ROESSLER INVESTMENT GROUP
COMMERCIAL BROKERAGE

Ms. Karel Detterman
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 Ms. Detterman:

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 Javaherian of Endpoint at 415-706-8935.

Sincerely,

James Roessler
Roessler Investment Group
442 Post St, Ste 700
San Francisco, CA 94102
Phone: (415) 837-3722
Fax: (415) 837-3717
Email: Jim@RoesslerInvestmentGroup.com
CA DRE #00339311

Endpoint.
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July 20, 2015

Ms. Karel Dettermen, P.G.
Alameda County Health Care Services Agency (County)
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

Subject: Focused Site Reconnaissance and Sampling Activities in Support of Site Closure
Crow Canyon Dry Cleaners
7272 San Ramon Road, Dublin, California
(RO # 0002863)

Dear Ms. Dettermen:

Endpoint Consulting, Inc. (Endpoint) is pleased to present this brief letter report summarizing results of the site reconnaissance and sampling activities performed per the request of the County and in support of environmental closure at the above-referenced site. The activities performed corresponded specifically to those requested by the County during the April 14th 2015 meeting with representatives of the site's responsible parties, Endpoint, and the County. These activities included performing a utility survey to determine the presence and orientation of any utility lines located in between the site and the adjacent residential complex, estimation of the ground surface elevation change in the area between the dry cleaner and the adjacent residential complex, resampling of VM-9SS (the sole onsite well which has exhibited tetrachloroethylene [PCE] at a concentration slightly above the commercial/industrial ESL), and resampling of VM-10 (one of the three offsite wells nearest the residential complex and which had not been sampled since June 2014), and an estimation of potential vapor intrusion health risks (under commercial/industrial land use) resulting from potential exposure to PCE beneath the drycleaner building.

Utility and Ground Elevation Survey

Per the County's request, a utility survey was performed targeting the area between the Crow Canyon Dry Cleaners building and the residential complex located adjacent to the site (see Figure 1). Also, the change in ground surface elevation local to the area in between the residential complex and the dry cleaner was estimated using a hand-held GPS device.

Figure 1 depicts the distribution of utility lines identified during this survey, while Figure 2 depicts a schematic cross-section showing the transition in ground surface elevation between the residential complex and the dry cleaner building. As indicated, an estimated 10-foot decline in ground surface elevation occurs between the location of the nearest residential building and the dry cleaner building. Moreover, while gas and sewer lines do run near the offsite wells VM-11 and VM-12, these lines do not extend to (nor are at the same elevation as) locations closer to the site where higher levels of tetrachloroethylene (PCE) have been detected. Importantly, the PCE concentrations at all three offsite

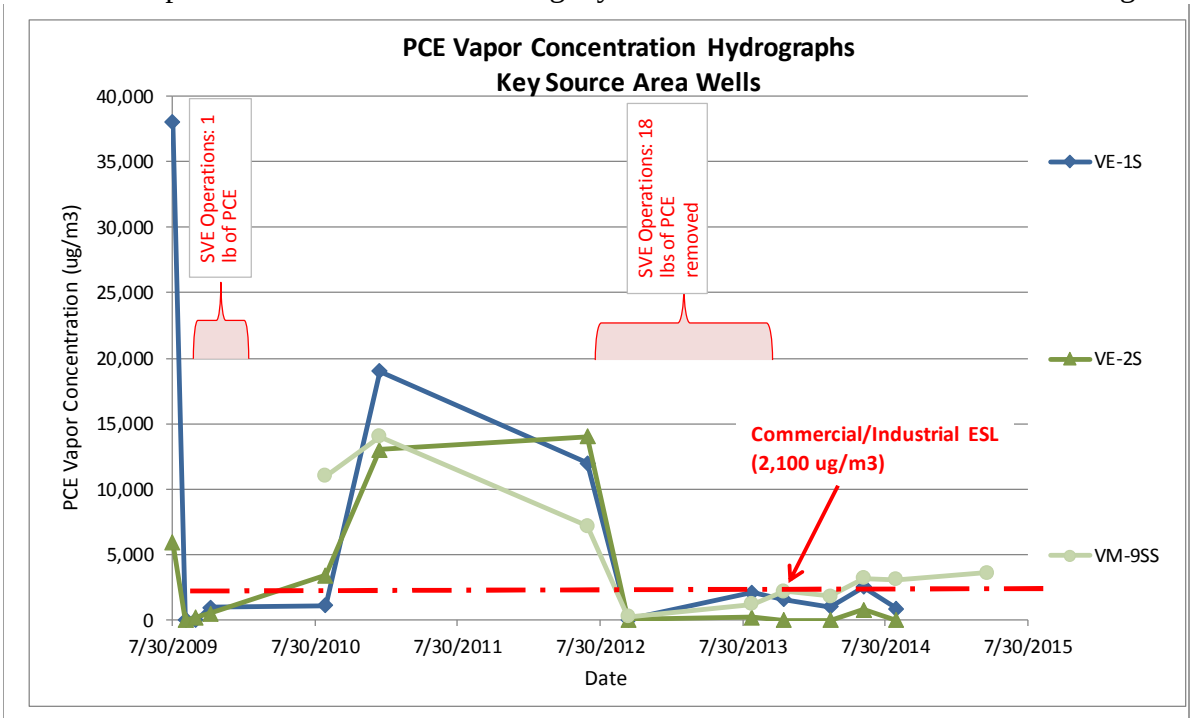
wells nearest the residential complex (ie., VM-10 through VM-12) have consistently remained below the PCE residential screening level of 210 ug/m^3 (see Table 1).

Vapor Sampling

Per the County's request, a focused round of vapor sampling was conducted at source area vapor monitoring well VM-9SS, located within the dry cleaner building. Also per the request of the County, an additional vapor sample was collected at offsite vapor monitoring well VM-10, located along the walkway nearest to the residential building (see Figure 1). Vapor sampling protocols corresponded to Department of Toxic Substance Control (DTSC) guidelines as previously approved by the County and implemented by Endpoint at this site, and the laboratory analytical report is included herein as Attachment 1.

Table 1 summarizes the historical vapor monitoring results, including the above-referenced samples collected on April 16th (VM-9SS) and April 30th 2015 (VM-10), respectively. As indicated on the table, the tetrachloroethylene (PCE) concentration at MV-10 (120 ug/m^3) marked a decline relative to the prior sample collected in June 2014 (10 months prior), and remains below the residential land use PCE screening level of 210 ug/m^3 approved by the County for residential screening for the site.

The PCE concentration in source area well VM-9SS was reported at 3,600 ug/m^3, marking a slight increase since the June 2014 round of sampling (10 months prior), but maintaining a general stable trend relative to the overall concentration trend exhibited at this well (see hydrograph below). As shown in the hydrograph below, this well remains the only well onsite and within the former source area which reports PCE at a concentration slightly above the commercial/industrial screening level.



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Vapor Intrusion Risk Calculations

Per the County's request, the approach to the vapor intrusion risk assessment was documented and sent to the County for its review and approval via electronic mail on April 14, 2015; however, the County concluded that it would not provide comments on the vapor intrusion risk calculation approach until after the risk calculations were completed.

As a conservative measure, several conservative approaches were implemented in assessing the significance, if any, of the single exceedance of the PCE commercial/industrial ESL (at VM-9SS) remaining at the site. These approaches were as follow-

1) The latest detected concentration of PCE at VM-9SS was used to directly back-calculate from the ESL of 2,100 ug/m^3 (which corresponds to a target cancer risk of 1 x 10^{-6}) the PCE vapor intrusion health risk. The equation used for this back-calculation is as follows:

$$\text{PCE Cancer Risk} = (3{,}600\ \text{ug/m}^3) \times (1\text{x}10^{-6}) \div 2{,}100\ \text{ug/m}^3$$

2) The latest detected concentration of PCE at VM-9SS was used in conjunction with the DTSC's latest version of the Johnson & Ettinger (J&E) Model incorporating the default building parameters and other conservative assumptions inherent to the J&E model, in order to estimate the resulting PCE health risk. The J&E model input and output data for this simulated risk calculation is included herein as Attachment 2.

3) The 95% UCL concentration of PCE throughout the period of record at VM-9SS was estimated and used in conjunction with the J&E model to estimate resulting vapor intrusion risks. The J&E model input and output data for this simulated risk calculation is included herein as Attachment 3.

4) The 95% UCL concentration of PCE was estimated using the latest round of sampling results from all source area monitoring wells at or immediately adjacent to the dry cleaner building. This concentration was then used in conjunction with the J&E model to obtain the vapor intrusion health risk estimate for PCE. The J&E model input and output data for this simulated risk calculation is included herein as Attachment 4.

The matrix below summarizes the conservatively estimated health risk using each of the above-referenced methods. As indicated, the estimated health risk using the various methods ranges from 4.8 x 10^{-7} to 1.7 x 10^{-6}, all of which are either below or at the lower end of the risk management range defined by DTSC at 1 x 10^{-4} to 1 x 10^{-6}. This conservatively estimated risk is accordingly deemed acceptable under the current commercial/industrial use of the property. In evaluating the above results, it should be noted that VM-9SS and the former PCE source area are located in the very back of the dry cleaner building and immediately adjacent to the back door of the building, which remains open daily during operation of the dry cleaner; thereby significantly increasing the actual air exchange inside the building relative to that assumed conservatively by the J&E Model, which in turn would further reduce actual potential health risks relative to those conservatively calculated herein.

Source Concentration (ug/m3)	Calculation	Estimated Health Risk
3,600	April 2015 Concentration at VM-9SS: Linear Back-Calculation from ESL	1.70E-06
3,600	April 2015 Concentration at VM-9SS: J&E Model	1.30E-06
3282	95% UCL at VM-9SS Since Termination of SVE System: J&E Model	1.10E-06
1389	95% UCL at VE-1S/D, VE-2S/D, VE-3S/D, VM-1S/D, VM-4SS, VM-5SS, VM-9SS	4.80E-07

*Consistent the observed lithology at the site, default soil properties for silty soils were used in J&E model runs.

Based on the remediation and sampling results for this site and the rationale set forth herein, Endpoint is of the opinion that the residual environmental impacts remaining beneath the dry cleaner following remediation activities at the site do not pose unacceptable risks to human health and the environment, and that the environmental case for the site may accordingly be closed.

CLOSING

As always, Endpoint greatly appreciates the County's continued assistance with this project. If you have any questions, please contact Mehrdad Javaherian at 415-706-8935, or at mehrdad@endpoint-inc.com.

Sincerely,
Endpoint Consulting, Inc.

Mehrdad Javaherian, Ph.D., MPH, PE, LEED®GA
Program Manager

Attachments:

Table 1 - PCE Vapor Concentrations

Figure 1 – Utility Line Layout
Figure 2 – Ground Surface Elevation Change

Attachment 1 – Laboratory Analytical Reports
Attachment 2 – J&E Model Input and Output Data- April 2015 Sampling Results
Attachment 3 – J&E Model Input and Output Data- 95% UCL at VM-9SS
Attachment 4 – J&E Model Input and Output Data- 95% UCL across Source Area

TABLE

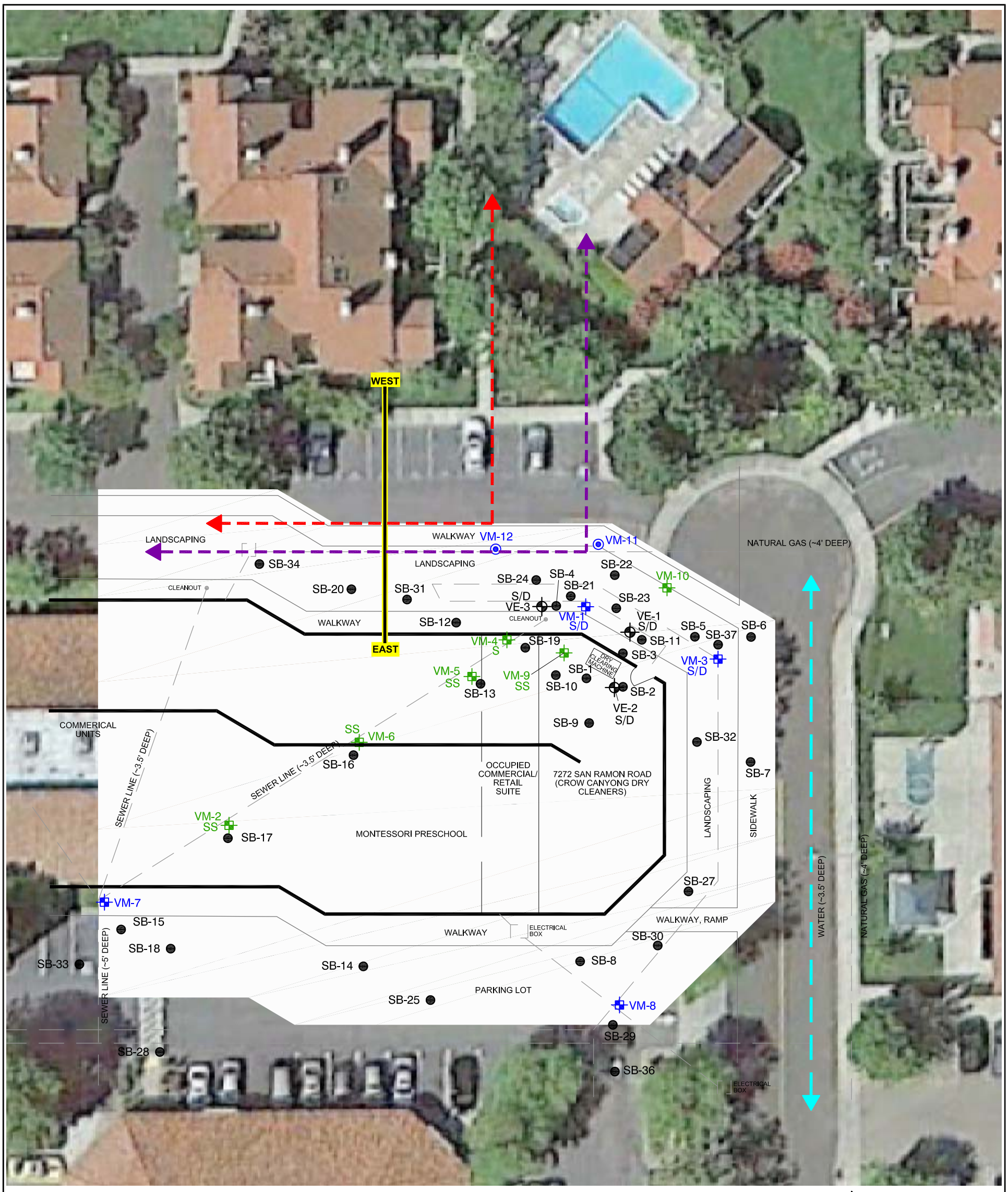
Table 1
PCE Vapor Concentrations
Vapor Monitoring and Extraction Well Locations
Crow Canyon Dry Clenaers
7272 San Ramon Road,
Dublin, California

Well I.D.	7/18/2009 to 7/30/2009 Baseline-Purge Test-SVE Shakedown Sampling Events	9/1/2009 1 Month after operation of SVE Pilot Test (IRAP)	9/28/2009 2 Months after operation of SVE Pilot Test	11/4/09 ~ 1 month after shutdown of SVE Pilot Test	8/26/10 ~ 11 months after shutdown of SVE system	1/12/11 ~ 17 months after shutdown of SVE Pilot Test	6/27/2012* ~ 34 months after shutdown of SVE system	10/9/2012 ~ 3.5 months after SVE restart** (CAP)	08/23/2013 ~ 5.5 months after shutdown of SVE system	11/13/2013 ~ 8.5 months after shutdown of SVE system	3/12/2014 ~ 12.5 months after shutdown of SVE system	6/4/2014 ~ 15.5 months after shutdown of SVE system	8/27/2014 ~ 18 months after shutdown of SVE system	4/16/15 -4/30/15 ~ 26 months after shutdown of SVE system
VE-1S/SB-11	380,000***	23	<14	970	1,100	19,000	12,000	41	2,100	1,600	1,000	2,500	890	NS
VE-1D	420	300	<14	770	NS	NS	4,500	NS	NS	NS	520	600	NS	NS
VE-2S	5,900	<14	200	500	3,400	13,000	14,000	35	190	NS	NS	800	NS	NS
VE-2D	1,100	<14	<14	350	NS	NS	5,100	NS	NS	NS	320	670	NS	NS
VE-3S	2,200	30	38	<14	870	260	<500	NS	NS	NS	NS	86	NS	NS
VE-3D	3,800	24	51	<14	NS	NS	790	NS	NS	NS	130	82	NS	NS
VM-1S/SB-23	17,000***	-	<14	20	2,600	580	1,200	NS	NS	NS	200	250	NS	NS
VM-1D	160	-	16	140	NS	NS	520	NS	NS	NS	NS	170	NS	NS
VM-3S	8,100	-	55	81	NS	NS	NS	NS	NS	NS	NS	77	NS	NS
VM-3D	34J	-	<14	300	NS	NS	NS	NS	NS	NS	NS	120	NS	NS
VM-4S	10,000	-	180	310	1,100	1,100	2,100	22	360	120	150	200	NS	NS
VM-5SS	-	-	-	-	1,300	1,100	NS	68	340	NS	NS	230	NS	NS
VM-6SS	-	-	-	-	650	390	NS	110	250	NS	NS	140	NS	NS
VM-2SS	-	-	-	-	28	<14	NS	NS	NS	NS	NS	57	NS	NS
VM-7	-	-	-	-	310	<14	240	NS	NS	NS	NS	88	NS	NS
VM-8	-	-	-	-	1,300	640	820	NS	NS	NS	NS	390	NS	NS
VM-9SS	-	-	-	-	11,000	14,000	7,200	280	1,200	2,200	1,800	3,200	3,100	3,600
VM-10	-	-	-	-	450	210	NS	NS	NS	NS	NS	180	NS	120
VM-11	-	-	-	-	-	-	-	-	-	-	51	190	170	NS
VM-12	-	-	-	-	-	-	-	-	-	-	15	58	NS	NS

Shallow Soil Gas ESL-Commercial/Industrial Land Use: 2,100 ug/m3 Residential Land Use: 210 ug/m3

* Baseline Sampling prior to start of SVE Operations on June 28, 2012
** system shutdown one week before sampling
*** Sample results from 2008 sample from SB-vapor probe location
NS = Not Sampled
Value exceeds the remedial action objective (Commercial/Industrial ESL) for the site

FIGURES



LEGEND:

VM-11	Vapor Monitoring Well (June/August 2014)
VM-4	Vapor Monitoring Well
VM-2SS	Sub-Slab Vapor Monitoring Well (2010)
VE-1	Soil Vapor Extraction Well Locations
SB-1	Historical Soil Vapor Boring Locations (2006- 2008))
S/D	Shallow Well Screen/Deep Well Screen
SS	Sub-Slab Well Screen
	Utility Line
	Water (3.5 feet deep)
	Gas (~3.5 feet deep)
	Storm (~3 feet deep)
WEST — EAST	Ground Surface Elevation Cross-Section

N

0 15 30

Scale (feet)

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

UTILITY LINE LAYOUT

CROW CANYON DRY CLEANERS
7272 SAN RAMON ROAD
DUBLIN, CALIFORNIA

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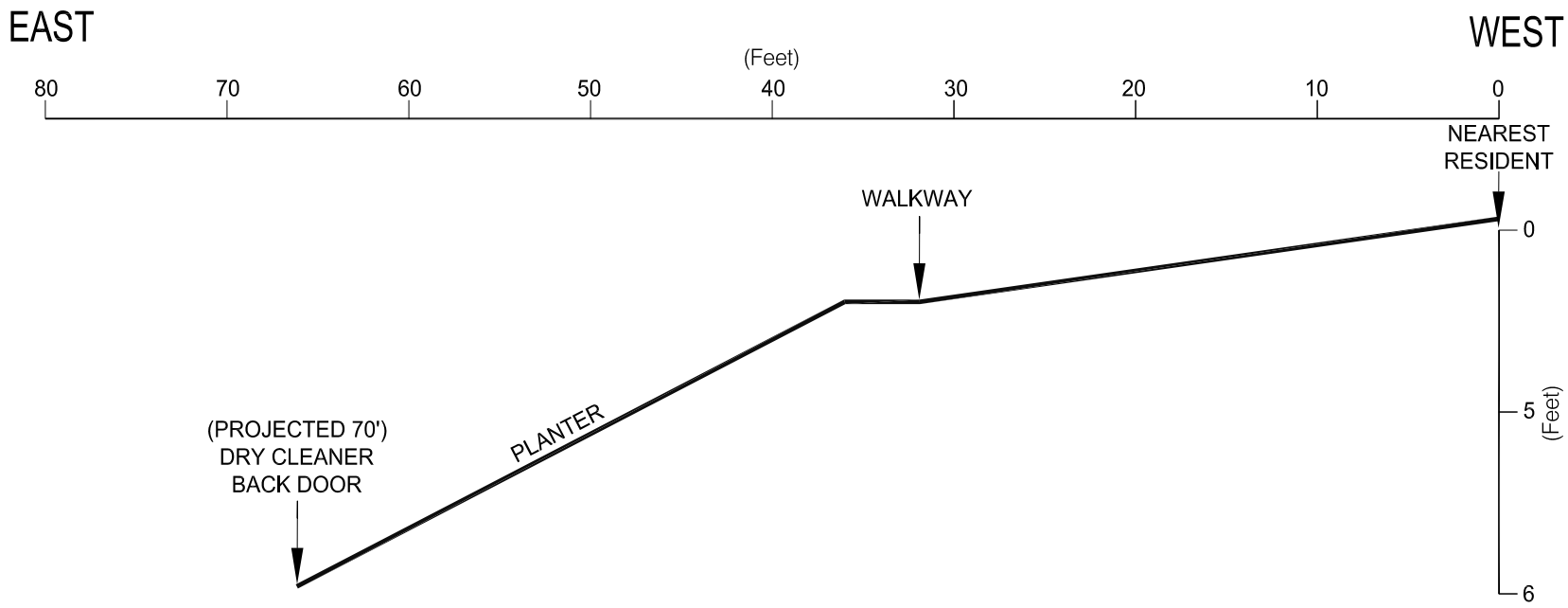
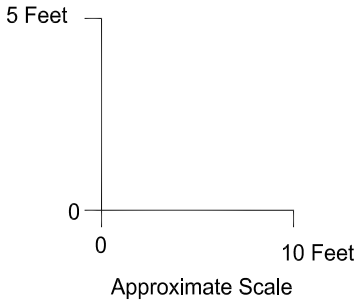
Date: 7/18/2015

Figure: 1





APPROXIMATE GROUND SURFACE ELEVATION CHANGE

CROW CANYON DRY CLEANERS
7272 SAN RAMON ROAD
DUBLIN, CALIFORNIA

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Date: 7/18/2015

Figure: **2**

ATTACHMENT 1

McCampbell Analytical, Inc.
"When Quality Counts"

Analytical Report

WorkOrder: 1504678

Report Created for: Endpoint

1534 Plaza Lane #243
Burlingame, CA 94010

Project Contact: Mehrdad Javaher
Project P.O.:
Project Name: TM Dublin; Crow Canyon Cleaners

Project Received: 04/16/2015

Analytical Report reviewed & approved for release on 04/23/2015 by:

Angela Rydelius,
Laboratory Manager

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Glossary of Terms & Qualifier Definitions

Client: Endpoint
Project: TM Dublin; Crow Canyon Cleaners
WorkOrder: 1504678

Glossary Abbreviation

95% Interval	95% Confident Interval
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DUP	Duplicate
EDL	Estimated Detection Limit
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
N/A	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.)
RPD	Relative Percent Deviation
RRT	Relative Retention Time
SPK Val	Spike Value
SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)

Quality Control Qualifiers

F2	LCS recovery for this compound is outside of acceptance limits.

McCampbell Analytical, Inc.
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Analytical Report

Client:	Endpoint	**WorkOrder:**	1504678
Project:	TM Dublin; Crow Canyon Cleaners	**Extraction Method:**	ASTM D 1946-90
Date Received:	4/16/15 13:07	**Analytical Method:**	ASTM D 1946-90
Date Prepared:	4/20/15	**Unit:**	%

Helium

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
VM-955	1504678-001A	SoilGas	04/16/2015 08:00	GC26	104010

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
13.64	27.20	AK

Analytes	Result	RL	DF	Date Analyzed
Helium	ND	0.050	1	04/20/2015 13:33

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Analytical Report

Client:	Endpoint	**WorkOrder:**	1504678
Project:	TM Dublin; Crow Canyon Cleaners	**Extraction Method:**	TO15
Date Received:	4/16/15 13:07	**Analytical Method:**	TO15
Date Prepared:	4/22/15	**Unit:**	µg/m³

Volatile Organic Compounds in µg/m³

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
VM-955	1504678-001A	SoilGas	04/16/2015 08:00	GC24	104006

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
13.64	27.20	AK

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	60	1	04/22/2015 06:31
Acrolein	ND	1.2	1	04/22/2015 06:31
Acrylonitrile	ND	1.1	1	04/22/2015 06:31
tert-Amyl methyl ether (TAME)	ND	2.1	1	04/22/2015 06:31
Benzene	ND	1.6	1	04/22/2015 06:31
Benzyl chloride	ND	2.6	1	04/22/2015 06:31
Bromodichloromethane	ND	3.5	1	04/22/2015 06:31
Bromoform	ND	5.2	1	04/22/2015 06:31
Bromomethane	ND	2.0	1	04/22/2015 06:31
1,3-Butadiene	ND	1.1	1	04/22/2015 06:31
2-Butanone (MEK)	ND	75	1	04/22/2015 06:31
t-Butyl alcohol (TBA)	ND	31	1	04/22/2015 06:31
Carbon Disulfide	ND	1.6	1	04/22/2015 06:31
Carbon Tetrachloride	ND	3.2	1	04/22/2015 06:31
Chlorobenzene	ND	2.4	1	04/22/2015 06:31
Chloroethane	ND	1.3	1	04/22/2015 06:31
Chloroform	ND	2.4	1	04/22/2015 06:31
Chloromethane	ND	1.0	1	04/22/2015 06:31
Cyclohexane	ND	18	1	04/22/2015 06:31
Dibromochloromethane	ND	4.4	1	04/22/2015 06:31
1,2-Dibromo-3-chloropropane	ND	0.12	1	04/22/2015 06:31
1,2-Dibromoethane (EDB)	ND	3.9	1	04/22/2015 06:31
1,2-Dichlorobenzene	ND	3.0	1	04/22/2015 06:31
1,3-Dichlorobenzene	ND	3.0	1	04/22/2015 06:31
1,4-Dichlorobenzene	ND	3.0	1	04/22/2015 06:31
Dichlorodifluoromethane	ND	2.5	1	04/22/2015 06:31
1,1-Dichloroethane	ND	2.0	1	04/22/2015 06:31
1,2-Dichloroethane (1,2-DCA)	ND	2.0	1	04/22/2015 06:31
1,1-Dichloroethene	ND	2.0	1	04/22/2015 06:31
cis-1,2-Dichloroethene	**7.3**	2.0	1	04/22/2015 06:31
trans-1,2-Dichloroethene	**2.2**	2.0	1	04/22/2015 06:31
1,2-Dichloropropane	ND	2.4	1	04/22/2015 06:31
cis-1,3-Dichloropropene	ND	2.3	1	04/22/2015 06:31
trans-1,3-Dichloropropene	ND	2.3	1	04/22/2015 06:31

(Cont.)

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"When Quality Counts"

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Analytical Report

Client:	Endpoint	**WorkOrder:**	1504678
Project:	TM Dublin; Crow Canyon Cleaners	**Extraction Method:**	TO15
Date Received:	4/16/15 13:07	**Analytical Method:**	TO15
Date Prepared:	4/22/15	**Unit:**	µg/m³

Volatile Organic Compounds in µg/m³

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
VM-955	1504678-001A	SoilGas	04/16/2015 08:00	GC24	104006

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
13.64	27.20	AK

Analytes	Result	RL	DF	Date Analyzed
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	3.6	1	04/22/2015 06:31
Diisopropyl ether (DIPE)	ND	2.1	1	04/22/2015 06:31
1,4-Dioxane	ND	1.8	1	04/22/2015 06:31
Ethanol	ND	96	1	04/22/2015 06:31
Ethyl acetate	ND	1.8	1	04/22/2015 06:31
Ethyl tert-butyl ether (ETBE)	ND	2.1	1	04/22/2015 06:31
Ethylbenzene	ND	2.2	1	04/22/2015 06:31
4-Ethyltoluene	ND	2.5	1	04/22/2015 06:31
Freon 113	ND	3.9	1	04/22/2015 06:31
Heptane	ND	21	1	04/22/2015 06:31
Hexachlorobutadiene	ND	5.4	1	04/22/2015 06:31
Hexane	ND	18	1	04/22/2015 06:31
2-Hexanone	**2.3**	2.1	1	04/22/2015 06:31
4-Methyl-2-pentanone (MIBK)	ND	2.1	1	04/22/2015 06:31
Methyl-t-butyl ether (MTBE)	ND	1.8	1	04/22/2015 06:31
Methylene chloride	ND	1.8	1	04/22/2015 06:31
Methyl methacrylate	ND	2.1	1	04/22/2015 06:31
Naphthalene	ND	5.3	1	04/22/2015 06:31
Propene	ND	88	1	04/22/2015 06:31
Styrene	ND	2.2	1	04/22/2015 06:31
1,1,1,2-Tetrachloroethane	ND	3.5	1	04/22/2015 06:31
1,1,2,2-Tetrachloroethane	ND	3.5	1	04/22/2015 06:31
Tetrachloroethene	**3600**	34	10	04/22/2015 02:26
Tetrahydrofuran	ND	1.5	1	04/22/2015 06:31
Toluene	ND	1.9	1	04/22/2015 06:31
1,2,4-Trichlorobenzene	ND	3.8	1	04/22/2015 06:31
1,1,1-Trichloroethane	ND	2.8	1	04/22/2015 06:31
1,1,2-Trichloroethane	ND	2.8	1	04/22/2015 06:31
Trichloroethene	**110**	2.8	1	04/22/2015 06:31
Trichlorofluoromethane	ND	2.8	1	04/22/2015 06:31
1,2,4-Trimethylbenzene	ND	2.5	1	04/22/2015 06:31
1,3,5-Trimethylbenzene	ND	2.5	1	04/22/2015 06:31
Vinyl Acetate	ND	1.8	1	04/22/2015 06:31
Vinyl Chloride	ND	1.3	1	04/22/2015 06:31

(Cont.)

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Analytical Report

Client:	Endpoint	**WorkOrder:**	1504678
Project:	TM Dublin; Crow Canyon Cleaners	**Extraction Method:**	TO15
Date Received:	4/16/15 13:07	**Analytical Method:**	TO15
Date Prepared:	4/22/15	**Unit:**	µg/m³

Volatile Organic Compounds in µg/m³

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
VM-955	**1504678-001A**	**SoilGas**	**04/16/2015 08:00**	**GC24**	**104006**

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
13.64	**27.20**	**AK**

Analytes	Result	RL	DF	Date Analyzed
Xylenes, Total	ND	6.6	1	04/22/2015 06:31
Surrogates	**REC (%)**	**Limits**		
1,2-DCA-d4	79	70-130		04/22/2015 06:31
Toluene-d8	89	70-130		04/22/2015 06:31
4-BFB	89	70-130		04/22/2015 06:31

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Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	Endpoint	**WorkOrder:**	1504678
Date Prepared:	4/23/15	**BatchID:**	104010
Date Analyzed:	4/20/15	**Extraction Method:**	ASTM D 1946-90
Instrument:	GC26	**Analytical Method:**	ASTM D 1946-90
Matrix:	Soilgas	**Unit:**	%
Project:	TM Dublin; Crow Canyon Cleaners	**Sample ID:**	MB/LCS-104010

QC Summary Report for ASTM D1946-90

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Helium	ND	ND	0.050	0.010	-	119	60-140

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Quality Control Report

Client:	Endpoint	**WorkOrder:**	1504678
Date Prepared:	4/23/15	**BatchID:**	104006
Date Analyzed:	4/21/15	**Extraction Method:**	TO15
Instrument:	GC24	**Analytical Method:**	TO15
Matrix:	Soilgas	**Unit:**	nL/L
Project:	TM Dublin; Crow Canyon Cleaners	**Sample ID:**	MB/LCS-104006

QC Summary Report for TO15

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Acetone	ND	ND	25	25	-	79	60-140
Acrolein	ND	19.2	0.50	25	-	77	60-140
Acrylonitrile	ND	22.5	0.50	25	-	90	60-140
tert-Amyl methyl ether (TAME)	ND	23.8	0.50	25	-	95	60-140
Benzene	ND	26.6	0.50	25	-	106	60-140
Benzyl chloride	ND	30.3	0.50	25	-	121	60-140
Bromodichloromethane	ND	27.3	0.50	25	-	109	60-140
Bromoform	ND	28.8	0.50	25	-	115	60-140
Bromomethane	ND	26.2	0.50	25	-	105	60-140
1,3-Butadiene	ND	23.0	0.50	25	-	92	60-140
2-Butanone (MEK)	ND	25.3	25	25	-	101	60-140
t-Butyl alcohol (TBA)	ND	20.2	10	25	-	81	60-140
Carbon Disulfide	ND	27.8	0.50	25	-	111	60-140
Carbon Tetrachloride	ND	28.4	0.50	25	-	114	60-140
Chlorobenzene	ND	28.7	0.50	25	-	115	60-140
Chloroethane	ND	22.3	0.50	25	-	89	60-140
Chloroform	ND	25.4	0.50	25	-	102	60-140
Chloromethane	ND	23.2	0.50	25	-	93	60-140
Cyclohexane	ND	25.3	5.0	25	-	101	60-140
Dibromochloromethane	ND	31.9	0.50	25	-	127	60-140
1,2-Dibromo-3-chloropropane	ND	24.0	0.012	25	-	96	60-140
1,2-Dibromoethane (EDB)	ND	28.3	0.50	25	-	113	60-140
1,2-Dichlorobenzene	ND	32.2	0.50	25	-	129	60-140
1,3-Dichlorobenzene	ND	32.3	0.50	25	-	129	60-140
1,4-Dichlorobenzene	ND	32.7	0.50	25	-	131	60-140
Dichlorodifluoromethane	ND	24.2	0.50	25	-	97	60-140
1,1-Dichloroethane	ND	26.0	0.50	25	-	104	60-140
1,2-Dichloroethane (1,2-DCA)	ND	23.3	0.50	25	-	93	60-140
1,1-Dichloroethene	ND	27.3	0.50	25	-	109	60-140
cis-1,2-Dichloroethene	ND	27.1	0.50	25	-	108	60-140
trans-1,2-Dichloroethene	ND	26.5	0.50	25	-	106	60-140
1,2-Dichloropropane	ND	25.7	0.50	25	-	103	60-140
cis-1,3-Dichloropropene	ND	28.0	0.50	25	-	112	60-140
trans-1,3-Dichloropropene	ND	25.6	0.50	25	-	102	60-140
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	24.6	0.50	25	-	98	60-140
Diisopropyl ether (DIPE)	ND	22.5	0.50	25	-	90	60-140
1,4-Dioxane	ND	29.2	0.50	25	-	117	60-140
Ethanol	ND	ND	50	25	-	82	60-140
Ethyl acetate	ND	25.0	0.50	25	-	100	60-140
Ethyl tert-butyl ether (ETBE)	ND	22.7	0.50	25	-	91	60-140

(Cont.)

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Quality Control Report

Client:	Endpoint	**WorkOrder:**	1504678
Date Prepared:	4/23/15	**BatchID:**	104006
Date Analyzed:	4/21/15	**Extraction Method:**	TO15
Instrument:	GC24	**Analytical Method:**	TO15
Matrix:	Soilgas	**Unit:**	nL/L
Project:	TM Dublin; Crow Canyon Cleaners	**Sample ID:**	MB/LCS-104006

QC Summary Report for TO15

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Ethylbenzene	ND	29.2	0.50	25	-	117	60-140
4-Ethyltoluene	ND	32.2	0.50	25	-	129	60-140
Freon 113	ND	25.7	0.50	25	-	103	60-140
Heptane	ND	24.2	5.0	25	-	97	60-140
Hexachlorobutadiene	ND	35.7	0.50	25	-	143, F2	60-140
Hexane	ND	26.1	5.0	25	-	104	60-140
2-Hexanone	ND	25.8	0.50	25	-	103	60-140
4-Methyl-2-pentanone (MIBK)	ND	29.4	0.50	25	-	118	60-140
Methyl-t-butyl ether (MTBE)	ND	25.9	0.50	25	-	104	60-140
Methylene chloride	ND	24.4	0.50	25	-	98	60-140
Methyl methacrylate	ND	28.8	0.50	25	-	115	60-140
Naphthalene	ND	73.5	1.0	50	-	147, F2	60-140
Propene	ND	ND	50	25	-	87	60-140
Styrene	ND	32.6	0.50	25	-	131	60-140
1,1,1,2-Tetrachloroethane	ND	24.3	0.50	25	-	97	60-140
1,1,2,2-Tetrachloroethane	ND	29.5	0.50	25	-	118	60-140
Tetrachloroethene	ND	25.6	0.50	25	-	102	60-140
Tetrahydrofuran	ND	23.4	0.50	25	-	93	60-140
Toluene	ND	27.1	0.50	25	-	109	60-140
1,2,4-Trichlorobenzene	ND	32.5	0.50	25	-	129	60-140
1,1,1-Trichloroethane	ND	25.9	0.50	25	-	104	60-140
1,1,2-Trichloroethane	ND	27.2	0.50	25	-	109	60-140
Trichloroethene	ND	26.4	0.50	25	-	106	60-140
Trichlorofluoromethane	ND	18.2	0.50	25	-	73	60-140
1,2,4-Trimethylbenzene	ND	31.2	0.50	25	-	125	60-140
1,3,5-Trimethylbenzene	ND	30.5	0.50	25	-	122	60-140
Vinyl Acetate	ND	28.0	0.50	25	-	112	60-140
Vinyl Chloride	ND	22.4	0.50	25	-	90	60-140
Xylenes, Total	ND	86.8	1.5	75	-	116	60-140
Surrogate Recovery							
1,2-DCA-d4	390	399		500	78	80	60-140
Toluene-d8	446	458		500	89	92	60-140
4-BFB	442	459		500	88	92	60-140

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(925) 252-9262

CHAIN-OF-CUSTODY RECORD

WorkOrder: 1504678 **ClientCode: EPB**

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

Report to:
Mehrdad Javaher
Endpoint
1534 Plaza Lane #243
Burlingame, CA 94010
415-706-8935 FAX:

Email: mehrdad@endpoint-inc.com
cc/3rd Party:
PO:
ProjectNo: TM Dublin; Crow Canyon Cleaners

Bill to:
Accounts Payable
Endpoint
1534 Plaza Lane #243
Burlingame, CA 94010
mehrdad@endpoint-inc.com

Requested TAT: 5 days

Date Received: **04/16/2015**
Date Printed: **04/24/2015**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12
1504678-001	VM-955	SoilGas	4/16/2015 8:00	☐	A	A	A									

Test Legend:

1	HELIUM_LC_SOILGAS(%)	2	O15_Scan-SIM_SOIL(UG/M3	3	TO15-8260_SOIL(UG/M3)	4		5	
6		7		8		9		10	
11		12							

The following SampID: 001A contains testgroup.

Prepared by: Erika Santos

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.

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WORK ORDER SUMMARY

Client Name: ENDPOINT
Project: TM Dublin; Crow Canyon Cleaners
Comments:

QC Level: LEVEL 2
Client Contact: Mehrdad Javaher
Contact's Email: mehrdad@endpoint-inc.com

Work Order: 1504678
Date Received: 4/16/2015

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

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1504678-001A	VM-955	SoilGas	TO15 w/ Helium	1	1L Summa	☐	4/16/2015 8:00	5 days		☐	

NOTES: - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

150478

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CHAIN OF CUSTODY RECORD

TURN AROUND TIME: RUSH ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 5 DAY ☐

GeoTracker EDF ☐ PDF ☐ EDD ☐ EQuIS ☐ 10 DAY ☐

UST Clean Up Fund Project ☐ Claim #

Report To: ENDPOINT	Bill To: ENDPOINT
Company: ENDPOINT	
1534 PLAZA LN #243	
BURLINGAME 94010	E-Mail:
Tele: (415) 706 8935	Fax: ( )
Project #: TM DUBLIN	Project Name: CROW CANYON
Project Location: 7272 SAN RAMON BLVD DUBLIN	
Sampler Signature:	

Field Sample ID (Location)	Collection Date	Collection Time	Canister SN#	Sampler Kit SN#
VM-955	4/16/15	0900	7522	1229

Analysis Requested

VOCs by TO-15 (ug/m3)	8010 by TO-15 (ug/m3)	TPH(g) (ug/m3)	LEED (inc. 4PCH, Formaldehyde, CO, Total VOCs)	Fixed Gas: CO2, Methane, Ethane, Ethylene, Acetylene, CO (please circle or indicate in notes) uL/L	Fixed Gas: O2, N2 (please circle) uL/L	Fixed Gas: Propane uL/L	Helium Leak Check (%)	Leak Check (IPA, Norflorane, 1,1-difluroethane) ug/m3	APH: Aliphatic and/or Aromatic (please circle) ug/m3	Other:
X							X			

Helium Shroud SN#

Other:

Notes: Please Specify units if different than defaults VOCs is ug/m3 and fixed gas is uL/L. Leak check default is IPA.

Matrix: Soilgas	Matrix: Indoor Air	Cannister Pressure/ Vacuum: Initial	Cannister Pressure/ Vacuum: Final
X		-29	-5

Relinquished By:	Date:	Time:	Received By:
	4/16/15	1220	
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

Temp (°C): _____ Work Order #: _____

Condition: _____

Custody Seals Intact?: Yes _____ No _____ None _____

Shipped Via: _____

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Sample Receipt Checklist

Client Name: **Endpoint**
Date and Time Received: **4/16/2015 1:07:22 PM**

Project Name: **TM Dublin; Crow Canyon Cleaners**
LogIn Reviewed by: Erika Santos

WorkOrder №: **1504678** Matrix: SoilGas
Carrier: Client Drop-In

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	☐	
Sample/Temp Blank temperature	Temp:				NA ☑
Water - VOA vials have zero headspace / no bubbles?	Yes	☐	No	☐	NA ☑
Sample labels checked for correct preservation?	Yes	☑	No	☐	
pH acceptable upon receipt (Metal: <2; 522: <4; 218.7: >8)?	Yes	☐	No	☐	NA ☑
Samples Received on Ice?	Yes	☐	No	☑	

UCMR3 Samples:

Total Chlorine tested and acceptable upon receipt for EPA 522?	Yes	☐	No	☐	NA ☑
Free Chlorine tested and acceptable upon receipt for EPA 218.7, 300.1, 537, 539?	Yes	☐	No	☐	NA ☑

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

Comments:

ATTACHMENT 2

USEPA SG-SCREEN
Version 2.0, 04/2003

DTSC Modification
March 2014

Department of Toxic Substances Control
Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: Commercial
Chemical: Tetrachloroethylene

Reset to Defaults

Results Summary				
Soil Gas Conc. ($\mu g/m^3$)	Attenuation Factor (unitless)	Indoor Air Conc. ($\mu g/m^3$)	Cancer Risk	Noncancer Hazard
3.60E+03	7.2E-04	2.6E+00	1.3E-06	1.7E-02

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	3.60E+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	55.87727319	24	SI		

MORE ↓

Lookup Soil Parameters

ENTER Vandose zone SCS soil type	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)
SI	1.35	0.489	0.167	5

MORE ↓

Lookup Receptor Parameters

	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Exposure Time ET (hrs/day)	ENTER Air Exchange Rate ACH $(hour)^{-1}$
NEW=> Commercial	70	25	25	250	8 (NEW)	1 (NEW)

END

Tetrachloroethylene

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Molecular weight, MW (g/mol)
5.05E-02	9.46E-06	1.77E-02	25	8,288	394.40	620.20	5.9E-06	3.5E-02	165.83

END

ATTACHMENT 3

	General UCL Statistics for Full Data Sets	
User Selected Options		
From File	WorkSheet.wst	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

C1

General Statistics

Number of Valid Observations	6	Number of Distinct Observations	6

Raw Statistics		**Log-transformed Statistics**	
Minimum	1200	Minimum of Log Data	7.09
Maximum	3600	Maximum of Log Data	8.189
Mean	2517	Mean of log Data	7.763
Median	2650	SD of log Data	0.42
SD	930.4		
Coefficient of Variation	0.37		
Skewness	-0.333		

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	0.938	Shapiro Wilk Test Statistic	0.915
Shapiro Wilk Critical Value	0.788	Shapiro Wilk Critical Value	0.788
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	3282	95% H-UCL	4075
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4419
95% Adjusted-CLT UCL (Chen-1995)	3086	97.5% Chebyshev (MVUE) UCL	5237
95% Modified-t UCL (Johnson-1978)	3273	99% Chebyshev (MVUE) UCL	6842
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.909	**Data appear Normal at 5% Significance Level**	
Theta Star	643.7		
MLE of Mean	2517		
MLE of Standard Deviation	1273		
nu star	46.91		
Approximate Chi Square Value (.05)	32.2	**Nonparametric Statistics**	

	A	B	C	D	E	F	G	H	I	J	K	L
55					Adjusted Level of Significance	0.0122					95% CLT UCL	3141
56					Adjusted Chi Square Value	27.87					95% Jackknife UCL	3282
57											95% Standard Bootstrap UCL	3083
58					Anderson-Darling Test Statistic	0.324					95% Bootstrap-t UCL	3206
59					Anderson-Darling 5% Critical Value	0.698					95% Hall's Bootstrap UCL	3029
60					Kolmogorov-Smirnov Test Statistic	0.263					95% Percentile Bootstrap UCL	3067
61					Kolmogorov-Smirnov 5% Critical Value	0.333					95% BCA Bootstrap UCL	3050
62					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	4172
63											97.5% Chebyshev(Mean, Sd) UCL	4889
64					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	6296
65					95% Approximate Gamma UCL	3667						
66					95% Adjusted Gamma UCL	4237						
67												
68					**Potential UCL to Use**						Use 95% Student's-t UCL	3282
69												
70	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**											
71	**These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)**											
72	**and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.**											
73												

USEPA SG-SCREEN
Version 2.0, 04/2003

DTSC Modification
March 2014

Department of Toxic Substances Control
Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: **Commercial**
Chemical: **Tetrachloroethylene**

Reset to Defaults

Results Summary

Soil Gas Conc. ($\mu g/m^3$)	Attenuation Factor (unitless)	Indoor Air Conc. ($\mu g/m^3$)	Cancer Risk	Noncancer Hazard
3.28E+03	7.2E-04	2.4E+00	1.1E-06	1.5E-02

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	3.28E+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	55.87727319	24	SI		

MORE ↓

Lookup Soil Parameters

ENTER Vandose zone SCS soil type	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)
SI	1.35	0.489	0.167	5

MORE ↓

Lookup Receptor Parameters

	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Exposure Time ET (hrs/day)	ENTER Air Exchange Rate ACH $(hour)^{-1}$
NEW=> Commercial	70	25	25	250	8 (NEW)	1 (NEW)

END

Tetrachloroethylene

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Molecular weight, MW (g/mol)
5.05E-02	9.46E-06	1.77E-02	25	8,288	394.40	620.20	5.9E-06	3.5E-02	165.83

END

ATTACHMENT 4

	General UCL Statistics for Full Data Sets	
User Selected Options		
From File	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	82	Minimum of Log Data	4.407
Maximum	3600	Maximum of Log Data	8.189
Mean	688.9	Mean of log Data	5.893
Median	250	SD of log Data	1.135
SD	1009		
Coefficient of Variation	1.464		
Skewness	2.832		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.941
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	1240	95% H-UCL	2228
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1645
95% Adjusted-CLT UCL (Chen-1995)	1467	97.5% Chebyshev (MVUE) UCL	2083
95% Modified-t UCL (Johnson-1978)	1284	99% Chebyshev (MVUE) UCL	2942
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.722	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	954.2		
MLE of Mean	688.9		
MLE of Standard Deviation	810.8		
nu star	15.88		
Approximate Chi Square Value (.05)	7.88	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0278	95% CLT UCL	1189
Adjusted Chi Square Value	6.98	95% Jackknife UCL	1240
		95% Standard Bootstrap UCL	1171
Anderson-Darling Test Statistic	0.594	95% Bootstrap-t UCL	2213
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	3003
Kolmogorov-Smirnov Test Statistic	0.221	95% Percentile Bootstrap UCL	1250
Kolmogorov-Smirnov 5% Critical Value	0.263	95% BCA Bootstrap UCL	1577
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2015
		97.5% Chebyshev(Mean, Sd) UCL	2589
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3716
95% Approximate Gamma UCL	1389		
95% Adjusted Gamma UCL	1568		

	A	B	C	D	E	F	G	H	I	J	K	L
55	**Potential UCL to Use**						Use 95% Approximate Gamma UCL					1389
56												
57	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**											
58	**These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)**											
59	**and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.**											
60												

USEPA SG-SCREEN
Version 2.0, 04/2003

DTSC Modification
March 2014

Department of Toxic Substances Control
Vapor Intrusion Screening Model - Soil Gas

DATA ENTRY SHEET

Scenario: **Commercial**
Chemical: **Tetrachloroethylene**

Reset to Defaults

Results Summary

Soil Gas Conc. ($\mu g/m^3$)	Attenuation Factor (unitless)	Indoor Air Conc. ($\mu g/m^3$)	Cancer Risk	Noncancer Hazard
1.39E+03	7.2E-04	1.0E+00	4.8E-07	6.5E-03

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	1.39E+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	55.87727319	24	SI		

MORE ↓

Lookup Soil Parameters

ENTER Vandose zone SCS soil type	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)
SI	1.35	0.489	0.167	5

MORE ↓

Lookup Receptor Parameters

	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Exposure Time ET (hrs/day)	ENTER Air Exchange Rate ACH $(hour)^{-1}$
NEW=> Commercial	70	25	25	250	8 (NEW)	1 (NEW)

END

Tetrachloroethylene

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Molecular weight, MW (g/mol)
5.05E-02	9.46E-06	1.77E-02	25	8,288	394.40	620.20	5.9E-06	3.5E-02	165.83

END