September 20, 2010

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9:19 am, Sep 22, 2010

Alameda County
Environmental Health

Mr. Paresh Khatri
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, CA 9502-6577

Subject: Crow Canyon Dry Cleaners
7272 San Ramon Road Dublin, CA
RO# 000283

Dear Mr. Khatri:

This enclosed report has been prepared by Endpoint Consulting, Inc. on behalf of the Burrows Company, Dwight & Carleton Perry, Gabriel H. Chui & Lai H. Trust, the Lee Family, Nam Sun and Seung Hee Park, and the Raphel-Roessler Retail Group.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge. If you have any questions, please contact Mr. Mehrdad Javaher or Ms. Jing Heisler of Endpoint at 415-398-3265.

Sincerely,

James Roessl

James Roessler
Raphel-Roessler Retail Group

September 14, 2010

Mr. Paresh Khatri
Hazardous Materials Specialist
Alameda County Health Care Services Agency (ACHCSA)
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

Subject: Vapor Well Installation and Monitoring Report
Crow Canyon Dry Cleaners
7272 San Ramon Road, Dublin, California
(RO # 0002863)

Dear Mr. Khatri,

Endpoint Consulting, Inc. (Endpoint) is pleased to present this letter report summarizing vapor monitoring well installation activities and vapor sampling results from the first of two rounds of sampling requested by the ACHCSA at and near the above-referenced site (Site) (see Figure 1). The work was conducted in accordance with the workplan (Endpoint, 2010a) and the workplan addendum (Endpoint, 2010b) approved in letters dated April 15, 2010 and July 1, 2010, respectively, by the ACHCSA. The primary objective of the vapor sampling activities was to evaluate PCE concentrations approximately one year following completion of interim remedial actions (IRA) involving soil vapor extraction (SVE) at the Site (Endpoint, 2009).

This report summarizes 1) new vapor well installation activities; 2) vapor sampling results from the newly installed and select existing vapor monitoring wells; and 3) an evaluation of the change in PCE concentrations since termination of IRA activities via a comparison of detected tetrachloroethene (PCE) concentrations with a range of potential cleanup goals previously discussed with the ACHCSA.

ADDITIONAL VAPOR MONITORING WELL INSTALLATION

Prior to initiation of drilling activities, a drilling permit was obtained from the Zone 7 Water Agency (Permit No. 2010072). Also, a Health and Safety Plan (HSP) was prepared, the drilling locations were marked, and Underground Service Alert (USA) was notified. Private utility clearance was also conducted to ensure clearance of potential utilities at proposed well locations.

To accommodate the Montessori School schedule, the field work was conducted during the week of August 23, 2010, at which point three (3) shallow vapor monitoring wells (VM-7, VM-8, and VM-10), and four (4) sub-slab vapor monitoring wells (VM-2SS, VM-5SS, VM-6SS, and VM-9SS) were installed at the Site. The newly installed vapor well locations are shown on Figure 1.

The new vapor wells were installed by Vironex, Inc. of Concord, California, a State Licensed Driller, under the supervision of Endpoint. Three soil-vapor wells, designated as VM-7, VM-8, and VM-10, were completed using a hand auger to a depth of approximately five feet below grade. One-quarter inch teflon tubing with a implant vapor sampling tip was placed in the hole to approximately three inches above the total depth. The lowermost six inches of annular space was filled with #2/16 sand. Approximately one foot of granular bentonite was placed over the sand pack. Neat cement grout was placed over the bentonite to the surface. A five-inch well box was placed over the sampling point at the surface. The vapor well logs are presented in Appendix A.

Three sub-slab points, designated as VM-2SS, VM-5SS, and VM-6SS, were installed within the footprint of Montessori school. These three points were located beneath shelving and underneath the existing carpet, away from foot traffic areas. Because gravels were encountered beneath the slab which would not remain open without caving, these sub-slab vapor monitoring points were built with stainless steel tubing, with the screened point extending several inches into the gravel beneath the slab. The uppermost portion of the sampling point was reamed out with a 1-1/4-inch drill bit and the rest of the cored portion of the slab was 7/8-inch diameter. A teflon washer isolated the uppermost portion of 1-1/4-inch diameter where a concrete seal was built around the stainless steel tubing, extending from the teflon washer to near the surface. A vapor tight ball valve was fitted to the tubing at the surface. A plastic cap was used to cover the valve at the top of the sampling point.

The last sub-slab sampling point VM-9SS was located within the dry cleaner in a foot traffic area, and finished with a well box at the surface. The soils beneath the slab remained open and it was possible to advance the hole with a hand auger. At this location, after coring the concrete slab, the same methodology as used in the 5-foot vapor monitoring wells was used to create the sampling point, which extended to about one foot below grade.

VAPOR MONITORING ACTIVITIES

On August 26, 2010, the newly installed wells/sample points and several previously existing wells, as defined by the approved workplan, were sampled by Vironex, Inc., under the supervision of Endpoint, in accordance with the approved work plan. Vapor well VE-1D was not sampled because there was several inches of water in the well.

Prior to sampling, a stepped purge test was performed on VM-9SS, following a shut-in test. This location was chosen as it was at the source, and because using a well with two-inch casing would have resulted in delays to extract the casing volumes using the required limited flow rates. Based on photoizonization detection (PID) readings from a “T” fitting sampling port of 2.3 parts per million (ppm) for one casing volume, 2.5 ppm for three casing volumes, and 2.8 ppm for seven casing volumes, a purge volume of seven casing volumes was used throughout the remaining soil vapor sampling activities; except for wells with two-inch casings, where two casing volumes was used due to the time required to extract that many casing volumes with the restricted flow rate, and considering the relatively close results of the stepped purge test. Field notes reflecting the vapor sampling efforts are included as

Appendix B, including data on the purge tests, shut-in tests, and leak tests associated with the vapor sampling.

Per the approved workplan, a shroud containing helium was used for leak testing. A plastic shroud was placed over the sample point and manifold, and the shroud was filled with helium to a concentration of approximately 10 to 16 %, based on helium meter monitoring. A "T" fitting was used to obtain PID and helium readings instead of tedlar bags due to the time it would take to fill tedlar bags (The one-liter summa canisters at 3 subslab locations took 40 minutes to fill). Per the work plan, a duplicate sample in a Tedlar bag for helium testing was collected at VE-1S and submitted to the lab, however, the helium was ultimately measured by the laboratory from the Summa canister sample at this location due to the limited hold time for the tedlar bag, which was received at the laboratory just prior to the weekend.

Following the helium leak test, summa canisters were utilized to collect soil vapor samples. For each vapor sample, final sampling times were recorded on the Chain of Custody. The sample elapse time ranged up to approximately 40 minutes at some locations.

Helium was not detected in the samples in the field. No VOCs were detected in sample tubing based on field screening by PID. Relatively low concentrations of VOCs (ranging from 0 ppm to 2.8 ppm) were detected at most of the wells/ sample points following helium testing, using the PID connected to a "T" fitting. The PID readings are recorded on the data sheets included in Appendix B.

Laboratory Analysis:

The vapor samples in summa canisters were transported on the same day to McCampbell Analytical in Pittsburg, California, a State-certified laboratory. The vapor samples were analyzed for EPA Method 8010 constituents by EPA Method TO-15. The laboratory analytical report is included as Appendix C. To confirm the helium screening result in the field, one vapor sample VE-1S was also analyzed for helium using ASTM D1946.

VAPOR MONITORING RESULTS

No significant breakthrough of the helium tracer was indicated during the vapor sample collection, as helium was recorded at 0% in the field (see Appendix B), and at 31 ug/L in the laboratory sample at VE-1S (see Appendix C lab result), which corresponds to ratio of 0.019 % relative to the measurements of helium introduced into the shroud. This ratio is below the 5% threshold defined by DTSC (2010) as the permissible level.

The vapor sampling results from 12 wells (7 new wells, 5 old wells) are summarized in Table 1 and presented on Figure 1. During this sampling event, the maximum concentration of PCE, the primary chemical of potential concern (COPC) at the site, was detected at newly installed sub-slab vapor monitoring well VM-9SS, inside the dry cleaner building and adjacent to the former PCE-related dry cleaning machine (recognized as the former release area), at a concentration of 11,000 ug/m^3. The PCE concentrations decline with distance away from the former dry cleaning, reaching a minimum detected concentration of 28 ug/m^3 in a sub-slab vapor sample from VM-2SS located inside the Montessori School.

It should also be noted that a few other chemicals other than PCE were also detected in the vapor samples (see Appendix C); however, these concentrations remain below the residential environmental screening levels (ESLs) for protection of indoor air quality (Regional Water Quality Control Board [RWQCB], 2008).

DISCUSSION

In support of evaluating the PCE impacts over time prior to and after the IRA activities, Table 1 also includes historical PCE data collected prior to initiation of SVE operations (Baseline sampling), two sampling events conducted during SVE activities, one round of sampling conducted approximately one month after termination of SVE activities, and this event which represents samples collected approximately 11 months after termination of SVE operations.

Per a discussion with ACHCSA, 95% upper confidence limit of the mean concentration (95% UCL) of PCE (see Appendix D for UCL calculations) were used to further compare the detected concentrations of PCE to a range of screening levels for the Site; these included the PCE residential ESL for protection of indoor air quality (RWQCB, 2008), commercial/industrial ESL for protection of indoor air quality (RWQCB, 2008), and a site-specific indoor air screening calculated using the DTSC-version of the Johnson and Ettinger (J&E) vapor model, accounting for school-specific exposure duration and frequency for children present in the school. The residential and commercial/industrial risks were back-calculated directly from the corresponding ESLs per the equations summarized on Table 1. The school-specific screening level and related risks were calculated from the equation shown on Table 1 for for children as the most sensitive (and conservative) receptor and was done so based on an exposure frequency and duration of 180 days per year (DTSC, 2004) and 4 years (based on personal communication with the Montessori School personnel), respectively; all other default parameters, including building dimensions and ventilation rate, in the J&E model were maintained as unchanged from the conservative values in the DTSC's version of the model. J&E model input and output data are included as Appendix E. The model estimated indoor air concentrations under the school scenario (see table below and Appendix E) were then used to calculate the potential risk based on the previously mentioned exposure duration/frequency, estimated body weight for children (15 kg) (DTSC, 2005), inhalation rate for children (10 m^3/day) for children (DTSC, 2005), a PCE cancer slope factor of 0.021 $(mg/kg\text{-}d)^{-1}$ (DTSC, 2005), and an averaging time of 70 years (DTSC, 2005).

PCE Source Concentration (ug/m3) (95% UCL-See Table 1)	Indoor Air Concentration (ug/m3) (See Appendix E)
7642	6.18
270	0.218
115	0.0931
489	0.396
4111	3.3

As indicated in Table 1, the 95% UCL concentration of PCE approximated 7,642 ug/m^3 prior to initiation of SVE operations in July 2009; this concentration corresponds to an estimated carcinogenic risk of 1.86 x 10^{-5} under residential land use, a carcinogenic risk of 5.46 x 10^{-6} under commercial/industrial land use, and a carcinogenic risk of 2.4 x 10^{-6} under the site-specific school use for children. These risk levels are within the target acceptable risk range of 1 x 10^{-4} to 1 x 10^{-6} defined by the US Environmental Protection Agency.

As shown in Table 1, in the months following initiation of SVE operations, the PCE concentrations declined significantly, resulting in a reduction of risks under all three cleanup scenarios to levels below the target risk range of 1 x 10^{-4} to 1 x 10^{-6}. In November 2009, approximately one month following termination of the SVE system, the 95% UCL concentration of PCE rebounded slightly to 489 ug/m^3, again yielding estimated risk levels for all three endpoints (i.e, residential, commercial/industrial, and site-specific school children) that were below the target risk range of 1 x 10^{-4} to 1 x 10^{-6}.

As shown on Table 1, the sampling results obtained during the August 2010 round of sampling indicate additional rebound of PCE concentrations since the sampling in November 2009, resulting in a 95% UCL concentration of 4,111 for PCE approximately 11 months following termination of SVE operations; however, while marking a rebound since the last sampling event, the PCE levels remain largely below levels detected prior to initiation of SVE operations. Specifically, the 95% UCL concentration of PCE during this event marks a 46% reduction from the Baseline sampling event, with estimated risk levels ranging from 1.0 x 10^{-5} under residential land use, 2.9 x 10^{-6} under commercial/industrial land use, and 1.3 x 10^{-6} under school usage by children; all within the target acceptable risk range of 1 x 10^{-4} to 1 x 10^{-6}.

Also worth noting is that the maximum detected concentration of PCE within the footprint of the Montessori School (1,100 ug/m^3) during the August 2010 event corresponds to a risk of 3.5 x 10^{-7} under the school land use for children (which is below the target acceptable risk range), while marking a significant reduction from 6,800 ug/m^3 historically detected (Ceres, 2008) at adjacent historical sub-slab sample SB-13 (see Figure 1).

PLANNED ACTIVITIES

The next vapor monitoring event is scheduled for December 2010. Vapor samples will be collected from the same wells outlined in the ACHCSA-approved workplan (LRM, 2010), and all proposed vapor samples will be collected using summa canisters following the ACHCSA-approved procedures outlined in the workplan (Endpoint, 2010a). Vapor samples will be analyzed for 8010 list using EPA TO-15 method. Following completion of December 2010's sampling event, a monitoring report including the recommendations for future site activities will be submitted to the ACHCSA.

As always, we appreciate your assistance with this project. If you have any questions, please contact Jing Heisler at 415-342-3713 or at jing@endpoint-inc.com, or Mehrdad Javaher at 415-706-8935, or at mehrdad@endpoint-inc.com .

Sincerely,
Endpoint Consulting, Inc.

Jing Heisler, PG, CHG
Senior Geologist

JING HEISLER
No. 666
CERTIFIED HYDROGEOLOGIST
Exp. 3/28/11

M Javaheri

Mehrdad M. Javaher, Ph.D(cand.), MPH
Principal Risk Assessor

Attachments:

Table 1 - PCE and Estimated Risks in Soil Vapor

Figure 1 – Vapor Monitoring Results (August 2010)

Appendix A – Vapor Well Logs
Appendix B – Field Data Sheets
Appendix C – Laboratory Analytical Reports of Vapor Samples
Appendix D – ProUCL Calculation
Appendix E – J&E Model Input and Output

References:

Ceres Associates, 2008. Soil Vapor and Soil Sampling Report, Crow Canyon Dry Cleaners, 7272 San Ramon Road, Dublin, California. May 2008.

DTSC, 2004. Guidance for School Site Risk Assessment Pursuant to Health and Safety Code Section 901(f): Guidance for Assessing Exposures and Health Risks at Existing and Proposed School Sites, Final Report, February.

DTSC, 2005. Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties, January 5.

DTSC, 2010. *Advisory – Active Soil Gas Sampling*, Department of Toxic Substances Control, California Environmental Protection Agency, March 2010

Endpoint, 2009. *Interim Remedial Action Report*, Crow Canyon Cleaners Site, 7272 San Ramon Road, Dublin, California, January 26, 2010

Endpoint, 2010a. *Vapor Well Installation and Monitoring Workplan*, Crow Canyon Cleaners Site, 7272 San Ramon Road, Dublin, California, May 10, 2010

Endpoint, 2010b. *Addendum Letter to Vapor Well Installation and Monitoring Workplan*, Crow Canyon Cleaners Site, 7272 San Ramon Road, Dublin, California, June 21, 2010

RWQCB 2008. "*Screening For Environmental Concerns at Sites with Contaminated Soil and Groundwater*", California Regional Water Quality Control Board, Interim Final, May 2008

TABLE

Table 1
PCE and Estimated Risks in Soil Vapor

Crow Canyon Dry Clenaers
7272 San Ramon Road,
Dublin, California

Well I.D.	**PCE Concentrations (ug/m^3)**				
	7/18/2009 to 7/30/2009 Baseline-Purge Test-SVE Shakedown Sampling Events	**9/1/2009 1 Month after operation of SVE system**	**9/28/2009 2 Months after operation of SVE system**	**11/4/09 ~ 1 month after shutdown of SVE system**	**8/26/10 ~ 11 months after shutdown of SVE system**
VE-1S	1,200	23	<14	970	1,100
VE-1D	420	300	<14	770	NS
VE-2S	5,900	<14	200	500	3,400
VE-2D	1,100	<14	<14	350	NS
VE-3S	2,200	30	38	<14	870
VE-3D	3,800	24	51	<14	NS
VM-1S	<73	-	<14	20	2,600
VM-1D	160	-	16	140	NS
VM-3S	8,100	-	55	81	NS
VM-3D	34J	-	<14	300	NS
VM-4S	10,000	-	180	310	1,100
VM-5SS	-	-	-	-	1,300
VM-6SS	-	-	-	-	650
VM-2SS	-	-	-	-	28
VM-7	-	-	-	-	310
VM-8	-	-	-	-	1,300
VM-9SS	-	-	-	-	11,000
VM-10	-	-	-	-	450
95% UCL Concentration (1)	**7,642**	**270**	**115**	**489**	**4,111**
Carcinogneic Risk-Residential Land Use (2)	**1.9E-05**	**6.6E-07**	**2.8E-07**	**1.2E-06**	**1.0E-05**
Carcinogneic Commercial Land Use (3)	**5.5E-06**	**1.9E-07**	**8.2E-08**	**3.5E-07**	**2.9E-06**
Carcinogneic Risk-School Land Use (4)	**2.4E-06**	**8.6E-08**	**3.7E-08**	**1.6E-07**	**1.3E-06**
ESLs Residential Exposure: 410 ug/m^3					
ESLs Commercial/Industrial Land Use: 1,400 ug/m3					
Site-Specific Screening Level for School Children: 2,600 ug/m^3					

`

Table 1
PCE and Estimated Risks in Soil Vapor

Crow Canyon Dry Clenaers
7272 San Ramon Road,
Dublin, California

Abbreviations:

SVE = Soil Vapor Extraction
ug/m^3 = microgram per cubic meter
"-" or "NS" = not available or not sampled
"<" = less than laboratory reporting limit
ESLs = Environmental Screening Levels developed by RWQCB, San Francisco Bay Region, May 2008 (Table E).

Notes:

(1) 95% UCL calculation is detailed in Appendix D.

(2) Since the residential ESL for PCE in soil vapor is 410 ug/m^3 derived from a target risk level of 1E-06, and the risk is approximately directly proportional to concentration, a potential risk posed by site PCE concentration (95% UCL) is estimated as follows:

$$risk \approx 4{,}111 ug/m^3 \times \frac{1E-06}{410 ug/m^3} \approx 1E-05$$

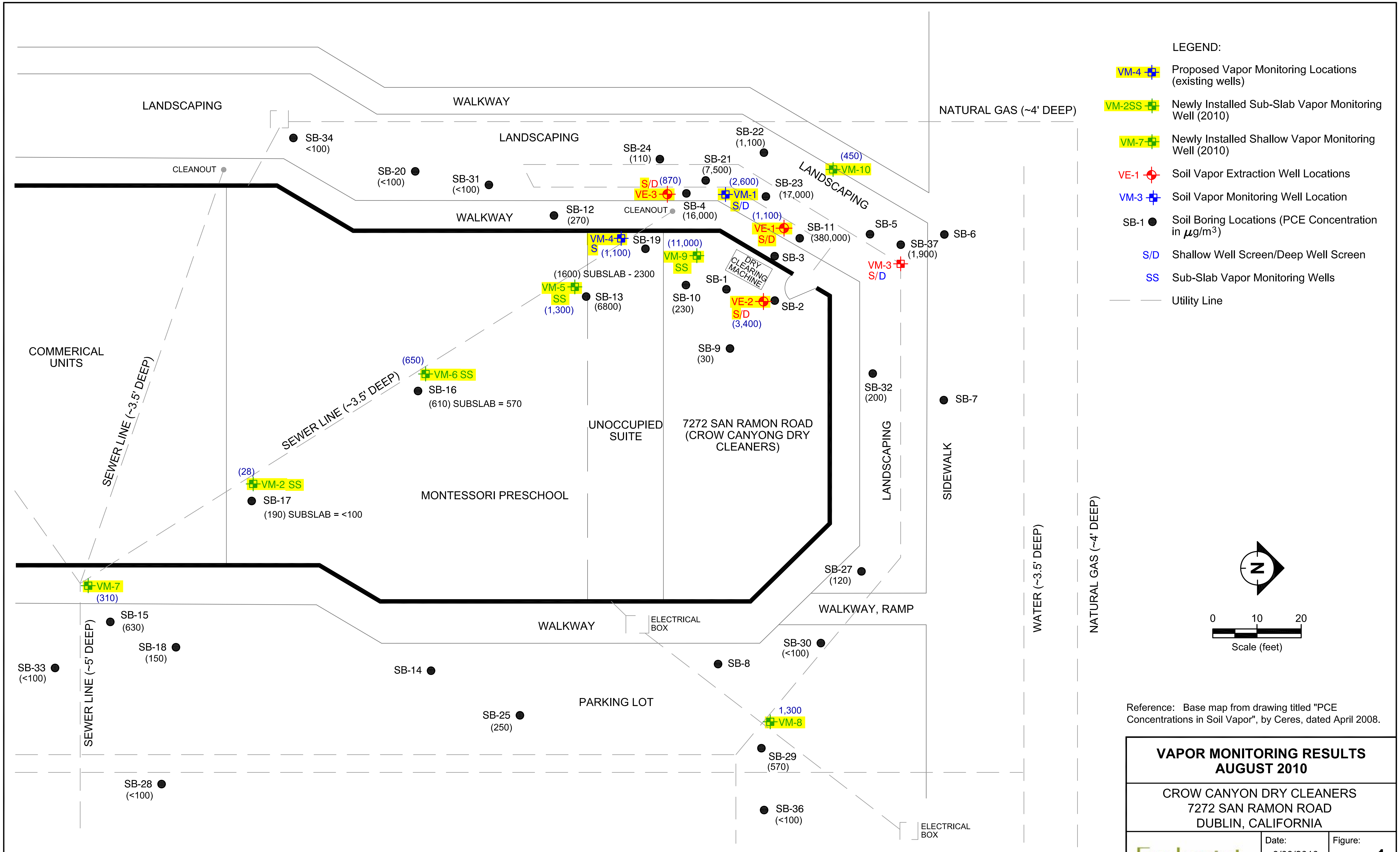
(3) Since the commercial ESL for PCE in soil vapor is 1,400 ug/m^3 derived from a target risk level of 1E-06, and the risk is approximately directly proportional to concentration, a potential risk posed by site PCE concentration (95% UCL) is estimated as follows:

$$risk \approx 4{,}111 ug/m^3 \times \frac{1E-06}{1{,}400 ug/m^3} \approx 2.94E-06$$

(4) A potential risk to children posed by site PCE concentration (95% UCL) for school use scenario is calculated based on J&E Model (Appendix E) and the equation below.

Risk = (Indoor air concentration x Inhalation Rate x Exposure Frequency x Exposure Duration x Inahlation Cancer Slope Factor)/(Body Weight x Averaging Time for Carcinogens)

FIGURE



Reference: Base map from drawing titled "PCE Concentrations in Soil Vapor", by Ceres, dated April 2008.

VAPOR MONITORING RESULTS AUGUST 2010

CROW CANYON DRY CLEANERS
7272 SAN RAMON ROAD
DUBLIN, CALIFORNIA

Endpoint. Strategy. Science. Sustainability.

	Date: 9/09/2010	Figure: 1

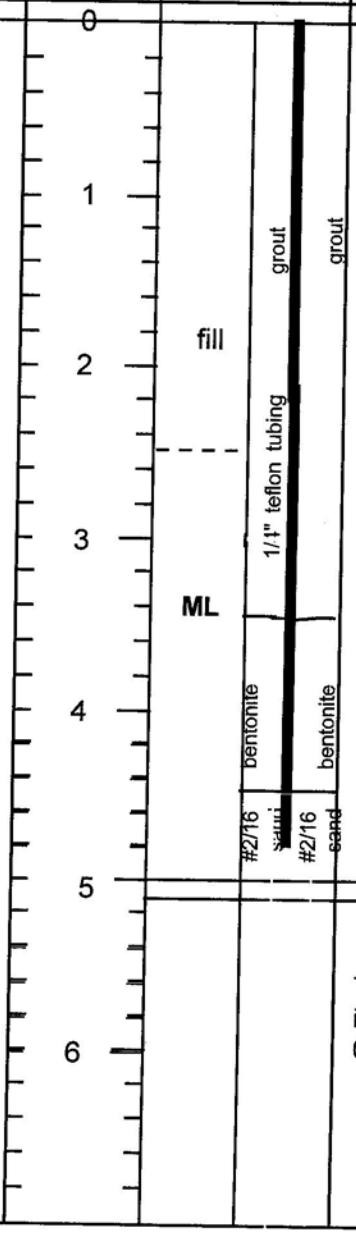
Appendix A

Vapor Well Logs

BORING LOG

Permit No. 2010072	Boring & casing diameter 3"/1/4"	Logged By: Joel Greger
Project: 7272 San Ramon Rd., Dublin, CA	Well Casing Elevation:	Date drilled: 8-23-2010
Well No. VM-7	Drilling Method: hand auger	Drilling Company: Vironex

Other notes	G.W. level	Sample Depth (ft)	Stratigraphy (USCS)	Description
				@ 0' - brown silt (ML), roots, moist, stiff, occasional pebbles to 3/8 inch diameter (fill).
				@ 1' - few roots, no pebbles, otherwise as above.
				@ 2.5' - relatively undisturbed native soil, greenish brown silt (ML), moist, stiff.
				@ 4.5' - greenish brown clayey silt (ML), moist, stiff.
				Total Depth: 5'. 1/4 inch casing with soil gas sampling implant tip, #2/16 sand 4.5-5', bentonite 3.5-4.5', neat cement 0-3.5'.

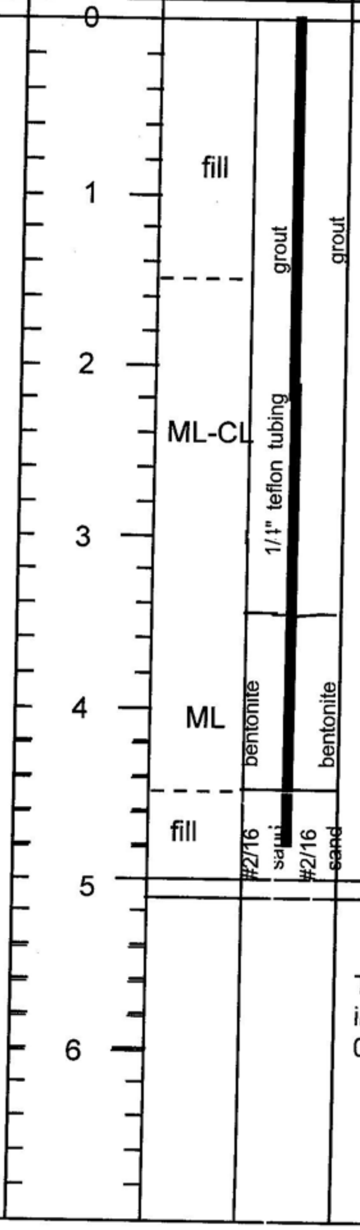


Crow Canyon Cleaners 7272 San Ramon Rd. Dublin, CA	**VM-7**	Date: 8-24-10 Drawn By: JG

BORING LOG

Permit No. 2010072	Boring & casing diameter 3"/1/4"	Logged By: Joel Greger
Project: 7272 San Ramon Rd., Dublin, CA	Well Casing Elevation:	Date drilled: 8-23-2010
Well No. VM-8	Drilling Method: hand auger	Drilling Company: Vironex

Other notes	G.W. level	Sample Depth (ft)	Stratigraphy (USCS)	Description
			fill	@ 0' - two separate asphalt pavements each 2.5" thick, then sand and gravel base.
				@ 1' - Disturbed native soil and sand and gravel base.
			ML-CL	@ 1.5' - Dark gray silty clay/clayey silt (CL-ML), moist, stiff.
				@ 2.5' - Color change to brown, occasional subrounded pebbles.
			ML	@ 4' - Olive green silt (ML), moist, stiff.
			fill	@ 4.5' - apparent storm drain trench backfill, silty sand with gravel, subangular gravels to 2 inches, v. moist, stiff.
				Total Depth: 5'. 1/4 inch casing with soil gas sampling implant tip, #2/16 sand 4.5-5', bentonite 3.5-4.5', neat cement 0-3.5'.

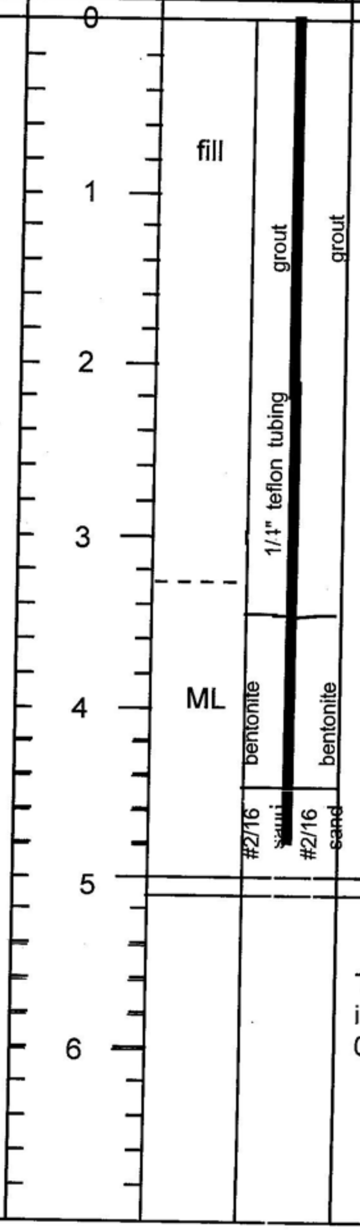


Crow Canyon Cleaners 7272 San Ramon Rd. Dublin, CA	**VM-8**	Date: 8-24-10 Drawn By: JG

BORING LOG

Permit No. 2010072	Boring & casing diameter 3"/1/4"	Logged By: Joel Greger
Project: 7272 San Ramon Rd., Dublin, CA	Well Casing Elevation:	Date drilled: 8-23-2010
Well No. VM-10	Drilling Method: hand auger	Drilling Company: Vironex

Other notes	G.W. level	Sample Depth (ft)	Stratigraphy (USCS)	Description



@ 0' - sandy silt with gravel, slightly moist, stiff, sub-angular gravels to 1" diameter(fill).

@ 1.5' - brown sandy silt with gravel, moist, stiff, sand v. fine-grained, some roots (fill).

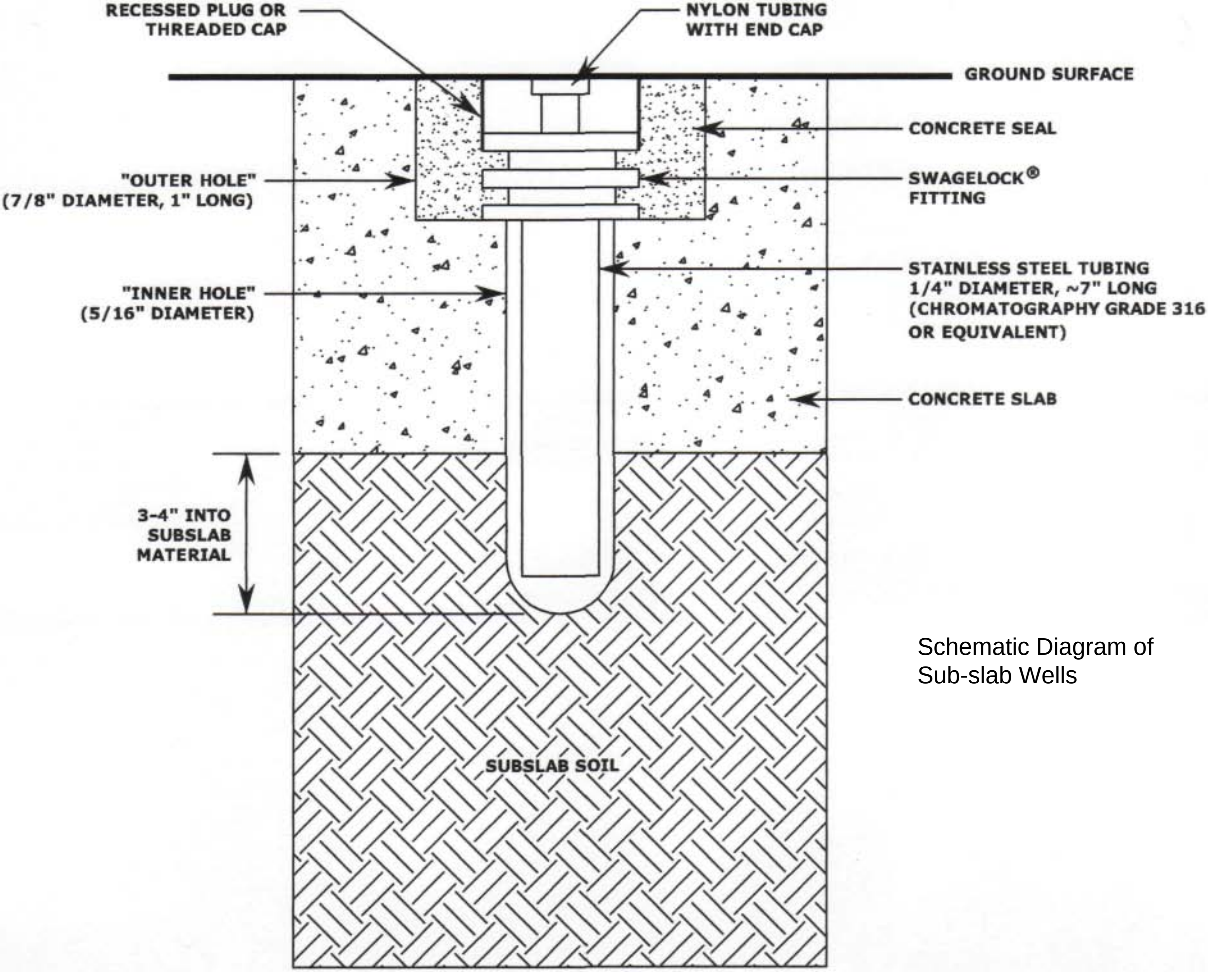
@ 2.5' - gravels to 2.5" diameter, estimated at up to 45% gravel (fill).

@ 3.2' - Transition to brown to greenish brown clayey silt (ML), moist, stiff.

@ 3.5' - greenish brown, otherwise as above.

Total Depth: 5'. 1/4 inch casing with soil gas sampling implant tip, #2/16 sand 4.5-5', bentonite 3.5-4.5', neat cement 0-3.5'.

Crow Canyon Cleaners 7272 San Ramon Rd. Dublin, CA	**VM-10**	Date: 8-24-10 Drawn By: JG



Schematic Diagram of
Sub-slab Wells

Appendix B

Field Data Sheets

VE-1S

Note: casing spins in hole

APPENDIX B - FIELD FORM FOR SOIL VAPOR/SUB SLAB SAMPLING

Project Name: Crow Canyon Cleaners
Date: 8-26-10 Project Number: ______
Site Location: 7272 San Ramon Rd, Dublin
Weather: Clear, mild
Field Personnel: John McAssey (Vironex), Joel Greger (Endpoint)
Recorded by: JG

Soil Vapor Probe No: VE1-S
~~Sub-Slab Probe~~ No: ______
PID Serial No: 62716 PID Lamp: 10.6 eV
MDG 2002 Serial No: 041268
Tracer Gas: helium

Surface Type: Asphalt ______ Concrete ______ Grass ______ Other soil
Surface Thickness (i.e., asphalt or concrete) ______

1 Casing Volume:
~~Sub-Slab Volume~~ ______ L
Soil Vapor Probe Volume 1235 ml ~~L~~

Initial Vacuum Prior to Pumping -29 inches of ~~water~~ Hg
Shut-in Test -24 inches of Water held for 5 min ~~seconds~~
Field Tubing: Blank PID Reading 0 ppmv
Shut in Test Completed Prior to Purging: X Yes ______ No

390 ml - 6' casing + 2"
834 ml 3' sandpack @ 0.3 porosity, 7" hole
1224

2 ft 3/16 tubing = 10.86

1235 ml / 150 ml/min =

8.23 min

Note: magnuhelic guage
in line but appeared to slow filling Summa

VE-15

Purging

Date	Start Time	End Time	Elapsed Time (min.)	Bag Volume (L) T-fitting	Purge Rate (LPM)	Cumulative Volume (L)	Tracer Gas		Sample (ppmv, %)	VOCs by PID (ppmv)
8-26-10	1014	1030	16.4		150	1235 ml	Shroud (%)			
							Min	Max		
							10.1	15.7	0	0.0

0.0 on Tedlar bag after summa filled

Helium Concentration in Field Screen Samples is Less than 5% of Minimum Concentration in the Shroud?

[✓ Yes] No

Sample Collection

MAN316-67C

Date	Time	Sample ID		Summa Canister ID	Flow Controller #	Vaccum Gage #	Initial Vacuum (in of Hg)	Final Vacuum (in Hg)
8-26-10	1029	VE-15		A7515			-29	-7
	1055							

Then collect filled Tedlar bag for helium duplicate sample using Geoprobe pump + vacuum chamber

start ~~[illegible]~~ 10:59 - 1107 END

VE-25

APPENDIX B - FIELD FORM FOR SOIL VAPOR/SUB SLAB SAMPLING

Project Name: Crow Canyon Cleaners
Date: 8-26-10 **Project Number:** ________
Site Location: 7272 San Ramon Rd, Dublin
Weather: Clear + mild
Field Personnel: John McAssey (Vironex), Joel Greger (Endpoint)
Recorded by: JG

Soil Vapor Probe No: VE-25
Sub~~Slab Probe~~ No: ________
PID Serial No: 02716 **PID Lamp:** 10.6 **eV**
MDG 2002 Serial No: 041268
Tracer Gas: helium

Surface Type: Asphalt ____ Concrete X 4.5 Grass ____ Other ____
Surface Thickness (i.e., asphalt or concrete) 4.5"

1 Casing Volume:
~~Sub-Slab Volume~~ ____ L
Soil Vapor Probe Volume 1235 ml

Initial Vacuum Prior to Pumping 28 inches of ~~water~~ Hg
Shut-in Test -28 inches of Water held for 180 seconds
Field Tubing: Blank PID Reading 0 ppmv
Shut in Test Completed Prior to Purging: X Yes ____ No

VE-25

Purging

Date	Start Time	End Time	Elapsed Time (min.)	Bag Volume (L) (tc+fitting)	Purge Rate (LPM)	Cumulative Volume (L)	Tracer Gas		Sample (ppmv, %)	VOCs by PID (ppmv)
8-26-10	1242 pm	1258	16.4		150ml	1225ml x 2	Shroud (%)			
							Min	Max		
							15.5	16.6	6	0.5

Helium Concentration in Field Screen Samples is Less than 5% of Minimum Concentration in the Shroud?

x Yes ________ No

Sample Collection

MAN 316-671

Date	Time	Sample ID		Summa Canister ID	Flow Controller #	Vaccum Gage #	Initial Vacuum (in of Hg)	Final Vacuum (in Hg)
8-26-10	1259	VE-25		6808			-28	-5
	104							

VE-35

APPENDIX B - FIELD FORM FOR SOIL VAPOR/SUB SLAB SAMPLING

Project Name: Crow Canyon Cleaners
Date: 8-26-10 **Project Number:** ____________
Site Location: 7272 San Ramon Rd, Dublin
Weather: clear, mild
Field Personnel: John McAssey (Vironex), Joel Greger (Endpoint)
Recorded by: JG

Soil Vapor Probe No: VE-35
~~Sub-Slab Probe No~~: ____________
PID Serial No: 62716 PID Lamp: 10.6 eV
MDG 2002 Serial No: 041268
Tracer Gas: helium

Surface Type: Asphalt ______ Concrete ______ Grass ______ Other Soil
Surface Thickness (i.e., asphalt or concrete) ____________

1 Casing Volume:

~~Sub-Slab-Vo~~lume ________ L
Soil Vapor Probe Volume 1235 mL

Initial Vacuum Prior to Pumping -29 ~~inches of water~~ Hg
Shut-in Test -28 inches of Water held for 240 seconds
Field Tubing: Blank PID Reading 0 ppmv
Shut in Test Completed Prior to Purging: X Yes ______ No

VE-35

Purging

Date	Start Time	End Time	Elapsed Time (min.)	Bag Volume (L) (to T fitting)	Purge Rate (LPM)	Cumulative Volume (L)	Tracer Gas		Sample (ppmv, %)	VOCs by PID (ppmv)
8-26/10	1148Am	1204pm	1615		150ml	1235ml x 2	Shroud (%)			
	1						Min	Max		
							10.7	13.9	0	0.1

Helium Concentration in Field Screen Samples is Less than 5% of Minimum Concentration in the Shroud?

[✓ Yes] No

mAN3116-844

Sample Collection

Date	Time	Sample ID		Summa Canister ID	Flow Controller #	Vaccum Gage #	Initial Vacuum (in of Hg)	Final Vacuum (in Hg)
8-26-10	1204pm	VE-35		1461			-29	-5
	1258PM							

VM-15

APPENDIX B - FIELD FORM FOR SOIL VAPOR/SUB SLAB SAMPLING

Project Name: Crow Canyon Cleaners
Date: 8/26-16 Project Number: ____________
Site Location: 7272 San Ramon Rd, Dublin
Weather: clear + mild
Field Personnel: John McAssey (Vironex), Joel Greger (Endpoint)
Recorded by: JG

Soil Vapor Probe No: VM-15
Sub ~~Slab Probe~~ No: ____________
PID Serial No: 02716 PID Lamp: 10.6 eV
MDG 2002 Serial No: 041268
Tracer Gas: helium

Surface Type: Asphalt ______ Concrete ________ Grass ______ Other soil
Surface Thickness (i.e., asphalt or concrete) __________

1 Casing Volume:
Sub ~~Slab Volume~~ ________ L
Soil Vapor Probe Volume 235 ml L 16.4 min

Initial Vacuum Prior to Pumping ~28 inches of ~~water~~ Hg
Shut-in Test -24 inches of ~~Water~~ Hg held for 180 seconds
Field Tubing: Blank PID Reading 0 ppmv
Shut in Test Completed Prior to Purging: X Yes ________ No

VM-15

Purging

Date	Start Time	End Time	Elapsed Time (min.)	Bag Volume (L) (to T-fitting)	Purge Rate (LPM)	Cumulative Volume (L)	Tracer Gas		Sample (ppmv, %)	VOCs by PID (ppmv)
8-26-10	1109	1125	16.4		150	1235 ml x2	Shroud (%)			
							Min	Max		
							10.3	14.4	0	0.6

Helium Concentration in Field Screen Samples is Less than 5% of Minimum Concentration in the Shroud?
__x__ Yes ________ No

Sample Collection

MAN316844

Date	Time	Sample ID		Summa Canister ID	Flow Controller #	Vaccum Gage #	Initial Vacuum (in of Hg)	Final Vacuum (in Hg)
8-26-10	1138 Am	VM15		6204			-28	-5
	1141 Am							

VM-2SS

APPENDIX B - FIELD FORM FOR SOIL VAPOR/SUB SLAB SAMPLING

Project Name: Crow Canyon Cleaners
Date: 8-26-10 **Project Number:** ____________
Site Location: 7272 San Ramon Rd, Dublin
Weather: clear+mild
Field Personnel: John McAssey (Vironex), Joel Greger (Endpoint)
Recorded by: JG

~~Soil Vapor Probe~~ No: ______________
Sub Slab Probe No: VM-2SS
PID Serial No: 02716 PID Lamp: 10.6 eV
MDG 2002 Serial No: 041268
Tracer Gas: helium

Surface Type: Asphalt _______ Concrete X Grass _______ Other _______
Surface Thickness (i.e., asphalt or concrete) 4.5"

1 Casing Volume:
Sub Slab Volume 11ml L x7 = 77ml
~~Soil Vapor Probe Volume~~ _______ L

Initial Vacuum Prior to Pumping -28 inches of ~~water~~ Hg
Shut-in Test -15 inches of ~~Water~~ Hg held for 4m ~~seconds~~
Field Tubing: Blank PID Reading 0 ppmv
Shut in Test Completed Prior to Purging: X Yes _______ No

VM-255

Purging

Date	Start Time	End Time	Elapsed Time (min.)	Bag Volume (L) (for T fitting)	Purge Rate (LPM)	Cumulative Volume (L)	Tracer Gas		Sample (ppmv, %)	VOCs by PID (ppmv)
8-26-10	223	225	1.5		50ml/m		Shroud (%)			
							Min	Max		
							10.3	12.4	0	0.0

Helium Concentration in Field Screen Samples is Less than 5% of Minimum Concentration in the Shroud?

X Yes ______ No

MAN316665

Sample Collection

Date	Time	Sample ID		Summa Canister ID	Flow Controller #	Vaccum Gage #	Initial Vacuum (in of Hg)	Final Vacuum (in Hg)
8-26-10	233	VM-255		6803			-28	-6
	310	end						

VM-4S

APPENDIX B - FIELD FORM FOR SOIL VAPOR/SUB SLAB SAMPLING

Project Name: Crow Canyon Cleaners
Date: 8-26-10 Project Number: ______
Site Location: 7272 San Ramon Rd, Dublin
Weather: clear, mild
Field Personnel: John McAssey (Vironex), Joel Greger (Endpoint)
Recorded by: JG

Soil Vapor Probe No: VM-4S
~~Sub-Slab Probe No~~: ______
PID Serial No: 02716
MDG 2002 Serial No: 041268
Tracer Gas: helium
PID Lamp: 10.6 eV

Surface Type: Asphalt ______ Concrete 4.5" Grass ______ Other ______
Surface Thickness (i.e., asphalt or concrete) ______

1 Casing Volume:
~~Sub-Slab Volume~~ ______ L
Soil Vapor Probe Volume 1235 L ml x 2

Initial Vacuum Prior to Pumping - 29 inches of ~~water~~ Hg
Shut-in Test -12 inches of ~~Water~~ Hg held for 5 min seconds
Field Tubing: Blank PID Reading 0 ppmv
Shut in Test Completed Prior to Purging: X Yes ______ No

VM-4S

Purging

Date	Start Time	End Time	Elapsed Time (min.)	Bag Volume (L) to 7 fitting	Purge Rate (LPM)	Cumulative Volume (L)	Tracer Gas		Sample (ppmv, %)	VOCs by PID (ppmv)
8-26-10	1216	1232	16.4		150 ml	1235 ml x 2	Shroud (%)			
							Min	Max		
							10.3	15.5	0	0.2

Helium Concentration in Field Screen Samples is Less than 5% of Minimum Concentration in the Shroud?

[✓ Yes] ______ No

Sample Collection

MAN 316-6670

Date	Time	Sample ID		Summa Canister ID	Flow Controller #	Vaccum Gage #	Initial Vacuum (in of Hg)	Final Vacuum (in Hg)
8-26-10	1233	VM4S		6168				
	1237 end						~29	~2

VM 5 s/s

APPENDIX B - FIELD FORM FOR SOIL VAPOR/SUB SLAB SAMPLING

Project Name: Crow Canyon Cleaners
Date: 8-26-16 Project Number: ____________
Site Location: 7272 San Ramon Rd, Dublin
Weather: ____________
Field Personnel: John McAssey (Vironex), Joel Greger (Endpoint)
Recorded by: JG

~~Soil Vapor Probe~~ No: ____________
Sub Slab Probe No: ~~[illegible]~~ VM-5 SS
PID Serial No: 02716 PID Lamp: 10.6 eV
MDG 2002 Serial No: 041268
Tracer Gas: helium

Surface Type: Asphalt ______ Concrete × Grass ______ Other ______
Surface Thickness (i.e., asphalt or concrete) 4.5"

1 Casing Volume:
Sub Slab Volume 11 ml L × 7 = 77 ml @ 50 ml/min = 1.5 min
~~Soil Vapor Probe Volume~~ ______ L

Initial Vacuum Prior to Pumping -29 inches of water Hg
Shut-in Test 14 inches of Water held for 240 seconds
Field Tubing: Blank PID Reading 0 ppmv
Shut in Test Completed Prior to Purging: × Yes ______ No

~~[illegible]~~ VM-5SS

Purging

Date	Start Time	End Time	Elapsed Time (min.)	Bag Volume (L) [illegible]	Purge Rate (LPM)	Cumulative Volume (L)	Tracer Gas		Sample (ppmv, %)	VOCs by PID (ppmv)
g							Shroud (%)			
							Min	Max		
8-26-10	118 Pm	120 pm	1.5		50ml/m	7x11 = 77ml	10.3	~~[illegible]~~ 13.7	0	0.0

Helium Concentration in Field Screen Samples is Less than 5% of Minimum Concentration in the Shroud?

X Yes ______ No

Sample Collection

MAN316672

Date	Time	Sample ID		Summa Canister ID	Flow Controller #	Vaccum Gage #	Initial Vacuum (in of Hg)	Final Vacuum (in Hg)
8-26-10	122 PM	Vm-5SS		6801			-29	-5
	200PM							

20 mn

VM-6SS

APPENDIX B - FIELD FORM FOR SOIL VAPOR/SUB SLAB SAMPLING

Project Name: Crow Canyon Cleaners
Date: 8-26-10 Project Number: ____________
Site Location: 7272 San Ramon Rd, Dublin
Weather: Clear + mild
Field Personnel: John McAssey (Vironex), Joel Greger (Endpoint)
Recorded by: JG

~~Soil Vapor Probe No:~~
Sub Slab Probe No: VM-6SS
PID Serial No: 02716
MDG 2002 Serial No: 041268
Tracer Gas: helium

PID Lamp: 10.6 eV

Surface Type: Asphalt ______ Concrete X Grass ______ Other ______
Surface Thickness (i.e., asphalt or concrete) 4.5"

1 Casing Volume:
Sub Slab Volume 11 ml L x 7 = 77 ml = 1.5 min
~~Soil Vapor Probe Volume~~ ______ L

Initial Vacuum Prior to Pumping -28 inches of ~~water~~ Hg
Shut-in Test -22 inches of Water held for 240 seconds
Field Tubing: Blank PID Reading 0 ppmv
Shut in Test Completed Prior to Purging: X Yes ______ No

VM-65S

Purging

Date	Start Time	End Time	Elapsed Time (min.)	Bag Volume (L)	Purge Rate (LPM)	Cumulative Volume (L)	Tracer Gas		Sample (ppmv, %)	VOCs by PID (ppmv)
8-26-10	213	215	1.5	to T fitting	50		Shroud (%)			
							Min	Max		
							10.1	13.1	0	0.0

Helium Concentration in Field Screen Samples is Less than 5% of Minimum Concentration in the Shroud?

X Yes ________ No

Sample Collection

MAN316679

Date	Time	Sample ID		Summa Canister ID	Flow Controller #	Vaccum Gage #	Initial Vacuum (in of Hg)	Final Vacuum (in Hg)
8-26-10	216	VM-65S		6806			-28	-5
	254 end							

0

VM-7

APPENDIX B - FIELD FORM FOR SOIL VAPOR/SUB SLAB SAMPLING

Project Name: Crow Canyon Cleaners
Date: 8-26-10 Project Number: __________
Site Location: 7272 San Ramon Rd, Dublin
Weather: Clear, mild
Field Personnel: John McAssey (Vironex), Joel Greger (Endpoint)
Recorded by: JG

Soil Vapor Probe No: VM-7
Sub ~~Slab Probe~~ No: __________
PID Serial No: 02716 PID Lamp: 10.6 eV
MDG 2002 Serial No: 041268
Tracer Gas: helium

Surface Type: Asphalt _____ Concrete _____ Grass _____ Other Soil in landscaped area
Surface Thickness (i.e., asphalt or concrete) 0

1 Casing Volume:

~~Sub Slab Volume~~ _____ L
Soil Vapor Probe Volume 58 ml L (x 7 casing vol)

Initial Vacuum Prior to Pumping -28 inches of ~~water~~ Hg
Shut-in Test -24 inches of Water held for 300 seconds
Field Tubing: Blank PID Reading 0 ppmv
Shut in Test Completed Prior to Purging: X Yes _____ No

VM-7

Purging

Date	Start Time	End Time	Elapsed Time (min.)	Bag Volume (L) (1 fitting)	Purge Rate (LPM)	Cumulative Volume (L)	Tracer Gas		Sample (ppmv, %)	VOCs by PID (ppmv)
							Shroud (%)			
							Min	Max		
8-26-10	900Am	903.2	3m16s		150	7 x 58 ml	10.7	15.6	0	0.4

Helium Concentration in Field Screen Samples is Less than 5% of Minimum Concentration in the Shroud?

[✓ Yes] ______ No

Sample Collection

MAN 316-762

Date	Time	Sample ID		Summa Canister ID	Flow Controller #	Vaccum Gage #	Initial Vacuum (in of Hg)	Final Vacuum (in Hg)
8-26-16	904	VM-7		6171			-28	-5
	910							

3m 16 sec

VM-8

APPENDIX B - FIELD FORM FOR SOIL VAPOR/SUB SLAB SAMPLING

Project Name: Crow Canyon Cleaners
Date: 8-26-10 **Project Number:** ______
Site Location: 7272 San Ramon Rd, Dublin
Weather: clear, mild
Field Personnel: John McAssey (Vironex), Joel Greger (Endpoint)
Recorded by: JG

Soil Vapor Probe No: VM-8
Sub-~~Slab Probe No~~: ______
PID Serial No: 02716 **PID Lamp:** 10.6 eV
MDG 2002 Serial No: 041268
Tracer Gas: helium

Surface Type: Asphalt X Concrete ______ Grass ______ Other ______
Surface Thickness (i.e., asphalt or concrete) 5"

1 Casing Volume:
~~Sub Slab Volume~~ ______ L
Soil Vapor Probe Volume 58 mls

21 ml on sand
tubing 7 @ 5.43 = 37
21
58 ml ≈ 28 seconds
7
196 sec. = 3 min, 16 sec.
7 casing volumes

Initial Vacuum Prior to Pumping -30 inches of ~~water~~ Hg
Shut-in Test -28 inches of ~~Water~~ Hg held for 180 seconds
Field Tubing: Blank PID Reading 0 ppmv
Shut in Test Completed Prior to Purging: X Yes ______ No

VM-8

Purging

Date	Start Time	End Time	Elapsed Time (min.)	~~Bag Volume~~ (L) (T fitting)	Purge Rate (LPM)	Cumulative Volume (L)	Tracer Gas helium		Sample (ppmv, %)	VOCs by PID (ppmv)
8-26-10	826 AM	829 AM	3m 16s		150 ml	7 × 58 ml	Shroud (%)			
							Min	Max		
							10.2	15.2	0	2.4

Helium Concentration in Field Screen Samples is Less than 5% of Minimum Concentration in the Shroud?

X Yes ________ No

Sample Collection

MAN 316843

Date	Time	Sample ID		Summa Canister ID	Flow Controller #	Vaccum Gage #	Initial Vacuum (in of Hg)	Final Vacuum (in Hg)
8-26-10	832	VM-8		6423			-28	-5
	838.6							

VM 9 S/S

APPENDIX B - FIELD FORM FOR SOIL VAPOR/SUB SLAB SAMPLING

Project Name: Crow Canyon Cleaners
Date: 8/26/10 Project Number: ____________
Site Location: 7272 San Ramon Rd, Dublin
Weather: cool, breezy (7 Am)
Field Personnel: John McAssey (Vironex), Joel Greger (Endpoint)
Recorded by: JG

PID = Mini RAE 2000

~~Soil Vapor Probe~~ No: ✗
Sub Slab Probe No: VM 9 S/S
PID Serial No: 02716 PID Lamp: 10.6 eV
MDG 2002 Serial No: 041268
Tracer Gas: helium

Surface Type: Asphalt _______ Concrete X Grass _______ Other _______
Surface Thickness (i.e., asphalt or concrete) 4.5"

1 Casing Volume:
Sub Slab Volume 21 ml ← 3" sand 2" diameter 0 140 ml/ft (.3 porosity) = ~~2 tot (for 6" vert.)~~ ~~10.5 ml~~ 10.5 ml for 3" vertical of sand
10.86 for 2' tubing
21
~~Soil Vapor Probe Volume~~ _______ L

Initial Vacuum Prior to Pumping -30 inches of ~~water~~ Hg
Shut-in Test -30 inches of ~~Water~~ Hg held for 180 seconds
Field Tubing: Blank PID Reading 0.0 ppmv
Shut in Test Completed Prior to Purging: X Yes _______ No

Vm 9 5/5

Purging

Date	Start Time	End Time	Elapsed Time (min.)	~~Bag Volume~~ (L) thru tubing	Purge Rate (LPM)	Cumulative Volume (L)	Tracer Gas		Sample (ppmv, %)	VOCs by PID (ppmv)
8-26-10	745 Am				150ml/m		Shroud (%)			
							Min	Max		
				7 sec		21 ml	10.2	14.1	0	2.3
				21 sec		63 ml	↓	↓	0	2.5
			757Am	49 sec		147 ml	↓	↓	0	2.8

Helium Concentration in Field Screen Samples is Less than 5% of Minimum Concentration in the Shroud?

__x__ Yes ________ No

MAN 316 669

Sample Collection

Date	Time	Sample ID		Summa Canister ID	Flow Controller #	Vaccum Gage #	Initial Vacuum (in of Hg)	Final Vacuum (in Hg)
8/26/10	757Am	vm 9 5/5		6312			-30	-5
end	804 AM							

Vm-10

APPENDIX B - FIELD FORM FOR SOIL VAPOR/SUB SLAB SAMPLING

Project Name: Crow Canyon Cleaners
Date: 8-26-10 **Project Number:** ____________
Site Location: 7272 San Ramon Rd, Dublin
Weather: Clear + mild
Field Personnel: John McAssey (Vironex), Joel Greger (Endpoint)
Recorded by: JG

Soil Vapor Probe No: VM10
~~Sub Slab Probe~~ No: ____________
PID Serial No: 62716 PID Lamp: 10.6 eV
MDG 2002 Serial No: 041268
Tracer Gas: helium

Surface Type: Asphalt _______ Concrete _______ Grass _______ Other soil
Surface Thickness (i.e., asphalt or concrete) __________

1 Casing Volume:
~~Sub Slab Volume~~ ________ L
Soil Vapor Probe Volume 58ml ~~L~~

Initial Vacuum Prior to Pumping - 30 Hg inches ~~of water~~ inches of Hg
Shut-in Test - 25 inches of ~~Water~~ Hg held for 180 seconds
Field Tubing: Blank PID Reading 0 ppmv
Shut in Test Completed Prior to Purging: X Yes ________ No

VM-10

Purging

Date	Start Time	End Time	Elapsed Time (min.)	~~Bag Volume~~ (L) (T fitting)	Purge Rate (LPM)	Cumulative Volume (L)	Tracer Gas Shroud (%) Min	Tracer Gas Shroud (%) Max	Sample (ppmv, %)	VOCs by PID (ppmv)
8-26-10										
	929AM	~~3m 16s~~	3m 16s							
		932			150ml	7×58ml	10.1	15.3	0	0.1

Helium Concentration in Field Screen Samples is Less than 5% of Minimum Concentration in the Shroud?

X Yes ______ No

Sample Collection

MAN316-712

Date	Time	Sample ID		Summa Canister ID	Flow Controller #	Vaccum Gage #	Initial Vacuum (in of Hg)	Final Vacuum (in Hg)
8-26-10	934AM	VM-10		6420				
	940						-30	-5

3m 16s purge

Appendix C

Laboratory Analytical Reports of Vapor Samples

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Web: www.mccampbell.com E-mail: main@mccampbell.com
Telephone: 877-252-9262 Fax: 925-252-9269

Endpoint	Client Project ID: Crow Canyon Cleaners	Date Sampled: 08/26/10
98 Battery Street, Suite 200		Date Received: 08/26/10
	Client Contact: Mehrdad Javaher	Date Reported: 09/02/10
San Francisco, CA 94111	Client P.O.:	Date Completed: 09/02/10

WorkOrder: 1008827

September 02, 2010

Dear Mehrdad:

Enclosed within are:

1) The results of the **12** analyzed samples from your project: **Crow Canyon Cleaners,**
2) A QC report for the above samples,
3) A copy of the chain of custody, and
4) An invoice for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits.

If you have any questions or concerns, please feel free to give me a call. Thank you for choosing McCampbell Analytical Laboratories for your analytical needs.

Best regards,

Angela Rydelius
Laboratory Manager
McCampbell Analytical, Inc.

1008827

McCAMPBELL ANALYTICAL, INC.
1534 WILLOW PASS ROAD
PITTSBURG, CA 94565-1701
Website: www.mccampbell.com Email: main@mccampbell.com
Telephone: (877) 252-9262 Fax: (925) 252-9269

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ 5 DAY

GeoTracker EDF ☐ PDF ☑ Excel ☐ Write On (DW) ☐

☐ Check if sample is effluent and "J" flag is required

Report To: Mehrdad Javaherian Bill To: End point
Company: Endpoint Consulting
98 Battery St. Suite 200
San Francisco CA 94111 E-Mail: mehrdad@endpoint.com
Tele: (415) 7068935 Fax: ( )
Project #: Project Name: Crow Canyon Cleaners
Project Location: 7272 San Ramon Rd, Dublin CA
Sampler Signature:

SAMPLE ID	LOCATION/ Field Point Name	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED ICE	METHOD PRESERVED HCL	METHOD PRESERVED HNO_3	METHOD PRESERVED Other	BTEX & TPH as Gas (602 / 8021 + 8015) / MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (1664 / 5520 E/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 502.2 / 601 / 8010 / 8021 (HVOCs)	MTBE / BTEX ONLY (EPA 602 / 8021)	EPA 505/ 608 / 8081 (Cl Pesticides)	EPA 608 / 8082 PCB's ONLY; Aroclors / Congeners	EPA 507 / 8141 (NP Pesticides)	EPA 515 / 8151 (Acidic Cl Herbicides)	EPA 524.2 / 624 / 8260 (VOCs)	EPA 525.2 / 625 / 8270 (SVOCs)	EPA 8270 SIM / 8310 (PAHs / PNAs)	CAM 17 Metals (200.7 / 200.8 / 6010 / 6020)	LUFT 5 Metals (200.7 / 200.8 / 6010 / 6020)	Lead (200.7 / 200.8 / 6010 / 6020)	Other: Filter sample for DISSOLVED metals analysis	TO15 - 8010 list	Helium	Comments: **Indicate here if these samples are potentially dangerous to handle:
VM9SS		8/26/10	804AM	1	S			x																								x		
VM8			838AM																													x		
VM7			910AM																													x		
VM10			940AM																													x		
VE-1S			1055AM																													x	X	
VM-1S		↓	1141AM	↓	↓			↓																								✓		
VE-3S			1208PM																													x		
VM-4S			1237PM																													x		
VE-2S			104PM																													x		
VM-5 SS			2:00PM																													x		
VM-6 SS		↓	254	↓	↓			↓																								x		

**MAI clients MUST disclose any dangerous chemicals known to be present in their submitted samples in concentrations that may cause immediate harm or serious future health endangerment as a result of brief, gloved, open air, sample handling by MAI staff. Non-disclosure incurs an immediate $250 surcharge and the client is subject to full legal liability for harm suffered. Thank you for your understanding and for allowing us to work safely.

Relinquished By:	Date:	Time:	Received By:
8-26-10		404pm	EnviroTech T. L.
Enviro-Tech SR	8/26/10	1710	
	8/26/10	1740	

ICE/t° ____
GOOD CONDITION ____
HEAD SPACE ABSENT ____
DECHLORINATED IN LAB ____
APPROPRIATE CONTAINERS ____
PRESERVED IN LAB ____

VOAS O&G METALS OTHER
PRESERVATION ____ pH<2 ____

COMMENTS:

McCAMPBELL ANALYTICAL, INC.

1534 WILLOW PASS ROAD
PITTSBURG, CA 94565-1701
Website: www.mccampbell.com Email: main@mccampbell.com
Telephone: (877) 252-9262 Fax: (925) 252-9269

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ 5 DAY

GeoTracker EDF ☐ **PDF** ☒ **Excel** ☐ **Write On (DW)** ☐

☐ **Check if sample is effluent and "J" flag is required**

Report To: Mehrdad Javaherian **Bill To:** Endpoint
Company: Endpoint Consulting
98 Battery St. Suite 200
San Francisco CA 94111 **E-Mail:** mehrdad@endpoint.com
Tele: (415) 7068935 **Fax:** ( )
Project #: **Project Name:** Crow Canyon Cleaners
Project Location: 7272 San Ramon Rd, Dublin CA
Sampler Signature:

		SAMPLING				MATRIX					METHOD PRESERVED				Analysis Request																Other			Comments
SAMPLE ID	LOCATION/ Field Point Name	Date	Time	# Containers	Type Containers	Water	Soil	Air	Sludge	Other	ICE	HCL	HNO_3	Other	BTEX & TPH as Gas (602 / 8021 + 8015) / MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (1664 / 5520 E/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 502.2 / 601 / 8010 / 8021 (HVOCs)	MTBE / BTEX ONLY (EPA 602 / 8021)	EPA 505/ 608 / 8081 (Cl Pesticides)	EPA 608 / 8082 PCB's ONLY; Aroclors / Congeners	EPA 507 / 8141 (NP Pesticides)	EPA 515 / 8151 (Acidic Cl Herbicides)	EPA 524.2 / 624 / 8260 (VOCs)	EPA 525.2 / 625 / 8270 (SVOCs)	EPA 8270 SIM / 8310 (PAHs / PNAs)	CAM 17 Metals (200.7 / 200.8 / 6010 / 6020)	LUFT 5 Metals (200.7 / 200.8 / 6010 / 6020)	Lead (200.7 / 200.8 / 6010 / 6020)	Filter sample for DISSOLVED metals analysis	8010 list TO-15	Helium–Cancelled 8/27	**Indicate here if these samples are potentially dangerous to handle:
VM-2 SS		8/26/10	310PM	1	S			X																								X		
VE-15-tedlar		8/26/10	1110AM	1	T			X																									~~X~~	

**MAI clients MUST disclose any dangerous chemicals known to be present in their submitted samples in concentrations that may cause immediate harm or serious future health endangerment as a result of brief, gloved, open air, sample handling by MAI staff. Non-disclosure incurs an immediate $250 surcharge and the client is subject to full legal liability for harm suffered. Thank you for your understanding and for allowing us to work safely.

Relinquished By:	Date:	Time:	Received By:
8-26-10		404 Pm	Envirotech/T.C.
Enviro-Tech SR	8/26/10	1710	
	8/26/10	1740	

ICE/t°______
GOOD CONDITION______
HEAD SPACE ABSENT______
DECHLORINATED IN LAB______
APPROPRIATE CONTAINERS______
PRESERVED IN LAB______

COMMENTS:

PRESERVATION VOAS O&G METALS OTHER
pH<2

McCampbell Analytical, Inc.
1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

WorkOrder: 1008827 **ClientCode: EPB**

☐ WaterTrax ☐ WriteOn ☐ EDF ☑ Excel ☐ Fax ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

Report to:
Mehrdad Javaher
Endpoint
98 Battery Street, Suite 200
San Francisco, CA 94111
415-706-8935 FAX

Email: mehrdad@endpoint-inc.com
cc:
PO:
ProjectNo: Crow Canyon Cleaners

Bill to:
Accounts Payable
Endpoint
98 Battery Street, Suite 200
San Francisco, CA 94111

Requested TAT: **5 days**

Date Received: **08/26/2010**
Date Printed: **08/31/2010**

					Requested Tests (See legend below)											
Lab ID	**Client ID**	**Matrix**	**Collection Date**	**Hold**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1008827-001	VM9 SS	Soil Vapor	8/26/2010 8:04	☐		A	A	A								
1008827-002	VM8	Soil Vapor	8/26/2010 8:38	☐				A								
1008827-003	VM7	Soil Vapor	8/26/2010 9:10	☐				A								
1008827-004	VM10	Soil Vapor	8/26/2010 9:40	☐				A								
1008827-005	VE-1S	Soil Vapor	8/26/2010 10:55	☐	A			A								
1008827-006	VM-1S	Soil Vapor	8/26/2010 11:41	☐				A								
1008827-007	VE-3S	Soil Vapor	8/26/2010 12:08	☐				A								
1008827-008	VM-4S	Soil Vapor	8/26/2010 12:37	☐				A								
1008827-009	VE-2S	Soil Vapor	8/26/2010 13:04	☐				A								
1008827-010	VM-5 SS	Soil Vapor	8/26/2010 14:00	☐				A								
1008827-011	VM-6 SS	Soil Vapor	8/26/2010 14:54	☐				A								
1008827-012	VM-2 SS	Soil Vapor	8/26/2010 15:00	☐				A								

Test Legend:

1	HELIUM_SOILGAS	2	PRTedlarBag	3	PRUNUSEDSUMMA	4	TO15-8010_SOIL(UG/M3)	5	
6		7		8		9		10	
11		12							

The following SampIDs: 001A, 002A, 003A, 004A, 005A, 006A, 007A, 008A, 009A, 010A, 011A, 012A contain testgroup.

Prepared by: Maria Venegas

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.

Sample Receipt Checklist

Client Name: **Endpoint**

Date and Time Received: **8/26/2010 5:40:00 PM**

Project Name: **Crow Canyon Cleaners**

Checklist completed and reviewed by: Maria Venegas

WorkOrder N°: **1008827** Matrix <u>Soil Vapor</u>

Carrier: <u>Benjamin Yslas (MAI Courier)</u>

Chain of Custody (COC) Information

Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Sample IDs noted by Client on COC?	Yes ☑	No ☐	
Date and Time of collection noted by Client on COC?	Yes ☑	No ☐	
Sampler's name noted on COC?	Yes ☑	No ☐	

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	NA ☑
Shipping container/cooler in good condition?	Yes ☑	No ☐	
Samples in proper containers/bottles?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature	Cooler Temp:		NA ☑
Water - VOA vials have zero headspace / no bubbles?	Yes ☐	No ☐	No VOA vials submitted ☑
Sample labels checked for correct preservation?	Yes ☑	No ☐	
Metal - pH acceptable upon receipt (pH<2)?	Yes ☐	No ☐	NA ☑
Samples Received on Ice?	Yes ☐	No ☑	

** NOTE: If the "No" box is checked, see comments below.*

Client contacted: Date contacted: Contacted by:

Comments:

Endpoint

98 Battery Street, Suite 200

San Francisco, CA 94111

Client Project ID: Crow Canyon Cleaners

Client Contact: Mehrdad Javaher

Client P.O.:

Date Sampled: 08/26/10

Date Received: 08/26/10

Date Extracted: 08/31/10

Date Analyzed: 08/31/10

Helium*

Extraction method: ASTM D 1946-90 Analytical methods: ASTM D 1946-90 Work Order: 1008827

Lab ID	Client ID	Matrix	Initial Pressure	Final Pressure	Helium	DF	% SS	Comments
005A	VE-1S	Soil Vapor	11.02	22	31	1	N/A	

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	psia	psia	NA	NA
	Soil Vapor	psia	psia	10	µg/L

* vapor samples are reported in µg/L.

%SS = Percent Recovery of Surrogate Standard
DF = Dilution Factor

DHS ELAP Certification 1644

Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.

"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Web: www.mccampbell.com E-mail: main@mccampbell.com
Telephone: 877-252-9262 Fax: 925-252-9269

Endpoint
98 Battery Street, Suite 200
San Francisco, CA 94111

Client Project ID: Crow Canyon Cleaners
Client Contact: Mehrdad Javaher
Client P.O.:

Date Sampled: 08/26/10
Date Received: 08/26/10
Date Extracted: 08/27/10-08/31/10
Date Analyzed: 08/27/10-08/31/10

Halogenated Volatile Organic Compounds in µg/m³*

Extraction Method: TO15 Analytical Method: TO15 Work Order: 1008827

Lab ID	1008827-001A	1008827-002A	1008827-003A	1008827-004A	Reporting Limit for DF =1	
Client ID	VM9 SS	VM8	VM7	VM10		
Matrix	Soil Vapor	Soil Vapor	Soil Vapor	Soil Vapor		
DF	1	1	1	1	Soil Vapor	W
Initial Pressure (psia)	13.02	12.31	12.17	12.93		
Final Pressure (psia)	26.06	24.55	24.27	25.8		
Compound	**Concentration**				µg/m³	ug/L
Bromodichloromethane	ND	ND	ND	ND	14	NA
Bromoform	ND	ND	ND	ND	21	NA
Bromomethane	ND	ND	ND	ND	7.9	NA
Carbon Tetrachloride	ND	ND	ND	ND	13	NA
Chlorobenzene	ND	ND	ND	ND	9.4	NA
Chloroethane	ND	ND	ND	ND	5.4	NA
Chloroform	ND	ND	ND	ND	9.9	NA
Chloromethane	ND	ND	ND	ND	4.2	NA
Dibromochloromethane	ND	ND	ND	ND	17	NA
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	16	NA
1,2-Dichlorobenzene	ND	ND	ND	ND	12	NA
1,3-Dichlorobenzene	ND	ND	ND	ND	12	NA
1,4-Dichlorobenzene	ND	ND	ND	ND	12	NA
Dichlorodifluoromethane	ND	ND	ND	ND	10	NA
1,1-Dichloroethane	ND	ND	ND	ND	8.2	NA
1,2-Dichloroethane (1,2-DCA)	ND	ND	ND	ND	8.2	NA
1,1-Dichloroethene	ND	ND	ND	ND	8.1	NA
cis-1,2-Dichloroethene	17	ND	ND	ND	8.1	NA
trans-1,2-Dichloroethene	ND	ND	ND	ND	8.1	NA
1,2-Dichloropropane	ND	ND	ND	ND	9.4	NA
cis-1,3-Dichloropropene	ND	ND	ND	ND	9.2	NA
trans-1,3-Dichloropropene	ND	ND	ND	ND	9.2	NA
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	ND	ND	ND	14	NA
Freon 113	ND	ND	ND	ND	16	NA
Methylene chloride	ND	ND	ND	ND	7.1	NA
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	14	NA
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	14	NA
Tetrachloroethene	11,000	1300	310	450	14	NA
1,2,4-Trichlorobenzene	ND	ND	ND	ND	15	NA
1,1,1-Trichloroethane	ND	ND	ND	23	11	NA
1,1,2-Trichloroethane	ND	ND	ND	ND	11	NA
Trichloroethene	110	ND	ND	ND	11	NA
Trichlorofluoromethane	ND	ND	ND	ND	11	NA
Vinyl Chloride	ND	ND	ND	ND	5.2	NA
Surrogate Recoveries (%)						
%SS1:	92	93	91	92		
%SS2:	110	111	111	111		
%SS3:	102	100	101	103		
Comments						

*vapor samples are reported in µg/m³.

ND means not detected above the reporting limit/method detection limit; N/A means analyte not applicable to this analysis.

surrogate diluted out of range or surrogate coelutes with another peak.

%SS = Percent Recovery of Surrogate Standard
DF = Dilution Factor

DHS ELAP Certification 1644

Angela Rydelius, Lab Manager

Endpoint 98 Battery Street, Suite 200 San Francisco, CA 94111	Client Project ID: Crow Canyon Cleaners	Date Sampled: 08/26/10 Date Received: 08/26/10
	Client Contact: Mehrdad Javaher	Date Extracted: 08/27/10-08/31/10
	Client P.O.:	Date Analyzed: 08/27/10-08/31/10

Halogenated Volatile Organic Compounds in μg/m³*

Extraction Method: TO15 Analytical Method: TO15 Work Order: 1008827

Lab ID	1008827-005A	1008827-006A	1008827-007A	1008827-008A	Reporting Limit for DF =1	
Client ID	VE-1S	VM-1S	VE-3S	VM-4S		
Matrix	Soil Vapor	Soil Vapor	Soil Vapor	Soil Vapor		
DF	1	1	1	1	Soil Vapor	W
Initial Pressure (psia)	11.02	11.76	12.29	14.17		
Final Pressure (psia)	22	23.53	24.53	28.25		
Compound	**Concentration**				μg/m³	ug/L
Bromodichloromethane	ND	ND	ND	ND	14	NA
Bromoform	ND	ND	ND	ND	21	NA
Bromomethane	ND	ND	ND	ND	7.9	NA
Carbon Tetrachloride	ND	ND	ND	ND	13	NA
Chlorobenzene	ND	ND	ND	ND	9.4	NA
Chloroethane	ND	ND	ND	ND	5.4	NA
Chloroform	27	ND	ND	ND	9.9	NA
Chloromethane	ND	ND	ND	ND	4.2	NA
Dibromochloromethane	ND	ND	ND	ND	17	NA
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	16	NA
1,2-Dichlorobenzene	ND	ND	ND	ND	12	NA
1,3-Dichlorobenzene	ND	ND	ND	ND	12	NA
1,4-Dichlorobenzene	ND	ND	ND	ND	12	NA
Dichlorodifluoromethane	ND	ND	ND	ND	10	NA
1,1-Dichloroethane	ND	ND	ND	ND	8.2	NA
1,2-Dichloroethane (1,2-DCA)	ND	ND	ND	ND	8.2	NA
1,1-Dichloroethene	ND	ND	ND	ND	8.1	NA
cis-1,2-Dichloroethene	ND	ND	ND	ND	8.1	NA
trans-1,2-Dichloroethene	ND	ND	ND	ND	8.1	NA
1,2-Dichloropropane	ND	ND	ND	ND	9.4	NA
cis-1,3-Dichloropropene	ND	ND	ND	ND	9.2	NA
trans-1,3-Dichloropropene	ND	ND	ND	ND	9.2	NA
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	ND	ND	ND	14	NA
Freon 113	ND	ND	ND	ND	16	NA
Methylene chloride	ND	ND	ND	ND	7.1	NA
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	14	NA
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	14	NA
Tetrachloroethene	1100	2600	870	1100	14	NA
1,2,4-Trichlorobenzene	ND	ND	ND	ND	15	NA
1,1,1-Trichloroethane	ND	ND	ND	ND	11	NA
1,1,2-Trichloroethane	ND	ND	ND	ND	11	NA
Trichloroethene	ND	ND	ND	ND	11	NA
Trichlorofluoromethane	ND	ND	ND	ND	11	NA
Vinyl Chloride	ND	ND	ND	ND	5.2	NA
Surrogate Recoveries (%)						
%SS1:	92	92	93	93		
%SS2:	110	111	110	110		
%SS3:	104	103	103	104		
Comments						

*vapor samples are reported in μg/m³.

ND means not detected above the reporting limit/method detection limit; N/A means analyte not applicable to this analysis.

surrogate diluted out of range or surrogate coelutes with another peak.

%SS = Percent Recovery of Surrogate Standard
DF = Dilution Factor

DHS ELAP Certification 1644

Angela Rydelius, Lab Manager

Endpoint 98 Battery Street, Suite 200 San Francisco, CA 94111	Client Project ID: Crow Canyon Cleaners	Date Sampled: 08/26/10 Date Received: 08/26/10
	Client Contact: Mehrdad Javaher	Date Extracted: 08/27/10-08/31/10
	Client P.O.:	Date Analyzed: 08/27/10-08/31/10

Halogenated Volatile Organic Compounds in µg/m³*

Extraction Method: TO15 Analytical Method: TO15 Work Order: 1008827

Lab ID	1008827-009A	1008827-010A	1008827-011A	1008827-012A	Reporting Limit for DF =1	
Client ID	VE-2S	VM-5 SS	VM-6 SS	VM-2 SS		
Matrix	Soil Vapor	Soil Vapor	Soil Vapor	Soil Vapor		
DF	1	1	1	1	Soil Vapor	W
Initial Pressure (psia)	12.16	12.12	12.03	11.21		
Final Pressure (psia)	24.31	24.2	24.03	22.42		
Compound	**Concentration**				µg/m³	ug/L
Bromodichloromethane	ND	ND	ND	ND	14	NA
Bromoform	ND	ND	ND	ND	21	NA
Bromomethane	ND	ND	ND	ND	7.9	NA
Carbon Tetrachloride	ND	ND	ND	ND	13	NA
Chlorobenzene	ND	ND	ND	ND	9.4	NA
Chloroethane	ND	ND	ND	ND	5.4	NA
Chloroform	ND	ND	ND	ND	9.9	NA
Chloromethane	ND	ND	ND	ND	4.2	NA
Dibromochloromethane	ND	ND	ND	ND	17	NA
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	16	NA
1,2-Dichlorobenzene	ND	ND	ND	ND	12	NA
1,3-Dichlorobenzene	ND	ND	ND	ND	12	NA
1,4-Dichlorobenzene	ND	ND	ND	ND	12	NA
Dichlorodifluoromethane	ND	ND	ND	ND	10	NA
1,1-Dichloroethane	ND	ND	ND	ND	8.2	NA
1,2-Dichloroethane (1,2-DCA)	ND	ND	ND	ND	8.2	NA
1,1-Dichloroethene	ND	ND	ND	ND	8.1	NA
cis-1,2-Dichloroethene	ND	ND	ND	ND	8.1	NA
trans-1,2-Dichloroethene	ND	ND	ND	ND	8.1	NA
1,2-Dichloropropane	ND	ND	ND	ND	9.4	NA
cis-1,3-Dichloropropene	ND	ND	ND	ND	9.2	NA
trans-1,3-Dichloropropene	ND	ND	ND	ND	9.2	NA
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	ND	ND	ND	14	NA
Freon 113	ND	ND	ND	ND	16	NA
Methylene chloride	ND	ND	ND	ND	7.1	NA
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	14	NA
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	14	NA
Tetrachloroethene	3400	1300	650	38	14	NA
1,2,4-Trichlorobenzene	ND	ND	ND	ND	15	NA
1,1,1-Trichloroethane	ND	ND	ND	ND	11	NA
1,1,2-Trichloroethane	ND	ND	ND	ND	11	NA
Trichloroethene	62	ND	ND	ND	11	NA
Trichlorofluoromethane	ND	ND	ND	ND	11	NA
Vinyl Chloride	ND	ND	ND	ND	5.2	NA
Surrogate Recoveries (%)						
%SS1:	101	95	96	96		
%SS2:	116	111	112	112		
%SS3:	109	105	105	103		
Comments						

*vapor samples are reported in µg/m³.

ND means not detected above the reporting limit/method detection limit; N/A means analyte not applicable to this analysis.

surrogate diluted out of range or surrogate coelutes with another peak.

%SS = Percent Recovery of Surrogate Standard
DF = Dilution Factor

Angela Rydelius, Lab Manager

QC SUMMARY REPORT FOR ASTM D 1946-90

W.O. Sample Matrix: Soil Vapor QC Matrix: Soil Vapor BatchID: 52797 WorkOrder 1008827

EPA Method ASTM D 1946-90 **Extraction ASTM D 1946-90** **Spiked Sample ID: N/A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
Helium	N/A	83	N/A	N/A	N/A	90.8	88	3.09	N/A	N/A	70 - 130	20

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
NONE

BATCH 52797 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1008827-005A	08/26/10 10:55 AM	08/31/10	08/31/10 2:47 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS ELAP Certification 1644

QA/QC Officer

QC SUMMARY REPORT FOR TO15

W.O. Sample Matrix: Soil Vapor QC Matrix: Indoor Air BatchID: 52642 WorkOrder 1008827

EPA Method TO15 **Extraction TO15** **Spiked Sample ID: N/A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	nL/L	nL/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
Chlorobenzene	N/A	5	N/A	N/A	N/A	101	102	0.568	N/A	N/A	70 - 130	30
1,2-Dibromoethane (EDB)	N/A	5	N/A	N/A	N/A	107	107	0	N/A	N/A	70 - 130	30
1,2-Dichloroethane (1,2-DCA)	N/A	5	N/A	N/A	N/A	95.8	97.1	1.29	N/A	N/A	70 - 130	30
1,2-Dichloro-1,1,2,2-tetrafluoroetha	N/A	5	N/A	N/A	N/A	102	104	1.69	N/A	N/A	70 - 130	30
Freon 113	N/A	5	N/A	N/A	N/A	93.3	92.6	0.822	N/A	N/A	70 - 130	30
Methylene chloride	N/A	5	N/A	N/A	N/A	96.5	98	1.58	N/A	N/A	70 - 130	30
1,1,1,2-Tetrachloroethane	N/A	5	N/A	N/A	N/A	97.8	97.7	0.0941	N/A	N/A	70 - 130	30
1,1,2,2-Tetrachloroethane	N/A	5	N/A	N/A	N/A	95.9	97.4	1.53	N/A	N/A	70 - 130	30
1,2,4-Trichlorobenzene	N/A	5	N/A	N/A	N/A	109	109	0	N/A	N/A	70 - 130	30
Trichloroethene	N/A	5	N/A	N/A	N/A	103	103	0	N/A	N/A	70 - 130	30
%SS1:	N/A	100	N/A	N/A	N/A	95	94	0.266	N/A	N/A	70 - 130	30
%SS2:	N/A	100	N/A	N/A	N/A	102	103	0.751	N/A	N/A	70 - 130	30
%SS3:	N/A	100	N/A	N/A	N/A	102	103	0.785	N/A	N/A	70 - 130	30

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
NONE

BATCH 52642 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1008827-001A	08/26/10 8:04 AM	08/27/10	08/27/10 8:49 PM	1008827-001A	08/26/10 8:04 AM	08/30/10	08/30/10 4:41 PM
1008827-002A	08/26/10 8:38 AM	08/27/10	08/27/10 9:32 PM	1008827-003A	08/26/10 9:10 AM	08/27/10	08/27/10 10:23 PM
1008827-004A	08/26/10 9:40 AM	08/27/10	08/27/10 11:06 PM	1008827-005A	08/26/10 10:55 AM	08/27/10	08/27/10 11:54 PM
1008827-006A	08/26/10 11:41 AM	08/28/10	08/28/10 12:43 AM	1008827-006A	08/26/10 11:41 AM	08/30/10	08/30/10 5:26 PM
1008827-007A	08/26/10 12:08 PM	08/28/10	08/28/10 1:32 AM	1008827-008A	08/26/10 12:37 PM	08/28/10	08/28/10 2:19 AM
1008827-009A	08/26/10 1:04 PM	08/31/10	08/31/10 3:30 PM	1008827-009A	08/26/10 1:04 PM	08/31/10	08/31/10 6:21 PM
1008827-010A	08/26/10 2:00 PM	08/31/10	08/31/10 4:12 PM	1008827-011A	08/26/10 2:54 PM	08/31/10	08/31/10 4:55 PM
1008827-012A	08/26/10 3:00 PM	08/31/10	08/31/10 5:39 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.
NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

Laboratory extraction solvents such as methylene chloride and acetone may occasionally appear in the method blank at low levels.

DHS ELAP Certification 1644 QA/QC Officer

Appendix D

ProUCL Calculation

```
                                   General UCL Statistics for Baseline Sampling Data Set
User Selected Options
From File                          E:\LRM Consulting, Inc\Misc\RISK ASSESSMENT\UCL Pro\WorkSheet.wst
Full Precision                     OFF
Confidence Coefficient                 95%
Number of Bootstrap Operations        2000


C2

General Statistics
Number of Valid Observations                        11 Number of Distinct Observations              11

Raw Statistics                                         Log-transformed Statistics
Minimum                                             34 Minimum of Log Data                       3.526
Maximum                                          10000 Maximum of Log Data                        9.21
Mean                                              2995 Mean of log Data                          6.832
Median                                            1200 SD of log Data                            2.045
SD                                                3519
Coefficient of Variation                         1.175
Skewness                                         1.113

Relevant UCL Statistics
Normal Distribution Test                               Lognormal Distribution Test
Shapiro Wilk Test Statistic                      0.826 Shapiro Wilk Test Statistic               0.907
Shapiro Wilk Critical Value                       0.85 Shapiro Wilk Critical Value                0.85
Data not Normal at 5% Significance Level               Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution                           Assuming Lognormal Distribution
  95% Student's-t UCL                             4919   95% H-UCL                              224278
  95% UCLs (Adjusted for Skewness)                       95% Chebyshev (MVUE) UCL                18950
  95% Adjusted-CLT UCL (Chen-1995)                5121  97.5% Chebyshev (MVUE) UCL               25008
  95% Modified-t UCL (Johnson-1978)               4978   99% Chebyshev (MVUE) UCL                36909

Gamma Distribution Test                                Data Distribution
k star (bias corrected)                           0.45 Data appear Gamma Distributed at 5% Significance Level
Theta Star                                        6653
MLE of Mean                                       2995
MLE of Standard Deviation                         4464
nu star                                          9.906
Approximate Chi Square Value (.05)               3.883 Nonparametric Statistics
Adjusted Level of Significance                  0.0278   95% CLT UCL                              4741
Adjusted Chi Square Value                        3.292   95% Jackknife UCL                        4919
                                                         95% Standard Bootstrap UCL               4703
Anderson-Darling Test Statistic                  0.241   95% Bootstrap-t UCL                      5746
Anderson-Darling 5% Critical Value               0.778   95% Hall's Bootstrap UCL                 5105
Kolmogorov-Smirnov Test Statistic                0.113   95% Percentile Bootstrap UCL             4816
Kolmogorov-Smirnov 5% Critical Value             0.268   95% BCA Bootstrap UCL                    5003
Data appear Gamma Distributed at 5% Significance Level 95% Chebyshev(Mean, Sd) UCL                7621
                                                       97.5% Chebyshev(Mean, Sd) UCL              9622
Assuming Gamma Distribution                            99% Chebyshev(Mean, Sd) UCL               13553
  95% Approximate Gamma UCL                       7642
  95% Adjusted Gamma UCL                          9014

Potential UCL to Use                                   Use 95% Approximate Gamma UCL              7642

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
 and Singh and Singh (2003).   For additional insight, the user may want to consult a statistician.
```

```
                            General UCL Statistics for September 1 2009 Sample Results
User Selected Options
From File                       E:\LRM Consulting, Inc\Misc\RISK ASSESSMENT\UCL Pro\WorkSheet.wst
Full Precision                  OFF
Confidence Coefficient               95%
Number of Bootstrap Operations      2000


C6

General Statistics
Number of Valid Observations                               6 Number of Distinct Observations                    5

Raw Statistics                                               Log-transformed Statistics
Minimum                                                    7 Minimum of Log Data                            1.946
Maximum                                                  300 Maximum of Log Data                            5.704
Mean                                                   65.17 Mean of log Data                               3.218
Median                                                  23.5 SD of log Data                                 1.375
SD                                                     115.4
Coefficient of Variation                               1.771
Skewness                                               2.412


Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!
If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.


Warning:  There are only 6 Values in this data
Note:  It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics
Normal Distribution Test                                     Lognormal Distribution Test
Shapiro Wilk Test Statistic                            0.571 Shapiro Wilk Test Statistic                    0.846
Shapiro Wilk Critical Value                            0.788 Shapiro Wilk Critical Value                    0.788
Data not Normal at 5% Significance Level                     Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution                                 Assuming Lognormal Distribution
  95% Student's-t UCL                                  160.1   95% H-UCL                                     1818
  95% UCLs (Adjusted for Skewness)                             95% Chebyshev (MVUE) UCL                     170.5
  95% Adjusted-CLT UCL (Chen-1995)                     192.3  97.5% Chebyshev (MVUE) UCL                    222.1
  95% Modified-t UCL (Johnson-1978)                    167.9   99% Chebyshev (MVUE) UCL                     323.6

Gamma Distribution Test                                      Data Distribution
k star (bias corrected)                                 0.43 Data appear Lognormal at 5% Significance Level
Theta Star                                             151.4
MLE of Mean                                            65.17
MLE of Standard Deviation                              99.32
nu star                                                5.166
Approximate Chi Square Value (.05)                      1.23 Nonparametric Statistics
Adjusted Level of Significance                        0.0122   95% CLT UCL                                  142.7
Adjusted Chi Square Value                               0.67   95% Jackknife UCL                            160.1
                                                               95% Standard Bootstrap UCL                   135.7
Anderson-Darling Test Statistic                        0.816   95% Bootstrap-t UCL                          755.5
Anderson-Darling 5% Critical Value                     0.728   95% Hall's Bootstrap UCL                     813.8
Kolmogorov-Smirnov Test Statistic                      0.377   95% Percentile Bootstrap UCL                 156.3
Kolmogorov-Smirnov 5% Critical Value                   0.346   95% BCA Bootstrap UCL                        162.7
Data not Gamma Distributed at 5% Significance Level          95% Chebyshev(Mean, Sd) UCL                    270.6
                                                             97.5% Chebyshev(Mean, Sd) UCL                  359.5
Assuming Gamma Distribution                                  99% Chebyshev(Mean, Sd) UCL                    534.1
  95% Approximate Gamma UCL                            273.8
  95% Adjusted Gamma UCL                               502.4

Potential UCL to Use                                         Use 95% Chebyshev (Mean, Sd) UCL               270.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
 and Singh and Singh (2003).   For additional insight, the user may want to consult a statistician.
```

```
                                    General UCL Statistics for September 28, 2009 Data Set
User Selected Options
From File                           E:\LRM Consulting, Inc\Misc\RISK ASSESSMENT\UCL Pro\WorkSheet.wst
Full Precision                      OFF
Confidence Coefficient                  95%
Number of Bootstrap Operations         2000


C8

General Statistics
Number of Valid Observations                                   11  Number of Distinct Observations                              7

Raw Statistics                                                     Log-transformed Statistics
Minimum                                                         7  Minimum of Log Data                                      1.946
Maximum                                                       200  Maximum of Log Data                                      5.298
Mean                                                        52.27  Mean of log Data                                         3.143
Median                                                         16  SD of log Data                                           1.333
SD                                                          70.65
Coefficient of Variation                                    1.352
Skewness                                                    1.661


Relevant UCL Statistics
Normal Distribution Test                                           Lognormal Distribution Test
Shapiro Wilk Test Statistic                                 0.684  Shapiro Wilk Test Statistic                              0.822
Shapiro Wilk Critical Value                                  0.85  Shapiro Wilk Critical Value                               0.85
Data not Normal at 5% Significance Level                           Data not Lognormal at 5% Significance Level

Assuming Normal Distribution                                       Assuming Lognormal Distribution
  95% Student's-t UCL                                       90.88    95% H-UCL                                              264.8
  95% UCLs (Adjusted for Skewness)                                   95% Chebyshev (MVUE) UCL                               142.8
  95% Adjusted-CLT UCL (Chen-1995)                          98.71   97.5% Chebyshev (MVUE) UCL                              183.2
  95% Modified-t UCL (Johnson-1978)                         92.66    99% Chebyshev (MVUE) UCL                               262.5

Gamma Distribution Test                                            Data Distribution
k star (bias corrected)                                     0.597  Data Follow Appr. Gamma Distribution at 5% Significance Level
Theta Star                                                  87.58
MLE of Mean                                                 52.27
MLE of Standard Deviation                                   67.66
nu star                                                     13.13
Approximate Chi Square Value (.05)                          5.981  Nonparametric Statistics
Adjusted Level of Significance                             0.0278    95% CLT UCL                                            87.31
Adjusted Chi Square Value                                   5.215    95% Jackknife UCL                                      90.88
                                                                     95% Standard Bootstrap UCL                             84.51
Anderson-Darling Test Statistic                             0.943    95% Bootstrap-t UCL                                      161
Anderson-Darling 5% Critical Value                          0.763    95% Hall's Bootstrap UCL                               284.7
Kolmogorov-Smirnov Test Statistic                           0.265    95% Percentile Bootstrap UCL                           89.55
Kolmogorov-Smirnov 5% Critical Value                        0.265    95% BCA Bootstrap UCL                                  98.27
Data follow Appr. Gamma Distribution at 5% Significance Level      95% Chebyshev(Mean, Sd) UCL                              145.1
                                                                   97.5% Chebyshev(Mean, Sd) UCL                            185.3
Assuming Gamma Distribution                                        99% Chebyshev(Mean, Sd) UCL                              264.2
  95% Approximate Gamma UCL                                 114.8
  95% Adjusted Gamma UCL                                    131.6

Potential UCL to Use                                               Use 95% Approximate Gamma UCL                            114.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
 and Singh and Singh (2003).   For additional insight, the user may want to consult a statistician.
```

General UCL Statistics for November 4, 2009 Data Set

```
User Selected Options
From File                              E:\LRM Consulting, Inc\Misc\RISK ASSESSMENT\UCL Pro\WorkSheet.wst
Full Precision                         OFF
Confidence Coefficient                      95%
Number of Bootstrap Operations             2000


C10

General Statistics
Number of Valid Observations                                 11 Number of Distinct Observations              10

Raw Statistics                                                  Log-transformed Statistics
Minimum                                                       7 Minimum of Log Data                       1.946
Maximum                                                     970 Maximum of Log Data                       6.877
Mean                                                      314.1 Mean of log Data                          4.842
Median                                                      300 SD of log Data                            1.796
SD                                                        321.5
Coefficient of Variation                                  1.024
Skewness                                                  1.037

Relevant UCL Statistics
Normal Distribution Test                                        Lognormal Distribution Test
Shapiro Wilk Test Statistic                               0.875 Shapiro Wilk Test Statistic               0.875
Shapiro Wilk Critical Value                                0.85 Shapiro Wilk Critical Value                0.85
Data appear Normal at 5% Significance Level                     Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution                                    Assuming Lognormal Distribution
   95% Student's-t UCL                                    489.8    95% H-UCL                               9117
   95% UCLs (Adjusted for Skewness)                                95% Chebyshev (MVUE) UCL                1678
   95% Adjusted-CLT UCL (Chen-1995)                         506  97.5% Chebyshev (MVUE) UCL                2198
   95% Modified-t UCL (Johnson-1978)                      494.9    99% Chebyshev (MVUE) UCL                3220

Gamma Distribution Test                                         Data Distribution
k star (bias corrected)                                   0.548 Data appear Normal at 5% Significance Level
Theta Star                                                573.4
MLE of Mean                                               314.1
MLE of Standard Deviation                                 424.4
nu star                                                   12.05
Approximate Chi Square Value (.05)                         5.26 Nonparametric Statistics
Adjusted Level of Significance                           0.0278    95% CLT UCL                            473.6
Adjusted Chi Square Value                                 4.551    95% Jackknife UCL                      489.8
                                                                   95% Standard Bootstrap UCL             465.2
Anderson-Darling Test Statistic                            0.34    95% Bootstrap-t UCL                    540.3
Anderson-Darling 5% Critical Value                        0.768    95% Hall's Bootstrap UCL               610.7
Kolmogorov-Smirnov Test Statistic                         0.192    95% Percentile Bootstrap UCL           478.2
Kolmogorov-Smirnov 5% Critical Value                      0.266    95% BCA Bootstrap UCL                  492.5
Data appear Gamma Distributed at 5% Significance Level          95% Chebyshev(Mean, Sd) UCL               736.7
                                                                97.5% Chebyshev(Mean, Sd) UCL             919.5
Assuming Gamma Distribution                                     99% Chebyshev(Mean, Sd) UCL                1279
   95% Approximate Gamma UCL                              719.5
   95% Adjusted Gamma UCL                                 831.8

Potential UCL to Use                                            Use 95% Student's-t UCL                   489.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
 and Singh and Singh (2003).   For additional insight, the user may want to consult a statistician.
```

```
                                General UCL Statistics for August 2010 Data Sets
User Selected Options
From File                       E:\LRM Consulting, Inc\Misc\RISK ASSESSMENT\UCL Pro\Dublin\Dublin Data.wst
Full Precision                  OFF
Confidence Coefficient              95%
Number of Bootstrap Operations     2000


C0

General Statistics
Number of Valid Observations                                  12 Number of Distinct Observations                       10

Raw Statistics                                                   Log-transformed Statistics
Minimum                                                       28 Minimum of Log Data                                3.332
Maximum                                                    11000 Maximum of Log Data                                9.306
Mean                                                        2009 Mean of log Data                                   6.839
Median                                                      1100 SD of log Data                                     1.454
SD                                                          2987
Coefficient of Variation                                   1.487
Skewness                                                   2.893

Relevant UCL Statistics
Normal Distribution Test                                         Lognormal Distribution Test
Shapiro Wilk Test Statistic                                0.601 Shapiro Wilk Test Statistic                         0.92
Shapiro Wilk Critical Value                                0.859 Shapiro Wilk Critical Value                        0.859
Data not Normal at 5% Significance Level                         Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution                                     Assuming Lognormal Distribution
   95% Student's-t UCL                                      3558    95% H-UCL                                       14223
   95% UCLs (Adjusted for Skewness)                                 95% Chebyshev (MVUE) UCL                         6945
   95% Adjusted-CLT UCL (Chen-1995)                         4197  97.5% Chebyshev (MVUE) UCL                         8949
   95% Modified-t UCL (Johnson-1978)                        3678    99% Chebyshev (MVUE) UCL                        12886

Gamma Distribution Test                                          Data Distribution
k star (bias corrected)                                    0.639 Data appear Gamma Distributed at 5% Significance Level
Theta Star                                                  3145
MLE of Mean                                                 2009
MLE of Standard Deviation                                   2514
nu star                                                    15.33
Approximate Chi Square Value (.05)                         7.491 Nonparametric Statistics
Adjusted Level of Significance                             0.029    95% CLT UCL                                      3427
Adjusted Chi Square Value                                  6.671    95% Jackknife UCL                                3558
                                                                    95% Standard Bootstrap UCL                       3375
Anderson-Darling Test Statistic                             0.48    95% Bootstrap-t UCL                              6908
Anderson-Darling 5% Critical Value                         0.765    95% Hall's Bootstrap UCL                         8615
Kolmogorov-Smirnov Test Statistic                          0.236    95% Percentile Bootstrap UCL                     3607
Kolmogorov-Smirnov 5% Critical Value                       0.255    95% BCA Bootstrap UCL                            4486
Data appear Gamma Distributed at 5% Significance Level           95% Chebyshev(Mean, Sd) UCL                         5768
                                                                 97.5% Chebyshev(Mean, Sd) UCL                       7394
Assuming Gamma Distribution                                      99% Chebyshev(Mean, Sd) UCL                        10589
   95% Approximate Gamma UCL                                4111
   95% Adjusted Gamma UCL                                   4616

Potential UCL to Use                                             Use 95% Approximate Gamma UCL                       4111

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
 and Singh and Singh (2003).   For additional insight, the user may want to consult a statistician.
```

Appendix E

J&E Model Input and Output

DATA ENTRY SHEET

SG-SCREEN
A Version 2.0; 04/

Reset to Defaults

DTSC
Vapor Intrusion Guidance
Interim Final 12/04
(last modified 2/4/09)

	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	7.64E+03			Tetrachloroethylene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^{o}C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	152.4	24			1.00E-08

MORE ↓

ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
C	1.5	0.43	0.15	5

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)
70	6	6	250

END

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone 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)
137.4	0.280	#N/A	#N/A	#N/A	1.00E-08	4,000	7.64E+03	3.39E+04

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} ($atm\text{-}m^3/mol$)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_V (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	5.00E-03	15	9,410	1.74E-02	7.14E-01	1.80E-04	5.62E-03	137.4

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., $C_{building}$ ($\mu g/m^3$)
15	7.64E+03	1.25	8.33E+01	5.62E-03	5.00E+03	7.73E+12	8.09E-04	6.18E+00

Unit risk factor, URF ($(\mu g/m^3)^{-1}$)	Reference conc., RfC (mg/m^3)
5.9E-06	3.5E-02

END

DATA ENTRY SHEET

SG-SCREEN
PA Version 2.0; 04/

Reset to Defaults

DTSC
Vapor Intrusion Guidance
Interim Final 12/04
(last modified 2/4/09)

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g (μg/m^3)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
127184	2.70E+02			Tetrachloroethylene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^{o}C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	152.4	24			1.00E-08

MORE ↓

ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
C	1.5	0.43	0.15	5

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)
70	6	6	250

END

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. (μg/m^3)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
137.4	0.280	#N/A	#N/A	#N/A	1.00E-08	4,000	2.70E+02	3.39E+04

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)	Vadose zone effective diffusion coefficient, $D^{eff}{}_V$ (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	5.00E-03	15	9,410	1.74E-02	7.14E-01	1.80E-04	5.62E-03	137.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m^3)
15	2.70E+02	1.25	8.33E+01	5.62E-03	5.00E+03	7.73E+12	8.09E-04	2.18E-01

Unit risk factor, URF (μg/m^3)$^{-1}$	Reference conc., RfC (mg/m^3)
5.9E-06	3.5E-02

END

DATA ENTRY SHEET

SG-SCREEN
PA Version 2.0; 04/

Reset to Defaults

DTSC
Vapor Intrusion Guidance
Interim Final 12/04
(last modified 2/4/09)

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	1.15E+02			Tetrachloroethylene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	152.4	24			1.00E-08

MORE ↓

ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
C	1.5	0.43	0.15	5

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)
70	6	6	250

END

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. (μg/m^3)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
137.4	0.280	#N/A	#N/A	#N/A	1.00E-08	4,000	1.15E+02	3.39E+04

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)	Vadose zone effective diffusion coefficient, D^{eff}_V (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	5.00E-03	15	9,410	1.74E-02	7.14E-01	1.80E-04	5.62E-03	137.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m^3)
15	1.15E+02	1.25	8.33E+01	5.62E-03	5.00E+03	7.73E+12	8.09E-04	9.31E-02

Unit risk factor, URF (μg/m^3)$^{-1}$	Reference conc., RfC (mg/m^3)
5.9E-06	3.5E-02

END

DATA ENTRY SHEET

SG-SCREEN
PA Version 2.0; 04/

Reset to Defaults

DTSC
Vapor Intrusion Guidance
Interim Final 12/04
(last modified 2/4/09)

	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	4.89E+02			Tetrachloroethylene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	**ENTER** Soil gas sampling depth below grade, L_s (cm)	**ENTER** Average soil temperature, T_S (^oC)	**ENTER** Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	**ENTER** User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	152.4	24			1.00E-08

MORE ↓

ENTER Vandose zone SCS soil type Lookup Soil Parameters	**ENTER** Vadose zone soil dry bulk density, $\rho_b{}^A$ (g/cm^3)	**ENTER** Vadose zone soil total porosity, n^V (unitless)	**ENTER** Vadose zone soil water-filled porosity, $\theta_w{}^V$ (cm^3/cm^3)	**ENTER** Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
C	1.5	0.43	0.15	5

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)
70	6	6	250

END

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone 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)
137.4	0.280	#N/A	#N/A	#N/A	1.00E-08	4,000	4.89E+02	3.39E+04

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} ($atm\text{-}m^3/mol$)	Henry's law constant at ave. soil temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_V (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	5.00E-03	15	9,410	1.74E-02	7.14E-01	1.80E-04	5.62E-03	137.4

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., $C_{building}$ ($\mu g/m^3$)
15	4.89E+02	1.25	8.33E+01	5.62E-03	5.00E+03	7.73E+12	8.09E-04	3.96E-01

Unit risk factor, URF ($\mu g/m^3$)$^{-1}$	Reference conc., RfC (mg/m^3)
5.9E-06	3.5E-02

END

DATA ENTRY SHEET

SG-SCREEN
PA Version 2.0; 04/

Reset to Defaults

DTSC
Vapor Intrusion Guidance
Interim Final 12/04
(last modified 2/4/09)

ENTER Chemical CAS No. (numbers only, no dashes)	Soil Gas Concentration Data ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
127184	4.11E+03			Tetrachloroethylene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	152.4	24			1.00E-08

MORE ↓

ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
C	1.5	0.43	0.15	5

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)
70	6	6	250

END

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. (μg/m^3)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
137.4	0.280	#N/A	#N/A	#N/A	1.00E-08	4,000	4.11E+03	3.39E+04

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)	Vadose zone effective diffusion coefficient, $D^{eff}{}_V$ (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	5.00E-03	15	9,410	1.74E-02	7.14E-01	1.80E-04	5.62E-03	137.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m^3)
15	4.11E+03	1.25	8.33E+01	5.62E-03	5.00E+03	7.73E+12	8.09E-04	3.33E+00

Unit risk factor, URF (μg/m^3)$^{-1}$	Reference conc., RfC (mg/m^3)
5.9E-06	3.5E-02

END

DATA ENTRY SHEET

SG-SCREEN
PA Version 2.0; 04/

Reset to Defaults

DTSC
Vapor Intrusion Guidance
Interim Final 12/04
(last modified 2/4/09)

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)		ENTER Soil gas conc., C_g (ppmv)	Chemical
		OR		
127184	1.10E+03			Tetrachloroethylene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)		ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
				OR	
15	152.4	24			1.00E-08

MORE ↓

ENTER Vandose zone SCS soil type Lookup Soil Parameters	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
C	1.5	0.43	0.15	5

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)
70	6	6	250

END

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Soil gas conc. (μg/m^3)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
137.4	0.280	#N/A	#N/A	#N/A	1.00E-08	4,000	1.10E+03	3.39E+04

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)	Vadose zone effective diffusion coefficient, D^{eff}_V (cm^2/s)	Diffusion path length, L_d (cm)
1.00E+06	5.00E-03	15	9,410	1.74E-02	7.14E-01	1.80E-04	5.62E-03	137.4

Convection path length, L_p (cm)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m^3)
15	1.10E+03	1.25	8.33E+01	5.62E-03	5.00E+03	7.73E+12	8.09E-04	8.90E-01

Unit risk factor, URF (μg/m^3)$^{-1}$	Reference conc., RfC (mg/m^3)
5.9E-06	3.5E-02

END