SOMA
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November 21, 2013

Ms. Dilan Roe, P.E.
Ms. Karel Detterman
Alameda County
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Oakland, California 94502

Subject: Fuel Leak Case#RO0000346
Site Location: 3519 Castro Valley Boulevard, Castro Valley

Dear Ms. Roe & Ms. Detterman:

SOMA's "Soil Gas Investigation Report and Updated Site Conceptual Model" for the subject site has been uploaded to the State's GeoTracker database and to the Alameda County ftp site for your review.

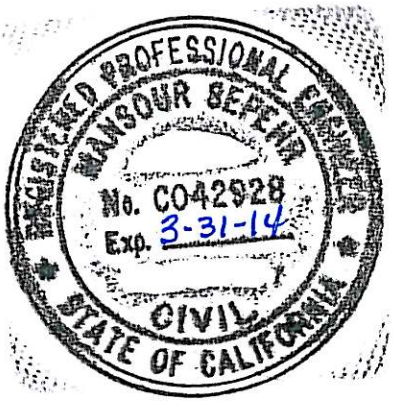
If you have any questions or comments, please do not hesitate to call me. Your time is greatly appreciated in reviewing our report.

Sincerely,

Mansour Sepehr, Ph.D., PE
Principal Hydrogeologist

Enclosure

cc: Mr. Mirazim Shakoori w/enclosure



Soil Gas Investigation Report
and Updated Site Conceptual Model

3519 Castro Valley Boulevard
Castro Valley, California 94546

November 21, 2013

Project 2762

Prepared for:

Mr. Mirazim Shakoori
4313 Mansfield Drive
Danville, California 94506

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PERJURY STATEMENT

Site Location: 3519 Castro Valley Boulevard, Castro Valley, CA

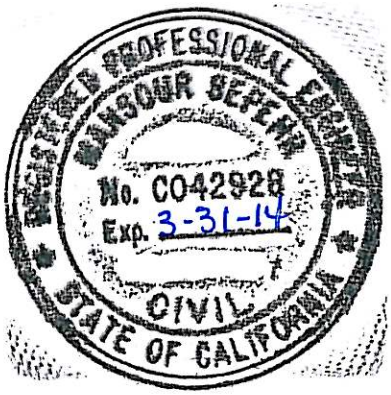
"I declare under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge".

Mirazim Shakoori
4313 Mansfield Drive
Danville, California 94506
Responsible Party

CERTIFICATION

SOMA Environmental Engineering, Inc. (SOMA) has prepared this technical report on behalf of Mr. Mirazim Shakoori, for property located at 3519 Castro Valley Boulevard, Castro Valley, California. This report was prepared in response to September 17, 2013 correspondence from Alameda County Environmental Health Services, Environmental Protection Division.

Mansour Sepehr, PhD, PE
Principal Hydrogeologist



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1. INTRODUCTION

SOMA Environmental Engineering, Inc. (SOMA) has prepared this report on behalf of Mr. Mirazim Shakoori, for property located at 3519 Castro Valley Boulevard, Castro Valley, California. This report was prepared in compliance with Alameda County Environmental Health Services (ACEHS) Environmental Protection Division correspondence dated September 17, 2013 in order to present the results of the soil gas investigation conducted in October 2013. An updated site conceptual model is also included in this report as Table 2.

1.1 Site Description

The site is located on the corner of Redwood Road and Castro Valley Boulevard (Figure 1). Prior to 1989, the site was a Mobil gasoline service station. In 1989, British Petroleum (BP) purchased and operated the station until ownership was transferred to Mr. Mirazim Shakoori in 1993. The station was operated under the Chevron brand until recently, and now operates as a Shell gasoline service station. Site features, including former and current USTs and former dispenser island, are shown in Figure 2.

In 1984, three single-walled fiberglass underground storage tanks (USTs) with capacities of 6,000 gallons, 8,000 gallons, and 10,000 gallons, were installed in the southeastern portion of the site. In 1988, a 1,000 gallon waste oil tank (WOT) was installed to replace the previous 380-gallon WOT. Holes were observed in the 380-gallon WOT. As a result, confirmation soil samples were collected from the bottom of the excavation and the analytical results confirmed contamination. Subsequently, groundwater monitoring wells were installed at the site and the site has been monitored since 1992. The other three USTs were removed and replaced in September 2003 with two new double-walled, fiberglass USTs with capacities of 12,000 gallons and 20,000 gallons. In addition, the dispensers, product lines, and vent lines were removed and replaced.

Petroleum hydrocarbon contamination has been detected in soils beneath the site and in groundwater beneath the site and in the downgradient areas and is related to a historical unauthorized release. A concise background of soil and groundwater investigations performed in connection with this case and an assessment of the residual impacts of chemicals of concern (COCs) for the site and the surrounding area are summarized in Appendix A.

As approved by ACEHS, SOMA proposes implementing a soil gas study adjacent to the southern property boundary to the west and east of and beneath the station building to establish whether vapor intrusion is a complete exposure pathway.

1.2 Site Geology and Hydrogeology

The site is underlain with interbedded silty clay, sandy silt/silty sand, clayey sand, and clayey silt. An unconsolidated sequence of permeable and relatively impermeable sediments underlies the site. Borehole logs for TWB-1 through TWB-5 and SOMA-4 demonstrate that these unconsolidated sequences continue off-site to the south, with no obvious changes in lithology.

Depth to first-encountered groundwater has been recorded at approximately 12 feet bgs in the Shallow WBZ and between 18 and 31 feet bgs in the Semi-Confined WBZ, with groundwater later stabilizing to between 8.39 and 10.6 feet bgs (Shallow WBZ) and to between 6.5 and 11.50 feet bgs (Semi-Confined WBZ, except in DP-4 and DP-6, which stabilized only to 28 feet bgs and 19.79 feet bgs, respectively). Sometimes the Shallow WBZ was not encountered during drilling, suggesting an element of discontinuity for that zone. For example, borings SB-6 (SOMA-6) and SB-9 (SOMA-9) were left open for 7 days but no water accumulated in these boreholes, suggesting that the Shallow WBZ is discontinuous in their vicinity.

The Shallow WBZ is composed of silty sand, sand, and clayey sand. Preferential flow (stream) channels have also been observed south (downgradient) of the Xtra Oil station across Redwood Road.

The Semi-Confined WBZ appears to be continuous and extends off-site to the southeast. Below the Semi-Confined WBZ is a fairly homogenous silty clay unit that extends to 30 feet bgs, the greatest depths explored on-site during historical investigations. During historical soil and groundwater investigations, groundwater was observed in all explored areas of the Semi-Confined WBZ.

Groundwater monitoring wells have been installed at the site to monitor the encountered Shallow and Semi-Confined WBZs. The following wells are screened within the Shallow WBZ: SOMA-2, SOMA-3, SOMA-5, SOMA-7, SOMA-8, OB-1 and OB-2.

2. SCOPE OF WORK

This investigation was implemented in order to conduct a soil gas study to evaluate the potential for soil vapor intrusion into the station building as well as the neighboring properties located south and east of the property. The property to the south is a strip mall containing a variety of businesses while the property to the east is commercial property occupied by Fremont Bank. In addition, the results of this investigation will be used to evaluate if the site meets the conditions of Low Threat Closure Policy (LTCP) as set forth by the State Water Resources Control Board.

The scope of work will include the following tasks:

Task 1: Permit Acquisition, Health and Safety Plan Preparation and Subsurface Utility Clearance
Task 2: Installation of Permanent Soil Gas Sampling Probes
Task 3: Soil Vapor Sampling
Task 4: Soil Vapor Analysis
Task 5: Report Preparation

The following are descriptions of the above tasks:

2.1 Permit Acquisition, Health and Safety Plan, Utility Clearance

Prior to commencing field activities, SOMA obtained permitting from Alameda County Public Works Agency for drilling activities (Appendix B), and submitted all appropriate drilling notifications to ACEHS (September 30, 2013).

SOMA prepared a site-specific Health and Safety Plan (HASP). The HASP is a requirement of the Occupational Safety and Health Administration (OSHA), "Hazardous Waste Operation and Emergency Response" guidelines (29 CFR 1910.120) and the California Occupational Safety and Health Administration (Cal/OSHA) "Hazardous Waste Operation and Emergency Response" guidelines (CCR Title 8, section 5192). The HASP is designed to address safety provisions during field activities and protect the field crew from physical and chemical hazards resulting from drilling and sampling. It establishes personnel responsibilities, general safe work practices, field procedures, personal protective equipment standards, decontamination procedures, and emergency action plans. The HASP was reviewed and signed by field staff and contractors prior to beginning field operations at the site.

SOMA's field crew visited the site on October 1, 2013 and marked proposed drilling locations using chalk-based white paint. SOMA contacted Underground Service Alert (USA) to verify that drilling and digging areas were clear of underground utilities on October 1, 2013 (Ticket # 387544). SOMA also retained a private utility locator (Cruz Brothers, October 1, 2013) to survey proposed drilling areas.

2.2 Installation of Permanent Soil Vapor Probes

On October 4, 2013, SOMA oversaw installation of five soil vapor sampling boreholes (SV-1 through SV-5) adjacent to site boundary next to the off- site buildings and also in areas where elevated levels of petroleum hydrocarbons were encountered in the shallow soils. The permanent soil vapor probes were installed by Vironex Drilling (C-57 licensed) utilizing Direct Push Technology (DPT). Figure 3 shows locations of borings SV-1 though SV-5.

Historical groundwater monitoring data at the site indicates that depth to groundwater ranges between 6.45 feet and 10.5 feet below ground surface (bgs). Using the historical groundwater elevation data at each proposed soil vapor probe location the depth of the soil vapor probe was determined so that the bottom of the soil vapor probes stay above the capillary fringe per recommendation of DTSC's guideline.

Soil Vapor Sampling Probe	Installed Depth (ft)
SV-1	**5.5**
SV-2	**7.5**
SV-3	**7.5**
SV-4	**8.0**
SV-5	**8.5**

At each boring location, a hand auger was used to clear the boring. Once the boring was hand cleared, a Geoprobe rod was hydraulically advanced to the target vapor sampling depth. During drilling operation, soil-filled liners were retrieved and SOMA's field geologist logged soil cores from each soil vapor sampling probe location using the Unified Soil Classification System. Encountered subsurface lithologies were recorded on the geologic borehole logs. On boring logs, SOMA indicated percent of gravel, sand, silt, and clay. At each depth-discrete soil sampling interval, the DPT drilling rig obtained a 4-foot soil core sample. Appendix C includes field records, soil boring logs and well completion reports. Appendix D includes photographic documentation of field activities.

Once the borehole was drilled, a sand pack was placed at the bottom of the borehole to minimize disruption of airflow to the sampling tip. The thickness of sand was approximately one foot and the tip of the probe was placed midway in the sand pack. After placement of the sand pack, one foot of dry granular bentonite was placed at the top of the sand pack. Following the dry bentonite, the remainder of the borehole was filled with hydrated bentonite. A down-hole rod was used to support the well tubing (1/4-inch Teflon) in the borehole during installation and to ensures that the probe tip was placed at the proper depth. As-built diagrams of soil gas wells are included on boring logs in Appendix C.

2.3 Installation of Sub-Slab Soil Vapor Probes

Also on October 4, 2013, SOMA oversaw Vironex install three shallow semi-permanent sub-slab vapor sampling probes SSG-1 through SSG-3 for evaluation of vapor intrusion concerns into the subject site building. The pins were installed inside the on-site station building.

In order to install each sub-slab sampling probe, a shallow outer hole, of larger diameter than the actual probe hole, was drilled. This outer hole only partially

penetrated the concrete slab (at least 1¾-inches into the slab) and was advanced utilizing a hammer drill. Then a smaller diameter (approximately 5/8-inch) inner hole was drilled through the outer hole and into the remainder of the slab and approximately 1-inch into the underlying soil, forming a void. The drill bit was removed and the loose cuttings were removed with a vacuum. The lower end of the Vapor Pin assembly was hammered into the drilled hole. During installation, the silicone sleeve formed a slight bulge between the slab and the Vapor Pin shoulder, creating a seal. A protective cap was placed on the Vapor Pin to prevent vapor loss prior to sampling and the Vapor Pin was then covered with a flush mount cover. Appendix C includes field records and Appendix E contains installation guide and pictures of Vapor Pin installation.

2.4 Soil Vapor Sampling

Soil vapor samples were collected on October 10, 2013. Prior to soil vapor sampling a shut-in test was conducted at each sampling location to check for a possible leak in the above ground sampling system. To conduct a shut-in test, the above ground valves, lines and fittings down-stream from the top of the probe were assembled. The test was conducted while the connection to the purge pump was in closed position. While the system was under negative pressure, the pressure gauge was observed and any possible vacuum drop was noted and any fittings would be tightened. During the shut in tests there were no leaks causing pressure drops detected. To ensure that stagnant air was removed from the sampling system and that samples are representative of the subsurface conditions, each sampling location was purged of approximately three purge volumes prior to sampling.

A vacuum pump was used to sample the soil gas, and the sampling train that Vironex provided contained a flow regulator. The flow regulator was calibrated to keep the flow from the sampling point set to 200 mL/minute. The sampling pump was connected to the outlet of the sample train, which was connected to the sampling point. A shroud was used with gaseous leak detection (helium) that covered the entire sampling train. A helium detector was used to gauge the amount of helium inside the shroud, keeping the helium at approximately 20 percent. For verification that there was not a leak in the sampling train, a leak check sample was taken using a lung box with a tedlar bag, which was connected to the sampling train. In order to take a sample, the sample pump was started and the start time was recorded. After the desired duration the pump was stopped and time was recorded again.

After sampling, the plugs at both ends of sample tube were replaced. The sample ID, tube ID, collection time and date and sample volume were recorded on the chain of custody. One duplicate sample was collected from the sampling location SV-1 and was labeled as SV-1D on the chain-of-custody. The sorbent tubes were stored in a cooler with ice and delivered to the lab. Figure 4 shows the

sampling set-up diagram and Figure 5 shows the soil vapor sampling train diagram.

2.5 Laboratory Analyses

Soil vapor samples were submitted under appropriate sample handling protocol to a California state-certified environmental laboratory for analysis of the following:

- EPA Method TO-17: benzene, toluene, ethylbenzene, total xylenes (collectively termed BTEX); and VOCs including naphthalene.

In addition to Helium (leak test compound), SOMA analyzed atmospheric gases O_2, CO_2, and methane. Reporting limits for O_2, CO_2, and methane were less than or equal to concentrations of these gases in the atmosphere. SOMA ensured that laboratory-reporting limits for COCs are below shallow soil gas Environmental Screening Levels (ESLs) that address inhalation of contaminants in an indoor setting, set by CRWCB–San Francisco Bay.

2.6 Sampling Results

The sampling manifold held the test vacuum prior to sampling. Furthermore, no significant breakthrough was indicated during the vapor sample collection, as helium (leak check compound) was either below laboratory reporting limits or detected at low concentrations (0.079 and 0.056 percent in SSG-2 and SSG-3, respectively) in all samples. According to the DTSC guidelines, any detection of the leak detection compound below an amount greater than or equal to 10 times the reporting limit for the target analytes is acceptable, therefore the sampling train was free of any significant leaks.

Soil vapor analytical data is summarized in Table 1. All concentrations were compared against shallow soil gas environmental screening levels (ESLs) and low threat underground storage tank case closure policy (LTCP) screening levels for 'Petroleum Vapor Intrusion to Indoor Air, scenario 4 for sites with no bioattenuation zone'.

Benzene was below the laboratory reporting limit in SSG-1 and SSG-2 and was detected in concentrations ranging from 18 $\mu g/m^3$ in SSG-3 to 250 $\mu g/m^3$ in SV-3. Benzene concentrations were below ESL of 420 $\mu g/m^3$ and LTCP screening level of 280 $\mu g/m^3$ for commercial/industrial land use in all samples.

However, benzene concentration in SV-3 was above the LTCP screening level of 85 $\mu g/m^3$ for residential land use and in SV-1 through SV-5 it was above the ESL of 42 $\mu g/m^3$ for residential land use.

Toluene was below the laboratory reporting limit in SSG-1 and SSG-2 and was detected in other samples at concentrations ranging from 26 µg/m^3 in SV-3 to 160 µg/m^3 in SV-4. Ethylbenzene was below the laboratory reporting limit in SV-5, SSG-1, and SSG-2 and was detected in other samples at concentrations ranging from 38 µg/m^3 in SV-2 to 820 µg/m^3 in SV-2. Total xylenes were below the laboratory reporting limit in SSG-1 and SSG-2 and were detected in concentrations ranging from 44 µg/m^3 in SV-5 to 580 µg/m^3 in SSG-3. All of the concentrations for these analytes are below ESLs for commercial/industrial land use.

Ethylbenzene concentrations were also below LTCP screening levels for commercial land use. However, ethylbenzene in SV-3 was above the ESL of 490 µg/m^3 for residential land use.

Naphthalene was detected in all samples at concentrations ranging from 3 µg/m^3 in SSG-2 to 76 µg/m^3 in SV-3. All naphthalene concentrations were below ESL of 360 µg/m^3 and LTCP screening level of 310 µg/m^3 for commercial/industrial land use. However, naphthalene concentrations in SV-3 and SSG-3 were above the ESL of 36 µg/m^3 for residential land use.

Oxygen was detected in all samples at concentrations ranging from 11 to 21 percent; methane was below the laboratory reporting limit in SSG-3 and ranged from 0.00012% in SV-2 to 0.002% in SV-1 and SV-3; carbon dioxide was detected in a range between 0.1% in SV-1 and 8.2% in SV-3. The approximate concentrations of above gases in the atmosphere are 20.44 percent for oxygen and 0.039 percent for carbon dioxide.

Analytical results from the duplicate sample SV-1D matched closely with results from the original sample SV-1. Certified analytical reports and chain-of-custody documentation are included in Appendix F.

3. CONCLUSIONS AND RECOMMENDATIONS

- During this soil gas study, SOMA evaluated the potential for soil vapor intrusion into the station building as well as the neighboring properties located south and east of the property. Five soil vapor sampling boreholes (SV-1 through SV-5) were installed to depths ranging between 5.5 and 8.5 feet bgs, adjacent to site boundary next to the off- site buildings and also in areas where elevated levels of petroleum hydrocarbons were encountered in the shallow soils. Three shallow semi-permanent sub-slab vapor sampling probes SSG-1 through SSG-3 were installed inside the on-site station building.

- Soil vapor samples were collected and analyzed for VOCs by EPA Method TO-17. Helium was used as a leak test gas. Based on the analytical result, the sampling train was free of any significant leaks.

- All contaminants of concern were either below laboratory-reporting limit or below the ESLs for commercial/industrial land use (CRWQCB, revised May 2013) and LTCP screening levels for commercial land use.

- Benzene in SV-3 was above the LTCP screening level for residential land use. Benzene concentrations in SV-1 through SV-5 were also above the ESL of 42 $\mu g/m^3$, ethylbenzene in SV-3 was above the ESL of 490 $\mu g/m^3$, and naphthalene concentrations in SV-3 and SSG-3 were above the ESL of 36 $\mu g/m^3$ for residential land use.

- An updated site conceptual model was prepared and is attached to this report as Table 2.

Results of the next sampling event to be conducted in the Spring of 2014 will help us assess temporal and seasonal variation in soil gas concentrations. Based on ACEHS directive dated September 17, 2013, results of the next sampling event will be documented in a vapor investigation report.

FIGURES

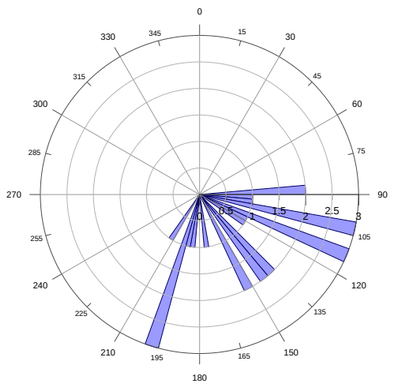
N

approximate scale in feet

0 60 120

Figure 1: Site vicinity map.

SOMA ENVIRONMENTAL ENGINEERING, INC.



Rose Diagram of Approximate Groundwater Flow Direction (3495 Castro Valley)

- Observation Wells June 2011
- Reconstructed Wells August 2010
- Shallow WBZ Wells, August 2010
- Shallow Soil Borings, August 2010
- MONITORING WELL, INSTALLED AUG. 2009
- SOIL BORINGS - SOMA ENV., AUG. 2009
- SOIL BORINGS- DELTA CONS. SEPT. 2008
- SOIL BORINGS REDWOOD ROAD EXPANSION FEB 1995
- MONITORING WELL
- DECOMMISSIONED WELL
- COMPLETED OFFSITE TEMPORARY WELL BOREHOLE DRILLED DEC. 2003
- SOIL BORINGS DRILLED PRIOR TO UST REMOVAL AUG. 2003
- MONITORING WELL (Located at 3495 Castro Valley Blvd.)

NOTES:
ESE-3 and ESE-4 were decommisioned during UST tank excavation activites.

MW-8 was decommissioned by the previous consultant.

Proposed wells SOMA-6 and SOMA-9 were not installed and they subsequently became soil borings SB-6 and SB-9

Rose Diagram of Approximate Groundwater Flow Direction (3519 Castro Valley)

N

approximate scale in feet
0 60 120

Figure 2: Site map showing locations of existing monitoring wells, decommissioned wells, offsite temporary well boreholes, monitoring wells installed by SOMA, and monitoring wells located at neighboring service station.

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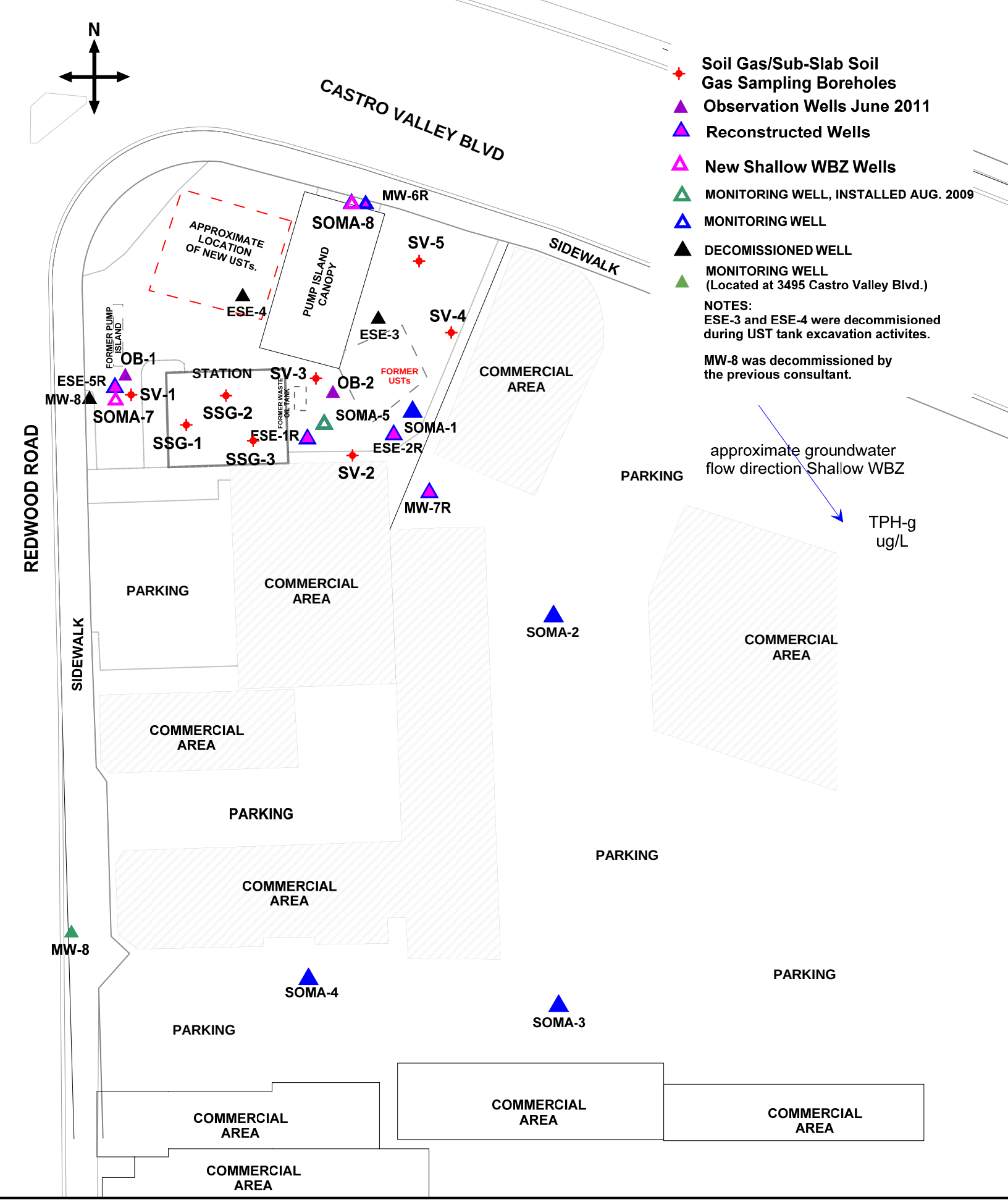

Figure 3: Locations of Soil Gas Sampling Boreholes and Sub-Slab Soil Gas Sampling Probes

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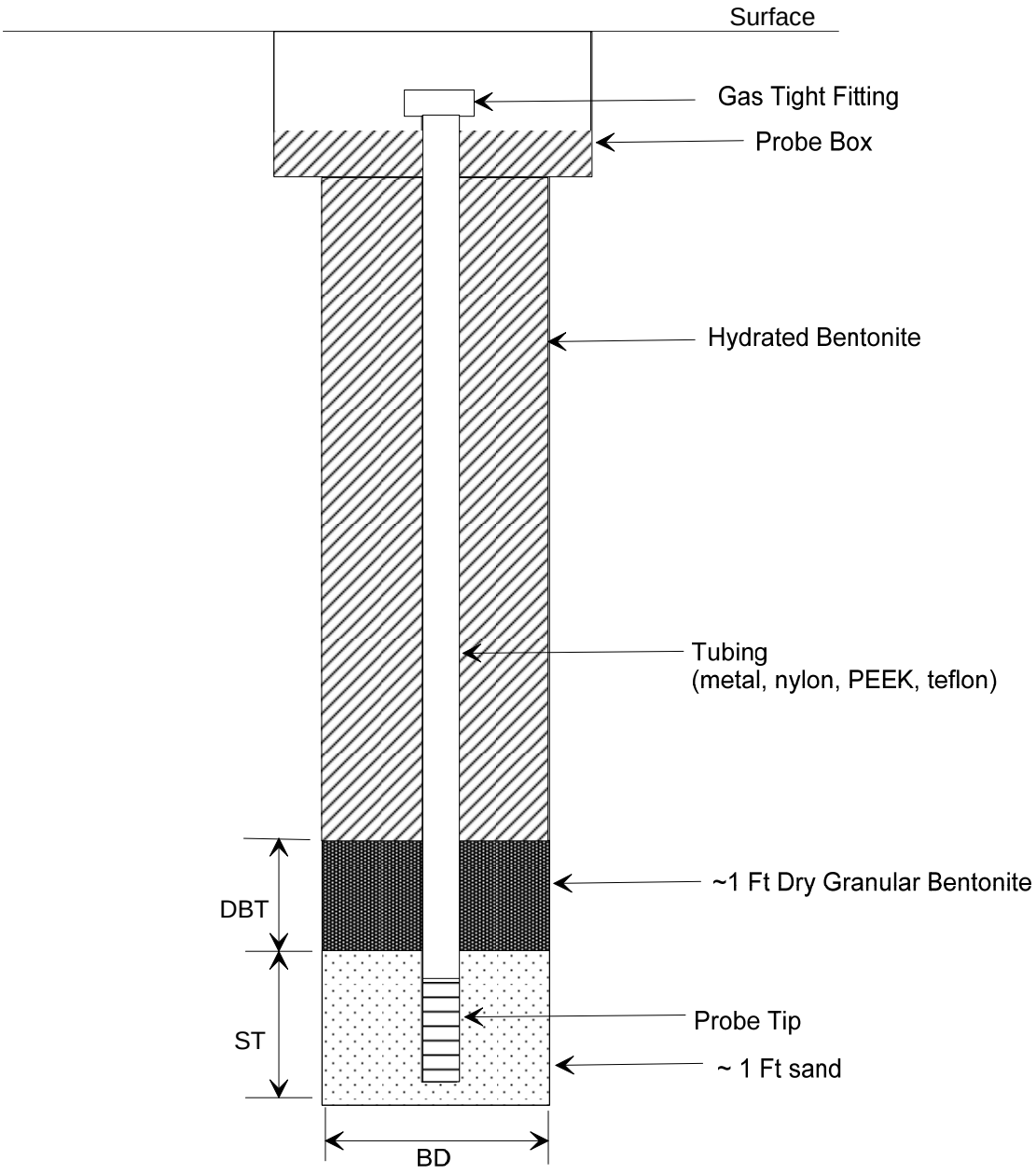

LEGEND

BD = borehole diameter (inches)
DBT = dry bentonite thickness (ft)
ST = sand pack thickness (FT)
PEEK = Polyetheretherketone

Not to Scale

Figure 4: Schematic Diagram of Soil Gas Probe

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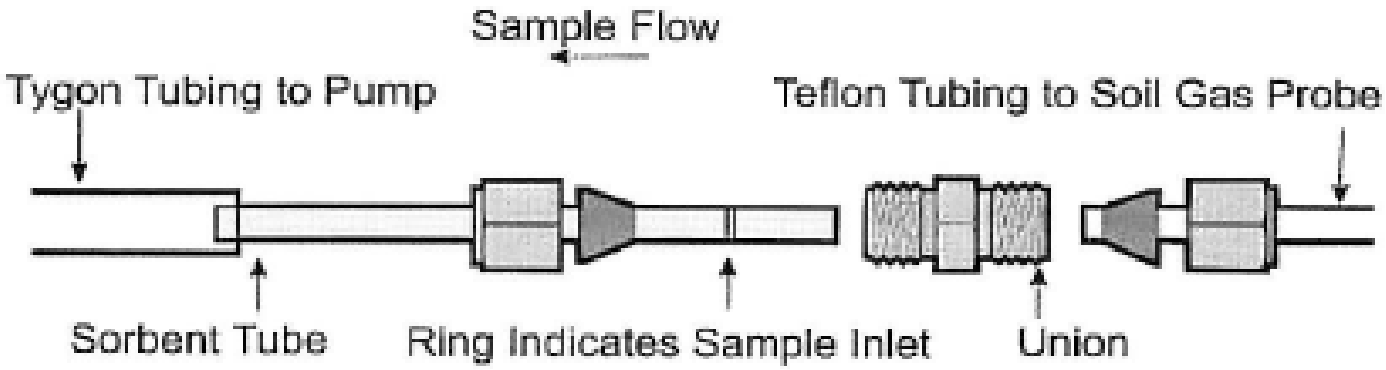

Not to Scale

Figure 5: Soil Vapor Sampling Train Diagram

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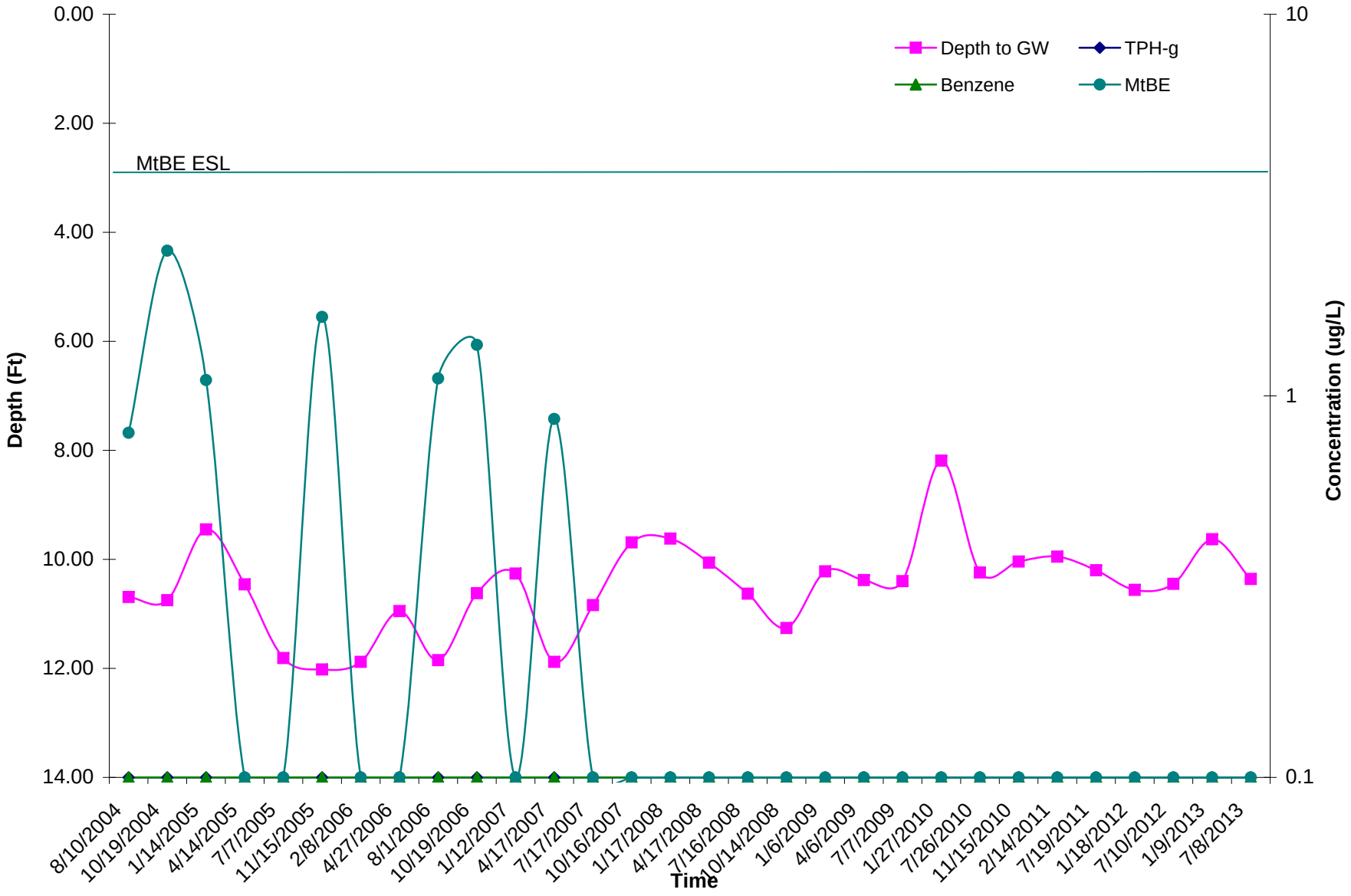


Figure 6: Contaminant Concentration Vs. Time in SOMA-2

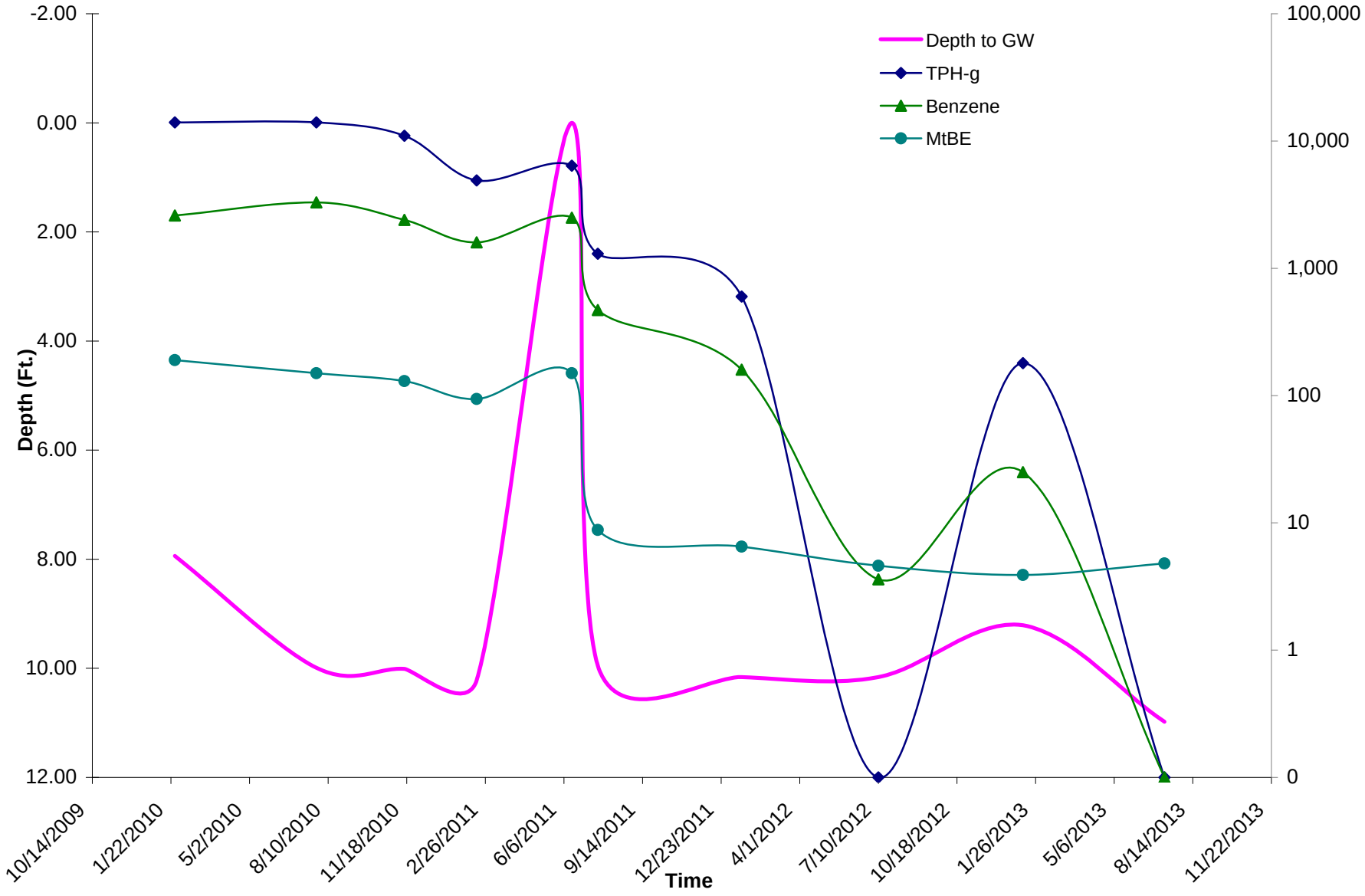


Figure 7: Contaminant Concentration Vs. Time in SOMA-5

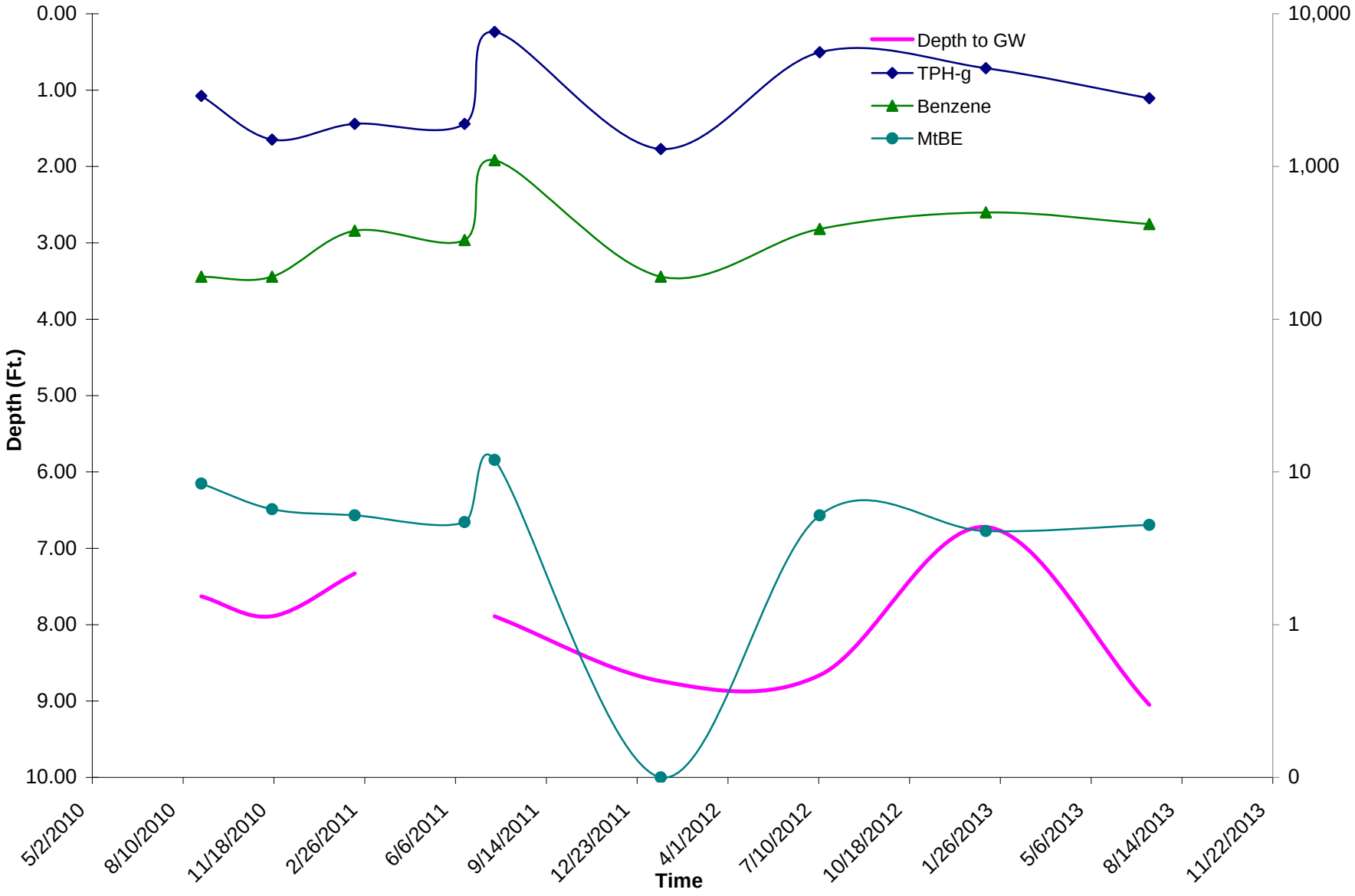


Figure 8: Contaminant Concentration Vs. Time in SOMA-7

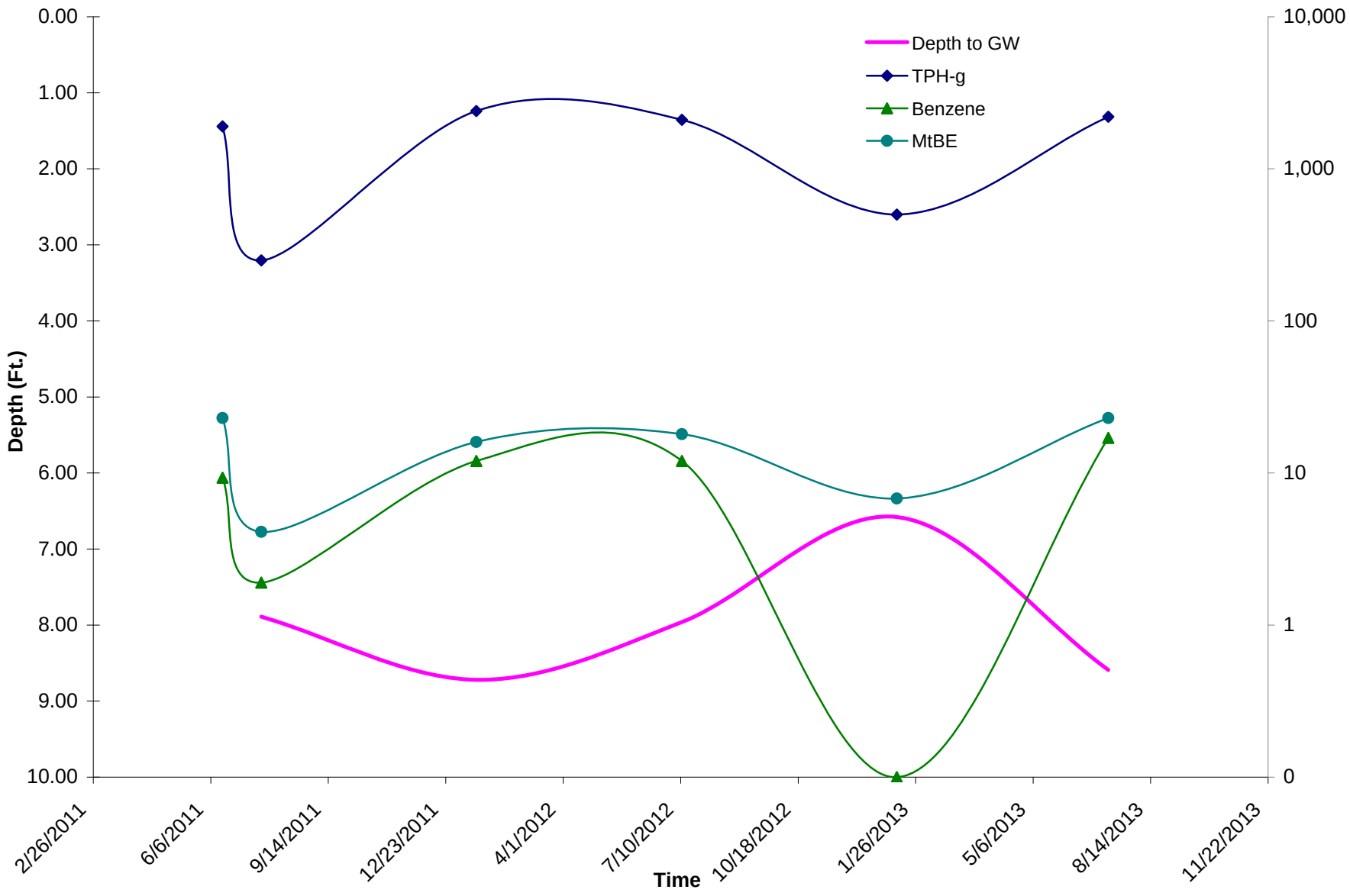


Figure 9: Contaminant Concentration Vs. Time in OB-1

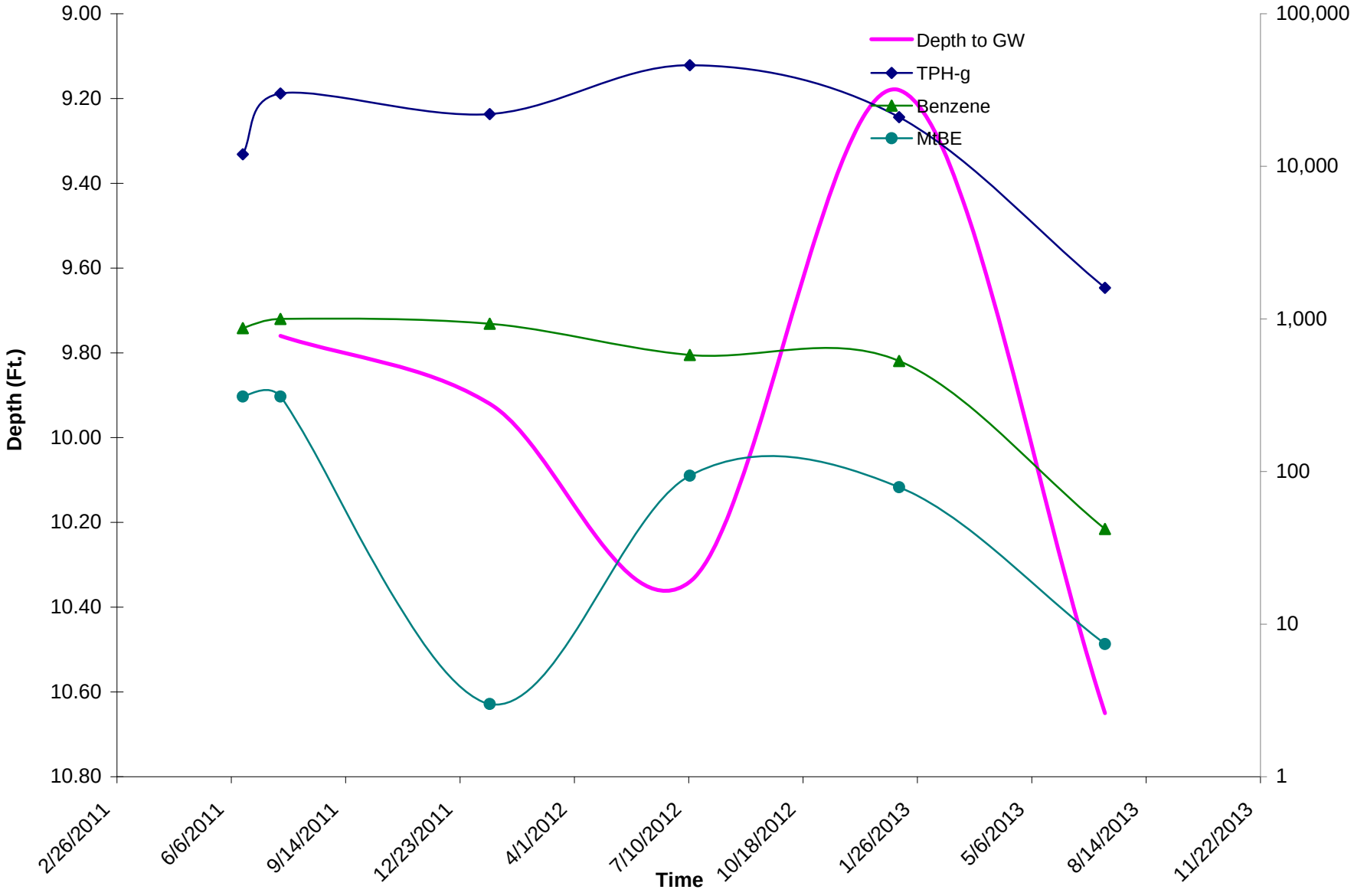


Figure 10: Contaminant Concentration Vs. Time in OB-2

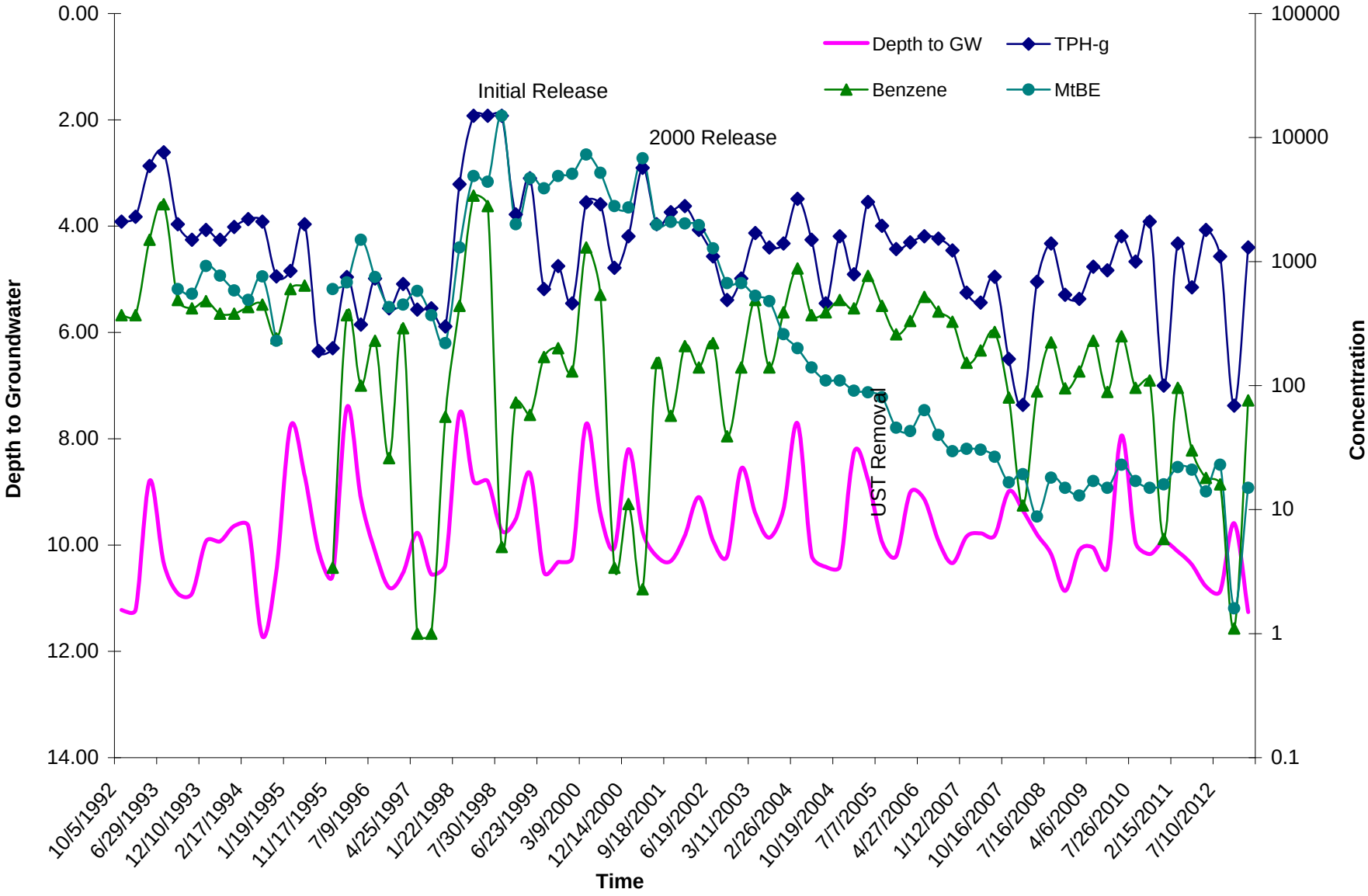


Figure 11:Contaminant Concentration Vs. Time in ESE-1

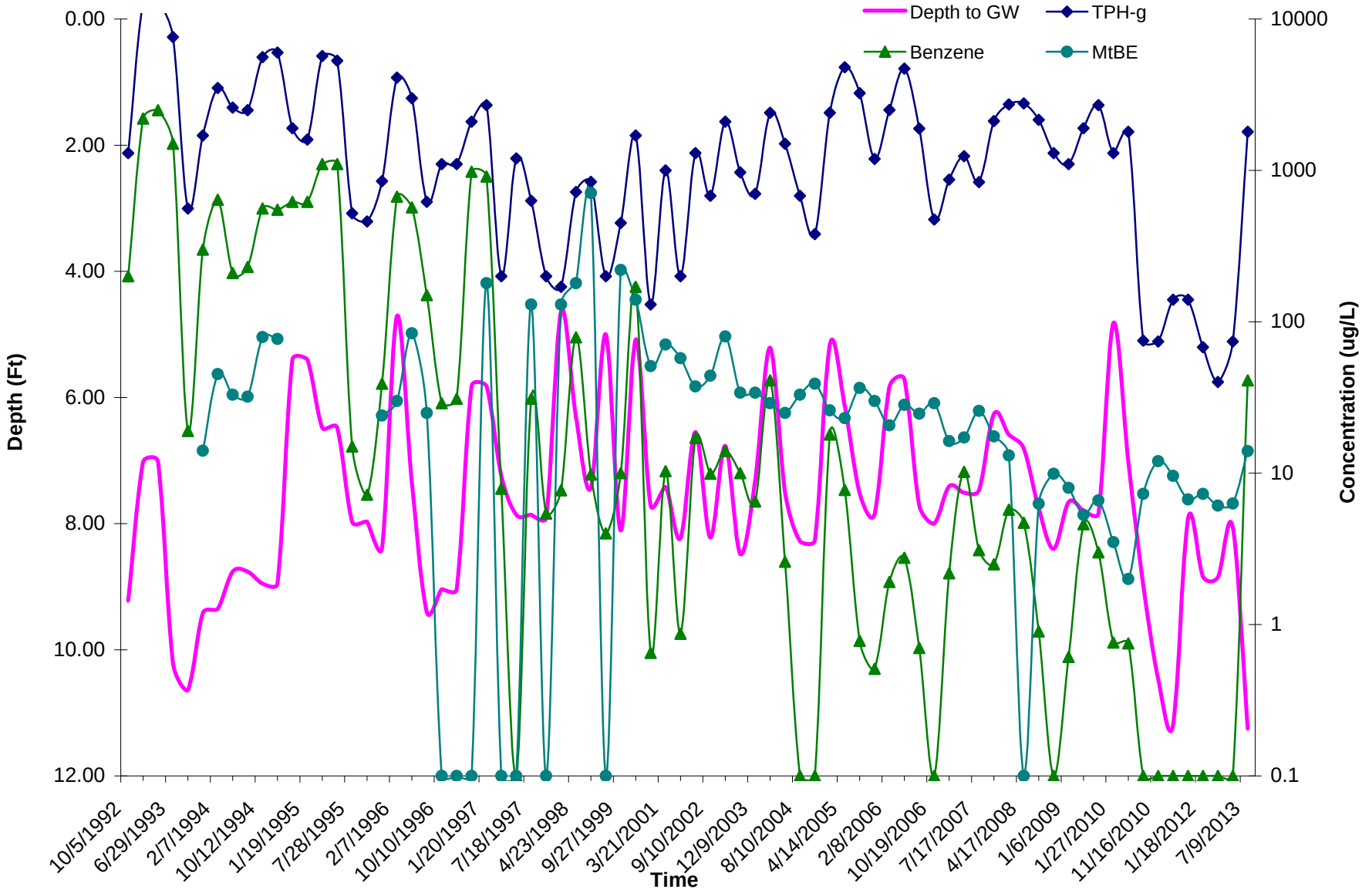


Figure 12: Contaminant Concentration Vs. Time in ESE-5

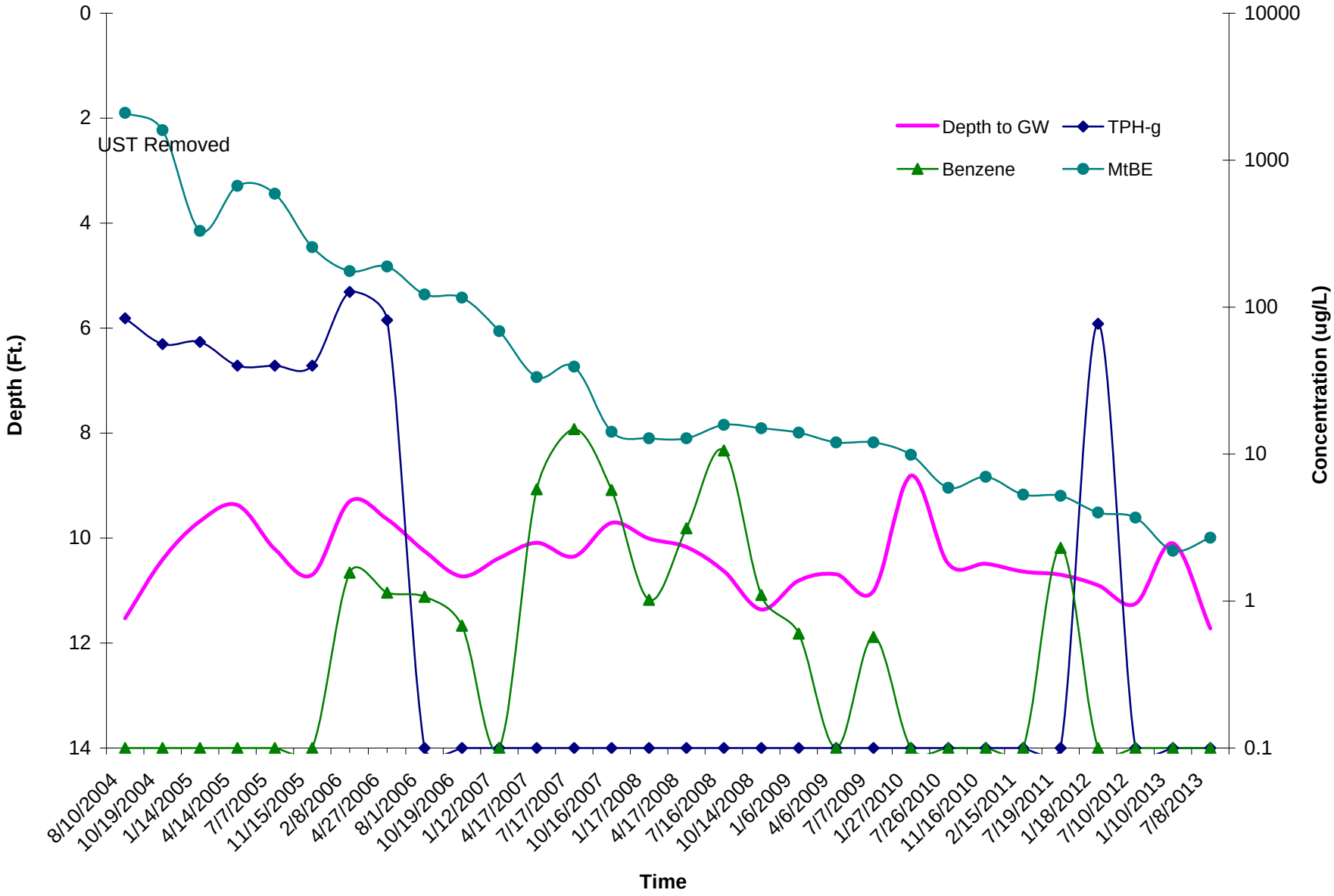


Figure 13: Contaminant Concentration Vs. Time in SOMA-1

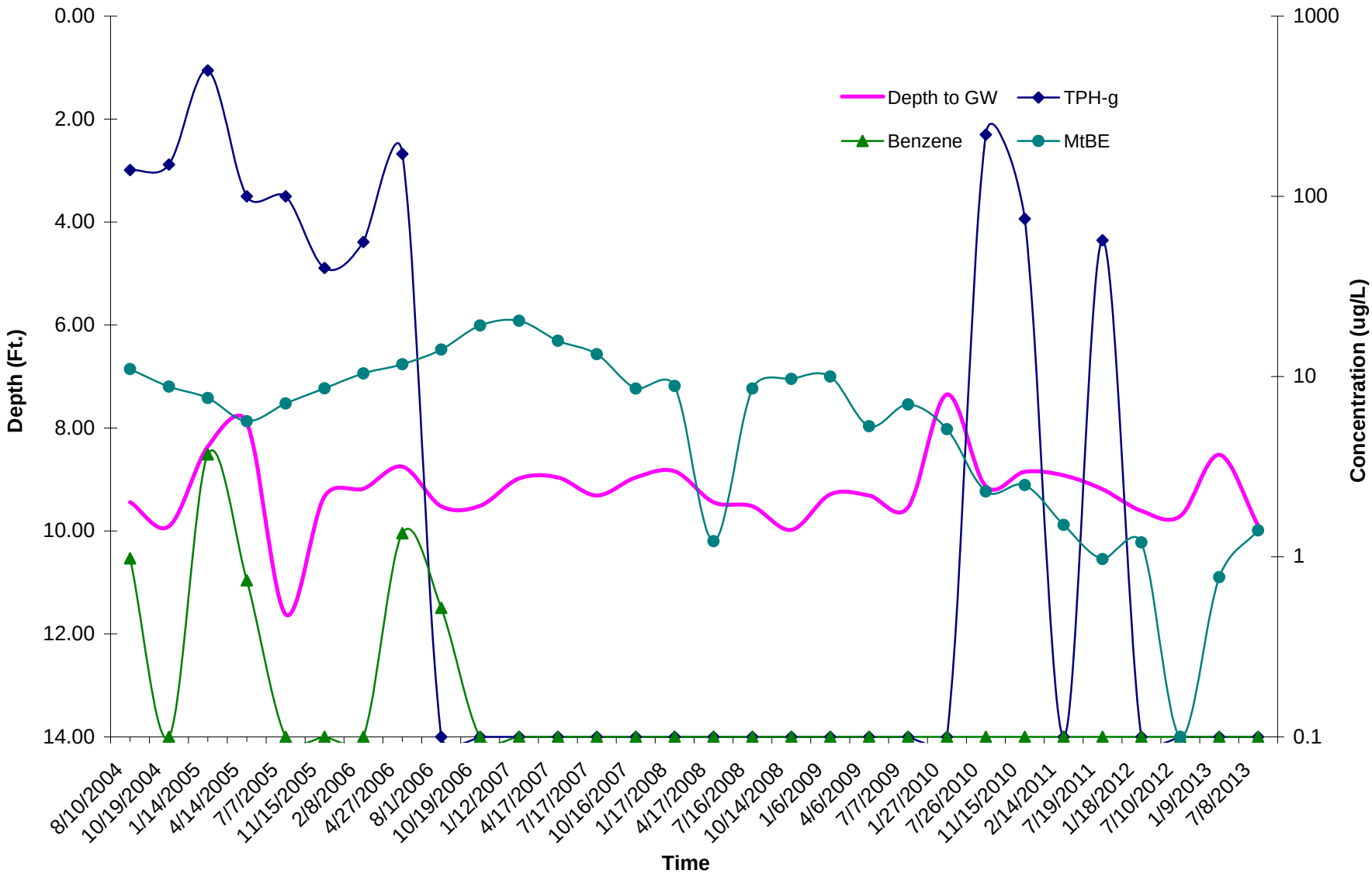


Figure 14: Contaminant Concentration Vs. Time in SOMA-4

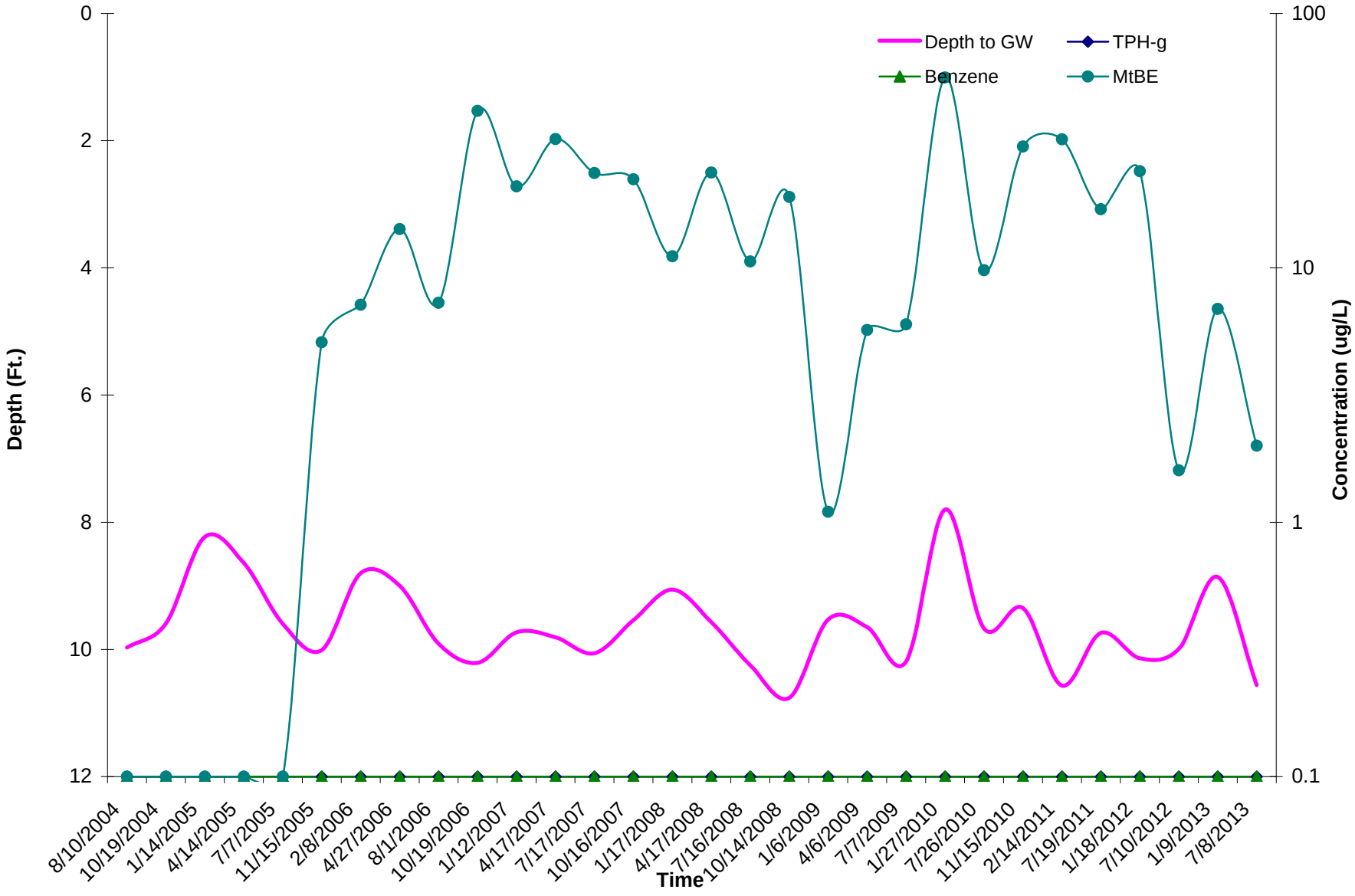


Figure 15: Contaminant Concentration Vs. Time in SOMA-3

Figure 16: TPH-g Conc vs. Distance from Former USTs

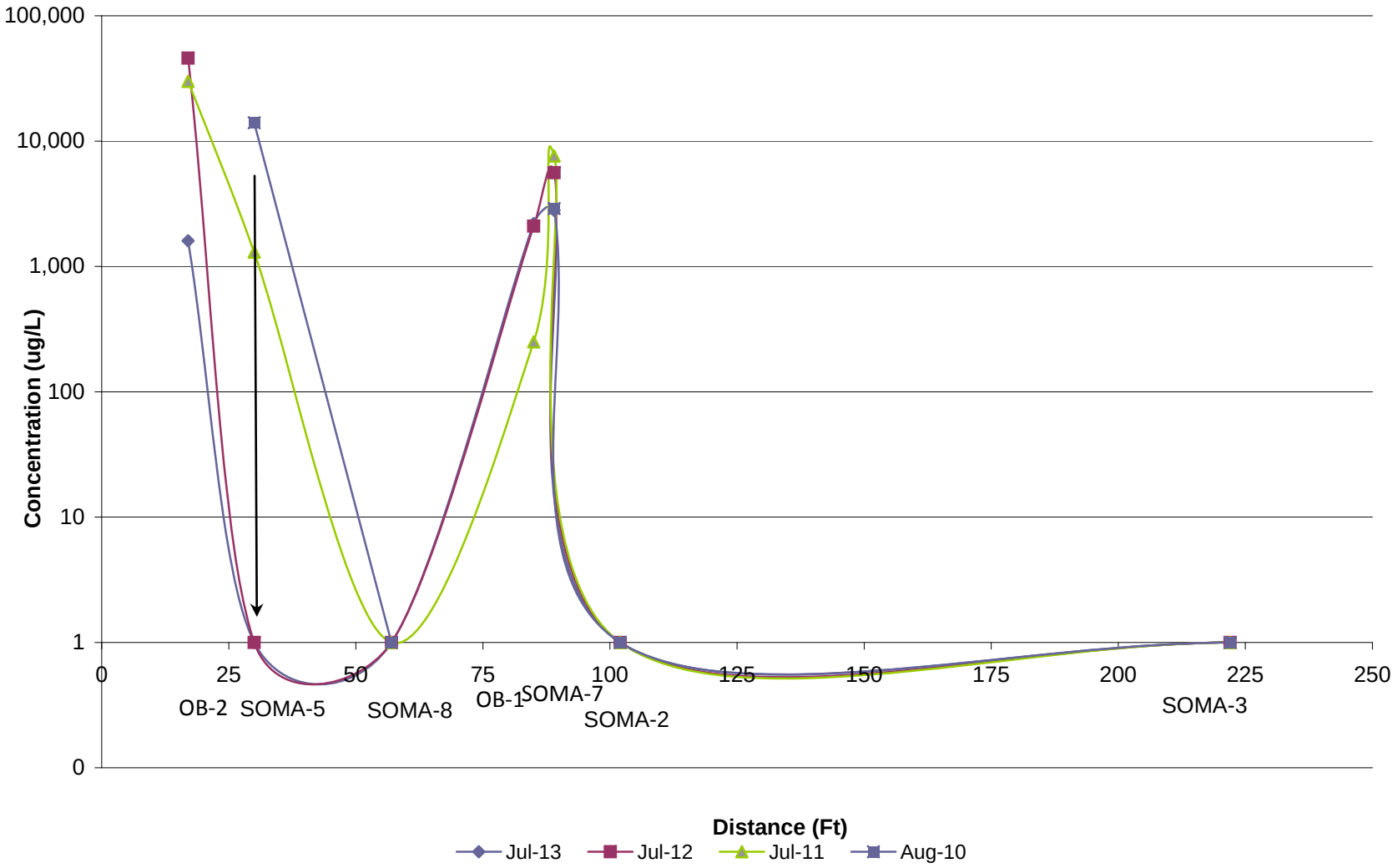


Figure 17: Benzene Conc vs. Distance from Former USTs

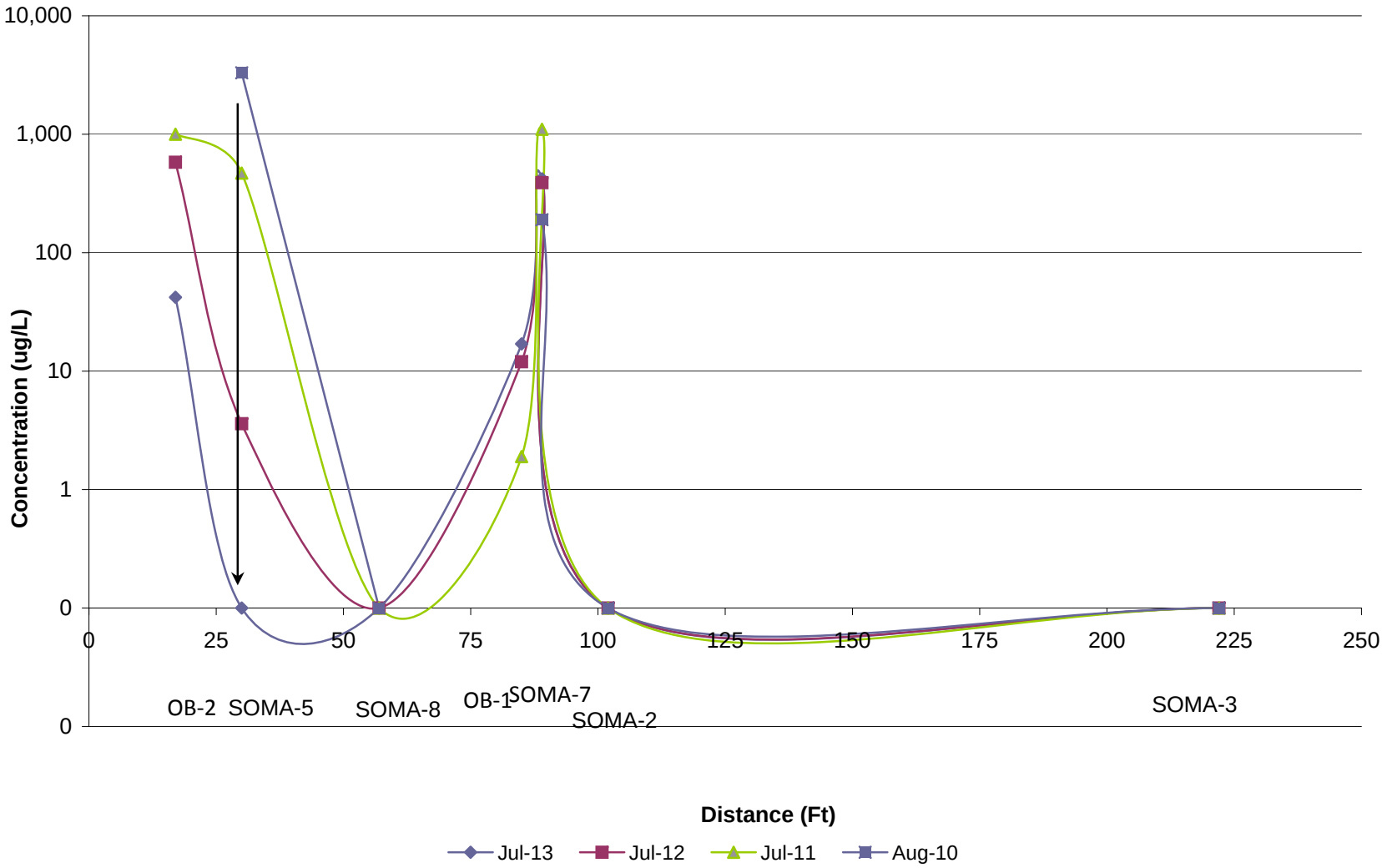
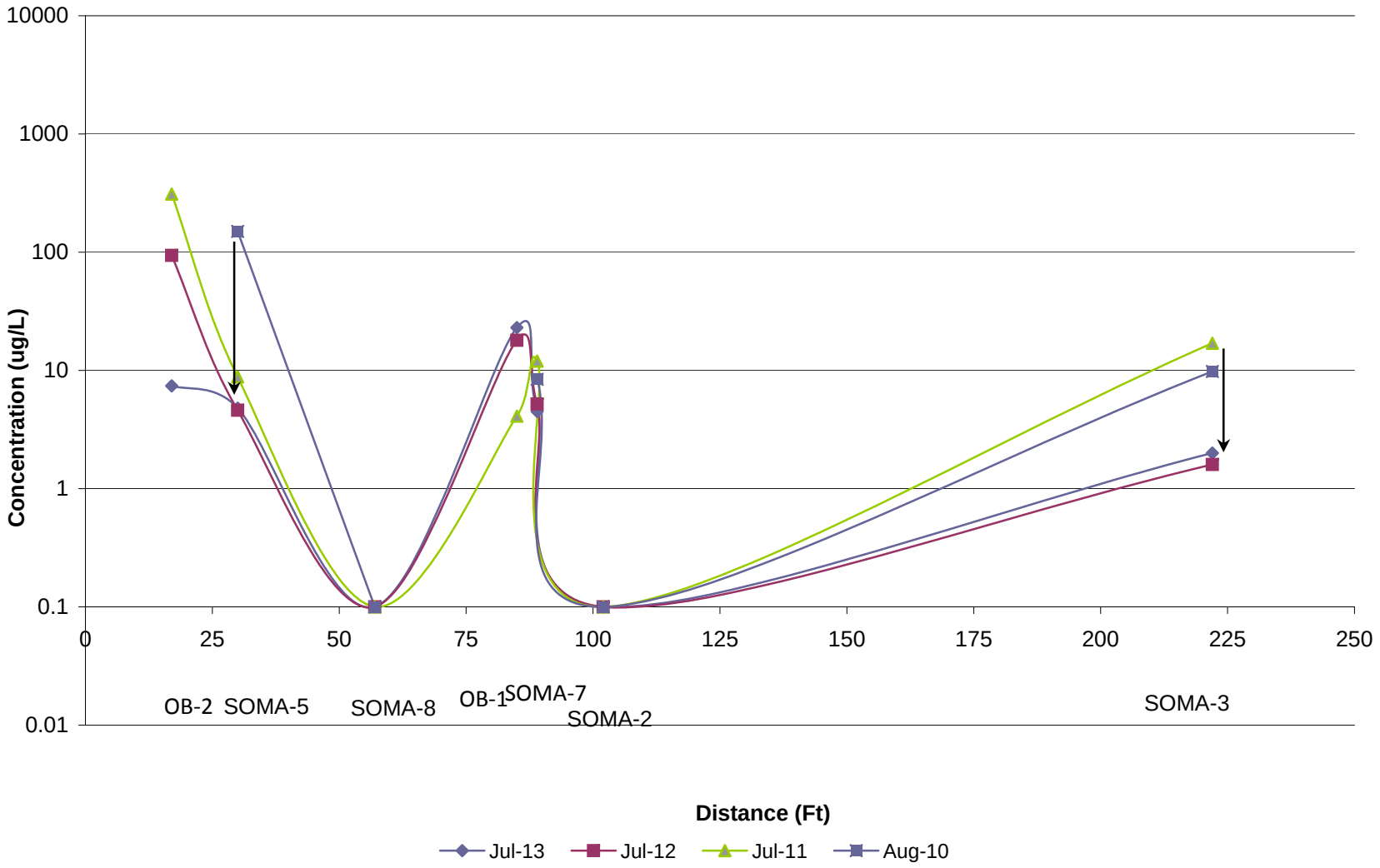


Figure 18: MtBE Conc vs. Distance from Former USTs



TABLES

Table 1
Soil Vapor Analytical Results -October 2013
3519 Castro Valley Blvd.
Castro Valley, California

Compound	Sample ID									Shallow Soil Gas Screening Levels (ESLs)		LTCP Screening Levels (Scenario 4, no bioattentuation zone)	
	SV-1 (ug/m^3)	SV-2 (ug/m^3)	SV-3 (ug/m^3)	SV-4 (ug/m^3)	SV-5 (ug/m^3)	SSG-1 (ug/m^3)	SSG-2 (ug/m^3)	SSG-3 (ug/m^3)	SV-1D *duplicate sample* (ug/m^3)	Commercial/ Industrial (ug/m^3)	Residential (ug/m^3)	Commercial/ Industrial (ug/m^3)	Residential (ug/m^3)
Benzene	51	63	**250**	51	43	<32	<32	18	53	420	42	280	85
Toluene	99	85	44	160	26	<19	<19	94[J]	73	1,300,000	160,000	NA	NA
Ethyl Benzene	280	38	820	68	<22	<22	<22	140	230	4,900	490	3,600	1,100
m,p-Xylene	450	57	300	230	44	<22	<22	500[J]	390	440,000	52,000	NA	NA
o-Xylene	66	52	49	74	<22	<22	<22	80[J]	60				
Total Xylenes	516	109	349	304	44	<22	<22	580[J]	450				
Naphthalene	14	4.7	76	3.7	3.7	9.4	3	65	16	360	36	310	93
	% by volume	% by volume	% by volume	% by volume	% by volume	% by volume	% by volume	% by volume	% by volume				
Carbondioxide	0.1	1.2	8.2	2.4	6.5	0.13	0.63	3.4	0.1	NL	NL	NA	NA
Methane	0.002	0.00012	0.002	0.00018	0.0001	0.00018	0.00019	<0.00010	0.002	NL	NL	NA	NA
Oxygen	21	20	11	12	15	21	20	17	21	NL	NL	NA	NA
Helium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.079	0.056	<0.05	NL	NL	NA	NA

Laboratory Note:

J- Estimated Value

Note

NL- Not Listed

< - Less Than Laboratory Reporting lLimit

ESLs Environmental Screening Levels per CRWQCB SFBay Region, Revised May 2013, Table E-2

(Shallow Soil Gas Screening levels for evaluation of Potential Vapor Intrusion Concerns)

LTCP Low Threat Underground Storage Tank Case Closure Policy, Media specific criteria: Petroleum vapor intrusion to indoor air, scenario 4, no bioattenuation zone

Table 2
Updated Site Conceptual Model

No.	CSM Element	CSM Sub-Element	Description	Data Gap	How to Address
1	Geology and Hydrogeology	Geology	The site is located in the Coast Range Geomorphic Province, on the eastern side of San Francisco Bay, approximately 1 mile west of the Hayward Fault. The U.S. Geologic Survey (USGS) mapped the site as weakly consolidated, slightly weathered, poorly sorted, irregular interbedded clay, silt, sand, and gravel. In addition, in developed urban areas such as the Bay Area, earthwork construction often involves emplacement of artificial fill derived from nearby cuts or quarries; quite often, artificial fill is emplaced over native earth materials to provide level building pads and base rock for roadways. Per ACEHS correspondence (1994), the site is located in the Castro Valley Basin, an isolated, structural basin surrounded to the west, north, and east by folded and faulted uplands comprised of Cretaceous sandstone, shale, and conglomerates of marine origin. The valley is bounded on the west by active traces of the Hayward fault. Sediments collected in the valley are mostly of fluvial origin and relatively thin (<100 feet thick). The site is underlaid with interbedded silty clay, sandy silt/silty sand, clayey sand, and clayey silt. An unconsolidated sequence of permeable and relatively impermeable sediments underlies the site. As borehole logs for TWB-1 through TWB-5 and SOMA-4 demonstrate, these unconsolidated sequences continue off-site to the south, with no obvious changes in lithology. Based on groundwater investigation results conducted in August 2009, groundwater under the site appears to be semi-confined. The semi-confining unit at the site is laterally continuous. The presence of groundwater at shallow depth bgs, above the Semi-Confined WBZ, suggests that there is a Shallow WBZ with a low recharge rate.		
		Hydrogeology	According to California's Groundwater Bulletin 118, the principal water bearing formation of the Castro Valley Groundwater Basin is alluvium of Pleistocene age, which unconformably overlies consolidated non-water bearing rock of Jurassic age and underlies a thin surficial deposit of alluvium of Holocene age. The Pleistocene alluvium is a heterogeneous mixture of unconsolidated clay, silt, sand, and gravel with a maximum thickness of 80 feet. According to Bulletin 118, groundwater in Castro Valley is unconfined and yields to wells are		

No.	CSM Element	CSM Sub-Element	Description	Data Gap	How to Address
			limited, usually only sufficient for irrigation. Per USGS (W-RIR 02-4259, 2003), this alluvium is part of the Newark aquifer that is present in the East Bay Flatlands to a depth of 30 to 130 feet below ground surface (bgs). Water in the Newark aquifer is generally confined except near recharge areas along the mountain front. The uplands north, east, and west of the valley likely represent areas of groundwater recharge from rain infiltration to aquifers present in the valley. The major drainage through the valley is San Lorenzo Creek located approximately ¾ mile east of the site. The Shallow WBZ is discontinuous. An 18 to 22 foot thick bed of silty clay and clayey silt overlies the Semi-Confined WBZ. This WBZ is composed of silty sand, sand, and clayey sand with a thickness of 2 to 15 feet. This Semi-Confined WBZ narrows under the center of the site to an approximately 2-foot thickness. If viewed south from ESE-5, along TWB-5 and SOMA-4, the WBZ thickens to 10 to 15 feet, possibly due to fossilized stream channels (which can occur in fluvial depositional environments). Preferential flow (stream) channels have also been observed south (downgradient) of the Xtra Oil station across Redwood Road. The Semi-Confined WBZ appears to be continuous and extends off-site to the southeast. Below the Semi-Confined WBZ is a fairly homogenous silty clay unit that extends to 30 feet bgs, the greatest depths explored on-site during historical investigations. Depth to first-encountered groundwater at the site has historically been at 12 feet bgs in the Shallow WBZ (when encountered) and between 18 and 31 feet bgs in the Semi-Confined WBZ, with groundwater later stabilizing to between 7.33 and 12.02 feet bgs (Shallow WBZ) and 6.5 and 11.50 feet bgs (Semi-Confined WBZ, except in DP-4 and DP-6, which only stabilized to 28 feet bgs and 19.79 feet bgs, respectively). Stable groundwater in the monitoring wells has historically been observed from 7.63 to 12.02 in the Shallow WBZ and from 2.36 to 12.02 feet bgs in the Semi-Confined WBZ. During the Third Quarter 2013 Groundwater Monitoring Event, groundwater was observed to flow southeasterly across the site in both WBZs at an approximate gradient of 0.016 feet/feet. The Rose diagram on Figure 2 demonstrates historical groundwater flow directions at the site. All monitoring wells on-site and off-site have been surveyed using the NAVD88 and NAD83 Datums.		

No.	CSM Element	CSM Sub-Element	Description	Data Gap	How to Address
2	Surface Water Bodies		Based on the information obtained from the Castro Valley General Plan, Castro Valley Creek, a tributary to the San Lorenzo Creek, is located approximately 200 feet to the east-southeast. The section of the creek, adjacent to the site and running from Castro Valley Boulevard north to Pine Street, was identified by the Alameda County Public Works Department as an improved channel with "Oak Riparian Woodland/ Wildlife Corridor." The creek's base flow channel is unlined and is approximately 15 to 20 feet wide. No special-status species were reported to use the Castro Valley Creek or its vicinity as their habitat. Although Castro Valley Creek is a potentially sensitive environment, due to the fact that no special-status species were reported to use this creek as their habitat and the creek's relative non-proximity to the site, the likelihood of significant impact from site groundwater contaminants is minimal.		
3	Nearby Wells		SOMA conducted a sensitive receptor survey in August 2006. After reviewing records from the Department of Water Resources District, 14 properties were identified as having well(s) on their premises. Of the 14 properties, five were reported to have irrigation wells. The remaining nine properties (locations) were reported to have monitoring or decommissioned wells. All five irrigation wells were located to the northeast (upgradient of the site) and are not expected to be impacted by contaminant plumes migrating off-site. Based on records obtained from the Alameda County Public Works Agency, 11 properties were identified as having well(s) on their premises. Of the 11 properties, two were reported to have irrigation wells; the remaining nine were reported to have decommissioned well(s), monitoring wells, or soil borings on their premises. From the two identified irrigation wells, one (No ***11***) is located upgradient, and the other (No ***4***) is located approximately 2,000 feet downgradient from the site. Although the off-site wells show detectable levels of COCs, the concentration levels are relatively low and decrease notably with distance. Therefore, the downgradient irrigation well (No ***4***), is not likely to be impacted by the contaminant plume in the immediate future.		
4	Nearby Release Sites		Xtra Oil is an active gasoline station located at 3495 Castro Valley Boulevard, directly west of the site (Figures 2 and 6). A similar lithology is observed at the site, consisting primarily of silty and clay with coarser sediments observed below 18 to 19 feet bgs. There are currently four 12,000-gallon USTs at the site; these tanks were		

No.	CSM Element	CSM Sub-Element	Description	Data Gap	How to Address
			installed in 1992 after removal of the former tanks. During the 1992 tank removal, surrounding soil was excavated from the tank pit and disposed of off-site. In 1990, MW-1 through MW-3 were installed at the Xtra Oil Station. TPH-g was detected in the soil at concentrations of 25 to 1,400 mg/kg. TPH-d was detected at 120 mg/kg. Also during this time, three boreholes were advanced at the site; TPH-g was detected in these boreholes ranging from 450 to 2,000 mg/kg. MW-2 was destroyed in 1996 during the widening of Redwood Road. In 1997, MW-4 was installed. In 2007, a groundwater extraction system was installed in EW-1. In late 2007, MW-5 through MW-12 were installed on-site and off-site downgradient of the USTs. Groundwater monitoring events have been ongoing since 1990. During the Fourth Quarter 2008 monitoring event at the site, approximately 0.33 feet of free product was encountered in OW-1 (located in Redwood Road, between Xtra Oil and subject site (approximately 55 feet west of subject site's property boundary). Free product was also observed in MW-4, along the eastern boarder of the Xtra Oil station (approximately 120 feet west of subject site's boundary). A reported groundwater flow direction at Xtra Oil station has fluctuated from easterly toward the subject site to the south-southwesterly (rose diagram of groundwater flow direction is shown on Figure 2). During the latest groundwater monitoring event dated January 9, 2013, TPH-g was detected at concentrations ranging from 14,000 to 42,000 µg/L, and TPH-d was observed from 13,000 to 92,000 µg/L. Benzene was detected at concentrations ranging from 46 to 14,000 µg/l, MtBE was detected in MW-3 and EW-1 at 500 and 1,500 µg/L, TBA was detected in EW-1 at 3,400 µg/L. Groundwater monitoring well MW-8 installed within the eastern sidewalk west of groundwater monitoring well SOMA-4 exhibited TPH-d and TPH-g concentrations of 1,900 µg/l and 680 µg/L illustrating the plume migration in the southeasterly direction from Xtra Oil Site. Groundwater was observed to flow west-southwest with a gradient of 0.0025 ft/ft at the site. The current groundwater flow direction at the site is not consistent with historical groundwater flow directions data. Historically, groundwater at this site has flowed due east, to south of east in the vicinity of the USTs; rose diagram of approximate groundwater flow direction is shown of Figure 2.		
5	Contaminants of Concern		Identified site-specific COCs include total petroleum hydrocarbons as gasoline (TPH-g); benzene, toluene, ethylbenzene, and total xylenes (collectively known as BTEX); methyl tertiary-butyl ether (MtBE); and		

No.	CSM Element	CSM Sub-Element	Description	Data Gap	How to Address
			tertiary-butyl alcohol (TBA). COCs have been detected in soil and groundwater beneath the site, including recently at concentrations that exceed CRWQCB Environmental Screening Limits (ESLs). There has been no historical or current observation of light or dense non-aqueous phase liquids (LNAPL/DNAPL) or free product in groundwater at the site.		
6	Source Removal		An Unauthorized Release was detected during the 1992 Preliminary Site Assessment at the subject site. A second Unauthorized Release was reported in May 2000, due to a leaking shear valve on the piping in the former UST pit. The site underwent remodeling in December 2003, when the former UST pit was excavated and the four USTs removed, a 2,000-gallon waste-oil tank was also removed at this time (location shown on Figure 2). Soils were over excavated to 12 feet bgs (8 feet for the waste-oil tank); the shallow soil (top 5 feet) was reused to backfill the new UST pit, after confirmation sampling determined that no COCs were present. The remaining soil and purge water from the former UST pit were transported off-site for disposal. The upgraded gasoline USTs, with capacities of 12,000 gallons and 20,000 gallons, as well as new piping and distribution lines, were installed during remodeling. A former dispenser island (and possible source of on-site contamination) was located along the western side of the site and was removed sometime prior to the 1995 Phase II Site Investigation (BP).		
7	Extent of Contamination in Soil		During removal of the USTs, piping, and distribution lines in 2003, TPH-g was detected at 530 mg/kg in PL1 at 4 feet bgs and in SB2-Composite at 390 mg/kg. MtBE was detected in samples taken from 8 to 10 feet bgs in the former UST tank pit along the northeast, northwest, and southwest tank wall. (0.059 to 0.075 mg/kg) and in the SB1-Composite at 0.23 mg/kg. During the off-site TWB investigation (December 2003), all COCs were non-detect or below ESLs, except MtBE, which was observed in TWB-2 at 24 feet bgs (0.027 mg/kg). Based on investigations conducted at the site from 2008 to 2011, residual soil impact (TPH-g) exists between 9 and 10 feet bgs in the western portion of the site to the south of former pump islands (980 mg/kg). High TPH-g levels have also been observed in the northeastern portion of the site at 720 mg/Kg. Historical sampling along the western property boundary exhibited TPH-g at 230 mg/kg between 7.5 and 8 feet bgs. The Environmental Screening Level (ESL) for TPH-g has been established at 100 mg/kg for shallow or deep soils		

No.	CSM Element	CSM Sub-Element	Description	Data Gap	How to Address
			where groundwater is a current or potential drinking water source. During the recent observation wells installation (June 2011), the highest TPH-g concentrations were detected adjacent to the western boundary of former UST cavity at 120 mg/kg. At present time the soil impact is shallow and extends from 4 to approximately 14 feet (or slightly below groundwater surface). Historically groundwater has fluctuated between 7.33 and 12.02 feet bgs in shallow WBZ, creating a smear zone where residual contamination is located. The smear zone is defined as an area where free product occurred in the soil and was then smeared across the soil when the water table fluctuated between historical high and low water table elevations.		
8	Extent of Contamination in Groundwater		Based on recent groundwater monitoring event (July 2013) and recent site investigation (August 2010): The Shallow WBZ appears to be impacted with TPH-g, TPH-d, and benzene along the southern portion of the site, with concentrations of 2,800 µg/L , 2,100 µg/L, and 420 µg/L respectively in SOMA-7. The Shallow WBZ is also impacted with MtBE along the southern portion of the site that has migrated off-site along the direction of groundwater flow. MtBE concentration was highest at OB-1 (23 µg/L), with concentration above ESL (5 µg/L) also observed in OB-2 (7.4 µg/L). The PHC plume in the Semi-Confined WBZ appears to be located along the southern portion of the site, in the vicinity of the former waste oil tank and downgradient of the former USTs. TPH-g was observed above ESL in ESE-1R (1,300 µg/L) and ESE-5R (1,800 µg/L). TPH-d concentrations were also highest at ESE-1R (1,600 µg/L), with elevated concentrations also observed in ESE-2R (250 µg/L), ESE-5R (190 µg/L), and MW-7R (200 µg/L). TPH-d contamination appears to be limited to the vicinity of the site. MtBE was observed in the Semi-Confined WBZ along the southern portion of the site and has migrated downgradient to SOMA-4. MtBE concentrations ranged from 1.4 µg/L in SOMA-4 to 15 µg/L in ESE-1R. TPH-g and benzene concentrations dropped significantly in ESE-5R after reconstruction, while concentrations are elevated in SOMA-7, suggesting that the majority of contamination along the western portion of the site is in the Shallow WBZ. Therefore, Groundwater contamination has been laterally and vertically delineated within the Shallow and Semi-Confined WBZs.		

No.	CSM Element	CSM Sub-Element	Description	Data Gap	How to Address
			Contamination in both WBZs is centered on the southern portion of the site with only slight contamination extending off-site. Limited concentrations at SOMA-3 and SOMA-4 delineate the lateral downgradient extent of contamination within the Shallow WBZ and Semi-Confined WBZ, respectively. TPH-g, TPH-d, and benzene contamination appear to be greatest in the Shallow WBZ, centered at SOMA-7. The highest TPH-g, TPH-d, and MtBE concentrations in the Semi-Confined WBZ are centered on ESE-1R and ESE-5R.		
9	Vapor Intrusion		A soil vapor investigation was conducted at the site, where five soil vapor sampling probes and three sub-slab vapor sampling probes were installed at the site. Soil vapor samples were obtained from all vapor probes. All contaminants of concern were either below laboratory-reporting limit or below the ESLs for commercial/industrial land use (CRWQCB, revised May 2013) and LTCP screening levels for commercial land use. However, Benzene concentration in SV-3 was above the LTCP screening level for residential land use. Benzene concentrations in SV-1 through SV-5 were also above the ESL of 42 µg/m^3, ethylbenzene in SV-3 was above the ESL of 490 µg/m^3, and naphthalene concentrations in SV-3 and SSG-3 were above the ESL of 36 µg/m^3 for residential land use.	Temporal and seasonal variation in soil gas concentrations	Results of the next sampling event to be conducted in spring 2014 will help us assess temporal and seasonal variation in soil gas concentrations
10	Plume Behavior Evaluation		Behavior of the plume margin is of concern when defining dissolved contaminant plume behavior. Evaluation of plume behavior assists in determining if the plume is a receding plume, a stable plume or an advancing plume. After the 2003 UST removal, COC concentrations dropped in SOMA-1 (Figure 13). MtBE is observed to migrate off-site, passing SOMA-2 from October 2004 through September 2007 and concentrations increased in SOMA-3 from early 2006, until dropping below ESLs during recent monitoring event (Figures 6 and 15). TPH-g was elevated in SOMA-4, until August 2006, when levels dropped below ESL and have remained constant at approximately 10 µg/L (Figure 14). Removal of the former USTs did not impact ESE-5 (Figure 12), where TPH-g concentrations have fluctuated with spikes in early 2005 and 2006, when concentrations jumped from 2,500 and 3,500 to nearly 5,000 µg/L. TPH-g levels fluctuated and were recently detected at 1,800 µg/L. The UST removal appears to have affected		

No.	CSM Element	CSM Sub-Element	Description	Data Gap	How to Address
			MtBE concentrations in ESE-1 (Figure 11). Since 2003, Benzene and TPH-g concentration in ESE-1 have fluctuated, but remained around 100-200 µg/L for benzene and around 1,000 µg/L for TPH-g. Similarly since 2003 in ESE-5/5R and since installation of SOMA-7 and OB-1, TPH-g and benzene have fluctuated but do not show a decreasing trend. Continued elevated concentrations suggest that the plume affecting these wells is moving across the southern portion of the site, in an easterly direction. To evaluate movement of the contaminant plume, concentration versus distance was plotted. Figures 16, 17, and 18 shows TPH-g, benzene, and MtBE concentrations with distance from the former USTs in shallow WBZ. The TPH-g plume is stable beneath the western property boundary (OB-1 and SOMA-7) and shrinking under the site, as shown by the decreased concentrations in OB-2 and SOMA-5. MtBE plume is shrinking as shown by decreasing concentrations in SOMA-3. Based on the most recent groundwater monitoring event (Q3 2013), groundwater flows southeasterly across the site at an approximate gradient of 0.016 feet/feet. In addition to determining the directions of groundwater flow, it is essential to determine approximate rates of groundwater movement. Hydraulic conductivity and gradient data are required to estimate the Darcian or bulk flow rates of ground water. Since at this time, no slug or pumping test has been conducted at the site, hydraulic conductivity data was estimated based on lithologies observed within the site WBZ. The WBZ is comprised of silty sands (SM) and sandy silts (ML) and some sands (SP). Therefore, hydraulic conductivity was estimated between 10^{-5} and 10^{-3} (cm/s). Using Darcy's Law and the groundwater flow gradient of 0.016 ft/ft and aquifer porosity of 0.25, the groundwater flow velocity was calculated to be between 0.2 and 20 ft/year.		

APPENDIX A
Site History

Previous Activities

1984: Three single-walled fiberglass underground storage tanks (USTs) with capacities of 6,000 gallons, 8,000 gallons, and 10,000 gallons, were installed in the southeastern portion of the site. A former dispenser island reportedly existed on the west side of the site; however, there was no available information about the dispenser removal date.

1988: A 1,000-gallon, double-walled, fiberglass waste oil tank (WOT) was installed to replace the previous 380-gallon WOT. In September, Kaprealian Engineering, Inc. removed the original 380-gallon WOT and observed holes in this UST. As a result, confirmation soil samples were collected from the bottom of the excavation. The following analytical soil results were observed: benzene and toluene were detected at 6.8 µg/kg and 9.5 µg/kg, respectively; total petroleum hydrocarbons (TPH) and total oil and grease (TOG) constituents were not detected.

September and October 1992: Environmental Science & Engineering, Inc. (ESE) drilled five soil boreholes and converted them into monitoring wells (ESE-1 through ESE-5). Soil and groundwater samples were collected during well installation. In the soil samples, the maximum level of soil contamination was detected in monitoring well borehole ESE-5 at 220,000 µg/kg TPH as gasoline (TPH-g); 1,400 µg/kg benzene; 8,200 µg/kg toluene; 3,300 µg/kg ethylbenzene; and 18,000 µg/kg xylenes. In the groundwater samples collected from ESE-1, maximum concentrations were TPH-g at 2,300 µg/L; benzene at 370 µg/L; toluene at 160 µg/L; ethylbenzene at 17 µg/L; and xylenes at 110 µg/L.

July 1995: Three additional monitoring wells were installed: two on-site wells, MW-6 and MW-8, and one off-site well, MW-7.

April 1996: Well MW-8, located on the western margin of the site, was decommissioned to accommodate the road-widening project along Redwood Boulevard.

August 20, 2003: Prior to UST removal, SOMA oversaw drilling of two boreholes by Vironex. The boreholes were drilled in order to characterize the soil for landfill acceptance criteria.

September 2003: Three single-walled, fiberglass USTs, with capacities of 6,000 gallons, 8,000 gallons, and 10,000 gallons, were removed and replaced with two new double-walled, fiberglass USTs with capacities of 12,000 gallons and 20,000 gallons. In addition, the dispensers, product lines, and vent lines were removed and replaced. Soil below 5 feet bgs was disposed of off-site. Shallow soil was used as backfill material for the former UST pit after confirmation.

Third Quarter 2003: Two monitoring wells, ESE-3 and ESE-4, were decommissioned due to construction activities.

Fourth Quarter 2003: In December, SOMA oversaw drilling of off-site temporary well boreholes TWB-1 through TWB-5 to determine the horizontal extent of off-site petroleum hydrocarbon contamination.

June 2004: On June 10, SOMA installed on- and off-site monitoring wells: SOMA-1 in the southeastern section of the site, and SOMA-2 to SOMA-4 south and southeast of the site. Kier and Wright Engineers Surveyors, of Pleasanton, California, surveyed all site wells on June 21.

August 2006: SOMA conducted a sensitive receptor survey and it was concluded that no irrigation or domestic wells, and no sensitive groups or environments, evaluated during this sensitive receptor survey and located within ½-mile radius have the potential to be impacted by the site's contaminants at this time

Third Quarter 1993 to Present: On-going quarterly groundwater monitoring events have been conducted at the site.

September 2008: Shell Oil conducted a Phase II investigation. Elevated TPH-g concentrations 900 µg/L in groundwater and 720 mg/kg in soil were observed in the borings. Based on these elevated readings, Shell Oil filed a UST Unauthorized Release Report with Alameda County Environmental Health on September 24, 2008.

February 2009: Per ACEHD correspondence dated January 8, 2009, SOMA prepared a Site Conceptual Model and workplan to address data gaps at the site. SOMA proposed advancing soil borings to further define the lateral and horizontal extent of COC impact to vadose zone and the WBZ (up to 31 feet bgs). Per the ACEHD correspondence dated March 27, 2009, SOMA submitted a workplan addendum which was approved by the ACEHD on July 10, 2009 which reduced the number of DP borings from 9 to 7 and proposed the advancement of a shallow groundwater monitoring well within the vadose zone (screened across the potentiometric surface) to determine the appropriateness of the screening interval for existing wells at the site.

August 2009: SOMA conducted a soil and groundwater investigation at the site, advancing seven soil borings and installed shallow groundwater monitoring well SOMA-5 to determine if groundwater at the site is confined or semi-confined. TPH-g was elevated in groundwater samples from DP-1 and DP-2 (210 µg/L and 130 µg/L, respectively) along the northwestern portion of the site and in DP-5 and DP-6 (640 µg/L and 1,600 µg/L, respectively) along the eastern portion of the station (north of the former USTs). TPH-d was elevated in all groundwater samples, with concentrations between 130 µg/L and 980 µg/L (DP-7 and DP-4,

respectively). TPH-mo was observed only along the western portion of the site, in DP-2 through DP-4, with concentrations ranging from 360 µg/L to 570 µg/L. Based on elevated TPH concentrations along the northwestern portion of the site it appears that plume commingling might be occurring. It was determined that wells of ESE-1, ESE-2, ESE-5, MW-6 and MW-7 appear to be screened excessively long and are causing cross-contamination.

August 2010: SOMA replaced (reconstructed) ESE-1, ESE-2, ESE-5, MW-6 and MW-7 with wells screened within the confined WBZ and installed two additional groundwater monitoring wells (SOMA-7 and SOMA-9) adjacent to the reconstructed wells (within 5 feet) and completed within the shallow zone. No water was observed in SB-6 and SB-8, therefore the borings were not converted to wells.

March 2011: SOMA prepared a CAP/Feasibility Study proposing MPE Pilot Testing, Air Sparging, and aquifer testing at the site.

June/July 2011: Two observation wells (OB-1 and OB-2) were installed on the site. Under SOMA's oversight, Golden Gate Remediation Technology (GGRT) performed MPE pilot testing between June 20 and July 1, 2011, utilizing SOMA-5, SOMA-7 OB-1 and OB-2. The pilot test was performed using a self-contained mobile treatment system (MTS). Both soil vapor and groundwater were extracted from the subsurface. Due to relatively low water recovery rates observed during pilot testing, MPE configuration rather than dual phase extraction (DPE) was utilized. The estimated total mass of VOCs removed from soil vapor extracted from extraction wells was 7.05 pounds. The calculated average VOC mass removal rate was approximately 2.46 lbs/day.

July 2013: SOMA submitted a workplan for soil gas study for evaluation of soil vapor intrusion to the ACEH.

APPENDIX B
Permits

Alameda County Public Works Agency - Water Resources Well Permit

399 Elmhurst Street
Hayward, CA 94544-1395
Telephone: (510)670-6633 Fax:(510)782-1939

Application Approved on: 10/02/2013 By jamesy

Permit Numbers: W2013-0828
Permits Valid from 10/04/2013 to 10/04/2013

Application Id: 1380237193994
City of Project Site: Castro Valley
Site Location: 3519 Castro Valley Blvd.
Project Start Date: 10/04/2013
Completion Date: 10/04/2013
Assigned Inspector: Contact Steve Miller at (510) 670-5517 or stevem@acpwa.org

Applicant: SOMA Environmental Engineering - Mansour Sepehr (510)-714-0406
6620 Owens Drive, Suite A, Pleasanton, CA 94588
Phone: 925-734-6400

Property Owner: Mirazim Shakoori
4313 Mansfield Drive, Danville, CA 94506
Phone: 925-648-0954

Client: ** same as Property Owner **

Contact: Lizzie Hightower
Phone: 925-734-6400
Cell: 925-330-5235

Total Due: $265.00
Receipt Number: WR2013-0376 **Total Amount Paid:** $265.00
Payer Name : Mansour Sepehr Paid By: VISA **PAID IN FULL**

Works Requesting Permits:

Well Construction-Vapor monitoring well-Vapor monitoring well - 5 Wells
Driller: Vironex - Lic #: 705927 - Method: DP

Work Total: $265.00

Specifications

Permit #	Issued Date	Expire Date	Owner Well Id	Hole Diam.	Casing Diam.	Seal Depth	Max. Depth
W2013-0828	10/02/2013	01/02/2014	SV-1	3.00 in.	0.25 in.	5.00 ft	7.00 ft
W2013-0828	10/02/2013	01/02/2014	SV-2	3.00 in.	0.25 in.	5.00 ft	8.50 ft
W2013-0828	10/02/2013	01/02/2014	SV-3	3.00 in.	0.25 in.	5.00 ft	9.50 ft
W2013-0828	10/02/2013	01/02/2014	SV-4	3.00 in.	0.25 in.	5.00 ft	10.00 ft
W2013-0828	10/02/2013	01/02/2014	SV-5	3.00 in.	0.25 in.	5.00 ft	8.00 ft

Specific Work Permit Conditions

1. Drilling Permit(s) can be voided/ cancelled only in writing. It is the applicant's responsibility to notify Alameda County Public Works Agency, Water Resources Section in writing for an extension or to cancel the drilling permit application. No drilling permit application(s) shall be extended beyond ninety (90) days from the original start date. Applicants may not cancel a drilling permit application after the completion date of the permit issued has passed.

2. Compliance with the above well-sealing specifications shall not exempt the well-sealing contractor from complying with appropriate state reporting-requirements related to well destruction (Sections 13750 through 13755 (Division 7, Chapter 10, Article 3) of the California Water Code). Contractor must complete State DWR Form 188 and mail original to the Alameda County Public Works Agency, Water Resources Section, within 60 days, including permit number and site map.

3. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to,

properly damage, personal injury and wrongful death.

4. Permittee, permittee's contractors, consultants or agents shall be responsible to assure that all material or waters generated during drilling, boring destruction, and/or other activities associated with this Permit will be safely handled, properly managed, and disposed of according to all applicable federal, state, and local statutes regulating such. In no case shall these materials and/or waters be allowed to enter, or potentially enter, on or off-site storm sewers, dry wells, or waterways or be allowed to move off the property where work is being completed.

5. Prior to any drilling activities, it shall be the applicant's responsibility to contact and coordinate an Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits or agreements required for that Federal, State, County or City, and follow all City or County Ordinances. No work shall begin until all the permits and requirements have been approved or obtained. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County an Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained.

6. No changes in construction procedures or well type shall change, as described on this permit application. This permit may be voided if it contains incorrect information.

7. Applicant shall submit the copies of the approved encroachment permit to this office within 60 days.

8. Applicant shall contact Steve Miller for an inspection time at (510) 670-5517 or email to stevem@acpwa.org at least five (5) working days prior to starting, once the permit has been approved. Confirm the scheduled date(s) at least 24 hours prior to drilling.

9. Wells shall have a Christy box or similar structure with a locking cap or cover. Well(s) shall be kept locked at all times. Well(s) that become damaged by traffic or construction shall be repaired in a timely manner or destroyed immediately (through permit process). No well(s) shall be left in a manner to act as a conduit at any time.

10. Copy of approved drilling permit must be on site at all times. Failure to present or show proof of the approved permit application on site shall result in a fine of $500.00.

11. Vapor monitoring wells above water level constructed with tubing maybe be backfilled with pancake-batter consistency bentonite. Minimum surface seal thickness is two inches of cement grout around well box.

Vapor monitoring wells above water level constructed with pvc pipe shall have a minimum seal depth (Neat Cement Seal) of 2 feet below ground surface (BGS). Minimum surface seal thickness is two inches of cement grout around well box. All other conditions for monitoring well construction shall apply.

APPENDIX C

Field Records, Boring Logs
and Well Completion Reports

SOMA
ENVIRONMENTAL ENGINEERING, INC.
6620 Owens Drive, Suite A • Pleasanton, CA 94588
TEL (925)734-6400 • FAX (925)734-6401

FIELD REPORT

Site Address: 3519 Castro Valley Blvd, Castro Valley Proj. No: 2762

Job Performing: Soil gas Sampling Date: 10/10/13

Arrival Time: 08:00 Departure Time: 16:00

Travel Time to Site & Back: 1 hour

Staff Geol/Eng Signature: _____

Time: 07:30 Left for site

08:00 Arrived onsite, Vironex onsite - did H&S meeting & site walk-thru.

8:45 Mobilized onto SSG-3 (inside building)

Time: Got set up & then clerk asked us to start outside ~~when~~ since store was busy in morning.

Time: 10:20 Mobilized onto SV-2. Purged sample of 3 purge volumes. Shut-in/leak test for ~2 minutes - no drop in pressure.

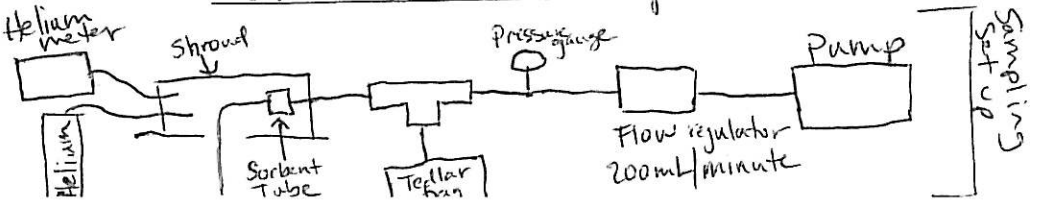
Time: Flow regulator on pump is pre-set for 200 mL/minute - will pull sample for 1 minute. Sampled 10:50 - 10:51

11:10 Mobilized onto SV-~~4~~3. Purged sample

Time: of 3 purge volumes. Shut-in/leak test for ~~app~~ ~2minutes - no drop in pressure Sampled 11:39 - 11:40

Time: 11:59 Mobilized onto SV-3. Purged sampled of 3 purge volumes. Shut-in/leak test for ~2minutes. Sampled 12:12 - 12:13

*Leak test samples for helium + atmospheric gases collected in tedlar bags @ each sampling point.



SOMA
ENVIRONMENTAL ENGINEERING, INC.
6620 Owens Drive, Suite A • Pleasanton, CA 94588
TEL (925)734-6400 • FAX (925)734-6401

FIELD REPORT

Site Address: 3519 Castro Valley Blvd, Castro Valley Proj. No: 2762

Job Performing: Soil gas sampling Date: 10/10/13

Arrival Time:_____ Departure Time: _____

Travel Time to Site & Back: _____

Staff Geol/Eng Signature:_____

Time: 12:38 Mobilized onto SV-5, purged sample of 3 purge volumes. Shut-in/leak test for ~2 minutes. Sampled 13:11-13:12 [13:15-13:45] Lunch

Time: 13:45 Mobilized onto SV-1. Purged sample of 3 purge volumes, shut-in/leak test for ~2 minutes. Sampled 14:03-14:04

Time: Took Duplicate sample SV-1D from 14:09-14:10 14:25 Mobilized onto SSG-1, purged prior to sampling (approx. 30 seconds since not a lot

Time: of volume to purge). Shut-in/leak test for ~2 minutes. Sampled 14:34-14:35 14:42 Mobilized onto SSG-2. Purged 30 sec. Shut-in/leak test for ~2minuts, Sampled 14:57-14:58

Time: 15:05 Mobilized onto SSG-3, purged 30 sec. Shut-in/leak test for ~2 minutes. Sampled 15:18-15:19

Time: 15:25 Cleared up/ loaded up truck & left site

SOMA ENVIRONMENTAL ENGINEERING, INC.

GEOLOGIC LOG OF BOREHOLE: SV-1

PROJECT: 2762

DATE DRILLED: October 4, 2013

SITE LOCATION: 3519 Castro Valley Blvd.
Castro Valley, CA

CASING ELEVATION: NA

DRILLER: Vironex

First Encountered GW: NA
Stablized GW: NA

DRILLING METHOD: Direct Push

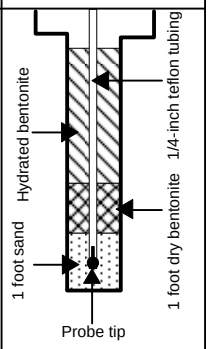
T.O.C. TO SCREEN: NA

BORING DIAMETER: 3-inch

SCREEN LENGTH: NA

LOGGED BY: E. Hightower

APPROVED BY: M. Sepehr

PID ppm	DEPTH	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	SAMPLED: SPLIT SPOON / CORE	GW LEVEL	BLOWCOUNTS	WELL DIAGRAM
	0		CL	Hand Auger to 4 feet bgs SANDY LEAN CLAY: Dark brown, firm, moist, ~40% fine to coarse-grained sand, medium toughness, medium plastic, medium dilatancy, medium dry strength, Petroleum Hydrocarbon (PHC) odor and green mottling begins at 1.5 feet As above, black at 3 feet.				
	5							
	10							
	15							
	20							
	25							

COMMENTS:

SOMA ENVIRONMENTAL ENGINEERING, INC.

GEOLOGIC LOG OF BOREHOLE: SV-2

PROJECT: 2762

DATE DRILLED: October 4, 2013

SITE LOCATION: 3519 Castro Valley Blvd.
Castro Valley, CA

CASING ELEVATION: NA

DRILLER: Vironex

First Encountered GW: NA
Stablized GW: NA

DRILLING METHOD: Direct Push

T.O.C. TO SCREEN: NA

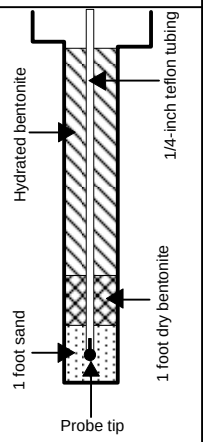
BORING DIAMETER: 3-inch

SCREEN LENGTH: NA

LOGGED BY: E. Hightower

APPROVED BY: M. Sepehr

PID ppm	DEPTH	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	SAMPLED: SPLIT SPOON	SAMPLED: CORE	GW LEVEL	BLOWCOUNTS	WELL DIAGRAM
			CL	Hand Auger to 5 feet bgs SANDY LEAN CLAY: Brown, soft, moist, ~30% fine to coarse-grained sand, medium toughness, medium plastic, slow dilatancy, medium dry strength, no Petroleum Hydrocarbon (PHC) odor.					
			CL	LEAN CLAY: Dark brown, moist, firm, high plasticity, medium toughness, medium dry strength, slow dilatancy, no PHC odor.					
	5		CL	LEAN CLAY WITH SAND: Brown, moist, firm, ~15% fine- to coarse-grained sand, high plasticity, medium toughness, medium dry strength, slow dilatancy, no PHC odor.					
	10								
	15								
	20								
	25								



COMMENTS:

ENVIRONMENTAL ENGINEERING, INC.

GEOLOGIC LOG OF BOREHOLE: SV-3

PROJECT: 2762

DATE DRILLED: October 4, 2013

SITE LOCATION: 3519 Castro Valley Blvd.
Castro Valley, CA

CASING ELEVATION: NA

DRILLER: Vironex

First Encountered GW: NA
Stablized GW: NA

DRILLING METHOD: Direct Push

T.O.C. TO SCREEN: NA

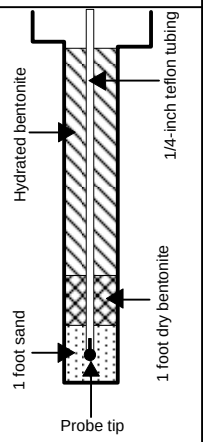
BORING DIAMETER: 3-inch

SCREEN LENGTH: NA

LOGGED BY: E. Hightower

APPROVED BY: M. Sepehr

PID ppm	DEPTH	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	SAMPLED: SPLIT SPOON	SAMPLED: CORE	GW LEVEL	BLOWCOUNTS	WELL DIAGRAM
			CL	Hand Auger to 5 feet bgs SANDY LEAN CLAY: Brown with some rust mottling, soft, moist, ~30% fine to coarse-grained sand, medium toughness, medium plastic, slow dilatancy, medium dry strength, no Petroleum Hydrocarbon (PHC) odor.					
			CL	LEAN CLAY: Dark brown, moist, firm, medium plasticity, medium toughness, medium dry strength, slow dilatancy, no PHC odor.					
	5		CL	SANDY LEAN CLAY: Brown with some rust mottling, soft, moist, ~30% fine to coarse-grained sand, medium toughness, medium plastic, slow dilatancy, medium dry strength, no PHC odor.					
	10								
	15								
	20								
	25								



COMMENTS:

SOMA ENVIRONMENTAL ENGINEERING, INC.

GEOLOGIC LOG OF BOREHOLE: SV-4

PROJECT: 2762

DATE DRILLED: October 4, 2013

SITE LOCATION: 3519 Castro Valley Blvd.
Castro Valley, CA

CASING ELEVATION: NA

DRILLER: Vironex

First Encountered GW: NA
Stablized GW: NA

DRILLING METHOD: Direct Push

T.O.C. TO SCREEN: NA

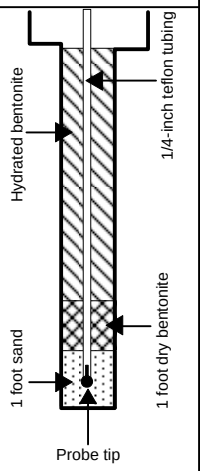
BORING DIAMETER: 3-inch

SCREEN LENGTH: NA

LOGGED BY: E. Hightower

APPROVED BY: M. Sepehr

PID ppm	DEPTH	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	SAMPLED: SPLIT SPOON	SAMPLED: CORE	GW LEVEL	BLOWCOUNTS	WELL DIAGRAM
	0		CL	Hand Auger to 5 feet bgs SANDY LEAN CLAY: Brown with some rust mottling, soft, moist, ~30% fine to coarse-grained sand, medium toughness, medium plastic, slow dilatancy, medium dry strength, no Petroleum Hydrocarbon (PHC) odor.					
			CL	LEAN CLAY: Dark brown, moist, firm, medium plasticity, medium toughness, medium dry strength, slow dilatancy, no PHC odor.					
	5		CL	SANDY LEAN CLAY: Brown with some rust mottling, soft, moist, ~30% fine to coarse-grained sand, medium toughness, medium plastic, slow dilatancy, medium dry strength, no PHC odor.					
	10								
	15								
	20								
	25								



COMMENTS:

SOMA ENVIRONMENTAL ENGINEERING, INC.

GEOLOGIC LOG OF BOREHOLE: SV-5

PROJECT: 2762

DATE DRILLED: October 4, 2013

SITE LOCATION: 3519 Castro Valley Blvd.
Castro Valley, CA

CASING ELEVATION: NA

DRILLER: Vironex

First Encountered GW: NA
Stablized GW: NA

DRILLING METHOD: Direct Push

T.O.C. TO SCREEN: NA

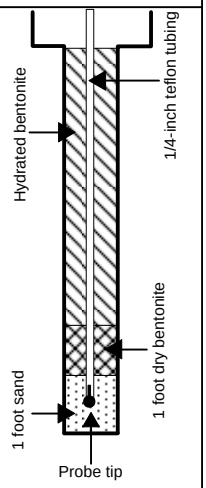
BORING DIAMETER: 3-inch

SCREEN LENGTH: NA

LOGGED BY: E. Hightower

APPROVED BY: M. Sepehr

PID ppm	DEPTH	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	SAMPLED: SPLIT SPOON	SAMPLED: CORE	GW LEVEL	BLOWCOUNTS	WELL DIAGRAM
	0		CL	Hand Auger to 5 feet bgs SANDY LEAN CLAY: Brown with some rust mottling, soft, moist, ~30% fine to coarse-grained sand, medium toughness, medium plastic, slow dilatancy, medium dry strength, no Petroleum Hydrocarbon (PHC) odor.					
				As above, moist, no PHC odor.					
	5		CL	SANDY LEAN CLAY: Brown with some rust mottling, soft, moist, ~30% fine to coarse-grained sand, medium toughness, medium plastic, slow dilatancy, medium dry strength, no PHC odor.					
	10								
	15								
	20								
	25								



COMMENTS:

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

1641 Challenge Drive Concord 94520

10/22/2013 705927

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

1641 Challenge Drive Concord 94520

10/22/2013 705927

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

1641 Challenge Drive Concord 94520

10/22/2013 705927

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

1641 Challenge Drive Concord 94520

10/22/2013 705927

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

1641 Challenge Drive Concord 94520

10/22/2013 705927

APPENDIX D
Photographic Documentation

Plate 1. Vironex concrete coring for SV-3

Plate 2. Using a hand auger to clear location for SV-4

Plate 3. Vironex coring location for SV-1

Plate 4. Vironex coring location for SV-5

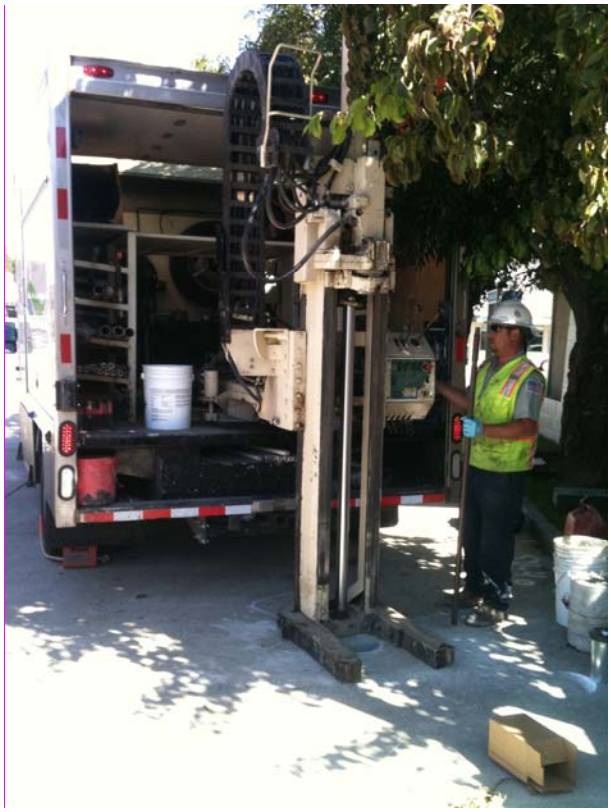


Plate 5. Vironex installing vapor point SV-4

Plate 6. Vapor sampling tip used to construct vapor points

Plate 7. Constructing soil vapor point

Plate 8. Adding water to hydrate bentonite for vapor point seal

Plate 9. Installation of soil vapor point

Plate 10. Installation of soil vapor point

Plate 11. Installation of soil vapor point

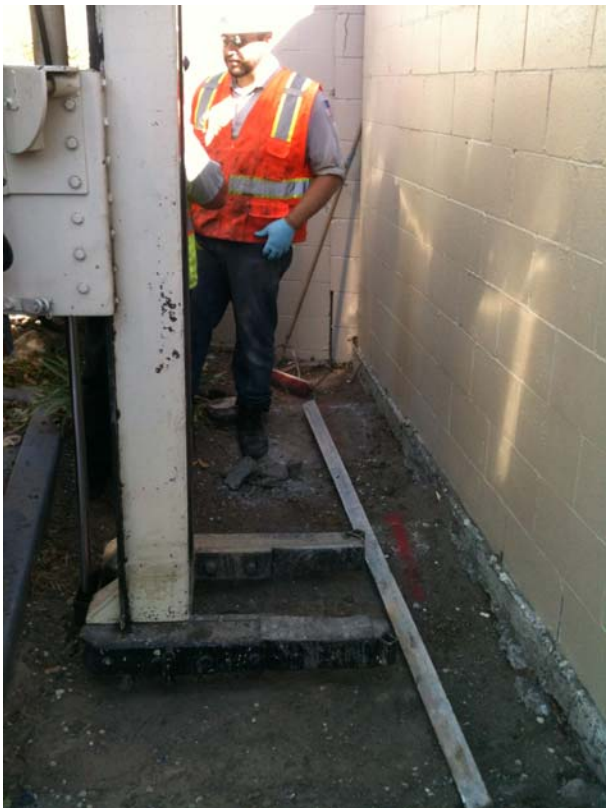


Plate 12. Mobilizing onto SV-2 for installation

Plate 13. Installing SV-1

Plate 14. Adding water to hydrate bentonite

Plate 15. Soil vapor sampling point set with small well box

Plate 16. Soil vapor sampling point set with small well box

Plate 17. Soil vapor sampling point set with small well box

Plate 18. Soil vapor sampling point set with small well box

Plate 19. Soil vapor sampling point set with small well box

Plate 20. Prepping to install indoor soil vapor sampling pins

Plate 21. Drilling through tile to install soil vapor sampling pin

Plate 22. Drilling through tile to install soil vapor sampling pin

Plate 23. Soil vapor sampling pin installed through tile

Plate 24. Soil vapor sampling pin installed through tile

Plate 25. Vironex setting up to sample soil vapor at SV-2

Plate 26. Shut-in test showing continuous vacuum held for two minutes

Plate 27. Soil vapor sample set-up on SV-2

Plate 28. Soil vapor sample set up on SV-4

Plate 29. Soil vapor sample set up on SV-3

Plate 30. Shut-in test showing continuous vacuum held for two minutes

Plate 31. Soil vapor sample set up on SV-5

Plate 32. Shut-in test showing continuous vacuum held for two minutes

Plate 33. Soil vapor sample set up on SV-1

Plate 34. Soil vapor sample set up on SSG-2

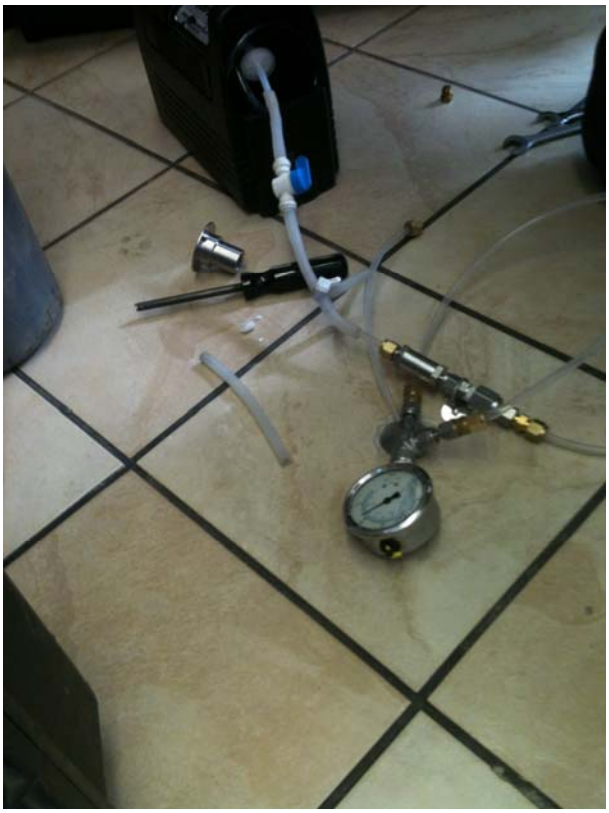


Plate 35. Shut-in test showing continuous vacuum held for two minutes

Plate 36. Vironex setting up for soil vapor sampling

Plate 37. Soil vapor sample on SSG-3

APPENDIX E

Standard Operating Procedures for Installation and Extraction of the Vapor Pin

Standard Operating Procedure Installation and Extraction of the Vapor Pin™

May 20, 2011

Scope:

This standard operating procedure describes the installation and extraction of the Vapor Pin™[1] for use in sub-slab soil-gas sampling.

Purpose:

The purpose of this procedure is to assure good quality control in field operations and uniformity between field personnel in the use of the Vapor Pin™ for the collection of sub-slab soil-gas samples.

Equipment Needed:

- Assembled Vapor Pin™ [Vapor Pin™ and silicone sleeve (Figure 1)];
- Hammer drill;
- 5/8-inch diameter hammer bit (Hilti™ TE-YX 5/8" x 22" #00206514 or equivalent);
- 1½-inch diameter hammer bit (Hilti™ TE-YX 1½" x 23" #00293032 or equivalent) for flush mount applications;
- ¾-inch diameter bottle brush;
- Wet/dry vacuum with HEPA filter (optional);
- Vapor Pin™ installation/extraction tool;
- Dead blow hammer;
- Vapor Pin™ flush mount cover, as necessary;
- Vapor Pin™ protective cap; and
- VOC-free hole patching material (hydraulic cement) and putty knife or trowel.

[1]Cox-Colvin & Associates, Inc., designed and developed the Vapor Pin™; a patent is pending.

Figure 1. Assembled Vapor Pin™.

Installation Procedure:

1) Check for buried obstacles (pipes, electrical lines, etc.) prior to proceeding.

2) Set up wet/dry vacuum to collect drill cuttings.

3) If a flush mount installation is required, drill a 1½-inch diameter hole at least 1¾-inches into the slab.

4) Drill a 5/8-inch diameter hole through the slab and approximately 1-inch into the underlying soil to form a void.

5) Remove the drill bit, brush the hole with the bottle brush, and remove the loose cuttings with the vacuum.

6) Place the lower end of Vapor Pin™ assembly into the drilled hole. Place the small hole located in the handle of the extraction/installation tool over the Vapor Pin™ to protect the barb fitting and cap, and tap the Vapor Pin™ into place using a

dead blow hammer (Figure 2). Make sure the extraction/installation tool is aligned parallel to the Vapor Pin™ to avoid damaging the barb fitting.

Figure 2. Installing the Vapor Pin™.

For flush mount installations, unscrew the threaded coupling from the installation/extraction handle and use the hole in the end of the tool to assist with the installation (Figure 3).

Figure 3. Flush-mount installation.

During installation, the silicone sleeve will form a slight bulge between the slab and the Vapor Pin™ shoulder. Place the protective cap on Vapor Pin™ to prevent vapor loss prior to sampling (Figure 4).

Figure 4. Installed Vapor Pin™.

7) For flush mount installations, cover the Vapor Pin™ with a flush mount cover.

8) Allow 20 minutes or more (consult applicable guidance for your situation) for the sub-slab soil-gas conditions to equilibrate prior to sampling.

9) Remove protective cap and connect sample tubing to the barb fitting of the Vapor Pin™ (Figure 5).

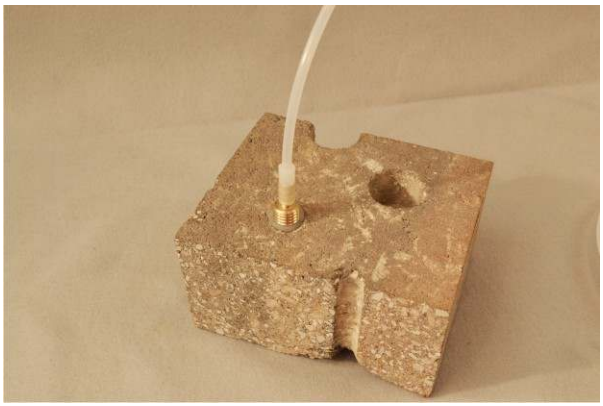


Figure 5. Vapor Pin™ sample connection.

10) Conduct leak tests [(e.g., real-time monitoring of oxygen levels on extracted sub-slab soil gas, or placement of a water

dam around the Vapor Pin™) Figure 6]. Consult your local guidance for possible tests.

Figure 6. Water dam used for leak detection.

11) Collect sub-slab soil gas sample. When finished sampling, replace the protective cap and flush mount cover until the next sampling event. If the sampling is complete, extract the Vapor Pin™.

Extraction Procedure:

1) Remove the protective cap, and thread the installation/extraction tool onto the barrel of the Vapor Pin™ (Figure 7). Continue turning the tool to assist in extraction, then pull the Vapor Pin™ from the hole (Figure 8).

Figure 7. Removing the Vapor Pin™.

Figure 8. Extracted Vapor Pin™.

2) Fill the void with hydraulic cement and smooth with the trowel or putty knife.

3) Prior to reuse, remove the silicone sleeve and discard. Decontaminate the Vapor Pin™ in a hot water and Alconox® wash, then heat in an oven to a temperature of 130° C.

The Vapor Pin™ to designed be used repeatedly; however, replacement parts and supplies will be required periodically. These parts are available on-line at www.CoxColvin.com.

Replacement Parts:

Vapor Pin™ Kit Case - VPC001
Vapor Pins™ - VPIN0522
Silicone Sleeves - VPTS077
Installation/Extraction Tool - VPIE023
Protective Caps - VPPC010
Flush Mount Covers - VPFM050
Water Dam - VPWD004
Brush - VPB026

APPENDIX F
Laboratory Analytical Results

eurofins | Air Toxics

10/30/2013
Ms. Lizzie Hightower
SOMA Environmental
6620 Owens Drive
Suite A
Pleasanton CA 94588

Project Name: 3519 Castro Valley Blvd. Castro Valley
Project #:
Workorder #: 1310265

Dear Ms. Lizzie Hightower

The following report includes the data for the above referenced project for sample(s) received on 10/11/2013 at Air Toxics Ltd.

The data and associated QC analyzed by Modified ASTM D-1946 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

Air Toxics LTD.

CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020

Project Manager Mansour Sepehr
Collected by: (Print and Sign) Lizzie Hightower
Company SOMA Environmental Email jbobek@somaenv.com
Address 6620 Owens Dr. Suite A City Pleasanton State CA Zip 94588
Phone 925-734-6400 Fax 925-734-6401

Project Info:
P.O. # 2762
Project # 3519 Castro Valley Blvd.
Project Name Castro Valley

Turn Around Time:
☒ Normal
☐ Rush
specify

Lab Use Only
Pressurized by: ____
Date: ____
Pressurization Gas: N_2 He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psig)
01A	SV-1	Tedlar Bag	10/10/13	14:10	Atmospheric Gas (O_2, CO_2, methane) Helium				
02A	SV-2			10:51					
03A	SV-3			12:13					
04A	SV-4			11:40					
05A	SV-5			13:12					
06A	SSG-1			14:35					
07A	SSG-2			14:58					
08A	SSG-3			15:19					

Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
	10/11/13 09:30	db	10/11/13 09:30
db	12:15 Oct 11, 13	Kathleen Kelly ATL	10/11/13 1215
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time

Notes:

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact? Yes No None	Work Order #
						1310265

Form 1293 rev.11

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WORK ORDER #: 1310265

Work Order Summary

CLIENT:	Ms. Lizzie Hightower SOMA Environmental 6620 Owens Drive Suite A Pleasanton, CA 94588	**BILL TO:**	Ms. Lizzie Hightower SOMA Environmental 6620 Owens Drive Suite A Pleasanton, CA 94588
PHONE:	925-734-6400	**P.O. #**	2762
FAX:	925-734-6401	**PROJECT #**	3519 Castro Valley Blvd. Castro Valley
DATE RECEIVED:	10/11/2013	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	10/30/2013		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SV-1	Modified ASTM D-1946	Tedlar Bag	Tedlar Bag
02A	SV-2	Modified ASTM D-1946	Tedlar Bag	Tedlar Bag
03A	SV-3	Modified ASTM D-1946	Tedlar Bag	Tedlar Bag
04A	SV-4	Modified ASTM D-1946	Tedlar Bag	Tedlar Bag
05A	SV-5	Modified ASTM D-1946	Tedlar Bag	Tedlar Bag
06A	SSG-1	Modified ASTM D-1946	Tedlar Bag	Tedlar Bag
07A	SSG-2	Modified ASTM D-1946	Tedlar Bag	Tedlar Bag
08A	SSG-3	Modified ASTM D-1946	Tedlar Bag	Tedlar Bag
09A	Lab Blank	Modified ASTM D-1946	NA	NA
09B	Lab Blank	Modified ASTM D-1946	NA	NA
10A	LCS	Modified ASTM D-1946	NA	NA
10AA	LCSD	Modified ASTM D-1946	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 10/30/13

Technical Director

Certification numbers: AZ Licensure AZ0775, CA NELAP - 12282CA, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-12-5, UT NELAP CA009332012-3, VA NELAP - 460197, WA NELAP - C935
Name of Accrediting Agency: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2012, Expiration date: 10/17/2013.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified ASTM D-1946
SOMA Environmental
Workorder# 1310265

Eight 1 Liter Tedlar Bag samples were received on October 11, 2013. The laboratory performed analysis via Modified ASTM Method D-1946 for Methane and fixed gases in air using GC/FID or GC/TCD. The method involves direct injection of 1.0 mL of sample.

On the analytical column employed for this analysis, Oxygen coelutes with Argon. The corresponding peak is quantitated as Oxygen.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***ASTM D-1946***	***ATL Modifications***
Calibration	A single point calibration is performed using a reference standard closely matching the composition of the unknown.	A 3-point calibration curve is performed. Quantitation is based on a daily calibration standard which may or may not resemble the composition of the associated samples.
Reference Standard	The composition of any reference standard must be known to within 0.01 mol % for any component.	The standards used by ATL are blended to a >/= 95% accuracy.
Sample Injection Volume	Components whose concentrations are in excess of 5 % should not be analyzed by using sample volumes greater than 0.5 mL.	The sample container is connected directly to a fixed volume sample loop of 1.0 mL on the GC. Linear range is defined by the calibration curve. Bags are loaded by vacuum.
Normalization	Normalize the mole percent values by multiplying each value by 100 and dividing by the sum of the original values. The sum of the original values should not differ from 100% by more than 1.0%.	Results are not normalized. The sum of the reported values can differ from 100% by as much as 15%, either due to analytical variability or an unusual sample matrix.
Precision	Precision requirements established at each concentration level.	Duplicates should agree within 25% RPD for detections > 5 X's the RL.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
B - Compound present in laboratory blank greater than reporting limit.
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.
M - Reported value may be biased due to apparent matrix interferences.
File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

Client Sample ID: SV-1

Lab ID#: 1310265-01A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	21
Carbon Dioxide	0.010	0.10
Methane	0.00010	0.0020

Client Sample ID: SV-2

Lab ID#: 1310265-02A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	20
Carbon Dioxide	0.010	1.2
Methane	0.00010	0.00012

Client Sample ID: SV-3

Lab ID#: 1310265-03A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	11
Carbon Dioxide	0.010	8.2
Methane	0.00010	0.0020

Client Sample ID: SV-4

Lab ID#: 1310265-04A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	12
Carbon Dioxide	0.010	2.4
Methane	0.00010	0.00018

Client Sample ID: SV-5

Lab ID#: 1310265-05A

Compound	Rpt. Limit (%)	Amount (%)

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Summary of Detected Compounds
NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

Client Sample ID: SV-5

Lab ID#: 1310265-05A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	15
Carbon Dioxide	0.010	6.5
Methane	0.00010	0.00010

Client Sample ID: SSG-1

Lab ID#: 1310265-06A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	21
Carbon Dioxide	0.010	0.13
Methane	0.00010	0.00018

Client Sample ID: SSG-2

Lab ID#: 1310265-07A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	20
Carbon Dioxide	0.010	0.63
Helium	0.050	0.079
Methane	0.00010	0.00019

Client Sample ID: SSG-3

Lab ID#: 1310265-08A

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	17
Carbon Dioxide	0.010	3.4
Helium	0.050	0.056

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Client Sample ID: SV-1

Lab ID#: 1310265-01A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10101114**	**Date of Collection: 10/10/13 2:10:00 PM**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/11/13 02:28 PM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Oxygen	0.10	21
Carbon Dioxide	0.010	0.10
Helium	0.050	Not Detected
Methane	0.00010	0.0020

Container Type: 1 Liter Tedlar Bag

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Client Sample ID: SV-2

Lab ID#: 1310265-02A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10101115**	**Date of Collection: 10/10/13 10:51:00 A**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/11/13 03:06 PM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Oxygen	0.10	20
Carbon Dioxide	0.010	1.2
Helium	0.050	Not Detected
Methane	0.00010	0.00012

Container Type: 1 Liter Tedlar Bag

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Client Sample ID: SV-3

Lab ID#: 1310265-03A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10101116**	**Date of Collection:**	**10/10/13 12:13:00 P**
Dil. Factor:	**1.00**	**Date of Analysis:**	**10/11/13 03:37 PM**

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	11
Carbon Dioxide	0.010	8.2
Helium	0.050	Not Detected
Methane	0.00010	0.0020

Container Type: 1 Liter Tedlar Bag

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Client Sample ID: SV-4

Lab ID#: 1310265-04A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10101117**	**Date of Collection:**	**10/10/13 11:40:00 A**
Dil. Factor:	**1.00**	**Date of Analysis:**	**10/11/13 04:11 PM**

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	12
Carbon Dioxide	0.010	2.4
Helium	0.050	Not Detected
Methane	0.00010	0.00018

Container Type: 1 Liter Tedlar Bag

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Client Sample ID: SV-5

Lab ID#: 1310265-05A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10101118**	**Date of Collection: 10/10/13 1:12:00 PM**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/11/13 04:43 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	15
Carbon Dioxide	0.010	6.5
Helium	0.050	Not Detected
Methane	0.00010	0.00010

Container Type: 1 Liter Tedlar Bag

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Client Sample ID: SSG-1

Lab ID#: 1310265-06A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10101119**	**Date of Collection: 10/10/13 2:35:00 PM**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/11/13 05:15 PM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Oxygen	0.10	21
Carbon Dioxide	0.010	0.13
Helium	0.050	Not Detected
Methane	0.00010	0.00018

Container Type: 1 Liter Tedlar Bag

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Client Sample ID: SSG-2

Lab ID#: 1310265-07A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10101120**	**Date of Collection: 10/10/13 2:58:00 PM**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/11/13 05:39 PM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	20
Carbon Dioxide	0.010	0.63
Helium	0.050	0.079
Methane	0.00010	0.00019

Container Type: 1 Liter Tedlar Bag

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Client Sample ID: SSG-3

Lab ID#: 1310265-08A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10101121**	**Date of Collection: 10/10/13 3:19:00 PM**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/11/13 06:03 PM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Oxygen	0.10	17
Carbon Dioxide	0.010	3.4
Helium	0.050	0.056
Methane	0.00010	Not Detected

Container Type: 1 Liter Tedlar Bag

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Client Sample ID: Lab Blank

Lab ID#: 1310265-09A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10101109**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/11/13 11:55 AM**	

Compound	Rpt. Limit (%)	Amount (%)
Oxygen	0.10	Not Detected
Carbon Dioxide	0.010	Not Detected
Methane	0.00010	Not Detected

Container Type: NA - Not Applicable

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Client Sample ID: Lab Blank

Lab ID#: 1310265-09B

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10101108c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/11/13 11:28 AM**	

Compound	**Rpt. Limit (%)**	**Amount (%)**
Helium	0.050	Not Detected

Container Type: NA - Not Applicable

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Client Sample ID: LCS

Lab ID#: 1310265-10A

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10101107**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/11/13 10:55 AM**	

Compound	%Recovery	Method Limits
Oxygen	102	85-115
Carbon Dioxide	102	85-115
Helium	99	85-115
Methane	101	85-115

Container Type: NA - Not Applicable

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Client Sample ID: LCSD

Lab ID#: 1310265-10AA

NATURAL GAS ANALYSIS BY MODIFIED ASTM D-1946

File Name:	**10101129**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/11/13 09:35 PM**	

Compound	%Recovery	Method Limits
Oxygen	100	85-115
Carbon Dioxide	101	85-115
Helium	98	85-115
Methane	101	85-115

Container Type: NA - Not Applicable

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10/31/2013
Ms. Lizzie Hightower
SOMA Environmental
6620 Owens Drive
Suite A
Pleasanton CA 94588

Project Name: 3519 Castro Valley Blvd Castro Valley CA
Project #:
Workorder #: 1310266

Dear Ms. Lizzie Hightower

The following report includes the data for the above referenced project for sample(s) received on 10/11/2013 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-17 VI are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

TO-17 SAMPLE COLLECTION

Air Toxics LTD.

CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922.

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630
(916) 985-1000 FAX (916) 985-1020

Project Manager Mansour Sepehr
Collected by: (Print and Sign) Lizzie Hightower
Company SOMA Environmental Email jbobek@somaenv.com
Address 6620 Owens Dr. Suite A City Pleasanton State CA Zip 94588
Phone 925-734-6400 Fax 925-734-6401

Project Info:
P.O. # 2762
Project # ____
Project Name 3519 Castro Valley Blvd Castro Valley, CA

Turn Around Time: ☒ Normal ☐ Rush ____ specify

Reporting Units: ☐ ppmv ☐ ppbv ☐ µg/m3 ☐ mg/m3

Lab I.D.	Field Sample I.D. (Location)	Engraved or Stamped Tube #	Date of Collection (mm/dd/yy)	Start Time (hr:min)	End Time (hr:min)	Pre-Test Flow Rate	Post-Test Flow Rate	Volume	Indoor/Outdoor % RH	Indoor/Outdoor Temp	Indoor Air	Outdoor Air	Soil Vapor	Other ( )
01A	SV-1	G0143664	10/10/13	14:03	14:04	200mL/min	200mL/min	200mL	60	66 °F	☐	☐	☒	☐
02A	SV-1D	G0143435		14:09	14:10	200 mL/min	200mL/min	200mL	60	66°F	☐	☐	☒	☐
03A	SV-2	G0135607		10:50	10:51	200mL/min	200mL/min	200mL	72	60°F	☐	☐	☒	☐
04A	SV-3	G0143663		12:12	12:13	200mL/min	200mL/min	200mL	58	65°F	☐	☐	☒	☐
05A	SV-4	G0144385		11:39	11:40	200 mL/min	200mL/min	200mL	70	62°F	☐	☐	☒	☐
06A	SV-5	G0139904		13:11	13:12	200mL/min	200mL/min	200mL	54	67°F	☐	☐	☒	☐
07A	SSG-1	G0143694		14:34	14:35	200 mL/min	200mL/min	200mL	60	66°F	☐	☐	☒	☐
08A	SSG-2	G0143693		14:57	14:58	200 mL/min	200mL/min	200mL	60	66°F	☐	☐	☒	☐
09A	SSG-3	G0148314	↓	15:18	15:19	200 mL/min	200mL/min	200mL	60	66°F	☐	☐	☒	☐
											☐	☐	☐	☐

Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
E. Hightower	10/11/13 09:30	db ede	10/11/13 09:30
db ede	12:15 OCT 11, 13	Katie Beckwith	10/11/13 1215
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time

Notes:

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	client drop off		13.8°C	good	Yes No None	1310266

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WORK ORDER #: 1310266

Work Order Summary

CLIENT:	Ms. Lizzie Hightower SOMA Environmental 6620 Owens Drive Suite A Pleasanton, CA 94588	**BILL TO:**	Ms. Lizzie Hightower SOMA Environmental 6620 Owens Drive Suite A Pleasanton, CA 94588
PHONE:	925-734-6400	**P.O. #**	2762
FAX:	925-734-6401	**PROJECT #**	3519 Castro Valley Blvd Castro Valley CA
DATE RECEIVED:	10/11/2013	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	10/29/2013		

FRACTION #	NAME	TEST
01A	SV-1	Modified TO-17 VI
02A	SV-1D	Modified TO-17 VI
03A	SV-2	Modified TO-17 VI
04A	SV-3	Modified TO-17 VI
05A	SV-4	Modified TO-17 VI
06A	SV-5	Modified TO-17 VI
07A	SSG-1	Modified TO-17 VI
08A	SSG-2	Modified TO-17 VI
09A	SSG-3	Modified TO-17 VI
10A	Lab Blank	Modified TO-17 VI
10B	Lab Blank	Modified TO-17 VI
11A	CCV	Modified TO-17 VI
11B	CCV High Split	Modified TO-17 VI
12A	LCS	Modified TO-17 VI
12AA	LCSD	Modified TO-17 VI
12B	LCS	Modified TO-17 VI
12BB	LCSD	Modified TO-17 VI

CERTIFIED BY: Heidi Mayo DATE: 10/30/13

Technical Director

Certification numbers: AZ Licensure AZ0775, CA NELAP - 12282CA, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-12-5, UT NELAP CA009332012-3, VA NELAP - 460197, WA NELAP - C935
Name of Accrediting Agency: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2012, Expiration date: 10/17/2013.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified EPA Method TO-17 (VI Tubes)
SOMA Environmental
Workorder# 1310266

Nine TO-17 VI Tube samples were received on October 11, 2013. The laboratory performed the analysis via modified EPA Method TO-17 using GC/MS in the full scan mode. TO-17 'VI' sorbent tubes are thermally desorbed onto a secondary trap. The trap is thermally desorbed to elute the components into the GC/MS system for compound separation and detection.

A modification that may be applied to EPA Method TO-17 at the client's discretion is the requirement to transport sorbent tubes at 4 deg C. Laboratory studies demonstrate a high level of stability for VOCs on the TO-17 'VI' tube at room temperature for periods of up to 14 days. Tubes can be shipped to and from the field site at ambient conditions as long as the 14-day sample hold time is upheld. Trip blanks and field surrogate spikes are used as additional control measures to monitor recovery and background contribution during tube transport.

Since the TO-17 VI application significantly extends the scope of target compounds addressed in EPA Method TO-15 and TO-17, the laboratory has implemented several method modifications outlined in the table below. Specific project requirements may over-ride the laboratory modifications.

Requirement	***TO-17***	***ATL Modifications***
Initial Calibration	%RSD</=30% with 2 allowed out up to 40%	VOC list: %RSD</=30% with 2 allowed out up to 40% SVOC list: %RSD</=30% with 2 allowed out up to 40%
Daily Calibration	%D for each target compound within +/-30%.	Fluorene, Phenanthrene, Anthracene, Fluoranthene, and Pyrene within +/-40%D
Audit Accuracy	70-130%	Second source recovery limits for Fluorene, Phenanthrene, Anthracene, Fluoranthene, and Pyrene = 60-140%.
Distributed Volume Pairs	Collection of distributed volume pairs required for monitoring ambient air to insure high quality.	If site is well-characterized or performance previously verified, single tube sampling may be appropriate. Distributed pairs may be impractical for soil gas collection due to configuration and volume constraints.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

A sampling volume of 0.200 L was used to convert ng to ug/m3 for the associated Lab Blanks.

Due to the Method Detection Limit study performed on the instrument, the reporting limit for Isopentane and Benzene were raised 6.0ng and 6.4ng, respectively.

Due to the linear calibration range of the instrument, the reporting limit for 1,2,4-Trichlorobenzene and Hexachlorobutadiene were raised to 15ng and 21ng, respectively.

The field surrogate, Naphthalene-d8, in sample SV-4 exceeded the laboratory limits of 50-150%.

Samples SV-1 and SV-1D had mass concentrations for 2,2,4-Trimethylpentane well above the standard calibration range at saturated levels. To provide reliable results, the samples were analyzed at a higher split than the initial calibration. The split used resulted in a dilution of 4 to 1, and the reporting limit and calibration range were raised accordingly.

2,2,4-Trimethylpentane, Methylcyclohexane, Toluene, m,p-Xylene, o-Xylene, Propylbenzene and 1,3,5-Trimethylbenzene were detected in sample SSG-3. Because the preceding sample contained concentrations exceeding the calibration range, the results for these compounds in sample SSG-3 may be biased high.

Due to extreme matrix interference, surrogate 1,2-Dichloroethane-d4 in samples SV-1, SV-1D, and SV-3 could not be quantitated and were not reported.

All Quality Control Limit exceedences and affected sample results are noted by flags. Each flag is defined at the bottom of this Case Narrative and on each Sample Result Summary page. Target compound non-detects in the samples that are associated with high bias in QC analyses have not been flagged.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-17

Client Sample ID: SV-1

Lab ID#: 1310266-01A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Isopentane	6.0	30	960 E	4800 E
Freon 11	5.6	28	100	510
Hexane	3.5	18	1400 E	6900 E
Benzene	6.4	32	10	51
Cyclohexane	3.4	17	1300 E	6600 E
2,2,4-Trimethylpentane	19	95	7500 E	38000 E
Heptane	4.1	20	1700 E	8600 E
Methylcyclohexane	4.0	20	2600 E	13000 E
Toluene	3.8	19	20	99
Ethyl Benzene	4.3	22	55	280
m,p-Xylene	4.3	22	90	450
o-Xylene	4.3	22	13	66
Cumene	4.9	24	80	400
Propylbenzene	4.9	24	40	200
4-Ethyltoluene	4.9	24	52	260
1,3,5-Trimethylbenzene	4.9	24	77	380
1,2,4-Trimethylbenzene	29	140	57	280
Naphthalene	0.50	2.5	2.8	14
2-Methylnaphthalene	0.50	2.5	0.75	3.7
1-Methylnaphthalene	0.50	2.5	0.51	2.6

Client Sample ID: SV-1D

Lab ID#: 1310266-02A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Isopentane	6.0	30	1000 E	5300 E
Freon 11	5.6	28	110	560
Hexane	3.5	18	1000 E	5200 E
Benzene	6.4	32	10	53
Cyclohexane	3.4	17	1200 E	5800 E
2,2,4-Trimethylpentane	19	95	6300 E	32000 E
Heptane	4.1	20	1200 E	6100 E
Methylcyclohexane	4.0	20	2000 E	10000 E

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Summary of Detected Compounds
EPA METHOD TO-17

Client Sample ID: SV-1D

Lab ID#: 1310266-02A

Toluene	3.8	19	14	73
Ethyl Benzene	4.3	22	46	230
m,p-Xylene	4.3	22	77	390
o-Xylene	4.3	22	12	60
Cumene	4.9	24	75	380
Propylbenzene	4.9	24	39	190
4-Ethyltoluene	4.9	24	54	270
1,3,5-Trimethylbenzene	4.9	24	76	380
1,2,4-Trimethylbenzene	29	140	56	280
Naphthalene	0.50	2.5	3.2	16
2-Methylnaphthalene	0.50	2.5	0.88	4.4
1-Methylnaphthalene	0.50	2.5	0.68	3.4

Client Sample ID: SV-2

Lab ID#: 1310266-03A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Benzene	6.4	32	13	63
Toluene	3.8	19	17	85
Ethyl Benzene	4.3	22	7.7	38
m,p-Xylene	4.3	22	11	57
o-Xylene	4.3	22	10	52
Naphthalene	0.50	2.5	0.95	4.7
2-Methylnaphthalene	0.50	2.5	0.55	2.8

Client Sample ID: SV-3

Lab ID#: 1310266-04A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Isopentane	6.0	30	2000 E	10000 E
Hexane	3.5	18	740 E	3700 E
Benzene	6.4	32	50	250
Cyclohexane	3.4	17	750 E	3800 E
2,2,4-Trimethylpentane	4.7	24	210	1100

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Summary of Detected Compounds
EPA METHOD TO-17

Client Sample ID: SV-3

Lab ID#: 1310266-04A

Heptane	4.1	20	340	1700
Methylcyclohexane	4.0	20	1300 E	6700 E
Toluene	3.8	19	8.9	44
Tetrachloroethene	6.8	34	7.0	35
Ethyl Benzene	4.3	22	160	820
m,p-Xylene	4.3	22	60	300
o-Xylene	4.3	22	9.8	49
Cumene	4.9	24	190	950
Propylbenzene	4.9	24	400	2000
4-Ethyltoluene	4.9	24	17	87
1,3,5-Trimethylbenzene	4.9	24	7.9	39
Naphthalene	0.50	2.5	15	76
2-Methylnaphthalene	0.50	2.5	13	66
1-Methylnaphthalene	0.50	2.5	9.1	46

Client Sample ID: SV-4

Lab ID#: 1310266-05A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Isopentane	6.0	30	9.2	46
Hexane	3.5	18	12	60
Benzene	6.4	32	10	51
Cyclohexane	3.4	17	5.0	25
2,2,4-Trimethylpentane	4.7	24	34	170
Heptane	4.1	20	11	56
Methylcyclohexane	4.0	20	4.7	24
4-Methyl-2-pentanone	4.1	20	13	64
Toluene	3.8	19	31	160
Tetrachloroethene	6.8	34	9.5	47
Ethyl Benzene	4.3	22	14	68
m,p-Xylene	4.3	22	46	230
o-Xylene	4.3	22	15	74
Styrene	4.2	21	9.3	46
4-Ethyltoluene	4.9	24	5.6	28
1,3,5-Trimethylbenzene	4.9	24	8.0	40

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Summary of Detected Compounds
EPA METHOD TO-17

Client Sample ID: SV-4

Lab ID#: 1310266-05A

Naphthalene	0.50	2.5	0.75	3.7

Client Sample ID: SV-5

Lab ID#: 1310266-06A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Benzene	6.4	32	8.6	43
Toluene	3.8	19	5.2	26
m,p-Xylene	4.3	22	8.8	44
Naphthalene	0.50	2.5	0.73	3.7

Client Sample ID: SSG-1

Lab ID#: 1310266-07A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Freon 11	5.6	28	9.7	49
Chloroform	4.9	24	21	100
Naphthalene	0.50	2.5	1.9	9.4

Client Sample ID: SSG-2

Lab ID#: 1310266-08A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Freon 11	5.6	28	13	64
Tetrachloroethene	6.8	34	55	270
Naphthalene	0.50	2.5	0.59	3.0
2-Methylnaphthalene	0.50	2.5	0.74	3.7
1-Methylnaphthalene	0.50	2.5	0.86	4.3

Client Sample ID: SSG-3

Lab ID#: 1310266-09A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Isopentane	6.0	30	16	83

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Summary of Detected Compounds
EPA METHOD TO-17

Client Sample ID: SSG-3

Lab ID#: 1310266-09A

Freon 11	5.6	28	6.7	33
Hexane	3.5	18	6.4	32
Benzene	6.4	32	3.7	18
2,2,4-Trimethylpentane	4.7	24	63 J	320 J
Heptane	4.1	20	19	94
Methylcyclohexane	4.0	20	21 J	110 J
Toluene	3.8	19	19 J	94 J
Tetrachloroethene	6.8	34	430	2100
Ethyl Benzene	4.3	22	28	140
m,p-Xylene	4.3	22	100 J	500 J
o-Xylene	4.3	22	16 J	80 J
Propylbenzene	4.9	24	6.7 J	33 J
4-Ethyltoluene	4.9	24	11	57
1,3,5-Trimethylbenzene	4.9	24	9.4 J	47 J
1,2,4-Trimethylbenzene	29	140	39	200
Naphthalene	0.50	2.5	13	65
2-Methylnaphthalene	0.50	2.5	22	110
1-Methylnaphthalene	0.50	2.5	15	77

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Client Sample ID: SV-1
Lab ID#: 1310266-01A
EPA METHOD TO-17

File Name:	**f101520**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 2:04:00 PM**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 06:26 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Freon 114	7.0	35	Not Detected	Not Detected
Vinyl Chloride	2.6	13	Not Detected	Not Detected
1,3-Butadiene	2.2	11	Not Detected	Not Detected
Isopentane	6.0	30	960 E	4800 E
Freon 11	5.6	28	100	510
1,1-Dichloroethene	4.0	20	Not Detected	Not Detected
Methylene Chloride	21	100	Not Detected	Not Detected
Freon 113	7.7	38	Not Detected	Not Detected
trans-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
1,1-Dichloroethane	4.0	20	Not Detected	Not Detected
cis-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
Hexane	3.5	18	1400 E	6900 E
Chloroform	4.9	24	Not Detected	Not Detected
1,2-Dichloroethane	4.0	20	Not Detected	Not Detected
1,1,1-Trichloroethane	5.4	27	Not Detected	Not Detected
Benzene	6.4	32	10	51
Carbon Tetrachloride	6.3	32	Not Detected	Not Detected
Cyclohexane	3.4	17	1300 E	6600 E
1,2-Dichloropropane	4.6	23	Not Detected	Not Detected
Trichloroethene	5.4	27	Not Detected	Not Detected
1,4-Dioxane	11	55	Not Detected	Not Detected
2,2,4-Trimethylpentane	19	95	7500 E	38000 E
Heptane	4.1	20	1700 E	8600 E
Methylcyclohexane	4.0	20	2600 E	13000 E
1,1,2-Trichloroethane	5.4	27	Not Detected	Not Detected
4-Methyl-2-pentanone	4.1	20	Not Detected	Not Detected
Toluene	3.8	19	20	99
2-Hexanone	4.1	20	Not Detected	Not Detected
Tetrachloroethene	6.8	34	Not Detected	Not Detected
Chlorobenzene	4.6	23	Not Detected	Not Detected
Ethyl Benzene	4.3	22	55	280
m,p-Xylene	4.3	22	90	450
o-Xylene	4.3	22	13	66
Styrene	4.2	21	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	6.9	34	Not Detected	Not Detected
Cumene	4.9	24	80	400
Propylbenzene	4.9	24	40	200
4-Ethyltoluene	4.9	24	52	260
1,3,5-Trimethylbenzene	4.9	24	77	380
1,2,4-Trimethylbenzene	29	140	57	280
1,3-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,4-Dichlorobenzene	6.0	30	Not Detected	Not Detected

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Client Sample ID: SV-1

Lab ID#: 1310266-01A

EPA METHOD TO-17

File Name:	**f101520**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 2:04:00 PM**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 06:26 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
1,2-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,2,4-Trichlorobenzene	15	75	Not Detected	Not Detected
Hexachlorobutadiene	21	100	Not Detected	Not Detected
Naphthalene	0.50	2.5	2.8	14
2-Methylnaphthalene	0.50	2.5	0.75	3.7
1-Methylnaphthalene	0.50	2.5	0.51	2.6
Acenaphthylene	5.0	25	Not Detected	Not Detected
Acenaphthene	5.0	25	Not Detected	Not Detected
Fluorene	5.0	25	Not Detected	Not Detected
Phenanthrene	5.0	25	Not Detected	Not Detected
Anthracene	5.0	25	Not Detected	Not Detected
Fluoranthene	5.0	25	Not Detected	Not Detected
Pyrene	5.0	25	Not Detected	Not Detected

Air Sample Volume(L): 0.200

E = Exceeds instrument calibration range.

2,2,4-Trimethylpentane was reported from file #f102521, analyzed on 10/25/13 with a dilution factor of 4.00.

Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
Toluene-d8	65	50-150
Naphthalene-d8	59	50-150

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Client Sample ID: SV-1D

Lab ID#: 1310266-02A

EPA METHOD TO-17

File Name:	**f101521**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 2:10:00 PM**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 07:07 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Freon 114	7.0	35	Not Detected	Not Detected
Vinyl Chloride	2.6	13	Not Detected	Not Detected
1,3-Butadiene	2.2	11	Not Detected	Not Detected
Isopentane	6.0	30	1000 E	5300 E
Freon 11	5.6	28	110	560
1,1-Dichloroethene	4.0	20	Not Detected	Not Detected
Methylene Chloride	21	100	Not Detected	Not Detected
Freon 113	7.7	38	Not Detected	Not Detected
trans-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
1,1-Dichloroethane	4.0	20	Not Detected	Not Detected
cis-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
Hexane	3.5	18	1000 E	5200 E
Chloroform	4.9	24	Not Detected	Not Detected
1,2-Dichloroethane	4.0	20	Not Detected	Not Detected
1,1,1-Trichloroethane	5.4	27	Not Detected	Not Detected
Benzene	6.4	32	10	53
Carbon Tetrachloride	6.3	32	Not Detected	Not Detected
Cyclohexane	3.4	17	1200 E	5800 E
1,2-Dichloropropane	4.6	23	Not Detected	Not Detected
Trichloroethene	5.4	27	Not Detected	Not Detected
1,4-Dioxane	11	55	Not Detected	Not Detected
2,2,4-Trimethylpentane	19	95	6300 E	32000 E
Heptane	4.1	20	1200 E	6100 E
Methylcyclohexane	4.0	20	2000 E	10000 E
1,1,2-Trichloroethane	5.4	27	Not Detected	Not Detected
4-Methyl-2-pentanone	4.1	20	Not Detected	Not Detected
Toluene	3.8	19	14	73
2-Hexanone	4.1	20	Not Detected	Not Detected
Tetrachloroethene	6.8	34	Not Detected	Not Detected
Chlorobenzene	4.6	23	Not Detected	Not Detected
Ethyl Benzene	4.3	22	46	230
m,p-Xylene	4.3	22	77	390
o-Xylene	4.3	22	12	60
Styrene	4.2	21	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	6.9	34	Not Detected	Not Detected
Cumene	4.9	24	75	380
Propylbenzene	4.9	24	39	190
4-Ethyltoluene	4.9	24	54	270
1,3,5-Trimethylbenzene	4.9	24	76	380
1,2,4-Trimethylbenzene	29	140	56	280
1,3-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,4-Dichlorobenzene	6.0	30	Not Detected	Not Detected

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Client Sample ID: SV-1D

Lab ID#: 1310266-02A

EPA METHOD TO-17

File Name:	**f101521**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 2:10:00 PM**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 07:07 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
1,2-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,2,4-Trichlorobenzene	15	75	Not Detected	Not Detected
Hexachlorobutadiene	21	100	Not Detected	Not Detected
Naphthalene	0.50	2.5	3.2	16
2-Methylnaphthalene	0.50	2.5	0.88	4.4
1-Methylnaphthalene	0.50	2.5	0.68	3.4
Acenaphthylene	5.0	25	Not Detected	Not Detected
Acenaphthene	5.0	25	Not Detected	Not Detected
Fluorene	5.0	25	Not Detected	Not Detected
Phenanthrene	5.0	25	Not Detected	Not Detected
Anthracene	5.0	25	Not Detected	Not Detected
Fluoranthene	5.0	25	Not Detected	Not Detected
Pyrene	5.0	25	Not Detected	Not Detected

Air Sample Volume(L): 0.200

E = Exceeds instrument calibration range.

2,2,4-Trimethylpentane was reported from file #f102522, analyzed on 10/25/13 with a dilution factor of 4.00.

Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
Toluene-d8	70	50-150
Naphthalene-d8	58	50-150

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Client Sample ID: SV-2

Lab ID#: 1310266-03A

EPA METHOD TO-17

File Name:	**f101522**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 10:51:00 A**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 07:49 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Freon 114	7.0	35	Not Detected	Not Detected
Vinyl Chloride	2.6	13	Not Detected	Not Detected
1,3-Butadiene	2.2	11	Not Detected	Not Detected
Isopentane	6.0	30	Not Detected	Not Detected
Freon 11	5.6	28	Not Detected	Not Detected
1,1-Dichloroethene	4.0	20	Not Detected	Not Detected
Methylene Chloride	21	100	Not Detected	Not Detected
Freon 113	7.7	38	Not Detected	Not Detected
trans-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
1,1-Dichloroethane	4.0	20	Not Detected	Not Detected
cis-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
Hexane	3.5	18	Not Detected	Not Detected
Chloroform	4.9	24	Not Detected	Not Detected
1,2-Dichloroethane	4.0	20	Not Detected	Not Detected
1,1,1-Trichloroethane	5.4	27	Not Detected	Not Detected
Benzene	6.4	32	13	63
Carbon Tetrachloride	6.3	32	Not Detected	Not Detected
Cyclohexane	3.4	17	Not Detected	Not Detected
1,2-Dichloropropane	4.6	23	Not Detected	Not Detected
Trichloroethene	5.4	27	Not Detected	Not Detected
1,4-Dioxane	11	55	Not Detected	Not Detected
2,2,4-Trimethylpentane	4.7	24	Not Detected	Not Detected
Heptane	4.1	20	Not Detected	Not Detected
Methylcyclohexane	4.0	20	Not Detected	Not Detected
1,1,2-Trichloroethane	5.4	27	Not Detected	Not Detected
4-Methyl-2-pentanone	4.1	20	Not Detected	Not Detected
Toluene	3.8	19	17	85
2-Hexanone	4.1	20	Not Detected	Not Detected
Tetrachloroethene	6.8	34	Not Detected	Not Detected
Chlorobenzene	4.6	23	Not Detected	Not Detected
Ethyl Benzene	4.3	22	7.7	38
m,p-Xylene	4.3	22	11	57
o-Xylene	4.3	22	10	52
Styrene	4.2	21	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	6.9	34	Not Detected	Not Detected
Cumene	4.9	24	Not Detected	Not Detected
Propylbenzene	4.9	24	Not Detected	Not Detected
4-Ethyltoluene	4.9	24	Not Detected	Not Detected
1,3,5-Trimethylbenzene	4.9	24	Not Detected	Not Detected
1,2,4-Trimethylbenzene	29	140	Not Detected	Not Detected
1,3-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,4-Dichlorobenzene	6.0	30	Not Detected	Not Detected

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Client Sample ID: SV-2
Lab ID#: 1310266-03A
EPA METHOD TO-17

File Name:	**f101522**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 10:51:00 A**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 07:49 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
1,2-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,2,4-Trichlorobenzene	15	75	Not Detected	Not Detected
Hexachlorobutadiene	21	100	Not Detected	Not Detected
Naphthalene	0.50	2.5	0.95	4.7
2-Methylnaphthalene	0.50	2.5	0.55	2.8
1-Methylnaphthalene	0.50	2.5	Not Detected	Not Detected
Acenaphthylene	5.0	25	Not Detected	Not Detected
Acenaphthene	5.0	25	Not Detected	Not Detected
Fluorene	5.0	25	Not Detected	Not Detected
Phenanthrene	5.0	25	Not Detected	Not Detected
Anthracene	5.0	25	Not Detected	Not Detected
Fluoranthene	5.0	25	Not Detected	Not Detected
Pyrene	5.0	25	Not Detected	Not Detected

Air Sample Volume(L): 0.200
Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	66	50-150
Toluene-d8	66	50-150
Naphthalene-d8	62	50-150

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Client Sample ID: SV-3
Lab ID#: 1310266-04A
EPA METHOD TO-17

File Name:	**f101523**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 12:13:00 P**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 08:31 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Freon 114	7.0	35	Not Detected	Not Detected
Vinyl Chloride	2.6	13	Not Detected	Not Detected
1,3-Butadiene	2.2	11	Not Detected	Not Detected
Isopentane	6.0	30	2000 E	10000 E
Freon 11	5.6	28	Not Detected	Not Detected
1,1-Dichloroethene	4.0	20	Not Detected	Not Detected
Methylene Chloride	21	100	Not Detected	Not Detected
Freon 113	7.7	38	Not Detected	Not Detected
trans-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
1,1-Dichloroethane	4.0	20	Not Detected	Not Detected
cis-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
Hexane	3.5	18	740 E	3700 E
Chloroform	4.9	24	Not Detected	Not Detected
1,2-Dichloroethane	4.0	20	Not Detected	Not Detected
1,1,1-Trichloroethane	5.4	27	Not Detected	Not Detected
Benzene	6.4	32	50	250
Carbon Tetrachloride	6.3	32	Not Detected	Not Detected
Cyclohexane	3.4	17	750 E	3800 E
1,2-Dichloropropane	4.6	23	Not Detected	Not Detected
Trichloroethene	5.4	27	Not Detected	Not Detected
1,4-Dioxane	11	55	Not Detected	Not Detected
2,2,4-Trimethylpentane	4.7	24	210	1100
Heptane	4.1	20	340	1700
Methylcyclohexane	4.0	20	1300 E	6700 E
1,1,2-Trichloroethane	5.4	27	Not Detected	Not Detected
4-Methyl-2-pentanone	4.1	20	Not Detected	Not Detected
Toluene	3.8	19	8.9	44
2-Hexanone	4.1	20	Not Detected	Not Detected
Tetrachloroethene	6.8	34	7.0	35
Chlorobenzene	4.6	23	Not Detected	Not Detected
Ethyl Benzene	4.3	22	160	820
m,p-Xylene	4.3	22	60	300
o-Xylene	4.3	22	9.8	49
Styrene	4.2	21	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	6.9	34	Not Detected	Not Detected
Cumene	4.9	24	190	950
Propylbenzene	4.9	24	400	2000
4-Ethyltoluene	4.9	24	17	87
1,3,5-Trimethylbenzene	4.9	24	7.9	39
1,2,4-Trimethylbenzene	29	140	Not Detected	Not Detected
1,3-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,4-Dichlorobenzene	6.0	30	Not Detected	Not Detected

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Client Sample ID: SV-3

Lab ID#: 1310266-04A

EPA METHOD TO-17

File Name:	**f101523**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 12:13:00 P**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 08:31 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
1,2-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,2,4-Trichlorobenzene	15	75	Not Detected	Not Detected
Hexachlorobutadiene	21	100	Not Detected	Not Detected
Naphthalene	0.50	2.5	15	76
2-Methylnaphthalene	0.50	2.5	13	66
1-Methylnaphthalene	0.50	2.5	9.1	46
Acenaphthylene	5.0	25	Not Detected	Not Detected
Acenaphthene	5.0	25	Not Detected	Not Detected
Fluorene	5.0	25	Not Detected	Not Detected
Phenanthrene	5.0	25	Not Detected	Not Detected
Anthracene	5.0	25	Not Detected	Not Detected
Fluoranthene	5.0	25	Not Detected	Not Detected
Pyrene	5.0	25	Not Detected	Not Detected

Air Sample Volume(L): 0.200

E = Exceeds instrument calibration range.

Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
Toluene-d8	68	50-150
Naphthalene-d8	59	50-150

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Client Sample ID: SV-4

Lab ID#: 1310266-05A

EPA METHOD TO-17

File Name:	**f101524**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 11:40:00 A**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 09:12 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Freon 114	7.0	35	Not Detected	Not Detected
Vinyl Chloride	2.6	13	Not Detected	Not Detected
1,3-Butadiene	2.2	11	Not Detected	Not Detected
Isopentane	6.0	30	9.2	46
Freon 11	5.6	28	Not Detected	Not Detected
1,1-Dichloroethene	4.0	20	Not Detected	Not Detected
Methylene Chloride	21	100	Not Detected	Not Detected
Freon 113	7.7	38	Not Detected	Not Detected
trans-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
1,1-Dichloroethane	4.0	20	Not Detected	Not Detected
cis-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
Hexane	3.5	18	12	60
Chloroform	4.9	24	Not Detected	Not Detected
1,2-Dichloroethane	4.0	20	Not Detected	Not Detected
1,1,1-Trichloroethane	5.4	27	Not Detected	Not Detected
Benzene	6.4	32	10	51
Carbon Tetrachloride	6.3	32	Not Detected	Not Detected
Cyclohexane	3.4	17	5.0	25
1,2-Dichloropropane	4.6	23	Not Detected	Not Detected
Trichloroethene	5.4	27	Not Detected	Not Detected
1,4-Dioxane	11	55	Not Detected	Not Detected
2,2,4-Trimethylpentane	4.7	24	34	170
Heptane	4.1	20	11	56
Methylcyclohexane	4.0	20	4.7	24
1,1,2-Trichloroethane	5.4	27	Not Detected	Not Detected
4-Methyl-2-pentanone	4.1	20	13	64
Toluene	3.8	19	31	160
2-Hexanone	4.1	20	Not Detected	Not Detected
Tetrachloroethene	6.8	34	9.5	47
Chlorobenzene	4.6	23	Not Detected	Not Detected
Ethyl Benzene	4.3	22	14	68
m,p-Xylene	4.3	22	46	230
o-Xylene	4.3	22	15	74
Styrene	4.2	21	9.3	46
1,1,2,2-Tetrachloroethane	6.9	34	Not Detected	Not Detected
Cumene	4.9	24	Not Detected	Not Detected
Propylbenzene	4.9	24	Not Detected	Not Detected
4-Ethyltoluene	4.9	24	5.6	28
1,3,5-Trimethylbenzene	4.9	24	8.0	40
1,2,4-Trimethylbenzene	29	140	Not Detected	Not Detected
1,3-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,4-Dichlorobenzene	6.0	30	Not Detected	Not Detected

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Client Sample ID: SV-4

Lab ID#: 1310266-05A

EPA METHOD TO-17

File Name:	**f101524**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 11:40:00 A**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 09:12 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
1,2-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,2,4-Trichlorobenzene	15	75	Not Detected	Not Detected
Hexachlorobutadiene	21	100	Not Detected	Not Detected
Naphthalene	0.50	2.5	0.75	3.7
2-Methylnaphthalene	0.50	2.5	Not Detected	Not Detected
1-Methylnaphthalene	0.50	2.5	Not Detected	Not Detected
Acenaphthylene	5.0	25	Not Detected	Not Detected
Acenaphthene	5.0	25	Not Detected	Not Detected
Fluorene	5.0	25	Not Detected	Not Detected
Phenanthrene	5.0	25	Not Detected	Not Detected
Anthracene	5.0	25	Not Detected	Not Detected
Fluoranthene	5.0	25	Not Detected	Not Detected
Pyrene	5.0	25	Not Detected	Not Detected

Air Sample Volume(L): 0.200

Q = Exceeds Quality Control limits.

Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	81	50-150
Toluene-d8	73	50-150
Naphthalene-d8	49 Q	50-150

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Client Sample ID: SV-5
Lab ID#: 1310266-06A
EPA METHOD TO-17

File Name:	**f101525**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 1:12:00 PM**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 09:53 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Freon 114	7.0	35	Not Detected	Not Detected
Vinyl Chloride	2.6	13	Not Detected	Not Detected
1,3-Butadiene	2.2	11	Not Detected	Not Detected
Isopentane	6.0	30	Not Detected	Not Detected
Freon 11	5.6	28	Not Detected	Not Detected
1,1-Dichloroethene	4.0	20	Not Detected	Not Detected
Methylene Chloride	21	100	Not Detected	Not Detected
Freon 113	7.7	38	Not Detected	Not Detected
trans-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
1,1-Dichloroethane	4.0	20	Not Detected	Not Detected
cis-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
Hexane	3.5	18	Not Detected	Not Detected
Chloroform	4.9	24	Not Detected	Not Detected
1,2-Dichloroethane	4.0	20	Not Detected	Not Detected
1,1,1-Trichloroethane	5.4	27	Not Detected	Not Detected
Benzene	6.4	32	8.6	43
Carbon Tetrachloride	6.3	32	Not Detected	Not Detected
Cyclohexane	3.4	17	Not Detected	Not Detected
1,2-Dichloropropane	4.6	23	Not Detected	Not Detected
Trichloroethene	5.4	27	Not Detected	Not Detected
1,4-Dioxane	11	55	Not Detected	Not Detected
2,2,4-Trimethylpentane	4.7	24	Not Detected	Not Detected
Heptane	4.1	20	Not Detected	Not Detected
Methylcyclohexane	4.0	20	Not Detected	Not Detected
1,1,2-Trichloroethane	5.4	27	Not Detected	Not Detected
4-Methyl-2-pentanone	4.1	20	Not Detected	Not Detected
Toluene	3.8	19	5.2	26
2-Hexanone	4.1	20	Not Detected	Not Detected
Tetrachloroethene	6.8	34	Not Detected	Not Detected
Chlorobenzene	4.6	23	Not Detected	Not Detected
Ethyl Benzene	4.3	22	Not Detected	Not Detected
m,p-Xylene	4.3	22	8.8	44
o-Xylene	4.3	22	Not Detected	Not Detected
Styrene	4.2	21	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	6.9	34	Not Detected	Not Detected
Cumene	4.9	24	Not Detected	Not Detected
Propylbenzene	4.9	24	Not Detected	Not Detected
4-Ethyltoluene	4.9	24	Not Detected	Not Detected
1,3,5-Trimethylbenzene	4.9	24	Not Detected	Not Detected
1,2,4-Trimethylbenzene	29	140	Not Detected	Not Detected
1,3-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,4-Dichlorobenzene	6.0	30	Not Detected	Not Detected

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Client Sample ID: SV-5
Lab ID#: 1310266-06A
EPA METHOD TO-17

File Name:	**f101525**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 1:12:00 PM**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 09:53 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
1,2-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,2,4-Trichlorobenzene	15	75	Not Detected	Not Detected
Hexachlorobutadiene	21	100	Not Detected	Not Detected
Naphthalene	0.50	2.5	0.73	3.7
2-Methylnaphthalene	0.50	2.5	Not Detected	Not Detected
1-Methylnaphthalene	0.50	2.5	Not Detected	Not Detected
Acenaphthylene	5.0	25	Not Detected	Not Detected
Acenaphthene	5.0	25	Not Detected	Not Detected
Fluorene	5.0	25	Not Detected	Not Detected
Phenanthrene	5.0	25	Not Detected	Not Detected
Anthracene	5.0	25	Not Detected	Not Detected
Fluoranthene	5.0	25	Not Detected	Not Detected
Pyrene	5.0	25	Not Detected	Not Detected

Air Sample Volume(L): 0.200
Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	70	50-150
Toluene-d8	71	50-150
Naphthalene-d8	61	50-150

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Client Sample ID: SSG-1

Lab ID#: 1310266-07A

EPA METHOD TO-17

File Name:	**f101526**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 2:35:00 PM**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 10:34 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Freon 114	7.0	35	Not Detected	Not Detected
Vinyl Chloride	2.6	13	Not Detected	Not Detected
1,3-Butadiene	2.2	11	Not Detected	Not Detected
Isopentane	6.0	30	Not Detected	Not Detected
Freon 11	5.6	28	9.7	49
1,1-Dichloroethene	4.0	20	Not Detected	Not Detected
Methylene Chloride	21	100	Not Detected	Not Detected
Freon 113	7.7	38	Not Detected	Not Detected
trans-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
1,1-Dichloroethane	4.0	20	Not Detected	Not Detected
cis-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
Hexane	3.5	18	Not Detected	Not Detected
Chloroform	4.9	24	21	100
1,2-Dichloroethane	4.0	20	Not Detected	Not Detected
1,1,1-Trichloroethane	5.4	27	Not Detected	Not Detected
Benzene	6.4	32	Not Detected	Not Detected
Carbon Tetrachloride	6.3	32	Not Detected	Not Detected
Cyclohexane	3.4	17	Not Detected	Not Detected
1,2-Dichloropropane	4.6	23	Not Detected	Not Detected
Trichloroethene	5.4	27	Not Detected	Not Detected
1,4-Dioxane	11	55	Not Detected	Not Detected
2,2,4-Trimethylpentane	4.7	24	Not Detected	Not Detected
Heptane	4.1	20	Not Detected	Not Detected
Methylcyclohexane	4.0	20	Not Detected	Not Detected
1,1,2-Trichloroethane	5.4	27	Not Detected	Not Detected
4-Methyl-2-pentanone	4.1	20	Not Detected	Not Detected
Toluene	3.8	19	Not Detected	Not Detected
2-Hexanone	4.1	20	Not Detected	Not Detected
Tetrachloroethene	6.8	34	Not Detected	Not Detected
Chlorobenzene	4.6	23	Not Detected	Not Detected
Ethyl Benzene	4.3	22	Not Detected	Not Detected
m,p-Xylene	4.3	22	Not Detected	Not Detected
o-Xylene	4.3	22	Not Detected	Not Detected
Styrene	4.2	21	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	6.9	34	Not Detected	Not Detected
Cumene	4.9	24	Not Detected	Not Detected
Propylbenzene	4.9	24	Not Detected	Not Detected
4-Ethyltoluene	4.9	24	Not Detected	Not Detected
1,3,5-Trimethylbenzene	4.9	24	Not Detected	Not Detected
1,2,4-Trimethylbenzene	29	140	Not Detected	Not Detected
1,3-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,4-Dichlorobenzene	6.0	30	Not Detected	Not Detected

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Client Sample ID: SSG-1

Lab ID#: 1310266-07A

EPA METHOD TO-17

File Name:	**f101526**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 2:35:00 PM**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 10:34 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
1,2-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,2,4-Trichlorobenzene	15	75	Not Detected	Not Detected
Hexachlorobutadiene	21	100	Not Detected	Not Detected
Naphthalene	0.50	2.5	1.9	9.4
2-Methylnaphthalene	0.50	2.5	Not Detected	Not Detected
1-Methylnaphthalene	0.50	2.5	Not Detected	Not Detected
Acenaphthylene	5.0	25	Not Detected	Not Detected
Acenaphthene	5.0	25	Not Detected	Not Detected
Fluorene	5.0	25	Not Detected	Not Detected
Phenanthrene	5.0	25	Not Detected	Not Detected
Anthracene	5.0	25	Not Detected	Not Detected
Fluoranthene	5.0	25	Not Detected	Not Detected
Pyrene	5.0	25	Not Detected	Not Detected

Air Sample Volume(L): 0.200

Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	71	50-150
Toluene-d8	73	50-150
Naphthalene-d8	66	50-150

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Client Sample ID: SSG-2

Lab ID#: 1310266-08A

EPA METHOD TO-17

File Name:	**f101527**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 2:58:00 PM**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 11:14 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Freon 114	7.0	35	Not Detected	Not Detected
Vinyl Chloride	2.6	13	Not Detected	Not Detected
1,3-Butadiene	2.2	11	Not Detected	Not Detected
Isopentane	6.0	30	Not Detected	Not Detected
Freon 11	5.6	28	13	64
1,1-Dichloroethene	4.0	20	Not Detected	Not Detected
Methylene Chloride	21	100	Not Detected	Not Detected
Freon 113	7.7	38	Not Detected	Not Detected
trans-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
1,1-Dichloroethane	4.0	20	Not Detected	Not Detected
cis-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
Hexane	3.5	18	Not Detected	Not Detected
Chloroform	4.9	24	Not Detected	Not Detected
1,2-Dichloroethane	4.0	20	Not Detected	Not Detected
1,1,1-Trichloroethane	5.4	27	Not Detected	Not Detected
Benzene	6.4	32	Not Detected	Not Detected
Carbon Tetrachloride	6.3	32	Not Detected	Not Detected
Cyclohexane	3.4	17	Not Detected	Not Detected
1,2-Dichloropropane	4.6	23	Not Detected	Not Detected
Trichloroethene	5.4	27	Not Detected	Not Detected
1,4-Dioxane	11	55	Not Detected	Not Detected
2,2,4-Trimethylpentane	4.7	24	Not Detected	Not Detected
Heptane	4.1	20	Not Detected	Not Detected
Methylcyclohexane	4.0	20	Not Detected	Not Detected
1,1,2-Trichloroethane	5.4	27	Not Detected	Not Detected
4-Methyl-2-pentanone	4.1	20	Not Detected	Not Detected
Toluene	3.8	19	Not Detected	Not Detected
2-Hexanone	4.1	20	Not Detected	Not Detected
Tetrachloroethene	6.8	34	55	270
Chlorobenzene	4.6	23	Not Detected	Not Detected
Ethyl Benzene	4.3	22	Not Detected	Not Detected
m,p-Xylene	4.3	22	Not Detected	Not Detected
o-Xylene	4.3	22	Not Detected	Not Detected
Styrene	4.2	21	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	6.9	34	Not Detected	Not Detected
Cumene	4.9	24	Not Detected	Not Detected
Propylbenzene	4.9	24	Not Detected	Not Detected
4-Ethyltoluene	4.9	24	Not Detected	Not Detected
1,3,5-Trimethylbenzene	4.9	24	Not Detected	Not Detected
1,2,4-Trimethylbenzene	29	140	Not Detected	Not Detected
1,3-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,4-Dichlorobenzene	6.0	30	Not Detected	Not Detected

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Client Sample ID: SSG-2

Lab ID#: 1310266-08A

EPA METHOD TO-17

File Name:	**f101527**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 2:58:00 PM**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 11:14 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
1,2-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,2,4-Trichlorobenzene	15	75	Not Detected	Not Detected
Hexachlorobutadiene	21	100	Not Detected	Not Detected
Naphthalene	0.50	2.5	0.59	3.0
2-Methylnaphthalene	0.50	2.5	0.74	3.7
1-Methylnaphthalene	0.50	2.5	0.86	4.3
Acenaphthylene	5.0	25	Not Detected	Not Detected
Acenaphthene	5.0	25	Not Detected	Not Detected
Fluorene	5.0	25	Not Detected	Not Detected
Phenanthrene	5.0	25	Not Detected	Not Detected
Anthracene	5.0	25	Not Detected	Not Detected
Fluoranthene	5.0	25	Not Detected	Not Detected
Pyrene	5.0	25	Not Detected	Not Detected

Air Sample Volume(L): 0.200

Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	78	50-150
Toluene-d8	73	50-150
Naphthalene-d8	65	50-150

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Client Sample ID: SSG-3

Lab ID#: 1310266-09A

EPA METHOD TO-17

File Name:	**f101542**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 3:19:00 PM**
Dil. Factor:	**1.00**		**Date of Analysis: 10/16/13 09:34 AM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Freon 114	7.0	35	Not Detected	Not Detected
Vinyl Chloride	2.6	13	Not Detected	Not Detected
1,3-Butadiene	2.2	11	Not Detected	Not Detected
Isopentane	6.0	30	16	83
Freon 11	5.6	28	6.7	33
1,1-Dichloroethene	4.0	20	Not Detected	Not Detected
Methylene Chloride	21	100	Not Detected	Not Detected
Freon 113	7.7	38	Not Detected	Not Detected
trans-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
1,1-Dichloroethane	4.0	20	Not Detected	Not Detected
cis-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
Hexane	3.5	18	6.4	32
Chloroform	4.9	24	Not Detected	Not Detected
1,2-Dichloroethane	4.0	20	Not Detected	Not Detected
1,1,1-Trichloroethane	5.4	27	Not Detected	Not Detected
Benzene	6.4	32	3.7	18
Carbon Tetrachloride	6.3	32	Not Detected	Not Detected
Cyclohexane	3.4	17	Not Detected	Not Detected
1,2-Dichloropropane	4.6	23	Not Detected	Not Detected
Trichloroethene	5.4	27	Not Detected	Not Detected
1,4-Dioxane	11	55	Not Detected	Not Detected
2,2,4-Trimethylpentane	4.7	24	63 J	320 J
Heptane	4.1	20	19	94
Methylcyclohexane	4.0	20	21 J	110 J
1,1,2-Trichloroethane	5.4	27	Not Detected	Not Detected
4-Methyl-2-pentanone	4.1	20	Not Detected	Not Detected
Toluene	3.8	19	19 J	94 J
2-Hexanone	4.1	20	Not Detected	Not Detected
Tetrachloroethene	6.8	34	430	2100
Chlorobenzene	4.6	23	Not Detected	Not Detected
Ethyl Benzene	4.3	22	28	140
m,p-Xylene	4.3	22	100 J	500 J
o-Xylene	4.3	22	16 J	80 J
Styrene	4.2	21	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	6.9	34	Not Detected	Not Detected
Cumene	4.9	24	Not Detected	Not Detected
Propylbenzene	4.9	24	6.7 J	33 J
4-Ethyltoluene	4.9	24	11	57
1,3,5-Trimethylbenzene	4.9	24	9.4 J	47 J
1,2,4-Trimethylbenzene	29	140	39	200
1,3-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,4-Dichlorobenzene	6.0	30	Not Detected	Not Detected

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Client Sample ID: SSG-3

Lab ID#: 1310266-09A

EPA METHOD TO-17

File Name:	**f101542**	**Date of Extraction: NA**	**Date of Collection: 10/10/13 3:19:00 PM**
Dil. Factor:	**1.00**		**Date of Analysis: 10/16/13 09:34 AM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
1,2-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,2,4-Trichlorobenzene	15	75	Not Detected	Not Detected
Hexachlorobutadiene	21	100	Not Detected	Not Detected
Naphthalene	0.50	2.5	13	65
2-Methylnaphthalene	0.50	2.5	22	110
1-Methylnaphthalene	0.50	2.5	15	77
Acenaphthylene	5.0	25	Not Detected	Not Detected
Acenaphthene	5.0	25	Not Detected	Not Detected
Fluorene	5.0	25	Not Detected	Not Detected
Phenanthrene	5.0	25	Not Detected	Not Detected
Anthracene	5.0	25	Not Detected	Not Detected
Fluoranthene	5.0	25	Not Detected	Not Detected
Pyrene	5.0	25	Not Detected	Not Detected

Air Sample Volume(L): 0.200

Container Type: TO-17 VI Tube

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	72	50-150
Toluene-d8	70	50-150
Naphthalene-d8	54	50-150

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Client Sample ID: Lab Blank

Lab ID#: 1310266-10A

EPA METHOD TO-17

File Name:	**f101517**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 03:11 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
Freon 114	7.0	35	Not Detected	Not Detected
Vinyl Chloride	2.6	13	Not Detected	Not Detected
1,3-Butadiene	2.2	11	Not Detected	Not Detected
Isopentane	6.0	30	Not Detected	Not Detected
Freon 11	5.6	28	Not Detected	Not Detected
1,1-Dichloroethene	4.0	20	Not Detected	Not Detected
Methylene Chloride	21	100	Not Detected	Not Detected
Freon 113	7.7	38	Not Detected	Not Detected
trans-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
1,1-Dichloroethane	4.0	20	Not Detected	Not Detected
cis-1,2-Dichloroethene	4.0	20	Not Detected	Not Detected
Hexane	3.5	18	Not Detected	Not Detected
Chloroform	4.9	24	Not Detected	Not Detected
1,2-Dichloroethane	4.0	20	Not Detected	Not Detected
1,1,1-Trichloroethane	5.4	27	Not Detected	Not Detected
Benzene	6.4	32	Not Detected	Not Detected
Carbon Tetrachloride	6.3	32	Not Detected	Not Detected
Cyclohexane	3.4	17	Not Detected	Not Detected
1,2-Dichloropropane	4.6	23	Not Detected	Not Detected
Trichloroethene	5.4	27	Not Detected	Not Detected
1,4-Dioxane	11	55	Not Detected	Not Detected
2,2,4-Trimethylpentane	4.7	24	Not Detected	Not Detected
Heptane	4.1	20	Not Detected	Not Detected
Methylcyclohexane	4.0	20	Not Detected	Not Detected
1,1,2-Trichloroethane	5.4	27	Not Detected	Not Detected
4-Methyl-2-pentanone	4.1	20	Not Detected	Not Detected
Toluene	3.8	19	Not Detected	Not Detected
2-Hexanone	4.1	20	Not Detected	Not Detected
Tetrachloroethene	6.8	34	Not Detected	Not Detected
Chlorobenzene	4.6	23	Not Detected	Not Detected
Ethyl Benzene	4.3	22	Not Detected	Not Detected
m,p-Xylene	4.3	22	Not Detected	Not Detected
o-Xylene	4.3	22	Not Detected	Not Detected
Styrene	4.2	21	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	6.9	34	Not Detected	Not Detected
Cumene	4.9	24	Not Detected	Not Detected
Propylbenzene	4.9	24	Not Detected	Not Detected
4-Ethyltoluene	4.9	24	Not Detected	Not Detected
1,3,5-Trimethylbenzene	4.9	24	Not Detected	Not Detected
1,2,4-Trimethylbenzene	29	140	Not Detected	Not Detected
1,3-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,4-Dichlorobenzene	6.0	30	Not Detected	Not Detected

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Client Sample ID: Lab Blank

Lab ID#: 1310266-10A

EPA METHOD TO-17

File Name:	**f101517**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 03:11 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
1,2-Dichlorobenzene	6.0	30	Not Detected	Not Detected
1,2,4-Trichlorobenzene	15	75	Not Detected	Not Detected
Hexachlorobutadiene	21	100	Not Detected	Not Detected
Naphthalene	0.50	2.5	Not Detected	Not Detected
2-Methylnaphthalene	0.50	2.5	Not Detected	Not Detected
1-Methylnaphthalene	0.50	2.5	Not Detected	Not Detected
Acenaphthylene	5.0	25	Not Detected	Not Detected
Acenaphthene	5.0	25	Not Detected	Not Detected
Fluorene	5.0	25	Not Detected	Not Detected
Phenanthrene	5.0	25	Not Detected	Not Detected
Anthracene	5.0	25	Not Detected	Not Detected
Fluoranthene	5.0	25	Not Detected	Not Detected
Pyrene	5.0	25	Not Detected	Not Detected

Air Sample Volume(L): 0.200

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	50-150
Toluene-d8	102	50-150
Naphthalene-d8	100	50-150

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Client Sample ID: Lab Blank

Lab ID#: 1310266-10B

EPA METHOD TO-17

File Name:	**f102515**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 10/25/13 02:15 PM**

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
2,2,4-Trimethylpentane	4.7	24	Not Detected	Not Detected

Air Sample Volume(L): 0.200

Container Type: NA - Not Applicable

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Client Sample ID: CCV
Lab ID#: 1310266-11A
EPA METHOD TO-17

File Name:	**f101514**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 12:57 PM**

Compound	%Recovery
Freon 114	95
Vinyl Chloride	79
1,3-Butadiene	70
Isopentane	74
Freon 11	91
1,1-Dichloroethene	91
Methylene Chloride	69 Q
Freon 113	99
trans-1,2-Dichloroethene	98
1,1-Dichloroethane	81
cis-1,2-Dichloroethene	96
Hexane	75
Chloroform	93
1,2-Dichloroethane	93
1,1,1-Trichloroethane	102
Benzene	95
Carbon Tetrachloride	113
Cyclohexane	95
1,2-Dichloropropane	88
Trichloroethene	100
1,4-Dioxane	104
2,2,4-Trimethylpentane	80
Heptane	90
Methylcyclohexane	95
1,1,2-Trichloroethane	100
4-Methyl-2-pentanone	83
Toluene	90
2-Hexanone	87
Tetrachloroethene	104
Chlorobenzene	96
Ethyl Benzene	94
m,p-Xylene	97
o-Xylene	82
Styrene	88
1,1,2,2-Tetrachloroethane	78
Cumene	81
Propylbenzene	80
4-Ethyltoluene	81
1,3,5-Trimethylbenzene	82
1,2,4-Trimethylbenzene	85
1,3-Dichlorobenzene	90
1,4-Dichlorobenzene	90

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Client Sample ID: CCV
Lab ID#: 1310266-11A
EPA METHOD TO-17

File Name:	**f101514**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 12:57 PM**

Compound	%Recovery
1,2-Dichlorobenzene	90
1,2,4-Trichlorobenzene	114
Hexachlorobutadiene	109
Naphthalene	98
2-Methylnaphthalene	122
1-Methylnaphthalene	116
Acenaphthylene	135
Acenaphthene	117
Fluorene	116
Phenanthrene	134
Anthracene	159 Q
Fluoranthene	130
Pyrene	128

Air Sample Volume(L): 1.00
Q = Exceeds Quality Control limits.
Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	93	50-150
Toluene-d8	97	50-150
Naphthalene-d8	101	50-150

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Client Sample ID: CCV High Split

Lab ID#: 1310266-11B

EPA METHOD TO-17

File Name:	**f102512**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**4.00**		**Date of Analysis: 10/25/13 12:10 PM**

Compound	%Recovery
2,2,4-Trimethylpentane	110

Air Sample Volume(L): 1.00

Container Type: NA - Not Applicable

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Client Sample ID: LCS
Lab ID#: 1310266-12A
EPA METHOD TO-17

File Name:	**f101515**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 01:39 PM**

Compound	%Recovery	Method Limits
Freon 114	103	70-130
Vinyl Chloride	87	70-130
1,3-Butadiene	80	70-130
Isopentane	80	70-130
Freon 11	99	70-130
1,1-Dichloroethene	100	70-130
Methylene Chloride	74	70-130
Freon 113	107	70-130
trans-1,2-Dichloroethene	119	70-130
1,1-Dichloroethane	88	70-130
cis-1,2-Dichloroethene	104	70-130
Hexane	82	70-130
Chloroform	101	70-130
1,2-Dichloroethane	97	70-130
1,1,1-Trichloroethane	107	70-130
Benzene	99	70-130
Carbon Tetrachloride	122	70-130
Cyclohexane	97	70-130
1,2-Dichloropropane	88	70-130
Trichloroethene	97	70-130
1,4-Dioxane	102	70-130
2,2,4-Trimethylpentane	83	70-130
Heptane	91	70-130
Methylcyclohexane	95	70-130
1,1,2-Trichloroethane	108	70-130
4-Methyl-2-pentanone	88	70-130
Toluene	92	70-130
2-Hexanone	98	70-130
Tetrachloroethene	102	70-130
Chlorobenzene	100	70-130
Ethyl Benzene	97	70-130
m,p-Xylene	100	70-130
o-Xylene	87	70-130
Styrene	100	70-130
1,1,2,2-Tetrachloroethane	90	70-130
Cumene	87	70-130
Propylbenzene	87	70-130
4-Ethyltoluene	88	70-130
1,3,5-Trimethylbenzene	88	70-130
1,2,4-Trimethylbenzene	92	70-130
1,3-Dichlorobenzene	95	70-130
1,4-Dichlorobenzene	94	70-130

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Client Sample ID: LCS
Lab ID#: 1310266-12A
EPA METHOD TO-17

File Name:	**f101515**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 01:39 PM**

Compound	%Recovery	Method Limits
1,2-Dichlorobenzene	95	70-130
1,2,4-Trichlorobenzene	102	70-130
Hexachlorobutadiene	98	70-130
Naphthalene	87	70-130
2-Methylnaphthalene	112	70-130
1-Methylnaphthalene	104	70-130
Acenaphthylene	107	70-130
Acenaphthene	110	70-130
Fluorene	115	60-140
Phenanthrene	106	60-140
Anthracene	164 Q	60-140
Fluoranthene	103	60-140
Pyrene	100	60-140

Air Sample Volume(L): 1.00
Q = Exceeds Quality Control limits.
Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	50-150
Toluene-d8	100	50-150
Naphthalene-d8	99	50-150

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Client Sample ID: LCSD
Lab ID#: 1310266-12AA
EPA METHOD TO-17

File Name:	**f101516**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 02:21 PM**

Compound	%Recovery	Method Limits
Freon 114	111	70-130
Vinyl Chloride	94	70-130
1,3-Butadiene	84	70-130
Isopentane	90	70-130
Freon 11	96	70-130
1,1-Dichloroethene	111	70-130
Methylene Chloride	81	70-130
Freon 113	111	70-130
trans-1,2-Dichloroethene	127	70-130
1,1-Dichloroethane	95	70-130
cis-1,2-Dichloroethene	111	70-130
Hexane	92	70-130
Chloroform	100	70-130
1,2-Dichloroethane	93	70-130
1,1,1-Trichloroethane	102	70-130
Benzene	103	70-130
Carbon Tetrachloride	113	70-130
Cyclohexane	98	70-130
1,2-Dichloropropane	92	70-130
Trichloroethene	96	70-130
1,4-Dioxane	106	70-130
2,2,4-Trimethylpentane	84	70-130
Heptane	94	70-130
Methylcyclohexane	98	70-130
1,1,2-Trichloroethane	105	70-130
4-Methyl-2-pentanone	89	70-130
Toluene	93	70-130
2-Hexanone	95	70-130
Tetrachloroethene	103	70-130
Chlorobenzene	98	70-130
Ethyl Benzene	97	70-130
m,p-Xylene	101	70-130
o-Xylene	89	70-130
Styrene	98	70-130
1,1,2,2-Tetrachloroethane	91	70-130
Cumene	88	70-130
Propylbenzene	88	70-130
4-Ethyltoluene	88	70-130
1,3,5-Trimethylbenzene	89	70-130
1,2,4-Trimethylbenzene	91	70-130
1,3-Dichlorobenzene	95	70-130
1,4-Dichlorobenzene	94	70-130

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Client Sample ID: LCSD
Lab ID#: 1310266-12AA
EPA METHOD TO-17

File Name:	**f101516**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 10/15/13 02:21 PM**

Compound	%Recovery	Method Limits
1,2-Dichlorobenzene	96	70-130
1,2,4-Trichlorobenzene	104	70-130
Hexachlorobutadiene	98	70-130
Naphthalene	87	70-130
2-Methylnaphthalene	111	70-130
1-Methylnaphthalene	105	70-130
Acenaphthylene	104	70-130
Acenaphthene	104	70-130
Fluorene	105	60-140
Phenanthrene	104	60-140
Anthracene	151 Q	60-140
Fluoranthene	111	60-140
Pyrene	106	60-140

Air Sample Volume(L): 1.00
Q = Exceeds Quality Control limits.
Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	50-150
Toluene-d8	98	50-150
Naphthalene-d8	98	50-150

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Client Sample ID: LCS
Lab ID#: 1310266-12B
EPA METHOD TO-17

File Name:	**f102513**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 10/25/13 12:52 PM**

Compound	%Recovery	Method Limits
2,2,4-Trimethylpentane	110	70-130

Air Sample Volume(L): 1.00
Container Type: NA - Not Applicable

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Client Sample ID: LCSD
Lab ID#: 1310266-12BB
EPA METHOD TO-17

File Name:	**f102514**	**Date of Extraction: NA**	**Date of Collection: NA**
Dil. Factor:	**1.00**		**Date of Analysis: 10/25/13 01:33 PM**

Compound	%Recovery	Method Limits
2,2,4-Trimethylpentane	109	70-130

Air Sample Volume(L): 1.00
Container Type: NA - Not Applicable