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Alameda County  
Environmental HealthCasimiro Damele  
3750 Victor Avenue  
Oakland CA 94619

25 August 2009

Project No. P257

Letter Report  
Soilgas Sampling Conducted 29 June 2009  
4401 Market Street  
Oakland CA  
**Fuel Leak Case No. RO 0000132**

Dear Mr. Damele (hardcopy):

This letter report documents the results of soilgas sampling conducted 29 June 2009 for six locations at/near 4401 Market Street, Oakland CA.

Soilgas sampling was conducted pursuant to mandates from the Alameda County Health Care Services Agency (letters dated 20 June 2008, 26 September 2008, and 16 March 2009) (ACHCSA 2008a, 2008b, and 2009). Soilgas sampling was conducted in accordance with Streamborn's workplan dated 5 August 2008 (Streamborn 2008) and the standard operating procedure contained in Attachment 5.

### SOILGAS SAMPLING

Fieldwork was conducted on 29 June 2009. EnProb Environmental Probing (Oroville CA) provided drilling services.

Prior to initiating fieldwork, the following activities were completed:

- An excavation permit was obtained from the City of Oakland (Attachment 3). This permit covered two soilgas sampling locations within the street.
- A drilling permit was obtained from Alameda County Public Works Agency - Water Resources Division (Attachment 3). This permit covered all sampling locations.
- Underground service alert (811) was notified to clear the proposed drilling locations.

## Rational for the Sampling Locations

Six soilgas sampling locations (SG1 through SG6) were conducted (Figures 2a and 2b):

- SG1: Located upgradient of the former underground gasoline tanks.
- SG2-SG4: Located within the area of the former underground gasoline tanks; where, at the time of tank removal, the greatest concentrations of benzene were measured in soil (up to 3.7 mg/kg).
- SG5: Located downgradient of the former underground gasoline tanks, adjacent to monitoring well MW2. The highest concentrations of benzene in groundwater have been and are currently measured in well MW2.
- SG6: Located further downgradient of the former underground gasoline tanks, adjacent to boring B10. Elevated concentrations of benzene in soil (up to 12 mg/kg) were measured in boring B10 in 1999.

## Soilgas Implant Installation

Boreholes for the soilgas implants were advanced using the direct-push method (Geoprobe 5410 rig). The following sequence of construction was used to install the soilgas implants:

- A 2.375-inch outside diameter expendable tip (steel drive point) was fitted to the base of 2.25-inch outside diameter drill rod.
- The drill rods (with expendable tip) were pushed to a depth of approximately 6.5 feet. The drill rods were then lifted approximately 0.5 feet and the inside of the drill rods was sounded to verify that the expendable tip had released from the end of the drill rods and was embedded in the soil.
- Sand (#3 sand) was poured through the inside of the drill rods while the drill rods were simultaneously lifted, producing a plug of sand pack approximately nine inches thick.
- Teflon tubing (3/16" ID, 1/4" OD) was fitted to the soilgas implant (SVPT91 polypropylene implant, purchased from Environmental Service Products).
- A 1-inch diameter PVC pipe was lowered inside the drill rod, and the soilgas implant (with tubing attached) was lowered inside the PVC pipe. A small amount of sand was poured inside the drill rod to hold the implant in place. The PVC pipe was removed.
- Sand was poured through the inside of the drill rods while the drill rods were simultaneously lifted, producing another plug of sand pack approximately inches thick.

- At this point in the process, approximately 18 inches of sand pack had been placed at the bottom of the borehole, with the soilgas implant centered inside the sand pack, and the tubing leading to the ground surface.
- Dry granular bentonite was poured through the inside of the drill rods while the drill rods were simultaneously lifted, producing a plug of dry bentonite approximately six inches thick.
- Dry granular bentonite was poured through the inside of the drill rods while the drill rods were simultaneously lifted, producing a plug of dry bentonite approximately 12 inches thick. Water (approximately 1.5 pints) was poured through the inside of the drill rods to hydrate the underlying bentonite. Construction was interrupted for several minutes while the bentonite hydrated.
- This last step was repeated until the remainder of the borehole was backfilled with hydrated bentonite.

The construction techniques were different for borehole SG6 (this borehole was drilled first). For SG6, attempts were initially made to push to the total depth (6.5 feet) using a 2.4-inch diameter conical tip affixed to the drill rods. The drill rods were pushed to 6.5 feet and the drill rods and tip were completely withdrawn - we discovered about 1.5 feet of slough at the base of the borehole. The drill rods were pushed again to 6.5 feet, at the same location, and withdrawn - only to discover caving/slough to within about two feet of the ground surface. We then elected to construct the implants, at the same location, using the drill rods as "temporary casing". SG6 was then constructed using the technique described above. Based on the amount of slough, caving, and disturbance associated with the initial attempts to construct SG6, we would expect greater "leakage" of atmospheric air to the sand-pack interval at this location. The tracer gas concentration in the sample from SG6 an order of magnitude greater than the other locations.

Borehole schematics and construction notes are contained in Attachment 1.

### **Purge Test**

Prior to performing soilgas sampling, a purge test was conducted for borehole SG3. The purpose of the purge test was to evaluate the relationship between purge volume and concentration in order to determine the appropriate purge volume for soilgas sampling. SG3 was chosen because soilgas was expected to be at or near the highest concentration at this location.

The sample tubing was attached to the inlet of an Air Toxics "Blue Box" flow regulator (the regulator had been preset to provide 0.167 liter/minute soilgas flow). The outlet of the regulator was attached to a Gast oil-less electric vacuum pump (Model DOA-9111-JH). A tee and Swageloc fitting were located immediately upstream of the vacuum pump to allow sample collection. Sample collection was performed using a hand-held vacuum pump and 1-liter tedlar bag. Concentrations were measured by attaching the tedlar bag to a field organic vapor meter. The field organic vapor meter was a Mini Rae 2000 organic vapor monitor, fitted with a 10.6 eV photoionization detector, calibrated to 100 ppm v/v isobutylene.

After one sand-pack volume had been purged, an attempt was made to collect a sample but the hand-held vacuum pump malfunctioned and no sample was collected. After two sand-pack volumes had been purged, a representative sample was collected using the hand-held vacuum pump and the concentration was measured using the field organic vapor meter. The process was successfully repeated after three, five, and seven sand-pack volumes. The highest concentration was observed after two sand-pack volumes, corresponding to a purge time of 4 minutes 13 seconds at the preset flowrate of 0.167 liter/minute.

The purge test log for SG3 is contained in Attachment 1. The standard operating procedure is contained in Attachment 5.

### **Tracer Gas Atmosphere and Soilgas Sample Collection**

Prior to purging and sampling, a shroud (clear plastic storage container, 12" x 9" x 6") was placed over the borehole. The shroud contained two bulkhead fittings, one on each end.

A tracer gas atmosphere was created inside the shroud by placing a source of 2-propanol (isopropyl alcohol, also known as "rubbing alcohol") beneath the shroud. The 2-propanol source consisted of a cloth that had been saturated with 2-propanol and placed inside a metal liner. The metal liner had been perforated with multiple holes. A short section of teflon tubing was inserted through one of the bulkhead fittings and the atmosphere inside the shroud was monitored in the field using the organic vapor monitor. The tracer gas concentration inside the shroud was typically 300,000 ppbv (parts per billion, volume/volume basis) or greater.

Tubing from the soilgas implant was threaded through the second bulkhead fitting on the shroud. The tubing was connected to the inlet of the "Blue Box" flow regulator (preset at a flowrate of 0.167 liter/minute). The outlet of the "Blue Box" flow regulator was connected to the Gast oil-less electric vacuum pump (Model DOA-9111-JH) with a short section of tubing.

The vacuum pump was operated for the previously-determined duration of 4 minutes 13 seconds to purge approximately two sand-pack volumes. After this time, the vacuum pump was shut off and the tubing was disconnected from the outlet of the "Blue Box" flow regulator. A 1-liter Summa canister (the sample container) was quickly connected to the outlet of the "Blue Box" regulator. The valve on the 1-liter Summa canister was opened for the predetermined sampling time of 6 minutes 0 seconds, corresponding to a sample volume of approximately one liter at a flowrate of 0.167 liters/minute. The valve on the 1-liter Summa canister was then closed and the sample canister was disconnected from the "Blue Box" regulator. Both the starting and ending vacuum of the sample container were recorded for the sampling event.

Purge and sample logs are included in Attachment 1. Tracer gas logs are included in Attachment 1. The standard operating procedure is contained in Attachment 5.

### **Leak Test**

After sampling was completed, a leak test was performed to verify the integrity of the connection between the implant and the "Blue Box" flow regulator, along with the integrity of the regulator itself. A 6-liter Summa canister was connected to the outlet of the "Blue Box" regulator and the implant tubing was cut near the ground surface. The valve for the 6-liter Summa canister was

opened while simultaneously blocking the implant tubing (holding one's thumb over the exposed end of the tubing). The initial vacuum was observed and, after five minutes, the final vacuum was observed. In all cases, no loss in vacuum was observed, verifying the integrity of the connections, along with the integrity of the "Blue Box".

Leak test logs are included in Attachment 1. The standard operating procedure is contained in Attachment 5.

### **Borehole Abandonment/Decommission**

The tubing and (for most boreholes) the soilgas implant were extracted (pulled) from the boreholes. Drill rods with a 2.4-inch diameter conical tip were pushed to 6.5 feet and the voidspace/borehole was backfilled with cement-bentonite grout (94 pounds cement, 5 pounds bentonite, 6 gallons water).

For borings SG1, SG2, and SG3; 1.5-feet of grout was removed and concrete (sackrete) was placed at the top of the boring.

Boreholes SG5 and SG6 were drilled in the street. As required by the City of Oakland, 1-foot by 1-foot by 6-inch thick sections of pavement were sawcut and removed and then patched with hot-mix asphalt. The patching was conducted 14 July 2009.

## **INVESTIGATION DERIVED WASTE**

No investigation derived wastes were generated during the work.

## **LABORATORY ANALYSES**

The samples (six 1-liter Summa canisters) were transported to Air Toxics (Folsom CA) on 30 June 2009; the laboratory received the samples in good condition on 1 July 2009. The samples were analyzed for volatile organic compounds (Modified EPA Method TO-15). The tracer gas (2-propanol) was included as one of the analytes.

## **ANALYTICAL RESULTS**

Soilgas analytical results are summarized in Table 7. A summary of tracer gas results is presented in Table 8. The laboratory report is included in Attachment 2.

The results of the soilgas sampling revealed the following:

- Benzene was detected in all soilgas samples, at concentrations ranging from  $5.1 \mu\text{g}/\text{m}^3$  to  $16 \mu\text{g}/\text{m}^3$ , with the maximum concentration measured at SG5. The measured concentrations were significantly below the Environmental Screening Levels (ESLs) promulgated by the San Francisco Bay Regional Water Quality Control Board and the

California Human Health Screening Levels (CHHSLs) promulgated by the California Department of Toxic Substance Control (84 and 36.2  $\mu\text{g}/\text{m}^3$  respectively) (inhalation risk, residential exposure).

- For the remaining petroleum constituents (toluene, ethylbenzene, xylenes), measured soilgas concentrations were lesser fractions of the human health screening criteria. This indicates that benzene represents a suitable indicator compound for risk assessments associated with soilgas.
- Of all the measured compounds, tetrachloroethene (PCE) was detected at concentrations closest to the human health screening criteria. Tetrachloroethene concentrations were still below the screening criteria for inhalation risks assuming residential exposure. There is no documented use or release of tetrachloroethene at 4401 Market Street.

The tracer gas (2-propanol, isopropyl alcohol, rubbing alcohol) was detected in all soilgas samples, albeit at low concentrations. We calculated the theoretical proportion of shroud atmosphere that was measured in the soilgas samples (Table 8). For soilgas samples SG1 through SG5, the proportion was  $5 \times 10^{-4}$  to  $5 \times 10^{-5}$ . This represents an insignificant proportion of shroud atmosphere in the soilgas samples and indicates a good seal was provided between the ground surface and the sand-pack interval (that contained the soilgas implant). For soilgas samples SG1 through SG5, the measured concentrations of 2-propanol are likely attributable to cross-contamination as the tubing was threaded through the bulkhead fitting of the shroud.

The tracer gas concentration in sample SG6 was an order of magnitude greater than samples SG1-SG5 (Table 8). As noted earlier in this report, caving and sloughing occurred during construction of sand-pack and seal for SG6; accordingly, it is logical to expect greater “short-circuiting” of air from above the ground surface to the implant. Despite the greater relative proportion observed for sample SG6, the absolute proportion of shroud atmosphere in the sample was 0.004 (less than 1%). Accordingly, we believe the sample results for SG6 are representative of insitu conditions.

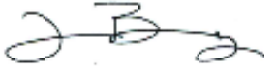
## CONCLUSIONS AND RECOMMENDATIONS

On the basis of (1) historic soil and groundwater investigations and (2) our previous Risk Assessment (Streamborn 2004), benzene represents the contaminant of concern for releases at 4401 Market Street. The sampling described in this report confirms that benzene is the constituent of greatest concern for soilgas. The soilgas concentrations measured during this investigation were below all applicable screening criteria for inhalation risks, even when assuming the most conservative exposure scenarios (residential exposure). Accordingly, soilgas does not pose significant risks for existing and future site use and development. Decisions regarding remediation and monitoring of the residual contamination, along with decisions regarding case closure, should be focused on soil and groundwater contamination.

Please contact us with any questions or comments.

Sincerely,

STREAMBORN



Juli A. Brady, PE  
Environmental Engineer



Attachments

cc: Paresh Khatri/Alameda County Health Care Services Agency, Alameda CA (ecopy)

This report was uploaded to the Alameda County Server.

This report was uploaded to Geotracker ([www.geotracker.swrcb.ca.gov](http://www.geotracker.swrcb.ca.gov))

**Table 1 (Page 1 of 3)**  
**Environmental Chronology**  
**4401 Market Street, Oakland CA**

Date	Activities Performed By	Description
Unknown	Unknown	<ul style="list-style-type: none"> <li>• Four underground gasoline tanks (one 1,000-gallon and three 500-gallon tanks) were installed.</li> <li>• W.A. Craig reported that the structure at 4401 Market Street was constructed in 1943 and used as a gasoline station until the 1970s.</li> </ul>
22 June 1990	Environmental Bio-Systems	<ul style="list-style-type: none"> <li>• The 4 underground gasoline tanks were removed. Removal of the fuel dispensers, product piping, and pump island was not documented. Soil excavated during tank removal was reused to backfill the excavations.</li> <li>• Soil samples were collected from below the tanks. Samples of the excavated soil were also collected. Soil samples were analyzed for TPH-gasoline and BTEX. Soil sampling indicated a release of gasoline.</li> </ul>
6 September 1990	W.A. Craig	<ul style="list-style-type: none"> <li>• Two trenches were excavated to depths of approximately 5 feet in the vicinity of the former dispenser island.</li> <li>• Contaminated soil was observed during excavation but no laboratory analyses were performed. The excavated soil was reused to backfill the trenches.</li> </ul>
27 and 28 October 1994	W.A. Craig	<ul style="list-style-type: none"> <li>• Seven borings were drilled to depths of approximately 25 feet at and near 4401 Market Street (SB1, SB2, SB3, SB4, MW1, MW2, and MW3); three of the borings were completed as monitoring wells (MW1, MW2, and MW3). Soil samples were collected during drilling.</li> <li>• Free product, presumably gasoline, was observed in boring SB2, located near the southwest corner of 4401 Market Street.</li> <li>• Soil samples were analyzed for TPH-gasoline and BTEX.</li> </ul>
8 November 1994	W.A. Craig	<ul style="list-style-type: none"> <li>• Groundwater monitoring was conducted for wells MW1, MW2, and MW3.</li> <li>• Samples were analyzed for TPH-gasoline and BTEX.</li> </ul>
14 February 1995	W.A. Craig	<ul style="list-style-type: none"> <li>• Groundwater monitoring was conducted for wells MW1, MW2, and MW3.</li> <li>• Samples were analyzed for TPH-gasoline and BTEX.</li> </ul>
7 June 1995	W.A. Craig	<ul style="list-style-type: none"> <li>• Groundwater monitoring was conducted for wells MW1, MW2, and MW3.</li> <li>• Samples were analyzed for TPH-gasoline and BTEX.</li> </ul>
29 August 1995	W.A. Craig	<ul style="list-style-type: none"> <li>• Groundwater monitoring was conducted for wells MW1, MW2, and MW3.</li> <li>• Samples were analyzed for TPH-gasoline and BTEX.</li> </ul>
8 December 1995	W.A. Craig	<ul style="list-style-type: none"> <li>• Groundwater monitoring was conducted for wells MW1, MW2, and MW3.</li> <li>• Samples were analyzed for TPH-gasoline and BTEX.</li> </ul>
7 March 1996	W.A. Craig	<ul style="list-style-type: none"> <li>• Groundwater monitoring was conducted for wells MW1, MW2, and MW3.</li> <li>• Samples were analyzed for TPH-gasoline, BTEX, and MtBE.</li> </ul>
19 June 1996	W.A. Craig	<ul style="list-style-type: none"> <li>• Groundwater monitoring was conducted for wells MW1, MW2, and MW3.</li> <li>• Samples were analyzed for TPH-gasoline, BTEX, and MtBE.</li> </ul>
20 December 1996	W.A. Craig	<ul style="list-style-type: none"> <li>• Groundwater monitoring was conducted for wells MW1, MW2, and MW3.</li> <li>• Samples were analyzed for TPH-gasoline, BTEX, and MtBE.</li> </ul>
12 June 1997	W.A. Craig	<ul style="list-style-type: none"> <li>• Groundwater monitoring was conducted for wells MW1, MW2, and MW3.</li> <li>• Samples were analyzed for TPH-gasoline, BTEX, and MtBE.</li> </ul>
31 March 1999	Streamborn	<ul style="list-style-type: none"> <li>• Groundwater levels measured in wells MW1, MW2, and MW3.</li> </ul>
April and July 1999	Streamborn	<ul style="list-style-type: none"> <li>• Nine borings were drilled to depths of approximately 20 feet near 4401 Market Street (B8 through B16). Free product, presumably gasoline, was observed in boring B10, located on the south side of 44th Street, adjacent to 903 44th Street. Soil samples were collected during drilling. Groundwater samples were collected from temporary casings installed in the borings. The borings were grouted upon completion of groundwater sampling.</li> <li>• Soil samples and groundwater samples were analyzed for TPH-gasoline, BTEX, and fuel oxygenates.</li> </ul>
4-5 January 2001	Streamborn	<ul style="list-style-type: none"> <li>• Four monitoring wells (MW4, MW5, MW6, and MW7) were installed to depths of approximately 25 feet near 4401 Market Street. Soil samples were collected during drilling.</li> <li>• Soil samples were analyzed for TPH-Gasoline, BTEX, and fuel oxygenates.</li> <li>• An elevation survey was performed for the newly-installed monitoring wells.</li> </ul>



**Table 1 (Page 2 of 3)**  
**Environmental Chronology**  
**4401 Market Street, Oakland CA**

Date	Activities Performed By	Description
1 February 2001	Streamborn	<ul style="list-style-type: none"> <li>Wells MW4, MW5, MW6, and MW7 were developed.</li> <li>Groundwater samples were collected from wells MW1, MW3, MW4, MW5, MW6, and MW7. Samples were analyzed for TPH-Gasoline, BTEX, and fuel oxygenates.</li> <li>Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, MW6, and MW7.</li> <li>Wells MW4, MW5, and MW6 were monitored for free product; no free product was detected.</li> </ul>
9 March 2001	Streamborn	<ul style="list-style-type: none"> <li>Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, MW6, and MW7.</li> <li>Wells MW4, MW5, and MW6 were monitored for free product; no free product was detected.</li> </ul>
23 April 2001	Streamborn	<ul style="list-style-type: none"> <li>Water levels were measured in MW1, MW2, MW3, MW4, MW5, MW6, and MW7.</li> <li>Wells MW4, MW5, and MW6 were monitored for free product; no free product was detected.</li> </ul>
30 May 2001	Streamborn	<ul style="list-style-type: none"> <li>Groundwater samples were collected from wells MW1, MW3, MW4, MW5, MW6 and MW7. Samples were analyzed for TPH-Gasoline, BTEX, and fuel oxygenates.</li> <li>Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, MW6, and MW7.</li> <li>Wells MW4, MW5, and MW6 were monitored for free product; no free product was detected.</li> </ul>
19 June 2001	Streamborn	<ul style="list-style-type: none"> <li>Water levels were measured in MW1, MW2, MW3, MW4, MW5, MW6, and MW7.</li> <li>Wells MW4, MW5, and MW6 were monitored for free product; no free product was detected.</li> </ul>
19 July 2001	Streamborn	<ul style="list-style-type: none"> <li>Water levels were measured in MW1, MW2, MW3, MW4, MW5, MW6, and MW7.</li> <li>Wells MW4, MW5, and MW6 were monitored for free product; no free product was detected.</li> </ul>
22 August 2001	Streamborn	<ul style="list-style-type: none"> <li>Groundwater samples were collected from wells MW1, MW3, MW4, MW5, MW6 and MW7. Samples were analyzed for TPH-Gasoline, BTEX, and fuel oxygenates.</li> <li>Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, MW6, and MW7.</li> <li>Wells MW4, MW5, and MW6 were monitored for free product; no free product was detected.</li> </ul>
29 November 2001	Streamborn	<ul style="list-style-type: none"> <li>Groundwater samples were collected from wells MW1, MW3, MW4, MW5, MW6 and MW7. Samples were analyzed for TPH-Gasoline, BTEX, and fuel oxygenates.</li> <li>Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, MW6, and MW7.</li> </ul>
29 September 2003	Streamborn	<ul style="list-style-type: none"> <li>Groundwater samples were collected from wells MW1, MW3, MW4, MW5, MW6 and MW7. Samples were analyzed for TPH-Gasoline, BTEX, and fuel oxygenates.</li> <li>Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, MW6, and MW7.</li> <li>Wells MW4, MW5, and MW6 were monitored for free product; no free product was detected.</li> </ul>
21 November 2008	Streamborn	<ul style="list-style-type: none"> <li>Wells MW1, MW2, MW3, MW4, MW5, and MW6 were redeveloped by surging with a surge block and pumping with a submersible pump.</li> <li>We could not contact the property owner of 903 44<sup>th</sup> Street and obtain permission to access well MW7.</li> </ul>
15 December 2008	Streamborn	<ul style="list-style-type: none"> <li>Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, and MW6.</li> <li>Groundwater samples were collected from wells MW1, MW2, MW3, MW4, MW5, and MW6. Samples were analyzed for TPH-Gasoline/BTEX/fuel oxygenates (EPA Method 8260).</li> <li>We could not contact the property owner of 903 44<sup>th</sup> Street and obtain permission to access well MW7.</li> </ul>
14 April 2009	Streamborn	<ul style="list-style-type: none"> <li>Water levels were measured in wells MW1, MW2, MW3, MW4, MW5, and MW6.</li> <li>Groundwater samples were collected from wells MW1, MW2, MW3, MW4, MW5, and MW6. Samples were analyzed for TPH-Gasoline/BTEX/fuel oxygenates (EPA Method 8260).</li> <li>Streamborn repeatedly attempted to contact the property owner of 903 44<sup>th</sup> Street where well MW7 is located. The property owner did not respond to our inquires.</li> </ul>

**Table 1 (Page 3 of 3)**  
**Environmental Chronology**  
**4401 Market Street, Oakland CA**

Date	Activities Performed By	Description
29 June 2009	Streamborn	<ul style="list-style-type: none"> <li>• Six borings (SG1 through SG6) were drilled to depths of approximately 6.5 feet at/near 4401 Market Street.</li> <li>• Soilgas implants were installed in each borehole at a depth of approximately 5.7 feet. Teflon tubing (3/16" ID, 1/4" OD) lead from the implant to the ground surface. The boreholes were backfilled with sand, dry bentonite, and hydrated bentonite and allowed to equilibrate for at least two hours prior to collecting soilgas samples.</li> <li>• A soilgas purge test was conducted in one of the boreholes (SG3) to determine the purge volume appropriate for sampling. The results of the purge test indicated that approximately two sand-pack volumes (sand-pack volume = volume of the voids in the interval of the sand pack) should be purged prior to sampling. This corresponded to a purge time of approximately 4.2 minutes at the purge flowrate = 0.167 liters/minute.</li> <li>• Soilgas samples were collected from each of the six implants. The samples were collected after purging two sand-pack volumes. The samples were collected using 1-liter summa canisters at the sampling flowrate = 0.167 liters/minute. Air Toxics (Folsom CA) analyzed the soilgas samples for volatile organic compounds (EPA Method Modified TO-15).</li> <li>• During soilgas sampling, a shroud was placed on the ground surface, over each borehole. A tracer gas (2-propanol or isopropyl alcohol also known as "rubbing alcohol") was introduced inside the shroud prior to and during purging and sampling. This activity was performed to determine whether soilgas samples contained atmospheric air (for example, due to short-circuiting or leakage along the outside of the implant tubing). Very low concentrations of the tracer gas were detected in each of the six soilgas samples; probably as a result of cross-contamination that occurred when the sample tubing was threaded through the shroud.</li> <li>• After each soilgas sample was collected; a vacuum leak check was performed on the sample train, including the implant tubing connection. The leak check consisted of applying a vacuum of approximately 27 inches Hg for a period of approximately five minutes. No leaks were detected.</li> <li>• The implant tubing was pulled and the borings were grouted. The asphalt concrete pavement was patched at the two sampling locations within the street.</li> </ul>

General Note

(a) TPH = total petroleum hydrocarbons. BTEX = benzene, toluene, ethylbenzene, and xylenes. MtBE = methyl tert-butyl ether.

**Table 2 (Page 1 of 2)**  
**Bibliography**  
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**Table 3**  
**Groundwater Level and Gradient Data Since 2001**  
**4401 Market Street, Oakland CA**

Location	MW1		MW2		MW3		MW4		MW5		MW6		MW7		Groundwater Gradient	
	Casing Diameter (inches)		2		2		2		2		2		2			
Ground Surface	Elev = 998.74		Elev = 998.07		Elev = 999.64		Elev = 998.18		Elev = 997.78		Elev = 998.02		Elev = 999.12			
Measuring Point	<b>TOC N Side, Elev = 998.22</b>		<b>TOC N Side, Elev = 997.73</b>		<b>TOC N Side, Elev = 998.90</b>		<b>TOC N Side, Elev = 997.87</b>		<b>TOC N Side, Elev = 997.33</b>		<b>TOC N Side, Elev = 997.50</b>		<b>TOC N Side, Elev = 998.69</b>			
Intercepted Interval	Depth	Elev	Depth	Elev	Depth	Elev	Depth	Elev	Depth	Elev	Depth	Elev	Depth	Elev	Direction	Magnitude
	19 to 25.5	972.9 to 979.7	19 to 27.5	970.6 to 979.1	19 to 27.5	972.1 to 980.6	9 to 25	973.2 to 989.2	9 to 25	972.8 to 988.8	9 to 25	973.0 to 989.0	9 to 25	974.1 to 990.1		
1 February 2001	13.77	984.45	13.21	984.52	14.01	984.89	13.22	984.65	13.14	984.19	13.31	984.19	14.76	983.93		
9 March 2001	12.54	985.68	12.30	985.43	13.32	985.58	12.28	985.59	11.70	985.63	12.54	984.96	13.94	984.75		
23 April 2001	14.01	984.21	13.36	984.37	14.15	984.75	13.05	984.82	13.30	984.03	13.39	984.11	14.63	984.06		
30 May 2001	14.74	983.48	NM	NM	14.67	984.23	13.93	983.94	14.14	983.19	14.17	983.33	15.79	982.90	N 138° W	0.01
19 June 2001	14.83	983.39	13.93	983.80	14.67	984.23	15.47	982.40	14.29	983.04	14.34	983.16	15.87	982.82		
19 July 2001	15.04	983.18	14.51	983.22	14.84	984.06	14.73	983.45	14.48	982.85	14.47	983.03	15.99	982.70		
22 August 2001	15.03	983.19	14.48	983.25	14.83	984.07	14.63	983.24	14.58	982.75	14.57	982.93	16.15	982.54	N 143° W	0.01
29 November 2001	12.59	985.63	12.01	985.72	12.66	986.24	12.78	985.09	11.05	986.28	11.42	986.08	12.94	985.75		
29 September 2003	15.05	983.17	14.50	983.23	14.94	983.96	14.53	983.34	14.53	982.80	14.52	982.98	16.19	982.50	N 131° W	0.01
15 December 2008	13.12	985.10	12.25	985.48	13.05	985.85	12.39	985.48	12.24	985.09	12.05	985.45	NM	NM	N 88° W	0.01
14 April 2009	13.33	984.89	12.51	985.22	13.16	985.74	12.63	985.24	12.56	984.77	12.34	985.16	NM	NM	N 97° W	0.01
Total Depth (last measurement)	24.6		24.6		24.6		24.5		24.9		24.8		24.6		Ave = N 119° W	Ave = 0.01

General Notes

- (a) Measurements are cited in units of feet, referenced to a site-specific datum (NOT Mean Sea Level).
- (b) TOC = top of PVC casing. N = north. Measuring points are the top of PVC casing, north side.
- (c) The depth to water and total depth were measured relative to the top of PVC casing.
- (d) The depth of the intercepted interval was measured relative to the ground surface and corresponds to the sand pack interval.

**Table 4**  
**Groundwater Purging and Sampling Information Since 2001**  
**4401 Market Street, Oakland CA**

Location	Sample Date	Sample Type	Dissolved Oxygen (mg/L)	pH	Specific Conductance (µS/cm)	Temperature (°C)	ORP (mV)	Turbidity and Color	Purge Method	Purge Duration (minutes)	Volume Purged (gallons)	Purged Dry ?	Standing Water Casing Volumes Removed
MW1	1 Feb 2001	GB	3.1	6.7	530	18.3	-210	Clear, none	SP	9	±5	Yes	±3
	30 May 2001	GB	1.0	6.8	560	24.2	30	Clear, none	SP	40	±5	Yes	±3
	22 Aug 2001	GB	3.0	6.9	510	20.4	50	Clear, none	SP	8	±5	Yes	±3
	29 Nov 2001	GB	NM	6.7	480	20.9	-170	Clear, none	SP	15	±4	Yes	±2
	29 Sep 2003	GB	1.6	6.3	520	21.5	130	Clear, none	SP	15	±5	Yes	±3
	15 Dec 2008	GB	1.0	6.6	410	18.0	80	Clear, none	SP	9	±6	no	±3
	14 Apr 2009	GB	1.1	6.5	400	17.5	180	Clear, none	SP	18	±7	no	±4
MW2	29 Sep 2003	GB	1.6	6.6	560	21.9	-80	Clear, none	SP	20	±5	no	±3
	15 Dec 2008	GB	1.1	6.6	590	18.5	-60	Clear, none	SP	11	±6	no	3
	14 Apr 2009	GB	1.1	6.1	610	19.5	-80	Clear, none	SP	27	±7	no	±4
MW3	1 Feb 2001	GB	5.0	6.7	370	17.4	-230	Clear, none	SP	4	±5	no	±3
	30 May 2001	GB	5.8	7.0	390	23.6	60	Clear, none	SP	26	±5	Yes	±3
	22 Aug 2001	GB	4.5	7.1	370	21.5	90	Cloudy, brown	SP	6	±5	Yes	±3
	29 Nov 2001	GB	NM	6.8	330	19.3	20	Clear, none	SP	10	±6	Yes	±3
	29 Sep 2003	GB	4.5	6.6	370	19.6	190	Clear, none	SP	10	±5	Yes	±3
	15 Dec 2008	GB	3.0	6.6	390	17.6	100	Clear, none	SP	9	±6	no	±3
	14 Apr 2009	GB	4.6	6.1	400	19.4	220	Clear, none	SP	28	±7	no	±4
MW4	1 Feb 2001	GB	5.2	6.8	580	18.2	-210	Cloudy, gray	SP	47	±15	Yes	±9
	30 May 2001	GB	1.5	6.8	700	22.8	20	Clear, none	SP	23	±6	Yes	±3
	22 Aug 2001	GB	2.1	6.9	540	21.2	-20	Clear, none	SP	5	±5	no	±3
	29 Nov 2001	GB	NM	6.7	550	19.5	-170	Clear, none	SP	16	±5	Yes	±3
	29 Sep 2003	GB	1.5	6.5	560	22.4	30	Clear, none	SP	10	±5	no	±3
	15 Dec 2008	GB	1.0	6.6	500	18.8	-20	Clear, none	SP	9	±6	no	±3
	14 Apr 2009	GB	0.9	6.0	510	20.7	-20	Clear, none	SP	22	±6	no	±3
MW5	1 Feb 2001	GB	0.8	6.7	640	18.1	-250	Turbid, brown	SP	18	±20	no	±10
	30 May 2001	GB	1.2	7.0	630	19.6	20	Clear, none	SP	4	±6	no	±3
	22 Aug 2001	GB	2.2	7.0	600	20.0	-40	Clear, none	SP	5	±5	no	±3
	29 Nov 2001	GB	NM	6.9	610	19.6	-170	Clear, none	SP	8	±7	no	±3
	29 Sep 2003	GB	1.6	6.7	560	21.9	-60	Clear, none	SP	10	±5	no	±3
	15 Dec 2008	GB	0.8	6.7	690	18.5	-50	Translucent, gray	SP	6	±6	no	±3
	14 Apr 2009	GB	0.9	6.5	680	17.8	10	Clear, none	SP	23	±6	no	±3
MW6	1 Feb 2001	GB	2.8	6.7	510	18.7	-360	Opaque, brown	SP	23	±20	no	±11
	30 May 2001	GB	2.9	6.8	470	24.2	80	Turbid, brown	SP	5	±6	no	±3
	22 Aug 2001	GB	2.6	6.9	400	21.0	30	Turbid, green	SP	5	±5	no	±3
	29 Nov 2001	GB	NM	6.8	390	19.5	-160	Clear, none	SP	8	±7	no	±3
	29 Sep 2003	GB	2.1	6.6	470	25.5	180	Clear, none	SP	10	±5	no	±3
	15 Dec 2008	GB	2.0	6.6	440	18.9	140	Translucent, brown	SP	6	±6	no	±3
	14 Apr 2009	GB	2.3	7.1	450	16.8	130	Clear, none	SP	14	±6	no	±3
MW7	1 Feb 2001	GB	3.0	6.8	430	16.1	-200	Cloudy, brown	SP	25	±17	no	±11
	30 May 2001	GB	3.1	6.8	500	23.6	60	Clear, none	SP	5	±5	no	±3
	22 Aug 2001	GB	4.6	6.9	420	19.3	20	Turbid, gray	SP	5	±5	no	±3
	29 Nov 2001	GB	NM	6.7	400	19.2	0	Clear, none	SP	6	±6	no	±3
	29 Sep 2003	GB	2.4	6.3	410	19.0	180	Clear, none	SP	10	±4	no	±3

General Notes

- (a) ORP = oxidation/reduction potential.
- (b) NM = not measured.
- (c) Entries in this table correspond to the end of purging (time of sampling).
- (d) SP = submersible purge pump.
- (e) GB = grab sample collected using a Teflon bailer fitted with a bottom-emptying device.

**Table 5 (Page 1 of 2)**  
**Groundwater Analytical Data from Monitoring Wells**  
**4401 Market Street, Oakland CA**

Location	Sample Date	Sampled By	TPH-Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Methyl Tert-Butyl Ether (µg/L)	Tert-Butyl-Alcohol (µg/L)	Other Fuel Oxygenates (µg/L)
MW1	8 Nov 1994	W.A. Craig	54	<0.5	<0.5	<0.5	1.2	NA	NA	NA
	14 Feb 1995	W.A. Craig	71	<0.5	<0.5	<0.5	0.97	NA	NA	NA
	7 Jun 1995	W.A. Craig	540	0.6	<0.5	1.7	1.3	NA	NA	NA
	29 Aug 1995	W.A. Craig	440	<0.5	<0.5	1.3	1.1	NA	NA	NA
	8 Dec 1995	W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NA
	7 Mar 1996	W.A. Craig	77	<0.5	<0.5	<0.5	<0.5	44	NA	NA
	19 Jun 1996	W.A. Craig	500	<0.5	<0.5	0.85	0.36	84	NA	NA
	20 Dec 1996	W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	28	NA	NA
	12 Jun 1997	W.A. Craig	190	<0.5	<0.5	<0.5	<0.5	12	NA	NA
	1 Feb 2001	Streamborn	<50	<0.5	<0.5	<0.5	1.1	<5.0	<5.0	<5.0 to <10
	30 May 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0
	22 Aug 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	100	<5.0 to <10
	29 Nov 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10
	29 Sep 2003	Streamborn	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<5.0	<0.5 to <1.0
	15 Dec 2008	Streamborn	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<20	<0.5 to <100
14 Apr 2009	Streamborn	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<5	<0.5 to <250	
MW2	8 Nov 1994	W.A. Craig	20,000	1,400	960	980	4,600	NA	NA	NA
	14 Feb 1995	W.A. Craig	8,600	380	210	410	2,000	NA	NA	NA
	7 Jun 1995	W.A. Craig	6,200	500	78	270	1,200	NA	NA	NA
	29 Aug 1995	W.A. Craig	4,100	330	61	210	980	NA	NA	NA
	8 Dec 1995	W.A. Craig	9,400	360	190	440	2,000	NA	NA	NA
	7 Mar 1996	W.A. Craig	12,000	790	170	440	2,000	18	NA	NA
	19 Jun 1996	W.A. Craig	9,000	520	82	350	1,500	<5.0	NA	NA
	20 Dec 1996	W.A. Craig	13,000	830	180	410	2,200	<16	NA	NA
	12 Jun 1997	W.A. Craig	5,100	320	32	190	880	<36	NA	NA
	29 Sep 2003	Streamborn	220	5.5	<0.5	2.1	9.1	<0.5	24	DIPE = 1.3 Others = <0.5
	15 Dec 2008	Streamborn	1,600	43	<0.5	53	150	<0.5	<20	<0.5 to <100
14 Apr 2009	Streamborn	1,400	37	<0.5	30	120	<0.5	10	<0.5 to <250	
MW3	8 Nov 1994	W.A. Craig	<50	0.71	0.84	1.2	5.8	NA	NA	NA
	14 Feb 1995	W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NA
	7 Jun 1995	W.A. Craig	<50	<0.5	<0.5	<0.5	1.6	NA	NA	NA
	29 Aug 1995	W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NA
	8 Dec 1995	W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	NA
	7 Mar 1996	W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	<5.0	NA	NA
	19 Jun 1996	W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	<5.0	NA	NA
	20 Dec 1996	W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	<5.0	NA	NA
	12 Jun 1997	W.A. Craig	<50	<0.5	<0.5	<0.5	<0.5	<5.0	NA	NA
	1 Feb 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10
	30 May 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10
	22 Aug 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	14	<5.0 to <10
	29 Nov 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10
	29 Sep 2003	Streamborn	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<5.0	<0.5 to <1.0
	15 Dec 2008	Streamborn	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<20	<0.5 to <100
14 Apr 2009	Streamborn	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<5.0	<0.5 to <250	
MW4	1 Feb 2001	Streamborn	1,500	58	1.3	83	320	<5.0	16	<5.0 to <10
	30 May 2001	Streamborn	1,000	19	<0.5	50	3.4	<5.0	23	<5.0 to <10
	22 Aug 2001	Streamborn	220	<0.5	<0.5	3.2	2.7	<5.0	8.8	<5.0 to <10
	29 Nov 2001	Streamborn	3,100	110	<5.0	120	410	<5.0	<5.0	<5.0 to <10
	29 Sep 2003	Streamborn	140	<0.5	<0.5	<0.5	<1.0	<0.5	<5.0	<0.5 to <1.0
	15 Dec 2008	Streamborn	70	1.1	<0.5	2.8	4.4	<0.5	<20	<0.5 to <100
	14 Apr 2009	Streamborn	110	2.5	<0.5	3.2	8.1	<0.5	<5.0	<0.5 to <250

**Table 5 (Page 2 of 2)**  
**Groundwater Analytical Data from Monitoring Wells**  
**4401 Market Street, Oakland CA**

Location	Sample Date	Sampled By	TPH-Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Methyl Tert-Butyl Ether (µg/L)	Tert-Butyl-Alcohol (µg/L)	Other Fuel Oxygenates (µg/L)
MW5	1 Feb 2001	Streamborn	1,200	57	1.8	45	160	<5.0	<5.0	<5.0 to <10
	30 May 2001	Streamborn	570	20	<0.5	26	22	<5.0	<5.0	<5.0 to <10
	22 Aug 2001	Streamborn	380	19	0.67	31	17	<5.0	<5.0	<5.0 to <10
	29 Nov 2001	Streamborn	1,600	73	2.1	78	180	<5.0	<5.0	<5.0 to <10
	29 Sep 2003	Streamborn	460	2.6	<0.5	0.69	<1.0	<0.5	<5.0	<0.5 to <1.0
	15 Dec 2008	Streamborn	3,300	53	1.1	58	110	<0.5	<20	<0.5 to <100
	14 Apr 2009	Streamborn	1,100	32	<0.5	24	23	<0.5	<5.0	<0.5 to <250
MW6	1 Feb 2001	Streamborn	260	8.0	<0.5	22	23	<5.0	<5.0	<5.0 to <10
	30 May 2001	Streamborn	53	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10
	22 Aug 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10
	29 Nov 2001	Streamborn	130	5.7	<0.5	1.6	5.0	<5.0	<5.0	<5.0 to <10
	29 Sep 2003	Streamborn	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<5.0	<0.5 to <1.0
	15 Dec 2008	Streamborn	78	<0.5	<0.5	<0.5	<1.0	<0.5	<20	<0.5 to <100
	14 Apr 2009	Streamborn	380	1.8	<0.5	<0.5	<1.0	<0.5	<5.0	<0.5 to <250
MW7	1 Feb 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10
	30 May 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10
	22 Aug 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10
	29 Nov 2001	Streamborn	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<5.0	<5.0 to <10
	29 Sep 2003	Streamborn	<50	<0.5	<0.5	<0.5	<1.0	<0.5	<5.0	<0.5 to <1.0
California Maximum Contaminant Level (Environmental Screening Level for groundwater that is a current or potential future drinking water resource)				1.0	150	300	1,750	13		
California Department of Health Services Notification Level (Environmental Screening Level for groundwater that is a current or potential future drinking water resource)									12	
Taste and Odor Threshold (Environmental Screening Level for groundwater that is a current or potential future drinking water resource)			100	170	40	30	20	5		

**General Notes**

- (a) TPH = total petroleum hydrocarbons. MtBE = methyl tert-butyl ether. DIPE = di-isopropyl ether.
- (b) NA = not analyzed.
- (c) Environmental Screening Levels from: *Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater (Interim Final - November 2007, Revised May 2008)*. Prepared by San Francisco Bay Regional Water Quality Control Board, Oakland CA. 27 May 2008. ([www.waterboards.ca.gov/sanfranciscobay/esl.shtml](http://www.waterboards.ca.gov/sanfranciscobay/esl.shtml))



**Table 6**  
**Free Product Thickness in Monitoring Wells MW4, MW5, and MW6**  
**4401 Market Street, Oakland CA**

Date	MW4 (feet)	MW5 (feet)	MW6 (feet)
1 February 2001	<0.005	<0.005	<0.005
9 March 2001	<0.005	<0.005	<0.005
23 April 2001	<0.005	<0.005	<0.005
30 May 2001	<0.005	<0.005	<0.005
19 June 2001	<0.005	<0.005	<0.005
19 July 2001	<0.005	<0.005	<0.005
22 August 2001	<0.005	<0.005	<0.005
29 November 2001	<0.005	<0.005	<0.005

General Note

(a) Free product monitoring was performed using a Water Mark Interface meter: Model H.OIL.

**Table 7**  
**Analytical Results from Soilgas Sampling**  
**4401 Market Street, Oakland CA**

Location	Sample Date	Sample Interval (feet)	Purge Flowrate (liter/min)	Purge Volume (liter)	Purge Volume (sand-pack volumes)	Sample Flowrate (liter/min)	Sample Volume (liter)	Approximate Depth to Groundwater (feet)	2-Propanol (µg/m <sup>3</sup> )	Benzene (µg/m <sup>3</sup> )	Toluene (µg/m <sup>3</sup> )	Ethylbenzene (µg/m <sup>3</sup> )	Total Xylenes (µg/m <sup>3</sup> )	PCE (µg/m <sup>3</sup> )	Acetone (µg/m <sup>3</sup> )	2-Butanone (µg/m <sup>3</sup> )	Carbon Disulfide (µg/m <sup>3</sup> )	1,2,4-Trimethylbenzene (µg/m <sup>3</sup> )	1,3,5-Trimethylbenzene (µg/m <sup>3</sup> )	Other Volatile Organic Compounds (EPA Method TO-15) (µg/m <sup>3</sup> )	
SG1	29 June 2009	4.3-6.0	0.167	0.704	2	0.167	1	13.7	100	5.6	16	8.8	44	170	80	11	<3.8	13	<6.8	Tetrahydrofuran = 7.2 Chloroform = 34 4-Methyl-2-pentanone = 8.7 Others <3.0 to <59	
SG2	29 June 2009	5.1-6.6	0.167	0.704	2	0.167	1	13.7	44	11	83	75	254	120	89	16	12	16	7.0	Carbon Disulfide = 12 Hexane = 32 Tetrahydrofuran = 6.4 Cyclohexane = 6.3 2,2,4-Trimethylpentane = 23 Heptane = 23 Others <3.0 to <59	
SG2 Laboratory Duplicate	29 June 2009	5.1-6.6	0.167	0.704	2	0.167	1	13.7	47	11	85	83	267	130	93	14	13	17	<14	Carbon Disulfide = 13 Hexane = 30 2,2,4-Trimethylpentane = 22 Heptane = 22 Others <6.4 to <120	
SG3	29 June 2009	4.8-6.4	0.167	0.704	2	0.167	1	13.7	190	5.1	29	6.2	29.7	29	72	13	4.6	16	<6.1	Carbon Disulfide = 4.6 Ethanol = 17 Hexane = 7.8 Tetrahydrofuran = 18 Heptane = 6.6 4-Methyl-2-pentanone = 7.6 Others <2.7 to <53	
SG4	29 June 2009	5.1-6.7	0.167	0.704	2	0.167	1	13.7	95	15	130	26	128	<9.1	110	31	10	40	17	Carbon Disulfide = 10 Hexane = 36 Cyclohexane = 6.6 2,2,4-Trimethylpentane = 38 Heptane = 38 4-Methyl-2-pentanone = 17 Propylbenzene = 8.6 Others <3.0 to <57	
SG5	29 June 2009	5.0-6.6	0.167	0.704	2	0.167	1	13.7	87	16	90	19	86	<12	70	15	34	40	11	Carbon Disulfide = 34 1,3-Butadiene = 4.4 Hexane = 48 Tetrahydrofuran = 9.5 Chloroform = 22 Heptane = 27 4-Methyl-2-pentanone = 22 Others <3.8 to <74	
SG6	29 June 2009	5.0-6.5	0.167	0.704	2	0.167	1	13.7	2,400 <sup>(1)</sup>	5.9	21	6.8	37.7	<8.2	32	7.4	40	10	<5.9	Carbon Disulfide = 40 Hexane = 66 Cyclohexane = 16 Heptane = 22 4-Methyl-2-pentanone = 10 Others <2.7 to <52	
Environmental Screening Level - Shallow Soilgas (vapor intrusion), Residential Exposure										84	63,000	980	21,000	410						Chloroform = 460	
California Human Health Screening Level (CHHSL) - Shallow Soilgas (vapor intrusion), Residential Land Use										36.2	135,000		315,000	180							

**General Notes**

- (a) 2-Propanol = Isopropyl alcohol or "rubbing alcohol". 2-Propanol was used as the tracer gas during purging and sampling.
- (b) PCE = Tetrachloroethene. 2-Butanone = Methyl ethyl ketone.
- (c) Environmental Screening Levels from: *Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater (Interim Final - November 2007, Revised May 2008)*. Prepared by San Francisco Bay Regional Water Quality Control Board, Oakland CA. 27 May 2008. ([www.waterboards.ca.gov/sanfranciscobay/esl.shtml](http://www.waterboards.ca.gov/sanfranciscobay/esl.shtml))
- (d) California Human Health Screening Level (CHHSL) from: *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties*. Prepared by California Environmental Protection Agency. January 2005.

**Footnote**

- (1) Result exceeded the instrument calibration range.

**Table 8**  
**Theoretical Proportion of the Shroud Atmosphere that was Measured in Each Soilgas**  
**4401 Market Street, Oakland CA**

Location	Sample Date	2-Propanol Concentration Measured Inside the Shroud		2-Propanol Concentrations Measured in the Soilgas Sample		Theoretical Proportion of Shroud Atmosphere that was Measured in Soilgas Sample
		ppbv	µg/m <sup>3</sup>	ppbv	µg/m <sup>3</sup>	Proportion
SG1	29 June 2009	350,000	860,000	42	100	1 x 10 <sup>-4</sup>
SG2	29 June 2009	360,000	882,000	18	44	5 x 10 <sup>-5</sup>
SG3	29 June 2009	340,000	833,000	78	190	2 x 10 <sup>-4</sup>
SG4	29 June 2009	305,000	747,000	39	95	1 x 10 <sup>-4</sup>
SG5	29 June 2009	70,000	172,000	36	87	5 x 10 <sup>-4</sup>
SG6	29 June 2009	245,000	600,000	960 <sup>(1)</sup>	2,400 <sup>(1)</sup>	4 x 10 <sup>-3</sup>

General Notes

- (a) 2-Propanol = Isopropyl alcohol or “rubbing alcohol”.
- (b) 2-Propanol was used as the tracer gas during soilgas purging and sampling. A cloth was soaked in 2-Propanol and the cloth was placed inside a metal liner. The liner had been previously drilled with multiple holes. The liner (containing the soaked cloth) was then placed inside the shroud. The atmosphere inside the shroud was monitored in the field using an organic vapor meter.
- (c) Organic vapor meter = Mini Rae 2000 organic vapor monitor fitted with a 10.6 eV photoionization detector, calibrated to 100 ppm v/v isobutylene.
- (d) The shroud consisted of a clear rectangular plastic storage container (12” x 9” x 6”). The lip of the storage container, where the container contacted the ground surface, was fitted with weather stripping. Two bulkhead fittings were installed in the side of the container. Teflon tubing (3/16” ID x 1/4” OD) was threaded through the bulkhead fittings. One tube consisted of the sample tube (leading from the implant). The other tube was used to monitor the shroud environment. A plug (nail) was inserted inside the tubing when the tubing was not in use.
- (e) During purging and sampling, multiple measurements of the atmosphere inside the shroud were made - the concentration cited in this table represents the average. In general, the measurements were consistent and did not vary significantly.
- (d) Theoretical Proportion of Shroud Atmosphere that was Measured in Soilgas Sample = (2-Propanol Concentration Measured in the Soilgas Sample) ÷ (2-Propanol Concentration Measured Inside the Shroud).

Footnote

- (1) Result exceeded the instrument calibration range.

**Table 9**  
**Soil Analytical Data During Tank Removal - Representing Soil That Was Not Excavated**  
**4401 Market Street, Oakland CA**

Location	Sample Depth (feet)	Location Description	Sample Date	Sample Type	TPH-Gasoline (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)
S2	±8.5	±2-feet below invert of middle 500-gallon gasoline tank	22 June 1990	Grab (liner)	360	0.99	12	9.5	53
S3	±7.5	±2-feet below invert of southern 500-gallon gasoline tank	22 June 1990	Grab (liner)	160	1.2	2.5	2.8	13
S4	±8	±2-feet below invert at non-fill end of 1,000-gallon gasoline tank	22 June 1990	Grab (liner)	210	3.3	9.4	7.6	32
S5	±8	±2-feet below invert at fill end of 1,000-gallon gasoline tank	22 June 1990	Grab (liner)	870	3.2	24	20	110
S6	±8.5	±2-feet below invert of northern 500-gallon gasoline tank	22 June 1990	Grab (liner)	730	5	24	26	140
S8	±15	±8.5-feet below inverts and midway between the two northern 500-gallon gasoline tanks	22 June 1990	Grab (liner)	260	3.7	14	7.1	33

General Note

(a) TPH = total petroleum hydrocarbons.

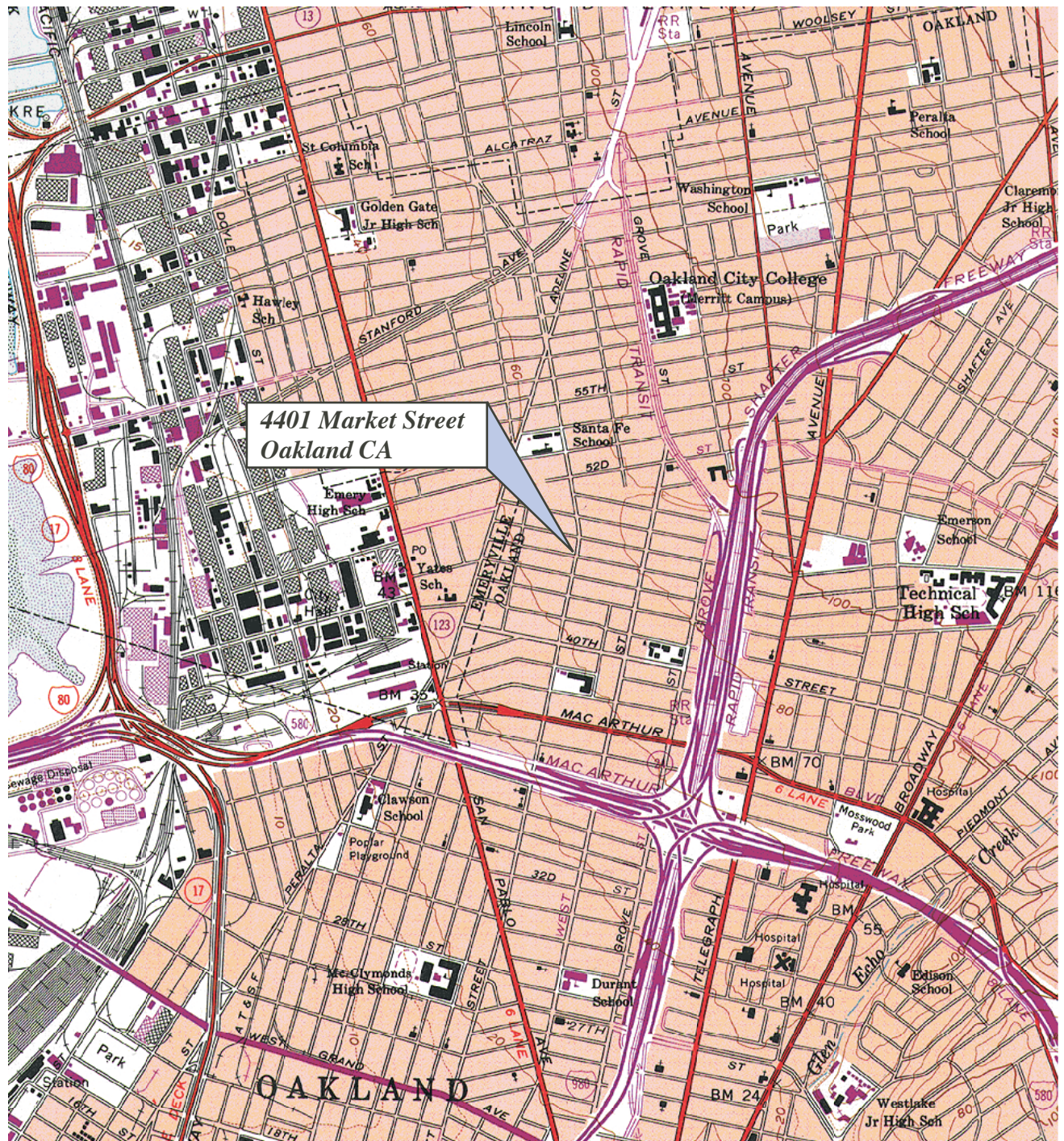
**Table 10**  
**Soil Analytical Data from Borings and Monitoring Wells**  
**4401 Market Street, Oakland CA**

Location	Sample Depth (feet)	Sample Date	TPH-Gasoline (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	MtBE (mg/kg)	Other Fuel Oxygenates (mg/kg)
SB1	10 to 10.5	27 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
	15 to 15.5	27 October 1994	72	<0.01	0.13	0.21	0.18	NM	NM
	20 to 20.5	27 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
SB2	10 to 10.5	27 October 1994	40	0.079	0.034	0.43	4.7	NM	NM
	15 to 15.5	27 October 1994	19	0.46	0.041	0.31	4.2	NM	NM
	20 to 20.5	27 October 1994	5.7	0.006	<0.005	0.010	0.079	NM	NM
SB3	10 to 10.5	27 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
	15 to 15.5	27 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
	19.5 to 20	27 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
SB4	10 to 10.5	28 October 1994	<1	<0.005	0.005	0.006	0.016	NM	NM
	15 to 15.5	28 October 1994	220	<0.01	0.60	0.46	0.93	NM	NM
	19.5 to 20	28 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
MW1	10 to 10.5	27 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
	15 to 15.5	27 October 1994	<1	<0.005	<0.005	0.005	<0.005	NM	NM
	20 to 20.5	27 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
MW2	10 to 10.5	28 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
	15 to 15.5	28 October 1994	97	1.5	1.4	2.3	12	NM	NM
	20 to 20.5	28 October 1994	2.0	<0.005	0.009	0.016	0.062	NM	NM
MW3	10 to 10.5	28 October 1994	1.1	<0.005	0.006	<0.005	0.010	NM	NM
	15 to 15.5	28 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
	20 to 20.5	28 October 1994	<1	<0.005	<0.005	<0.005	<0.005	NM	NM
B8	11.5 to 12	8 April 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	8 April 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
B9	11.5 to 12	8 April 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	8 April 1999	110	<0.62	<0.62	<0.62	<0.62	<0.62	NM
B10	11.5 to 12	8 April 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	8 April 1999	1,300	12	22	25	100	<3.1	NM
B11	11.5 to 12	8 April 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	8 April 1999	140	<0.62	<0.62	1.8	8.9	<0.62	NM
B12	11.5 to 12	8 April 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	8 April 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
B13	11.5 to 12	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
B14	11.5 to 12	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	9 July 1999	3.6	<0.005	<0.005	<0.005	0.036	<0.005	NM
	21 to 21.5	9 July 1999	2.1	<0.005	<0.005	0.059	0.32	<0.005	NM
B15	11.5 to 12	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	17.5 to 18	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
B16	11.5 to 12	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	15 to 15.5	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
	19.5 to 20	9 July 1999	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	NM
MW4	12.5 to 13	5 January 2001	25	<0.62	<0.62	<0.62	<0.62	<0.005	<0.005 to <0.010
	14 to 14.5	5 January 2001	29	<0.62	<0.62	<0.62	<0.62	<0.023	<0.023 to <0.046
	15.5 to 16	5 January 2001	140	<3.1	<3.1	<3.1	5.3	<0.023	<0.023 to <0.046
MW5	12.5 to 13	4 January 2001	120	<3.1	<3.1	<3.1	9.2	<0.019	<0.019 to <0.038
	14 to 14.5	4 January 2001	560	<1.2	<1.2	8.5	43	<0.023	<0.023 to <0.045
	15.5 to 16	4 January 2001	93	<0.62	0.79	1.3	7.6	<0.022	<0.022 to <0.043
MW6	12.5 to 13	4 January 2001	91	<0.62	<0.62	1.0	1.3	<0.016	<0.016 to <0.038
	14 to 14.5	4 January 2001	200	<3.1	<3.1	<3.1	<3.1	<0.020	<0.020 to <0.040
MW7	10 to 10.5	5 January 2001	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.010
	15 to 15.5	5 January 2001	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 to <0.010

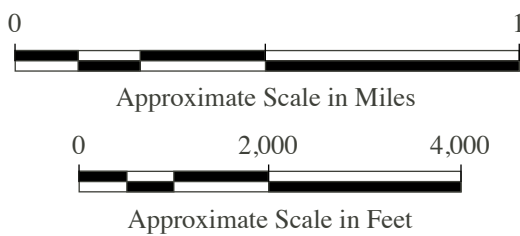
General Note

(a) TPH = total petroleum hydrocarbons. MtBE = methyl tert-butyl ether. NM = not measured.



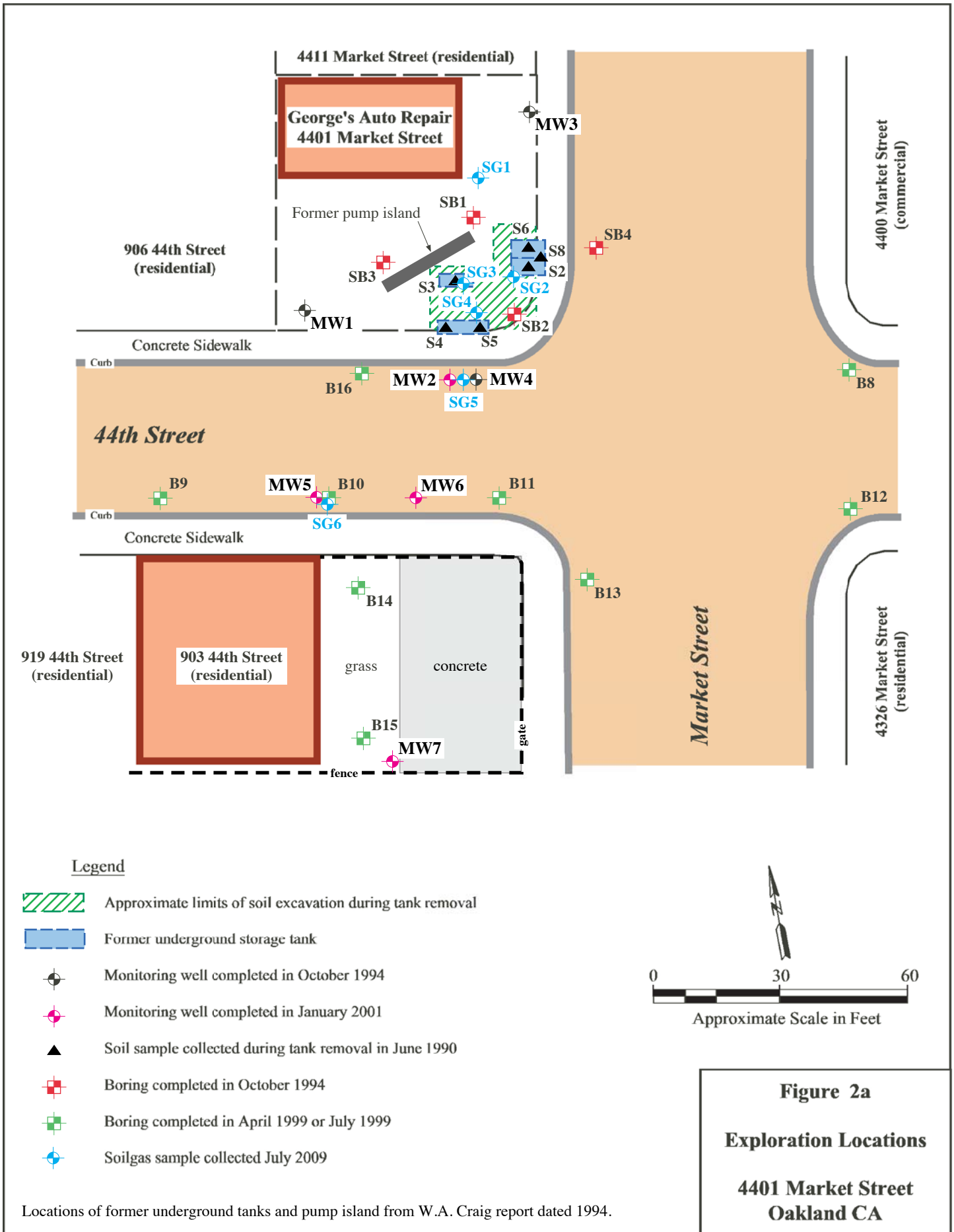


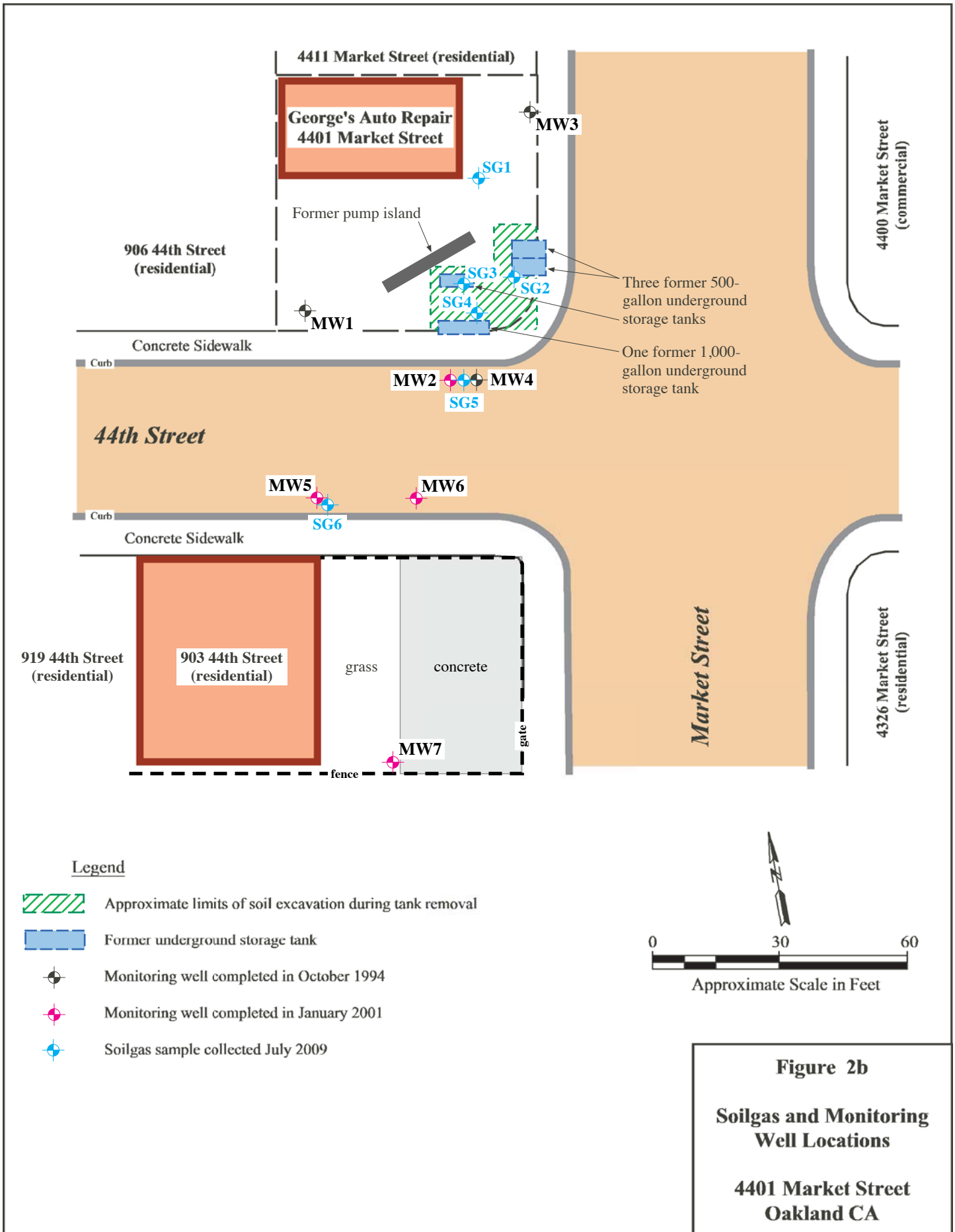
Basemap: U.S. Geological Survey, 7.5 Minute Quadrangle, Oakland West CA, 1959 (Photorevised 1980).



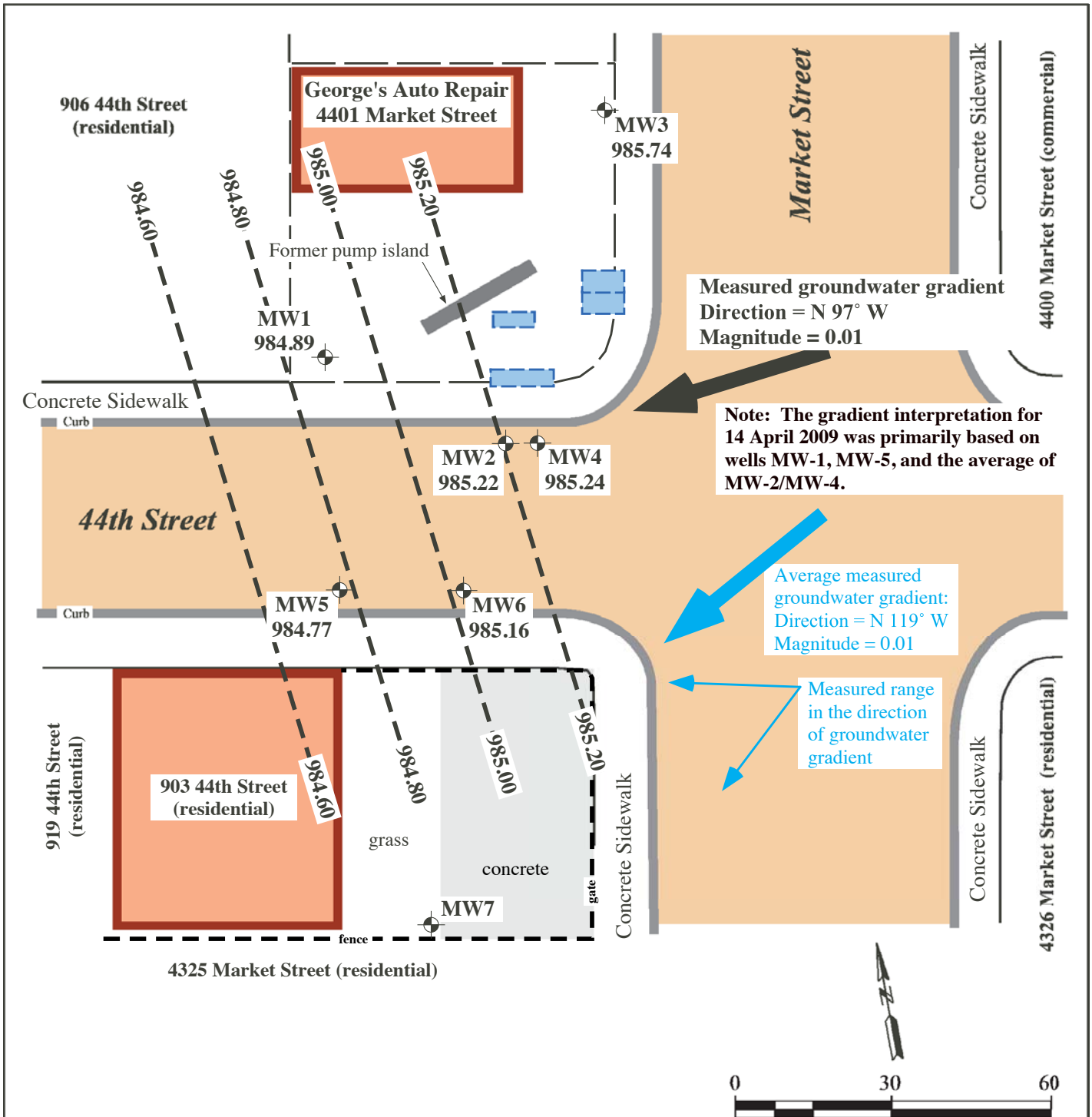
**Figure 1**  
**Location Map**  
**4401 Market Street**  
**Oakland CA**













Note: Groundwater elevations cited in units of feet, referenced to site-specific datum (NOT Mean Sea Level).

Legend

-  Monitoring well
-  Former underground tank

Locations of former underground tanks and pump island from W.A. Craig report dated 1994.

**Figure 3**  
**Groundwater Levels and Gradient (14 April 2009)**  
**4401 Market Street**  
**Oakland CA**

# **ATTACHMENT 1**

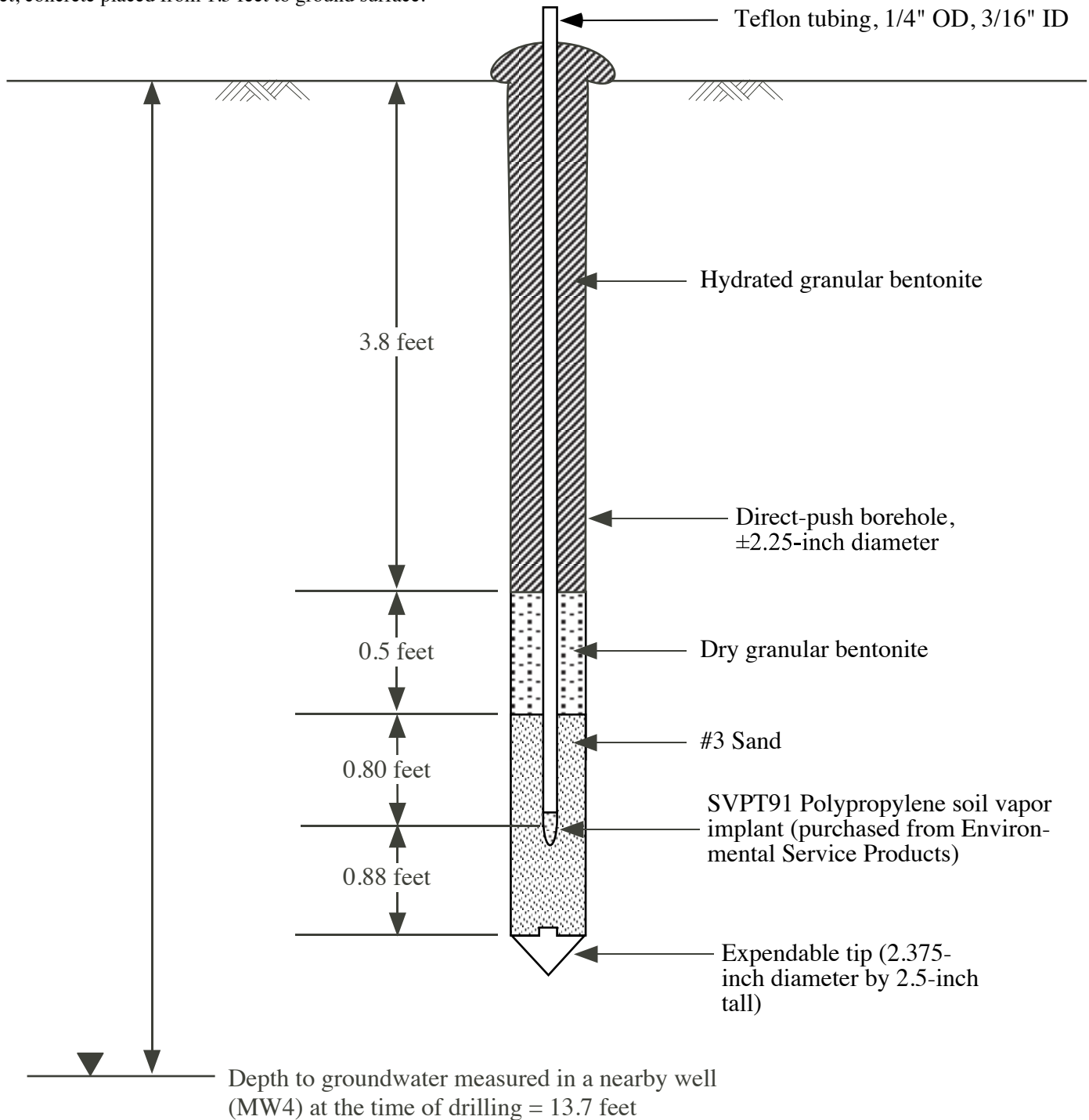
Borehole Schematics and Field Forms

GPS Coordinates N 37° 50.037'  
W 122° 16.396'

Start Drilling 29 June 2009, 10:40 am  
Complete Borehole Construction 29 June 2009, 11:10 am

Abandon/Decommission: Tubing extracted (pulled), rods with 2.4-inch diameter conical tip pushed to 6.5 feet, cement-bentonite grout (94 pounds cement, 5 pounds bentonite, 6 gallons water) placed from 6.5 feet to 1.5 feet, concrete placed from 1.5 feet to ground surface.

Driller: Steve LaPorte/EnProb (Oroville CA)



*Not To Scale*

**Schematic for Borehole SG1**

**4401 Market Street  
Oakland CA**

Measurements referenced from ground/pavement surface.

- Start Drilling: 10:40 am, 6/29/09
- Cut hole in concrete with a concrete bit.
- Pushed a borehole using a ball. It collapsed.
- Proceeded using the previous method.
- Pushed drilling rods with expendable tip to depth of 78"
- Pulled the drilling rods up, producing a stick up of 30" (top of threads)
- 6" at the bottom of the borehole sluffed. Schematic was not changed.
- Bottom of borehole at  $102" - 30" = 72"$  depth
- Sand added to  $91.5" - 30" = 61.5"$  depth
- Soil vapor implant and tubing installed
- Sand added to  $82" - 30" = 52"$
- Dry bentonite added to  $76" - 30" = 46"$
- Hydrated bentonite added to surface as rods were pulled.
- Borehole completed: 11:10 AM

**SOILGAS PURGE/SAMPLE LOG (IMPLANT, SUMMA CANISTER, FLOWRATE = 0.167 L/MIN)**

Project Name/Number: 4401 Market St/P257	Logged By: Alex S. Bowerman
Project Address: 4401 Market St, Oakland CA	Date: 29 June 2009
Location/Borehole ID: SG1	Approximate Date of Last Rain Event: 1 May 2009
Odors from Borehole: None, OVM <5 ppm v/v	Approximate Depth to Water at Site (ft): 13.7
Borehole Sandpack Description: #3 Sand	Borehole Diameter (in): 2.25
OVM Meter: MiniRAE 2000	Total Depth Borehole (ft): 6.5
Implant Description: SVPT91 Polypropylene soil vapor implant (purchased from Environmental Service Products)	Depth to Top of Sandpack Interval (ft): 5.0
Purge Equipment Description: Gast Oil-less Vacuum Pump	Length of Sandpack Interval (ft): 1.5
Flow Regulator Description: Air Toxics "Blue Box" Regulator	Time When Borehole Const. Completed: 11:10 am
Comments:	Time When Purge Began: 4:59 pm

Total Depth (feet)	-	Depth to Top of Sandpack (feet)	x	0.005 ft <sup>2</sup> for 1-inch borehole 0.022 ft <sup>2</sup> for 2-inch borehole 0.0276 ft <sup>2</sup> for 2.25-inch borehole	x	28.32 L per cubic foot	x	0.3 (porosity)	=	Single Sandpack Purge Volume (L)		Target Purge (L)	
6.5	-	5.0	x	0.0276	x	28.32	x	0.3	=	0.352	x	2	0.704

Purge time = 0.704 / 0.167 = 4.22 min (4 min, 13 sec). Sample Container = 1 L Summa. Sample time = 1.0 / 0.167 = 5.99 min (6 min, 0 sec).

Purge Volume (L)	Time	Purge Vacuum Applied Downstream of Flow Regulator (inches of Hg)	Sample Vacuum Applied Downstream of Flow Regulator - Sample Canister Vacuum (inches of Hg)	Regulated Flow Rate (L/min)	OVM (ppm v/v)	Comments
0	4:49:00	26		0.167		Start purge
0.704	5:03:13	26		0.167		End purge
	5:04:45		30+	0.167		Begin sample
	5:10:45		8	0.167		End sample

Single Sandpack Purge Volume = volume of the void space of the sandpack.

All depths measured from ground/pavement surface.

OVM = Organic Vapor Monitor, Photoionization Device, 10.6 eV lamp, calibrated to 100 ppm v/v isobutylene.

## VACUUM LEAK TEST AND TRACER GAS LOG

Project Name/Number: 4401 Market St/P257	Logged By: Alex S. Bowerman
Project Address: 4401 Market St, Oakland CA	Date: 29 June 2009
Location/Borehole ID: SG1	Comments:

### Vacuum Leak Test of Sample Train

Description of Test Setup: Sample hose-Air Toxics "Blue Box" regulator-6 L Summa canister
Initial Vacuum (inches Hg): 27.25
Duration of Test: 5:11:50 to 5:15:50 = 5 minutes
Final Vacuum (inches Hg): 27.25
Comments: No leaks

### Shroud and Tracer Gas Covering Borehole

Description of Shroud: Rectangular clear-plastic box
Tracer Gas: Isopropyl alcohol
Method of Tracer Gas Introduction: Alcohol-soaked rag inside perforated metal soil liner
OVM Meter: MiniRAE 2000
Comments:

Time	OVM (ppm v/v)	Time	OVM (ppm v/v)
4:58	340		
5:09	360		

### Shroud and Tracer Gas Covering Sample Container (Summa Canister)

Description of Shroud: Clear-plastic bag
Tracer Gas: Isopropyl alcohol
Method of Tracer Gas Introduction: Alcohol-soaked rag inside perforated metal soil liner
OVM Meter: MiniRAE 2000
Comments: <b>NOT EMPLOYED</b>

Time	OVM (ppm v/v)	Time	OVM (ppm v/v)

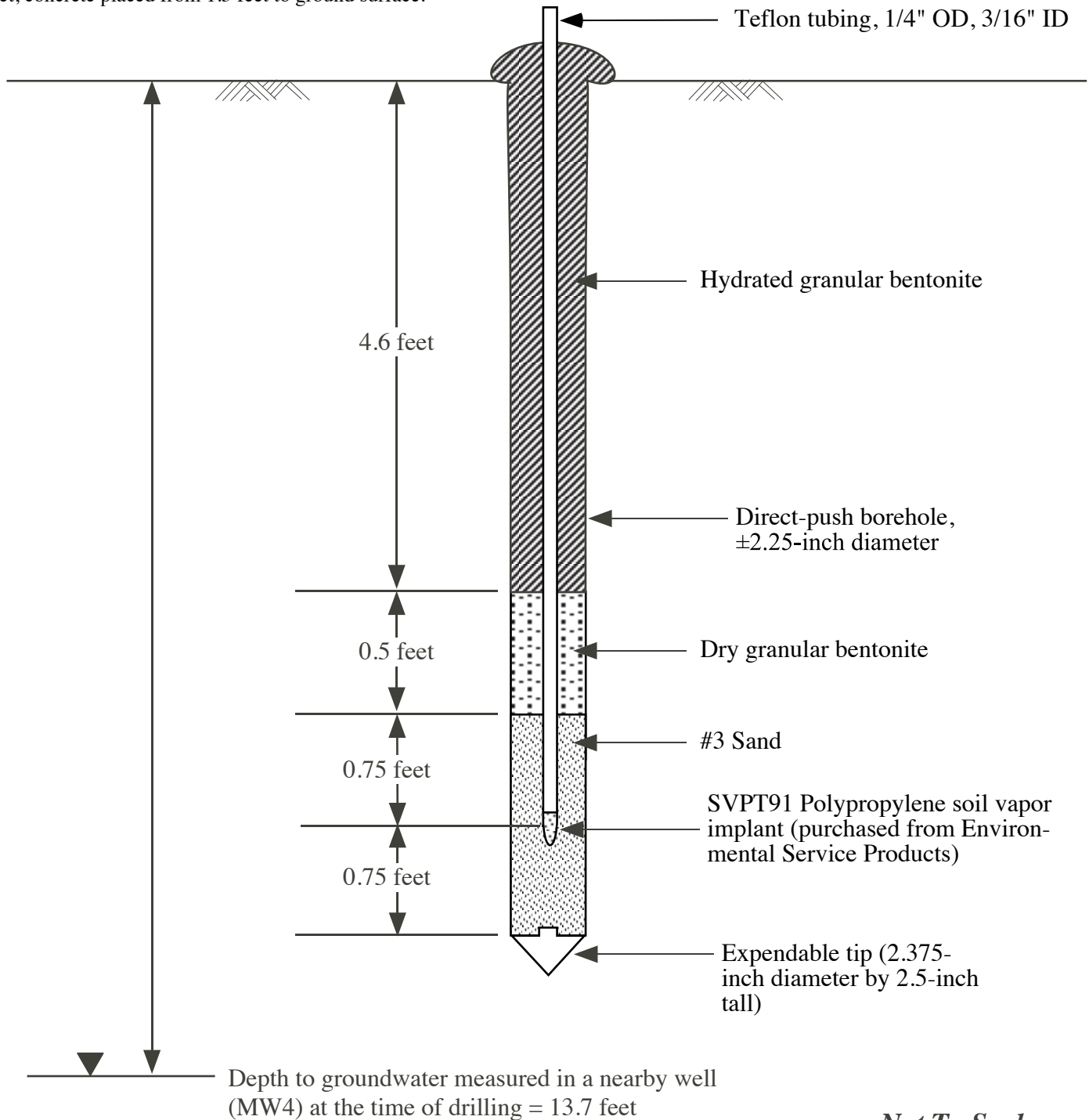
OVM = Organic Vapor Monitor, Photoionization Device, 10.6 eV lamp, calibrated to 100 ppm v/v isobutylene.

GPS Coordinates N 37° 50.033'  
W 122° 16.396'

Start Drilling 29 June 2009, 12:15 pm  
Complete Borehole Construction 29 June 2009, 12:45 pm

Abandon/Decommission: Tubing extracted (pulled), rods with 2.4-inch diameter conical tip pushed to 6.5 feet, cement-bentonite grout (94 pounds cement, 5 pounds bentonite, 6 gallons water) placed from 6.5 feet to 1.5 feet, concrete placed from 1.5 feet to ground surface.

Driller: Steve LaPorte/EnProb (Oroville CA)



*Not To Scale*

**Schematic for Borehole SG2**

**4401 Market Street  
Oakland CA**

Measurements referenced from ground/pavement surface.

- Start drilling: 12:15 pm, 6/29/09
- Cut hole in concrete using concrete bit.
- Pushed hole to a depth of 79"
- Raised drilling rod to produce a stick up of 26" (to top of threads)
- Expendable tip at  $105'' - 26'' = 79''$
- Sand added to  $96'' - 26'' = 70''$
- Soil vapor implant and tubing installed
- Sand added to  $87'' - 26'' = 61''$
- Rods were raised, producing a stickup of 42"
- <sup>Dry</sup> Bentonite was added from 103" to  $97'' - 42'' = 55''$
- Hydrated bentonite was added to the surface as the rods were pulled.
- Borehole completed: 12:45 pm



**SOILGAS PURGE/SAMPLE LOG (IMPLANT, SUMMA CANISTER, FLOWRATE = 0.167 L/MIN)**

Project Name/Number: 4401 Market St/P257	Logged By: Alex S. Bowerman
Project Address: 4401 Market St, Oakland CA	Date: 29 June 2009
Location/Borehole ID: SG2	Approximate Date of Last Rain Event: 1 May 2009
Odors from Borehole: None, OVM <5 ppm v/v	Approximate Depth to Water at Site (ft): 13.7
Borehole Sandpack Description: #3 Sand	Borehole Diameter (in): 2.25
OVM Meter: MiniRAE 2000	Total Depth Borehole (ft): 6.5
Implant Description: SVPT91 Polypropylene soil vapor implant (purchased from Environmental Service Products)	Depth to Top of Sandpack Interval (ft): 5.0
Purge Equipment Description: Gast Oil-less Vacuum Pump	Length of Sandpack Interval (ft): 1.5
Flow Regulator Description: Air Toxics "Blue Box" Regulator	Time When Borehole Const. Completed: 12:45 pm
Comments:	Time When Purge Began: 3:33 pm

Total Depth (feet)	-	Depth to Top of Sandpack (feet)	x	0.005 ft <sup>2</sup> for 1-inch borehole 0.022 ft <sup>2</sup> for 2-inch borehole 0.0276 ft <sup>2</sup> for 2.25-inch borehole	x	28.32 L per cubic foot	x	0.3 (porosity)	=	Single Sandpack Purge Volume (L)		Target Purge (L)	
6.5	-	5.0	x	0.0276	x	28.32	x	0.3	=	0.352	x	2	0.704

Purge time = 0.704 / 0.167 = 4.22 min (4 min, 13 sec). Sample Container = 1 L Summa. Sample time = 1.0 / 0.167 = 5.99 min (6 min, 0 sec).

Purge Volume (L)	Time	Purge Vacuum Applied Downstream of Flow Regulator (inches of Hg)	Sample Vacuum Applied Downstream of Flow Regulator - Sample Canister Vacuum (inches of Hg)	Regulated Flow Rate (L/min)	OVM (ppm v/v)	Comments
0	3:33:00	26		0.167		Start purge
0.704	3:37:13	26		0.167		End purge
	3:38:50		30+	0.167		Begin sample
	3:44:50		8	0.167		End sample

Single Sandpack Purge Volume = volume of the void space of the sandpack.

All depths measured from ground/pavement surface.

OVM = Organic Vapor Monitor, Photoionization Device, 10.6 eV lamp, calibrated to 100 ppm v/v isobutylene.

## VACUUM LEAK TEST AND TRACER GAS LOG

Project Name/Number: 4401 Market St/P257	Logged By: Alex S. Bowerman
Project Address: 4401 Market St, Oakland CA	Date: 29 June 2009
Location/Borehole ID: SG2	Comments:

### Vacuum Leak Test of Sample Train

Description of Test Setup: Sample hose-Air Toxics "Blue Box" regulator-6 L Summa canister
Initial Vacuum (inches Hg): 27.75
Duration of Test: 3:47 to 3:52 = 5 minutes
Final Vacuum (inches Hg): 27.75
Comments: No leaks

### Shroud and Tracer Gas Covering Borehole

Description of Shroud: Rectangular clear-plastic box
Tracer Gas: Isopropyl alcohol
Method of Tracer Gas Introduction: Alcohol-soaked rag inside perforated metal soil liner
OVM Meter: MiniRAE 2000
Comments:

Time	OVM (ppm v/v)	Time	OVM (ppm v/v)
3:30	380		
3:43	340		

### Shroud and Tracer Gas Covering Sample Container (Summa Canister)

Description of Shroud: Clear-plastic bag
Tracer Gas: Isopropyl alcohol
Method of Tracer Gas Introduction: Alcohol-soaked rag inside perforated metal soil liner
OVM Meter: MiniRAE 2000
Comments: <b>NOT EMPLOYED</b>

Time	OVM (ppm v/v)	Time	OVM (ppm v/v)

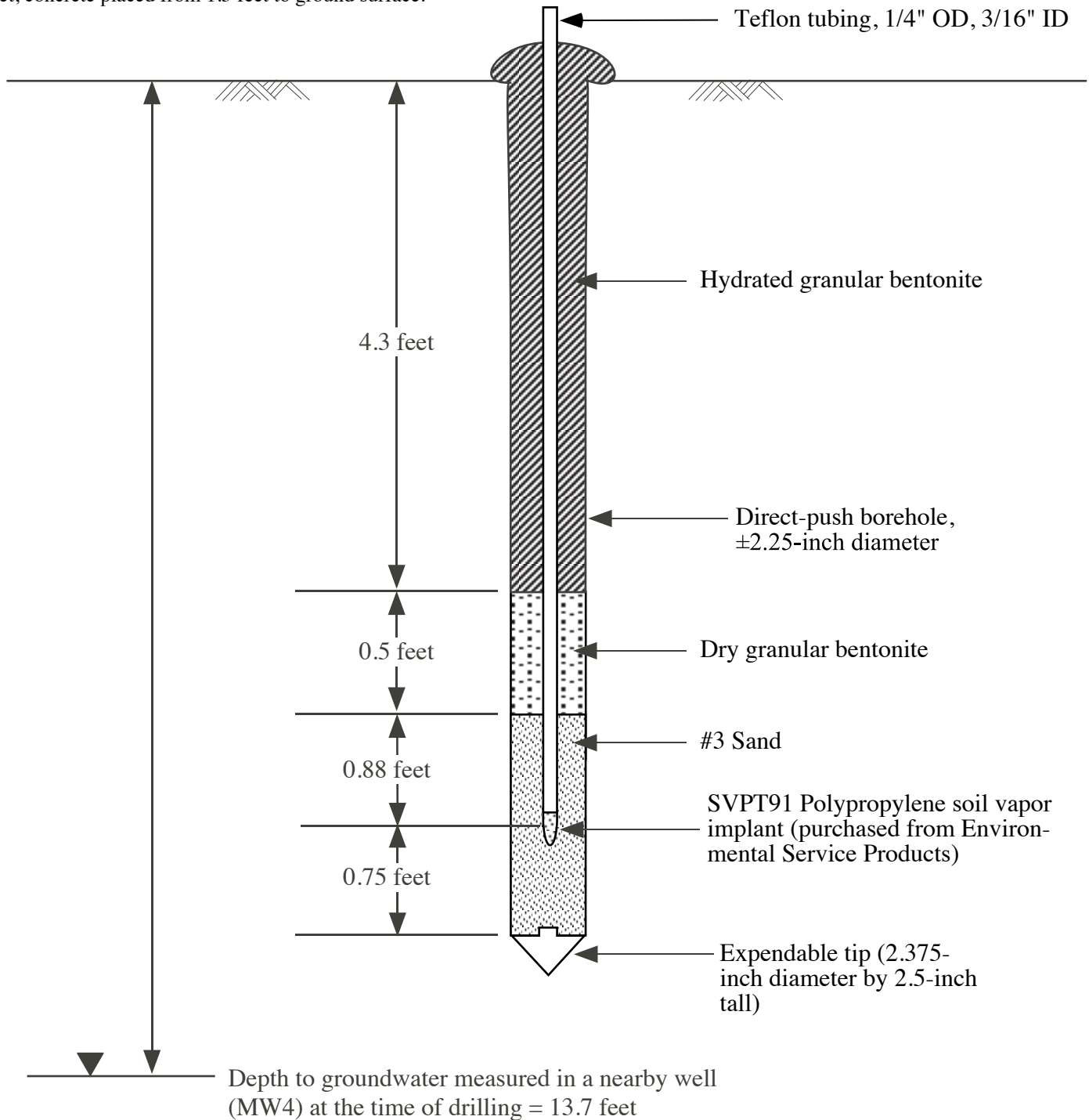
OVM = Organic Vapor Monitor, Photoionization Device, 10.6 eV lamp, calibrated to 100 ppm v/v isobutylene.

GPS Coordinates N 37° 50.034'  
W 122° 16.398'

Start Drilling 29 June 2009, 11:20 am  
Complete Borehole Construction 29 June 2009, 11:50 am

Abandon/Decommission: Tubing extracted (pulled), rods with 2.4-inch diameter conical tip pushed to 6.5 feet, cement-bentonite grout (94 pounds cement, 5 pounds bentonite, 6 gallons water) placed from 6.5 feet to 1.5 feet, concrete placed from 1.5 feet to ground surface.

Driller: Steve LaPorte/EnProb (Oroville CA)



*Not To Scale*

**Schematic for Borehole SG3**

**4401 Market Street  
Oakland CA**

Measurements referenced from ground/pavement surface.

Borehole SG3

Logged By Alex S. Bowerman

- Drilling started: 11:20 AM, 6/29/09
- Cut hole in concrete with concrete bit.
- Pushed borehole to a depth of 77.5"
- Raised rods to produce a stick up of 21.5" (to top of threads)
- Expendable tip at  $99" - 21.5" = 77.5$
- Sand added to  $90" - 21.5" = 68.5"$
- Soil vapor implant and tubing installed.
- Sand added to  $79.5" - 21.5" = 58"$
- Dry bentonite added to  $73" - 21.5" = 51.5"$
- Hydrated bentonite added up to the surface as the rods were pulled.
- Borehole completed: 11:50 AM

**SOILGAS PURGE VOLUME TEST LOG (IMPLANT, FLOWRATE = 0.167 L/MIN)**

Project Name/Number: 4401 Market St/P257	Logged By: Douglas W. Lovell
Project Address: 4401 Market St, Oakland CA	Date: 29 June 2009
Location/Borehole ID: SG3	Approximate Date of Last Rain Event: 1 May 2009
Odors from Borehole: None, OVM <5 ppm v/v	Approximate Depth to Water at Site (ft): 13
Borehole Sandpack Description: #3 Sand	Borehole Diameter (in): 2.25
OVM Meter: MiniRAE 2000	Total Depth Borehole (ft): 6.5
Implant Description: SVPT91 Polypropylene soil vapor implant (purchased from Environmental Service Products)	Depth to Top of Sandpack Interval (ft): 5.0
Purge Equipment Description: Gast Oil-less Vacuum Pump	Length of Sandpack Interval (ft): 1.5
Flow Regulator Description: Air Toxics "Blue Box" Regulator	Time When Borehole Const. Completed: 11:50 am
Comments:	Time When Purge Volume Test Began: 1:15 pm

Total Depth (feet)	-	Depth to Top of Sandpack (feet)	x	0.005 ft <sup>2</sup> for 1-inch borehole 0.022 ft <sup>2</sup> for 2-inch borehole 0.0276 ft <sup>2</sup> for 2.25-inch borehole	x	28.32 L per cubic foot	x	0.3 (porosity)	=	Single Sandpack Purge Volume (L)
6.5	-	5.0	x	0.0276	x	28.32	x	0.3	=	0.352

Purge time for 1 volume = 0.352 / 0.167 = 2.11 min (2 min, 7 sec). Purge time for 2 volumes = 0.704 / 0.167 = 4.22 min (4 min, 13 sec).  
Purge time for 3 volumes = 1.056 / 0.167 = 6.32 min (6 min, 19 sec). Purge time for 7 volumes = 2.464 / 0.167 = 14.75 min (14 min, 45 sec).

Purge Volume (L)	Time	Purge Vacuum Applied Downstream of Flow Regulator (inches of Hg)	Regulated Flow Rate (L/min)	OVM (ppm v/v)	Comments
0	1:15:00 *	26	0.167	Not measured	Start purge volume test
0.352	1:17:07 *	26	0.167	Not measured	Trouble with hand pump
0.704	1:19:13 *	26	0.167	185	Good measurement
1.056	1:21:19 *	26	0.167	70	OVM pump may have shut off
	1:25:00 *	26	0.167	117	Good measurement
2.464	1:29:45 *	26	0.167	84	Good measurement

\* = Actual sampling interval was about 40 seconds, starting about 20 seconds before the stated time and extending about 20 seconds past the stated time.

Single Sandpack Purge Volume = volume of the void space of the sandpack.

All depths measured from ground/pavement surface.

OVM = Organic Vapor Monitor, Photoionization Device, 10.6 eV lamp, calibrated to 100 ppm v/v isobutylene.

**SOILGAS PURGE/SAMPLE LOG (IMPLANT, SUMMA CANISTER, FLOWRATE = 0.167 L/MIN)**

Project Name/Number: 4401 Market St/P257	Logged By: Alex S. Bowerman
Project Address: 4401 Market St, Oakland CA	Date: 29 June 2009
Location/Borehole ID: SG3	Approximate Date of Last Rain Event: 1 May 2009
Odors from Borehole: None, OVM <5 ppm v/v	Approximate Depth to Water at Site (ft): 13.7
Borehole Sandpack Description: #3 Sand	Borehole Diameter (in): 2.25
OVM Meter: MiniRAE 2000	Total Depth Borehole (ft): 6.5
Implant Description: SVPT91 Polypropylene soil vapor implant (purchased from Environmental Service Products)	Depth to Top of Sandpack Interval (ft): 5.0
Purge Equipment Description: Gast Oil-less Vacuum Pump	Length of Sandpack Interval (ft): 1.5
Flow Regulator Description: Air Toxics "Blue Box" Regulator	Time When Borehole Const. Completed: 11:50 am
Comments:	Time When Purge Began: 4:04:30 pm

Total Depth (feet)	-	Depth to Top of Sandpack (feet)	x	0.005 ft <sup>2</sup> for 1-inch borehole 0.022 ft <sup>2</sup> for 2-inch borehole 0.0276 ft <sup>2</sup> for 2.25-inch borehole	x	28.32 L per cubic foot	x	0.3 (porosity)	=	Single Sandpack Purge Volume (L)		Target Purge (L)	
6.5	-	5.0	x	0.0276	x	28.32	x	0.3	=	0.352	x	2	0.704

Purge time = 0.704 / 0.167 = 4.22 min (4 min, 13 sec). Sample Container = 1 L Summa. Sample time = 1.0 / 0.167 = 5.99 min (6 min, 0 sec).

Purge Volume (L)	Time	Purge Vacuum Applied Downstream of Flow Regulator (inches of Hg)	Sample Vacuum Applied Downstream of Flow Regulator - Sample Canister Vacuum (inches of Hg)	Regulated Flow Rate (L/min)	OVM (ppm v/v)	Comments
0	4:04:30	26		0.167		Start purge
0.704	4:08:43	26		0.167		End purge
	4:10:10		28	0.167		Begin sample
	4:16:10		6	0.167		End sample

Single Sandpack Purge Volume = volume of the void space of the sandpack.

All depths measured from ground/pavement surface.

OVM = Organic Vapor Monitor, Photoionization Device, 10.6 eV lamp, calibrated to 100 ppm v/v isobutylene.

## VACUUM LEAK TEST AND TRACER GAS LOG

Project Name/Number: 4401 Market St/P257	Logged By: Alex S. Bowerman
Project Address: 4401 Market St, Oakland CA	Date: 29 June 2009
Location/Borehole ID: SG3	Comments:

### Vacuum Leak Test of Sample Train

Description of Test Setup: Sample hose-Air Toxics "Blue Box" regulator-6 L Summa canister
Initial Vacuum (inches Hg): 27.5
Duration of Test: 4:17:30 to 4:22:30 = 5 minutes
Final Vacuum (inches Hg): 27.5
Comments: No leaks

### Shroud and Tracer Gas Covering Borehole

Description of Shroud: Rectangular clear-plastic box
Tracer Gas: Isopropyl alcohol
Method of Tracer Gas Introduction: Alcohol-soaked rag inside perforated metal soil liner
OVM Meter: MiniRAE 2000
Comments:

Time	OVM (ppm v/v)	Time	OVM (ppm v/v)
4:03	360		
4:15	320		

### Shroud and Tracer Gas Covering Sample Container (Summa Canister)

Description of Shroud: Clear-plastic bag
Tracer Gas: Isopropyl alcohol
Method of Tracer Gas Introduction: Alcohol-soaked rag inside perforated metal soil liner
OVM Meter: MiniRAE 2000
Comments: <b>NOT EMPLOYED</b>

Time	OVM (ppm v/v)	Time	OVM (ppm v/v)

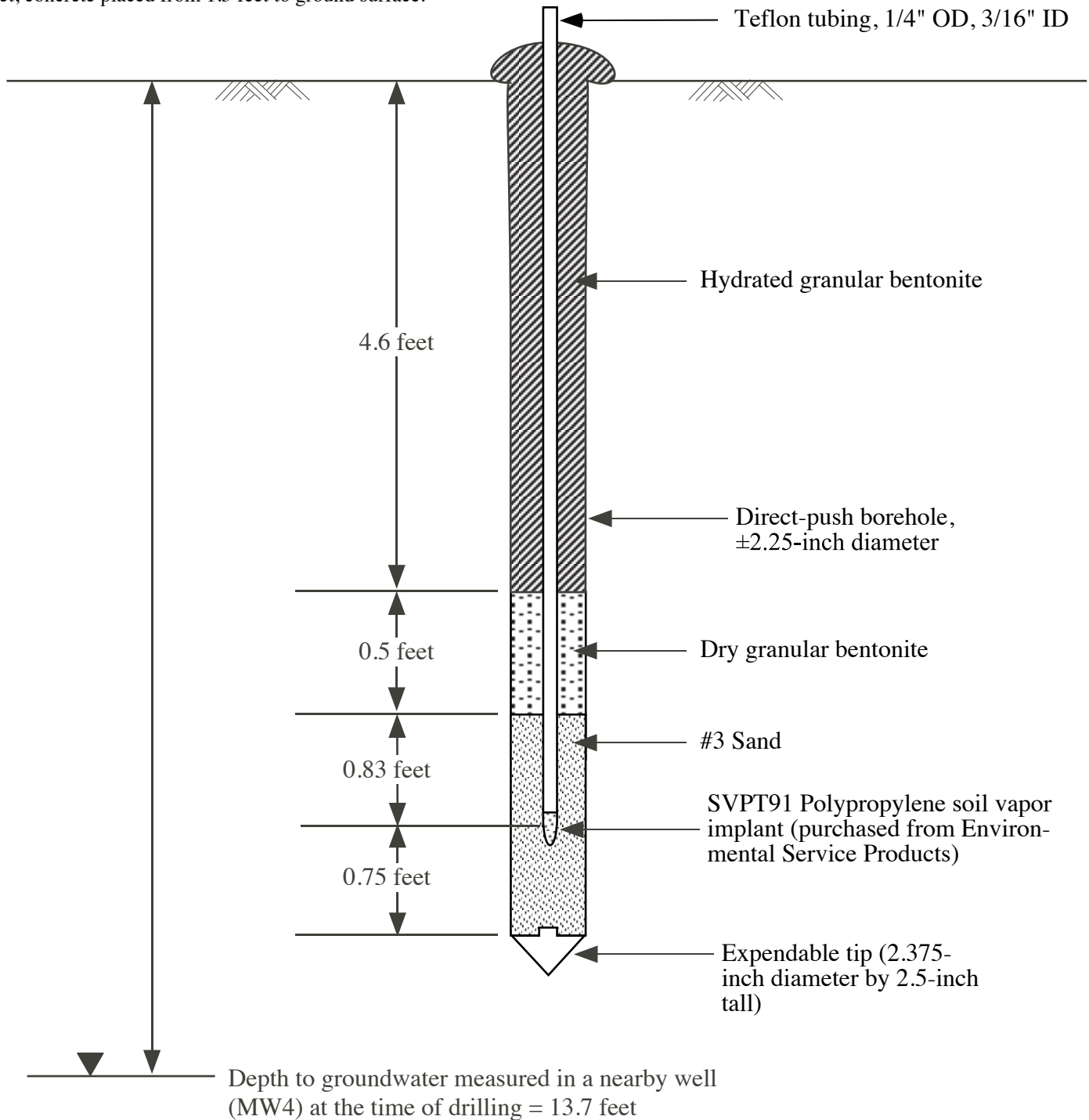
OVM = Organic Vapor Monitor, Photoionization Device, 10.6 eV lamp, calibrated to 100 ppm v/v isobutylene.

GPS Coordinates N 37° 50.033'  
W 122° 16.400'

Start Drilling 29 June 2009, 11:50 am  
Complete Borehole Construction 29 June 2009, 12:15 pm

Abandon/Decommission: Tubing extracted (pulled), rods with 2.4-inch diameter conical tip pushed to 6.5 feet, cement-bentonite grout (94 pounds cement, 5 pounds bentonite, 6 gallons water) placed from 6.5 feet to 1.5 feet, concrete placed from 1.5 feet to ground surface.

Driller: Steve LaPorte/EnProb (Oroville CA)



*Not To Scale*

**Schematic for Borehole SG4**

**4401 Market Street  
Oakland CA**

Measurements referenced from ground/pavement surface.



- Drilling started: 11:50 AM, 6/29/09
- Borehole pushed to 80" depth. Rod raised to produce 27" stick up (to top of threads)
- Expendable tip at  $107" - 27" = 80"$
- Sand added to  $98" - 27" = 71"$
- Soil vapor implant and tubing installed.
- Sand added to  $88" - 27" = 61"$
- Rods raised, producing a stickup of 47" (to top of threads).
- Dry bentonite added from 108" to  $102" - 47" = 55"$
- Hydrated bentonite added up to the surface as the rods were raised.
- Borehole completed: 12:15 pm

**SOILGAS PURGE/SAMPLE LOG (IMPLANT, SUMMA CANISTER, FLOWRATE = 0.167 L/MIN)**

Project Name/Number: 4401 Market St/P257	Logged By: Alex S. Bowerman
Project Address: 4401 Market St, Oakland CA	Date: 29 June 2009
Location/Borehole ID: SG4	Approximate Date of Last Rain Event: 1 May 2009
Odors from Borehole: None, OVM <5 ppm v/v	Approximate Depth to Water at Site (ft): 13.7
Borehole Sandpack Description: #3 Sand	Borehole Diameter (in): 2.25
OVM Meter: MiniRAE 2000	Total Depth Borehole (ft): 6.5
Implant Description: SVPT91 Polypropylene soil vapor implant (purchased from Environmental Service Products)	Depth to Top of Sandpack Interval (ft): 5.0
Purge Equipment Description: Gast Oil-less Vacuum Pump	Length of Sandpack Interval (ft): 1.5
Flow Regulator Description: Air Toxics "Blue Box" Regulator	Time When Borehole Const. Completed: 12:15 pm
Comments:	Time When Purge Began: 4:34 pm

Total Depth (feet)	-	Depth to Top of Sandpack (feet)	x	0.005 ft <sup>2</sup> for 1-inch borehole 0.022 ft <sup>2</sup> for 2-inch borehole 0.0276 ft <sup>2</sup> for 2.25-inch borehole	x	28.32 L per cubic foot	x	0.3 (porosity)	=	Single Sandpack Purge Volume (L)		Target Purge (L)	
6.5	-	5.0	x	0.0276	x	28.32	x	0.3	=	0.352	x	2	0.704

Purge time = 0.704 / 0.167 = 4.22 min (4 min, 13 sec). Sample Container = 1 L Summa. Sample time = 1.0 / 0.167 = 5.99 min (6 min, 0 sec).

Purge Volume (L)	Time	Purge Vacuum Applied Downstream of Flow Regulator (inches of Hg)	Sample Vacuum Applied Downstream of Flow Regulator - Sample Canister Vacuum (inches of Hg)	Regulated Flow Rate (L/min)	OVM (ppm v/v)	Comments
0	4:34:00	26		0.167		Start purge
0.704	4:38:13	26		0.167		End purge
	4:39:30		30+	0.167		Begin sample
	4:45:30		8	0.167		End sample

Single Sandpack Purge Volume = volume of the void space of the sandpack.

All depths measured from ground/pavement surface.

OVM = Organic Vapor Monitor, Photoionization Device, 10.6 eV lamp, calibrated to 100 ppm v/v isobutylene.

## VACUUM LEAK TEST AND TRACER GAS LOG

Project Name/Number: 4401 Market St/P257	Logged By: Alex S. Bowerman
Project Address: 4401 Market St, Oakland CA	Date: 29 June 2009
Location/Borehole ID: SG4	Comments:

### Vacuum Leak Test of Sample Train

Description of Test Setup: Sample hose-Air Toxics "Blue Box" regulator-6 L Summa canister
Initial Vacuum (inches Hg): 27.25
Duration of Test: 4:46:30 to 4:51:30 = 5 minutes
Final Vacuum (inches Hg): 27.25
Comments: No leaks

### Shroud and Tracer Gas Covering Borehole

Description of Shroud: Rectangular clear-plastic box
Tracer Gas: Isopropyl alcohol
Method of Tracer Gas Introduction: Alcohol-soaked rag inside perforated metal soil liner
OVM Meter: MiniRAE 2000
Comments:

Time	OVM (ppm v/v)	Time	OVM (ppm v/v)
4:31	320		
4:43	290		

### Shroud and Tracer Gas Covering Sample Container (Summa Canister)

Description of Shroud: Clear-plastic bag
Tracer Gas: Isopropyl alcohol
Method of Tracer Gas Introduction: Alcohol-soaked rag inside perforated metal soil liner
OVM Meter: MiniRAE 2000
Comments: <b>NOT EMPLOYED</b>

Time	OVM (ppm v/v)	Time	OVM (ppm v/v)

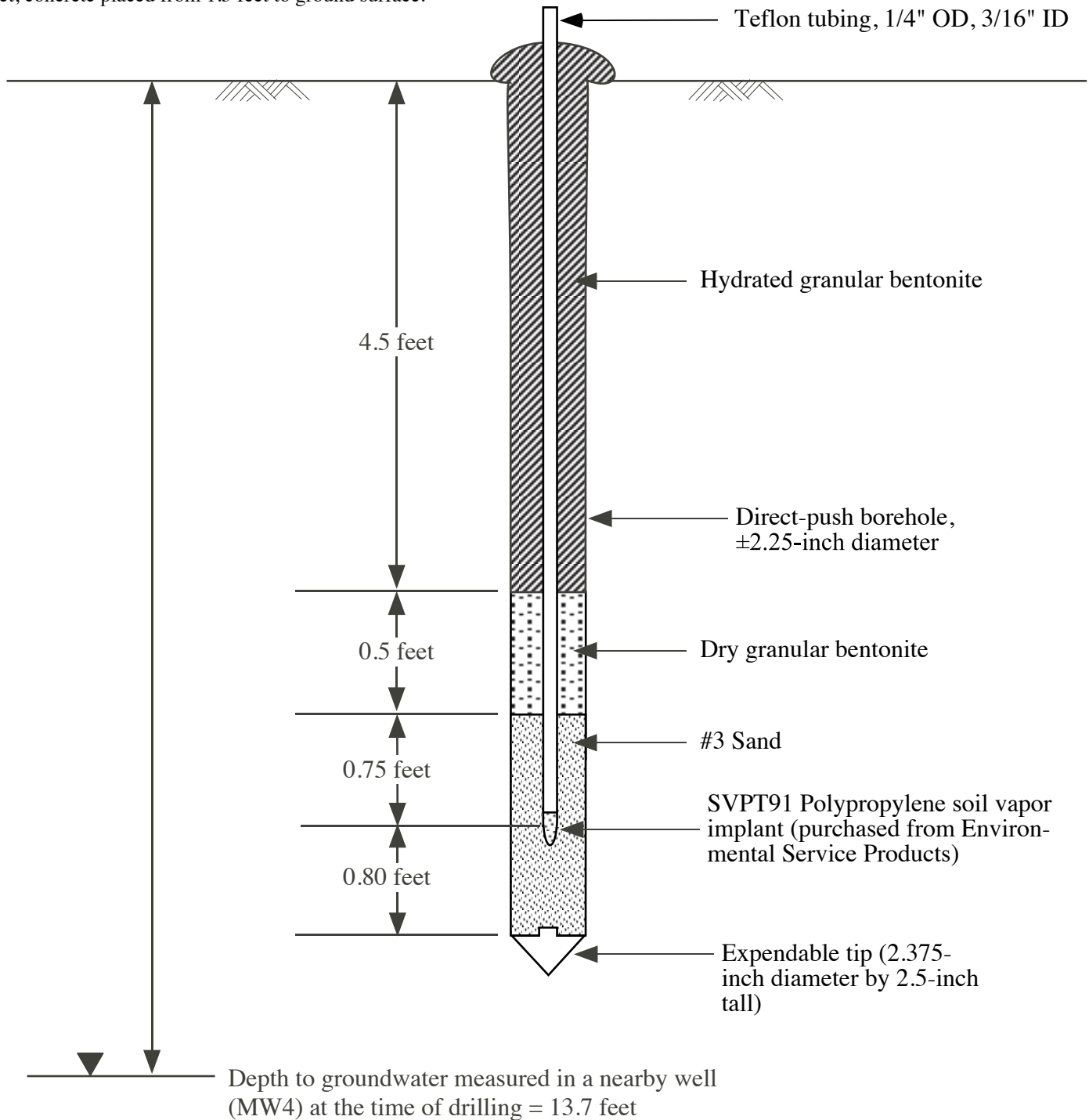
OVM = Organic Vapor Monitor, Photoionization Device, 10.6 eV lamp, calibrated to 100 ppm v/v isobutylene.

GPS Coordinates N 37° 50.029'  
W 122° 16.400'

Start Drilling 29 June 2009, 9:50 am  
Complete Borehole Construction 29 June 2009, 10:20 am

Abandon/Decommission: Tubing extracted (pulled), rods with 2.4-inch diameter conical tip pushed to 6.5 feet, cement-bentonite grout (94 pounds cement, 5 pounds bentonite, 6 gallons water) placed from 6.5 feet to 1.5 feet, concrete placed from 1.5 feet to ground surface.

Driller: Steve LaPorte/EnProb (Oroville CA)



*Not To Scale*

**Schematic for Borehole SG5**

**4401 Market Street  
Oakland CA**

Measurements referenced from ground/pavement surface.

- Drilling started: 9:50 AM, 6/29/09
- Used ball to punch through pavement, then switched to rods with expendable tip to push the hole.
- Pushed hole to 79" depth, stick up of 17" (to top of threads).
- Expendable tip at  $96" - 17" = 79"$
- Sand added to  $86.5" - 17" = 69.5"$
- Installed soil vapor implant and tubing.
- Sand added to  $82" - 17" = 65"$
- Rod raised, producing a stick up of 30" (to top of threads).
- Sand added to  $90.5" - 30" = ~~87.5"~~ 60.5"$
- Dry bentonite added to  $84.5" - 30" = 54.5"$
- Hydrated bentonite added to the surface as the rods were pulled.
- Borehole completed: 10:20 AM

**SOILGAS PURGE/SAMPLE LOG (IMPLANT, SUMMA CANISTER, FLOWRATE = 0.167 L/MIN)**

Project Name/Number: 4401 Market St/P257	Logged By: Alex S. Bowerman
Project Address: 4401 Market St, Oakland CA	Date: 29 June 2009
Location/Borehole ID: SG5	Approximate Date of Last Rain Event: 1 May 2009
Odors from Borehole: None, OVM <5 ppm v/v	Approximate Depth to Water at Site (ft): 13.7
Borehole Sandpack Description: #3 Sand	Borehole Diameter (in): 2.25
OVM Meter: MiniRAE 2000	Total Depth Borehole (ft): 6.5
Implant Description: SVPT91 Polypropylene soil vapor implant (purchased from Environmental Service Products)	Depth to Top of Sandpack Interval (ft): 5.0
Purge Equipment Description: Gast Oil-less Vacuum Pump	Length of Sandpack Interval (ft): 1.5
Flow Regulator Description: Air Toxics "Blue Box" Regulator	Time When Borehole Const. Completed: 10:20 am
Comments:	Time When Purge Began: 2:50 pm

Total Depth (feet)	-	Depth to Top of Sandpack (feet)	x	0.005 ft <sup>2</sup> for 1-inch borehole 0.022 ft <sup>2</sup> for 2-inch borehole 0.0276 ft <sup>2</sup> for 2.25-inch borehole	x	28.32 L per cubic foot	x	0.3 (porosity)	=	Single Sandpack Purge Volume (L)		Target Purge (L)	
6.5	-	5.0	x	0.0276	x	28.32	x	0.3	=	0.352	x	2	0.704

Purge time = 0.704 / 0.167 = 4.22 min (4 min, 13 sec). Sample Container = 1 L Summa. Sample time = 1.0 / 0.167 = 5.99 min (6 min, 0 sec).

Purge Volume (L)	Time	Purge Vacuum Applied Downstream of Flow Regulator (inches of Hg)	Sample Vacuum Applied Downstream of Flow Regulator - Sample Canister Vacuum (inches of Hg)	Regulated Flow Rate (L/min)	OVM (ppm v/v)	Comments
0	2:50:00	26		0.167		Start purge
0.704	2:54:13	26		0.167		End purge
	2:57:47		30+	0.167		Begin sample
	3:03:47		13	0.167		End sample

Single Sandpack Purge Volume = volume of the void space of the sandpack.

All depths measured from ground/pavement surface.

OVM = Organic Vapor Monitor, Photoionization Device, 10.6 eV lamp, calibrated to 100 ppm v/v isobutylene.

## VACUUM LEAK TEST AND TRACER GAS LOG

Project Name/Number: 4401 Market St/P257	Logged By: Alex S. Bowerman
Project Address: 4401 Market St, Oakland CA	Date: 29 June 2009
Location/Borehole ID: SG5	Comments:

### Vacuum Leak Test of Sample Train

Description of Test Setup: Sample hose-Air Toxics "Blue Box" regulator-6 L Summa canister
Initial Vacuum (inches Hg): 28.5
Duration of Test: 3:07:30 to 3:12:30 = 5 minutes
Final Vacuum (inches Hg): 28.5
Comments: No leaks

### Shroud and Tracer Gas Covering Borehole

Description of Shroud: Rectangular clear-plastic box
Tracer Gas: Isopropyl alcohol
Method of Tracer Gas Introduction: Alcohol-soaked rag inside perforated metal soil liner
OVM Meter: MiniRAE 2000
Comments: Should have used fresh-soaked liner (did not)

Time	OVM (ppm v/v)	Time	OVM (ppm v/v)
2:48	70		
3:00	70		

### Shroud and Tracer Gas Covering Sample Container (Summa Canister)

Description of Shroud: Clear-plastic bag
Tracer Gas: Isopropyl alcohol
Method of Tracer Gas Introduction: Alcohol-soaked rag inside perforated metal soil liner
OVM Meter: MiniRAE 2000
Comments: <b>NOT EMPLOYED</b>

Time	OVM (ppm v/v)	Time	OVM (ppm v/v)

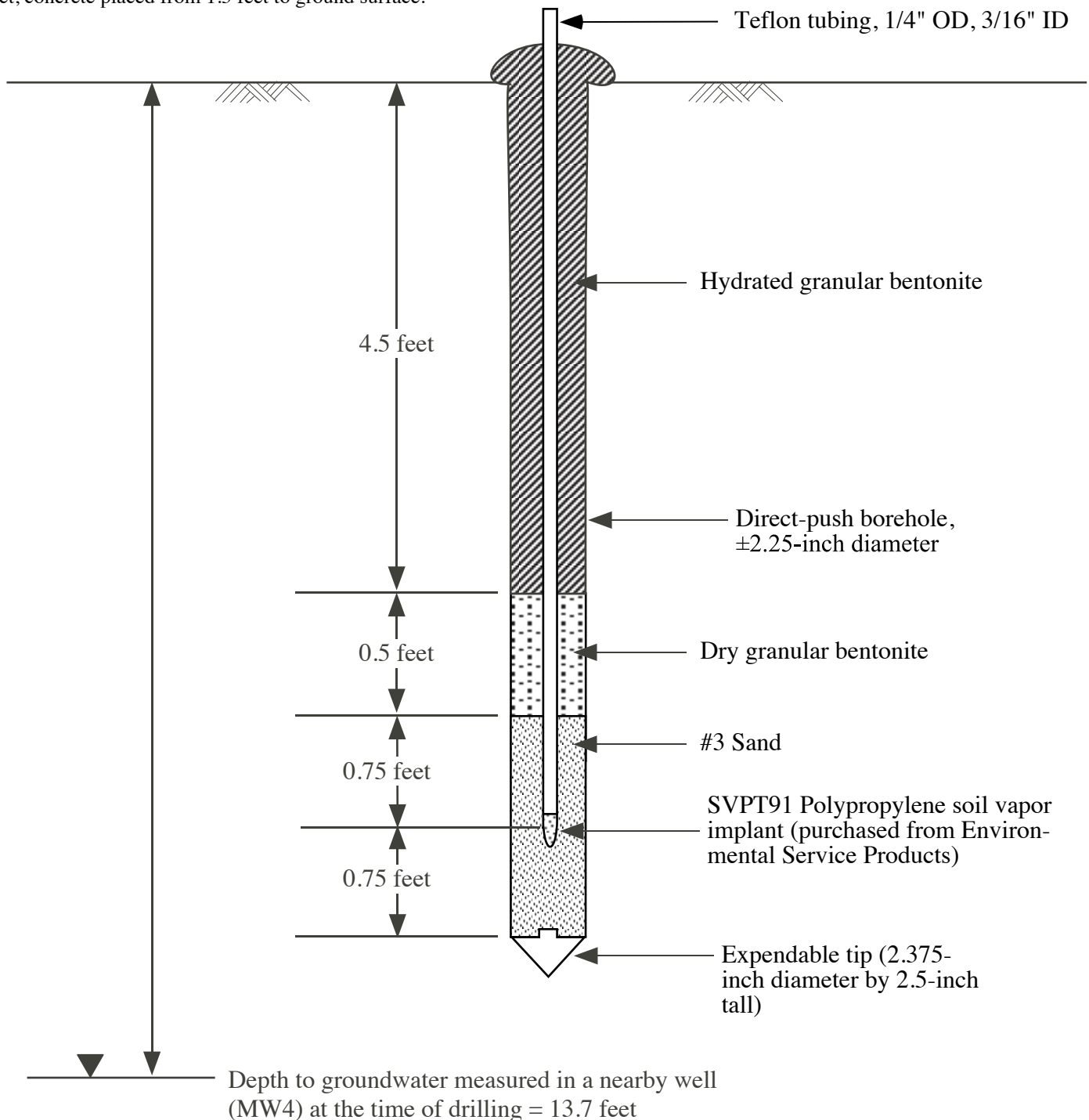
OVM = Organic Vapor Monitor, Photoionization Device, 10.6 eV lamp, calibrated to 100 ppm v/v isobutylene.

GPS Coordinates N 37° 50.024'  
W 122° 16.405'

Start Drilling 29 June 2009, 8:40 am  
Complete Borehole Construction 29 June 2009, 9:45 am

Abandon/Decommission: Tubing extracted (pulled), rods with 2.4-inch diameter conical tip pushed to 6.5 feet, cement-bentonite grout (94 pounds cement, 5 pounds bentonite, 6 gallons water) placed from 6.5 feet to 1.5 feet, concrete placed from 1.5 feet to ground surface.

Driller: Steve LaPorte/EnProb (Oroville CA)



Note: Initially pushed hole using 2.4-inch diameter conical tip and retracted rods - hole caved to within 2 feet of ground surface. Subsequently changed to 2.25-inch diameter drill rods and expendable tip, re-pushed to 6.5 feet, and constructed vapor sampling borehole inside the annulus of the drill rods (to keep from caving). The remaining boreholes (SG1-SG5) were subsequently constructed inside the annulus of the drill rods.

Measurements referenced from ground/pavement surface.

*Not To Scale*

**Schematic for Borehole SG6**

**4401 Market Street  
Oakland CA**



Start: 8:40 am. Push  $2\frac{3}{8}$ "  $\phi$  conical tip on solid steel rods to 6.5'. Pull back  $\pm 1'$  & re-push to 6.5'. Pull out of hole, sloughing over bottom 1.5'. Repeat above, pull out of hole, sloughing to within 2' of ground surface. SWITCH METHODS TO BUILD BOREHOLE IN CASED ENVIRONMENT.

Set up w/ 2.25" OD hollow rods (4' long) and expendable  $2\frac{3}{8}$ "  $\phi$  by 2.5" high tip.

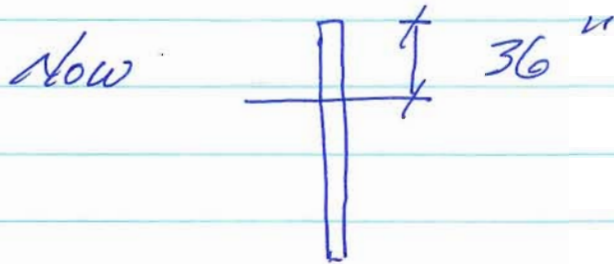
Restart 9:05 am. Push to 6.5', pull back  $\pm 8"$ , insert pvc & verify tip staged pct.

$\downarrow$  26". Depth to tip =  $104 - 26 = 78"$ .

Add 9" #3 sand.  $95 - 26 = 69"$ . Attach  $\frac{1}{4}$ " Teflon tubing to implant. Put  $\frac{1}{2}$ " PVC pipe inside drill rods to center implant.

566 Continued.

Add  $\pm 2''$  sand to "lock" implant.  
Pulled rods up  $\pm 10''$ .

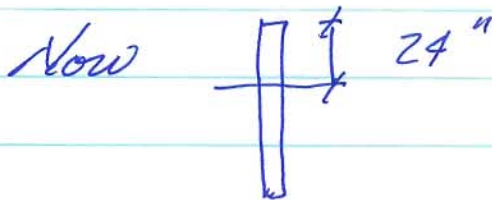


Add sand to 96" from top of rods

Top of sand =  $96 - 36 = \pm 60''$  OK ✓

Add dry granular bentonite,  $90'' - 36''$   
 $= 54''$  to top of dry bentonite OK ✓

Pulled rods - removed on section.



Added  $\pm 12''$  dry bentonite &  $\pm 1.5$  pints  $H_2O$

Added  $\pm 12''$  dry bentonite &  $\pm 1.5$  pints  $H_2O$

Pulled rod - hole open

Added  $\pm 12''$  dry bentonite &  $\pm 1.5$  pints  $H_2O$

Added  $\pm 12''$  dry bentonite &  $\pm 1.5$  pints  $H_2O$

SLG Continued

Added dry bentonite to mound at ground surface & poured H<sub>2</sub>O on top.

Finish: 9:45 am

DW put nail in end of tubing (to keep dirt out)

Took GPS reading.

Covered hole w/ traffic cone & will let hydrate for at least 1 hour.



**SOILGAS PURGE/SAMPLE LOG (IMPLANT, SUMMA CANISTER, FLOWRATE = 0.167 L/MIN)**

Project Name/Number: 4401 Market St/P257	Logged By: Douglas W. Lovell
Project Address: 4401 Market St, Oakland CA	Date: 29 June 2009
Location/Borehole ID: SG6	Approximate Date of Last Rain Event: 1 May 2009
Odors from Borehole: None, OVM <5 ppm v/v	Approximate Depth to Water at Site (ft): 13.7
Borehole Sandpack Description: #3 Sand	Borehole Diameter (in): 2.25
OVM Meter: MiniRAE 2000	Total Depth Borehole (ft): 6.5
Implant Description: SVPT91 Polypropylene soil vapor implant (purchased from Environmental Service Products)	Depth to Top of Sandpack Interval (ft): 5.0
Purge Equipment Description: Gast Oil-less Vacuum Pump	Length of Sandpack Interval (ft): 1.5
Flow Regulator Description: Air Toxics "Blue Box" Regulator	Time When Borehole Const. Completed: 9:45 am
Comments:	Time When Purge Began: 2:00:00 pm

Total Depth (feet)	-	Depth to Top of Sandpack (feet)	x	0.005 ft <sup>2</sup> for 1-inch borehole 0.022 ft <sup>2</sup> for 2-inch borehole 0.0276 ft <sup>2</sup> for 2.25-inch borehole	x	28.32 L per cubic foot	x	0.3 (porosity)	=	Single Sandpack Purge Volume (L)		Target Purge (L)	
6.5	-	5.0	x	0.0276	x	28.32	x	0.3	=	0.352	x	2	0.704

Purge time = 0.704 / 0.167 = 4.22 min (4 min, 13 sec). Sample Container = 1 L Summa. Sample time = 1.0 / 0.167 = 5.99 min (6 min, 0 sec).

Purge Volume (L)	Time	Purge Vacuum Applied Downstream of Flow Regulator (inches of Hg)	Sample Vacuum Applied Downstream of Flow Regulator - Sample Canister Vacuum (inches of Hg)	Regulated Flow Rate (L/min)	OVM (ppm v/v)	Comments
0	2:00:00	26		0.167		Start purge
0.704	2:04:13	26		0.167		End purge
	2:07:20		30+	0.167		Begin sample
	2:13:20		5	0.167		End sample

Single Sandpack Purge Volume = volume of the void space of the sandpack.

All depths measured from ground/pavement surface.

OVM = Organic Vapor Monitor, Photoionization Device, 10.6 eV lamp, calibrated to 100 ppm v/v isobutylene.

## VACUUM LEAK TEST AND TRACER GAS LOG

Project Name/Number: 4401 Market St/P257	Logged By: Douglas W. Lovell
Project Address: 4401 Market St, Oakland CA	Date: 29 June 2009
Location/Borehole ID: SG6	Comments:

### Vacuum Leak Test of Sample Train

Description of Test Setup: Sample hose-Air Toxics "Blue Box" regulator-6 L Summa canister
Initial Vacuum (inches Hg): 29.0
Duration of Test: 2:18:30 to 2:23:30 = 5 minutes
Final Vacuum (inches Hg): 28.5
Comments: No leaks

### Shroud and Tracer Gas Covering Borehole

Description of Shroud: Rectangular clear-plastic box
Tracer Gas: Isopropyl alcohol
Method of Tracer Gas Introduction: Alcohol-soaked rag inside perforated metal soil liner
OVM Meter: MiniRAE 2000
Comments: Should have used fresh-soaked liner (did not)

Time	OVM (ppm v/v)	Time	OVM (ppm v/v)
2:00	210		
2:14	280		

### Shroud and Tracer Gas Covering Sample Container (Summa Canister)

Description of Shroud: Clear-plastic bag
Tracer Gas: Isopropyl alcohol
Method of Tracer Gas Introduction: Alcohol-soaked rag inside perforated metal soil liner
OVM Meter: MiniRAE 2000
Comments: <b>NOT EMPLOYED</b>

Time	OVM (ppm v/v)	Time	OVM (ppm v/v)

OVM = Organic Vapor Monitor, Photoionization Device, 10.6 eV lamp, calibrated to 100 ppm v/v isobutylene.

## **ATTACHMENT 2**

Laboratory Report and Chain-of-Custody  
Form

7/16/2009  
Ms. Juli Brady  
Streamborn  
P.O. Box 8330

Berkeley CA 94707

Project Name: 4401 Market St  
Project #: P257  
Workorder #: 0907016

Dear Ms. Juli Brady

The following report includes the data for the above referenced project for sample(s) received on 7/1/2009 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 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: Kyle Vagadori at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Kyle Vagadori  
Project Manager

**WORK ORDER #: 0907016**

Work Order Summary

<b>CLIENT:</b>	Ms. Juli Brady Streamborn P.O. Box 8330 Berkeley, CA 94707	<b>BILL TO:</b>	Ms. Juli Brady Streamborn P.O. Box 8330 Berkeley, CA 94707
<b>PHONE:</b>	510-528-4234	<b>P.O. #</b>	
<b>FAX:</b>		<b>PROJECT #</b>	P257 4401 Market St
<b>DATE RECEIVED:</b>	07/01/2009	<b>CONTACT:</b>	Kyle Vagadori
<b>DATE COMPLETED:</b>	07/16/2009		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	SG6	Modified TO-15	5.0 "Hg	15 psi
02A	SG5	Modified TO-15	12.5 "Hg	15 psi
03A	SG2	Modified TO-15	8.0 "Hg	15 psi
03AA	SG2 Lab Duplicate	Modified TO-15	8.0 "Hg	15 psi
04A	SG3	Modified TO-15	5.5 "Hg	15 psi
05A	SG4	Modified TO-15	7.5 "Hg	15 psi
06A	SG1	Modified TO-15	8.0 "Hg	15 psi
07A	Lab Blank	Modified TO-15	NA	NA
07B	Lab Blank	Modified TO-15	NA	NA
08A	CCV	Modified TO-15	NA	NA
08B	CCV	Modified TO-15	NA	NA
09A	LCS	Modified TO-15	NA	NA
09B	LCS	Modified TO-15	NA	NA

CERTIFIED BY: 

DATE: 07/16/09

Laboratory Director

Certification numbers: CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004  
NY NELAP - 11291, UT NELAP - 9166389892, AZ Licensure AZ0719

Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,  
Accreditation number: E87680, Effective date: 07/01/08, Expiration date: 06/30/09

Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

This report shall not be reproduced, except in full, without the written approval of Air Toxics Ltd.

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630  
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020



**LABORATORY NARRATIVE  
Modified TO-15  
Streamborn  
Workorder# 0907016**

Six 1 Liter Summa Canister samples were received on July 01, 2009. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

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

<i>Requirement</i>	<i>TO-15</i>	<i>ATL Modifications</i>
Daily CCV	<=/= 30% Difference	<=/= 30% Difference; Compounds exceeding this criterion and associated data are flagged and narrated.
Sample collection media	Summa canister	ATL recommends use of summa canisters to insure data defensibility, but will report results from Tedlar bags at client request
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

**Receiving Notes**

There were no receiving discrepancies.

**Analytical Notes**

There were no analytical discrepancies.

**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 no 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.

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

**Summary of Detected Compounds  
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

**Client Sample ID: SG6**

**Lab ID#: 0907016-01A**

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
Acetone	4.8	14	11	32
2-Propanol	4.8	960 E	12	2400 E
Carbon Disulfide	1.2	13	3.8	40
Hexane	1.2	19	4.3	66
2-Butanone (Methyl Ethyl Ketone)	1.2	2.5	3.6	7.4
Cyclohexane	1.2	4.5	4.2	16
Benzene	1.2	1.8	3.9	5.9
Heptane	1.2	5.5	5.0	22
4-Methyl-2-pentanone	1.2	2.6	5.0	10
Toluene	1.2	5.7	4.6	21
Ethyl Benzene	1.2	1.6	5.2	6.8
m,p-Xylene	1.2	6.5	5.2	28
o-Xylene	1.2	2.2	5.2	9.7
4-Ethyltoluene	1.2	2.4	5.9	12
1,2,4-Trimethylbenzene	1.2	2.1	5.9	10

**Client Sample ID: SG5**

**Lab ID#: 0907016-02A**

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
1,3-Butadiene	1.7	2.0	3.8	4.4
Acetone	6.9	30	16	70
2-Propanol	6.9	36	17	87
Carbon Disulfide	1.7	11	5.4	34
Hexane	1.7	14	6.1	48
2-Butanone (Methyl Ethyl Ketone)	1.7	5.0	5.1	15
Tetrahydrofuran	1.7	3.2	5.1	9.5
Chloroform	1.7	4.5	8.4	22
Benzene	1.7	5.0	5.5	16
Heptane	1.7	6.6	7.1	27
4-Methyl-2-pentanone	1.7	5.3	7.1	22
Toluene	1.7	24	6.5	90
Ethyl Benzene	1.7	4.4	7.5	19
m,p-Xylene	1.7	14	7.5	63
o-Xylene	1.7	5.3	7.5	23
4-Ethyltoluene	1.7	6.9	8.5	34

**Summary of Detected Compounds  
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

**Client Sample ID: SG5**

**Lab ID#: 0907016-02A**

1,3,5-Trimethylbenzene	1.7	2.3	8.5	11
1,2,4-Trimethylbenzene	1.7	8.1	8.5	40

**Client Sample ID: SG2**

**Lab ID#: 0907016-03A**

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
Acetone	5.5	38	13	89
2-Propanol	5.5	18	14	44
Carbon Disulfide	1.4	3.9	4.3	12
Hexane	1.4	9.0	4.9	32
2-Butanone (Methyl Ethyl Ketone)	1.4	5.4	4.1	16
Tetrahydrofuran	1.4	2.2	4.1	6.4
Cyclohexane	1.4	1.8	4.8	6.3
2,2,4-Trimethylpentane	1.4	4.9	6.4	23
Benzene	1.4	3.4	4.4	11
Heptane	1.4	5.6	5.6	23
Toluene	1.4	22	5.2	83
Tetrachloroethene	1.4	17	9.4	120
Ethyl Benzene	1.4	17	6.0	75
m,p-Xylene	1.4	45	6.0	200
o-Xylene	1.4	12	6.0	54
4-Ethyltoluene	1.4	3.5	6.8	17
1,3,5-Trimethylbenzene	1.4	1.4	6.8	7.0
1,2,4-Trimethylbenzene	1.4	3.2	6.8	16

**Client Sample ID: SG2 Lab Duplicate**

**Lab ID#: 0907016-03AA**

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
Acetone	12	39	28	93
2-Propanol	12	19	28	47
Carbon Disulfide	2.9	4.2	9.0	13
Hexane	2.9	8.4	10	30
2-Butanone (Methyl Ethyl Ketone)	2.9	4.9	8.6	14
2,2,4-Trimethylpentane	2.9	4.8	14	22
Benzene	2.9	3.5	9.3	11
Heptane	2.9	5.4	12	22

**Summary of Detected Compounds  
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

**Client Sample ID: SG2 Lab Duplicate**

**Lab ID#: 0907016-03AA**

Toluene	2.9	22	11	85
Tetrachloroethene	2.9	19	20	130
Ethyl Benzene	2.9	19	13	83
m,p-Xylene	2.9	48	13	210
o-Xylene	2.9	13	13	57
4-Ethyltoluene	2.9	3.7	14	18
1,2,4-Trimethylbenzene	2.9	3.4	14	17

**Client Sample ID: SG3**

**Lab ID#: 0907016-04A**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Ethanol	4.9	8.9	9.3	17
Acetone	4.9	30	12	72
2-Propanol	4.9	78	12	190
Carbon Disulfide	1.2	1.5	3.8	4.6
Hexane	1.2	2.2	4.4	7.8
2-Butanone (Methyl Ethyl Ketone)	1.2	4.5	3.6	13
Tetrahydrofuran	1.2	6.2	3.6	18
Benzene	1.2	1.6	3.9	5.1
Heptane	1.2	1.6	5.1	6.6
4-Methyl-2-pentanone	1.2	1.8	5.0	7.6
Toluene	1.2	7.7	4.6	29
Tetrachloroethene	1.2	4.2	8.4	29
Ethyl Benzene	1.2	1.4	5.4	6.2
m,p-Xylene	1.2	5.0	5.4	22
o-Xylene	1.2	1.8	5.4	7.7
4-Ethyltoluene	1.2	2.6	6.1	13
1,2,4-Trimethylbenzene	1.2	3.3	6.1	16

**Client Sample ID: SG4**

**Lab ID#: 0907016-05A**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Acetone	5.4	47	13	110
2-Propanol	5.4	39	13	95
Carbon Disulfide	1.3	3.2	4.2	10
Hexane	1.3	10	4.7	36

**Summary of Detected Compounds  
MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

**Client Sample ID: SG4**

**Lab ID#: 0907016-05A**

2-Butanone (Methyl Ethyl Ketone)	1.3	10	4.0	31
Tetrahydrofuran	1.3	2.6	4.0	7.7
Cyclohexane	1.3	1.9	4.6	6.6
2,2,4-Trimethylpentane	1.3	8.2	6.3	38
Benzene	1.3	4.8	4.3	15
Heptane	1.3	9.3	5.5	38
4-Methyl-2-pentanone	1.3	4.2	5.5	17
Toluene	1.3	34	5.1	130
Ethyl Benzene	1.3	6.0	5.8	26
m,p-Xylene	1.3	22	5.8	94
o-Xylene	1.3	7.8	5.8	34
Propylbenzene	1.3	1.7	6.6	8.6
4-Ethyltoluene	1.3	8.0	6.6	39
1,3,5-Trimethylbenzene	1.3	3.5	6.6	17
1,2,4-Trimethylbenzene	1.3	8.1	6.6	40

**Client Sample ID: SG1**

**Lab ID#: 0907016-06A**

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
Acetone	5.5	34	13	80
2-Propanol	5.5	42	14	100
2-Butanone (Methyl Ethyl Ketone)	1.4	3.8	4.1	11
Tetrahydrofuran	1.4	2.4	4.1	7.2
Chloroform	1.4	7.0	6.7	34
Benzene	1.4	1.8	4.4	5.6
4-Methyl-2-pentanone	1.4	2.1	5.6	8.7
Toluene	1.4	4.4	5.2	16
Tetrachloroethene	1.4	25	9.4	170
Ethyl Benzene	1.4	2.0	6.0	8.8
m,p-Xylene	1.4	7.6	6.0	33
o-Xylene	1.4	2.6	6.0	11
4-Ethyltoluene	1.4	1.9	6.8	9.2
1,2,4-Trimethylbenzene	1.4	2.6	6.8	13

Client Sample ID: SG6

Lab ID#: 0907016-01A

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>7071213</b>	<b>Date of Collection: 6/29/09 2:07:00 AM</b>
<b>Dil. Factor:</b>	<b>2.42</b>	<b>Date of Analysis: 7/12/09 07:22 PM</b>

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
Freon 12	1.2	Not Detected	6.0	Not Detected
Freon 114	1.2	Not Detected	8.4	Not Detected
Chloromethane	4.8	Not Detected	10	Not Detected
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,3-Butadiene	1.2	Not Detected	2.7	Not Detected
Bromomethane	1.2	Not Detected	4.7	Not Detected
Chloroethane	1.2	Not Detected	3.2	Not Detected
Freon 11	1.2	Not Detected	6.8	Not Detected
Ethanol	4.8	Not Detected	9.1	Not Detected
Freon 113	1.2	Not Detected	9.3	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Acetone	4.8	14	11	32
2-Propanol	4.8	960 E	12	2400 E
Carbon Disulfide	1.2	13	3.8	40
3-Chloropropene	4.8	Not Detected	15	Not Detected
Methylene Chloride	1.2	Not Detected	4.2	Not Detected
Methyl tert-butyl ether	1.2	Not Detected	4.4	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Hexane	1.2	19	4.3	66
1,1-Dichloroethane	1.2	Not Detected	4.9	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.2	2.5	3.6	7.4
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Tetrahydrofuran	1.2	Not Detected	3.6	Not Detected
Chloroform	1.2	Not Detected	5.9	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
Cyclohexane	1.2	4.5	4.2	16
Carbon Tetrachloride	1.2	Not Detected	7.6	Not Detected
2,2,4-Trimethylpentane	1.2	Not Detected	5.6	Not Detected
Benzene	1.2	1.8	3.9	5.9
1,2-Dichloroethane	1.2	Not Detected	4.9	Not Detected
Heptane	1.2	5.5	5.0	22
Trichloroethene	1.2	Not Detected	6.5	Not Detected
1,2-Dichloropropane	1.2	Not Detected	5.6	Not Detected
1,4-Dioxane	4.8	Not Detected	17	Not Detected
Bromodichloromethane	1.2	Not Detected	8.1	Not Detected
cis-1,3-Dichloropropene	1.2	Not Detected	5.5	Not Detected
4-Methyl-2-pentanone	1.2	2.6	5.0	10
Toluene	1.2	5.7	4.6	21
trans-1,3-Dichloropropene	1.2	Not Detected	5.5	Not Detected

Client Sample ID: SG6

Lab ID#: 0907016-01A

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>7071213</b>	<b>Date of Collection:</b> 6/29/09 2:07:00 AM
<b>Dil. Factor:</b>	<b>2.42</b>	<b>Date of Analysis:</b> 7/12/09 07:22 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	1.2	Not Detected	6.6	Not Detected
Tetrachloroethene	1.2	Not Detected	8.2	Not Detected
2-Hexanone	4.8	Not Detected	20	Not Detected
Dibromochloromethane	1.2	Not Detected	10	Not Detected
1,2-Dibromoethane (EDB)	1.2	Not Detected	9.3	Not Detected
Chlorobenzene	1.2	Not Detected	5.6	Not Detected
Ethyl Benzene	1.2	1.6	5.2	6.8
m,p-Xylene	1.2	6.5	5.2	28
o-Xylene	1.2	2.2	5.2	9.7
Styrene	1.2	Not Detected	5.2	Not Detected
Bromoform	1.2	Not Detected	12	Not Detected
Cumene	1.2	Not Detected	5.9	Not Detected
1,1,2,2-Tetrachloroethane	1.2	Not Detected	8.3	Not Detected
Propylbenzene	1.2	Not Detected	5.9	Not Detected
4-Ethyltoluene	1.2	2.4	5.9	12
1,3,5-Trimethylbenzene	1.2	Not Detected	5.9	Not Detected
1,2,4-Trimethylbenzene	1.2	2.1	5.9	10
1,3-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
alpha-Chlorotoluene	1.2	Not Detected	6.3	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.3	Not Detected
1,2,4-Trichlorobenzene	4.8	Not Detected	36	Not Detected
Hexachlorobutadiene	4.8	Not Detected	52	Not Detected

E = Exceeds instrument calibration range.

**Container Type: 1 Liter Summa Canister**

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	109	70-130
4-Bromofluorobenzene	106	70-130



Client Sample ID: SG5

Lab ID#: 0907016-02A

## MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

<b>File Name:</b>	<b>7071216</b>	<b>Date of Collection: 6/29/09 2:57:00 AM</b>
<b>Dil. Factor:</b>	<b>3.46</b>	<b>Date of Analysis: 7/12/09 09:51 PM</b>

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
Freon 12	1.7	Not Detected	8.6	Not Detected
Freon 114	1.7	Not Detected	12	Not Detected
Chloromethane	6.9	Not Detected	14	Not Detected
Vinyl Chloride	1.7	Not Detected	4.4	Not Detected
1,3-Butadiene	1.7	2.0	3.8	4.4
Bromomethane	1.7	Not Detected	6.7	Not Detected
Chloroethane	1.7	Not Detected	4.6	Not Detected
Freon 11	1.7	Not Detected	9.7	Not Detected
Ethanol	6.9	Not Detected	13	Not Detected
Freon 113	1.7	Not Detected	13	Not Detected
1,1-Dichloroethene	1.7	Not Detected	6.8	Not Detected
Acetone	6.9	30	16	70
2-Propanol	6.9	36	17	87
Carbon Disulfide	1.7	11	5.4	34
3-Chloropropene	6.9	Not Detected	22	Not Detected
Methylene Chloride	1.7	Not Detected	6.0	Not Detected
Methyl tert-butyl ether	1.7	Not Detected	6.2	Not Detected
trans-1,2-Dichloroethene	1.7	Not Detected	6.8	Not Detected
Hexane	1.7	14	6.1	48
1,1-Dichloroethane	1.7	Not Detected	7.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.7	5.0	5.1	15
cis-1,2-Dichloroethene	1.7	Not Detected	6.8	Not Detected
Tetrahydrofuran	1.7	3.2	5.1	9.5
Chloroform	1.7	4.5	8.4	22
1,1,1-Trichloroethane	1.7	Not Detected	9.4	Not Detected
Cyclohexane	1.7	Not Detected	6.0	Not Detected
Carbon Tetrachloride	1.7	Not Detected	11	Not Detected
2,2,4-Trimethylpentane	1.7	Not Detected	8.1	Not Detected
Benzene	1.7	5.0	5.5	16
1,2-Dichloroethane	1.7	Not Detected	7.0	Not Detected
Heptane	1.7	6.6	7.1	27
Trichloroethene	1.7	Not Detected	9.3	Not Detected
1,2-Dichloropropane	1.7	Not Detected	8.0	Not Detected
1,4-Dioxane	6.9	Not Detected	25	Not Detected
Bromodichloromethane	1.7	Not Detected	12	Not Detected
cis-1,3-Dichloropropene	1.7	Not Detected	7.8	Not Detected
4-Methyl-2-pentanone	1.7	5.3	7.1	22
Toluene	1.7	24	6.5	90
trans-1,3-Dichloropropene	1.7	Not Detected	7.8	Not Detected

Client Sample ID: SG5

Lab ID#: 0907016-02A

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>7071216</b>	<b>Date of Collection: 6/29/09 2:57:00 AM</b>
<b>Dil. Factor:</b>	<b>3.46</b>	<b>Date of Analysis: 7/12/09 09:51 PM</b>

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
1,1,2-Trichloroethane	1.7	Not Detected	9.4	Not Detected
Tetrachloroethene	1.7	Not Detected	12	Not Detected
2-Hexanone	6.9	Not Detected	28	Not Detected
Dibromochloromethane	1.7	Not Detected	15	Not Detected
1,2-Dibromoethane (EDB)	1.7	Not Detected	13	Not Detected
Chlorobenzene	1.7	Not Detected	8.0	Not Detected
Ethyl Benzene	1.7	4.4	7.5	19
m,p-Xylene	1.7	14	7.5	63
o-Xylene	1.7	5.3	7.5	23
Styrene	1.7	Not Detected	7.4	Not Detected
Bromoform	1.7	Not Detected	18	Not Detected
Cumene	1.7	Not Detected	8.5	Not Detected
1,1,2,2-Tetrachloroethane	1.7	Not Detected	12	Not Detected
Propylbenzene	1.7	Not Detected	8.5	Not Detected
4-Ethyltoluene	1.7	6.9	8.5	34
1,3,5-Trimethylbenzene	1.7	2.3	8.5	11
1,2,4-Trimethylbenzene	1.7	8.1	8.5	40
1,3-Dichlorobenzene	1.7	Not Detected	10	Not Detected
1,4-Dichlorobenzene	1.7	Not Detected	10	Not Detected
alpha-Chlorotoluene	1.7	Not Detected	9.0	Not Detected
1,2-Dichlorobenzene	1.7	Not Detected	10	Not Detected
1,2,4-Trichlorobenzene	6.9	Not Detected	51	Not Detected
Hexachlorobutadiene	6.9	Not Detected	74	Not Detected

**Container Type: 1 Liter Summa Canister**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	104	70-130

Client Sample ID: SG2

Lab ID#: 0907016-03A

## MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

<b>File Name:</b>	<b>y071413</b>	<b>Date of Collection: 6/29/09 3:38:00 AM</b>
<b>Dil. Factor:</b>	<b>2.76</b>	<b>Date of Analysis: 7/14/09 05:01 PM</b>

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
Freon 12	1.4	Not Detected	6.8	Not Detected
Freon 114	1.4	Not Detected	9.6	Not Detected
Chloromethane	5.5	Not Detected	11	Not Detected
Vinyl Chloride	1.4	Not Detected	3.5	Not Detected
1,3-Butadiene	1.4	Not Detected	3.0	Not Detected
Bromomethane	1.4	Not Detected	5.4	Not Detected
Chloroethane	1.4	Not Detected	3.6	Not Detected
Freon 11	1.4	Not Detected	7.8	Not Detected
Ethanol	5.5	Not Detected	10	Not Detected
Freon 113	1.4	Not Detected	10	Not Detected
1,1-Dichloroethene	1.4	Not Detected	5.5	Not Detected
Acetone	5.5	38	13	89
2-Propanol	5.5	18	14	44
Carbon Disulfide	1.4	3.9	4.3	12
3-Chloropropene	5.5	Not Detected	17	Not Detected
Methylene Chloride	1.4	Not Detected	4.8	Not Detected
Methyl tert-butyl ether	1.4	Not Detected	5.0	Not Detected
trans-1,2-Dichloroethene	1.4	Not Detected	5.5	Not Detected
Hexane	1.4	9.0	4.9	32
1,1-Dichloroethane	1.4	Not Detected	5.6	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.4	5.4	4.1	16
cis-1,2-Dichloroethene	1.4	Not Detected	5.5	Not Detected
Tetrahydrofuran	1.4	2.2	4.1	6.4
Chloroform	1.4	Not Detected	6.7	Not Detected
1,1,1-Trichloroethane	1.4	Not Detected	7.5	Not Detected
Cyclohexane	1.4	1.8	4.8	6.3
Carbon Tetrachloride	1.4	Not Detected	8.7	Not Detected
2,2,4-Trimethylpentane	1.4	4.9	6.4	23
Benzene	1.4	3.4	4.4	11
1,2-Dichloroethane	1.4	Not Detected	5.6	Not Detected
Heptane	1.4	5.6	5.6	23
Trichloroethene	1.4	Not Detected	7.4	Not Detected
1,2-Dichloropropane	1.4	Not Detected	6.4	Not Detected
1,4-Dioxane	5.5	Not Detected	20	Not Detected
Bromodichloromethane	1.4	Not Detected	9.2	Not Detected
cis-1,3-Dichloropropene	1.4	Not Detected	6.3	Not Detected
4-Methyl-2-pentanone	1.4	Not Detected	5.6	Not Detected
Toluene	1.4	22	5.2	83
trans-1,3-Dichloropropene	1.4	Not Detected	6.3	Not Detected

Client Sample ID: SG2

Lab ID#: 0907016-03A

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>y071413</b>	<b>Date of Collection: 6/29/09 3:38:00 AM</b>
<b>Dil. Factor:</b>	<b>2.76</b>	<b>Date of Analysis: 7/14/09 05:01 PM</b>

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
1,1,2-Trichloroethane	1.4	Not Detected	7.5	Not Detected
Tetrachloroethene	1.4	17	9.4	120
2-Hexanone	5.5	Not Detected	23	Not Detected
Dibromochloromethane	1.4	Not Detected	12	Not Detected
1,2-Dibromoethane (EDB)	1.4	Not Detected	11	Not Detected
Chlorobenzene	1.4	Not Detected	6.4	Not Detected
Ethyl Benzene	1.4	17	6.0	75
m,p-Xylene	1.4	45	6.0	200
o-Xylene	1.4	12	6.0	54
Styrene	1.4	Not Detected	5.9	Not Detected
Bromoform	1.4	Not Detected	14	Not Detected
Cumene	1.4	Not Detected	6.8	Not Detected
1,1,2,2-Tetrachloroethane	1.4	Not Detected	9.5	Not Detected
Propylbenzene	1.4	Not Detected	6.8	Not Detected
4-Ethyltoluene	1.4	3.5	6.8	17
1,3,5-Trimethylbenzene	1.4	1.4	6.8	7.0
1,2,4-Trimethylbenzene	1.4	3.2	6.8	16
1,3-Dichlorobenzene	1.4	Not Detected	8.3	Not Detected
1,4-Dichlorobenzene	1.4	Not Detected	8.3	Not Detected
alpha-Chlorotoluene	1.4	Not Detected	7.1	Not Detected
1,2-Dichlorobenzene	1.4	Not Detected	8.3	Not Detected
1,2,4-Trichlorobenzene	5.5	Not Detected	41	Not Detected
Hexachlorobutadiene	5.5	Not Detected	59	Not Detected

**Container Type: 1 Liter Summa Canister**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	109	70-130
4-Bromofluorobenzene	101	70-130

Client Sample ID: SG2 Lab Duplicate

Lab ID#: 0907016-03AA

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	y071411	Date of Collection: 6/29/09 3:38:00 AM
Dil. Factor:	5.81	Date of Analysis: 7/14/09 03:51 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	2.9	Not Detected	14	Not Detected
Freon 114	2.9	Not Detected	20	Not Detected
Chloromethane	12	Not Detected	24	Not Detected
Vinyl Chloride	2.9	Not Detected	7.4	Not Detected
1,3-Butadiene	2.9	Not Detected	6.4	Not Detected
Bromomethane	2.9	Not Detected	11	Not Detected
Chloroethane	2.9	Not Detected	7.7	Not Detected
Freon 11	2.9	Not Detected	16	Not Detected
Ethanol	12	Not Detected	22	Not Detected
Freon 113	2.9	Not Detected	22	Not Detected
1,1-Dichloroethene	2.9	Not Detected	12	Not Detected
Acetone	12	39	28	93
2-Propanol	12	19	28	47
Carbon Disulfide	2.9	4.2	9.0	13
3-Chloropropene	12	Not Detected	36	Not Detected
Methylene Chloride	2.9	Not Detected	10	Not Detected
Methyl tert-butyl ether	2.9	Not Detected	10	Not Detected
trans-1,2-Dichloroethene	2.9	Not Detected	12	Not Detected
Hexane	2.9	8.4	10	30
1,1-Dichloroethane	2.9	Not Detected	12	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.9	4.9	8.6	14
cis-1,2-Dichloroethene	2.9	Not Detected	12	Not Detected
Tetrahydrofuran	2.9	Not Detected	8.6	Not Detected
Chloroform	2.9	Not Detected	14	Not Detected
1,1,1-Trichloroethane	2.9	Not Detected	16	Not Detected
Cyclohexane	2.9	Not Detected	10	Not Detected
Carbon Tetrachloride	2.9	Not Detected	18	Not Detected
2,2,4-Trimethylpentane	2.9	4.8	14	22
Benzene	2.9	3.5	9.3	11
1,2-Dichloroethane	2.9	Not Detected	12	Not Detected
Heptane	2.9	5.4	12	22
Trichloroethene	2.9	Not Detected	16	Not Detected
1,2-Dichloropropane	2.9	Not Detected	13	Not Detected
1,4-Dioxane	12	Not Detected	42	Not Detected
Bromodichloromethane	2.9	Not Detected	19	Not Detected
cis-1,3-Dichloropropene	2.9	Not Detected	13	Not Detected
4-Methyl-2-pentanone	2.9	Not Detected	12	Not Detected
Toluene	2.9	22	11	85
trans-1,3-Dichloropropene	2.9	Not Detected	13	Not Detected

Client Sample ID: SG2 Lab Duplicate

Lab ID#: 0907016-03AA

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>y071411</b>	<b>Date of Collection: 6/29/09 3:38:00 AM</b>
<b>Dil. Factor:</b>	<b>5.81</b>	<b>Date of Analysis: 7/14/09 03:51 PM</b>

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	2.9	Not Detected	16	Not Detected
Tetrachloroethene	2.9	19	20	130
2-Hexanone	12	Not Detected	48	Not Detected
Dibromochloromethane	2.9	Not Detected	25	Not Detected
1,2-Dibromoethane (EDB)	2.9	Not Detected	22	Not Detected
Chlorobenzene	2.9	Not Detected	13	Not Detected
Ethyl Benzene	2.9	19	13	83
m,p-Xylene	2.9	48	13	210
o-Xylene	2.9	13	13	57
Styrene	2.9	Not Detected	12	Not Detected
Bromoform	2.9	Not Detected	30	Not Detected
Cumene	2.9	Not Detected	14	Not Detected
1,1,2,2-Tetrachloroethane	2.9	Not Detected	20	Not Detected
Propylbenzene	2.9	Not Detected	14	Not Detected
4-Ethyltoluene	2.9	3.7	14	18
1,3,5-Trimethylbenzene	2.9	Not Detected	14	Not Detected
1,2,4-Trimethylbenzene	2.9	3.4	14	17
1,3-Dichlorobenzene	2.9	Not Detected	17	Not Detected
1,4-Dichlorobenzene	2.9	Not Detected	17	Not Detected
alpha-Chlorotoluene	2.9	Not Detected	15	Not Detected
1,2-Dichlorobenzene	2.9	Not Detected	17	Not Detected
1,2,4-Trichlorobenzene	12	Not Detected	86	Not Detected
Hexachlorobutadiene	12	Not Detected	120	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	98	70-130

Client Sample ID: SG3

Lab ID#: 0907016-04A

## MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

<b>File Name:</b>	<b>7071215</b>	<b>Date of Collection: 6/29/09 4:10:00 AM</b>
<b>Dil. Factor:</b>	<b>2.47</b>	<b>Date of Analysis: 7/12/09 08:58 PM</b>

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
Freon 12	1.2	Not Detected	6.1	Not Detected
Freon 114	1.2	Not Detected	8.6	Not Detected
Chloromethane	4.9	Not Detected	10	Not Detected
Vinyl Chloride	1.2	Not Detected	3.2	Not Detected
1,3-Butadiene	1.2	Not Detected	2.7	Not Detected
Bromomethane	1.2	Not Detected	4.8	Not Detected
Chloroethane	1.2	Not Detected	3.2	Not Detected
Freon 11	1.2	Not Detected	6.9	Not Detected
Ethanol	4.9	8.9	9.3	17
Freon 113	1.2	Not Detected	9.5	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Acetone	4.9	30	12	72
2-Propanol	4.9	78	12	190
Carbon Disulfide	1.2	1.5	3.8	4.6
3-Chloropropene	4.9	Not Detected	15	Not Detected
Methylene Chloride	1.2	Not Detected	4.3	Not Detected
Methyl tert-butyl ether	1.2	Not Detected	4.4	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Hexane	1.2	2.2	4.4	7.8
1,1-Dichloroethane	1.2	Not Detected	5.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.2	4.5	3.6	13
cis-1,2-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Tetrahydrofuran	1.2	6.2	3.6	18
Chloroform	1.2	Not Detected	6.0	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.7	Not Detected
Cyclohexane	1.2	Not Detected	4.2	Not Detected
Carbon Tetrachloride	1.2	Not Detected	7.8	Not Detected
2,2,4-Trimethylpentane	1.2	Not Detected	5.8	Not Detected
Benzene	1.2	1.6	3.9	5.1
1,2-Dichloroethane	1.2	Not Detected	5.0	Not Detected
Heptane	1.2	1.6	5.1	6.6
Trichloroethene	1.2	Not Detected	6.6	Not Detected
1,2-Dichloropropane	1.2	Not Detected	5.7	Not Detected
1,4-Dioxane	4.9	Not Detected	18	Not Detected
Bromodichloromethane	1.2	Not Detected	8.3	Not Detected
cis-1,3-Dichloropropene	1.2	Not Detected	5.6	Not Detected
4-Methyl-2-pentanone	1.2	1.8	5.0	7.6
Toluene	1.2	7.7	4.6	29
trans-1,3-Dichloropropene	1.2	Not Detected	5.6	Not Detected

Client Sample ID: SG3

Lab ID#: 0907016-04A

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>7071215</b>	<b>Date of Collection: 6/29/09 4:10:00 AM</b>
<b>Dil. Factor:</b>	<b>2.47</b>	<b>Date of Analysis: 7/12/09 08:58 PM</b>

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	1.2	Not Detected	6.7	Not Detected
Tetrachloroethene	1.2	4.2	8.4	29
2-Hexanone	4.9	Not Detected	20	Not Detected
Dibromochloromethane	1.2	Not Detected	10	Not Detected
1,2-Dibromoethane (EDB)	1.2	Not Detected	9.5	Not Detected
Chlorobenzene	1.2	Not Detected	5.7	Not Detected
Ethyl Benzene	1.2	1.4	5.4	6.2
m,p-Xylene	1.2	5.0	5.4	22
o-Xylene	1.2	1.8	5.4	7.7
Styrene	1.2	Not Detected	5.3	Not Detected
Bromoform	1.2	Not Detected	13	Not Detected
Cumene	1.2	Not Detected	6.1	Not Detected
1,1,2,2-Tetrachloroethane	1.2	Not Detected	8.5	Not Detected
Propylbenzene	1.2	Not Detected	6.1	Not Detected
4-Ethyltoluene	1.2	2.6	6.1	13
1,3,5-Trimethylbenzene	1.2	Not Detected	6.1	Not Detected
1,2,4-Trimethylbenzene	1.2	3.3	6.1	16
1,3-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
1,4-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
alpha-Chlorotoluene	1.2	Not Detected	6.4	Not Detected
1,2-Dichlorobenzene	1.2	Not Detected	7.4	Not Detected
1,2,4-Trichlorobenzene	4.9	Not Detected	37	Not Detected
Hexachlorobutadiene	4.9	Not Detected	53	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	102	70-130



Client Sample ID: SG4

Lab ID#: 0907016-05A

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>y071412</b>	<b>Date of Collection: 6/29/09 4:39:00 AM</b>
<b>Dil. Factor:</b>	<b>2.69</b>	<b>Date of Analysis: 7/14/09 04:26 PM</b>

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
Freon 12	1.3	Not Detected	6.6	Not Detected
Freon 114	1.3	Not Detected	9.4	Not Detected
Chloromethane	5.4	Not Detected	11	Not Detected
Vinyl Chloride	1.3	Not Detected	3.4	Not Detected
1,3-Butadiene	1.3	Not Detected	3.0	Not Detected
Bromomethane	1.3	Not Detected	5.2	Not Detected
Chloroethane	1.3	Not Detected	3.5	Not Detected
Freon 11	1.3	Not Detected	7.6	Not Detected
Ethanol	5.4	Not Detected	10	Not Detected
Freon 113	1.3	Not Detected	10	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.3	Not Detected
Acetone	5.4	47	13	110
2-Propanol	5.4	39	13	95
Carbon Disulfide	1.3	3.2	4.2	10
3-Chloropropene	5.4	Not Detected	17	Not Detected
Methylene Chloride	1.3	Not Detected	4.7	Not Detected
Methyl tert-butyl ether	1.3	Not Detected	4.8	Not Detected
trans-1,2-Dichloroethene	1.3	Not Detected	5.3	Not Detected
Hexane	1.3	10	4.7	36
1,1-Dichloroethane	1.3	Not Detected	5.4	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.3	10	4.0	31
cis-1,2-Dichloroethene	1.3	Not Detected	5.3	Not Detected
Tetrahydrofuran	1.3	2.6	4.0	7.7
Chloroform	1.3	Not Detected	6.6	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	7.3	Not Detected
Cyclohexane	1.3	1.9	4.6	6.6
Carbon Tetrachloride	1.3	Not Detected	8.5	Not Detected
2,2,4-Trimethylpentane	1.3	8.2	6.3	38
Benzene	1.3	4.8	4.3	15
1,2-Dichloroethane	1.3	Not Detected	5.4	Not Detected
Heptane	1.3	9.3	5.5	38
Trichloroethene	1.3	Not Detected	7.2	Not Detected
1,2-Dichloropropane	1.3	Not Detected	6.2	Not Detected
1,4-Dioxane	5.4	Not Detected	19	Not Detected
Bromodichloromethane	1.3	Not Detected	9.0	Not Detected
cis-1,3-Dichloropropene	1.3	Not Detected	6.1	Not Detected
4-Methyl-2-pentanone	1.3	4.2	5.5	17
Toluene	1.3	34	5.1	130
trans-1,3-Dichloropropene	1.3	Not Detected	6.1	Not Detected

Client Sample ID: SG4

Lab ID#: 0907016-05A

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>y071412</b>	<b>Date of Collection: 6/29/09 4:39:00 AM</b>
<b>Dil. Factor:</b>	<b>2.69</b>	<b>Date of Analysis: 7/14/09 04:26 PM</b>

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
1,1,2-Trichloroethane	1.3	Not Detected	7.3	Not Detected
Tetrachloroethene	1.3	Not Detected	9.1	Not Detected
2-Hexanone	5.4	Not Detected	22	Not Detected
Dibromochloromethane	1.3	Not Detected	11	Not Detected
1,2-Dibromoethane (EDB)	1.3	Not Detected	10	Not Detected
Chlorobenzene	1.3	Not Detected	6.2	Not Detected
Ethyl Benzene	1.3	6.0	5.8	26
m,p-Xylene	1.3	22	5.8	94
o-Xylene	1.3	7.8	5.8	34
Styrene	1.3	Not Detected	5.7	Not Detected
Bromoform	1.3	Not Detected	14	Not Detected
Cumene	1.3	Not Detected	6.6	Not Detected
1,1,2,2-Tetrachloroethane	1.3	Not Detected	9.2	Not Detected
Propylbenzene	1.3	1.7	6.6	8.6
4-Ethyltoluene	1.3	8.0	6.6	39
1,3,5-Trimethylbenzene	1.3	3.5	6.6	17
1,2,4-Trimethylbenzene	1.3	8.1	6.6	40
1,3-Dichlorobenzene	1.3	Not Detected	8.1	Not Detected
1,4-Dichlorobenzene	1.3	Not Detected	8.1	Not Detected
alpha-Chlorotoluene	1.3	Not Detected	7.0	Not Detected
1,2-Dichlorobenzene	1.3	Not Detected	8.1	Not Detected
1,2,4-Trichlorobenzene	5.4	Not Detected	40	Not Detected
Hexachlorobutadiene	5.4	Not Detected	57	Not Detected

**Container Type: 1 Liter Summa Canister**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	109	70-130
4-Bromofluorobenzene	101	70-130

Client Sample ID: SG1

Lab ID#: 0907016-06A

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>y071414</b>	<b>Date of Collection:</b> 6/29/09 5:04:00 AM
<b>Dil. Factor:</b>	<b>2.76</b>	<b>Date of Analysis:</b> 7/14/09 05:41 PM

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
Freon 12	1.4	Not Detected	6.8	Not Detected
Freon 114	1.4	Not Detected	9.6	Not Detected
Chloromethane	5.5	Not Detected	11	Not Detected
Vinyl Chloride	1.4	Not Detected	3.5	Not Detected
1,3-Butadiene	1.4	Not Detected	3.0	Not Detected
Bromomethane	1.4	Not Detected	5.4	Not Detected
Chloroethane	1.4	Not Detected	3.6	Not Detected
Freon 11	1.4	Not Detected	7.8	Not Detected
Ethanol	5.5	Not Detected	10	Not Detected
Freon 113	1.4	Not Detected	10	Not Detected
1,1-Dichloroethene	1.4	Not Detected	5.5	Not Detected
Acetone	5.5	34	13	80
2-Propanol	5.5	42	14	100
Carbon Disulfide	1.4	Not Detected	4.3	Not Detected
3-Chloropropene	5.5	Not Detected	17	Not Detected
Methylene Chloride	1.4	Not Detected	4.8	Not Detected
Methyl tert-butyl ether	1.4	Not Detected	5.0	Not Detected
trans-1,2-Dichloroethene	1.4	Not Detected	5.5	Not Detected
Hexane	1.4	Not Detected	4.9	Not Detected
1,1-Dichloroethane	1.4	Not Detected	5.6	Not Detected
2-Butanone (Methyl Ethyl Ketone)	1.4	3.8	4.1	11
cis-1,2-Dichloroethene	1.4	Not Detected	5.5	Not Detected
Tetrahydrofuran	1.4	2.4	4.1	7.2
Chloroform	1.4	7.0	6.7	34
1,1,1-Trichloroethane	1.4	Not Detected	7.5	Not Detected
Cyclohexane	1.4	Not Detected	4.8	Not Detected
Carbon Tetrachloride	1.4	Not Detected	8.7	Not Detected
2,2,4-Trimethylpentane	1.4	Not Detected	6.4	Not Detected
Benzene	1.4	1.8	4.4	5.6
1,2-Dichloroethane	1.4	Not Detected	5.6	Not Detected
Heptane	1.4	Not Detected	5.6	Not Detected
Trichloroethene	1.4	Not Detected	7.4	Not Detected
1,2-Dichloropropane	1.4	Not Detected	6.4	Not Detected
1,4-Dioxane	5.5	Not Detected	20	Not Detected
Bromodichloromethane	1.4	Not Detected	9.2	Not Detected
cis-1,3-Dichloropropene	1.4	Not Detected	6.3	Not Detected
4-Methyl-2-pentanone	1.4	2.1	5.6	8.7
Toluene	1.4	4.4	5.2	16
trans-1,3-Dichloropropene	1.4	Not Detected	6.3	Not Detected

Client Sample ID: SG1

Lab ID#: 0907016-06A

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>y071414</b>	<b>Date of Collection:</b> 6/29/09 5:04:00 AM
<b>Dil. Factor:</b>	<b>2.76</b>	<b>Date of Analysis:</b> 7/14/09 05:41 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,2-Trichloroethane	1.4	Not Detected	7.5	Not Detected
Tetrachloroethene	1.4	25	9.4	170
2-Hexanone	5.5	Not Detected	23	Not Detected
Dibromochloromethane	1.4	Not Detected	12	Not Detected
1,2-Dibromoethane (EDB)	1.4	Not Detected	11	Not Detected
Chlorobenzene	1.4	Not Detected	6.4	Not Detected
Ethyl Benzene	1.4	2.0	6.0	8.8
m,p-Xylene	1.4	7.6	6.0	33
o-Xylene	1.4	2.6	6.0	11
Styrene	1.4	Not Detected	5.9	Not Detected
Bromoform	1.4	Not Detected	14	Not Detected
Cumene	1.4	Not Detected	6.8	Not Detected
1,1,2,2-Tetrachloroethane	1.4	Not Detected	9.5	Not Detected
Propylbenzene	1.4	Not Detected	6.8	Not Detected
4-Ethyltoluene	1.4	1.9	6.8	9.2
1,3,5-Trimethylbenzene	1.4	Not Detected	6.8	Not Detected
1,2,4-Trimethylbenzene	1.4	2.6	6.8	13
1,3-Dichlorobenzene	1.4	Not Detected	8.3	Not Detected
1,4-Dichlorobenzene	1.4	Not Detected	8.3	Not Detected
alpha-Chlorotoluene	1.4	Not Detected	7.1	Not Detected
1,2-Dichlorobenzene	1.4	Not Detected	8.3	Not Detected
1,2,4-Trichlorobenzene	5.5	Not Detected	41	Not Detected
Hexachlorobutadiene	5.5	Not Detected	59	Not Detected

**Container Type: 1 Liter Summa Canister**

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	109	70-130
4-Bromofluorobenzene	103	70-130

Client Sample ID: Lab Blank

Lab ID#: 0907016-07A

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>7071205</b>	<b>Date of Collection: NA</b>
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis: 7/12/09 11:23 AM</b>

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	2.0	Not Detected	4.1	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	0.50	Not Detected	1.9	Not Detected
Chloroethane	0.50	Not Detected	1.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	2.0	Not Detected	4.8	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	0.50	Not Detected	1.6	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	0.50	Not Detected	1.7	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.50	Not Detected	1.5	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected

Client Sample ID: Lab Blank

Lab ID#: 0907016-07A

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>7071205</b>	<b>Date of Collection: NA</b>
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis: 7/12/09 11:23 AM</b>

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected

Container Type: NA - Not Applicable

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	90	70-130
4-Bromofluorobenzene	99	70-130

Client Sample ID: Lab Blank

Lab ID#: 0907016-07B

## MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

<b>File Name:</b>	<b>y071405</b>	<b>Date of Collection: NA</b>
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis: 7/14/09 11:14 AM</b>

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	2.0	Not Detected	4.1	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	0.50	Not Detected	1.9	Not Detected
Chloroethane	0.50	Not Detected	1.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	2.0	Not Detected	4.8	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	0.50	Not Detected	1.6	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	0.50	Not Detected	1.7	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	0.50	Not Detected	1.5	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected

Client Sample ID: Lab Blank

Lab ID#: 0907016-07B

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>y071405</b>	<b>Date of Collection: NA</b>
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis: 7/14/09 11:14 AM</b>

<b>Compound</b>	<b>Rpt. Limit (ppbv)</b>	<b>Amount (ppbv)</b>	<b>Rpt. Limit (ug/m3)</b>	<b>Amount (ug/m3)</b>
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected

Container Type: NA - Not Applicable

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	110	70-130
4-Bromofluorobenzene	101	70-130



Client Sample ID: CCV

Lab ID#: 0907016-08A

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>7071203</b>	<b>Date of Collection: NA</b>
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis: 7/12/09 09:40 AM</b>

<b>Compound</b>	<b>%Recovery</b>
Freon 12	101
Freon 114	112
Chloromethane	91
Vinyl Chloride	99
1,3-Butadiene	98
Bromomethane	100
Chloroethane	99
Freon 11	95
Ethanol	98
Freon 113	107
1,1-Dichloroethene	98
Acetone	101
2-Propanol	97
Carbon Disulfide	100
3-Chloropropene	102
Methylene Chloride	88
Methyl tert-butyl ether	102
trans-1,2-Dichloroethene	103
Hexane	100
1,1-Dichloroethane	93
2-Butanone (Methyl Ethyl Ketone)	104
cis-1,2-Dichloroethene	94
Tetrahydrofuran	93
Chloroform	89
1,1,1-Trichloroethane	93
Cyclohexane	101
Carbon Tetrachloride	95
2,2,4-Trimethylpentane	96
Benzene	94
1,2-Dichloroethane	94
Heptane	100
Trichloroethene	98
1,2-Dichloropropane	95
1,4-Dioxane	100
Bromodichloromethane	98
cis-1,3-Dichloropropene	102
4-Methyl-2-pentanone	105
Toluene	97
trans-1,3-Dichloropropene	100

Client Sample ID: CCV

Lab ID#: 0907016-08A

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>7071203</b>	<b>Date of Collection: NA</b>
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis: 7/12/09 09:40 AM</b>

<b>Compound</b>	<b>%Recovery</b>
1,1,2-Trichloroethane	95
Tetrachloroethene	99
2-Hexanone	97
Dibromochloromethane	100
1,2-Dibromoethane (EDB)	94
Chlorobenzene	94
Ethyl Benzene	99
m,p-Xylene	100
o-Xylene	103
Styrene	102
Bromoform	100
Cumene	97
1,1,2,2-Tetrachloroethane	86
Propylbenzene	94
4-Ethyltoluene	95
1,3,5-Trimethylbenzene	86
1,2,4-Trimethylbenzene	92
1,3-Dichlorobenzene	91
1,4-Dichlorobenzene	94
alpha-Chlorotoluene	100
1,2-Dichlorobenzene	93
1,2,4-Trichlorobenzene	89
Hexachlorobutadiene	85

**Container Type: NA - Not Applicable**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	90	70-130
4-Bromofluorobenzene	104	70-130

Client Sample ID: CCV

Lab ID#: 0907016-08B

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	y071403	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/14/09 09:59 AM

Compound	%Recovery
Freon 12	108
Freon 114	108
Chloromethane	101
Vinyl Chloride	113
1,3-Butadiene	114
Bromomethane	102
Chloroethane	110
Freon 11	107
Ethanol	107
Freon 113	105
1,1-Dichloroethene	109
Acetone	101
2-Propanol	104
Carbon Disulfide	108
3-Chloropropene	105
Methylene Chloride	92
Methyl tert-butyl ether	90
trans-1,2-Dichloroethene	102
Hexane	102
1,1-Dichloroethane	105
2-Butanone (Methyl Ethyl Ketone)	104
cis-1,2-Dichloroethene	104
Tetrahydrofuran	104
Chloroform	104
1,1,1-Trichloroethane	108
Cyclohexane	100
Carbon Tetrachloride	109
2,2,4-Trimethylpentane	102
Benzene	98
1,2-Dichloroethane	110
Heptane	104
Trichloroethene	103
1,2-Dichloropropane	102
1,4-Dioxane	98
Bromodichloromethane	111
cis-1,3-Dichloropropene	108
4-Methyl-2-pentanone	109
Toluene	100
trans-1,3-Dichloropropene	111

Client Sample ID: CCV

Lab ID#: 0907016-08B

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>y071403</b>	<b>Date of Collection: NA</b>
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis: 7/14/09 09:59 AM</b>

<b>Compound</b>	<b>%Recovery</b>
1,1,2-Trichloroethane	104
Tetrachloroethene	102
2-Hexanone	104
Dibromochloromethane	113
1,2-Dibromoethane (EDB)	105
Chlorobenzene	97
Ethyl Benzene	100
m,p-Xylene	102
o-Xylene	100
Styrene	102
Bromoform	108
Cumene	91
1,1,2,2-Tetrachloroethane	96
Propylbenzene	95
4-Ethyltoluene	95
1,3,5-Trimethylbenzene	86
1,2,4-Trimethylbenzene	84
1,3-Dichlorobenzene	94
1,4-Dichlorobenzene	95
alpha-Chlorotoluene	104
1,2-Dichlorobenzene	95
1,2,4-Trichlorobenzene	102
Hexachlorobutadiene	104

**Container Type: NA - Not Applicable**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	100	70-130

Client Sample ID: LCS

Lab ID#: 0907016-09A

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>7071204</b>	<b>Date of Collection: NA</b>
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis: 7/12/09 10:25 AM</b>

<b>Compound</b>	<b>%Recovery</b>
Freon 12	90
Freon 114	96
Chloromethane	80
Vinyl Chloride	87
1,3-Butadiene	85
Bromomethane	88
Chloroethane	90
Freon 11	90
Ethanol	62
Freon 113	111
1,1-Dichloroethene	104
Acetone	98
2-Propanol	97
Carbon Disulfide	95
3-Chloropropene	97
Methylene Chloride	91
Methyl tert-butyl ether	99
trans-1,2-Dichloroethene	98
Hexane	97
1,1-Dichloroethane	92
2-Butanone (Methyl Ethyl Ketone)	101
cis-1,2-Dichloroethene	102
Tetrahydrofuran	89
Chloroform	88
1,1,1-Trichloroethane	90
Cyclohexane	98
Carbon Tetrachloride	92
2,2,4-Trimethylpentane	93
Benzene	89
1,2-Dichloroethane	89
Heptane	96
Trichloroethene	93
1,2-Dichloropropane	90
1,4-Dioxane	96
Bromodichloromethane	94
cis-1,3-Dichloropropene	97
4-Methyl-2-pentanone	103
Toluene	97
trans-1,3-Dichloropropene	95

Client Sample ID: LCS

Lab ID#: 0907016-09A

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>7071204</b>	<b>Date of Collection: NA</b>
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis: 7/12/09 10:25 AM</b>

<b>Compound</b>	<b>%Recovery</b>
1,1,2-Trichloroethane	90
Tetrachloroethene	94
2-Hexanone	94
Dibromochloromethane	95
1,2-Dibromoethane (EDB)	86
Chlorobenzene	88
Ethyl Benzene	91
m,p-Xylene	93
o-Xylene	96
Styrene	97
Bromoform	95
Cumene	93
1,1,2,2-Tetrachloroethane	81
Propylbenzene	90
4-Ethyltoluene	89
1,3,5-Trimethylbenzene	80
1,2,4-Trimethylbenzene	85
1,3-Dichlorobenzene	83
1,4-Dichlorobenzene	84
alpha-Chlorotoluene	96
1,2-Dichlorobenzene	83
1,2,4-Trichlorobenzene	70
Hexachlorobutadiene	69 Q

Q = Exceeds Quality Control limits.

**Container Type: NA - Not Applicable**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	90	70-130
4-Bromofluorobenzene	103	70-130

Client Sample ID: LCS

Lab ID#: 0907016-09B

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>y071404</b>	<b>Date of Collection: NA</b>
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis: 7/14/09 10:34 AM</b>

<b>Compound</b>	<b>%Recovery</b>
Freon 12	102
Freon 114	100
Chloromethane	98
Vinyl Chloride	106
1,3-Butadiene	106
Bromomethane	100
Chloroethane	105
Freon 11	100
Ethanol	73
Freon 113	112
1,1-Dichloroethene	115
Acetone	103
2-Propanol	101
Carbon Disulfide	105
3-Chloropropene	102
Methylene Chloride	96
Methyl tert-butyl ether	91
trans-1,2-Dichloroethene	100
Hexane	101
1,1-Dichloroethane	106
2-Butanone (Methyl Ethyl Ketone)	99
cis-1,2-Dichloroethene	112
Tetrahydrofuran	100
Chloroform	103
1,1,1-Trichloroethane	105
Cyclohexane	99
Carbon Tetrachloride	107
2,2,4-Trimethylpentane	100
Benzene	96
1,2-Dichloroethane	106
Heptane	101
Trichloroethene	101
1,2-Dichloropropane	99
1,4-Dioxane	90
Bromodichloromethane	108
cis-1,3-Dichloropropene	104
4-Methyl-2-pentanone	105
Toluene	101
trans-1,3-Dichloropropene	106

Client Sample ID: LCS

Lab ID#: 0907016-09B

**MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN**

<b>File Name:</b>	<b>y071404</b>	<b>Date of Collection: NA</b>
<b>Dil. Factor:</b>	<b>1.00</b>	<b>Date of Analysis: 7/14/09 10:34 AM</b>

<b>Compound</b>	<b>%Recovery</b>
1,1,2-Trichloroethane	101
Tetrachloroethene	100
2-Hexanone	93
Dibromochloromethane	107
1,2-Dibromoethane (EDB)	98
Chlorobenzene	94
Ethyl Benzene	95
m,p-Xylene	97
o-Xylene	97
Styrene	96
Bromoform	105
Cumene	90
1,1,2,2-Tetrachloroethane	90
Propylbenzene	93
4-Ethyltoluene	92
1,3,5-Trimethylbenzene	82
1,2,4-Trimethylbenzene	80
1,3-Dichlorobenzene	90
1,4-Dichlorobenzene	89
alpha-Chlorotoluene	99
1,2-Dichlorobenzene	89
1,2,4-Trichlorobenzene	99
Hexachlorobutadiene	101

**Container Type: NA - Not Applicable**

<b>Surrogates</b>	<b>%Recovery</b>	<b>Method Limits</b>
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	100	70-130





**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. 49 CFR (800) 467 4922

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

Page 1 of 1

Project Manager Juli A. Brady  
 Collected by: (Print and Sign) Alex S. Bowerman  
 Company Streamborn Email information@streamborn.com  
 Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Phone 510-528-4234 Fax \_\_\_\_\_

<b>Project Info:</b> P.O. # _____ Project # <u>P257</u> Project Name <u>4401 Market St</u>	<b>Turn Around Time:</b> <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Rush specify _____	<b>Lab Use Only</b> Pressurized by: Date: Pressurization Gas: N <sub>2</sub> 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 (psid)
01A	566	12374	29 Jun 09	2:07:20	TD-15	30 <sup>+</sup>	5		
02A	565	34662	⚡	2:57:47	⚡	30 <sup>+</sup>	13		
03A	562	1002		3:38:50		30 <sup>+</sup>	8		
04A	563	34591		4:10:10		28	6		
05A	564	36564		4:39:30		30 <sup>+</sup>	8		
06A	561	2138		5:04:45		30 <sup>+</sup>	8		

Relinquished by: (signature) <u>Alex S. B</u> Date/Time <u>6/30/09 12:30</u>	Received by: (signature) <u>Monica Peterson</u> Date/Time <u>ATL 7/1/09 1:30</u>	<b>Notes:</b> <u>Tracer gas was isopropyl alcohol. Make sure to report isopropyl alcohol.</u>
Relinquished by: (signature) _____ Date/Time _____	Received by: (signature) _____ Date/Time _____	
Relinquished by: (signature) _____ Date/Time _____	Received by: (signature) _____ Date/Time _____	

Lab Use Only

Shipper Name: UPS Air Bill #: 1Z74E 559 039132 912 MA Temp (°C): 6.00 Condition: Good Custody Seals intact? Yes Work Order #: 0907016

# **ATTACHMENT 3**

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: 06/03/2009 By jamesy

Permit Numbers: W2009-0450  
Permits Valid from 06/29/2009 to 06/29/2009

Application Id: 1243985880363  
Site Location: 4401 Market St, Oakland, CA  
Project Start Date: 06/29/2009  
Assigned Inspector: Contact John Shouldice at (510) 670-5424 or johns@acpwa.org

City of Project Site:Oakland

Completion Date:06/29/2009

Applicant: Streamborn - The Streamborn  
PO Box 8330, Berkeley, CA 94707  
Property Owner: Casimiro Damele  
3750 Victor Ave., Oakland, CA 94619  
Client: \*\* same as Property Owner \*\*

Phone: 510-528-4234

Phone: 510-531-0778

Receipt Number: WR2009-0203 Total Due: \$230.00  
Payer Name : Streamborn Total Amount Paid: \$230.00  
Paid By: CHECK PAID IN FULL

## Works Requesting Permits:

Borehole(s) for Investigation-Geotechnical Study/CPT's - 6 Boreholes  
Driller: En Probe - Lic #: 777007 - Method: DP

Work Total: \$230.00

## Specifications

Permit Number	Issued Dt	Expire Dt	# Boreholes	Hole Diam	Max Depth
W2009-0450	06/03/2009	09/27/2009	6	1.00 in.	7.00 ft

## Specific Work Permit Conditions

1. Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings. All cuttings remaining or unused shall be containerized and hauled off site.
2. Boreholes shall not be left open for a period of more than 24 hours. All boreholes left open more than 24 hours will need approval from Alameda County Public Works Agency, Water Resources Section. All boreholes shall be backfilled according to permit destruction requirements and all concrete material and asphalt material shall be to Caltrans Spec or County/City Codes. No borehole(s) shall be left in a manner to act as a conduit at any time.
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. 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.
5. Applicant shall contact John Shouldice for an inspection time at 510-670-5424 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.

## **Alameda County Public Works Agency - Water Resources Well Permit**

6. 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.

7. 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.

8. Permit is valid only for the purpose specified herein. No changes in construction procedures, as described on this permit application. Boreholes shall not be converted to monitoring wells, without a permit application process.

---

# PROGRAMS AND SERVICES

## Well Standards Program

The Alameda County Public Works Agency, Water Resources is located at:

399 Elmhurst Street

Hayward, CA 94544

For Driving Directions or General Info, Please Contact 510-670-5480 or [wells@acpwa.org](mailto:wells@acpwa.org)

For Drilling Permit information and process contact [James Yoo](mailto:James.Yoo@acpwa.org) at

Phone: 510-670-6633

FAX: 510-782-1939

Email: [Jamesy@acpwa.org](mailto:Jamesy@acpwa.org)

Alameda County Public Works is the administering agency of [General Ordinance Code, Chapter 6.88](#) . The purpose of this chapter is to provide for the regulation of groundwater wells and exploratory holes as required by [California Water Code](#). The provisions of these laws are administered and enforced by Alameda County Public Works Agency through its Well Standards Program.

**Drilling Permit Jurisdictions in Alameda County:** There are four jurisdictions in Alameda County.

### Location: Agency with Jurisdiction Contact Number

Berkeley City of Berkeley Ph: 510-981-7460

Fax: 510-540-5672

Fremont, Newark, Union City Alameda County Water District Ph: 510-668-4460

Fax: 510-651-1760

Pleasanton, Dublin, Livermore, Sunol [Zone 7 Water Agency](#) Ph: 925-454-5000

Fax: 510-454-5728

**The Alameda County Public Works Agency, Water Resources** has the responsibility and authority to issue drilling permits and to enforce the County Water Well Ordinance 73-68. This jurisdiction covers the western Alameda County area of **Oakland, Alameda, Piedmont, Emeryville, Albany, San Leandro, San Lorenzo, Castro Valley, and Hayward** . The purpose of the drilling permits are to ensure that any new well or the destruction of wells, including geotechnical investigations and environmental sampling within the above jurisdiction and within Alameda County will not cause pollution or contamination of ground water or otherwise jeopardize the health, safety or welfare of the people of Alameda County.

**Permits** are required for all work pertaining to wells and exploratory holes at any depth within the jurisdiction of the Well Standards Program. A completed [permit application \(30 Kb\)\\*](#) , along with a site map, should be submitted at least **ten (10) working days prior to the planned start of work**. Submittals should be sent to the address or fax number provided on the application form. When submitting an application via fax, please use a high resolution scan to retain legibility.

### Fees

**Beginning April 11, 2005** , the following fees shall apply:

A permit to construct, rehabilitate, or destroy wells, including cathodic protection wells, but excluding dewatering wells (\*Horizontal hillside dewatering and dewatering for construction period only), shall cost \$300.00 per well.

A permit to bore exploratory holes, including temporary test wells, shall cost \$200 per site. A site includes the project parcel as well as any adjoining parcels.

Please make checks payable to: **Treasurer, County of Alameda**

### Permit Fees are exempt to State & Federal Projects

Applicants shall submit a letter from the agency requesting the fee exemption.

**Scheduling Work/Inspections:**

Alameda County Public Works Agency (ACPWA), Water Resources Section requires scheduling and inspection of permitted work. All drilling activities must be scheduled in advance. Availability of inspections will vary from week to week and will come on a first come, first served bases. To ensure inspection availability on your desired or driller scheduled date, the following procedures are required:

Please contact **James Yoo at 510-670-6633** to schedule the inspection date and time (You must have drilling permit approved prior to scheduling).

Schedule the work as far in advance as possible (at least 5 days in advance); and confirm the scheduled drilling date(s) at least 24 hours prior to drilling.

Once the work has been scheduled, an ACPWA Inspector will coordinate the inspection requirements as well as how the Inspector can be reached if they are not at the site when Inspection is required. Expect for special circumstances given, all work will require the inspection to be conducted during the working hours of 8:30am to 2:30pm., Monday to Friday, excluding holidays.

**Request for Permit Extension:**

Permits are only valid from the start date to the completion date as stated on the drilling permit application and Conditions of Approval. To request an extension of a drilling permit application, applicants must request in writing prior to the completion date as set forth in the Conditions of Approval of the drilling permit application. Please send fax or email to Water Resources Section, Fax 510-782-1939 or email at [wells@acpwa.org](mailto:wells@acpwa.org). There are no additional fees for permit extensions or for re-scheduling inspection dates. You may not extend your drilling permit dates beyond 90 days from the approval date of the permit application. **NO refunds** shall be given back after 90 days and the permit shall be deemed voided.

**Cancel a Drilling Permit:**

Applicants may cancel a drilling permit only in writing by mail, fax or email to Water Resources Section, Fax 510-782-1939 or email at [wells@acpwa.org](mailto:wells@acpwa.org). If you do not cancel your drilling permit application before the drilling completion date or notify in writing within 90 days, Alameda County Public Works Agency, Water Resources Section may void the permit and No refunds may be given back.

**Refunds/Service Charge:**

A service charge of \$25.00 dollars for the first check returned and \$35.00 dollars for each subsequent check returned.

Applicants who cancel a drilling permit application **before** we issue the approved permit(s), will receive a **FULL** refund (at any amount) and will be mailed back within two weeks.

Applicants who cancel a drilling permit application **after** a permit has been issued will then be charged a service fee of \$50.00 (fifty Dollars).

To collect the remaining funds will be determined by the amount of the refund to be refunded (see process below).

Board of Supervisors Minute Order, File No. 9763, dated January 9, 1996, gives blanket authority to the Auditor-Controller to process claims, from all County departments for the refund of fees which do not exceed \$500 (Five Hundred Dollars)(with the exception of the County Clerk whose limit is \$1,500).

Refunds over the amounts must be authorized by the Board of Supervisors Minute Order, File No. 9763 require specific approval by the Board of Supervisors. The forms to request for refunds under \$500.00 (Five Hundred Dollars) are available at this office or any County Offices. If the amount is exceeded, a Board letter and Minute Order must accompany the claim. Applicant shall fill out the request form and the County Fiscal department will process the request.

**Enforcement**

Penalty. Any person who does any work for which a permit is required by this chapter and who fails to obtain a permit shall be guilty of a misdemeanor punishable by fine not exceeding Five Hundred Dollars (\$500.00) or by imprisonment not exceeding six months, or by both such fine and imprisonment, and such person shall be deemed guilty of a separate offense for each and every day or portion thereof during which any such

violation is committed, continued, or permitted, and shall be subject to the same punishment as for the original offense. (Prior gen. code §3-160.6)

**Enforcement actions will be determined by this office on a case-by-case basis**

Drilling without a permit shall be the cost of the permit(s) and a fine of \$500.00 (Five Hundred Dollars).

**Well Completion Reports** (State DWR-188 forms) must be filed with the Well Standards Program within 60 days of completing work. Staff will review the report, assign a state well number, and then forward it to the California Department of Water Resources (DWR). Drillers should not send completed reports to DWR directly. Failure to file a Well Completion Report or deliberate falsification of the information is a misdemeanor; it is also grounds for disciplinary action by the Contractors' State License Board. Also note that filed Well Completion Reports are considered private record protected by state law and can only be released to the well owner or those specifically authorized by government agencies.

See our website ([www.acgov.org/pwa/wells/index.shtml](http://www.acgov.org/pwa/wells/index.shtml)) for links to additional forms.

CITY OF OAKLAND • Community and Economic Development Agency  
250 Frank H. Ogawa Plaza, 2nd Floor, Oakland, CA 94612 • Phone (510) 238-3443 • Fax (510) 238-2263

Applications for which no permit is issued within 180 days shall expire by limitation. No refund after 180 days when expired.

Appl# X0900667

Job Site 4401 MARKET ST

Parcel# 013 -1087-004-00

Descr permit to do soil sampling

Permit Issued 06/04/09  
**JOB SITE**

Work Type EXCAVATION-PRIVATE P

USA #

Util Co. Job #  
Util Fund #:

Acctg#:

Applcmt Phone# Lic# --License Classes--

Owner DAMELE CASIMIRO & GUISEPPINA T

Contractor ENPROB ENVIRONMENTAL PROBING

X

(530)589-2019 777007 C57

Arch/Engr

Agent

Applic Addr P O BOX 6093, OROVILLE, CA, 95966

\$419.99 TOTAL FEES PAID AT ISSUANCE

\$66.00 Applic

\$300.00 Permit

\$0.00 Process

\$34.77 Rec Mgmt

\$0.00 Gen Plan

\$0.00 Invstg

\$0.00 Other

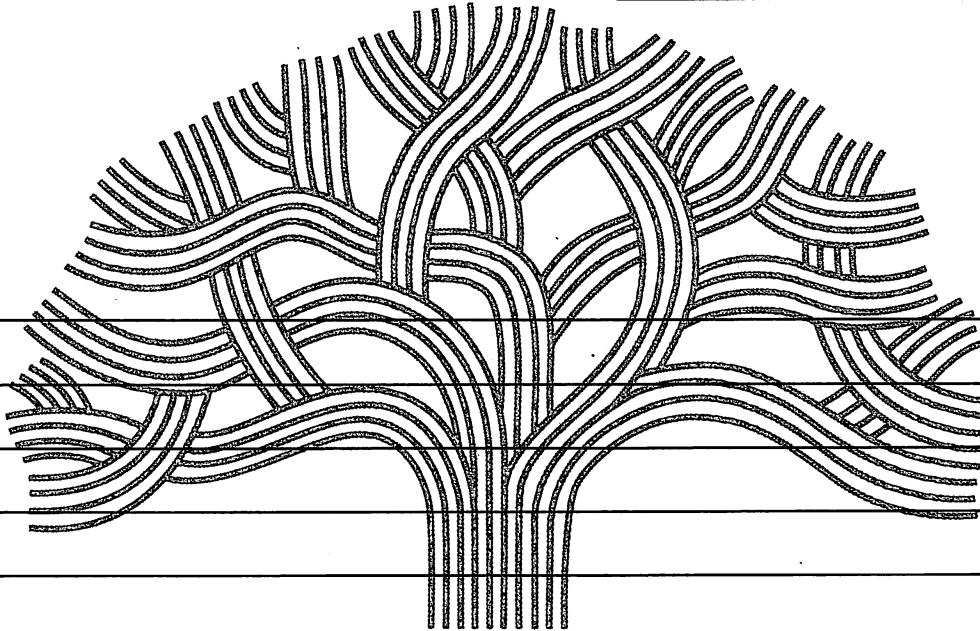
\$19.22 Tech Enh

Permit Issued By \_\_\_\_\_

Date: 6.4.09

Finalled By \_\_\_\_\_

Date: \_\_\_\_\_



ADDRESS:

DIST:

CITY OF OAKLAND

**PAID**

6/4/09



Applications for which no permit is issued within 180 days shall expire by limitation. No refund after 180 days when expired.

Permit No. X0900667 Parcel #: 013 -1087-004-00  
Project Address: 4401 MARKET ST

Page 2 of 2

Licensed Contractors' Declaration

I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect.

Construction Lending Agency Declaration

I hereby affirm under penalty of perjury that there is a construction-lending agency for the performance of the work for which this permit is issued, as provided by Section 3097 of the Business and Professions Code. N/A under Lender implies No Lending Agency.

Lender \_\_\_\_\_ Address \_\_\_\_\_

Workers' Compensation Declaration

I hereby affirm under penalty of perjury one of the following declarations:

I have and will maintain a certificate of consent to self-insure for workers' compensation, as provided for by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued.

I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued.

CARRIER: \_\_\_\_\_ POLICY NO. \_\_\_\_\_

I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the workers' compensation laws of California, and agree that if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.

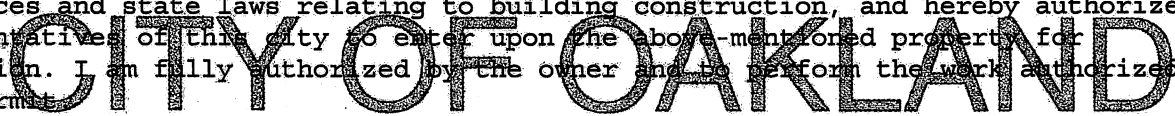
WARNING: FAILURE TO SECURE WORKERS' COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS, IN ADDITION TO THE COST OF COMPENSATION DAMAGES AS PROVIDED FOR IN SECTION 3707 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

Hazardous Materials Declaration

I hereby affirm that the intended occupancy  WILL  WILL NOT use, handle or store any hazardous, or acutely hazardous, materials. (Checking "WILL" acknowledges that sections 25505, 25533, & 25534 of the Health & Safety Code, as well as filing instructions, were made available to you.)

I HEREBY CERTIFY THE FOLLOWING: That I have read this document; that the above information is correct; and that I have truthfully affirmed all applicable declarations contained in this document. I agree to comply with all city and county ordinances and state laws relating to building construction, and hereby authorize representative of this city to enter upon the above-mentioned property for inspection. I am fully authorized by the owner and to perform the work authorized by this permit.

ADDRESS:  
DIST:



PRINT NAME

Signature  Contractor, or  Agent

Date



# EXCAVATION PERMIT

## TO EXCAVATE IN STREETS OR OTHER SPECIFIED WORK

CIVIL ENGINEERING

PAGE 2 of 2

Permit valid for 90 days from date of issuance.

PERMIT NUMBER <b>X 0 9 0 0 6 6 7 *</b>		SITE ADDRESS/LOCATION <b>4401 Parker St</b>
APPROX. START DATE	APPROX. END DATE	24-HOUR EMERGENCY PHONE NUMBER (Permit not valid without 24-Hour number)
CONTRACTOR'S LICENSE # AND CLASS <b>777007</b>		CITY BUSINESS TAX #

**ATTENTION:**

- 1- State law requires that the contractor/owner call Underground Service Alert (USA) two working days before excavating. This permit is not valid unless applicant has secured an inquiry identification number issued by USA. The USA telephone number is 1-800-642-2444. Underground Service Alert (USA) # \_\_\_\_\_
- 2- 48 hours prior to starting work, you **MUST CALL** (510) 238-3651 to schedule an inspection.
- 3- 48 hours prior to re-paving, a compaction certificate is required (waived for approved slurry backfill).

**OWNER/BUILDER**

I hereby affirm that I am exempt from the Contractor's License Law for the following reason (Sec. 7031.5 Business and Professions Code: Any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he is licensed pursuant to the provisions of the Contractor's License law Chapter 9 (commencing with Sec. 7000) of Division 3 of the Business and Professions Code, or that he is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than \$500):

I, as an owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who does such work himself or through his own employees, provided that such improvements are not intended or offered for sale. If however, the building or improvement is sold within one year of completion, the owner-builder will have the burden of proving that he did not build or improve for the purpose of sale).

I, as owner of the property, am exempt from the sale requirements of the above due to: (1) I am improving my principal place of residence or appurtenances thereto, (2) the work will be performed prior to sale, (3) I have resided in the residence for the 12 months prior to completion of the work, and (4) I have not claimed exemption on this subdivision on more than two structures more than once during any three-year period. (Sec. 7044 Business and Professions Code).

I, as owner of the property, am exclusively contracting with licensed contractors to construct the project, (Sec. 7044, Business and Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractor's License law).

I am exempt under Sec. \_\_\_\_\_, B&PC for this reason \_\_\_\_\_

**WORKER'S COMPENSATION**


I hereby affirm that I have a certificate of consent to self-insure, or a certificate of Worker's Compensation Insurance, or a certified copy thereof (Sec. 3700, Labor Code).

Policy # \_\_\_\_\_ Company Name \_\_\_\_\_

I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the Worker's Compensation Laws of California (not required for work valued at one hundred dollars (\$100) or less).

**NOTICE TO APPLICANT:** If, after making this Certificate of Exemption, you should become subject to the Worker's Compensation provisions of the Labor Code, you must forthwith comply with such provisions or this permit shall be deemed revoked. This permit is issued pursuant to all provisions of Title 12 Chapter 12.12 of the Oakland Municipal Code. It is granted upon the express condition that the permittee shall be responsible for all claims and liabilities arising out of work performed under the permit or arising out of permittee's failure to perform the obligations with respect to street maintenance. The permittee shall, and by acceptance of the permit agrees to defend, indemnify, save and hold harmless the City, its officers and employees, from and against any and all suits, claims, or actions brought by any person for or on account of any bodily injuries, disease or illness or damage to persons and/or property sustained or arising in the construction of the work performed under the permit or in consequence of permittee's failure to perform the obligations with respect to street maintenance. This permit is void 90 days from the date of issuance unless an extension is granted by the Director of the Office of Planning and Building.

I hereby affirm that I am licensed under provisions of Chapter 9 of Division 3 of the Business and Professions Code and my license is in full force and effect (if contractor), that I have read this permit and agree to its requirements, and that the above information is true and correct under penalty of law.

**X**  \_\_\_\_\_  
 Agent for  Contractor  Owner \_\_\_\_\_ Date \_\_\_\_\_

DATE STREET LAST RESURFACED	SPECIAL PAVING DETAIL REQUIRED? <input type="checkbox"/> YES <input type="checkbox"/> NO	HOLIDAY RESTRICTION? (NOV 1 - JAN 1) <input type="checkbox"/> YES <input type="checkbox"/> NO	LIMITED OPERATION AREA? (7AM-9AM & 4PM-6PM) <input type="checkbox"/> YES <input type="checkbox"/> NO
ISSUED BY		DATE ISSUED	



**May 27, 2009**

**Letter of Authorization: Client Streamborn**

**To City of Oakland Permit Department**

**I Dennis Ott DBA EnProb Environmental Probing authorize Streamborn Personnel to obtain excavation permit on my behalf for the project at 4401 Market Street in Oakland, California. The drilling is scheduled for June 29<sup>th</sup> at 8 am doing Direct Push Soil Gas Sampling. If there is any reason why this letter of authorization is not accepted, please fill free to call me on my cell.**

**Thanks,**

**Dennis Ott**

**EnProb Environmental Probing**

**CA. Small Business Certified 60412**



**Office: 530-589-2019**

**Cell: 530-693-0219**

**Fax: 530-589-2230**

**[dennis@enprob.com](mailto:dennis@enprob.com)**


**[www.enprob.com](http://www.enprob.com)**


**State Of California**  
**CONTRACTORS STATE LICENSE BOARD**  
**ACTIVE LICENSE**


License Number **777007**      Entry **PART**

Business Name **ENPROB ENVIRONMENTAL PROBING**

Classification(s) **C57**

Expiration Date **04/30/2010**


**BUSINESS TAX CERTIFICATE**  
CITY OF OAKLAND

POST IN A  
CONSPICUOUS  
PLACE

The issuing of a Business Tax Certificate is for revenue purposes only. It does not relieve the taxpayer from the responsibility of complying with the requirements of any other agency of the City of Oakland and/or any other ordinance, law or regulation of the State of California, or any other governmental agency. This certificate is void if non-payable instruments are tendered to obtain it. The Business Tax Certificate expires on December 31st, and you are allowed a grace period until March 1st of the following year.



**EXPIRES**  
**12/31/2009**

<b>ACCOUNT NUMBER</b>	<b>3222462</b>
<b>BUSINESS NAME</b>	<b>ENPROB ENVIRONMENTAL PROBING</b>
<b>BUSINESS ADDRESS</b>	<b>105 LOMA VISTA DR OROVILLE, CA 95966-9105</b>
<b>BUSINESS CLASSIFICATION</b>	<b>H - Construction Contractors</b>



**YOU MAY BE REQUIRED TO OBTAIN A VALID ZONING CLEARANCE TO OPERATE YOUR BUSINESS LEGALLY. RENTAL OF REAL PROPERTY IS EXCLUDED FROM ZONING.**

CITY OF OAKLAND  
Community & Economic Development Agency  
250 Frank H. Ogawa Pl, Oakland CA, 94612  
Phone: (510)238-4774 FAX: (510)238-2263

PAYMENT RECEIPT

=====  
Application#: X8900667 Payment#: 001  
APPLICATION FEE \$66.00  
EXCAVATION PERMIT \$300.00  
RECORDS MANAGEMENT FEE \$34.77  
TECHNOLOGY ENHANCEMENT FE \$19.22  
Subtotal: \$419.99

=====  
Sales Tax: \$.00  
\*\*\*\*\* TOTAL PAID: \$419.99

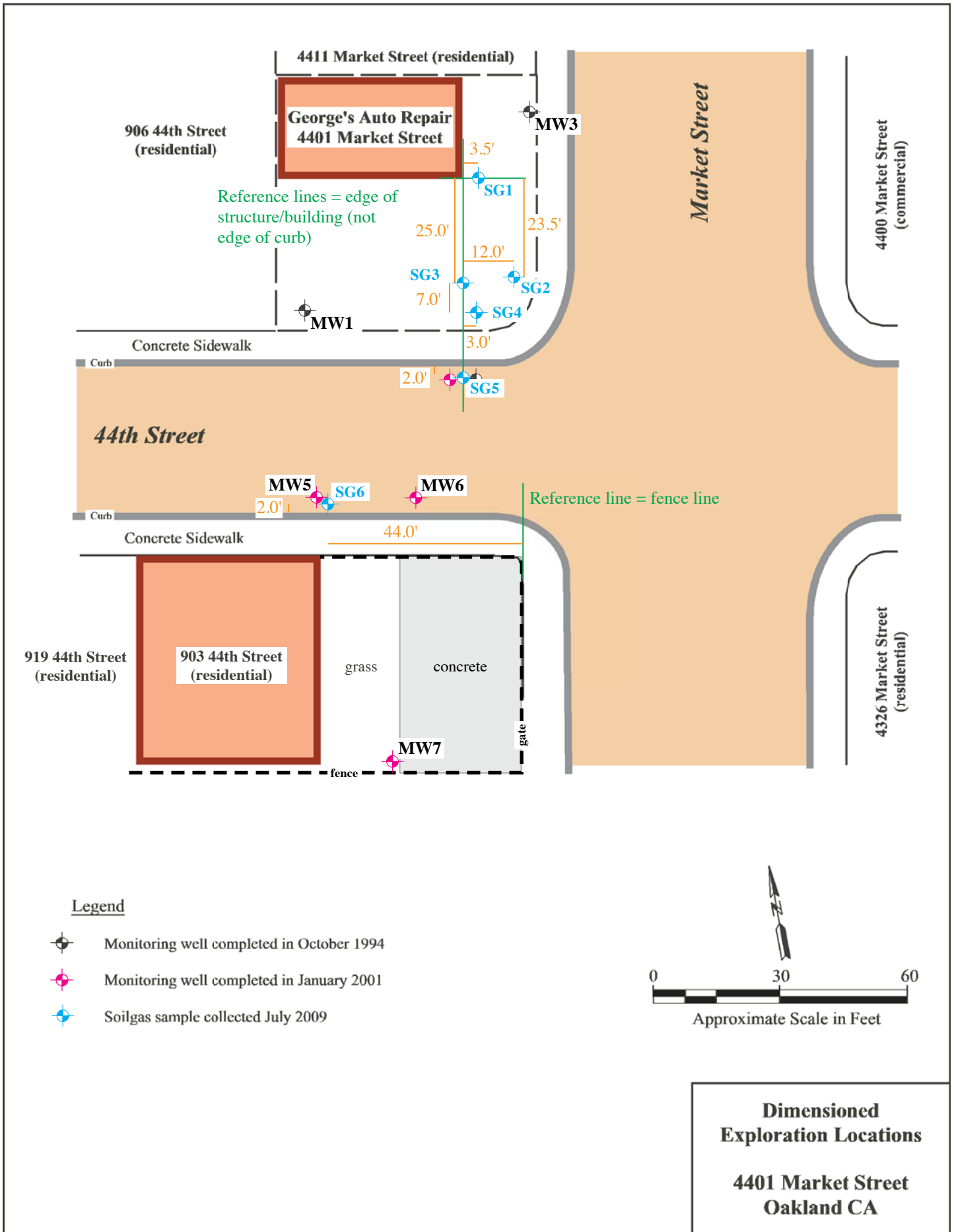
=====  
Check Payment: \$419.99  
=====

Payor: JULI A BRADY 1460  
Date: 06/04/09 Time: 12:55:04  
By: MKH Register R02 Receipt# 128330

\*\*\*\*\*  
ORIGINAL RECEIPT REQUIRED FOR REFUND  
\*\*\*\*\*

# **ATTACHMENT 4**

Dimensioned Exploration Locations



# **ATTACHMENT 5**

Standard Operating Procedure for Soilgas  
Sampling Using Implants



## STANDARD OPERATING PROCEDURE (SOP) 39

### SOILGAS PURGING AND SAMPLING FROM BOREHOLES USING IMPLANTS, SUMMA CANISTERS, VACUUM PUMP, AND FLOWRATE = 0.167 L/MIN

#### 1.0 INTRODUCTION AND SUMMARY

This SOP describes procedures to purge and sample soilgas from boreholes using implants, Air Toxics, Ltd. (Folsom CA) provided flow regulators set for 0.167 L/min, Summa canisters, an electric vacuum pump, and a shroud.

When conducting soilgas sampling the following protocols should always be in place: 1) sampling should not be conducted at depths greater than 5 feet below grade (to reduce the effects of barometric pumping) 2) sampling should not be conducted following a significant rain event (significant being  $\geq 1$  inch/hour), and 3) purging and sampling should be conducted (at the same) low flow rates ( $< 0.200$  L/min).

Typical soilgas sampling and purging activities include: purging stagnant air from a sandpack interval and the downhole tubing, measuring volatile organic compound levels using an organic vapor meter (OVM), measuring/calculating the optimal purge volume, conducting leak tests, collecting soil gas samples, and labeling and preserving the collected samples.

#### 2.0 EQUIPMENT AND MATERIALS

- Water level meter
- Cooler (samples need to be kept cool and dark, do not use ice)
- Field organic vapor monitor. The make, model, and calibration information of the field organic vapor monitor (including compound and concentration of calibration gas) should be documented
- Shroud (and bricks to keep it weighted down)
- Stainless steel soil sample tubes with holes drilled and caps, rags, 2-Propanol (isopropyl or rubbing alcohol), mason jars for soaking
- Laboratory supplied Summa canisters (typically 1-liter)
- Air Toxics, Ltd. (Folsom CA) “Blue Box” flow regulator preset for a flow of 0.167 L/min.
- Electric vacuum pump: Vacuum pump (GAST Vacuum Pump DOA-V502-JH, 1/8 HP or equivalent), with flow throttle valve, sample port and vacuum gauges
- New tedlar bags for collecting samples during the purge test
- Hand pump for collecting samples during the purge test
- 12 volt battery for vacuum pump

- Tubing and connectors: ¼ -inch ID teflon tubing (Down hole tubing is typically supplied by driller)
- Soilgas sampling( w/shroud) toolbox
- Field Forms: borehole installation log, borehole construction schematic, purge volume test form, purge/sample log and vacuum test/leak test log

### 3.0 TYPICAL PROCEDURES

The following procedures are intended to cover the majority of purging and sampling conditions. However, normal field practice requires reevaluation of these procedures and implementation of alternate procedures upon encountering unusual or unexpected conditions. Deviations from the following procedures may be expected and should be documented.

Upon arriving at the site, measure the static water level in at least two monitoring wells if available. Record water level on purge and sample form.

#### **3.1 Soilgas Probe Emplacement Method - Using drill rods as “temporary casings”**

A drive rod with expendable tip should be driven to a predetermined depth and then pulled back approximately 0.5 feet. The drill rod should then be sounded to verify that the expendable tip released from the end of the drill rod and it is embedded in the soil.

Sand should be poured through the inside of the drill rod while the drill rod is simultaneously lifted producing a plug of sand pack to the predetermined thickness.

A 1-inch diameter PVC pipe should then be lowered into the drill rod and the soilgas implant (with tubing attached) should be lowered inside the PVC pipe. A small amount of sand should then be poured inside the drill rod to hold the implant in place and then the PVC pipe should be removed. Sand should then be poured through the inside of the drill rod while the drill rod is simultaneously lifted, producing another plug of sand pack to the predetermined thickness. (The implant should be placed midway in the sand pack interval with a minimum of 1 foot of appropriately sized sand pack. The sand pack should be no smaller than the adjacent formation).

At least one foot of dry granular bentonite should be placed above the sandpack. The dry granular bentonite should be poured through the inside of the drill rod while the drill rod is simultaneously lifted, producing a plug of dry bentonite.

Above the 1-foot (minimum) of dry granular bentonite, dry granular bentonite should continue to be poured through the inside of the drill rod while the drill rod is simultaneously lifted with the intent of hydrating this layer of bentonite. The remainder of the borehole should be backfilled with hydrated bentonite to ground surface (see attached schematic: Typical Soilgas Sampling Borehole Using Implants)

### Equilibration

The purge volume test, leak test, and soil gas sampling should not be conducted for at least **30 minutes** following installation.

Installation time should be recorded in the *Purge/Sample Log* (attached).

### Decontamination

After each use, drive rods and other reusable components should be properly decontaminated to prevent cross contamination.

## **3.2 Purge Volume Test**

To ensure stagnant or ambient air is removed from the sampling system and assure samples collected are representative of subsurface conditions a purge volume versus contaminant concentration test should be conducted as the first soilgas sampling activity at the selected test location.

### Purge Test Location:

The purge test location should be selected as near as possible to the anticipated or confirmed contaminant source and in an area where the soilgas concentrations are expected to be greatest based on lithology.

### Purge Volume:

The purge volume can be estimated based on a summation of the internal volume of tubing and annular space (sand pack interval) around the probe tip.

### Step Purge Test:

The purge test should be conducted at the same flow rate as the sampling and purging (0.167 L/min) using the “Blue Box” flow regulator and the Gast oil-less electric vacuum pump (Model DOA-9111-JH). The shroud is not necessary.

The sample tubing exiting the ground surface should be attached to the inlet of the “Blue Box” flow regulator. The outlet of the regulator should be attached to the electric vacuum pump via a short section of tubing. A sample port (e.g., a tee and Swagelok fitting) should be located immediately upstream of the vacuum pump to allow sample collection. Sample collection should be conducted using a hand-held vacuum pump and 1-liter tedlar bag. Purge volume concentrations should be measured by attaching the tedlar bags to the field organic vapor meter.

One, three, and seven purge volumes should be extracted as a means to determine the purge volume to be applied at all sampling points. The appropriate purge volume should be selected based on the highest concentration detected by the OVM meter. If no volatile organic compounds (VOCs) are detected during the step purge test, a default of three purge volumes should be extracted prior to sampling.

The purge test data (calculated purge volume, flow rate, duration of each purge step) should be recorded on the *Purge Volume Test Log* (attached).

### Additional Purge Volume Test

Additional purge volume tests should be performed if 1) widely variable or different site soils are encountered or 2) the default purge volume is used and a VOC is newly detected. (Reference DTSC 2003 Guidance Documents page 10)

### 3.3 Tracer Gas Atmosphere, Purging and Soilgas Sample Collection

Review *Air Toxics, Ltd.. Guide to Air Sampling and Analysis* section 3.0 "Sampling with Canisters" prior to sampling with the Summa Canisters.

Prior to purging and sampling, an air tight shroud (clear plastic storage container with weather stripping) should be placed over the borehole and down hole sample tubing. The shroud should have two bulkhead fittings, one on each end (See attached Schematic: Maintaining a Tracer Gas Atmosphere and Purging and Sampling Using a Vacuum Pump).

A tracer gas atmosphere, of concentration greater than laboratory detection limits, should be maintained inside the shroud by placing a source of 2-propanol\* (isopropyl alcohol, also known as "rubbing alcohol") beneath the shroud. The 2-propanol source should consist of a cloth that has been saturated with 2-propanol and placed inside a metal liner. The metal liner should be perforated with multiple holes. A short section of teflon tubing should then be inserted through one of the bulkhead fittings and the atmosphere inside the shroud should be monitored using the organic vapor monitor. Concentrations measured should be recorded periodically on the *Leak Test and Tracer Gas Log (attached)*.

Tubing from the soilgas implant should be threaded through the second bulkhead fitting on the shroud. The tubing should then be connected to the inlet of the "Blue Box" flow regulator (preset at a flowrate of 0.167 liter/minute). The outlet of the "Blue Box" flow regulator should be connected to the vacuum pump with a short section of tubing.

The vacuum pump should be operated for the pre-determined duration (from the purge test). Then the vacuum pump should be shut off and the tubing disconnected from the outlet of the "Blue Box" flow regulator. A 1-liter Summa canister (the sample container) should be quickly connected to the outlet of the "Blue Box" regulator. The valve on the 1-liter Summa canister can then be opened for the predetermined sampling time (sample time should correspond to a sample volume of approximately one liter at a flowrate of 0.167 liters/minute). The valve on the 1-liter Summa canister should then be closed and the sample canister disconnected from the "Blue Box" regulator. All observations and measurements should be recorded on the *Purge/Sample Log (attached)*. **It is imperative that both the starting and ending vacuum of the sample container are recorded for each sampling event.** Note: Tedlar bags should not be used for collecting volatile organic compounds.

\* Tracer compounds such as pentane, isobutane, propane, and butane may also be used. 2-Propanol which is rubbing alcohol (also called Isopropyl alcohol; sec-propyl alcohol; isopropanol; sec-propanol; dimethylcarbinol) is easily obtained, detected using an OVM meter, and typically included in the TO-15 analytical suite as opposed to some of the other compounds.

### 3.4 Leak Test on Sampling Train

A leak test should be conducted at every soil gas probe location after sample collection to verify the integrity of the connection between the implant and the “Blue Box” flow regulator, along with the integrity of the regulator itself.

A Summa canister (under vacuum) should be connected to the outlet of the “Blue Box” regulator and the implant tubing should be cut near the ground surface. The valve for the Summa canister should be opened while simultaneously blocking the implant tubing (holding one’s thumb over the exposed end of the tubing). The initial vacuum should be observed and, after five minutes, the final vacuum should be observed. In all cases, no loss in vacuum should be observed. Vacuum observations and time should be recorded on the *Vacuum Leak Test and Tracer Gas Log* (attached).

There are several methods of conducting leak checks on the sampling apparatus, depending upon the method of sampling and regulatory oversight. If required by regulatory oversight. A 6 mL plastic bag can be placed over the entire sampling apparatus. Similar to the plastic shroud used to cover the borehole. Two ports or added to the plastic bag, one for monitoring the atmosphere inside and one for the sampling tubing (see attached schematic: *Maintaining a Tracer Gas Atmosphere and Purging and Sampling Using a Vacuum Pump*).

### 3.5 Sample Handling

- Samples should not be exposed to light, changes in temperature and pressure. All of these will accelerate sample degradation.
- Do not chill samples.
- Do not ship samples by air.
- If condensation is observed in the sample container, the container should be discarded.

## 4.0 BOREHOLE ABANDONMENT

The tubing and soilgas implants should be extracted (pulled) from the boreholes. Drill rods with a 2.4-inch diameter conical tip should then be pushed to total depth and the voidspace/borehole should be backfilled with cement-bentonite grout (94 pounds cement, 5 pounds bentonite, 6 gallons water).

## 4.0 LABORATORY

Please reference section 2.7 “Analysis of Soil Gas Samples” from the DTSC and LARWQCB *Advisory - Active Soil Gas Investigations* (DTSC 2003). It is paramount that necessary detection limits be confirmed based prior to sample submittal.

Always ensure the tracer gas used is on the laboratory analytical list and the appropriate detection limit is reported.

## 5.0 QUALITY ASSURANCE AND QUALITY CONTROL

The OVM meter should be calibrated at least once per day. Recalibration may be appropriate if unusual measurements are noticed.

## 6.0 DECONTAMINATION

All down hole equipment should be decontaminated prior to boring other holes. New tubing should be used for each well.

## 7.0 SAFETY

Primary chemical hazards during soil vapor purging and sampling are associated with inhalation exposure. Primary protection against inhalation exposure includes avoiding all exhaust ports and maintaining proper ventilation.

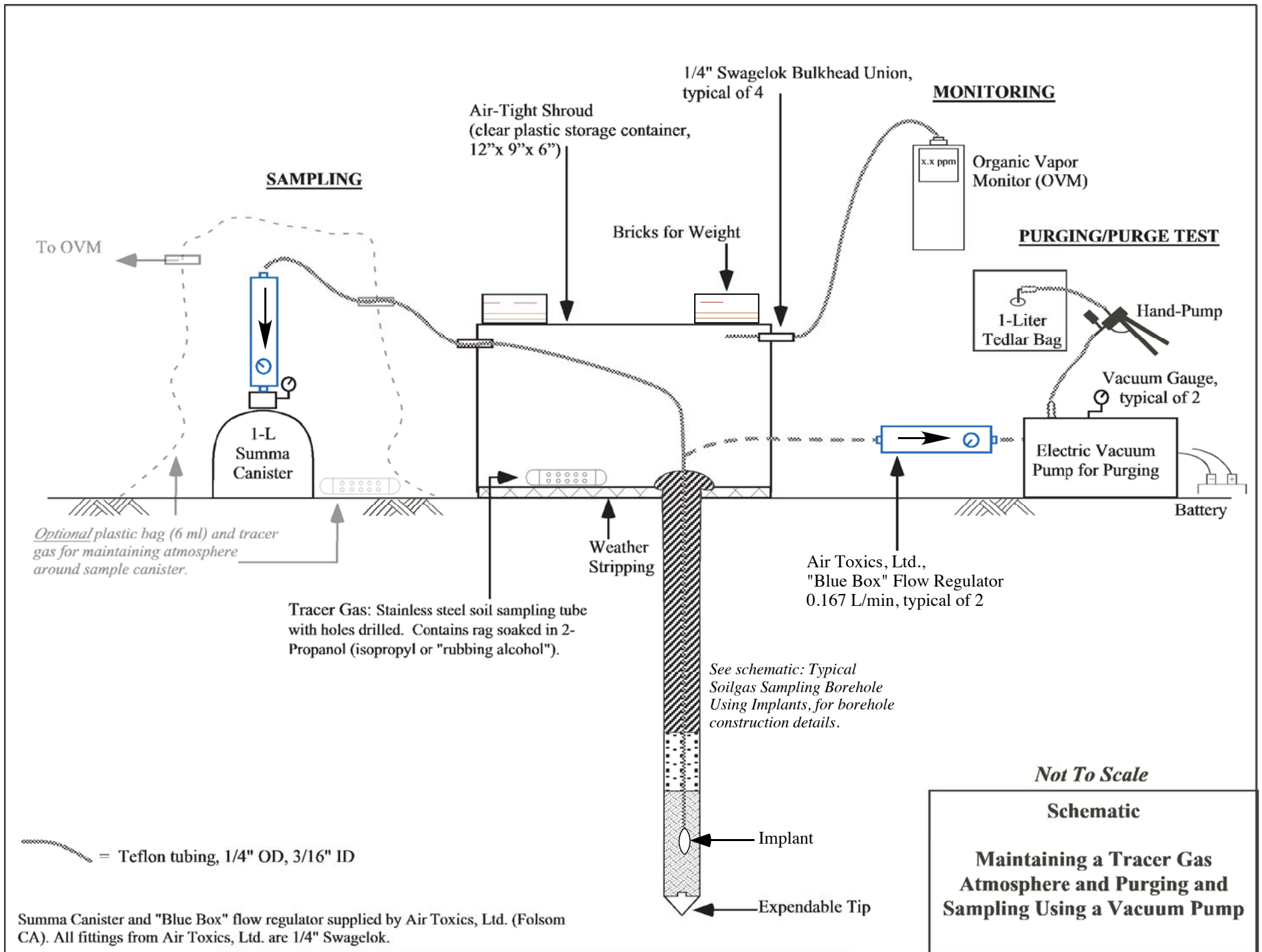
Other specific site safety guidance is provided in the Site Safety Plan.

## 9.0 REFERENCES

Air Toxics. *Guide to Air Sampling and Analysis*.

Department of Toxic Substances Control and Los Angeles Regional Water Quality Control Board (2003). *Advisory - Active Soil Gas Investigations*. Prepared by the Department of Toxic Substances Control and the Los Angeles Regional Water Quality Control Board, Glendale CA and Los Angeles CA. 28 January 2003.

Department of Toxic Substances Control (2005). *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Interim Final - 15 December 2004, Revised 7 February 2005)*. Prepared by the Department of Toxic Substances Control, California Environmental Protection Agency, Sacramento CA. 7 February 2005.



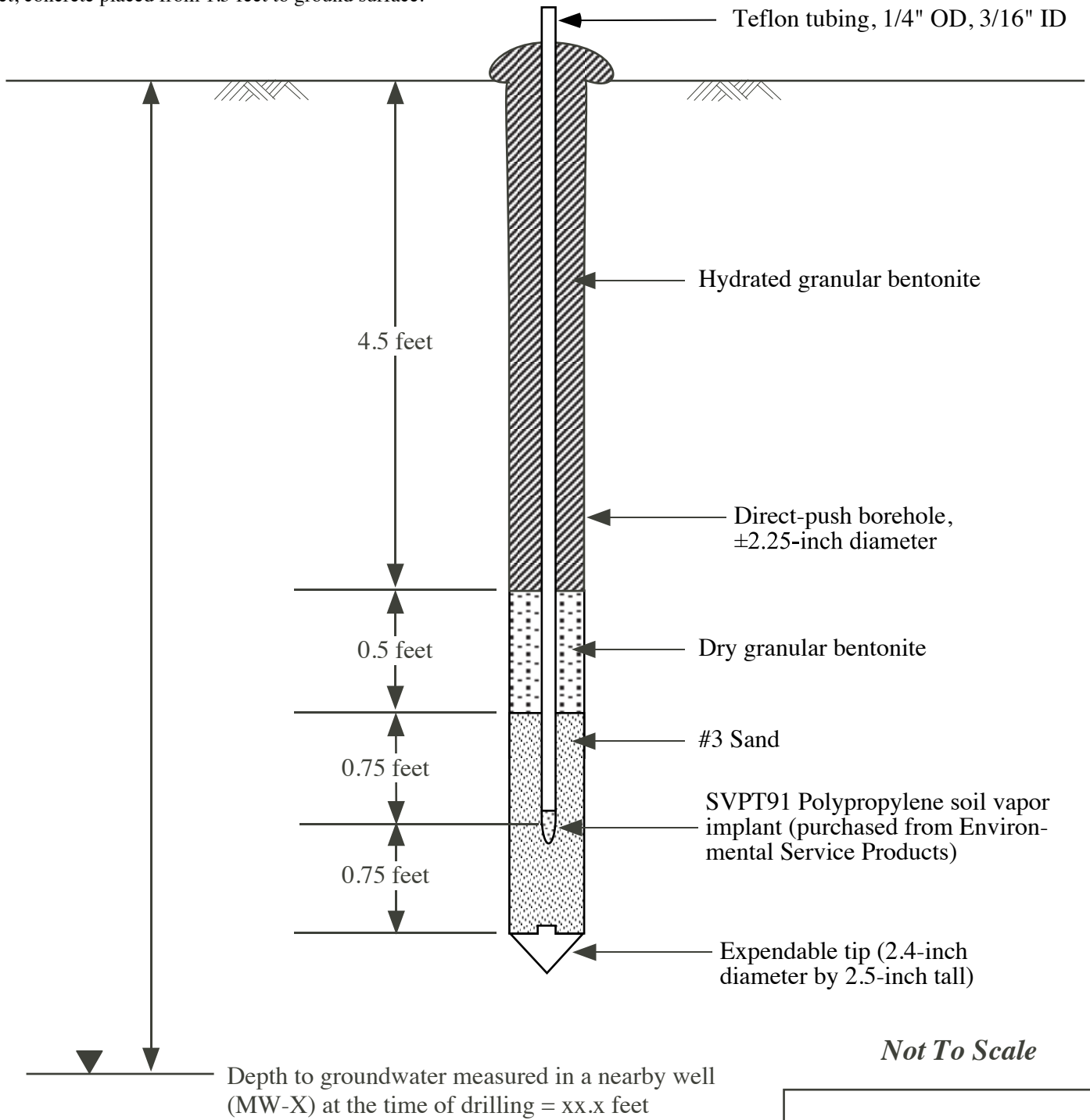
GPS Coordinates N °  
W °

Start Drilling  
Complete Borehole Construction

Date, Time  
Date, Time

Abandon/Decommission: Tubing extracted (pulled), rods with 2.4-inch diameter conical tip pushed to TD feet, cement-bentonite grout (94 pounds cement, 5 pounds bentonite, 6 gallons water) placed from TD feet to 1.5 feet, concrete placed from 1.5 feet to ground surface.

Driller: Name/Company (City, CA)



**Schematic**

**Typical Soilgas Sampling  
Borehole Using Implants**

Measurements referenced from ground/pavement surface.



**SOILGAS PURGE VOLUME TEST LOG (IMPLANT, FLOWRATE = 0.167 L/MIN)**

Project Name/Number:	Logged By:
Project Address:	Date:
Location/Borehole ID:	Approximate Date of Last Rain Event:
Odors from Borehole:	Approximate Depth to Water at Site (ft):
Borehole Sandpack Description:	Borehole Diameter (in):
OVM Meter:	Total Depth Borehole (ft):
Implant Description:	Depth to Top of Sandpack Interval (ft):
Purge Equipment Description:	Length of Sandpack Interval (ft):
Flow Regulator Description:	Time When Borehole Const. Completed:
Comments:	Time When Purge Volume Test Began:

Total Depth (feet)	-	Depth to Top of Sandpack (feet)	x	0.005 ft <sup>2</sup> for 1-inch borehole 0.022 ft <sup>2</sup> for 2-inch borehole 0.0276 ft <sup>2</sup> for 2.25-inch borehole	x	28.32 L per cubic foot	x	0.3 (porosity)	=	Single Sandpack Purge Volume (L)
	-		x		x		x		=	

Purge time for 1 volume =  $0.352 / 0.167 = 2.11$  min (2 min, 7 sec). Purge time for 2 volumes =  $0.704 / 0.167 = 4.22$  min (4 min, 13 sec).  
Purge time for 3 volumes =  $1.056 / 0.167 = 6.32$  min (6 min, 19 sec). Purge time for 7 volumes =  $2.464 / 0.167 = 14.75$  min (14 min, 45 sec).

Purge Volume (L)	Time	Purge Vacuum Applied Downstream of Flow Regulator (inches of Hg)	Regulated Flow Rate (L/min)	OVM (ppm v/v)	Comments
					Start purge volume test

Single Sandpack Purge Volume = volume of the void space of the sandpack.  
All depths measured from ground/pavement surface.  
OVM = Organic Vapor Monitor, Photoionization Device, 10.6 eV lamp, calibrated to 100 ppm v/v isobutylene.

**SOILGAS PURGE/SAMPLE LOG (IMPLANT, SUMMA CANISTER, FLOWRATE = 0.167 L/MIN)**

Project Name/Number:	Logged By:
Project Address:	Date:
Location/Borehole ID:	Approximate Date of Last Rain Event:
Odors from Borehole:	Approximate Depth to Water at Site (ft):
Borehole Sandpack Description:	Borehole Diameter (in):
OVM Meter:	Total Depth Borehole (ft):
Implant Description:	Depth to Top of Sandpack Interval (ft):
Purge Equipment Description:	Length of Sandpack Interval (ft):
Flow Regulator Description:	Time When Borehole Const. Completed:
Comments:	Time When Purge Began:

Total Depth (feet)	-	Depth to Top of Sandpack (feet)	x	0.005 ft <sup>2</sup> for 1-inch borehole 0.022 ft <sup>2</sup> for 2-inch borehole 0.0276 ft <sup>2</sup> for 2.25-inch borehole	x	28.32 L per cubic foot	x	0.3 (porosity)	=	Single Sandpack Purge Volume (L)			Target Purge (L)
	-		x		x		x		=		x	2	

Purge time = 0.704 / 0.167 = 4.22 min (4 min, 13 sec). Sample Container = 1 L Summa. Sample time = 1.0 / 0.167 = 5.99 min (6 min, 0 sec).

Purge Volume (L)	Time	Purge Vacuum Applied Downstream of Flow Regulator (inches of Hg)	Sample Vacuum Applied Downstream of Flow Regulator - Sample Canister Vacuum (inches of Hg)	Regulated Flow Rate (L/min)	OVM (ppm v/v)	Comments
0						Start purge
						End purge
						Begin sample
						End sample

Single Sandpack Purge Volume = volume of the void space of the sandpack.

All depths measured from ground/pavement surface.

OVM = Organic Vapor Monitor, Photoionization Device, 10.6 eV lamp, calibrated to 100 ppm v/v isobutylene.

## VACUUM LEAK TEST AND TRACER GAS LOG

Project Name/Number:	Logged By:
Project Address:	Date:
Location/Borehole ID:	Comments:

### Vacuum Leak Test of Sample Train

Description of Test Setup:
Initial Vacuum (inches Hg):
Duration of Test:
Final Vacuum (inches Hg):
Comments:

### Shroud and Tracer Gas Covering Borehole

Description of Shroud:
Tracer Gas:
Method of Tracer Gas Introduction:
OVM Meter:
Comments:

Time	OVM (ppm v/v)	Time	OVM (ppm v/v)

### Shroud and Tracer Gas Covering Sample Container (Summa Canister)

Description of Shroud: Clear-plastic bag
Tracer Gas: Isopropyl alcohol
Method of Tracer Gas Introduction: Alcohol-soaked rag inside perforated metal soil liner
OVM Meter: MiniRAE 2000
Comments:

Time	OVM (ppm v/v)	Time	OVM (ppm v/v)

OVM = Organic Vapor Monitor, Photoionization Device, 10.6 eV lamp, calibrated to 100 ppm v/v isobutylene.