory control sample duplicate.
MDL	Method detection limit.
MRL	Modified reporting limit. When sample is subject to dilution, reporting limit times dilution factor yields MRL.
MS/MSD	Matrix spike/matrix spike duplicate.
N/A	Not applicable.
ND	Not detected at or above detection limit.
NR	Not reported.
QC	Quality Control.
RL	Reporting limit.
% RPD	Percent relative difference.
a	pH was measured immediately upon the receipt of the sample, but it was still done outside the holding time.
sub	Analyzed by subcontracting laboratory, Lab Certificate #

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

CLIENT: Environmental Investigation Services
Work Order: 0712078
Project: 717-3F /461 McGraw Ave, Livermore CA

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID **MB** SampType: **MBLK** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/19/2007** RunNo: **14846**
Client ID: **ZZZZZ** Batch ID: **R14846** TestNo: **TO-15** Analysis Date: **12/19/2007** SeqNo: **214422**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1 - Dichloroethene	ND	0.50									
1,1,1,2-Tetrachloroethane	ND	0.50									
1,1,1-Trichloroethane	ND	0.50									
1,1,2,2-Tetrachloroethane	ND	0.50									
1,1,2-Trichloroethane	ND	0.50									
1,1-Dichloroethane	ND	0.50									
1,2,4-Trichlorobenzene	ND	0.50									
1,2,4-Trimethylbenzene	ND	0.50									
1,2-Dibromoethane(Ethylene dibromide	ND	0.50									
1,2-Dichlorobenzene	ND	0.50									
1,2-Dichloroethane	ND	0.50									
1,2-Dichloropropane	ND	0.50									
1,2-dichlorotetrafluoroethane(F114)	ND	0.50									
1,3,5-Trimethylbenzene	ND	0.50									
1,3-Butadiene	ND	0.50									
1,3-Dichlorobenzene	ND	0.50									
1,4-Dichlorobenzene	ND	0.50									
1,4-Dioxane	ND	0.50									
2-Butanone (MEK)	ND	0.50									
2-Hexanone	ND	0.50									
4-Ethyl Toluene	ND	0.50									
4-Methyl-2-Pentanone (MIBK)	ND	0.50									
Acetone	ND	4.0									
Benzene	ND	0.50									
Benzyl Chloride	ND	0.50									
Bromodichloromethane	ND	0.50									
Bromoform	ND	0.50									
Bromomethane	ND	0.50									
Carbon Disulfide	ND	0.50									
Carbon Tetrachloride	ND	0.50									

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712078
Project: 717-3F /461 McGraw Ave, Livermore CA

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID **MB**	SampType: **MBLK**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **12/19/2007**	RunNo: **14846**
Client ID: **ZZZZZ**	Batch ID: **R14846**	TestNo: **TO-15**		Analysis Date: **12/19/2007**	SeqNo: **214422**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chlorobenzene	ND	0.50									
Chloroethane	ND	0.50									
Chloroform	ND	0.50									
Chloromethane	ND	0.50									
cis-1,2-dichloroethene	ND	0.50									
cis-1,3-Dichloropropene	ND	0.50									
Dibromochloromethane	ND	0.50									
Dichlorodifluoromethane	ND	0.50									
Ethyl Acetate	ND	0.50									
Ethyl Benzene	ND	0.50									
Freon 113	ND	0.50									
Hexachlorobutadiene	ND	0.50									
Hexane	ND	1.0									
Isopropanol	ND	4.0									
m,p-Xylene	ND	0.50									
Methylene Chloride	ND	1.0									
MTBE	ND	0.50									
Naphthalene	ND	5.0									
o-xylene	ND	0.50									
Styrene	ND	0.50									
Tetrachloroethene	ND	0.50									
Tetrahydrofuran	ND	0.50									
Toluene	ND	0.50									
trans-1,2-Dichloroethene	ND	0.50									
Trichloroethene	ND	0.50									
Trichlorofluoromethane	ND	0.50									
Vinyl Acetate	ND	0.50									
Vinyl Chloride	ND	0.50									
Surr: 4-Bromofluorobenzene	19.85	0	20	0	99.2	65	135				

Qualifiers:

E	Value above quantitation range	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712078
Project: 717-3F /461 McGraw Ave, Livermore CA

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID **LCS** SampType: **LCS** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/18/2007** RunNo: **14846**
Client ID: **ZZZZZ** Batch ID: **R14846** TestNo: **TO-15** Analysis Date: **12/18/2007** SeqNo: **214423**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1 - Dichloroethene	20.58	0.50	20	0	103	65	135				
1,1,1,2-Tetrachloroethane	21.35	0.50	20	0	107	65	135				
1,1,1-Trichloroethane	19.38	0.50	20	0	96.9	65	135				
1,1,2,2-Tetrachloroethane	20.78	0.50	20	0	104	65	135				
1,1,2-Trichloroethane	21.57	0.50	20	0	108	65	135				
1,1-Dichloroethane	20.30	0.50	20	0	102	65	135				
1,2,4-Trichlorobenzene	18.11	0.50	20	0	90.6	65	135				
1,2,4-Trimethylbenzene	19.74	0.50	20	0	98.7	65	135				
1,2-Dibromoethane(Ethylene dibromide	20.22	0.50	20	0	101	65	135				
1,2-Dichlorobenzene	19.39	0.50	20	0	97.0	65	135				
1,2-Dichloroethane	21.70	0.50	20	0	108	65	135				
1,2-Dichloropropane	21.37	0.50	20	0	107	65	135				
1,2-dichlorotetrafluoroethane(F114)	15.30	0.50	20	0	76.5	65	135				
1,3,5-Trimethylbenzene	20.58	0.50	20	0	103	65	135				
1,3-Butadiene	20.64	0.50	20	0	103	65	135				
1,3-Dichlorobenzene	19.27	0.50	20	0	96.4	65	135				
1,4-Dichlorobenzene	19.27	0.50	20	0	96.4	65	135				
1,4-Dioxane	22.38	0.50	20	0	112	65	135				
2-Butanone (MEK)	21.93	0.50	20	0	110	65	135				
2-Hexanone	22.95	0.50	20	0	115	65	135				
4-Ethyl Toluene	20.90	0.50	20	0	104	65	135				
4-Methyl-2-Pentanone (MIBK)	22.26	0.50	20	0	111	65	135				
Acetone	23.19	4.0	20	0	116	65	135				
Benzene	20.12	0.50	20	0	101	65	135				
Benzyl Chloride	19.92	0.50	20	0	99.6	65	135				
Bromodichloromethane	21.52	0.50	20	0	108	65	135				
Bromoform	21.61	0.50	20	0	108	65	135				
Bromomethane	19.61	0.50	20	0	98.0	65	135				
Carbon Disulfide	20.97	0.50	20	0	105	65	135				
Carbon Tetrachloride	18.99	0.50	20	0	95.0	65	135				
Chlorobenzene	21.64	0.50	20	0	108	65	135				

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712078
Project: 717-3F /461 McGraw Ave, Livermore CA

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID **LCS**	SampType: **LCS**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **12/18/2007**	RunNo: **14846**
Client ID: **ZZZZZ**	Batch ID: **R14846**	TestNo: **TO-15**		Analysis Date: **12/18/2007**	SeqNo: **214423**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloroethane	19.54	0.50	20	0	97.7	65	135				
Chloroform	19.35	0.50	20	0	96.8	65	135				
Chloromethane	21.09	0.50	20	0	105	65	135				
cis-1,2-dichloroethene	19.46	0.50	20	0	97.3	65	135				
cis-1,3-Dichloropropene	20.96	0.50	20	0	105	65	135				
Dibromochloromethane	21.27	0.50	20	0	106	65	135				
Ethyl Acetate	21.61	0.50	20	0	108	65	135				
Ethyl Benzene	20.20	0.50	20	0	101	65	135				
Freon 113	19.28	0.50	20	0	96.4	65	135				
Hexachlorobutadiene	16.93	0.50	20	0	84.6	65	135				
Hexane	20.21	1.0	20	0	101	65	135				
Isopropanol	21.59	4.0	20	0	108	65	135				
m,p-Xylene	41.21	0.50	40	0	103	65	135				
Methylene Chloride	21.19	1.0	20	0	106	65	135				
MTBE	20.51	0.50	20	0	103	65	135				
Naphthalene	17.83	5.0	20	0	89.2	65	135				
o-xylene	20.88	0.50	20	0	104	65	135				
Styrene	20.52	0.50	20	0	103	65	135				
Tetrachloroethene	20.79	0.50	20	0	104	65	135				
Toluene	20.78	0.50	20	0	104	65	135				
trans-1,2-Dichloroethene	19.65	0.50	20	0	98.2	65	135				
Trichloroethene	20.84	0.50	20	0	104	65	135				
Trichlorofluoromethane	20.91	0.50	20	0	105	65	135				
Vinyl Acetate	21.90	0.50	20	0	110	65	135				
Vinyl Chloride	20.14	0.50	20	0	101	65	135				
Surr: 4-Bromofluorobenzene	19.36	0	20	0	96.8	65	135				

Sample ID **LCSD**	SampType: **LCSD**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **12/19/2007**	RunNo: **14846**
Client ID: **ZZZZZ**	Batch ID: **R14846**	TestNo: **TO-15**		Analysis Date: **12/19/2007**	SeqNo: **214424**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

E	Value above quantitation range	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712078
Project: 717-3F /461 McGraw Ave, Livermore CA

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID **LCSD** SampType: **LCSD** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/19/2007** RunNo: **14846**
Client ID: **ZZZZZ** Batch ID: **R14846** TestNo: **TO-15** Analysis Date: **12/19/2007** SeqNo: **214424**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1 - Dichloroethene	20.00	0.50	20	0	100	65	135	20.58	2.86	30	
1,1,1,2-Tetrachloroethane	21.15	0.50	20	0	106	65	135	21.35	0.941	30	
1,1,1-Trichloroethane	20.05	0.50	20	0	100	65	135	19.38	3.40	30	
1,1,2,2-Tetrachloroethane	20.46	0.50	20	0	102	65	135	20.78	1.55	30	
1,1,2-Trichloroethane	21.21	0.50	20	0	106	65	135	21.57	1.68	30	
1,1-Dichloroethane	19.59	0.50	20	0	98.0	65	135	20.3	3.56	30	
1,2,4-Trichlorobenzene	17.85	0.50	20	0	89.2	65	135	18.11	1.45	30	
1,2,4-Trimethylbenzene	20.17	0.50	20	0	101	65	135	19.74	2.15	30	
1,2-Dibromoethane(Ethylene dibromide	20.57	0.50	20	0	103	65	135	20.22	1.72	30	
1,2-Dichlorobenzene	19.03	0.50	20	0	95.2	65	135	19.39	1.87	30	
1,2-Dichloroethane	22.23	0.50	20	0	111	65	135	21.7	2.41	30	
1,2-Dichloropropane	20.18	0.50	20	0	101	65	135	21.37	5.73	30	
1,2-dichlorotetrafluoroethane(F114)	17.03	0.50	20	0	85.2	65	135	15.3	10.7	30	
1,3,5-Trimethylbenzene	20.58	0.50	20	0	103	65	135	20.58	0	30	
1,3-Butadiene	19.75	0.50	20	0	98.8	65	135	20.64	4.41	30	
1,3-Dichlorobenzene	19.63	0.50	20	0	98.2	65	135	19.27	1.85	30	
1,4-Dichlorobenzene	19.63	0.50	20	0	98.2	65	135	19.27	1.85	30	
1,4-Dioxane	23.22	0.50	20	0	116	65	135	22.38	3.68	30	
2-Butanone (MEK)	20.95	0.50	20	0	105	65	135	21.93	4.57	30	
2-Hexanone	21.77	0.50	20	0	109	65	135	22.95	5.28	30	
4-Ethyl Toluene	20.60	0.50	20	0	103	65	135	20.9	1.45	30	
4-Methyl-2-Pentanone (MIBK)	22.71	0.50	20	0	114	65	135	22.26	2.00	30	
Acetone	21.93	4.0	20	0	110	65	135	23.19	5.59	30	
Benzene	19.58	0.50	20	0	97.9	65	135	20.12	2.72	30	
Benzyl Chloride	20.09	0.50	20	0	100	65	135	19.92	0.850	30	
Bromodichloromethane	22.38	0.50	20	0	112	65	135	21.52	3.92	30	
Bromoform	21.70	0.50	20	0	108	65	135	21.61	0.416	30	
Bromomethane	19.43	0.50	20	0	97.2	65	135	19.61	0.922	30	
Carbon Disulfide	19.87	0.50	20	0	99.4	65	135	20.97	5.39	30	
Carbon Tetrachloride	19.66	0.50	20	0	98.3	65	135	18.99	3.47	30	
Chlorobenzene	21.10	0.50	20	0	106	65	135	21.64	2.53	30	

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712078
Project: 717-3F /461 McGraw Ave, Livermore CA

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID **LCSD**	SampType: **LCSD**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **12/19/2007**	RunNo: **14846**
Client ID: **ZZZZZ**	Batch ID: **R14846**	TestNo: **TO-15**		Analysis Date: **12/19/2007**	SeqNo: **214424**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloroethane	15.37	0.50	20	0	76.8	65	135	19.54	23.9	30	
Chloroform	19.39	0.50	20	0	97.0	65	135	19.35	0.207	30	
Chloromethane	22.67	0.50	20	0	113	65	135	21.09	7.22	30	
cis-1,2-dichloroethene	19.71	0.50	20	0	98.6	65	135	19.46	1.28	30	
cis-1,3-Dichloropropene	22.11	0.50	20	0	111	65	135	20.96	5.34	30	
Dibromochloromethane	21.00	0.50	20	0	105	65	135	21.27	1.28	30	
Ethyl Acetate	20.75	0.50	20	0	104	65	135	21.61	4.06	30	
Ethyl Benzene	20.35	0.50	20	0	102	65	135	20.2	0.740	30	
Freon 113	20.15	0.50	20	0	101	65	135	19.28	4.41	30	
Hexachlorobutadiene	17.06	0.50	20	0	85.3	65	135	16.93	0.765	30	
Hexane	19.98	1.0	20	0	99.9	65	135	20.21	1.14	30	
Isopropanol	22.18	4.0	20	0	111	65	135	21.59	2.70	30	
m,p-Xylene	39.86	0.50	40	0	99.7	65	135	41.21	3.33	30	
Methylene Chloride	19.80	1.0	20	0	99.0	65	135	21.19	6.78	30	
MTBE	20.32	0.50	20	0	102	65	135	20.51	0.931	30	
Naphthalene	17.94	5.0	20	0	89.7	65	135	17.83	0.615	30	
o-xylene	19.86	0.50	20	0	99.3	65	135	20.88	5.01	30	
Styrene	20.46	0.50	20	0	102	65	135	20.52	0.293	30	
Tetrachloroethene	20.57	0.50	20	0	103	65	135	20.79	1.06	30	
Toluene	22.21	0.50	20	0	111	65	135	20.78	6.65	30	
trans-1,2-Dichloroethene	19.12	0.50	20	0	95.6	65	135	19.65	2.73	30	
Trichloroethene	21.18	0.50	20	0	106	65	135	20.84	1.62	30	
Trichlorofluoromethane	20.11	0.50	20	0	101	65	135	20.91	3.90	30	
Vinyl Acetate	20.96	0.50	20	0	105	65	135	21.9	4.39	30	
Vinyl Chloride	19.16	0.50	20	0	95.8	65	135	20.14	4.99	30	
Surr: 4-Bromofluorobenzene	19.80	0	20	0	99.0	65	135	0	0	30	

Qualifiers:

E	Value above quantitation range	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712078
Project: 717-3F /461 McGraw Ave, Livermore CA

ANALYTICAL QC SUMMARY REPORT

BatchID: R14857

Sample ID **MB2**	SampType: **MBLK**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **12/20/2007**	RunNo: **14857**
Client ID: **ZZZZZ**	Batch ID: **R14857**	TestNo: **TO-15**		Analysis Date: **12/20/2007**	SeqNo: **214513**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1 - Dichloroethene	ND	0.50									
1,1,1,2-Tetrachloroethane	ND	0.50									
1,1,1-Trichloroethane	ND	0.50									
1,1,2,2-Tetrachloroethane	ND	0.50									
1,1,2-Trichloroethane	ND	0.50									
1,1-Dichloroethane	ND	0.50									
1,2,4-Trichlorobenzene	ND	0.50									
1,2,4-Trimethylbenzene	ND	0.50									
1,2-Dibromoethane(Ethylene dibromide	ND	0.50									
1,2-Dichlorobenzene	ND	0.50									
1,2-Dichloroethane	ND	0.50									
1,2-Dichloropropane	ND	0.50									
1,2-dichlorotetrafluoroethane(F114)	ND	0.50									
1,3,5-Trimethylbenzene	ND	0.50									
1,3-Butadiene	ND	0.50									
1,3-Dichlorobenzene	ND	0.50									
1,4-Dichlorobenzene	ND	0.50									
1,4-Dioxane	ND	0.50									
2-Butanone (MEK)	ND	0.50									
2-Hexanone	ND	0.50									
4-Ethyl Toluene	ND	0.50									
4-Methyl-2-Pentanone (MIBK)	ND	0.50									
Acetone	ND	4.0									
Benzene	ND	0.50									
Benzyl Chloride	ND	0.50									
Bromodichloromethane	ND	0.50									
Bromoform	ND	0.50									
Bromomethane	ND	0.50									
Carbon Disulfide	ND	0.50									
Carbon Tetrachloride	ND	0.50									
Chlorobenzene	ND	0.50									

Qualifiers:
E Value above quantitation range
ND Not Detected at the Reporting Limit
H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits
J Analyte detected below quantitation limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712078
Project: 717-3F /461 McGraw Ave, Livermore CA

ANALYTICAL QC SUMMARY REPORT

BatchID: R14857

Sample ID **MB2**	SampType: **MBLK**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **12/20/2007**	RunNo: **14857**
Client ID: **ZZZZZ**	Batch ID: **R14857**	TestNo: **TO-15**		Analysis Date: **12/20/2007**	SeqNo: **214513**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloroethane	ND	0.50									
Chloroform	ND	0.50									
Chloromethane	ND	0.50									
cis-1,2-dichloroethene	ND	0.50									
cis-1,3-Dichloropropene	ND	0.50									
Dibromochloromethane	ND	0.50									
Dichlorodifluoromethane	ND	0.50									
Ethyl Acetate	ND	0.50									
Ethyl Benzene	ND	0.50									
Freon 113	ND	0.50									
Hexachlorobutadiene	ND	0.50									
Hexane	ND	1.0									
Isopropanol	ND	4.0									
m,p-Xylene	ND	0.50									
Methylene Chloride	ND	1.0									
MTBE	ND	0.50									
Naphthalene	ND	5.0									
o-xylene	ND	0.50									
Styrene	ND	0.50									
Tetrachloroethene	ND	0.50									
Tetrahydrofuran	ND	0.50									
Toluene	ND	0.50									
trans-1,2-Dichloroethene	ND	0.50									
Trichloroethene	ND	0.50									
Trichlorofluoromethane	ND	0.50									
Vinyl Acetate	ND	0.50									
Vinyl Chloride	ND	0.50									
Surr: 4-Bromofluorobenzene	19.29	0	20	0	96.5	65	135				

Qualifiers:

E	Value above quantitation range	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712078
Project: 717-3F /461 McGraw Ave, Livermore CA

ANALYTICAL QC SUMMARY REPORT

BatchID: R14857

Sample ID **LCS2**	SampType: **LCS**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **12/20/2007**	RunNo: **14857**
Client ID: **ZZZZZ**	Batch ID: **R14857**	TestNo: **TO-15**		Analysis Date: **12/20/2007**	SeqNo: **214514**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1 - Dichloroethene	20.59	0.50	20	0	103	65	135				
1,1,1,2-Tetrachloroethane	22.59	0.50	20	0	113	65	135				
1,1,1-Trichloroethane	20.58	0.50	20	0	103	65	135				
1,1,2,2-Tetrachloroethane	22.30	0.50	20	0	112	65	135				
1,1,2-Trichloroethane	23.52	0.50	20	0	118	65	135				
1,1-Dichloroethane	20.37	0.50	20	0	102	65	135				
1,2,4-Trichlorobenzene	19.25	0.50	20	0	96.2	65	135				
1,2,4-Trimethylbenzene	21.31	0.50	20	0	107	65	135				
1,2-Dibromoethane(Ethylene dibromide	21.86	0.50	20	0	109	65	135				
1,2-Dichlorobenzene	20.81	0.50	20	0	104	65	135				
1,2-Dichloroethane	21.46	0.50	20	0	107	65	135				
1,2-Dichloropropane	19.06	0.50	20	0	95.3	65	135				
1,2-dichlorotetrafluoroethane(F114)	20.79	0.50	20	0	104	65	135				
1,3,5-Trimethylbenzene	22.27	0.50	20	0	111	65	135				
1,3-Butadiene	21.03	0.50	20	0	105	65	135				
1,3-Dichlorobenzene	20.96	0.50	20	0	105	65	135				
1,4-Dichlorobenzene	20.96	0.50	20	0	105	65	135				
1,4-Dioxane	21.97	0.50	20	0	110	65	135				
2-Butanone (MEK)	21.62	0.50	20	0	108	65	135				
2-Hexanone	23.18	0.50	20	0	116	65	135				
4-Ethyl Toluene	22.09	0.50	20	0	110	65	135				
4-Methyl-2-Pentanone (MIBK)	22.77	0.50	20	0	114	65	135				
Acetone	22.22	4.0	20	0	111	65	135				
Benzene	21.48	0.50	20	0	107	65	135				
Benzyl Chloride	21.00	0.50	20	0	105	65	135				
Bromodichloromethane	21.90	0.50	20	0	110	65	135				
Bromoform	24.06	0.50	20	0	120	65	135				
Bromomethane	20.11	0.50	20	0	101	65	135				
Carbon Disulfide	20.75	0.50	20	0	104	65	135				
Carbon Tetrachloride	20.29	0.50	20	0	101	65	135				
Chlorobenzene	22.54	0.50	20	0	113	65	135				

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712078
Project: 717-3F /461 McGraw Ave, Livermore CA

ANALYTICAL QC SUMMARY REPORT

BatchID: R14857

Sample ID **LCS2** SampType: **LCS** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/20/2007** RunNo: **14857**
Client ID: **ZZZZZ** Batch ID: **R14857** TestNo: **TO-15** Analysis Date: **12/20/2007** SeqNo: **214514**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloroethane	21.26	0.50	20	0	106	65	135				
Chloroform	19.28	0.50	20	0	96.4	65	135				
Chloromethane	27.03	0.50	20	0	135	65	135				
cis-1,2-dichloroethene	20.38	0.50	20	0	102	65	135				
cis-1,3-Dichloropropene	21.66	0.50	20	0	108	65	135				
Dibromochloromethane	22.83	0.50	20	0	114	65	135				
Ethyl Acetate	21.58	0.50	20	0	108	65	135				
Ethyl Benzene	21.69	0.50	20	0	108	65	135				
Freon 113	20.48	0.50	20	0	102	65	135				
Hexachlorobutadiene	18.71	0.50	20	0	93.6	65	135				
Hexane	21.12	1.0	20	0	106	65	135				
Isopropanol	24.11	4.0	20	0	121	65	135				
m,p-Xylene	43.57	0.50	40	0	109	65	135				
Methylene Chloride	21.59	1.0	20	0	108	65	135				
MTBE	20.48	0.50	20	0	102	65	135				
Naphthalene	19.39	5.0	20	0	97.0	65	135				
o-xylene	20.57	0.50	20	0	103	65	135				
Styrene	21.84	0.50	20	0	109	65	135				
Tetrachloroethene	22.59	0.50	20	0.36	111	65	135				
Toluene	21.86	0.50	20	0	109	65	135				
trans-1,2-Dichloroethene	19.85	0.50	20	0	99.2	65	135				
Trichloroethene	21.47	0.50	20	0	107	65	135				
Trichlorofluoromethane	21.26	0.50	20	0	106	65	135				
Vinyl Acetate	20.86	0.50	20	0	104	65	135				
Vinyl Chloride	20.64	0.50	20	0	103	65	135				
Surr: 4-Bromofluorobenzene	20.44	0	20	0	102	65	135				

Sample ID **LCSD2** SampType: **LCSD** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/21/2007** RunNo: **14857**
Client ID: **ZZZZZ** Batch ID: **R14857** TestNo: **TO-15** Analysis Date: **12/21/2007** SeqNo: **214515**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712078
Project: 717-3F /461 McGraw Ave, Livermore CA

ANALYTICAL QC SUMMARY REPORT

BatchID: R14857

Sample ID **LCSD2** SampType: **LCSD** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/21/2007** RunNo: **14857**
Client ID: **ZZZZZ** Batch ID: **R14857** TestNo: **TO-15** Analysis Date: **12/21/2007** SeqNo: **214515**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1 - Dichloroethene	21.47	0.50	20	0	107	65	135	20.59	4.18	30	
1,1,1,2-Tetrachloroethane	21.77	0.50	20	0	109	65	135	22.59	3.70	30	
1,1,1-Trichloroethane	20.90	0.50	20	0	104	65	135	20.58	1.54	30	
1,1,2,2-Tetrachloroethane	22.36	0.50	20	0	112	65	135	22.3	0.269	30	
1,1,2-Trichloroethane	22.82	0.50	20	0	114	65	135	23.52	3.02	30	
1,1-Dichloroethane	21.78	0.50	20	0	109	65	135	20.37	6.69	30	
1,2,4-Trichlorobenzene	19.47	0.50	20	0	97.4	65	135	19.25	1.14	30	
1,2,4-Trimethylbenzene	20.38	0.50	20	0	102	65	135	21.31	4.46	30	
1,2-Dibromoethane(Ethylene dibromide	21.68	0.50	20	0	108	65	135	21.86	0.827	30	
1,2-Dichlorobenzene	20.83	0.50	20	0	104	65	135	20.81	0.0961	30	
1,2-Dichloroethane	23.61	0.50	20	0	118	65	135	21.46	9.54	30	
1,2-Dichloropropane	18.08	0.50	20	0	90.4	65	135	19.06	5.28	30	
1,2-dichlorotetrafluoroethane(F114)	18.77	0.50	20	0	93.8	65	135	20.79	10.2	30	
1,3,5-Trimethylbenzene	20.88	0.50	20	0	104	65	135	22.27	6.44	30	
1,3-Butadiene	22.13	0.50	20	0	111	65	135	21.03	5.10	30	
1,3-Dichlorobenzene	20.73	0.50	20	0	104	65	135	20.96	1.10	30	
1,4-Dichlorobenzene	20.73	0.50	20	0	104	65	135	20.96	1.10	30	
1,4-Dioxane	22.09	0.50	20	0	110	65	135	21.97	0.545	30	
2-Butanone (MEK)	23.00	0.50	20	0	115	65	135	21.62	6.19	30	
2-Hexanone	23.30	0.50	20	0	116	65	135	23.18	0.516	30	
4-Ethyl Toluene	20.90	0.50	20	0	104	65	135	22.09	5.54	30	
4-Methyl-2-Pentanone (MIBK)	23.08	0.50	20	0	115	65	135	22.77	1.35	30	
Acetone	25.93	4.0	20	0	130	65	135	22.22	15.4	30	
Benzene	20.47	0.50	20	0	102	65	135	21.48	4.82	30	
Benzyl Chloride	20.44	0.50	20	0	102	65	135	21	2.70	30	
Bromodichloromethane	22.73	0.50	20	0	114	65	135	21.9	3.72	30	
Bromoform	22.37	0.50	20	0	112	65	135	24.06	7.28	30	
Bromomethane	21.64	0.50	20	0	108	65	135	20.11	7.33	30	
Carbon Disulfide	21.89	0.50	20	0	109	65	135	20.75	5.35	30	
Carbon Tetrachloride	21.08	0.50	20	0	105	65	135	20.29	3.82	30	
Chlorobenzene	22.59	0.50	20	0	113	65	135	22.54	0.222	30	

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712078
Project: 717-3F /461 McGraw Ave, Livermore CA

ANALYTICAL QC SUMMARY REPORT

BatchID: R14857

Sample ID **LCSD2**	SampType: **LCSD**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **12/21/2007**	RunNo: **14857**
Client ID: **ZZZZZ**	Batch ID: **R14857**	TestNo: **TO-15**		Analysis Date: **12/21/2007**	SeqNo: **214515**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloroethane	20.05	0.50	20	0	100	65	135	21.26	5.86	30	
Chloroform	19.85	0.50	20	0	99.2	65	135	19.28	2.91	30	
Chloromethane	22.74	0.50	20	0	114	65	135	27.03	17.2	30	
cis-1,2-dichloroethene	21.01	0.50	20	0	105	65	135	20.38	3.04	30	
cis-1,3-Dichloropropene	21.58	0.50	20	0	108	65	135	21.66	0.370	30	
Dibromochloromethane	23.07	0.50	20	0	115	65	135	22.83	1.05	30	
Ethyl Acetate	22.45	0.50	20	0	112	65	135	21.58	3.95	30	
Ethyl Benzene	21.29	0.50	20	0	106	65	135	21.69	1.86	30	
Freon 113	21.01	0.50	20	0	105	65	135	20.48	2.55	30	
Hexachlorobutadiene	19.30	0.50	20	0	96.5	65	135	18.71	3.10	30	
Hexane	20.84	1.0	20	0	104	65	135	21.12	1.33	30	
Isopropanol	23.68	4.0	20	0	118	65	135	24.11	1.80	30	
m,p-Xylene	44.23	0.50	40	0	111	65	135	43.57	1.50	30	
Methylene Chloride	22.11	1.0	20	0	111	65	135	21.59	2.38	30	
MTBE	22.09	0.50	20	0	110	65	135	20.48	7.56	30	
Naphthalene	19.17	5.0	20	0	95.8	65	135	19.39	1.14	30	
o-xylene	21.92	0.50	20	0	110	65	135	20.57	6.35	30	
Styrene	21.87	0.50	20	0	109	65	135	21.84	0.137	30	
Tetrachloroethene	22.16	0.50	20	0.36	109	65	135	22.59	1.92	30	
Toluene	21.15	0.50	20	0	106	65	135	21.86	3.30	30	
trans-1,2-Dichloroethene	20.21	0.50	20	0	101	65	135	19.85	1.80	30	
Trichloroethene	21.40	0.50	20	0	107	65	135	21.47	0.327	30	
Trichlorofluoromethane	22.29	0.50	20	0	111	65	135	21.26	4.73	30	
Vinyl Acetate	19.43	0.50	20	0	97.2	65	135	20.86	7.10	30	
Vinyl Chloride	22.03	0.50	20	0	110	65	135	20.64	6.52	30	
Surr: 4-Bromofluorobenzene	19.49	0	20	0	97.5	65	135	0	0	30	

Qualifiers:

E	Value above quantitation range	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike Recovery outside accepted recovery limits

Torrent LABORATORY, INC.
483 Sinclair Frontage Road
Milpitas, CA 95035
Phone: 408.263.5258
FAX: 408.263.8293
www.torrentlab.com

CHAIN OF CUSTODY

• NOTE: SHADED AREAS ARE FOR TORRENT LAB USE ONLY •

LAB WORK ORDER NO: 071207E

Company Name: Environmental Investigation Services	Location of Sampling: 461 McGraw Ave. Livermore CA
Address: 170 Knowles Drive, Suite 212	Purpose:
City: Los Gatos State: CA Zip Code: 95032	Special Instructions / Comments:
Telephone: 408 871 1470 FAX: 408 871 1520	
REPORT TO: Peter Littman SAMPLER: Pan + Em	P.O. #: 717-3F EMAIL: plittman@eisi.net

TURNAROUND TIME: ☐ 10 Work Days ☐ 3 Work Days ☐ Noon - Nxt Day ☐ 7 Work Days ☐ 2 Work Days ☐ 2 - 8 Hours ☒ 5 Work Days ☐ 1 Work Day ☐ Other

SAMPLE TYPE: ☐ Storm Water ☒ Air ☐ Waste Water ☐ Other ☐ Ground Water ☐ Soil

REPORT FORMAT: ☐ QC Level IV ☒ EDF ☒ Excel / EDD

ANALYSIS REQUESTED

LAB ID	CLIENT'S SAMPLE I.D.	DATE / TIME SAMPLED	MATRIX	# OF CONT	CONT TYPE	EPA 8260B - Full List ☐ EPA 8260B - 8010 List ☐	THP gas ☐ BTEX ☐ Oxygenates ☐ MTBE ☐	THP Diesel ☐ Si-Gel ☐ Motor Oil ☐	Pesticide - 8081 ☐	PCB - 8082 ☐	Metals ☐ CAM - 17 ☐ LUFT 5 ☐ 7 Metals ☐	8270 Full List ☐ PAHs Only ☐	TO-15		REMARKS
01A	SG-9@4'A	9:45 12/15/07	Gas	1	Summa								X		
02A	SG-7B	9:55	"	1	"								X		
03A	SG-22	10:25	"	1	"								X		
04A	SG-24	10:31	"	1	"								X		
05A	SG-23	10:55	"	1	"								X		
06A	SG-17	11:20	"	1	"								X		
07A	SG-16	11:34	"	1	"								X		
08A	SG-19	11:35	"	1	"								X		
09A	SG-14@4'	10 22													
10A	SG-14@8'A	10 08													

TORRENT LAB

	Relinquished By:	Print:	Date:	Time:	Received By:	Print:	Date:	Time:
1	[signature]	PANINDER	12/15/07	2:00	[signature]		12/15/07	14:45
2	Relinquished By:	Print:	Date:	Time:	Received By:	Print:	Date:	Time:

Were Samples Received in Good Condition? ☐ Yes ☐ NO Samples on Ice? ☐ Yes ☒ NO Method of Shipment _____ Sample seals intact? ☐ Yes ☐ NO ☐ N/A

NOTE: Samples are discarded by the laboratory 30 days from date of receipt unless other arrangements are made.

Page 1 of 1

Log In By: _____ Date: _____ Log In Reviewed By: _____ Date: _____

Torrent
LABORATORY, INC.

December 26, 2007

Peter Littman
Environmental Investigation Services
170 Knowles Drive,Suite 212
Los Gatos, CA 95032

TEL: (408) 871-1470
FAX (408) 871-1520

RE: 717-3F

Order No.: 0712087

Dear Peter Littman:

Torrent Laboratory, Inc. received 8 samples on 12/14/2007 for the analyses presented in the following report.

All data for associated QC met EPA or laboratory specification(s) except where noted in the case narrative.

Torrent Laboratory, Inc, is certified by the State of California, ELAP #1991. If you have any questions regarding these tests results, please feel free to contact the Project Management Team at (408)263-5258;ext: 204.

Sincerely,

Laboratory Director 12/26/07 Date

TORRENT LABORATORY, INC.

483 Sinclair Frontage Road * Milpitas, CA * Phone: (408) 2635258 * Fax: (408) 263-8293
Visit us ar www.torrentlab.com email: analysis@torrentlab.com

Report Prepaired For: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported: 12/26/2007

Summary Report

SG-21 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712087-001A**

Parameter	Preped	Analyzed	Result	RL	Unit
2-Butanone (MEK)	12/18/2007	12/18/2007	7.5	1.5	µg/m³
Acetone	12/18/2007	12/18/2007	180	9.5	µg/m³
Isopropanol	12/18/2007	12/18/2007	35	16	µg/m³
m,p-Xylene	12/18/2007	12/18/2007	7.3	2.0	µg/m³
Tetrachloroethene	12/19/2007	12/19/2007	4100	68	µg/m³
Toluene	12/18/2007	12/18/2007	150	1.9	µg/m³
Trichlorofluoromethane	12/18/2007	12/18/2007	260	2.5	µg/m³

SG-11 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712087-002A**

Parameter	Preped	Analyzed	Result	RL	Unit
Acetone	12/18/2007	12/18/2007	71	9.5	µg/m³
Benzene	12/18/2007	12/18/2007	3.3	1.6	µg/m³
Hexane	12/18/2007	12/18/2007	30	3.5	µg/m³
Isopropanol	12/19/2007	12/19/2007	420	82	µg/m³
m,p-Xylene	12/18/2007	12/18/2007	9.2	2.0	µg/m³
Toluene	12/18/2007	12/18/2007	16	1.9	µg/m³

SG-12 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712087-003A**

Parameter	Preped	Analyzed	Result	RL	Unit
Acetone	12/19/2007	12/19/2007	11	9.5	µg/m³
Benzene	12/19/2007	12/19/2007	1.7	1.6	µg/m³
m,p-Xylene	12/19/2007	12/19/2007	5.2	2.0	µg/m³
Methylene Chloride	12/19/2007	12/19/2007	34	3.6	µg/m³
Toluene	12/19/2007	12/19/2007	3.5	1.9	µg/m³

SG-13 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712087-004A**

Parameter	Preped	Analyzed	Result	RL	Unit
1,2,4-Trimethylbenzene	12/18/2007	12/18/2007	2.6	2.5	µg/m³
2-Butanone (MEK)	12/18/2007	12/18/2007	7.8	1.5	µg/m³
Acetone	12/18/2007	12/18/2007	28	9.5	µg/m³
Benzene	12/18/2007	12/18/2007	9.3	1.6	µg/m³
m,p-Xylene	12/18/2007	12/18/2007	5.7	2.0	µg/m³

TORRENT LABORATORY, INC.

483 Sinclair Frontage Road * Milpitas, CA * Phone: (408) 2635258 * Fax: (408) 263-8293
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Report Prepaired For: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported: 12/26/2007

Summary Report

SG-13 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712087-004A**

Parameter	Preped	Analyzed	Result	RL	Unit
Tetrachloroethene	12/18/2007	12/18/2007	4300	170	µg/m³
Toluene	12/18/2007	12/18/2007	7.0	1.9	µg/m³
Trichlorofluoromethane	12/18/2007	12/18/2007	1100	120	µg/m³

SG-20 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712087-005A**

Parameter	Preped	Analyzed	Result	RL	Unit
Acetone	12/18/2007	12/18/2007	32	9.5	µg/m³
Benzene	12/18/2007	12/18/2007	2.3	1.6	µg/m³
m,p-Xylene	12/18/2007	12/18/2007	4.7	2.0	µg/m³
Tetrachloroethene	12/18/2007	12/18/2007	190	3.4	µg/m³
Toluene	12/18/2007	12/18/2007	3.3	1.9	µg/m³
Trichlorofluoromethane	12/18/2007	12/18/2007	84	2.5	µg/m³

SG-15 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712087-006A**

Parameter	Preped	Analyzed	Result	RL	Unit
2-Butanone (MEK)	12/18/2007	12/18/2007	10	1.5	µg/m³
Acetone	12/18/2007	12/18/2007	56	9.5	µg/m³
Benzene	12/18/2007	12/18/2007	4.1	1.6	µg/m³
Carbon Disulfide	12/18/2007	12/18/2007	4.2	1.6	µg/m³
m,p-Xylene	12/18/2007	12/18/2007	7.2	2.0	µg/m³
Tetrachloroethene	12/18/2007	12/18/2007	59	3.4	µg/m³
Toluene	12/18/2007	12/18/2007	8.0	1.9	µg/m³
Trichlorofluoromethane	12/18/2007	12/18/2007	290	25	µg/m³

SG-18 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712087-007A**

Parameter	Preped	Analyzed	Result	RL	Unit
Acetone	12/18/2007	12/18/2007	55	9.5	µg/m³
Benzene	12/18/2007	12/18/2007	3.1	1.6	µg/m³
m,p-Xylene	12/18/2007	12/18/2007	7.1	2.0	µg/m³
Tetrachloroethene	12/18/2007	12/18/2007	16	3.4	µg/m³
Toluene	12/18/2007	12/18/2007	8.4	1.9	µg/m³
Trichlorofluoromethane	12/18/2007	12/18/2007	76	25	µg/m³

TORRENT LABORATORY, INC.

483 Sinclair Frontage Road * Milpitas, CA * Phone: (408) 2635258 * Fax: (408) 263-8293
Visit us ar www.torrentlab.com email: analysis@torrentlab.com

Report Prepaired For: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported: 12/26/2007

Summary Report

SG-10 **Toxic Organics in Air by EPA TO-15** **Lab ID: 0712087-008A**

Parameter	Preped	Analyzed	Result	RL	Unit
1,2,4-Trimethylbenzene	12/18/2007	12/18/2007	4.0	2.5	µg/m³
2-Butanone (MEK)	12/18/2007	12/18/2007	7.5	1.5	µg/m³
Acetone	12/18/2007	12/18/2007	23	9.5	µg/m³
Benzene	12/18/2007	12/18/2007	3.5	1.6	µg/m³
m,p-Xylene	12/18/2007	12/18/2007	9.0	2.0	µg/m³
o-xylene	12/18/2007	12/18/2007	2.7	2.2	µg/m³
Tetrachloroethene	12/18/2007	12/18/2007	4600	340	µg/m³
Toluene	12/18/2007	12/18/2007	2.5	1.9	µg/m³
Trichloroethene	12/18/2007	12/18/2007	21	2.7	µg/m³
Trichlorofluoromethane	12/18/2007	12/18/2007	330	250	µg/m³

TORRENT LABORATORY, INC.

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Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported:

Client Sample ID: SG-21
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 1:30:00 PM

Lab Sample ID: 0712087-001
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/18/2007	1.99	1	2.0	ND	µg/m³	R14846
1,1,1,2-Tetrachloroethane	TO-15	12/18/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,1-Trichloroethane	TO-15	12/18/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1,2,2-Tetrachloroethane	TO-15	12/18/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,2-Trichloroethane	TO-15	12/18/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1-Dichloroethane	TO-15	12/18/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2,4-Trichlorobenzene	TO-15	12/18/2007	3.56	1	3.6	ND	µg/m³	R14846
1,2,4-Trimethylbenzene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14846
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/18/2007	3.84	1	3.8	ND	µg/m³	R14846
1,2-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14846
1,2-Dichloroethane	TO-15	12/18/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2-Dichloropropane	TO-15	12/18/2007	2.31	1	2.3	ND	µg/m³	R14846
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/18/2007	3.13	1	3.1	ND	µg/m³	R14846
1,3,5-Trimethylbenzene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14846
1,3-Butadiene	TO-15	12/18/2007	1.11	1	1.1	ND	µg/m³	R14846
1,3-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dioxane	TO-15	12/18/2007	1.8	1	1.8	ND	µg/m³	R14846
2-Butanone (MEK)	TO-15	12/18/2007	1.48	1	1.5	7.5	µg/m³	R14846
2-Hexanone	TO-15	12/18/2007	2.05	1	2.0	ND	µg/m³	R14846
4-Ethyl Toluene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14846
4-Methyl-2-Pentanone (MIBK)	TO-15	12/18/2007	2.05	1	2.0	ND	µg/m³	R14846
Acetone	TO-15	12/18/2007	9.52	1	9.5	180	µg/m³	R14846
Benzene	TO-15	12/18/2007	1.6	1	1.6	ND	µg/m³	R14846
Benzyl Chloride	TO-15	12/18/2007	2.88	1	2.9	ND	µg/m³	R14846
Bromodichloromethane	TO-15	12/18/2007	3.35	1	3.4	ND	µg/m³	R14846
Bromoform	TO-15	12/18/2007	5.17	1	5.2	ND	µg/m³	R14846
Bromomethane	TO-15	12/18/2007	1.94	1	1.9	ND	µg/m³	R14846
Carbon Disulfide	TO-15	12/18/2007	1.56	1	1.6	ND	µg/m³	R14846
Carbon Tetrachloride	TO-15	12/18/2007	3.15	1	3.2	ND	µg/m³	R14846
Chlorobenzene	TO-15	12/18/2007	2.3	1	2.3	ND	µg/m³	R14846
Chloroethane	TO-15	12/18/2007	1.32	1	1.3	ND	µg/m³	R14846
Chloroform	TO-15	12/18/2007	2.44	1	2.4	ND	µg/m³	R14846
Chloromethane	TO-15	12/18/2007	1.04	1	1.0	ND	µg/m³	R14846
cis-1,2-dichloroethene	TO-15	12/18/2007	1.98	1	2.0	ND	µg/m³	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported:

Client Sample ID: SG-21
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 1:30:00 PM

Lab Sample ID: 0712087-001
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
cis-1,3-Dichloropropene	TO-15	12/18/2007	2.27	1	2.3	ND	µg/m³	R14846
Dibromochloromethane	TO-15	12/18/2007	4.26	1	4.3	ND	µg/m³	R14846
Dichlorodifluoromethane	TO-15	12/18/2007	2.48	1	2.5	ND	µg/m³	R14846
Ethyl Acetate	TO-15	12/18/2007	1.8	1	1.8	ND	µg/m³	R14846
Ethyl Benzene	TO-15	12/18/2007	1.67	1	1.7	ND	µg/m³	R14846
Freon 113	TO-15	12/18/2007	3.83	1	3.8	ND	µg/m³	R14846
Hexachlorobutadiene	TO-15	12/18/2007	5.34	1	5.3	ND	µg/m³	R14846
Hexane	TO-15	12/18/2007	3.52	1	3.5	ND	µg/m³	R14846
Isopropanol	TO-15	12/18/2007	16.4	1	16	35	µg/m³	R14846
m,p-Xylene	TO-15	12/18/2007	2.05	1	2.0	7.3	µg/m³	R14846
Methylene Chloride	TO-15	12/18/2007	3.61	1	3.6	ND	µg/m³	R14846
MTBE	TO-15	12/18/2007	1.81	1	1.8	ND	µg/m³	R14846
Naphthalene	TO-15	12/18/2007	2.62	1	2.6	ND	µg/m³	R14846
o-xylene	TO-15	12/18/2007	2.17	1	2.2	ND	µg/m³	R14846
Styrene	TO-15	12/18/2007	2.13	1	2.1	ND	µg/m³	R14846
Tetrachloroethene	TO-15	12/19/2007	3.39	20	68	4100	µg/m³	R14846
Tetrahydrofuran	TO-15	12/18/2007	1.48	1	1.5	ND	µg/m³	R14846
Toluene	TO-15	12/18/2007	1.89	1	1.9	150	µg/m³	R14846
trans-1,2-Dichloroethene	TO-15	12/18/2007	1.98	1	2.0	ND	µg/m³	R14846
Trichloroethene	TO-15	12/18/2007	2.69	1	2.7	ND	µg/m³	R14846
Trichlorofluoromethane	TO-15	12/18/2007	2.48	1	2.5	260	µg/m³	R14846
Vinyl Acetate	TO-15	12/18/2007	1.76	1	1.8	ND	µg/m³	R14846
Vinyl Chloride	TO-15	12/18/2007	1.28	1	1.3	ND	µg/m³	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/19/2007	0	20	65-135	99.9	%REC	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/18/2007	0	1	65-135	93.2	%REC	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported:

Client Sample ID: SG-11
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 11:30:00 AM

Lab Sample ID: 0712087-002
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/18/2007	1.99	1	2.0	ND	µg/m³	R14846
1,1,1,2-Tetrachloroethane	TO-15	12/18/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,1-Trichloroethane	TO-15	12/18/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1,2,2-Tetrachloroethane	TO-15	12/18/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,2-Trichloroethane	TO-15	12/18/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1-Dichloroethane	TO-15	12/18/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2,4-Trichlorobenzene	TO-15	12/18/2007	3.56	1	3.6	ND	µg/m³	R14846
1,2,4-Trimethylbenzene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14846
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/18/2007	3.84	1	3.8	ND	µg/m³	R14846
1,2-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14846
1,2-Dichloroethane	TO-15	12/18/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2-Dichloropropane	TO-15	12/18/2007	2.31	1	2.3	ND	µg/m³	R14846
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/18/2007	3.13	1	3.1	ND	µg/m³	R14846
1,3,5-Trimethylbenzene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14846
1,3-Butadiene	TO-15	12/18/2007	1.11	1	1.1	ND	µg/m³	R14846
1,3-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dioxane	TO-15	12/18/2007	1.8	1	1.8	ND	µg/m³	R14846
2-Butanone (MEK)	TO-15	12/18/2007	1.48	1	1.5	ND	µg/m³	R14846
2-Hexanone	TO-15	12/18/2007	2.05	1	2.0	ND	µg/m³	R14846
4-Ethyl Toluene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14846
4-Methyl-2-Pentanone (MIBK)	TO-15	12/18/2007	2.05	1	2.0	ND	µg/m³	R14846
Acetone	TO-15	12/18/2007	9.52	1	9.5	71	µg/m³	R14846
Benzene	TO-15	12/18/2007	1.6	1	1.6	3.3	µg/m³	R14846
Benzyl Chloride	TO-15	12/18/2007	2.88	1	2.9	ND	µg/m³	R14846
Bromodichloromethane	TO-15	12/18/2007	3.35	1	3.4	ND	µg/m³	R14846
Bromoform	TO-15	12/18/2007	5.17	1	5.2	ND	µg/m³	R14846
Bromomethane	TO-15	12/18/2007	1.94	1	1.9	ND	µg/m³	R14846
Carbon Disulfide	TO-15	12/18/2007	1.56	1	1.6	ND	µg/m³	R14846
Carbon Tetrachloride	TO-15	12/18/2007	3.15	1	3.2	ND	µg/m³	R14846
Chlorobenzene	TO-15	12/18/2007	2.3	1	2.3	ND	µg/m³	R14846
Chloroethane	TO-15	12/18/2007	1.32	1	1.3	ND	µg/m³	R14846
Chloroform	TO-15	12/18/2007	2.44	1	2.4	ND	µg/m³	R14846
Chloromethane	TO-15	12/18/2007	1.04	1	1.0	ND	µg/m³	R14846
cis-1,2-dichloroethene	TO-15	12/18/2007	1.98	1	2.0	ND	µg/m³	R14846
cis-1,3-Dichloropropene	TO-15	12/18/2007	2.27	1	2.3	ND	µg/m³	R14846
Dibromochloromethane	TO-15	12/18/2007	4.26	1	4.3	ND	µg/m³	R14846
Dichlorodifluoromethane	TO-15	12/18/2007	2.48	1	2.5	ND	µg/m³	R14846
Ethyl Acetate	TO-15	12/18/2007	1.8	1	1.8	ND	µg/m³	R14846
Ethyl Benzene	TO-15	12/18/2007	1.67	1	1.7	ND	µg/m³	R14846
Freon 113	TO-15	12/18/2007	3.83	1	3.8	ND	µg/m³	R14846
Hexachlorobutadiene	TO-15	12/18/2007	5.34	1	5.3	ND	µg/m³	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported:

Client Sample ID: SG-11
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 11:30:00 AM

Lab Sample ID: 0712087-002
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/18/2007	3.52	1	3.5	30	µg/m³	R14846
Isopropanol	TO-15	12/19/2007	16.4	5	82	420	µg/m³	R14846
m,p-Xylene	TO-15	12/18/2007	2.05	1	2.0	9.2	µg/m³	R14846
Methylene Chloride	TO-15	12/18/2007	3.61	1	3.6	ND	µg/m³	R14846
MTBE	TO-15	12/18/2007	1.81	1	1.8	ND	µg/m³	R14846
Naphthalene	TO-15	12/18/2007	2.62	1	2.6	ND	µg/m³	R14846
o-xylene	TO-15	12/18/2007	2.17	1	2.2	ND	µg/m³	R14846
Styrene	TO-15	12/18/2007	2.13	1	2.1	ND	µg/m³	R14846
Tetrachloroethene	TO-15	12/18/2007	3.39	1	3.4	ND	µg/m³	R14846
Tetrahydrofuran	TO-15	12/18/2007	1.48	1	1.5	ND	µg/m³	R14846
Toluene	TO-15	12/18/2007	1.89	1	1.9	16	µg/m³	R14846
trans-1,2-Dichloroethene	TO-15	12/18/2007	1.98	1	2.0	ND	µg/m³	R14846
Trichloroethene	TO-15	12/18/2007	2.69	1	2.7	ND	µg/m³	R14846
Trichlorofluoromethane	TO-15	12/18/2007	2.48	1	2.5	ND	µg/m³	R14846
Vinyl Acetate	TO-15	12/18/2007	1.76	1	1.8	ND	µg/m³	R14846
Vinyl Chloride	TO-15	12/18/2007	1.28	1	1.3	ND	µg/m³	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/18/2007	0	1	65-135	95.0	%REC	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/19/2007	0	5	65-135	99.0	%REC	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported:

Client Sample ID: SG-12
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 11:40:00 AM

Lab Sample ID: 0712087-003
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/19/2007	1.99	1	2.0	ND	µg/m³	R14846
1,1,1,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,1-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1,2,2-Tetrachloroethane	TO-15	12/19/2007	3.44	1	3.4	ND	µg/m³	R14846
1,1,2-Trichloroethane	TO-15	12/19/2007	2.73	1	2.7	ND	µg/m³	R14846
1,1-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2,4-Trichlorobenzene	TO-15	12/19/2007	3.56	1	3.6	ND	µg/m³	R14846
1,2,4-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/19/2007	3.84	1	3.8	ND	µg/m³	R14846
1,2-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,2-Dichloroethane	TO-15	12/19/2007	2.03	1	2.0	ND	µg/m³	R14846
1,2-Dichloropropane	TO-15	12/19/2007	2.31	1	2.3	ND	µg/m³	R14846
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/19/2007	3.13	1	3.1	ND	µg/m³	R14846
1,3,5-Trimethylbenzene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
1,3-Butadiene	TO-15	12/19/2007	1.11	1	1.1	ND	µg/m³	R14846
1,3-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dichlorobenzene	TO-15	12/19/2007	3.01	1	3.0	ND	µg/m³	R14846
1,4-Dioxane	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
2-Butanone (MEK)	TO-15	12/19/2007	1.48	1	1.5	ND	µg/m³	R14846
2-Hexanone	TO-15	12/19/2007	2.05	1	2.0	ND	µg/m³	R14846
4-Ethyl Toluene	TO-15	12/19/2007	2.46	1	2.5	ND	µg/m³	R14846
4-Methyl-2-Pentanone (MIBK)	TO-15	12/19/2007	2.05	1	2.0	ND	µg/m³	R14846
Acetone	TO-15	12/19/2007	9.52	1	9.5	11	µg/m³	R14846
Benzene	TO-15	12/19/2007	1.6	1	1.6	1.7	µg/m³	R14846
Benzyl Chloride	TO-15	12/19/2007	2.88	1	2.9	ND	µg/m³	R14846
Bromodichloromethane	TO-15	12/19/2007	3.35	1	3.4	ND	µg/m³	R14846
Bromoform	TO-15	12/19/2007	5.17	1	5.2	ND	µg/m³	R14846
Bromomethane	TO-15	12/19/2007	1.94	1	1.9	ND	µg/m³	R14846
Carbon Disulfide	TO-15	12/19/2007	1.56	1	1.6	ND	µg/m³	R14846
Carbon Tetrachloride	TO-15	12/19/2007	3.15	1	3.2	ND	µg/m³	R14846
Chlorobenzene	TO-15	12/19/2007	2.3	1	2.3	ND	µg/m³	R14846
Chloroethane	TO-15	12/19/2007	1.32	1	1.3	ND	µg/m³	R14846
Chloroform	TO-15	12/19/2007	2.44	1	2.4	ND	µg/m³	R14846
Chloromethane	TO-15	12/19/2007	1.04	1	1.0	ND	µg/m³	R14846
cis-1,2-dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846
cis-1,3-Dichloropropene	TO-15	12/19/2007	2.27	1	2.3	ND	µg/m³	R14846
Dibromochloromethane	TO-15	12/19/2007	4.26	1	4.3	ND	µg/m³	R14846
Dichlorodifluoromethane	TO-15	12/19/2007	2.48	1	2.5	ND	µg/m³	R14846
Ethyl Acetate	TO-15	12/19/2007	1.8	1	1.8	ND	µg/m³	R14846
Ethyl Benzene	TO-15	12/19/2007	1.67	1	1.7	ND	µg/m³	R14846
Freon 113	TO-15	12/19/2007	3.83	1	3.8	ND	µg/m³	R14846
Hexachlorobutadiene	TO-15	12/19/2007	5.34	1	5.3	ND	µg/m³	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported:

Client Sample ID: SG-12
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 11:40:00 AM

Lab Sample ID: 0712087-003
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/19/2007	3.52	1	3.5	ND	µg/m³	R14846
Isopropanol	TO-15	12/19/2007	16.4	1	16	ND	µg/m³	R14846
m,p-Xylene	TO-15	12/19/2007	2.05	1	2.0	5.2	µg/m³	R14846
Methylene Chloride	TO-15	12/19/2007	3.61	1	3.6	34	µg/m³	R14846
MTBE	TO-15	12/19/2007	1.81	1	1.8	ND	µg/m³	R14846
Naphthalene	TO-15	12/19/2007	2.62	1	2.6	ND	µg/m³	R14846
o-xylene	TO-15	12/19/2007	2.17	1	2.2	ND	µg/m³	R14846
Styrene	TO-15	12/19/2007	2.13	1	2.1	ND	µg/m³	R14846
Tetrachloroethene	TO-15	12/19/2007	3.39	1	3.4	ND	µg/m³	R14846
Tetrahydrofuran	TO-15	12/19/2007	1.48	1	1.5	ND	µg/m³	R14846
Toluene	TO-15	12/19/2007	1.89	1	1.9	3.5	µg/m³	R14846
trans-1,2-Dichloroethene	TO-15	12/19/2007	1.98	1	2.0	ND	µg/m³	R14846
Trichloroethene	TO-15	12/19/2007	2.69	1	2.7	ND	µg/m³	R14846
Trichlorofluoromethane	TO-15	12/19/2007	2.48	1	2.5	ND	µg/m³	R14846
Vinyl Acetate	TO-15	12/19/2007	1.76	1	1.8	ND	µg/m³	R14846
Vinyl Chloride	TO-15	12/19/2007	1.28	1	1.3	ND	µg/m³	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/19/2007	0	1	65-135	95.2	%REC	R14846

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported:

Client Sample ID: SG-13
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 1:25:00 PM

Lab Sample ID: 0712087-004
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/18/2007	1.99	1	2.0	ND	µg/m³	R14864
1,1,1,2-Tetrachloroethane	TO-15	12/18/2007	3.44	1	3.4	ND	µg/m³	R14864
1,1,1-Trichloroethane	TO-15	12/18/2007	2.73	1	2.7	ND	µg/m³	R14864
1,1,2,2-Tetrachloroethane	TO-15	12/18/2007	3.44	1	3.4	ND	µg/m³	R14864
1,1,2-Trichloroethane	TO-15	12/18/2007	2.73	1	2.7	ND	µg/m³	R14864
1,1-Dichloroethane	TO-15	12/18/2007	2.03	1	2.0	ND	µg/m³	R14864
1,2,4-Trichlorobenzene	TO-15	12/18/2007	3.56	1	3.6	ND	µg/m³	R14864
1,2,4-Trimethylbenzene	TO-15	12/18/2007	2.46	1	2.5	2.6	µg/m³	R14864
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/18/2007	3.84	1	3.8	ND	µg/m³	R14864
1,2-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14864
1,2-Dichloroethane	TO-15	12/18/2007	2.03	1	2.0	ND	µg/m³	R14864
1,2-Dichloropropane	TO-15	12/18/2007	2.31	1	2.3	ND	µg/m³	R14864
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/18/2007	3.13	1	3.1	ND	µg/m³	R14864
1,3,5-Trimethylbenzene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14864
1,3-Butadiene	TO-15	12/18/2007	1.11	1	1.1	ND	µg/m³	R14864
1,3-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14864
1,4-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14864
1,4-Dioxane	TO-15	12/18/2007	1.8	1	1.8	ND	µg/m³	R14864
2-Butanone (MEK)	TO-15	12/18/2007	1.48	1	1.5	7.8	µg/m³	R14864
2-Hexanone	TO-15	12/18/2007	2.05	1	2.0	ND	µg/m³	R14864
4-Ethyl Toluene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14864
4-Methyl-2-Pentanone (MIBK)	TO-15	12/18/2007	2.05	1	2.0	ND	µg/m³	R14864
Acetone	TO-15	12/18/2007	9.52	1	9.5	28	µg/m³	R14864
Benzene	TO-15	12/18/2007	1.6	1	1.6	9.3	µg/m³	R14864
Benzyl Chloride	TO-15	12/18/2007	2.88	1	2.9	ND	µg/m³	R14864
Bromodichloromethane	TO-15	12/18/2007	3.35	1	3.4	ND	µg/m³	R14864
Bromoform	TO-15	12/18/2007	5.17	1	5.2	ND	µg/m³	R14864
Bromomethane	TO-15	12/18/2007	1.94	1	1.9	ND	µg/m³	R14864
Carbon Disulfide	TO-15	12/18/2007	1.56	1	1.6	ND	µg/m³	R14864
Carbon Tetrachloride	TO-15	12/18/2007	3.15	1	3.2	ND	µg/m³	R14864
Chlorobenzene	TO-15	12/18/2007	2.3	1	2.3	ND	µg/m³	R14864
Chloroethane	TO-15	12/18/2007	1.32	1	1.3	ND	µg/m³	R14864
Chloroform	TO-15	12/18/2007	2.44	1	2.4	ND	µg/m³	R14864
Chloromethane	TO-15	12/18/2007	1.04	1	1.0	ND	µg/m³	R14864
cis-1,2-dichloroethene	TO-15	12/18/2007	1.98	1	2.0	ND	µg/m³	R14864
cis-1,3-Dichloropropene	TO-15	12/18/2007	2.27	1	2.3	ND	µg/m³	R14864
Dibromochloromethane	TO-15	12/18/2007	4.26	1	4.3	ND	µg/m³	R14864
Dichlorodifluoromethane	TO-15	12/18/2007	2.48	1	2.5	ND	µg/m³	R14864
Ethyl Acetate	TO-15	12/18/2007	1.8	1	1.8	ND	µg/m³	R14864
Ethyl Benzene	TO-15	12/18/2007	1.67	1	1.7	ND	µg/m³	R14864
Freon 113	TO-15	12/18/2007	3.83	1	3.8	ND	µg/m³	R14864
Hexachlorobutadiene	TO-15	12/18/2007	5.34	1	5.3	ND	µg/m³	R14864

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported:

Client Sample ID: SG-13
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 1:25:00 PM

Lab Sample ID: 0712087-004
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/18/2007	3.52	1	3.5	ND	µg/m³	R14864
Isopropanol	TO-15	12/18/2007	16.4	1	16	ND	µg/m³	R14864
m,p-Xylene	TO-15	12/18/2007	2.05	1	2.0	5.7	µg/m³	R14864
Methylene Chloride	TO-15	12/18/2007	3.61	1	3.6	ND	µg/m³	R14864
MTBE	TO-15	12/18/2007	1.81	1	1.8	ND	µg/m³	R14864
Naphthalene	TO-15	12/18/2007	2.62	1	2.6	ND	µg/m³	R14864
o-xylene	TO-15	12/18/2007	2.17	1	2.2	ND	µg/m³	R14864
Styrene	TO-15	12/18/2007	2.13	1	2.1	ND	µg/m³	R14864
Tetrachloroethene	TO-15	12/18/2007	3.39	50	170	4300	µg/m³	R14846
Tetrahydrofuran	TO-15	12/18/2007	1.48	1	1.5	ND	µg/m³	R14864
Toluene	TO-15	12/18/2007	1.89	1	1.9	7.0	µg/m³	R14864
trans-1,2-Dichloroethene	TO-15	12/18/2007	1.98	1	2.0	ND	µg/m³	R14864
Trichloroethene	TO-15	12/18/2007	2.69	1	2.7	ND	µg/m³	R14864
Trichlorofluoromethane	TO-15	12/18/2007	2.48	50	120	1100	µg/m³	R14846
Vinyl Acetate	TO-15	12/18/2007	1.76	1	1.8	ND	µg/m³	R14864
Vinyl Chloride	TO-15	12/18/2007	1.28	1	1.3	ND	µg/m³	R14864
Surr: 4-Bromofluorobenzene	TO-15	12/18/2007	0	50	65-135	97.3	%REC	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/18/2007	0	1	50-150	94.3	%REC	R14864

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported:

Client Sample ID: SG-20
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 2:55:00 PM

Lab Sample ID: 0712087-005
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/18/2007	1.99	1	2.0	ND	µg/m³	R14864
1,1,1,2-Tetrachloroethane	TO-15	12/18/2007	3.44	1	3.4	ND	µg/m³	R14864
1,1,1-Trichloroethane	TO-15	12/18/2007	2.73	1	2.7	ND	µg/m³	R14864
1,1,2,2-Tetrachloroethane	TO-15	12/18/2007	3.44	1	3.4	ND	µg/m³	R14864
1,1,2-Trichloroethane	TO-15	12/18/2007	2.73	1	2.7	ND	µg/m³	R14864
1,1-Dichloroethane	TO-15	12/18/2007	2.03	1	2.0	ND	µg/m³	R14864
1,2,4-Trichlorobenzene	TO-15	12/18/2007	3.56	1	3.6	ND	µg/m³	R14864
1,2,4-Trimethylbenzene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14864
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/18/2007	3.84	1	3.8	ND	µg/m³	R14864
1,2-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14864
1,2-Dichloroethane	TO-15	12/18/2007	2.03	1	2.0	ND	µg/m³	R14864
1,2-Dichloropropane	TO-15	12/18/2007	2.31	1	2.3	ND	µg/m³	R14864
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/18/2007	3.13	1	3.1	ND	µg/m³	R14864
1,3,5-Trimethylbenzene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14864
1,3-Butadiene	TO-15	12/18/2007	1.11	1	1.1	ND	µg/m³	R14864
1,3-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14864
1,4-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14864
1,4-Dioxane	TO-15	12/18/2007	1.8	1	1.8	ND	µg/m³	R14864
2-Butanone (MEK)	TO-15	12/18/2007	1.48	1	1.5	ND	µg/m³	R14864
2-Hexanone	TO-15	12/18/2007	2.05	1	2.0	ND	µg/m³	R14864
4-Ethyl Toluene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14864
4-Methyl-2-Pentanone (MIBK)	TO-15	12/18/2007	2.05	1	2.0	ND	µg/m³	R14864
Acetone	TO-15	12/18/2007	9.52	1	9.5	32	µg/m³	R14864
Benzene	TO-15	12/18/2007	1.6	1	1.6	2.3	µg/m³	R14864
Benzyl Chloride	TO-15	12/18/2007	2.88	1	2.9	ND	µg/m³	R14864
Bromodichloromethane	TO-15	12/18/2007	3.35	1	3.4	ND	µg/m³	R14864
Bromoform	TO-15	12/18/2007	5.17	1	5.2	ND	µg/m³	R14864
Bromomethane	TO-15	12/18/2007	1.94	1	1.9	ND	µg/m³	R14864
Carbon Disulfide	TO-15	12/18/2007	1.56	1	1.6	ND	µg/m³	R14864
Carbon Tetrachloride	TO-15	12/18/2007	3.15	1	3.2	ND	µg/m³	R14864
Chlorobenzene	TO-15	12/18/2007	2.3	1	2.3	ND	µg/m³	R14864
Chloroethane	TO-15	12/18/2007	1.32	1	1.3	ND	µg/m³	R14864
Chloroform	TO-15	12/18/2007	2.44	1	2.4	ND	µg/m³	R14864
Chloromethane	TO-15	12/18/2007	1.04	1	1.0	ND	µg/m³	R14864
cis-1,2-dichloroethene	TO-15	12/18/2007	1.98	1	2.0	ND	µg/m³	R14864
cis-1,3-Dichloropropene	TO-15	12/18/2007	2.27	1	2.3	ND	µg/m³	R14864
Dibromochloromethane	TO-15	12/18/2007	4.26	1	4.3	ND	µg/m³	R14864
Dichlorodifluoromethane	TO-15	12/18/2007	2.48	1	2.5	ND	µg/m³	R14864
Ethyl Acetate	TO-15	12/18/2007	1.8	1	1.8	ND	µg/m³	R14864
Ethyl Benzene	TO-15	12/18/2007	1.67	1	1.7	ND	µg/m³	R14864
Freon 113	TO-15	12/18/2007	3.83	1	3.8	ND	µg/m³	R14864
Hexachlorobutadiene	TO-15	12/18/2007	5.34	1	5.3	ND	µg/m³	R14864

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported:

Client Sample ID: SG-20
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 2:55:00 PM

Lab Sample ID: 0712087-005
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/18/2007	3.52	1	3.5	ND	µg/m³	R14864
Isopropanol	TO-15	12/18/2007	16.4	1	16	ND	µg/m³	R14864
m,p-Xylene	TO-15	12/18/2007	2.05	1	2.0	4.7	µg/m³	R14864
Methylene Chloride	TO-15	12/18/2007	3.61	1	3.6	ND	µg/m³	R14864
MTBE	TO-15	12/18/2007	1.81	1	1.8	ND	µg/m³	R14864
Naphthalene	TO-15	12/18/2007	2.62	1	2.6	ND	µg/m³	R14864
o-xylene	TO-15	12/18/2007	2.17	1	2.2	ND	µg/m³	R14864
Styrene	TO-15	12/18/2007	2.13	1	2.1	ND	µg/m³	R14864
Tetrachloroethene	TO-15	12/18/2007	3.39	1	3.4	190	µg/m³	R14864
Tetrahydrofuran	TO-15	12/18/2007	1.48	1	1.5	ND	µg/m³	R14864
Toluene	TO-15	12/18/2007	1.89	1	1.9	3.3	µg/m³	R14864
trans-1,2-Dichloroethene	TO-15	12/18/2007	1.98	1	2.0	ND	µg/m³	R14864
Trichloroethene	TO-15	12/18/2007	2.69	1	2.7	ND	µg/m³	R14864
Trichlorofluoromethane	TO-15	12/18/2007	2.48	1	2.5	84	µg/m³	R14864
Vinyl Acetate	TO-15	12/18/2007	1.76	1	1.8	ND	µg/m³	R14864
Vinyl Chloride	TO-15	12/18/2007	1.28	1	1.3	ND	µg/m³	R14864
Surr: 4-Bromofluorobenzene	TO-15	12/18/2007	0	1	50-150	93.1	%REC	R14864

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported:

Client Sample ID: SG-15
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 2:33:00 PM

Lab Sample ID: 0712087-006
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/18/2007	1.99	1	2.0	ND	µg/m³	R14864
1,1,1,2-Tetrachloroethane	TO-15	12/18/2007	3.44	1	3.4	ND	µg/m³	R14864
1,1,1-Trichloroethane	TO-15	12/18/2007	2.73	1	2.7	ND	µg/m³	R14864
1,1,2,2-Tetrachloroethane	TO-15	12/18/2007	3.44	1	3.4	ND	µg/m³	R14864
1,1,2-Trichloroethane	TO-15	12/18/2007	2.73	1	2.7	ND	µg/m³	R14864
1,1-Dichloroethane	TO-15	12/18/2007	2.03	1	2.0	ND	µg/m³	R14864
1,2,4-Trichlorobenzene	TO-15	12/18/2007	3.56	1	3.6	ND	µg/m³	R14864
1,2,4-Trimethylbenzene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14864
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/18/2007	3.84	1	3.8	ND	µg/m³	R14864
1,2-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14864
1,2-Dichloroethane	TO-15	12/18/2007	2.03	1	2.0	ND	µg/m³	R14864
1,2-Dichloropropane	TO-15	12/18/2007	2.31	1	2.3	ND	µg/m³	R14864
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/18/2007	3.13	1	3.1	ND	µg/m³	R14864
1,3,5-Trimethylbenzene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14864
1,3-Butadiene	TO-15	12/18/2007	1.11	1	1.1	ND	µg/m³	R14864
1,3-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14864
1,4-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14864
1,4-Dioxane	TO-15	12/18/2007	1.8	1	1.8	ND	µg/m³	R14864
2-Butanone (MEK)	TO-15	12/18/2007	1.48	1	1.5	10	µg/m³	R14864
2-Hexanone	TO-15	12/18/2007	2.05	1	2.0	ND	µg/m³	R14864
4-Ethyl Toluene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14864
4-Methyl-2-Pentanone (MIBK)	TO-15	12/18/2007	2.05	1	2.0	ND	µg/m³	R14864
Acetone	TO-15	12/18/2007	9.52	1	9.5	56	µg/m³	R14864
Benzene	TO-15	12/18/2007	1.6	1	1.6	4.1	µg/m³	R14864
Benzyl Chloride	TO-15	12/18/2007	2.88	1	2.9	ND	µg/m³	R14864
Bromodichloromethane	TO-15	12/18/2007	3.35	1	3.4	ND	µg/m³	R14864
Bromoform	TO-15	12/18/2007	5.17	1	5.2	ND	µg/m³	R14864
Bromomethane	TO-15	12/18/2007	1.94	1	1.9	ND	µg/m³	R14864
Carbon Disulfide	TO-15	12/18/2007	1.56	1	1.6	4.2	µg/m³	R14864
Carbon Tetrachloride	TO-15	12/18/2007	3.15	1	3.2	ND	µg/m³	R14864
Chlorobenzene	TO-15	12/18/2007	2.3	1	2.3	ND	µg/m³	R14864
Chloroethane	TO-15	12/18/2007	1.32	1	1.3	ND	µg/m³	R14864
Chloroform	TO-15	12/18/2007	2.44	1	2.4	ND	µg/m³	R14864
Chloromethane	TO-15	12/18/2007	1.04	1	1.0	ND	µg/m³	R14864
cis-1,2-dichloroethene	TO-15	12/18/2007	1.98	1	2.0	ND	µg/m³	R14864
cis-1,3-Dichloropropene	TO-15	12/18/2007	2.27	1	2.3	ND	µg/m³	R14864
Dibromochloromethane	TO-15	12/18/2007	4.26	1	4.3	ND	µg/m³	R14864
Dichlorodifluoromethane	TO-15	12/18/2007	2.48	1	2.5	ND	µg/m³	R14864
Ethyl Acetate	TO-15	12/18/2007	1.8	1	1.8	ND	µg/m³	R14864
Ethyl Benzene	TO-15	12/18/2007	1.67	1	1.7	ND	µg/m³	R14864
Freon 113	TO-15	12/18/2007	3.83	1	3.8	ND	µg/m³	R14864
Hexachlorobutadiene	TO-15	12/18/2007	5.34	1	5.3	ND	µg/m³	R14864

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported:

Client Sample ID: SG-15
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 2:33:00 PM

Lab Sample ID: 0712087-006
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/18/2007	3.52	1	3.5	ND	µg/m³	R14864
Isopropanol	TO-15	12/18/2007	16.4	1	16	ND	µg/m³	R14864
m,p-Xylene	TO-15	12/18/2007	2.05	1	2.0	7.2	µg/m³	R14864
Methylene Chloride	TO-15	12/18/2007	3.61	1	3.6	ND	µg/m³	R14864
MTBE	TO-15	12/18/2007	1.81	1	1.8	ND	µg/m³	R14864
Naphthalene	TO-15	12/18/2007	2.62	1	2.6	ND	µg/m³	R14864
o-xylene	TO-15	12/18/2007	2.17	1	2.2	ND	µg/m³	R14864
Styrene	TO-15	12/18/2007	2.13	1	2.1	ND	µg/m³	R14864
Tetrachloroethene	TO-15	12/18/2007	3.39	1	3.4	59	µg/m³	R14864
Tetrahydrofuran	TO-15	12/18/2007	1.48	1	1.5	ND	µg/m³	R14864
Toluene	TO-15	12/18/2007	1.89	1	1.9	8.0	µg/m³	R14864
trans-1,2-Dichloroethene	TO-15	12/18/2007	1.98	1	2.0	ND	µg/m³	R14864
Trichloroethene	TO-15	12/18/2007	2.69	1	2.7	ND	µg/m³	R14864
Trichlorofluoromethane	TO-15	12/18/2007	2.48	10	25	290	µg/m³	R14846
Vinyl Acetate	TO-15	12/18/2007	1.76	1	1.8	ND	µg/m³	R14864
Vinyl Chloride	TO-15	12/18/2007	1.28	1	1.3	ND	µg/m³	R14864
Surr: 4-Bromofluorobenzene	TO-15	12/18/2007	0	10	65-135	94.8	%REC	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/18/2007	0	1	50-150	96.1	%REC	R14864

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported:

Client Sample ID: SG-18
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 2:36:00 PM

Lab Sample ID: 0712087-007
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/18/2007	1.99	1	2.0	ND	µg/m³	R14864
1,1,1,2-Tetrachloroethane	TO-15	12/18/2007	3.44	1	3.4	ND	µg/m³	R14864
1,1,1-Trichloroethane	TO-15	12/18/2007	2.73	1	2.7	ND	µg/m³	R14864
1,1,2,2-Tetrachloroethane	TO-15	12/18/2007	3.44	1	3.4	ND	µg/m³	R14864
1,1,2-Trichloroethane	TO-15	12/18/2007	2.73	1	2.7	ND	µg/m³	R14864
1,1-Dichloroethane	TO-15	12/18/2007	2.03	1	2.0	ND	µg/m³	R14864
1,2,4-Trichlorobenzene	TO-15	12/18/2007	3.56	1	3.6	ND	µg/m³	R14864
1,2,4-Trimethylbenzene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14864
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/18/2007	3.84	1	3.8	ND	µg/m³	R14864
1,2-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14864
1,2-Dichloroethane	TO-15	12/18/2007	2.03	1	2.0	ND	µg/m³	R14864
1,2-Dichloropropane	TO-15	12/18/2007	2.31	1	2.3	ND	µg/m³	R14864
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/18/2007	3.13	1	3.1	ND	µg/m³	R14864
1,3,5-Trimethylbenzene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14864
1,3-Butadiene	TO-15	12/18/2007	1.11	1	1.1	ND	µg/m³	R14864
1,3-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14864
1,4-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14864
1,4-Dioxane	TO-15	12/18/2007	1.8	1	1.8	ND	µg/m³	R14864
2-Butanone (MEK)	TO-15	12/18/2007	1.48	1	1.5	ND	µg/m³	R14864
2-Hexanone	TO-15	12/18/2007	2.05	1	2.0	ND	µg/m³	R14864
4-Ethyl Toluene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14864
4-Methyl-2-Pentanone (MIBK)	TO-15	12/18/2007	2.05	1	2.0	ND	µg/m³	R14864
Acetone	TO-15	12/18/2007	9.52	1	9.5	55	µg/m³	R14864
Benzene	TO-15	12/18/2007	1.6	1	1.6	3.1	µg/m³	R14864
Benzyl Chloride	TO-15	12/18/2007	2.88	1	2.9	ND	µg/m³	R14864
Bromodichloromethane	TO-15	12/18/2007	3.35	1	3.4	ND	µg/m³	R14864
Bromoform	TO-15	12/18/2007	5.17	1	5.2	ND	µg/m³	R14864
Bromomethane	TO-15	12/18/2007	1.94	1	1.9	ND	µg/m³	R14864
Carbon Disulfide	TO-15	12/18/2007	1.56	1	1.6	ND	µg/m³	R14864
Carbon Tetrachloride	TO-15	12/18/2007	3.15	1	3.2	ND	µg/m³	R14864
Chlorobenzene	TO-15	12/18/2007	2.3	1	2.3	ND	µg/m³	R14864
Chloroethane	TO-15	12/18/2007	1.32	1	1.3	ND	µg/m³	R14864
Chloroform	TO-15	12/18/2007	2.44	1	2.4	ND	µg/m³	R14864
Chloromethane	TO-15	12/18/2007	1.04	1	1.0	ND	µg/m³	R14864
cis-1,2-dichloroethene	TO-15	12/18/2007	1.98	1	2.0	ND	µg/m³	R14864
cis-1,3-Dichloropropene	TO-15	12/18/2007	2.27	1	2.3	ND	µg/m³	R14864
Dibromochloromethane	TO-15	12/18/2007	4.26	1	4.3	ND	µg/m³	R14864
Dichlorodifluoromethane	TO-15	12/18/2007	2.48	1	2.5	ND	µg/m³	R14864
Ethyl Acetate	TO-15	12/18/2007	1.8	1	1.8	ND	µg/m³	R14864
Ethyl Benzene	TO-15	12/18/2007	1.67	1	1.7	ND	µg/m³	R14864
Freon 113	TO-15	12/18/2007	3.83	1	3.8	ND	µg/m³	R14864
Hexachlorobutadiene	TO-15	12/18/2007	5.34	1	5.3	ND	µg/m³	R14864

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported:

Client Sample ID: SG-18
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 2:36:00 PM

Lab Sample ID: 0712087-007
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/18/2007	3.52	1	3.5	ND	µg/m³	R14864
Isopropanol	TO-15	12/18/2007	16.4	1	16	ND	µg/m³	R14864
m,p-Xylene	TO-15	12/18/2007	2.05	1	2.0	7.1	µg/m³	R14864
Methylene Chloride	TO-15	12/18/2007	3.61	1	3.6	ND	µg/m³	R14864
MTBE	TO-15	12/18/2007	1.81	1	1.8	ND	µg/m³	R14864
Naphthalene	TO-15	12/18/2007	2.62	1	2.6	ND	µg/m³	R14864
o-xylene	TO-15	12/18/2007	2.17	1	2.2	ND	µg/m³	R14864
Styrene	TO-15	12/18/2007	2.13	1	2.1	ND	µg/m³	R14864
Tetrachloroethene	TO-15	12/18/2007	3.39	1	3.4	16	µg/m³	R14864
Tetrahydrofuran	TO-15	12/18/2007	1.48	1	1.5	ND	µg/m³	R14864
Toluene	TO-15	12/18/2007	1.89	1	1.9	8.4	µg/m³	R14864
trans-1,2-Dichloroethene	TO-15	12/18/2007	1.98	1	2.0	ND	µg/m³	R14864
Trichloroethene	TO-15	12/18/2007	2.69	1	2.7	ND	µg/m³	R14864
Trichlorofluoromethane	TO-15	12/18/2007	2.48	10	25	76	µg/m³	R14846
Vinyl Acetate	TO-15	12/18/2007	1.76	1	1.8	ND	µg/m³	R14864
Vinyl Chloride	TO-15	12/18/2007	1.28	1	1.3	ND	µg/m³	R14864
Surr: 4-Bromofluorobenzene	TO-15	12/18/2007	0	10	65-135	96.5	%REC	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/18/2007	0	1	50-150	95.7	%REC	R14864

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported:

Client Sample ID: SG-10
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 12:40:00 PM

Lab Sample ID: 0712087-008
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
1,1 - Dichloroethene	TO-15	12/18/2007	1.99	1	2.0	ND	µg/m³	R14864
1,1,1,2-Tetrachloroethane	TO-15	12/18/2007	3.44	1	3.4	ND	µg/m³	R14864
1,1,1-Trichloroethane	TO-15	12/18/2007	2.73	1	2.7	ND	µg/m³	R14864
1,1,2,2-Tetrachloroethane	TO-15	12/18/2007	3.44	1	3.4	ND	µg/m³	R14864
1,1,2-Trichloroethane	TO-15	12/18/2007	2.73	1	2.7	ND	µg/m³	R14864
1,1-Dichloroethane	TO-15	12/18/2007	2.03	1	2.0	ND	µg/m³	R14864
1,2,4-Trichlorobenzene	TO-15	12/18/2007	3.56	1	3.6	ND	µg/m³	R14864
1,2,4-Trimethylbenzene	TO-15	12/18/2007	2.46	1	2.5	4.0	µg/m³	R14864
1,2-Dibromoethane(Ethylene dibromide)	TO-15	12/18/2007	3.84	1	3.8	ND	µg/m³	R14864
1,2-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14864
1,2-Dichloroethane	TO-15	12/18/2007	2.03	1	2.0	ND	µg/m³	R14864
1,2-Dichloropropane	TO-15	12/18/2007	2.31	1	2.3	ND	µg/m³	R14864
1,2-dichlorotetrafluoroethane(F114)	TO-15	12/18/2007	3.13	1	3.1	ND	µg/m³	R14864
1,3,5-Trimethylbenzene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14864
1,3-Butadiene	TO-15	12/18/2007	1.11	1	1.1	ND	µg/m³	R14864
1,3-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14864
1,4-Dichlorobenzene	TO-15	12/18/2007	3.01	1	3.0	ND	µg/m³	R14864
1,4-Dioxane	TO-15	12/18/2007	1.8	1	1.8	ND	µg/m³	R14864
2-Butanone (MEK)	TO-15	12/18/2007	1.48	1	1.5	7.5	µg/m³	R14864
2-Hexanone	TO-15	12/18/2007	2.05	1	2.0	ND	µg/m³	R14864
4-Ethyl Toluene	TO-15	12/18/2007	2.46	1	2.5	ND	µg/m³	R14864
4-Methyl-2-Pentanone (MIBK)	TO-15	12/18/2007	2.05	1	2.0	ND	µg/m³	R14864
Acetone	TO-15	12/18/2007	9.52	1	9.5	23	µg/m³	R14864
Benzene	TO-15	12/18/2007	1.6	1	1.6	3.5	µg/m³	R14864
Benzyl Chloride	TO-15	12/18/2007	2.88	1	2.9	ND	µg/m³	R14864
Bromodichloromethane	TO-15	12/18/2007	3.35	1	3.4	ND	µg/m³	R14864
Bromoform	TO-15	12/18/2007	5.17	1	5.2	ND	µg/m³	R14864
Bromomethane	TO-15	12/18/2007	1.94	1	1.9	ND	µg/m³	R14864
Carbon Disulfide	TO-15	12/18/2007	1.56	1	1.6	ND	µg/m³	R14864
Carbon Tetrachloride	TO-15	12/18/2007	3.15	1	3.2	ND	µg/m³	R14864
Chlorobenzene	TO-15	12/18/2007	2.3	1	2.3	ND	µg/m³	R14864
Chloroethane	TO-15	12/18/2007	1.32	1	1.3	ND	µg/m³	R14864
Chloroform	TO-15	12/18/2007	2.44	1	2.4	ND	µg/m³	R14864
Chloromethane	TO-15	12/18/2007	1.04	1	1.0	ND	µg/m³	R14864
cis-1,2-dichloroethene	TO-15	12/18/2007	1.98	1	2.0	ND	µg/m³	R14864
cis-1,3-Dichloropropene	TO-15	12/18/2007	2.27	1	2.3	ND	µg/m³	R14864
Dibromochloromethane	TO-15	12/18/2007	4.26	1	4.3	ND	µg/m³	R14864
Dichlorodifluoromethane	TO-15	12/18/2007	2.48	1	2.5	ND	µg/m³	R14864
Ethyl Acetate	TO-15	12/18/2007	1.8	1	1.8	ND	µg/m³	R14864
Ethyl Benzene	TO-15	12/18/2007	1.67	1	1.7	ND	µg/m³	R14864
Freon 113	TO-15	12/18/2007	3.83	1	3.8	ND	µg/m³	R14864
Hexachlorobutadiene	TO-15	12/18/2007	5.34	1	5.3	ND	µg/m³	R14864

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Peter Littman
Environmental Investigation Services

Date Received: 12/14/2007
Date Reported:

Client Sample ID: SG-10
Sample Location: 461 Mcgraw Ave,Livermore
Sample Matrix: AIR
Date/Time Sampled 12/14/2007 12:40:00 PM

Lab Sample ID: 0712087-008
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Hexane	TO-15	12/18/2007	3.52	1	3.5	ND	µg/m³	R14864
Isopropanol	TO-15	12/18/2007	16.4	1	16	ND	µg/m³	R14864
m,p-Xylene	TO-15	12/18/2007	2.05	1	2.0	9.0	µg/m³	R14864
Methylene Chloride	TO-15	12/18/2007	3.61	1	3.6	ND	µg/m³	R14864
MTBE	TO-15	12/18/2007	1.81	1	1.8	ND	µg/m³	R14864
Naphthalene	TO-15	12/18/2007	2.62	1	2.6	ND	µg/m³	R14864
o-xylene	TO-15	12/18/2007	2.17	1	2.2	2.7	µg/m³	R14864
Styrene	TO-15	12/18/2007	2.13	1	2.1	ND	µg/m³	R14864
Tetrachloroethene	TO-15	12/18/2007	3.39	100	340	4600	µg/m³	R14846
Tetrahydrofuran	TO-15	12/18/2007	1.48	1	1.5	ND	µg/m³	R14864
Toluene	TO-15	12/18/2007	1.89	1	1.9	2.5	µg/m³	R14864
trans-1,2-Dichloroethene	TO-15	12/18/2007	1.98	1	2.0	ND	µg/m³	R14864
Trichloroethene	TO-15	12/18/2007	2.69	1	2.7	21	µg/m³	R14864
Trichlorofluoromethane	TO-15	12/18/2007	2.48	100	250	330	µg/m³	R14846
Vinyl Acetate	TO-15	12/18/2007	1.76	1	1.8	ND	µg/m³	R14864
Vinyl Chloride	TO-15	12/18/2007	1.28	1	1.3	ND	µg/m³	R14864
Surr: 4-Bromofluorobenzene	TO-15	12/18/2007	0	100	65-135	93.8	%REC	R14846
Surr: 4-Bromofluorobenzene	TO-15	12/18/2007	0	1	50-150	94.7	%REC	R14864

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Definitions, legends and Notes

Note	Description
ug/kg	Microgram per kilogram (ppb, part per billion).
ug/L	Microgram per liter (ppb, part per billion).
mg/kg	Milligram per kilogram (ppm, part per million).
mg/L	Milligram per liter (ppm, part per million).
LCS/LCSD	Laboratory control sample/laboratory control sample duplicate.
MDL	Method detection limit.
MRL	Modified reporting limit. When sample is subject to dilution, reporting limit times dilution factor yields MRL.
MS/MSD	Matrix spike/matrix spike duplicate.
N/A	Not applicable.
ND	Not detected at or above detection limit.
NR	Not reported.
QC	Quality Control.
RL	Reporting limit.
% RPD	Percent relative difference.
a	pH was measured immediately upon the receipt of the sample, but it was still done outside the holding time.
sub	Analyzed by subcontracting laboratory, Lab Certificate #

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

CLIENT: Environmental Investigation Services
Work Order: 0712087
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID: **MB** SampType: **MBLK** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/19/2007** RunNo: **14846**
Client ID: **ZZZZZ** Batch ID: **R14846** TestNo: **TO-15** Analysis Date: **12/19/2007** SeqNo: **214422**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1 - Dichloroethene	ND	0.50									
1,1,1,2-Tetrachloroethane	ND	0.50									
1,1,1-Trichloroethane	ND	0.50									
1,1,2,2-Tetrachloroethane	ND	0.50									
1,1,2-Trichloroethane	ND	0.50									
1,1-Dichloroethane	ND	0.50									
1,2,4-Trichlorobenzene	ND	0.50									
1,2,4-Trimethylbenzene	ND	0.50									
1,2-Dibromoethane(Ethylene dibromide)	ND	0.50									
1,2-Dichlorobenzene	ND	0.50									
1,2-Dichloroethane	ND	0.50									
1,2-Dichloropropane	ND	0.50									
1,2-dichlorotetrafluoroethane(F114)	ND	0.50									
1,3,5-Trimethylbenzene	ND	0.50									
1,3-Butadiene	ND	0.50									
1,3-Dichlorobenzene	ND	0.50									
1,4-Dichlorobenzene	ND	0.50									
1,4-Dioxane	ND	0.50									
2-Butanone (MEK)	ND	0.50									
2-Hexanone	ND	0.50									
4-Ethyl Toluene	ND	0.50									
4-Methyl-2-Pentanone (MIBK)	ND	0.50									
Acetone	ND	4.0									
Benzene	ND	0.50									
Benzyl Chloride	ND	0.50									
Bromodichloromethane	ND	0.50									
Bromoform	ND	0.50									
Bromomethane	ND	0.50									
Carbon Disulfide	ND	0.50									
Carbon Tetrachloride	ND	0.50									

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712087
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID: **MB** SampType: **MBLK** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/19/2007** RunNo: **14846**
Client ID: **ZZZZZ** Batch ID: **R14846** TestNo: **TO-15** Analysis Date: **12/19/2007** SeqNo: **214422**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chlorobenzene	ND	0.50									
Chloroethane	ND	0.50									
Chloroform	ND	0.50									
Chloromethane	ND	0.50									
cis-1,2-dichloroethene	ND	0.50									
cis-1,3-Dichloropropene	ND	0.50									
Dibromochloromethane	ND	0.50									
Dichlorodifluoromethane	ND	0.50									
Ethyl Acetate	ND	0.50									
Ethyl Benzene	ND	0.50									
Freon 113	ND	0.50									
Hexachlorobutadiene	ND	0.50									
Hexane	ND	1.0									
Isopropanol	ND	4.0									
m,p-Xylene	ND	0.50									
Methylene Chloride	ND	1.0									
MTBE	ND	0.50									
Naphthalene	ND	5.0									
o-xylene	ND	0.50									
Styrene	ND	0.50									
Tetrachloroethene	ND	0.50									
Tetrahydrofuran	ND	0.50									
Toluene	ND	0.50									
trans-1,2-Dichloroethene	ND	0.50									
Trichloroethene	ND	0.50									
Trichlorofluoromethane	ND	0.50									
Vinyl Acetate	ND	0.50									
Vinyl Chloride	ND	0.50									
Surr: 4-Bromofluorobenzene	19.85	0	20	0	99.2	65	135				

Qualifiers:
E Value above quantitation range
ND Not Detected at the Reporting Limit
H Holding times for preparation or analysis exceeded
R RPD outside accepted recovery limits
J Analyte detected below quantitation limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712087
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID: **LCS** SampType: **LCS** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/18/2007** RunNo: **14846**
Client ID: **ZZZZZ** Batch ID: **R14846** TestNo: **TO-15** Analysis Date: **12/18/2007** SeqNo: **214423**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1 - Dichloroethene	20.58	0.50	20	0	103	65	135				
1,1,1,2-Tetrachloroethane	21.35	0.50	20	0	107	65	135				
1,1,1-Trichloroethane	19.38	0.50	20	0	96.9	65	135				
1,1,2,2-Tetrachloroethane	20.78	0.50	20	0	104	65	135				
1,1,2-Trichloroethane	21.57	0.50	20	0	108	65	135				
1,1-Dichloroethane	20.30	0.50	20	0	102	65	135				
1,2,4-Trichlorobenzene	18.11	0.50	20	0	90.6	65	135				
1,2,4-Trimethylbenzene	19.74	0.50	20	0	98.7	65	135				
1,2-Dibromoethane(Ethylene dibromide)	20.22	0.50	20	0	101	65	135				
1,2-Dichlorobenzene	19.39	0.50	20	0	97.0	65	135				
1,2-Dichloroethane	21.70	0.50	20	0	108	65	135				
1,2-Dichloropropane	21.37	0.50	20	0	107	65	135				
1,2-dichlorotetrafluoroethane(F114)	15.30	0.50	20	0	76.5	65	135				
1,3,5-Trimethylbenzene	20.58	0.50	20	0	103	65	135				
1,3-Butadiene	20.64	0.50	20	0	103	65	135				
1,3-Dichlorobenzene	19.27	0.50	20	0	96.4	65	135				
1,4-Dichlorobenzene	19.27	0.50	20	0	96.4	65	135				
1,4-Dioxane	22.38	0.50	20	0	112	65	135				
2-Butanone (MEK)	21.93	0.50	20	0	110	65	135				
2-Hexanone	22.95	0.50	20	0	115	65	135				
4-Ethyl Toluene	20.90	0.50	20	0	104	65	135				
4-Methyl-2-Pentanone (MIBK)	22.26	0.50	20	0	111	65	135				
Acetone	23.19	4.0	20	0	116	65	135				
Benzene	20.12	0.50	20	0	101	65	135				
Benzyl Chloride	19.92	0.50	20	0	99.6	65	135				
Bromodichloromethane	21.52	0.50	20	0	108	65	135				
Bromoform	21.61	0.50	20	0	108	65	135				
Bromomethane	19.61	0.50	20	0	98.0	65	135				
Carbon Disulfide	20.97	0.50	20	0	105	65	135				
Carbon Tetrachloride	18.99	0.50	20	0	95.0	65	135				
Chlorobenzene	21.64	0.50	20	0	108	65	135				

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712087
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID: **LCS** SampType: **LCS** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/18/2007** RunNo: **14846**
Client ID: **ZZZZZ** Batch ID: **R14846** TestNo: **TO-15** Analysis Date: **12/18/2007** SeqNo: **214423**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloroethane	19.54	0.50	20	0	97.7	65	135				
Chloroform	19.35	0.50	20	0	96.8	65	135				
Chloromethane	21.09	0.50	20	0	105	65	135				
cis-1,2-dichloroethene	19.46	0.50	20	0	97.3	65	135				
cis-1,3-Dichloropropene	20.96	0.50	20	0	105	65	135				
Dibromochloromethane	21.27	0.50	20	0	106	65	135				
Ethyl Acetate	21.61	0.50	20	0	108	65	135				
Ethyl Benzene	20.20	0.50	20	0	101	65	135				
Freon 113	19.28	0.50	20	0	96.4	65	135				
Hexachlorobutadiene	16.93	0.50	20	0	84.6	65	135				
Hexane	20.21	1.0	20	0	101	65	135				
Isopropanol	21.59	4.0	20	0	108	65	135				
m,p-Xylene	41.21	0.50	40	0	103	65	135				
Methylene Chloride	21.19	1.0	20	0	106	65	135				
MTBE	20.51	0.50	20	0	103	65	135				
Naphthalene	17.83	5.0	20	0	89.2	65	135				
o-xylene	20.88	0.50	20	0	104	65	135				
Styrene	20.52	0.50	20	0	103	65	135				
Tetrachloroethene	20.79	0.50	20	0	104	65	135				
Toluene	20.78	0.50	20	0	104	65	135				
trans-1,2-Dichloroethene	19.65	0.50	20	0	98.2	65	135				
Trichloroethene	20.84	0.50	20	0	104	65	135				
Trichlorofluoromethane	20.91	0.50	20	0	105	65	135				
Vinyl Acetate	21.90	0.50	20	0	110	65	135				
Vinyl Chloride	20.14	0.50	20	0	101	65	135				
Surr: 4-Bromofluorobenzene	19.36	0	20	0	96.8	65	135				

Sample ID: **LCSD** SampType: **LCSD** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/19/2007** RunNo: **14846**
Client ID: **ZZZZZ** Batch ID: **R14846** TestNo: **TO-15** Analysis Date: **12/19/2007** SeqNo: **214424**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712087
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID: **LCSD** SampType: **LCSD** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/19/2007** RunNo: **14846**
Client ID: **ZZZZZ** Batch ID: **R14846** TestNo: **TO-15** Analysis Date: **12/19/2007** SeqNo: **214424**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1 - Dichloroethene	20.00	0.50	20	0	100	65	135	20.58	2.86	30	
1,1,1,2-Tetrachloroethane	21.15	0.50	20	0	106	65	135	21.35	0.941	30	
1,1,1-Trichloroethane	20.05	0.50	20	0	100	65	135	19.38	3.40	30	
1,1,2,2-Tetrachloroethane	20.46	0.50	20	0	102	65	135	20.78	1.55	30	
1,1,2-Trichloroethane	21.21	0.50	20	0	106	65	135	21.57	1.68	30	
1,1-Dichloroethane	19.59	0.50	20	0	98.0	65	135	20.3	3.56	30	
1,2,4-Trichlorobenzene	17.85	0.50	20	0	89.2	65	135	18.11	1.45	30	
1,2,4-Trimethylbenzene	20.17	0.50	20	0	101	65	135	19.74	2.15	30	
1,2-Dibromoethane(Ethylene dibromide)	20.57	0.50	20	0	103	65	135	20.22	1.72	30	
1,2-Dichlorobenzene	19.03	0.50	20	0	95.2	65	135	19.39	1.87	30	
1,2-Dichloroethane	22.23	0.50	20	0	111	65	135	21.7	2.41	30	
1,2-Dichloropropane	20.18	0.50	20	0	101	65	135	21.37	5.73	30	
1,2-dichlorotetrafluoroethane(F114)	17.03	0.50	20	0	85.2	65	135	15.3	10.7	30	
1,3,5-Trimethylbenzene	20.58	0.50	20	0	103	65	135	20.58	0	30	
1,3-Butadiene	19.75	0.50	20	0	98.8	65	135	20.64	4.41	30	
1,3-Dichlorobenzene	19.63	0.50	20	0	98.2	65	135	19.27	1.85	30	
1,4-Dichlorobenzene	19.63	0.50	20	0	98.2	65	135	19.27	1.85	30	
1,4-Dioxane	23.22	0.50	20	0	116	65	135	22.38	3.68	30	
2-Butanone (MEK)	20.95	0.50	20	0	105	65	135	21.93	4.57	30	
2-Hexanone	21.77	0.50	20	0	109	65	135	22.95	5.28	30	
4-Ethyl Toluene	20.60	0.50	20	0	103	65	135	20.9	1.45	30	
4-Methyl-2-Pentanone (MIBK)	22.71	0.50	20	0	114	65	135	22.26	2.00	30	
Acetone	21.93	4.0	20	0	110	65	135	23.19	5.59	30	
Benzene	19.58	0.50	20	0	97.9	65	135	20.12	2.72	30	
Benzyl Chloride	20.09	0.50	20	0	100	65	135	19.92	0.850	30	
Bromodichloromethane	22.38	0.50	20	0	112	65	135	21.52	3.92	30	
Bromoform	21.70	0.50	20	0	108	65	135	21.61	0.416	30	
Bromomethane	19.43	0.50	20	0	97.2	65	135	19.61	0.922	30	
Carbon Disulfide	19.87	0.50	20	0	99.4	65	135	20.97	5.39	30	
Carbon Tetrachloride	19.66	0.50	20	0	98.3	65	135	18.99	3.47	30	
Chlorobenzene	21.10	0.50	20	0	106	65	135	21.64	2.53	30	

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712087
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14846

Sample ID: **LCSD** SampType: **LCSD** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/19/2007** RunNo: **14846**
Client ID: **ZZZZZ** Batch ID: **R14846** TestNo: **TO-15** Analysis Date: **12/19/2007** SeqNo: **214424**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloroethane	15.37	0.50	20	0	76.8	65	135	19.54	23.9	30	
Chloroform	19.39	0.50	20	0	97.0	65	135	19.35	0.207	30	
Chloromethane	22.67	0.50	20	0	113	65	135	21.09	7.22	30	
cis-1,2-dichloroethene	19.71	0.50	20	0	98.6	65	135	19.46	1.28	30	
cis-1,3-Dichloropropene	22.11	0.50	20	0	111	65	135	20.96	5.34	30	
Dibromochloromethane	21.00	0.50	20	0	105	65	135	21.27	1.28	30	
Ethyl Acetate	20.75	0.50	20	0	104	65	135	21.61	4.06	30	
Ethyl Benzene	20.35	0.50	20	0	102	65	135	20.2	0.740	30	
Freon 113	20.15	0.50	20	0	101	65	135	19.28	4.41	30	
Hexachlorobutadiene	17.06	0.50	20	0	85.3	65	135	16.93	0.765	30	
Hexane	19.98	1.0	20	0	99.9	65	135	20.21	1.14	30	
Isopropanol	22.18	4.0	20	0	111	65	135	21.59	2.70	30	
m,p-Xylene	39.86	0.50	40	0	99.7	65	135	41.21	3.33	30	
Methylene Chloride	19.80	1.0	20	0	99.0	65	135	21.19	6.78	30	
MTBE	20.32	0.50	20	0	102	65	135	20.51	0.931	30	
Naphthalene	17.94	5.0	20	0	89.7	65	135	17.83	0.615	30	
o-xylene	19.86	0.50	20	0	99.3	65	135	20.88	5.01	30	
Styrene	20.46	0.50	20	0	102	65	135	20.52	0.293	30	
Tetrachloroethene	20.57	0.50	20	0	103	65	135	20.79	1.06	30	
Toluene	22.21	0.50	20	0	111	65	135	20.78	6.65	30	
trans-1,2-Dichloroethene	19.12	0.50	20	0	95.6	65	135	19.65	2.73	30	
Trichloroethene	21.18	0.50	20	0	106	65	135	20.84	1.62	30	
Trichlorofluoromethane	20.11	0.50	20	0	101	65	135	20.91	3.90	30	
Vinyl Acetate	20.96	0.50	20	0	105	65	135	21.9	4.39	30	
Vinyl Chloride	19.16	0.50	20	0	95.8	65	135	20.14	4.99	30	
Surr: 4-Bromofluorobenzene	19.80	0	20	0	99.0	65	135	0	0	30	

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712087
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14864

Sample ID: **MB** SampType: **MBLK** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/17/2007** RunNo: **14864**
Client ID: **ZZZZZ** Batch ID: **R14864** TestNo: **TO-15** Analysis Date: **12/17/2007** SeqNo: **213794**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1 - Dichloroethene	ND	0.50									
1,1,1,2-Tetrachloroethane	ND	0.50									
1,1,1-Trichloroethane	ND	0.50									
1,1,2,2-Tetrachloroethane	ND	0.50									
1,1,2-Trichloroethane	ND	0.50									
1,1-Dichloroethane	ND	0.50									
1,2,4-Trichlorobenzene	ND	0.50									
1,2,4-Trimethylbenzene	ND	0.50									
1,2-Dibromoethane(Ethylene dibromide)	ND	0.50									
1,2-Dichlorobenzene	ND	0.50									
1,2-Dichloroethane	ND	0.50									
1,2-Dichloropropane	ND	0.50									
1,2-dichlorotetrafluoroethane(F114)	ND	0.50									
1,3,5-Trimethylbenzene	ND	0.50									
1,3-Butadiene	ND	0.50									
1,3-Dichlorobenzene	ND	0.50									
1,4-Dichlorobenzene	ND	0.50									
1,4-Dioxane	ND	0.50									
2-Butanone (MEK)	ND	0.50									
2-Hexanone	ND	0.50									
4-Ethyl Toluene	ND	0.50									
4-Methyl-2-Pentanone (MIBK)	ND	0.50									
Acetone	ND	4.0									
Benzene	ND	0.50									
Benzyl Chloride	ND	0.50									
Bromodichloromethane	ND	0.50									
Bromoform	ND	0.50									
Bromomethane	ND	0.50									
Carbon Disulfide	ND	0.50									
Carbon Tetrachloride	ND	0.50									
Chlorobenzene	ND	0.50									

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712087
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14864

Sample ID: **MB** SampType: **MBLK** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/17/2007** RunNo: **14864**
Client ID: **ZZZZZ** Batch ID: **R14864** TestNo: **TO-15** Analysis Date: **12/17/2007** SeqNo: **213794**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloroethane	ND	0.50									
Chloroform	ND	0.50									
Chloromethane	ND	0.50									
cis-1,2-dichloroethene	ND	0.50									
cis-1,3-Dichloropropene	ND	0.50									
Dibromochloromethane	ND	0.50									
Dichlorodifluoromethane	ND	0.50									
Ethyl Acetate	ND	0.50									
Ethyl Benzene	ND	0.50									
Freon 113	ND	0.50									
Hexachlorobutadiene	ND	0.50									
Hexane	ND	1.0									
Isopropanol	ND	4.0									
m,p-Xylene	ND	0.50									
Methylene Chloride	ND	1.0									
MTBE	ND	0.50									
Naphthalene	ND	5.0									
o-xylene	ND	0.50									
Styrene	ND	0.50									
Tetrachloroethene	ND	0.50									
Tetrahydrofuran	ND	0.50									
Toluene	ND	0.50									
trans-1,2-Dichloroethene	ND	0.50									
Trichloroethene	ND	0.50									
Trichlorofluoromethane	ND	0.50									
Vinyl Acetate	ND	0.50									
Vinyl Chloride	ND	0.50									
Surr: 4-Bromofluorobenzene	20.37	0	20	0	102	50	150				

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712087
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14864

Sample ID: **LCS** SampType: **LCS** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/17/2007** RunNo: **14864**
Client ID: **ZZZZZ** Batch ID: **R14864** TestNo: **TO-15** Analysis Date: **12/17/2007** SeqNo: **213795**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1 - Dichloroethene	17.62	0.50	20	0	88.1	50	150				
1,1,1,2-Tetrachloroethane	20.20	0.50	20	0	101	50	150				
1,1,1-Trichloroethane	18.06	0.50	20	0	90.3	50	150				
1,1,2,2-Tetrachloroethane	18.88	0.50	20	0	94.4	50	150				
1,1,2-Trichloroethane	19.58	0.50	20	0	97.9	50	150				
1,1-Dichloroethane	17.65	0.50	20	0	88.2	50	150				
1,2,4-Trichlorobenzene	16.24	0.50	20	0	81.2	50	150				
1,2,4-Trimethylbenzene	18.75	0.50	20	0	93.8	50	150				
1,2-Dibromoethane(Ethylene dibromide)	19.59	0.50	20	0	98.0	50	150				
1,2-Dichlorobenzene	17.35	0.50	20	0	86.8	50	150				
1,2-Dichloroethane	20.95	0.50	20	0	105	50	150				
1,2-Dichloropropane	21.88	0.50	20	0	109	50	150				
1,2-dichlorotetrafluoroethane(F114)	13.35	0.50	20	0	66.8	50	150				
1,3,5-Trimethylbenzene	19.13	0.50	20	0	95.7	50	150				
1,3-Butadiene	18.74	0.50	20	0	93.7	50	150				
1,3-Dichlorobenzene	17.77	0.50	20	0	88.8	50	150				
1,4-Dichlorobenzene	17.77	0.50	20	0	88.8	50	150				
1,4-Dioxane	21.45	0.50	20	0	107	50	150				
2-Butanone (MEK)	19.03	0.50	20	0	95.2	50	150				
2-Hexanone	20.80	0.50	20	0	104	50	150				
4-Ethyl Toluene	19.51	0.50	20	0	97.6	50	150				
4-Methyl-2-Pentanone (MIBK)	20.99	0.50	20	0	105	50	150				
Acetone	19.94	4.0	20	0	99.7	50	150				
Benzene	18.06	0.50	20	0	90.3	50	150				
Benzyl Chloride	18.26	0.50	20	0	91.3	50	150				
Bromodichloromethane	19.95	0.50	20	0	99.8	50	150				
Bromoform	20.22	0.50	20	0	101	50	150				
Bromomethane	18.22	0.50	20	0	91.1	50	150				
Carbon Disulfide	18.21	0.50	20	0	91.0	50	150				
Carbon Tetrachloride	17.91	0.50	20	0	89.6	50	150				
Chlorobenzene	19.68	0.50	20	0	98.4	50	150				

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712087
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14864

Sample ID: **LCS** SampType: **LCS** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/17/2007** RunNo: **14864**
Client ID: **ZZZZZ** Batch ID: **R14864** TestNo: **TO-15** Analysis Date: **12/17/2007** SeqNo: **213795**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloroethane	18.01	0.50	20	0	90.0	50	150				
Chloroform	17.53	0.50	20	0	87.6	50	150				
Chloromethane	22.30	0.50	20	0	112	50	150				
cis-1,2-dichloroethene	17.90	0.50	20	0	89.5	50	150				
cis-1,3-Dichloropropene	19.69	0.50	20	0	98.4	50	150				
Dibromochloromethane	19.99	0.50	20	0	100	50	150				
Ethyl Acetate	18.77	0.50	20	0	93.8	50	150				
Ethyl Benzene	19.03	0.50	20	0	95.2	50	150				
Freon 113	18.78	0.50	20	0	93.9	50	150				
Hexachlorobutadiene	16.05	0.50	20	0	80.2	50	150				
Hexane	18.61	1.0	20	0	93.0	50	150				
Isopropanol	14.55	4.0	20	0	72.8	50	150				
m,p-Xylene	38.01	0.50	40	0	95.0	50	150				
Methylene Chloride	18.80	1.0	20	0	94.0	50	150				
MTBE	18.71	0.50	20	0	93.6	50	150				
Naphthalene	16.65	5.0	20	0	83.3	50	150				
o-xylene	18.70	0.50	20	0	93.5	50	150				
Styrene	19.25	0.50	20	0	96.2	50	150				
Tetrachloroethene	19.52	0.50	20	0	97.6	50	150				
Toluene	20.04	0.50	20	0	100	50	150				
trans-1,2-Dichloroethene	17.62	0.50	20	0	88.1	50	150				
Trichloroethene	19.70	0.50	20	0	98.5	50	150				
Trichlorofluoromethane	18.90	0.50	20	0	94.5	50	150				
Vinyl Acetate	18.80	0.50	20	0	94.0	50	150				
Vinyl Chloride	18.88	0.50	20	0	94.4	50	150				
Surr: 4-Bromofluorobenzene	18.44	0	20	0	92.2	50	150				

Sample ID: **LCSD** SampType: **LCSD** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/17/2007** RunNo: **14864**
Client ID: **ZZZZZ** Batch ID: **R14864** TestNo: **TO-15** Analysis Date: **12/17/2007** SeqNo: **213796**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712087
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14864

Sample ID: **LCSD** SampType: **LCSD** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/17/2007** RunNo: **14864**
Client ID: **ZZZZZ** Batch ID: **R14864** TestNo: **TO-15** Analysis Date: **12/17/2007** SeqNo: **213796**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1 - Dichloroethene	17.02	0.50	20	0	85.1	50	150	17.62	3.46	30	
1,1,1,2-Tetrachloroethane	20.43	0.50	20	0	102	50	150	20.2	1.13	30	
1,1,1-Trichloroethane	18.70	0.50	20	0	93.5	50	150	18.06	3.48	30	
1,1,2,2-Tetrachloroethane	19.02	0.50	20	0	95.1	50	150	18.88	0.739	30	
1,1,2-Trichloroethane	19.56	0.50	20	0	97.8	50	150	19.58	0.102	30	
1,1-Dichloroethane	17.06	0.50	20	0	85.3	50	150	17.65	3.40	30	
1,2,4-Trichlorobenzene	17.06	0.50	20	0	85.3	50	150	16.24	4.92	30	
1,2,4-Trimethylbenzene	19.34	0.50	20	0	96.7	50	150	18.75	3.10	30	
1,2-Dibromoethane(Ethylene dibromide)	20.03	0.50	20	0	100	50	150	19.59	2.22	30	
1,2-Dichlorobenzene	17.72	0.50	20	0	88.6	50	150	17.35	2.11	30	
1,2-Dichloroethane	21.02	0.50	20	0	105	50	150	20.95	0.334	30	
1,2-Dichloropropane	21.83	0.50	20	0	109	50	150	21.88	0.229	30	
1,2-dichlorotetrafluoroethane(F114)	16.40	0.50	20	0	82.0	50	150	13.35	20.5	30	
1,3,5-Trimethylbenzene	19.68	0.50	20	0	98.4	50	150	19.13	2.83	30	
1,3-Butadiene	17.09	0.50	20	0	85.4	50	150	18.74	9.21	30	
1,3-Dichlorobenzene	18.42	0.50	20	0	92.1	50	150	17.77	3.59	30	
1,4-Dichlorobenzene	18.42	0.50	20	0	92.1	50	150	17.77	3.59	30	
1,4-Dioxane	22.32	0.50	20	0	112	50	150	21.45	3.98	30	
2-Butanone (MEK)	18.78	0.50	20	0	93.9	50	150	19.03	1.32	30	
2-Hexanone	21.10	0.50	20	0	106	50	150	20.8	1.43	30	
4-Ethyl Toluene	19.55	0.50	20	0	97.8	50	150	19.51	0.205	30	
4-Methyl-2-Pentanone (MIBK)	21.36	0.50	20	0	107	50	150	20.99	1.75	30	
Acetone	19.22	4.0	20	0	96.1	50	150	19.94	3.68	30	
Benzene	18.44	0.50	20	0	92.2	50	150	18.06	2.08	30	
Benzyl Chloride	19.16	0.50	20	0	95.8	50	150	18.26	4.81	30	
Bromodichloromethane	20.74	0.50	20	0	104	50	150	19.95	3.88	30	
Bromoform	21.03	0.50	20	0	105	50	150	20.22	3.93	30	
Bromomethane	17.91	0.50	20	0	89.6	50	150	18.22	1.72	30	
Carbon Disulfide	18.22	0.50	20	0	91.1	50	150	18.21	0.0549	30	
Carbon Tetrachloride	18.43	0.50	20	0	92.2	50	150	17.91	2.86	30	
Chlorobenzene	19.74	0.50	20	0	98.7	50	150	19.68	0.304	30	

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: Environmental Investigation Services
Work Order: 0712087
Project: 717-3F

ANALYTICAL QC SUMMARY REPORT

BatchID: R14864

Sample ID: **LCSD** SampType: **LCSD** TestCode: **TO-15** Units: **ppbv** Prep Date: **12/17/2007** RunNo: **14864**
Client ID: **ZZZZZ** Batch ID: **R14864** TestNo: **TO-15** Analysis Date: **12/17/2007** SeqNo: **213796**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloroethane	14.34	0.50	20	0	71.7	50	150	18.01	22.7	30	
Chloroform	17.74	0.50	20	0	88.7	50	150	17.53	1.19	30	
Chloromethane	24.17	0.50	20	0	121	50	150	22.3	8.05	30	
cis-1,2-dichloroethene	17.41	0.50	20	0	87.0	50	150	17.9	2.78	30	
cis-1,3-Dichloropropene	20.83	0.50	20	0	104	50	150	19.69	5.63	30	
Dibromochloromethane	20.60	0.50	20	0	103	50	150	19.99	3.01	30	
Ethyl Acetate	19.07	0.50	20	0	95.4	50	150	18.77	1.59	30	
Ethyl Benzene	19.42	0.50	20	0	97.1	50	150	19.03	2.03	30	
Freon 113	18.55	0.50	20	0	92.8	50	150	18.78	1.23	30	
Hexachlorobutadiene	16.90	0.50	20	0	84.5	50	150	16.05	5.16	30	
Hexane	18.49	1.0	20	0	92.5	50	150	18.61	0.647	30	
Isopropanol	13.55	4.0	20	0	67.8	50	150	14.55	7.12	30	
m,p-Xylene	38.36	0.50	40	0	95.9	50	150	38.01	0.917	30	
Methylene Chloride	18.71	1.0	20	0	93.6	50	150	18.8	0.480	30	
MTBE	19.36	0.50	20	0	96.8	50	150	18.71	3.41	30	
Naphthalene	17.29	5.0	20	0	86.5	50	150	16.65	3.77	30	
o-xylene	19.13	0.50	20	0	95.7	50	150	18.7	2.27	30	
Styrene	19.46	0.50	20	0	97.3	50	150	19.25	1.08	30	
Tetrachloroethene	19.85	0.50	20	0	99.2	50	150	19.52	1.68	30	
Toluene	20.67	0.50	20	0	103	50	150	20.04	3.10	30	
trans-1,2-Dichloroethene	16.61	0.50	20	0	83.0	50	150	17.62	5.90	30	
Trichloroethene	19.89	0.50	20	0	99.4	50	150	19.7	0.960	30	
Trichlorofluoromethane	17.87	0.50	20	0	89.4	50	150	18.9	5.60	30	
Vinyl Acetate	18.83	0.50	20	0	94.2	50	150	18.8	0.159	30	
Vinyl Chloride	15.05	0.50	20	0	75.2	50	150	18.88	22.6	30	
Surr: 4-Bromofluorobenzene	19.37	0	20	0	96.8	50	150	0	0	30	

Qualifiers:
E Value above quantitation range
H Holding times for preparation or analysis exceeded
J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

Torrent LABORATORY, INC.

483 Sinclair Frontage Road
Milpitas, CA 95035
Phone: 408.263.5258
FAX: 408.263.8293
www.torrentlab.com

CHAIN OF CUSTODY

• NOTE: SHADED AREAS ARE FOR TORRENT LAB USE ONLY •

LAB WORK ORDER NO: 0712087

Company Name: Environmental Investigation Services	Location of Sampling: 461 McGraw Ave Livermore, CA
Address: 170 Knowles Drive Suite 212	Purpose:
City: Los Gatos CA State: CA Zip Code: 95032	Special Instructions / Comments:
Telephone: 408 871 1470 FAX: 408 871 1520	
REPORT TO: Peter Littman SAMPLER: Pan + Ean	P.O. #: 717-3F EMAIL: plittman@eisinet

TURNAROUND TIME:
- ☐ 10 Work Days ☐ 3 Work Days ☐ Noon - Nxt Day
- ☐ 7 Work Days ☐ 2 Work Days ☐ 2 - 8 Hours
- ☒ 5 Work Days ☐ 1 Work Day ☐ Other

SAMPLE TYPE:
- ☐ Storm Water ☒ Air
- ☐ Waste Water ☐ Other
- ☐ Ground Water
- ☐ Soil

REPORT FORMAT:
- ☐ QC Level IV
- ☒ EDF
- ☒ Excel / EDD

ANALYSIS REQUESTED

LAB ID	CLIENT'S SAMPLE I.D.	DATE / TIME SAMPLED	MATRIX	# OF CONT	CONT TYPE	EPA 8260B - Full List ☐ / EPA 8260B - 8010 List ☐	THP gas ☐ / BTEX ☐ / Oxygenates ☐ / MTBE ☐	THP Diesel ☐ / Si-Gel ☐ / Motor Oil ☐	Pesticide - 8081 ☐	PCB - 8082 ☐	Metals ☐ / CAM - 17 ☐ / LUFT 5 ☐ / 7 Metals ☐	8270 Full List ☐ / PAHs Only ☐	TO-15		REMARKS
01A	SG-21	1:30 12/14	Gas	1	Summa								X		
02A	SG-11	11:30	"	1	"								X		
03A	SG-12	11:40	"	1	"								X		
04A	SG-13	1:25	"	1	"								X		
05A	SG-20	2:55	"	1	"								X		
06A	SG-15	2:33	"	1	"								X		
07A	SG-18	2:36	"	1	"								X		
08A	SG-10	12:40	"	1	"								X		

TORRENT LAB

	Relinquished By:	Print:	Date:	Time:	Received By:	Print:	Date:	Time:
1		RAMINDHAR	5:05	12/14/			12/14/ 16:50	
2	Relinquished By:	Print:	Date:	Time:	Received By:	Print:	Date:	Time:

Were Samples Received in Good Condition? ☐ Yes ☐ NO Samples on Ice? ☐ Yes ☐ NO Method of Shipment _____ Sample seals intact? ☐ Yes ☐ NO ☐ N/A

NOTE: Samples are discarded by the laboratory 30 days from date of receipt unless other arrangements are made. Page 1 of _____

NO Date: 12/17 Log In Reviewed By: _____ Date:

Attachment 2

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
95636	8.70E+00			1,2,4-Trimethylbenzene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
9	121.9	22	19	102.9	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
6.06E-02	7.92E-06	6.14E-03	25	9,369	442.30	649.17	120.20	0.0E+00	6.0E-03

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	112.9	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	8.70E+00	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	11,541	5.04E-03	2.08E-01	1.79E-04	9.80E-03	9.80E-03	0.00E+00	9.80E-03	112.9

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	8.70E+00	1.51	1.54E+02	9.80E-03	9.27E+03	4.46E+06	2.51E-04	2.19E-03	NA	6.0E-03

END

Crack width caclulation

crack width=$(A_B*\eta)/(2*(L_B+W_B))$

crack width=$(A_B*0.005)/(2*(L_B+W_B))$

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
108678	2.70E+00			1,3,5-Trimethylbenzene

MORE

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
9	121.9	22	19	102.9	0			1.00E-08

MORE

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
6.02E-02	8.67E-06	5.87E-03	25	9,321	437.89	637.25	120.20	0.0E+00	6.0E-03

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	112.9	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	2.70E+00	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	11,521	4.82E-03	1.99E-01	1.79E-04	9.73E-03	9.73E-03	0.00E+00	9.73E-03	112.9

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	2.70E+00	1.51	1.54E+02	9.73E-03	9.27E+03	4.94E+06	2.50E-04	6.76E-04	NA	6.0E-03

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
67630	6.10E+02			Isopropyl Alcohol (2-propanol)

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
9	121.9	22	19	102.9	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
Lookup Soil Parameters				Lookup Soil Parameters				Lookup Soil Parameters			
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9.80E-02	1.04E-05	8.10E-06	25	10,848	355.45	508.15	60.10	0.0E+00	0.0E+00

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	112.9	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	6.10E+02	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	12,400	6.55E-06	2.70E-04	1.79E-04	1.59E-02	1.59E-02	0.00E+00	1.59E-02	112.9

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	6.10E+02	1.51	1.54E+02	1.59E-02	9.27E+03	1.28E+04	3.09E-04	1.89E-01	NA	NA

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

DATA ENTRY SHEET

SG-ADV Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
106423	6.30E+00			p-Xylene

MORE

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
9	121.9	22	19	102.9	0			1.00E-08

MORE

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
7.69E-02	8.44E-06	7.64E-03	25	8,525	411.52	616.20	106.17	0.0E+00	1.0E-01

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	112.9	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	6.30E+00	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	10,107	6.42E-03	2.65E-01	1.79E-04	1.24E-02	1.24E-02	0.00E+00	1.24E-02	112.9

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	6.30E+00	1.51	1.54E+02	1.24E-02	9.27E+03	1.74E+05	2.80E-04	1.77E-03	NA	1.0E-01

END

Crack width caclulation

crack width=$(A_B*\eta)/(2*(L_B+W_B))$

crack width=$(A_B*0.005)/(2*(L_B+W_B))$

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
67641	1.20E+04			Acetone

MORE

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
9	121.9	22	19	102.9	0			1.00E-08

MORE

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
1.24E-01	1.14E-05	3.87E-05	25	6,955	329.20	508.10	58.08	0.0E+00	3.5E-01

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	112.9	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	1.20E+04	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	7,410	3.41E-05	1.41E-03	1.79E-04	2.00E-02	2.00E-02	0.00E+00	2.00E-02	112.9

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	1.20E+04	1.51	1.54E+02	2.00E-02	9.27E+03	1.78E+03	3.35E-04	4.02E+00	NA	3.5E-01

END

Crack width caclulation

crack width=$(A_B*\eta)/(2*(L_B+W_B))$

crack width=$(A_B*0.005)/(2*(L_B+W_B))$

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
71432	2.50E+01			Benzene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
9	121.9	22	19	102.9	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
8.80E-02	9.80E-06	5.54E-03	25	7,342	353.24	562.16	78.11	2.9E-05	3.0E-02

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	112.9	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	2.50E+01	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	7,998	4.83E-03	1.99E-01	1.79E-04	1.42E-02	1.42E-02	0.00E+00	1.42E-02	112.9

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	2.50E+01	1.51	1.54E+02	1.42E-02	9.27E+03	3.80E+04	2.97E-04	7.41E-03	2.9E-05	3.0E-02

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
71432	4.90E+01			Benzene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
9	243.8	22	19	224.8	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
8.80E-02	9.80E-06	5.54E-03	25	7,342	353.24	562.16	78.11	2.9E-05	3.0E-02

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	234.8	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	4.90E+01	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	7,998	4.83E-03	1.99E-01	1.79E-04	1.42E-02	1.42E-02	0.00E+00	1.42E-02	234.8

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	4.90E+01	1.51	1.54E+02	1.42E-02	9.27E+03	3.80E+04	2.07E-04	1.02E-02	2.9E-05	3.0E-02

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
78933	1.60E+02			Methylethylketone (2-butanone)

MORE

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
9	121.9	22	19	102.9	0			1.00E-08

MORE

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
8.08E-02	9.80E-06	5.58E-05	25	7,481	352.50	536.78	72.11	0.0E+00	5.0E+00

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	112.9	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	1.60E+02	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	8,269	4.84E-05	2.00E-03	1.79E-04	1.31E-02	1.31E-02	0.00E+00	1.31E-02	112.9

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	1.60E+02	1.51	1.54E+02	1.31E-02	9.27E+03	9.69E+04	2.86E-04	4.58E-02	NA	5.0E+00

END

Crack width caclulation

crack width=$(A_B*\eta)/(2*(L_B+W_B))$

crack width=$(A_B*0.005)/(2*(L_B+W_B))$

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
78933	2.20E+02			Methylethylketone (2-butanone)

MORE

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
9	243.8	22	19	224.8	0			1.00E-08

MORE

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
8.08E-02	9.80E-06	5.58E-05	25	7,481	352.50	536.78	72.11	0.0E+00	5.0E+00

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	234.8	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	2.20E+02	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	8,269	4.84E-05	2.00E-03	1.79E-04	1.31E-02	1.31E-02	0.00E+00	1.31E-02	234.8

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	2.20E+02	1.51	1.54E+02	1.31E-02	9.27E+03	9.69E+04	1.97E-04	4.34E-02	NA	5.0E+00

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

DATA ENTRY SHEET

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
75150	2.80E+01			Carbon disulfide

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
9	121.9	22	19	102.9	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
Lookup Soil Parameters				Lookup Soil Parameters				Lookup Soil Parameters			
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
1.04E-01	1.00E-05	3.02E-02	25	6,391	319.00	552.00	76.13	0.0E+00	7.0E-01

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	112.9	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	2.80E+01	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	6,588	2.70E-02	1.11E+00	1.79E-04	1.68E-02	1.68E-02	0.00E+00	1.68E-02	112.9

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	2.80E+01	1.51	1.54E+02	1.68E-02	9.27E+03	7.49E+03	3.16E-04	8.84E-03	NA	7.0E-01

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
75150	7.30E+01			Carbon disulfide

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
9	243.8	22	19	224.8	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
Lookup Soil Parameters				Lookup Soil Parameters				Lookup Soil Parameters			
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
1.04E-01	1.00E-05	3.02E-02	25	6,391	319.00	552.00	76.13	0.0E+00	7.0E-01

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	234.8	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	7.30E+01	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	6,588	2.70E-02	1.11E+00	1.79E-04	1.68E-02	1.68E-02	0.00E+00	1.68E-02	234.8

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	7.30E+01	1.51	1.54E+02	1.68E-02	9.27E+03	7.49E+03	2.28E-04	1.66E-02	NA	7.0E-01

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
67663	2.20E+02			Chloroform

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
9	243.8	22	19	224.8	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
1.04E-01	1.00E-05	3.66E-03	25	6,988	334.32	536.40	119.38	5.3E-06	3.0E-01

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	234.8	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	2.20E+02	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	7,429	3.22E-03	1.33E-01	1.79E-04	1.68E-02	1.68E-02	0.00E+00	1.68E-02	234.8

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	2.20E+02	1.51	1.54E+02	1.68E-02	9.27E+03	7.49E+03	2.28E-04	5.01E-02	5.3E-06	3.0E-01

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
67663	2.20E+02			Chloroform

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
9	243.8	22	19	224.8	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
1.04E-01	1.00E-05	3.66E-03	25	6,988	334.32	536.40	119.38	5.3E-06	3.0E-01

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	234.8	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	2.20E+02	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	7,429	3.22E-03	1.33E-01	1.79E-04	1.68E-02	1.68E-02	0.00E+00	1.68E-02	234.8

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	2.20E+02	1.51	1.54E+02	1.68E-02	9.27E+03	7.49E+03	2.28E-04	5.01E-02	5.3E-06	3.0E-01

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
100414	1.50E+02			Ethylbenzene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
9	121.9	22	19	102.9	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
7.50E-02	7.80E-06	7.86E-03	25	8,501	409.34	617.20	106.17	0.0E+00	1.0E+00

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	112.9	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	1.50E+02	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	10,017	6.62E-03	2.73E-01	1.79E-04	1.21E-02	1.21E-02	0.00E+00	1.21E-02	112.9

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	1.50E+02	1.51	1.54E+02	1.21E-02	9.27E+03	2.36E+05	2.77E-04	4.16E-02	NA	1.0E+00

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
110543	5.60E+01			Hexane

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
9	121.9	22	19	102.9	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
2.00E-01	7.77E-06	1.66E+00	25	6,895	341.70	508.00	86.18	0.0E+00	2.0E-01

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	112.9	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	5.60E+01	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	7,576	1.46E+00	6.03E+01	1.79E-04	3.23E-02	3.23E-02	0.00E+00	3.23E-02	112.9

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	5.60E+01	1.51	1.54E+02	3.23E-02	9.27E+03	1.03E+02	3.84E-04	2.15E-02	NA	2.0E-01

END

Crack width caclulation

crack width=$(A_B*\eta)/(2*(L_B+W_B))$

crack width=$(A_B*0.005)/(2*(L_B+W_B))$

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
110543	3.50E+02			Hexane

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
9	243.8	22	19	224.8	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
2.00E-01	7.77E-06	1.66E+00	25	6,895	341.70	508.00	86.18	0.0E+00	2.0E-01

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	234.8	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	3.50E+02	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	7,576	1.46E+00	6.03E+01	1.79E-04	3.23E-02	3.23E-02	0.00E+00	3.23E-02	234.8

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	3.50E+02	1.51	1.54E+02	3.23E-02	9.27E+03	1.03E+02	3.09E-04	1.08E-01	NA	2.0E-01

END

Crack width caclulation

crack width=$(A_B*\eta)/(2*(L_B+W_B))$

crack width=$(A_B*0.005)/(2*(L_B+W_B))$

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
75092	1.40E+02			Methylene chloride

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
9	121.9	22	19	102.9	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
1.01E-01	1.17E-05	2.18E-03	25	6,706	313.00	510.00	84.93	1.0E-06	4.0E-01

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	112.9	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	1.40E+02	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	6,906	1.94E-03	8.01E-02	1.79E-04	1.63E-02	1.63E-02	0.00E+00	1.63E-02	112.9

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	1.40E+02	1.51	1.54E+02	1.63E-02	9.27E+03	9.77E+03	3.13E-04	4.38E-02	1.0E-06	4.0E-01

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
127184	2.40E+04	0		Tetrachloroethylene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Totals must add up to value of Ls (cell F24) Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
9	121.9	22	19	102.9	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	165.83	5.9E-06	3.5E-02

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	112.9	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	2.40E+04	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	9,431	1.56E-02	6.45E-01	1.79E-04	1.16E-02	1.16E-02	0.00E+00	1.16E-02	112.9

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	2.40E+04	1.51	1.54E+02	1.16E-02	9.27E+03	3.95E+05	2.72E-04	6.54E+00	5.9E-06	3.5E-02

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
127184	4.00E+04			Tetrachloroethylene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
9	243.8	22	19	224.8	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	165.83	5.9E-06	3.5E-02

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	234.8	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	4.00E+04	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	9,431	1.56E-02	6.45E-01	1.79E-04	1.16E-02	1.16E-02	0.00E+00	1.16E-02	234.8

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	4.00E+04	1.51	1.54E+02	1.16E-02	9.27E+03	3.95E+05	1.84E-04	7.35E+00	5.9E-06	3.5E-02

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
100425	2.40E+01			Styrene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
9	121.9	22	19	102.9	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
7.10E-02	8.00E-06	2.74E-03	25	8,737	418.31	636.00	104.15	0.0E+00	9.0E-01

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	112.9	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	2.40E+01	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	10,317	2.30E-03	9.49E-02	1.79E-04	1.15E-02	1.15E-02	0.00E+00	1.15E-02	112.9

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	2.40E+01	1.51	1.54E+02	1.15E-02	9.27E+03	4.74E+05	2.71E-04	6.50E-03	NA	9.0E-01

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

DATA ENTRY SHEET

SG-ADV Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
100425	2.60E+01			Styrene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
9	243.8	22	19	224.8	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
7.10E-02	8.00E-06	2.74E-03	25	8,737	418.31	636.00	104.15	0.0E+00	9.0E-01

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	234.8	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	2.60E+01	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	10,317	2.30E-03	9.49E-02	1.79E-04	1.15E-02	1.15E-02	0.00E+00	1.15E-02	234.8

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	2.60E+01	1.51	1.54E+02	1.15E-02	9.27E+03	4.74E+05	1.82E-04	4.74E-03	NA	9.0E-01

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

DATA ENTRY SHEET

SG-ADV Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
79016	2.10E+01			Trichloroethylene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
9	121.9	22	19	102.9	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
Lookup Soil Parameters				Lookup Soil Parameters				Lookup Soil Parameters			
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
7.90E-02	9.10E-06	1.03E-02	25	7,505	360.36	544.20	131.39	2.0E-06	6.0E-01

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	112.9	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	2.10E+01	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	8,407	8.89E-03	3.67E-01	1.79E-04	1.28E-02	1.28E-02	0.00E+00	1.28E-02	112.9

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	2.10E+01	1.51	1.54E+02	1.28E-02	9.27E+03	1.26E+05	2.84E-04	5.96E-03	2.0E-06	6.0E-01

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
108883	1.80E+04			Toluene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
9	121.9	22	19	102.9	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
8.70E-02	8.60E-06	6.62E-03	25	7,930	383.78	591.79	92.14	0.0E+00	3.0E-01

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	112.9	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	1.80E+04	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	9,023	5.67E-03	2.34E-01	1.79E-04	1.41E-02	1.41E-02	0.00E+00	1.41E-02	112.9

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	1.80E+04	1.51	1.54E+02	1.41E-02	9.27E+03	4.28E+04	2.95E-04	5.31E+00	NA	3.0E-01

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

SG-ADV
Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
75694	1.10E+03			Trichlorofluoromethane

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
9	121.9	22	19	102.9	0			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
8.70E-02	9.70E-06	9.68E-02	25	5,999	296.70	471.00	137.36	0.0E+00	7.0E-01

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	112.9	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	1.10E+03	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	6,018	8.73E-02	3.60E+00	1.79E-04	1.41E-02	1.41E-02	0.00E+00	1.41E-02	112.9

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	1.10E+03	1.51	1.54E+02	1.41E-02	9.27E+03	4.28E+04	2.95E-04	3.25E-01	NA	7.0E-01

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

DATA ENTRY SHEET

SG-ADV Version 3.1; 02/04

Reset to Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
106423	6.10E+02			p-Xylene

MORE

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of Ls (cell F24)					
9	121.9	22	19	102.9	0			1.00E-08

MORE

ENTER Stratum A SCS soil type (Lookup Soil Parameters)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
S	1.66	0.375	0.054	S	1.66	0.375	0.054	SIC	1.38	0.481	0.216

MORE

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	25	25	250

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Molecular weight, MW (g/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
7.69E-02	8.44E-06	7.64E-03	25	8,525	411.52	616.20	106.17	0.0E+00	1.0E-01

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. ($\mu g/m^3$)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
7.88E+08	112.9	0.321	0.321	0.265	#N/A	#N/A	#N/A	1.00E-08	6,154	6.10E+02	3.14E+05

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
1.85E+06	5.00E-03	9	10,107	6.42E-03	2.65E-01	1.79E-04	1.24E-02	1.24E-02	0.00E+00	1.24E-02	112.9

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	6.10E+02	1.51	1.54E+02	1.24E-02	9.27E+03	1.74E+05	2.80E-04	1.71E-01	NA	1.0E-01

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00

Attachment 3

DATA ENTRY SHEET

GW-ADV Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
127184	3.20E+02	Tetrachloroethylene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm^2)
			Totals must add up to value of L_{WT} (cell G28)							
22	9	478	19	459	0	B	S			1.00E-08

MORE ↓

ENTER Stratum A SCS soil type	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Stratum B SCS soil type	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm^3)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm^3/cm^3)	ENTER Stratum C SCS soil type	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm^3)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm^3/cm^3)
Lookup Soil Parameters				Lookup Soil Parameters				Lookup Soil Parameters			
S	1.66	0.375	0.054	S	1.66	0.375	0.054	C	1.43	0.459	0.215

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP ($g/cm\text{-}s^2$)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
9	40	822	2255	609	1.51E+00	1	9.3

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	25	25	250	1.0E-06	1
				Used to calculate risk-based groundwater concentration.	

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	3.5E-02

END

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, τ (sec)	Source-building separation, L_T (cm)	Stratum A soil air-filled porosity, θ_a^A (cm^3/cm^3)	Stratum B soil air-filled porosity, θ_a^B (cm^3/cm^3)	Stratum C soil air-filled porosity, θ_a^C (cm^3/cm^3)	Stratum A effective total fluid saturation, S_{te} (cm^3/cm^3)	Stratum A soil intrinsic permeability, k_i (cm^2)	Stratum A soil relative air permeability, k_{rg} (cm^2)	Stratum A soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
7.88E+08	469	0.321	0.321	0.244	#N/A	#N/A	#N/A	1.00E-08	17.05	0.375	0.122	0.253	6,154

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Stratum A effective diffusion coefficient, D^{eff}_A (cm^2/s)	Stratum B effective diffusion coefficient, D^{eff}_B (cm^2/s)	Stratum C effective diffusion coefficient, D^{eff}_C (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)
3.14E+05	1.85E+06	5.00E-03	9	9,431	1.56E-02	6.45E-01	1.79E-04	1.16E-02	1.16E-02	0.00E+00	4.62E-04	6.19E-03	469

Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9	2.06E+05	1.51	1.54E+02	1.16E-02	9.27E+03	3.95E+05	6.74E-05	1.39E+01	5.9E-06	3.5E-02

END

Crack width caclulation

crack width=(A_B*η)/(2*(L_B+W_B))

crack width=(A_B*0.005)/(2*(L_B+W_B))

1.51E+00