Summary of Comments presented at the Multi-Agency Wildomar Meeting on January 17, 2014 at the CCAEJ Office in Riverside, CA

PART I

1. The site had approximately 51,000 cubic feet (cuft) of soil imported to the Autumnwood Development for grading purposes. According to DTSC's Information Advisory Clean Imported Fill (Fill Advisory) dated October 2001, there should have been 51 samples collected to show it was not contaminated. At the time of grading, 2 local gas stations had USTs removed.

   DTSC Response: According to the Rough Grading Plan Report, Tract 31175 (a.k.a. Autumnwood Development) required 41,500 cubic yards of import fill (Petra 2005). The site also contained undocumented fill referred to as *"end dump piles" which contained "rocks, logs, and branches."* During grading, the import and stockpiled soil were mixed, during over-excavation of the site, with onsite native soil to depths of 10 to 15 feet below ground surface (bgs). Since DTSC did not regulate this site or the grading operations and there are currently no established standards in the statutes or regulations that address environmental requirements for imported fill material, untested imported fill was used at this site.

   The Review of the Rough Grading Plans (Petra 2003) recommended that if import fill was required, the fill *"should be free of deleterious/oversized and hazardous materials, be non-expansive, non-corrosive and approved by the project geotechnical consultant prior to being brought onsite."*

   At sites DTSC regulates, where undocumented fill or the soils environmental quality is in question, DTSC requires soil sampling for a range of common contaminants including, but not limited to, Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), Polychlorinated Biphenyls (PCBs), Organochlorine Pesticides (OCPs), and metals. Since the Autumnwood Development had undocumented import soil and undocumented onsite soil containing debris, the above constituents were included in the soil sampling and analysis program.

   The analytical results indicated metals were within the typical background range for soil (Kearney, 1996), no OCPs or PCBs were detected and only one SVOC was detected at a concentration that did not pose a threat to human health. VOCs were detected in soil gas at concentrations representing a health risk at or below1 x 10^{-6}.

2. Soil samples were collected at the neighborhood park on Front St. showing VOCs, SVOCs, metals and dioxins.

   DTSC Response: DTSC was not presented any data related to sampling activities conducted at a neighborhood park in the Autumnwood Development. DTSC requested the resident's presentation provided on January 17, 2014, including the park sample results. DTSC was not provided with the requested information and cannot offer any opinion regarding said data or its significance.

3. 1,2-dibromoethane or ethylene dibromide (EDB) was raised as a contaminant issue. Specifically, it was claimed that EDB was found in park soil matrix samples and AQMD soil samples.

   DTSC Response: As discussed above, DTSC is unaware of any data related to samples collected in a neighborhood park and DTSC was never provided the sampling results, even after four separate requests.

   EDB was only detected in six indoor air samples collected in three homes during the SCAQMD sampling on January 2, 2013. No other soil gas or sub-slab samples in any investigation conducted in the Autumnwood Development detected EDB. The SCAQMD determined that the initial EDB identification was in fact a misidentification (a.k.a. false positive) and provided the following explanation in their Revised Report:

   September 13, 2013 update by SCAQMD: Due to an external inquiry, laboratory staff reevaluated the six sample results collected on January 2, 2013. A detailed manual review determined that the computer software used in the sample analysis misidentified a very small peak in the chromatograms as 1,2 dibromoethane. According to the laboratory, this type of misidentification is also known as a "false positive." As a result, it was verified that none of the samples had that compound present above detection limits. Therefore, all sample results for 1,2 dibromoethane should have been reported as not detected (N.D.).

PART II

4. Fill Advisory says samples should have been collected for import fill soil.
   DTSC Response: See DTSC response to Comment 1.

5. Water under slabs; moist slabs and moist/wet ground all the time; groundwater flowing horizontally below slabs.

DTSC Response: The Rough Grading Plan Report (Petra 2005) indicates there are several retaining walls at the Autumnwood Development requiring back drains to relieve potential hydrostatic pressure from the buildup of irrigation water from the common landscape areas. The system is designed to account for *"an anticipated rainfall equivalency on the order of 60 to 100± inches per year at the site due to irrigation."* The walls have approximately one three inch diameter hole every ten linear feet (a.k.a. weep holes) to convey irrigation water to concrete V-ditches or area drains which discharge into the street gutters. Some seepage may occur around or below the wall back drains or from leaks in the area drains, causing moisture to potentially accumulate in yards and below slabs.

Groundwater at the development was gauged at 20 to 30 feet below ground surface (bgs) during this investigation. During previous investigations conducted for geotechnical purposes in 2003 and prior years, groundwater was gauged between 21-33 feet bgs. Groundwater was not observed flowing anywhere above the water table levels of 20 to 30 feet bgs during the November 2013 sampling event. Water or moisture in the unsaturated zone observed at Location 6 and in some yards may originate from landscape areas surrounding the development or from the retaining walls in the northern portion of the Autumnwood Development, where wall back drains transfer water from the walls to numerous area drains and eventually discharging into the street gutters.

6. Boring location 15 has no PID readings.

   DTSC Response: Boring logs were recorded for Locations 1, 6, 7, 8, 11, 12, and 13 which corresponds to the 3 soil sample locations and the 4 groundwater locations; hence there is no soil boring log for Location 15, as it was not continuously cored or logged.

7. No methanol analyzed in soil gas samples.

   DTSC Response: Methanol could not be analyzed by EPA Method 8260B in soil gas or groundwater samples, as methanol is a component of the method standards used in calibration. However, methanol was analyzed for in the sub-slab soil gas samples, which were analyzed by EPA Method TO-15. The low levels of methanol detected in sub-slab samples do not represent an indoor air hazard, as discussed in detail in the DTSC Investigation Report.

8. Formaldehyde detected in soil gas samples.

   DTSC Response: Formaldehyde was not detected in shallow groundwater nor in the soil gas samples collected. Low levels of formaldehyde were detected in the three sub-slab soil gas samples, and as discussed in detail in the DTSC

Investigation Report, are likely due to indoor air formaldehyde because of the large volume of air (approximately 32 Liters) required by the sample method. Based on the fact that no formaldehyde was detected in groundwater or soil gas, the formaldehyde originally detected in indoor air samples is due to indoor air sources and is not coming from subsurface soil.

9. Protective groundwater concentrations related to MCL?

   DTSC Response: Residents raised the issue that the reporting limits were not low enough for evaluating inhalation hazards or vapor intrusion. The reporting limits for VOCs in groundwater are designed to achieve reporting limits consistent with the State of California Maximum Contaminant Levels (MCLs) or drinking water standards. Having evaluated thousands of vapor intrusion sites across the State of California, it has been DTSC's experience that MCLs in groundwater are typically protective of indoor air from vapor intrusion.

   Using benzene as an example, the groundwater reporting limit was 0.5 μg/L. Using the Johnson and Ettinger Screening Groundwater Model and assuming a depth to groundwater of 25-feet and a sandy-clay-loam soil type, the risk-based groundwater concentration protective of vapor intrusion, that is, corresponding to an indoor air risk of one-in-one million, would be 11.2 μg/L, which is about 22-times higher than the reporting limit. Consequently, the groundwater reporting limits are more than adequate for evaluating the potential for vapor intrusion.

10. TO 15 vs TO 17; TO 15 is biased low for naphthalene

    DTSC Response: Naphthalene was only detected in two soil gas samples and was never detected in shallow groundwater or the sub-slab soil gas samples from three homes. While TO-17 would be appropriate for confirmation sampling for a defined naphthalene source, such as a leaking underground storage tank, former tank farm or former manufactured gas plant (MGP) site, there is no data supporting the existence of widespread naphthalene contamination or a source area. Consequently, confirmation of soil gas samples by TO-17 would not be necessary.

11. EDB soil gas sub-slab results not in the data package.

    DTSC Response: The original data packages provided in the Draft DTSC Investigation Report were slightly abbreviated and did not include the results for EDB, even though EDB was analyzed for in both soil gas and sub-slab samples. EDB was not detected in any of the soil gas or sub-slab soil gas samples, with reporting limits of 0.1 μg/L in soil gas and 7.8 μg/m3 in sub-slab samples.

12. J&E assumes soil is not wet but all soil logs describe soil as “moist.”

DTSC Response: One condition that would preclude the use of the J&E Model would be very shallow groundwater where the building foundation is wetted by groundwater. There is no evidence to support the conclusion of the existence of very shallow groundwater. Groundwater occurs at approximately 20 to 30 feet below ground surface, as shown by the boring logs from the four groundwater sampling locations and numerous soil borings during the grading phase of the development where subsurface soil was observed to depths of approximately 10 to 15 feet across the site and groundwater depth was measured. Groundwater was never encountered during completion of the sub-slab soil gas probes in the three homes sampled during the DTSC investigation nor was it encountered in any of the 12 soil gas locations at five and 15 feet bgs. Further, groundwater was not encountered during previous sub-slab sampling conducted in 2012 or in the overexcavation of onsite soil during grading in 2004.

During soil boring logging, a visual estimation of the relative moisture content of the soil should be made for soil field classification. The field moisture content of the soil should be based on the criteria outlined below, which is in accordance with the industry standard guidance, ASTM 2488:

Moisture Description	Criteria
Dry	Absence of moisture; dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water

All soil has a certain amount of moisture, which is taken into account by the J&E Model based on the soil type selected. The J&E Model is routinely used by DTSC to evaluate vapor intrusion at sites throughout the State of California. Further, the J&E Model was used by OEHHA to derive attenuation factors used in developing the soil gas CHHSLs.

DTSC conservatively used the maximum soil gas concentration detected in the Autumnwood Development to estimate an upper-bound indoor air risk and hazard using the J&E Model. Based on the results, the maximum estimated indoor air risk and hazard were 1×10^{-6} and 0.04, respectively. Based on the soil gas sample analytical results presented in Table 3 of the DTSC Investigation Report, the following table presents the screening level risks and hazards for each soil gas sample location which are based on CHHSLs.

Concentrations reported in micrograms per liter (µg/L)

Sample Location	Sample Depth (feet bgs)	Sample Identification	Sample Date	Tetrachloroethene	Chloroform[1]	Benzene	Toluene	Ethylbenzene	m, p-Xylene	O-Xylene	1,2,4-Trimethylbenzene[2]	1,3,5- Trimethylbenzene[3]	Naphthalene	p-Isopropyltoluene[4]	Methanol	Tracer 1,1 Difluoroethane (LCC)	Max Screening IA Risk	Max Screening IA Hazard
		CHHSL	**(µg/L)**	**0.47**	**0.42**	**0.085**	**320**	**1.1**	**800**	**740**	**3.65**	**3.65**	**0.093**	**210**				
1-SV	5	1-SV-5	11/15/13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	N/A	N/A
	5-Rep	1-SV-5-Rep	11/15/13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	N/A	N/A
	10	1-SV-10	11/15/13	ND	ND	**0.03**	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	3.E-07	1.E-03
2-SV-1PV	5	2-SV-5	11/14/13	ND	ND	ND	ND	ND	**0.19**	ND	ND	ND	ND	ND	--	ND	N/A	N/A
2-SV-3PV				ND	ND	**0.02**	ND	ND	**0.21**	ND	ND	ND	ND	ND	--	ND	2.E-07	9.E-04
2-SV-10PV				ND	**0.04**	**0.02**	ND	ND	**0.27**	ND	ND	ND	ND	ND	--	ND	N/A	N/A
2SV	15	2-SV-15	11/14/13	ND	ND	**0.08**	**0.25**	ND	**0.26**	ND	**0.10**	ND	**0.20**	ND	--	ND	3.E-06	8.E-02
4-SV	15	4-SV-15	11/15/13	ND	ND	**0.10**	**0.29**	ND	**0.30**	ND	ND	ND	ND	ND	--	ND	1.E-06	5.E-03
	5	4-SV-5	11/15/13	ND	ND	**0.02**	ND	ND	ND	ND	ND	ND	ND	ND	--	**1.1**	2.E-07	6.E-04
5-SV	15	5-SV-15	11/14/13	ND	ND	**0.03**	ND	ND	**0.27**	ND	**0.17**	ND	ND	ND	--	**0.27**	3.E-07	5.E-02
	5	5-SV-5	11/14/13	ND	**0.04**	ND	ND	ND	**0.14**	ND	ND	ND	ND	ND	--	ND	1.E-07	4.E-04
6-SV	15	6-SV-15	11/14/13	ND	ND	**0.02**	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	2.E-07	6.E-04
	15-Rep	6-SV-15-Rep	11/14/13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	N/A	N/A
	3	6-SV-3	11/15/13	ND	ND	**0.02**	ND	ND	**0.18**	ND	ND	ND	ND	ND	--	ND	2.E-07	9.E-04
7-SV	5	7-SV-5	11/15/13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	N/A	N/A
	15	7-SV-15	11/15/13	ND	ND	**0.08**	**0.23**	**0.25**	**1.5**	**0.42**	**0.13**	ND	ND	**0.15**	--	ND	1.E-06	4.E-02
8-SV	3	8-SV-3	11/15/13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	N/A	N/A
	15	8-SV-15	11/15/13	ND	ND	**0.08**	ND	**0.13**	**0.71**	**0.20**	**0.14**	ND	ND	**0.22**	--	ND	1.E-06	4.E-02
9-SV	15	9-SV-15	11/15/13	ND	ND	**0.03**	ND	ND	**0.24**	ND	**0.37**	**0.14**	ND	ND	--	ND	3.E-07	1.E-01
	5	9-SV-5	11/15/13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	N/A	N/A
11-SV	15	11-SV-15	11/15/13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	N/A	N/A
	5	11-SV-5	11/15/13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	N/A	N/A
12-SV-1PV	15	12-SV-15	11/13/13	ND	ND	**0.06**	**0.26**	ND	**0.33**	**0.12**	ND	ND	**0.02**	ND	--	**0.70**	9.E-07	8.E-03
12-SV-3PV				ND	ND	**0.02**	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	N/A	N/A
12-SV-10PV				ND	ND	**0.02**	ND	ND	**0.13**	ND	ND	ND	ND	ND	--	ND	N/A	N/A
12-SV	5	12-SV-5	11/14/13	ND	ND	**0.02**	ND	ND	**0.11**	ND	**0.11**	ND	ND	ND	--	**0.89**	2.E-07	3.E-02
13-SV	15	13-SV-15	11/14/13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	N/A	N/A
	5	13-SV-5	11/14/13	ND	**0.02**	**0.06**	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	7.E-07	2.E-03
15-SV	15	15-SV-15	11/15/13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	N/A	N/A
	5	15-SV-5	11/15/13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	N/A	N/A

[1] For Chloroform, the soil gas CHHSL of 420 µg/L was provided by Dr. David Siegel of OEHHA.

[2] For 1,2,4-trimethylbenzene, the soil gas screening level was calculated using the EPA indoor air RSL (7.3 $\mu g/m^3$) and a default soil gas attenuation factor of 0.002, per the DTSC Vapor Intrusion Guidance (DTSC 2011).

[3] For 1,3,5-trimethylbenzene, the soil gas screening level for 1,2,4-trimethylbenzene was used as a surrogate.

[4] For isopropyltoluene, the soil gas screening level was calculated using the indoor air RSL for cumene (420 $\mu g/m^3$) as a surrogate and a default soil gas attenuation factor of 0.002, per the DTSC Vapor Intrusion Guidance (2011).

Notes:

1. Soil gas samples analyzed by mobile laboratory for volatile organic compounds using EPA Method 8260SV (see laboratory sheets for
2. Detections at or above the laboratory reporting limit are shown in **bold**.
3. Purge volume tests were conducted at 2-SV-5 and 12-SV-15. A numeric and "PV" following the probe ID indicate the purge volume applied prior to collecting the soil gas sample. Shallow (3 and 5-foot depth) soil gas samples were collected after 3 purge volume and deeper (10-
4. bgs = below ground surface.
5. -- = Not analyzed.
6. Rep = duplicate sample.

As can be seen from the above table, the screening level indoor air risks range from 1 x 10^{-7} to 3 x 10^{-6}, with a site-wide average indoor air risk of 7 x 10^{-7}. All of the screening hazards are well below 1.0. Therefore, regardless of whether risks

are estimated using CHHSLs or the J&E Model, there is no vapor intrusion threat from VOCs detected in soil gas.

13. Drinking water at Autumnwood has not been tested.

    DTSC Response: Drinking water was tested for total dissolved solids by DTSC's Office of Criminal Investigation. The total dissolved solids results, while at the upper end of the range of typical concentrations, were considered normal and acceptable by the CDPH.

    Drinking water is routinely tested for the Federal/State primary and secondary drinking water standards and those results are distributed to customers in the water purveyor's area. Under the Safe Drinking Water Act (SDWA), EPA sets legal limits on the levels of certain contaminants in drinking water. The legal limits reflect both the level that protects human health and the level that water systems can achieve using the best available technology. Besides prescribing these legal limits, EPA rules set water-testing schedules and methods that water systems must follow. The rules also list acceptable techniques for treating contaminated water. SDWA gives individual states the opportunity to set and enforce their own drinking water standards if the standards are at least as strong as EPA's national standards.

14. Evaporate from domestic water in yards and on cement and pottery.

    DTSC Response: A "whitish substance" was reported by some residents on the soil in their yards and on pottery. As municipal water evaporates, the residual salts dissolved in the water precipitate out where the water previously existed. These salts are what typically make up the measurement of Total Dissolved Solids and exist in all water except deionized and distilled water, where these salts are removed.

15. For the soil gas collected at Location 12 there were 2 purge samples collected and analyzed. These samples had high Leak Check Compound (LCC) detected but also detected several analytes not found in the final sample. Why?

    DTSC Response: Purge samples collected at Location 12 contained LCC in excess of the recommended limits in the Advisory Active Soil Gas Investigations (2012 Advisory) and, therefore, are not considered representative samples. The fact that these samples had high concentration of LCC indicates that there was a substantial leak in the sampling train above ground, allowing ambient air to enter into the sample.

16. Photoionizing Detector (PID) for Location 12 was around 300-400 where there were a lot of chemicals previously detected; however, the DTSC data only shows a few analytes. Why?

    DTSC Response: The initial PID reading of 398 ppm at Location 12 at 10 feet bgs was reported when the probe tip became plugged by the baggie containing the soil. After recalibrating the PID and waiting for the instrument to re-equilibrate approximately 10 minutes, a retest of the sample yielded a PID reading of 2.1 ppm. The above explanation is also noted on the boring log for Location 12.

    Since PIDs are calibrated to a particular compound, the instrument cannot distinguish between detectable organic compounds in a mixture of gases and, therefore, indicates an integrated response to the mixture. The PID was used in this sampling event to qualitatively screen soil samples for analysis. Once a sample is selected for analysis, it is prepared and sent to the laboratory for analysis by US EPA Method 8260B. Method 8260B discretely identifies a wide range of organic compounds at project specific detection limits using a gas chromatograph/mass spectrometer (a.k.a. GC/MS). The GC/MS is a much more sensitive instrument for detecting and identifying individual VOCs in soil gas samples. Additionally, a GC/MS is not hindered by analytical interferences, such as moisture, as is the case with the PID.

17. No PID readings at Location 12 after 13 feet; no PID at Location 8; no PID readings at Location 6.

    DTSC Response: PID readings were generally collected where samples were collected to screen the data for organic vapors. PID readings were collected for all groundwater and soil sample locations which included borings 1, 6, 7, 8, 11, 12, and 13. At location 12, there is a PID reading of 1.5 parts per million (ppm) at 12.5 feet bgs. The soil at 12.5 to 16 feet bgs is interpreted as having the same description; hence no additional PID readings were necessary. Location 8 has PID readings of 0.8, 0.6, and 0.9 ppm at 6, 12.5 and 14 feet bgs., respectively. Location 6 has PID readings of 0.8, 1.6, and 1.2 ppm at 6, 11, and 14 feet bgs., respectively.

18. Measurement units are in μg/L and some in $\mu g/m^3$; data is confusing with so many different units; data tables refer to CHHLS.

    DTSC Response: Data units are relative to the media sampled and concentration. Generally, soil gas analytical results are reported in either micrograms per liter (μg/L) or micrograms per cubic meter ($\mu g/m^3$) depending on the laboratory. Soil samples are reported in milligram per kilogram (mg/kg) and groundwater is reported in μg/L.

19. Soil gas sampling was conducted by Nancy Carraway, a Certified Industrial Hygienist, at 3 Autumnwood homes and the Development Park. An approximately 3 foot and 5 foot section of ½ to 3/8 inch copper pipe was crimped at one end; capped at the other end; had low density polyethylene tubing attached for the sample container; and had holes drilled in the side for vapor extraction of soil gas samples. Data was presented showing multiple constituents in the samples collected, many above CHHLS. The presentation stated soil gas was collected at depths of 3.5 and 5 feet bgs and at distances of 5, 14 and 25 feet from residential structures.

    DTSC Response: The data presented to the meeting participants on January 17, 2014 only contained a column for "underground" and one column for "above ground." No depth or distance discrete designations are noted on the data sheet provided at the meeting.

    The soil gas sample data presented at the January 17, 2014 meeting, as well as previously collected sub-slab sample data collected on May 29 and 30, 2012 and July 10 and 11, 2012, were not collected within acceptable soil gas sampling standards. There are a number of technically and scientifically accepted soil gas sampling protocols that describe how to sample soil gas and allow latitude for sampling using a variety of equipment; however, equipment used must be free of contaminants and tested to show cleanliness; equipment should not alter the composition or concentration of the soil gas sample; quality control and quality assurance (QA/QC) samples and protocols should be employed to assure the soil gas sample is representative of insitu conditions; and shut-in, purge volume, and leak check tests should be performed to assure the soil gas sample is not diluted or contaminated with ambient air during sampling.

    None of the QA/QC samples or protocols detailed in the above paragraph were presented with the data; hence, the data cannot be evaluated as quantitative data or considered representative of insitu soil gas concentrations.

20. Need seasonal sampling.

    DTSC Response: Seasonal sampling is not employed at sites when characterizing sites for soil gas contamination. Soil gas sampling defines contaminant plumes both in the unsaturated zone and from the saturated zone. At the Autumnwood Development, no contaminant plume was identified.

21. What level of contaminants triggers a full investigation?

DTSC Response: When contamination is discovered and is determined to affect or threaten to affect human health or the environment, a site investigation is initiated. The investigation at the Autumnwood Development was a site characterization for the purpose of determining whether a subsurface contaminant source existed and whether detected subsurface contaminants were potentially migrating into the residences. The findings of the investigation were that the contaminants were not at a sufficient level to cause vapor intrusion, adverse human health or affect the environment.

Summary of Comments presented at the Multi-Agency Wildomar Meeting on September 19, 2014 in Wildomar, CA

The following comments were taken directly from the CCAEJ presentation.

22. "Concerns and questions regarding DTSC Testing; deviation from the sampling plan:
    - Did not test in warmer months as recognized by all parties as the preferred timing;
    - Even though Director Raphael emphasized the need to test for things we hadn't tested for, DTSC did not test ENTIRE LIST OF EPA Method 8260 & TO-15 which would have been 108+ chemicals; and
    - Created own list of target VOCs for lab analysis: 44 sub-slab and 43 soil gas."

DTSC Response: DTSC installed and sampled sub-slab probes on November 13th and 14th, 2013 when temperatures ranged from 52-54 degrees at 8 AM to 91-92 degrees for the high on those days and 77 degrees at the end of both work days. The requirement to do seasonal sampling does not apply to soil gas samples as temperature does not affect the soil concentrations at depths of 5 and 15 feet below ground surface.

The EPA Methods list all compounds that can be determined by the outlined method. Most laboratories do not analyze for all compounds listed. Analytical laboratories generate a standard list of target analytes based on existing lists outlined in regulations and commonly requested compounds from their clientele. Since the focus of this sampling event was to determine if vapor intrusion from the sub-surface was occurring, the compound list outlined in the Active Soil Gas Investigations Advisory, dated April 2012, was chosen for reporting.

23. “EXCLUDED from Sub-Slab Testing:
    - 1,2-Dibromoethane
    - Styrene
    - Chloromethane
    - Chlorobenzene

    DTSC Response: 1,2-dibromoethane (EDB) and styrene were analyzed for, but not reported in the draft data set. Both chemicals were not detected. The final laboratory reports for soil gas and sub-slab soil gas includes these two analytes. Chloromethane and chlorobenzene were not reported by the laboratory. However, based on the quantitation reports from the Level 4 Data Package, both chemicals were listed as target analytes for both US EPA Methods 8260B and TO-15. If these chemicals were present, they would have been identified as part of the tentatively identified compound (TIC) analysis. Therefore, none of these chemicals were detected in soil gas or sub-slab soil gas at the Autumnwood development.

24. “Excluded from soil gas and groundwater:
    - Methanol”

    DTSC Response: Please see DTSC Response to Comment No. 7, above.

25. “Excluded testing for URANIUM"

    DTSC Response: Per agreement with the residents during the development of the sampling plan, uranium was not a target analyte for soil matrix samples. DTSC never analyzes soil samples for uranium, as it is naturally occurring and is found everywhere. The only exception, would be a site like Santa Susana Field Lab, which had a nuclear reactor and handled uranium containing fuel rods.

26. “The Sub-slab RL were set higher than CHHSLs.”

    DTSC Response: CHHSLs were developed by OEHHA for indoor air and soil gas, and only for a select number of common VOC contaminants. There are no published CHHSLs for sub-slab soil gas. Using benzene as an example, the reporting limit for sub-slab soil gas sample analysis was 3.2 $\mu g/m^3$. Using the default attenuation factor of 0.05 for sub-slab soil gas samples, the risk-based sub-slab soil gas level would be 1.7 $\mu g/m^3$. While the reporting limit is higher than the estimated risk-based concentration, the reporting limit is sufficient for evaluating indoor air risks, as there is no real difference in the overall risk represented by these two values.

27. “Did not test for URANIUM”

DTSC Response: Please see response to Comment No. 25, above.

28. “Did not used PID across soil borings to detect highest concentrations along the rod.”

DTSC Response: The PID was used to screen soil samples for the presence of VOCs. The readings for the various detected results are noted on the boring logs in Attachment E. The PID was not used to detect the highest VOC concentrations on logged soil cores because soil gas was used for VOC quantitative analysis using US EPA Method 8260 modified for soil vapor.

29. “Inferior Methods
    - TO-15 vs. TO-17 for Naphthalene biased low concentrations.”

DTSC Response: Please see DTSC Response to Comment No. 10, above.

30. “Sample Collection
    - Disposed of 3 samples – Location 12 @ 15 ft. & documentation/field log record;
    - Excessive leaking of soil gas during collection at PV1 -470; PV3 – 93,000; PV-10 – 15,000

      398 PID reading then device recalibrated.

    - AMEC staff redirected on sample collection by DTSC strikeouts on record (“per Theo”);
    - Mishandling of soil boring samples causing reduction in VOC concentrations.”

DTSC Response: No samples were “disposed of” during this investigation. Soil gas samples were collected in accordance with the *Soil, Soil Gas, and Groundwater Sampling Workplan for Autumnwood Development, Amaryllis Court and Vicinity Wildomar, California,* dated November 2013. Specifically Section 7.1.1 details that the sampling will “be conducted in accordance with the *Advisory – Active Soil Gas Investigations* (Advisory) [Cal/EPA, 2012]. . .”

Samples collected at Location 12, for the five foot soil gas probe purge volume testing for the 3 and 10 purge volumes, were in excess of the recommended leak check compound (LCC) concentration of one µg/L, or ten times the analyte detection limit (See ASGI Section 4.2.2.1). These samples were not considered

representative and were not used in the purge test evaluation for Location 12 at five feet. Instead. An alternate location, Location 2, was used for the five foot purge test.

Response to issues with PID readings at Location 12 can be found at comment numbers 16 and 28 of this Attachment.

No valid samples were eliminated from the chain of custody records. Sample Location 1 at 15 feet below ground surface was lined out on the chain of custody because there was excessive vacuum (greater than 100 inches of water) during purging, preventing collection of a representative sample at this depth in accordance with the recommendations in the 2012 ASGI (See *Final Investigation Report Autumnwood Development Wildomar, California,* Section 4.1 Deviations from Proposed Work Scope).

Decisions on changes to sample locations, sample representativeness and purge volume selection were made by DTSC field staff onsite. Changes to sample locations and adjustments made in the field to collect representative samples are documented in the *Final Investigation Report Autumnwood Development Wildomar, California,* Section 4.1 Deviations from Proposed Work Scope.

Soil boring samples were analyzed for semivolatile organic compounds, polychlorinated biphenols, organochlorine pesticides, and metals. Soil samples for PID screening were placed in baggies, sealed and left to equilibrate before PID readings were collected. Soil samples were not analyzed for VOCs in accordance with the *Soil, Soil Gas, and Groundwater Sampling Workplan for Autumnwood Development, Amaryllis Court and Vicinity Wildomar, California,* dated November 2013.

31. "Draft Report
    - Johnson & Ettinger Model not appropriate for site-specific conditions, i.e.
        - Moisture; lateral water flow; slab defects; voids, water touching slabs
    - Formaldehyde 8 µg/m3 in Sub-slab DTSC says indoor air source – no public health referrals for residence!
    - Methanol in Sub-slab of 540 µg/m3 – DTSC estimates 27 µg/m3 as indoor air concentration
    - Methanol metabolizes into formaldehyde"

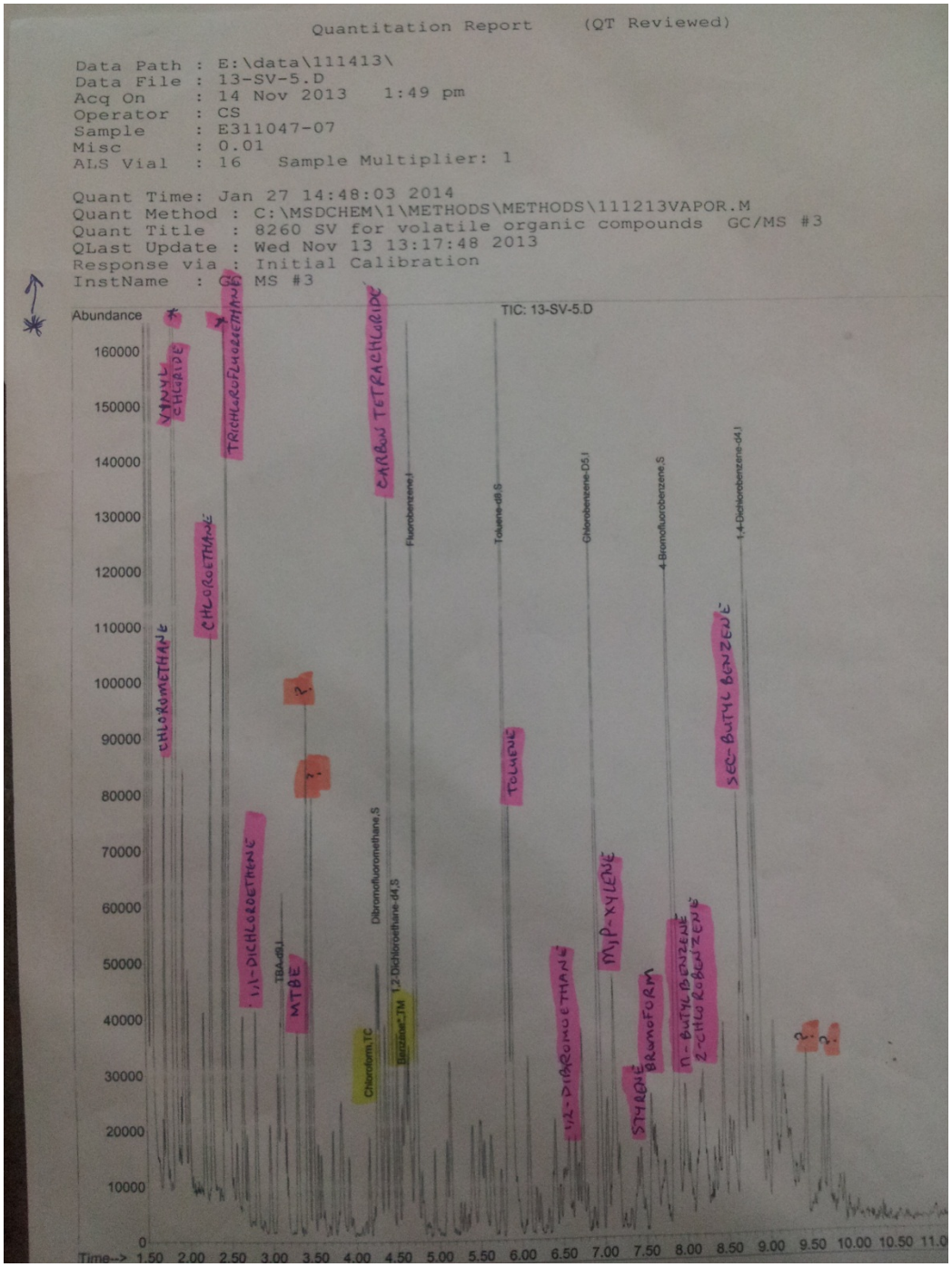
DTSC Response: Regarding the Johnson and Ettinger Vapor Intrusion Model, please see DTSC Response to Comment No. 12, above.

Regarding formaldehyde, the California Department of Public Health (CDPH) reviewed the Draft Report and the Draft Final Report and concurred with DTSC's finding and conclusions (See Attachment M).

Regarding the estimated indoor air concentration of methanol based on the detected sub-slab soil gas concentration, DTSC directly compared this estimated concentration to the OEHHA Reference Exposure Level (REL), which is 4,000 $\mu g/m^3$. Consequently, methanol in indoor air would not pose a threat to human health from inhalation. The EPA RSL for methanol in indoor air is even higher, 21,000 $\mu g/m^3$.

Methanol, whether ingested, inhaled or absorbed through the skin, must first be absorbed, distributed and metabolized by the liver. Methanol is metabolized to formaldehyde by the enzyme alcohol dehydrogenase. Formaldehyde is then rapidly metabolized to formate by the enzyme aldehyde dehydrogenase. The half-life of fomaldehyde is approximately 1 minute. (EPA 2013). Acute exposure to high levels of methanol can saturate the enzyme systems, leading to increased levels of formate, resulting in ocular toxicity. This does not happen following chronic exposure to low levels of methanol. In fact, methanol occurs naturally in the human body as a product of metabolism and through ingestion of fruits, vegetables and alcoholic beverages which contain low levels of methanol (EPA 2013). The background blood level of methanol in healthy people ranges from 0.25 to 5.2 mg/L (EPA 2013). The toxikokinteics of exposure to formaldehyde in indoor air is far different than from exposure to methanol. Human data show statistically significant associations between site-specific respiratory neoplasms and exposure to formaldehyde or formaldehyde-containing products (IRIS, 2013). Methanol, on the other hand, is not a carcinogenic chemical. Consequently, exposure to formaldehyde as a result of methanol metabolism can't be compared to direct exposure to formaldehyde in indoor air.

32. DTSC hiding data



Quantitation Report (QT Reviewed)

```
Data Path : E:\data\111413\
Data File : 13-SV-5.D
Acq On    : 14 Nov 2013   1:49 pm
Operator  : CS
Sample    : E311047-07
Misc      : 0.01
ALS Vial  : 16   Sample Multiplier: 1

Quant Time: Jan 27 14:48:03 2014
Quant Method : C:\MSDCHEM\1\METHODS\METHODS\111213VAPOR.M
Quant Title  : 8260 SV for volatile organic compounds  GC/MS #3
QLast Update : Wed Nov 13 13:17:48 2013
Response via : Initial Calibration
InstName  : GC MS #3

Internal Standards                    R.T. QIon  Response  Conc Units Dev(Min)
-------------------------------------------------------------------------------
  1) Fluorobenzene                    4.73   96   133226    50.00 ng       0.0
 43) Chlorobenzene-D5                 6.94   82    47497    50.00 ng       0.0
 54) 1,4-Dichlorobenzene-d4           8.84  152    39303    50.00 ng       0.0
 77) TBA-d9                           3.10   65    18290  1000.00 ng        0.

System Monitoring Compounds
 24) Dibromofluoromethane             4.26  113    21754    43.08 ng       0.0
  Spiked Amount      50.000   Range  75 - 125    Recovery   =   86.16%
 27) 1,2-Dichloroethane-d4            4.51   65    23486    49.63 ng       0.0
  Spiked Amount      50.000   Range  62 - 139    Recovery   =   99.26%
 37) Toluene-d8                       5.84   98   118980    51.53 ng       0.0
  Spiked Amount      50.000   Range  75 - 125    Recovery   =  103.06%
 55) 4-Bromofluorobenzene             7.87  174    27890    50.35 ng       0.0
  Spiked Amount      50.000   Range  75 - 125    Recovery   =  100.70%

Target Compounds                                                      Qvalue
 21) Chloroform ✓                     4.16   83     2625     2.41 ng    #    6
 30) Benzene*                         4.56   78    14751     5.54 ng         9
-------------------------------------------------------------------------------

(#) = qualifier out of range (m) = manual integration (+) = signals summe
```

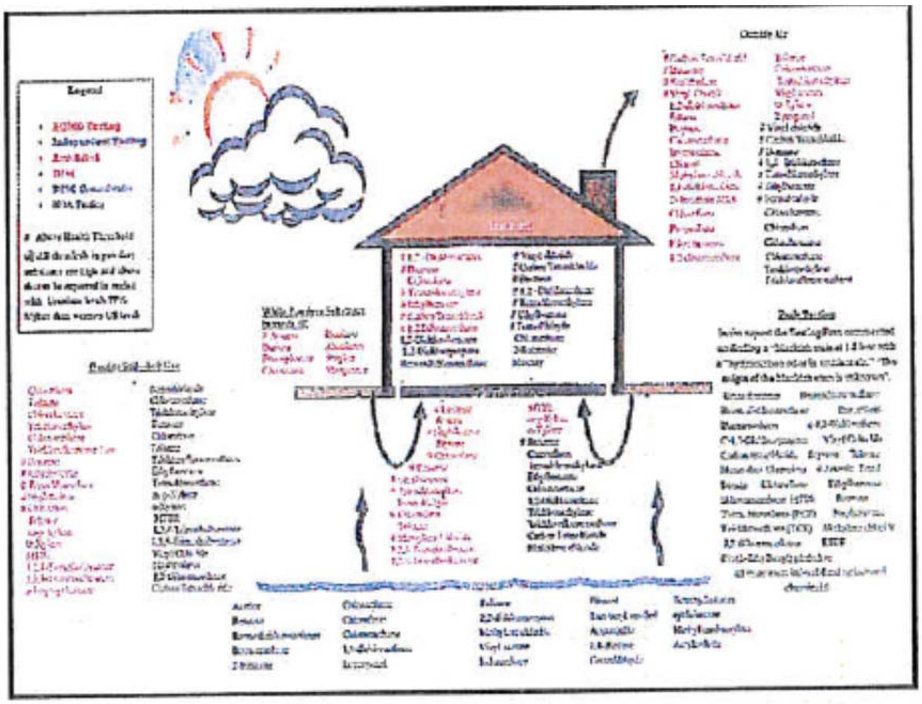
DTSC Response: Gas Chromatography Mass Spectroscopy (GCMS) compound identification is based on retention time and on comparison of the sample's mass spectrum with characteristic ions in a reference mass spectrum of the compounds of interest. Each compound produces a specific mass spectrum

in a GC MS system that is unique for that compound, similar to a finger print. In this particular example, there are peaks in the chromatogram that look to have the same retention time as compounds of interest. The computer software would have compared the mass spectrum of those peaks to the reference mass spectrum of the compounds of interest. The mass spectrum of the peaks in the chromatogram must not have matched the reference mass spectrum for the compounds otherwise the computer would have identified them in the quantitation report. The computer system looked at those peaks in the chromatogram but did not identify them because their mass spectrum did not match that of the compounds. Positive identification of a compound requires both a mass spectrum match and retention time match.

DTSC's Environmental Chemistry Laboratory (ECL) conducted a full Level 4 Data Evaluation and concluded that the data were useable for risk assessment and decision making. As an additional step, DTSC had the laboratory perform a Tentatively Identified Compound (TIC) analysis where the computer takes the mass spectrum from the sample and compares it to a library full of compound mass spectrum to try to identify the compound. None of the tentatively identified peaks were associated with compounds of concern. Because many of the chromatograms exhibited similar patterns to fuels, samples were also evaluated for TPH and the resultant tentatively identified compounds (TICs) were quantitatively evaluated in the risk assessment and found not to pose an indoor air health threat.

Finally, DTSC's Report was independently reviewed by the Office of Environmental Health Hazard Assessment (OEHHA) and the California Department of Public Health (CDPH) (See Attachment M). Both OEHHA and CDPH concurred with DTSC's conclusions that 1) no data reviewed, either historical or current, were indicative of a significant hazardous substance release or a significant source of contamination in soil, groundwater or soil gas; and 2) based on multiple lines of evidence, including groundwater data, soil gas data, sub-slab soil gas data and previous indoor and outdoor air data, VOCs in the subsurface were so low or minimal that no discernable impact could be detected in the indoor air at Autumnwood.

33. Conceptual Site Model



DTSC Response: The conceptual site model (CSM) presented by CCAEJ is inaccurate and is not supported by data collected from several, independent investigations. In order for vapor intrusion to occur, there must be a source of VOC contamination in shallow groundwater. Based on the DTSC Investigation, no VOCs were detected above their reporting limits in shallow groundwater. Consequently, there is no VOC plume in shallow groundwater. While low levels of fuel related hydrocarbons were detected in a diffuse pattern throughout the Autumnwood Development, no data reviewed, either historical or current, were indicative of a significant hazardous substance release or a significant source of contamination in soil, groundwater or soil gas. VOCs detected in soil gas were so low or minimal that they do not pose a significant indoor air risk or hazard.

As discussed in DTSC's Response to Comment No. 19, the CCAEJ CSM relies entirely on the soil gas sample data presented at the January 17, 2014 meeting, as well as previously collected sub-slab sample data collected on May 29 and 30, 2012 and July 10 and 11, 2012. These sample results were not collected with acceptable soil gas sampling protocols. There are a number of technically and scientifically accepted soil gas sampling protocols that describe how to sample soil gas and allow latitude for sampling using a variety of equipment; however,

equipment used must be free of contaminants and tested to show cleanliness; equipment should not alter the composition or concentration of the soil gas sample; quality control and quality assurance (QA/QC) samples and protocols should be employed to assure the soil gas sample is representative of in-situ conditions; and shut-in, purge volume, and leak check tests should be performed to assure the soil gas sample is not diluted or contaminated with ambient air during sampling. None of the QA/QC samples or protocols detailed in the above paragraph were presented with the data; hence, the data cannot be evaluated as quantitative data or considered representative of in-situ soil gas concentrations.

References

Cal/EPA, 2012. Active Soil Gas Investigations Advisory. April.

DTSC, 2013. Soil, Soil Gas, and Groundwater Sampling Workplan for Autumnwood Development, Amaryllis Court and Vicinity Wildomar, California. November.

DTSC, 2014. Final Investigation Report Autumnwood Development Wildomar, California. October.

EPA, 2013. Toxicological Review of Methanol (Noncancer). (CAS# 67-56-1). In Support of Summary Information on the Integrated Risk Information System (IRIS). EPA/635/R-11/001Fa.

(IRIS, 2013). Integrated Risk Information System, Formaldehyde Summary. http://www.epa.gov/iris/subst/0419.htm.

Kearney, 1996. Kearney Foundation Special Report, Background Concentrations of Trace and Major Elements in California Soils, Kearney Foundation of Soil Science, Division of Agriculture and Natural Resources, University of California, March 1996.

Petra, 2005. Geotechnical Report of Rough Grading, Lots 1 through 62, Amaryllis Court, Pink Ginger Court, Protea Court, Front Street, Tract 31175, Wildomar Area, Riverside County, California: For Inland Pacific Builders Inc. Temecula, California, May 23.