WEINGARTEN REALTY

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RECEIVED
By Alameda County Environmental Health at 1:28 pm, Jan 21, 2015

Mr. Gabe Stivala, P.G
Cardno ATC
701 University Drive Suite 701
Sacramento, CA 95825

Subject: **Exterior Additional Soil and Soil Vapor Assessment Work Plan**

580 Market Place Shopping Center
Alameda County LOP No. RO 3097

Dear Mr. Stivala:

I have reviewed and approved the subject report. Please submit it to the regulatory agencies listed in the distribution section of the report. Should any of the agencies require it, I am prepared to declare, under penalty of perjury, that to the best of my knowledge, the information contained in the report is true and correct.

Sincerely,

Charles Gurney

Weingarten Realty Investors

2600 Citadel Plaza Drive

Houston, Texas 77008

Date: 1-19-15

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December 19, 2014

Ms. Karel Detterman
Alameda County
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

SUBJECT **Exterior Additional Soil and Soil Vapor Assessment Work Plan**
580 Market Place Shopping Center
3735–4065 East Castro Valley Boulevard, Casto Valley CA
Alameda County LOP Site Cleanup Case No. RO 3003097
Cardno ATC Project No: Z075000152

Ms. Detterman:

On behalf of Weingarten Realty Investors (Weingarten), Cardno ATC has prepared this Work Plan for additional assessment of soil vapor at the subject site (Figure 1). This Work Plan addresses comments received from the Alameda County Environmental Health Services (ACEH) regarding Cardno ATC's previously submitted report entitled *Revised Data Gap Assessment Report* (hereafter "Report") dated July 30, 2014. The ACEH provided comments on the Report in electronic mail correspondence dated September 30, 2014 (Appendix A).

The proposed scope of work includes installation and sampling of seven soil vapor sampling (SVS) wells in the parking lot southeast, south, and southwest of the dry cleaning facility (Plate 2). The purpose of this work is to delineate the vertical and lateral extent of vapor-phase constituents, including benzene, in soil gas in the parking lot southeast of the building. Work Plans for additional soil and sub-slab soil vapor assessment in the shopping center units will be submitted under separate cover.

SITE DESCRIPTION

The site is located in the 580 Market Place Shopping Center in Castro Valley, California (Figure 1). An extended Site Plan illustrating the layout of pertinent areas of the shopping is shown on Figure 2. The assessment targets include a dry cleaning facility, the adjacent Verizon and AT&T retail outlets, and the parking lot southeast of the buildings.

Detailed descriptions of land usage and previous assessment work are included in Cardno ATC's Report. Descriptions of geology, hydrogeology chemicals of concern, potential exposure pathways, and data gaps are presented in Cardno ATC's report entitled *Site Conceptual Model,* submitted November 30, 2012.

REGULATORY AGENCY COMMENTS

Select comments provided by the ACEH in the September 30, 2014 electronic correspondence include:

- Benzene concentrations in soil gas clearly indicate a petroleum hydrocarbon release. The release is additionally supported by naphthalene concentrations.
- The vertical and lateral extent of benzene in soil gas is not defined.
- The source of the petroleum hydrocarbon release and the effect on the degradation of chlorinated hydrocarbons has not been assessed.
- An evaluation of the effect of petroleum hydrocarbons on the natural attenuation of the chlorinated solvents and the ability of vinyl chloride to continue on the path of reductive dechlorination.

PROPOSED WORK

To address the ACEH's comments summarized above, Cardno ATC proposes to conduct the following work:

- Advancement of seven direct-push soil borings in the locations shown on Figure 2, with collection of continuous soil samples, and laboratory analyses of select soil samples. Field conditions will determine the depth that soil samples are collected.
- Reaming of the direct-push borings with 4-inch diameter solid-stem augers, and installation of semi-permanent, dual-completion SVS wells in the borings.
- Collection and analyses of soil vapor samples from the newly installed SVS wells.
- Comparison of reported concentrations of residual and vapor-phase constituent concentrations to appropriate regulatory standards.

Cardno ATC will conduct the soil vapor assessment in accordance with protocol presented in the following guidance documentation:

- *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air*, published by the Department of Toxic Substances Control of the California Environmental Protection Agency (DTSC, 2011).
- *Advisory – Active Soil Gas Investigations*, jointly issued by the Department of Toxic Substances Control of the California Environmental Protection Agency and the California Regional Water Quality Control Board, Los Angeles Region (DTSC, 2012).
- *Collecting and Interpreting Soil Gas-Samples from the Vadose Zone, A Practical Strategy for Assessing the Subsurface Vapor-to-Indoor Air Migration Pathway of Petroleum Hydrocarbon Sites*, American Petroleum Institute Publication Number 4741 (November 2005) (API, 2005).
- *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*, published by the Regional Board (revised May 2008) (CRWQCB-SFB, 2008).

Direct-Push Borings

Prior to mobilization Cardno ATC will obtain permits from the ACEH, notify USA, and utilize the service of a commercial underground utility locator. Cardno ATC will observe a California-licensed well driller clear the boring locations to five feet bgs using safe dig techniques. The driller will then advance the direct-push borings to refusal (approximately 24 feet bgs in previous borings). Cardno ERI will identify the sediment encountered using visual and manual methods, classify the sediment according to the Unified Soil Classification System, and compile a boring log. Samples will be screened using a photo-ionization detector (PID). Select soil samples will be preserved for laboratory analyses.

Soil Vapor Sampling Well Installation

The direct-push borings will be reamed with 4-inch diameter solid stem augers. Each SVS well will be screened at two intervals: at approximately 5 feet bgs, and at a deeper level based on PID readings and observed field conditions (approximately 15 feet bgs to total depth). The bottom portion of each boring will be backfilled with neat cement grout prior to setting the deeper level screen. A schematic SVS well construction diagram is shown on Figure 3.

Soil Vapor Sample Collection

Soil vapor samples will be collected using a soil vapor purging and sampling manifold consisting of a flow regulator, vacuum gauges, vacuum pump, and laboratory-prepared, gas-tight, opaque containers such as Summa™ canisters. Prior to use, Summa™ canisters will be checked to ensure they are under the laboratory induced vacuum between 31 and 25 inches of mercury (in. Hg). New inert Tygon or Nylaflow tubing will be used to purge and sample each well. Prior to purging and sampling each SVS well, the

sampling manifold is connected to the gas-tight vacuum fitting or valve at the wellhead, and the downstream tubing and fittings are vacuum tested at approximately 24 to 28 in. Hg. Purging and sampling are conducted only on SVS wells when the tubing and fittings hold the applied vacuum for 5 minutes per vacuum gauge reading.

A purge volume test will be conducted on at least one SVS well prior to purging and sampling. The purge volume test well is selected based on the location of the anticipated source of chemical constituents at the site and on the location of anticipated maximum soil vapor concentrations. If the SVS well has been in place for more than 1 week, it is assumed that soil vapor in the sand pack has equilibrated with the surrounding soil, and only the screen and tubing volumes are included in the purge volume calculation. If the SVS well has been in place for less than 1 week, the volume of the sand pack around the screen is included in the purge volume calculation. A PID will be used to evaluate concentrations of chemical constituents in the vapor stream after 1, 3, and 10 volumes of vapor have been purged from the SVS well. Purging is conducted at a rate of 100 to 200 milliliters per minute (ml/min). The purge volume exhibiting the highest concentration is the volume of vapor purged from each SVS well prior to sampling.

Prior to purging and sampling, vacuum and helium leak tests will be performed at each SVS well. To check for leaks in the well annular seal and sampling equipment, a purging and sampling manifold will be connected to each well. A vacuum of approximately 23 to 24 inches of mercury (in Hg) will be applied to sample collection system and the vacuum pump will be turned off and isolated. If the sampling manifold and tubing hold the applied vacuum for 5 minutes the well seal and sample collection system are considered air tight.

To assess the potential for leaks in the well seal and sample collection train during investigative sample collection, a shroud will be placed over the well and Summa^{TM} canister. Helium will be introduced into the shroud and maintained at a constant concentration (approximately 10%), as measured on a helium meter. Helium screening is performed in the field by drawing soil gas from the well into a Tedlar bag via a lung-box or syringe and screening the contents with a helium meter. The concentration of helium in the sample divided by the concentration of helium in the shroud provides a measure of the proportion of the sample attributable to leakage. Leaked air that comprises less than 5% of the sample is insignificant (DTSC, 2012). Helium concentrations in the investigative samples determined by laboratory analyses are also used to evaluate leakage.

At a minimum, weather conditions (temperature, barometric pressure and precipitation), the sampling flow rate, the purge volume, the leak detection chemical, the sample canister identification number, the method of sample collection, and the vacuum of the sampling canister at the start and end of sample collection (if applicable) are recorded on a log for each SVS well purged and sampled.

Laboratory Analyses

Select soil and soil vapor samples will be submitted for analysis to a California state-certified analytical laboratory, under COC protocol.

Select soil samples will be analyzed for TPHg by EPA Method 8015B and volatile organic compounds (VOCs) including halogenated volatile organic compounds (HVOCs), benzene, toluene, ethylbenzene, and xylenes (BTEX), oxygenated compounds (MTBE, TBA, TAME, ETBE, and DIPE), and lead scavengers (1,2-DCA and EDB) by EPA Method 8260B. Select soil samples will also be analyzed for physical properties: moisture content (API R40/ASTM D2216); dry bulk density, grain density, total porosity, air-filled porosity, water-filled porosity, effective and specific permeability to air (API R40); effective porosity (ASTM D425M); specific permeability to water, hydraulic conductivity, intrinsic permeability (API R40/EPA 9100); particle size distribution (ASTM D4464); and total organic carbon and fraction organic carbon (Walkley-Black).

Soil vapor samples will be analyzed for full-scan VOCs, including HVOCs, BTEX, oxygenated compounds, lead scavengers (including 1,2-DCA), naphthalene, ethene, ethane, and the leak detection compound using EPA Method TO-15, if applicable, naphthalene will be collected with sorbent tubes and analyzed using EPA Method TO-17; TPHg using EPA Method TO-3 or TO-15; and oxygen, carbon dioxide, methane, and hydrogen using American Society of Testing and Materials (ASTM) Method 1946.

Waste Management

The soil and decontamination water generated during SVS well installation activities will be temporarily stored on site in DOT-approved, 55-gallon drums pending characterization and disposal. Copies of the waste manifests for the disposal of soil and water will be included in the report.

COMPARISON OF LABORATORY ANALYTICAL RESULTS TO REGULATORY STANDARDS

Reported concentrations of residual and vapor-phase constituents will be evaluated under the following:

- San Francisco Bay Regional Water Quality Control Board *Table E-2, Soil Gas Screening Levels for Evaluation of Potential Vapor Intrusion (ESLs).*
- *Human Health Risk Assessment Note 3* issued by the California Department of Toxic Substance Control (DTSC), Office of Human and Ecological Risk (HERO).

- *Interim Action Levels and Response Recommendations to Address Potential Developmental Hazards Arising from Inhalation Exposures to TCE in Indoor Air from Subsurface Vapor Intrusion* issued by the United States Environmental Protection Agency, Region 9.

EFFECT OF PETROLEUM HYDROCARBONS ON DEGRADATION OF CHLORINATED HYDROCARBONS

Soil vapor underlying the building and parking lot contains both chlorinated hydrocarbons and non-chlorinated aliphatic and aromatic hydrocarbons. These compounds exist in vapor phase; phreatic groundwater has not been observed at the site. Scientific literature regarding the degradation of chlorinated hydrocarbons generally addresses dissolved-phase solvent plumes; therefore evaluation of the effect of fuel hydrocarbons on the degradation of HVOCs in vapor-phase is based on extrapolation of processes effecting dissolved phase solvent plumes.

The results of laboratory analyses of sub-slab and external soil vapor samples collected during January 2014 (Cardno ATC, 2014) indicate that oxygen levels in soil vapor ranged from 4.9 percent by volume to 21 percent by volume. The reported oxygen concentrations are indicative of aerobic conditions.

Degradation of HVOCs occurs by the following mechanisms:

Electron Acceptor Reactions (Reductive Dehalogenation)

During reductive dehalogenation the HVOCs are used as an electron acceptor, not as a source of carbon (Weidemeier et al., 1998; Interstate Technology & Regulatory Council [ITRC], 2008). The mechanism causes replacement of a chlorine atom with a hydrogen atom. For chlorinated ethenes, the process results in sequential dechlorination from tetrachloroethylene (PCE) to trichloroethylene (TCE) to dichloroethylene (DCE) to vinyl chloride to ethene. The process may be interrupted and other processes may act on the degradation products. Highly chlorinated ethenes (PCE and TCE) are most susceptible to reductive dechlorination because they are the most oxidized. Vinyl chloride is the least oxidized compound and is therefore the least susceptible. Reductive dehalogenation requires an adequate source of carbon and anaerobic conditions. The carbon may be derived from anthropogenic sources (aliphatic or aromatic fuel hydrocarbons), naturally occurring organic matter, or other anthropogenic sources.

Electron Donor Reactions

Microorganisms are generally not capable of using PCE or TCE as a primary substrate (electron donor). Under aerobic and some anaerobic conditions the less oxidized chlorinated compounds, including vinyl

chloride, can be used as the primary substrate in oxidation-reduction reactions. Aerobic degradation of vinyl chloride is characterized by a decrease of mass and a decreasing ratio of vinyl chloride to other chlorinated compounds.

Cometabolism

During cometabolic degradation of chlorinated hydrocarbons, the microorganism does not receive a known benefit from the degradation process; the degradation is catalyzed by an enzyme or cofactor that is produced by the organism for other purposes. Cometabolism occurs predominantly under aerobic conditions. During cometabolism the chlorinated alkene is transformed by microorganisms that use carbon as the energy source. Aliphatic and aromatic hydrocarbons, including BTEX compounds, are common sources of carbon.

Based on the mechanisms of chlorinated compound degradation and the observed site conditions Cardno ATC concludes the following:

- Aerobic conditions exist in soil vapor underlying the site.
- Reductive dechlorination occurs under anaerobic conditions.
- Non-chlorinated aliphatic and aromatic compounds, including fuel hydrocarbons, provide carbon to the degradation mechanism.
- Degradation is likely occurring in soil moisture rather than soil vapor; degradation rates are slower than those occurring in dissolved-phase plumes.
- Degradation of chlorinated hydrocarbons requires carbon; the presence of fuel hydrocarbons is advantageous for degradation.
- It is unlikely that the vapor-phase chlorinated hydrocarbons, including vinyl chloride, will degrade by reductive dechlorination. However, degradation by other (aerobic) mechanisms is likely.

During upcoming assessment of sub-slab and external soil vapor, Cardno ATC will evaluate the degradation process by the following methods:

- Laboratory analyses will include PCE and breakdown products (TCE, DCE, vinyl chloride, ethene, ethane), as well as oxygen and carbon dioxide.
- The relative concentrations of the PCE and breakdown products, including vinyl chloride, will be compared.

SCHEDULE

Upon receipt of approval from the ACEH, Cardno ATC estimates the scope and related reporting will be completed within 90 days.

CLOSING

Please contact Mr. Gabe Stivala, Cardno ATC's senior project manager for this site, at (916) 923-1097 or at gabe.stivala@cardno.com or with any questions regarding this report.

Sincerely,

John Bobbitt
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for Cardno ERI
707 766 2000
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Gabe Stivala
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Enclosures:

References

Table 1: Summary of Detected Vapor Laboratory Analytical Data

Figure 1 Site Vicinity Map
Figure 2: Extended Generalized Site Plan
Figure 3: Schematic Soil Vapor Sampling Well Diagram

Appendix A Regulatory Correspondence

cc: Mr. Chuck Gurney, Weingarten Realty Investors
Mr. Thomas J. Treacy, John Hancock Life Insurance Company USA

TABLE 1
Summary of Detected Vapor Laboratory Analytical Data

580 Marketplace
3735-4065 East Castro Valley Boulevard
Castro Valley, California

Well Number	Date	Depth (feet bgs)	Vinyl Chloride	1,1-Dichloroethene	trans 1,2-Dichloroethene	cis-1,2 Dichloroethene	Benzene	Toluene	Ethylbenzene	m, p - Xylene*	o - Xylene	TCE	PCE
			All results in micrograms per cubic meter ($\mu g/m^3$).										
Indoor Air/Commercial ESL ($\mu g/m^3$) with 0.05 attenuation factor (sub slab vapor screening)+			**3**	**17,600**	**5,200**	**620**	**8.4**	**26,000**	**98**	**8,800**	**8,800**	**60**	**42**
CHHSL ($\mu g/m^3$) (soil vapor screening)			**95**	**NE**	**240,000**	**120,000**	**280**	**890,000**	**3,600**	**2,200,000**	**2,100,000**	**4,400**	**1,600**
			Historical Vapor Data - Reported by PES Environmental, Inc.										
			Environmental Protection Agency (EPA) Method 8010										
SG-1	11/11/97	3.0	<1000	NA	<1000	<1000	NA	NA	NA	NA	NA	<1000	<1000
SG-2	11/11/97	3.0	<1000	NA	<1000	<1000	NA	NA	NA	NA	NA	<1000	<1000
SG-3	11/11/97	3.0	<1000	NA	<1000	<1000	NA	NA	NA	NA	NA	<1000	<1000
SG-4	11/11/97	2.5	<1000	NA	<1000	<1000	NA	NA	NA	NA	NA	<1000	**5,800**
SG-4	11/11/97	7.5	<1000	NA	<1000	<1000	NA	NA	NA	NA	NA	<1000	**4,000**
SG-5	11/11/97	1.0	<1000	NA	<1000	<1000	NA	NA	NA	NA	NA	<1000	**65,000**
SG-5	11/11/97	7.5	<1000	NA	<1000	<1000	NA	NA	NA	NA	NA	**6,800**	**119,700**
SG-5	11/11/97	11.5	<1000	NA	<1000	<1000	NA	NA	NA	NA	NA	<1000	<1000
SG-6	11/11/97	3.0	<1000	NA	<1000	<1000	NA	NA	NA	NA	NA	<1000	**1,700**
SG-7	11/11/97	2.0	<1000	NA	<1000	<1000	NA	NA	NA	NA	NA	<1000	<1000
SG-8	11/12/97	5.0	<1000	NA	<1000	<1000	NA	NA	NA	NA	NA	2,100	**29,700**
SG-8	11/12/97	10.0	<1000	NA	<1000	<1000	NA	NA	NA	NA	NA	1,400	**30,300**
SG-8 (DUP)	11/12/97	10.0	<1000	NA	<1000	<1000	NA	NA	NA	NA	NA	1,100	**24,600**
SG-9	11/12/97	1.0	<1000	NA	<1000	<1000	NA	NA	NA	NA	NA	<1000	**33,500**
SG-10	11/12/97	1.0	<1000	NA	<1000	<1000	NA	NA	NA	NA	NA	<1000	**14,000**
SG-10	11/12/97	10.0	<1000	NA	<1000	<1000	NA	NA	NA	NA	NA	<1000	**4,700**
SG-11	11/12/97	2.0	<1000	NA	<1000	<1000	NA	NA	NA	NA	NA	1,400	**105,900**
			Current Vapor Data - Reported by Cardno ATC										
			EPA Method 8260B										
SS-1	01/06/14	0.66	<13	<100	<100	<100	<35	<200	<100	<200	<100	<100	**130**
SS-2	01/06/14	0.66	<13	<100	<100	<100	<35	<200	<100	<200	<100	<100	<100
SS-3	01/06/14	0.66	<13	<100	<100	<100	<35	<200	<100	<200	<100	**160**	**1,200**
SS-4	01/06/14	0.66	<13	<100	<100	<100	<35	<200	<100	<200	<100	<100	**180**
SS-5	01/07/14	0.66	<13	<100	<100	<100	<35	<200	<100	<200	<100	<100	**160**
SS-6	01/07/14	0.66	<13	<100	<100	<100	<35	<200	<100	<200	<100	<100	<100
SS-7	01/07/14	0.66	<13	<100	<100	<100	<35	<200	<100	<200	<100	<100	**150**
SS-8	01/07/14	0.66	<13	<100	<100	<100	<35	<200	<100	<200	<100	**120**	**260**
SS-9	01/17/14	0.66	<13	<100	<100	<100	<35	<200	<100	<200	<100	**380**	**340**
SS-10	01/17/14	0.66	<13	<100	<100	<100	<35	<200	<100	<200	<100	<100	<100
SV-1	01/06/14	5.0	**190**	280	330	7,400	<35	<200	<100	<200	<100	600	**9,500**
SV-2	01/06/14	5.0	<13	<100	<100	<100	110	<200	<100	<200	<100	<100	190

TABLE 1
Summary of Detected Vapor Laboratory Analytical Data

580 Marketplace
3735-4065 East Castro Valley Boulevard
Castro Valley, California

Well Number	Date	Depth (feet bgs)	Vinyl Chloride	1,1-Dichloroethene	trans 1,2-Dichloroethene	cis-1,2 Dichloroethene	Benzene	Toluene	Ethylbenzene	m, p - Xylene*	o - Xylene	TCE	PCE
			All results in micrograms per cubic meter ($\mu g/m^3$).										
Indoor Air/Commercial ESL ($\mu g/m^3$) with 0.05 attenuation factor (sub slab vapor screening)+			**3**	**17,600**	**5,200**	**620**	**8.4**	**26,000**	**98**	**8,800**	**8,800**	**60**	**42**
CHHSL ($\mu g/m^3$) (soil vapor screening)			**95**	**NE**	**240,000**	**120,000**	**280**	**890,000**	**3,600**	**2,200,000**	**2,100,000**	**4,400**	**1,600**
SV-3	01/06/14	5.0	<13	<100	<100	<100	170	<200	<100	<200	<100	<100	<100
SV-4	01/07/14	5.0	<13	<100	<100	<100	72	<200	<100	<200	<100	<100	<100
SV-5	01/07/14	5.0	**110**	<100	<100	650	56	<200	<100	<200	<100	450	<100
SV-6	01/07/14	5.0	**110**	110	<100	960	83	<200	<100	<200	<100	1,400	**1,800**
SV-7	01/07/14	5.0	<13	<100	<100	<100	<35	<200	<100	<200	<100	<100	**3,600**
SV-8	01/07/14	5.0	<13	<100	<100	<100	<35	<200	<100	<200	<100	<100	<100
SV-9	01/17/14	5.0	<13	<100	<100	<100	170	<200	190	560	160	<100	160
SV-10	01/17/14	5.0	<13	<100	<100	<100	170	<200	270	910	270	<100	<100
SV-11	01/17/14	5.0	<13	<100	<100	<100	91	<200	<100	270	<100	<100	**2,200**
SV-12	01/17/14	5.0	43	<100	<100	<100	**290**	<200	<100	<200	<100	<100	<100
SV-13	01/17/14	5.0	<13	<100	<100	<100	**400**	280	<100	<200	<100	<100	<100
SV-14	01/17/14	5.0	<13	<100	<100	<100	150	<200	<100	<200	<100	<100	<100
SV-15	01/17/14	5.0	<13	<100	<100	<100	150	<200	<100	<200	<100	<100	<100

Notes:

bgs	- Below ground surface.
*	- CHHSL listed is the more conservative value for p-xylene.
TCE	- Trichloroethene
PCE	- Tetrachloroethene
CHHSLs	- California Human Health Screening Levels Table 2 - September 2010
NE	- Not established.
NA	- Not analyzed.
<5.0	- Constituent not detected above specific minimum laboratory method reporting limit.
Bold	- Concentration equals or exceeds CHHSL.
+	- The sub slab soil analytical results were compared to theoretical calculated commercial indoor air ESLs using a defaultattenuation factor of 0.05, as recommended by DTSC

References

American Petroleum Institute (API). 2005. *Collecting and Interpreting Soil Gas samples from the Vadose Zone, a Practical Strategy for Assessing the Subsurface Vapor-to-Indoor Air Migration Pathway.* API Publication Number 4741

California Environmental Protection Agency, Department of Toxic Substances Control. 2011. *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion into Indoor Air*

California Environmental Protection Agency, Department of Toxic Substances Control, Office of Human and Ecological Risk (HERO). July 2014. *Human Health Risk Assessment Note 3.*

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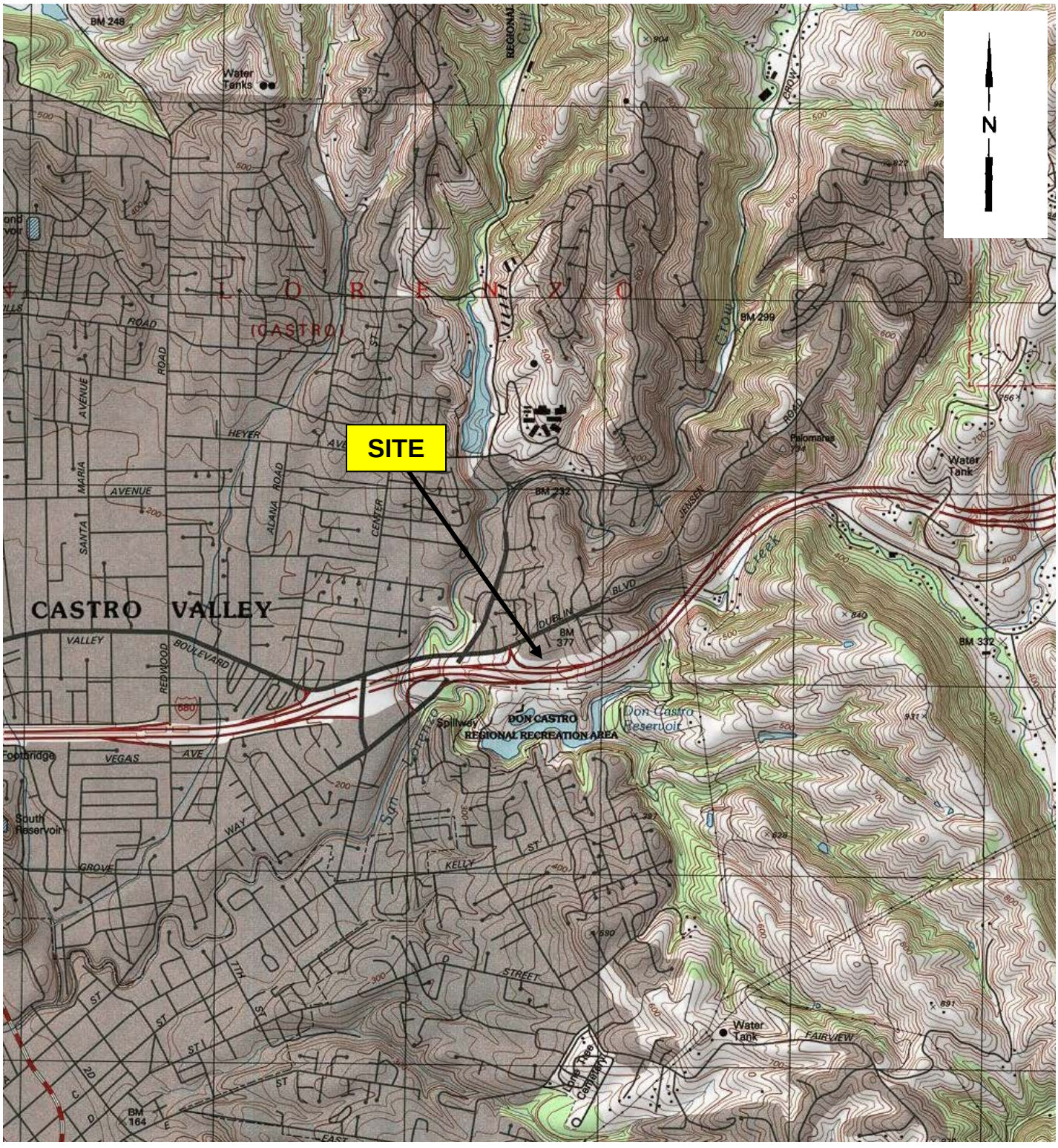
Cardno ATC. November 2012. *Site Conceptual Model, 580 Market Place Center, 3735 – 4065 East Castro Valley Boulevard, Castro Valley, California*

Cardno ATC. July 2014. *Revised Data Gap Assessment Report, 580 East Castro Valley Boulevard, 3735 – 4065 East Castro Valley Boulevard, Castro Valley, California*

Interstate Technology Regulatory Council (ITRC). June 2008. *In Situ Bioremediation of Chlorinated Ethene: DNAPL Source Zones*

United States Environmental Protection Agency, Region 9. June 2014. *Interim Action Levels and Response Recommendations to Address Potential Developmental Hazards Arising from Inhalation Exposure to TCE in Indoor Air from Subsurface Vapor Intrusion*

Weidemeier, T.H., M.A. Swanson, J.T. Wilson, P.E. Haas, F.H. Chappelle. September 1998. *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater*



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP
CASTRO VALLEY QUADRANGLE, CALIFORNIA, DATED 1968, PHOTOREVISED 1987.

FIGURE 1

SITE VICINITY MAP

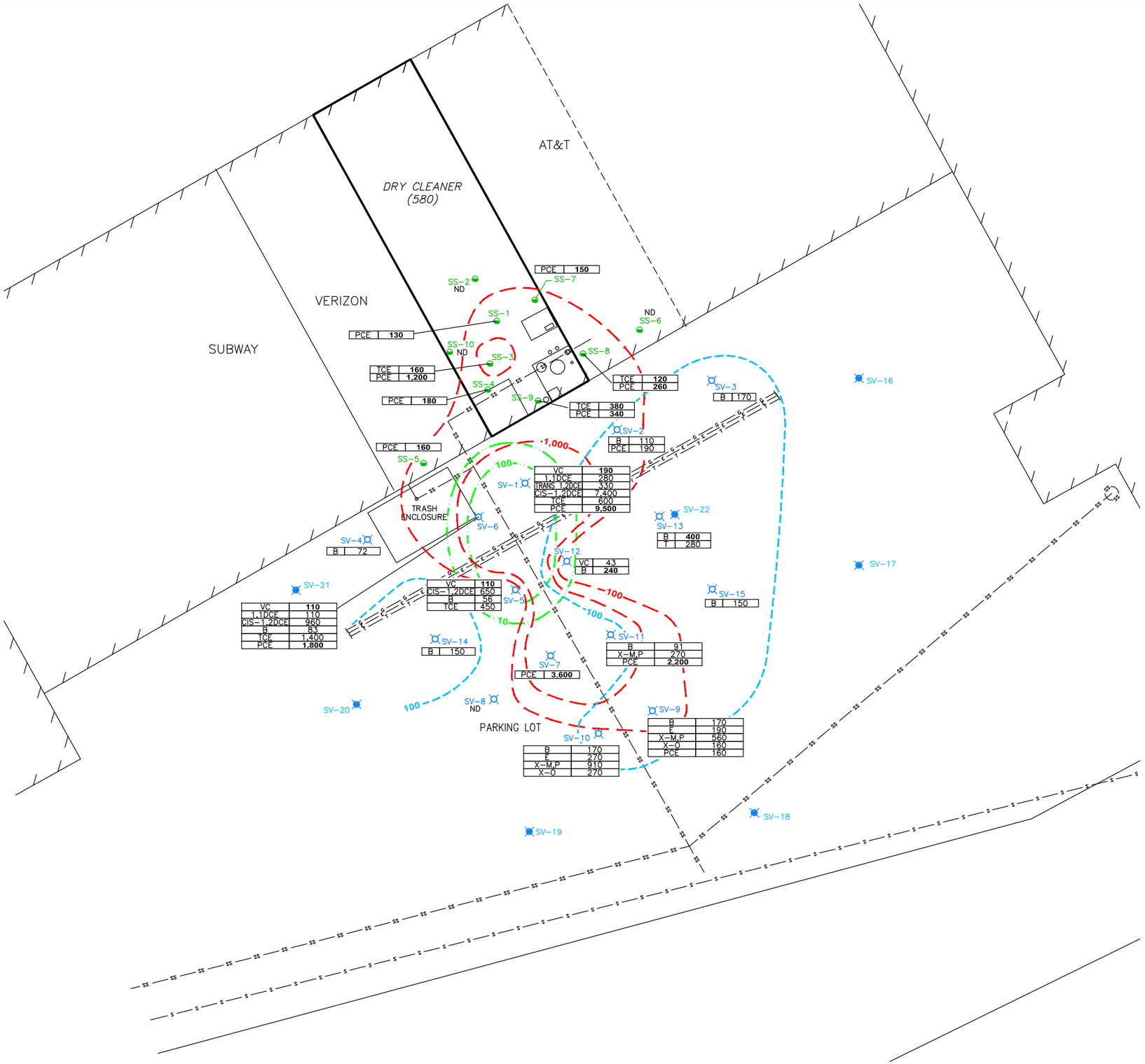
580 MARKET PLACE SHOPPING CENTER
3735-4065 EAST CASTRO VALLEY BOULEVARD
CASTRO VALLEY, CALIFORNIA 94552

Cardno ATC
Shaping the Future
1117 Lone Palm Ave, Ste 201B
Modesto, CA 95351
(209) 579-2221

PROJECT NO: 075.75356.0002		
DESIGNED BY: JK	SCALE: 1:24,000	REVIEWED BY: JH
DRAWN BY: JK	DATE: 10/12	FILE: LOCATION

PROPOSED ADDITIONAL SOIL VAPOR POINTS

DRYCLEAN 580
3735 E. CASTRO VALLEY BOULEVARD
CASTRO VALLEY, CA



LEGEND

- SUBSLAB SAMPLE POINT
- PROPOSED SOIL GAS SAMPLE POINT
- SOIL GAS SAMPLE POINT
- GAS LINE
- ELECTRIC LINE
- TELEPHONE LINE
- SANITARY SEWER
- STORM SEWER
- PCE, µg/m³
- BENZENE, µg/m³
- VINYL CHLORIDE, µg/m³

VC	**190**	VINYL CHLORIDE
1,1DCE	280	1,1-DICHLOROETHANE
TRANS 1,2DCE	330	TRANS-1,2 DICHLOROETHANE
CIS-1,2DCE	7,400	CIS-1,2 DICCHLOROETHENE
B	**400**	BENZENE
T	280	TOULENE
E	270	ETHYLBENZENE
X-M,P	910	M,P XYLENE
X-O	270	O XYLENE
TCE	600	TRICHLOROETHENE
PCE	**9,500**	TETRACHLOROETHENE

ALL CONCENTRATIONS IN µg/m³

ND NOT DETECTED ABOVE METHOD DETECTION LIMIT

BOLD CONCENTRATION EQUALS OR EXCEEDS CHHSL OR INDOOR AIR-BASED ESL SCREENING VALUE

0 20 40

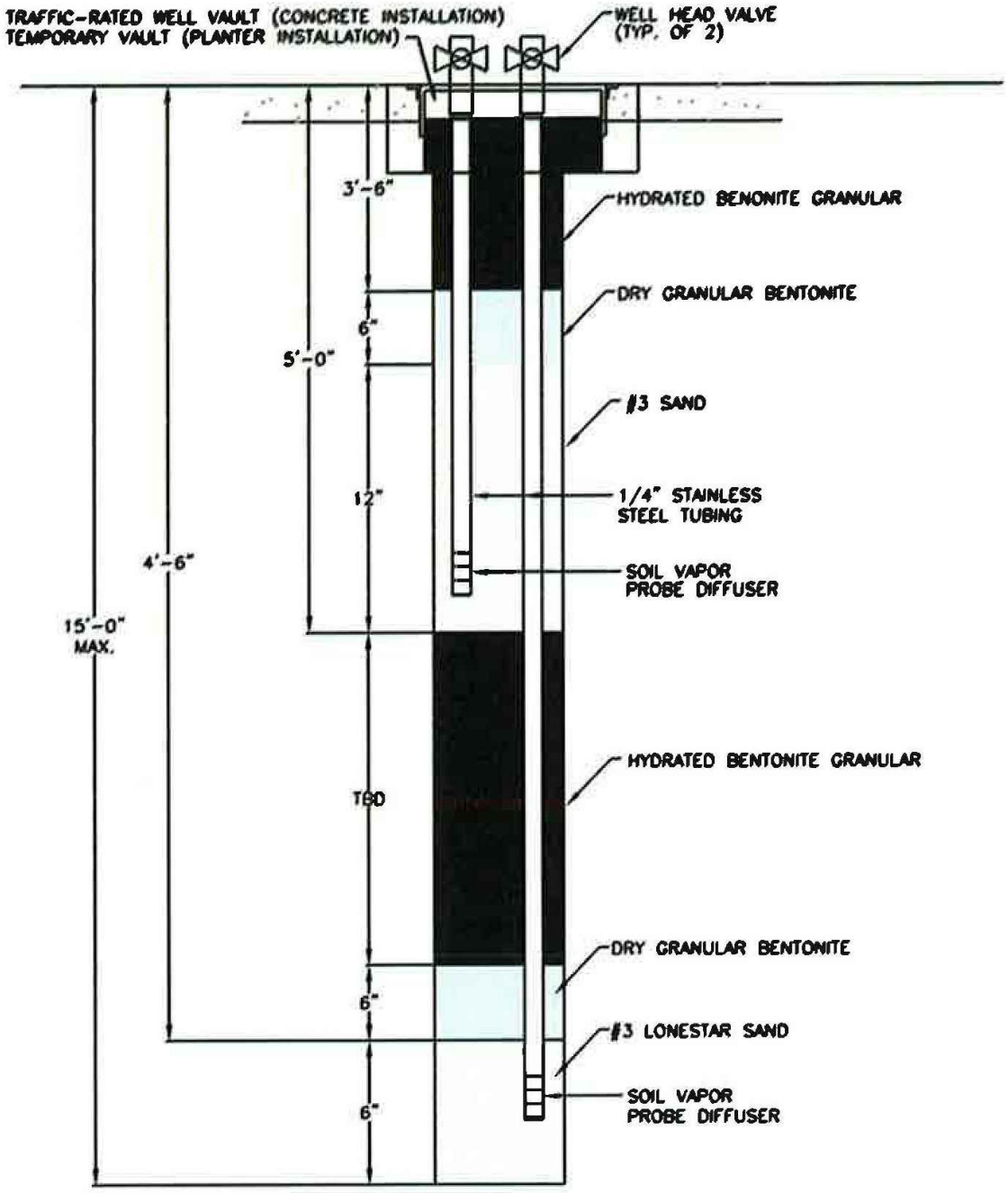
SCALE, FT

NOTE: 1. SCALE AND LOCATIONS ARE APPROXIMATE.
2. MAP SHOWS DETECTION ONLY.

Cardno 701 University Avenue, Ste. #200
Sacramento, California 95825
Ph: (916) 923-1097 *** Fax: (916) 923-6251

PROJECT NUMBER: Z075000152 | DATE: 1/16/15 | FIGURE 2
APPROVED BY: GS | DRAWN BY: BK

S:\Projects\75\75354 Marketplace\00022\2_PRADSVPNTS.dwg



NOT TO SCALE

SOIL VAPOR SAMPLING WELL DETAIL

580 MARKET PLACE
580 MARKET PLACE SHOPPING CENTER
CASTRO VALLEY, CA

PROJECT NUMBER: Z075000152		DATE: 1/16/15	FIGURE
APPROVED BY: GS		DRAWN BY: BK	3

Cardno Shaping the Future
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Sacramento, California 95825
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APPENDIX A

AGENCY CORRESPONDNACE

gabe stivala

From: Detterman, Karel, Env. Health <Karel.Detterman@acgov.org>
Sent: Thursday, January 08, 2015 4:55 PM
To: gabe stivala
Cc: Charles Gurney; Roe, Dilan, Env. Health
Subject: RE: RO3097 SCP Program 580 Market Place Shopping Center, East Castro Valley Boulevard, Castro Valley, CA
Attachments: Attachment_1_and_ftpUploadInstructions_2014-05-15.pdf

Hello Gabe:

Alameda County Environmental Health (ACEH) staff has reviewed the Site Cleanup Program (SCP) case file for the above-referenced site including the recently submitted document entitled "*Sub-Slab Vapor and Indoor Air Work Plan Addendum,*" dated December 5, 2014 (Addendum). The Addendum was revised in response to ACEH Directive Letter dated November 17, 2014 for the *Scope of Work for the Indoor Air Quality Assessment and Additional Sub-Slab Sampling* (Scope of Work) e-mailed to ACEH on October 31, 2014. The Scope of Work was submitted as a Work Plan in response to ACEH's September 30, 2014 Directive Letter. Thank you for submitting the documents.

Approval of the Addendum is contingent upon submittal of the following documents to ACEH:

1. Finalization of the October 31, 2014 Scope of Work and submittal to ACEH and Geotracker;
2. Word document of the *Fact Sheet* included in the Addendum. A brief description of the work outlined in the Addendum should be included the *Next Steps* section of the *Fact Sheet*;
3. Word documents of the four letters: *Notification to Tenants, Letter to Occupants/Owner, Fact Sheet for VOCs in Household Products*, and *Instructions to Occupants*, found in Appendix C, *Indoor Air Sampling*, California Department of Toxic Substances Control's "*Vapor Intrusion Public Participation Advisory*," dated March 2012. The four letters should each be revised to reflect tenant names, addresses, and commercial use instead of residential use.

ACEH will finalize and distribute the Fact Sheet to addresses in the immediate vicinity and Notifications to the Dry Cleaner and the two adjacent tenants.

TECHNICAL REPORT REQUEST

- **January 23, 2015** – Word document of the Fact Sheet and Word document Notifications to the two adjacent tenants e-mailed to karel.detterman@acgov.org

Please upload the requested document to the ACEH ftp site (Attention: Karel Detterman), and to the State Water Resources Control Board's Geotracker website, in accordance with Attachment 1 and the following specified file naming convention and schedule:

- **February 13, 2015** – *Indoor Air Quality Assessment and Additional Sub-Slab Work Plan*
  File to be named: RO3097_WP_R_yyyy-mm-dd

Thank you,

Karel Detterman, PG
Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502
Direct: 510.567.6708