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February 24, 2015

653016.A1.01

Mr. Paul Cho
Regional Water Quality Control Board,
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

Subject: Results of October 2014 Soil Vapor Monitoring at the South-Central and Southeastern Offsite Areas of the SFPP Norwalk Pump Station, Norwalk, California

Dear Mr. Cho:

This letter report presents the results of the follow-up annual soil vapor monitoring conducted in October 2014 at the SFPP Norwalk Pump Station, located at 15306 Norwalk Boulevard, Norwalk, California (the site; Figure 1). The work was performed by CH2M HILL Engineers, Inc. (CH2M HILL) in accordance with the following work plan and work plan addendum:

- *Work Plan for Soil Vapor Monitoring, South-Central and Southeastern Off-Site Areas, Defense Fuel Support Point Norwalk, 15306 Norwalk Boulevard, Norwalk, California (SCP No. 0286B, Site No. 204DM00)*, prepared by AMEC Geomatrix, Inc. (AMEC) (formerly Geomatrix Consultants, Inc.), dated May 27, 2010.
- *Work Plan Addendum for Soil Vapor Monitoring, South-Central and Southeastern Off-Site Areas, Defense Fuel Support Point Norwalk, 15306 Norwalk Boulevard, Norwalk, California (SCP No. 0286B, Site No. 204DM00)*, prepared by CH2M HILL, dated June 3, 2011.

The project background, approach, and results of the October 2014 soil vapor sampling event are presented below.

Background

A soil vapor monitoring program was implemented at the site in July 2012 pursuant to a request made by the California Regional Water Quality Control Board, Los Angeles Region (RWQCB) in its letter dated March 30, 2010. As part of this program, 10 nested soil vapor monitoring probes (SVM-1 through SVM-10) were installed in the south-central and southeastern offsite areas in accordance with the above-referenced work plans. Figure 2 shows the approximate location of the 10 probes. Each monitoring location consists of a soil vapor probe nest with probes installed at depths of approximately 5 and 15 feet below ground surface (bgs) in a single borehole. The probe installation and initial sampling event were conducted in July 2012; the results were documented in the following report:

- *Results of Soil Vapor Monitoring at the South-Central and Southeastern Offsite Areas of the SFPP Norwalk Pump Station, Norwalk, California*, prepared by CH2M HILL, dated November 30, 2012.

A technical meeting between Kinder Morgan Energy Partners, L.P. (KMEP) and RWQCB was held on December 14, 2012, and the results of the 2012 soil vapor investigation were presented. A reduction in the soil vapor monitoring frequency from semiannual to annual was recommended by the RWQCB since the

concentrations of constituents of potential concern (COPCs) were below California Human Health Screening Levels (CHHSLs).

Follow-up annual soil vapor monitoring using mobile and fixed laboratories was conducted in August 2013; the results are presented in the following report:

- *Results of August 2013 Soil Vapor Monitoring at the South-Central and Southeastern Offsite Areas of the SFPP Norwalk Pump Station, Norwalk, California*, prepared by CH2M HILL, dated February 18, 2014.

In September 2014, CH2M HILL retained Environmental Support Technologies, Inc. (EST) of Irvine, California, to install six triple nested soil vapor monitoring probes (SVM-11 to SVM-16) to supplement the existing monitoring probes in the south-central area. The objective of these probes was to have a sufficient coverage of probes spatially to evaluate (1) the radius of influence (ROI) during upcoming pilot testing of the newly constructed horizontal biosparge well, (2) potential migration of vapor hydrocarbons, and (3) the changes in vapor chemistry with distance above the hydrocarbon smear zone and increasing distance from the biosparge well. Each monitoring point consists of a soil vapor probe nest with probes completed at approximately 7, 15, and 22 feet bgs in a single borehole. Figure 2 shows the locations of the new soil vapor monitoring points. Figure 3 presents a typical nested soil vapor monitoring probe completion diagram. Additional details are presented in the following report:

- *Horizontal Biosparge Well and Soil Vapor Monitoring Probe Completion Report, SFPP Norwalk Pump Station, Norwalk, California*, prepared by CH2M HILL, dated February 18, 2015.

American Analytics, Inc., of Chatsworth, California, was retained by CH2M HILL to conduct the 2014 annual soil vapor monitoring between October 28 and October 31, 2014, which included the sampling of probes SVM-1 through SVM-3, and SVM-5 through SVM-16. A mobile laboratory was utilized by American Analytics for onsite laboratory analysis of soil vapor samples. Fixed laboratory samples also were collected and submitted to an offsite laboratory (Asset Laboratories of Las Vegas, Nevada). The technical approach and analytical results are discussed below.

Approach

Soil vapor samples were collected from probes SVM-1 through SVM-3 and SVM-5 through SVM-16 between October 28 and October 31, 2014. SFPP's soil vapor extraction (SVE) system has been offline since July 2014 due to mechanical issues with the heat exchanger. Repairs to the SVE system were made in December 2014, but the system remains offline in order to facilitate processing of a new South Coast Air Quality Control Management District (SCAQMD) permit. Soil vapor sampling was performed by American Analytics under the direction of CH2M HILL. The soil vapor probes at each monitoring point were purged and sampled in accordance with the recommended guidelines in the Department of Toxic Substances Control (DTSC) Advisory for Active Soil Gas Investigations (Advisory), dated April 2012 (DTSC, 2012). The sampling procedures for these activities (including purge volume, shut-in, and leak tests) are described below.

Purge Volume Test

Prior to sampling, a site-specific purge volume test was conducted with 1, 3, and 10 purge volumes at the deepest probe (22-foot depth) of SVM-14. A default of 10 purge volumes was used for subsequent sampling in the deepest zone (22-foot depth) at probes SVM-11 through SVM-16 since target analyte concentrations were generally higher using 10 purge volumes. A site-specific purge volume (three purge volumes) for soil gas sampling at 5 and 15 feet bgs was established during previous sampling events. Soil vapor was purged from each probe using a vacuum/pressure sampling pump calibrated to a flow rate of 200 milliliters per minute (ml/min). The use of a consistent low rate at each sample location limited stripping and ambient air intrusion. The purge volume for each probe was recorded in the field.

Shut-In Test

Prior to purging and sampling each soil vapor probe, a shut-in test was conducted to check for leaks in the aboveground sampling train (valves, tubing, and fittings from downstream to the top of the probe).

A vacuum of approximately 100 inches of water (in-H₂O) was applied to the aboveground sampling train for a period of approximately 1 minute. No significant decreases in vacuum were reported during any of the shut-in tests conducted.

Leak Test

During purging and sampling at each soil vapor probe, a leak test was conducted using 2-propanol (a liquid tracer compound) to evaluate the potential for ambient air breakthrough or leaks in the sampling train. Prior to purging, the liquid tracer compound was applied to a paper towel and placed inside the vapor probe vaults; the compound was included in the method analyte list for soil vapor samples. Care was taken to prevent cross-contamination between the liquid tracer compound and the sampling train and sampling containers. The 2-propanol was detected at trace concentrations in samples collected at SVM-1, SVM-2, SVM-6, and SVM-12; therefore, these probes were resampled during subsequent days. Further discussion of the analytical results is presented in the Analytical Results section below.

Soil Vapor Sampling and Analysis

As described above, soil vapor sampling was conducted from probes SVM-1 through SVM-3, and SVM-5 through SVM-16 between October 28 and October 31, 2014. The soil vapor probes from each monitoring point were purged and sampled using a vacuum/pressure sampling pump calibrated to a flow rate of 200 ml/min in accordance with recommended flow rates in the Advisory (DTSC, 2012).

A soil vapor sample was not collected at the shallow probe at SVM-10 due to flow restrictions (excessive vacuum) observed during purging activities with a mechanical and hand-held sampling pump. The need to replace this probe will be discussed with the RWQCB. Soil vapor samples also were not collected from the shallow or deep probes at SVM-4 due to access restrictions with the new property owner. A new access agreement will need to be executed before the next planned sampling event in 2015.

Soil vapor samples were collected using glass syringes and were analyzed at the American Analytics onsite mobile laboratory for fuel constituents including benzene, toluene, ethylbenzene, and total xylenes (BTEX); methyl tert-butyl ether (MTBE); tert-butyl alcohol (TBA); 1,2-dichloroethane (1,2-DCA); 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; n-butylbenzene; sec-butylbenzene; isopropylbenzene; n-propylbenzene; and 2-propanol (the leak test compound) using U.S. Environmental Protection Agency (EPA) Method 8260B. These constituents were identified as COPCs based on the results of the 2006 soil gas investigation. The mobile laboratory also analyzed samples for total petroleum hydrocarbons quantified as gasoline (TPH-g) using EPA Method 8260M and fixed gases (carbon dioxide, methane, and oxygen) using EPA Method 3C.

Four confirmation soil vapor samples were collected in 1-liter Summa canisters at the deepest probes (15-foot depth) of SVM-3, SVM-5, and SVM-9 and the middle probe (15-foot depth) of SVM-15. The Summa canisters were submitted by CH2M HILL to Asset Laboratories for volatile organic compound (VOC) analysis using EPA Method TO-15 and TPH-g using EPA Method TO-3. Fixed gas samples were analyzed by Air Technology Laboratories of City of Industry, California, using ASTM International (ASTM) Method D1946. The analysis of methane, oxygen, and carbon dioxide will assist with the evaluation of natural attenuation in the vadose zone.

In accordance with the Advisory (DTSC, 2012), field duplicate soil vapor samples were collected at a minimum frequency of 1 per every 20 soil vapor samples collected. Duplicate soil vapor samples were collected at SVM-1 (14.5-foot depth), SVM-5 (15.5-foot depth), SVM-11 (15-foot depth), and SVM-12 (7-foot and 22-foot depths). The duplicate samples were collected and analyzed in the same manner as the primary samples.

Analytical Results

Mobile Laboratory

Table 1 presents the analytical results for VOCs, TPH-g, and fixed gases provided by the onsite mobile laboratory. The results are also shown in Figure 4. Laboratory analytical reports are provided in Attachment A. The results show the following:

- Hydrocarbon constituents were detected primarily in the deeper probes in SVM-12, SVM-14, and SVM-16. Benzene and TPH-g were detected in the deepest probe (22-foot depth) of SVM-12 in both the primary and field duplicate samples. As shown in Table 1, respective benzene concentrations of 2.9 and 2.8 micrograms per liter ($\mu\text{g/L}$) and TPH-g concentrations of 20,000 $\mu\text{g/L}$ and 21,000 $\mu\text{g/L}$ were above human health screening levels under residential and commercial scenarios. Benzene, TPH-g, and other COPCs were detected in the deepest probe (22-foot depth) of SVM-14 and SVM-16. TPH-g was also detected in the middle probe (15.5-foot depth) of SVM-16. All COPCs detected in SVM-14 were above screening levels under residential and commercial scenarios. At the deepest probe of SVM-16, 1,2,4-trimethylbenzene, 1,2,5-trimethylbenzene, benzene, ethylbenzene, and TPH-g concentrations exceeded screening levels under residential and commercial scenarios.
- COPCs were not detected in the remaining probes, with the exception of the leak test compound (2-propanol), which was detected above the laboratory reporting limit in the 14.5-foot depth of SVM-1 and SVM-2; and at 7-foot, 15-foot, and 22-foot depths of SVM-12. At SVM-6 (6.5-foot and 15.5-foot depths), 2-propanol was also detected but at trace concentrations below the laboratory reporting limit. The maximum 2-propanol detection (1.3 $\mu\text{g/L}$) was reported at the 15-foot depth of SVM-12. Although 2-propanol was detected, the concentrations are still less than 10 times the concentration of the reporting limit. According to the Advisory (DTSC, 2012), if a leak test compound is detected at a concentration 10 times or more above the laboratory reporting limit, then corrective actions are required to be taken in order to confirm ambient air breakthrough or leaks in the sampling train. Although the concentrations of 2-propanol were below this level, samples were still recollected on October 31, 2014, to confirm whether breakthrough had occurred. Concentrations of 2-propanol were below the laboratory reporting limit in samples collected during confirmation sampling; thus, confirming the integrity of the sampling train.

Table 1 also presents the analytical results provided by the mobile laboratory for methane, oxygen, and carbon dioxide analysis using EPA Method 3C. Laboratory analytical reports are provided in Attachment A. As mentioned in the previous section, the analysis of methane, oxygen, and carbon dioxide was used to assist with the evaluation of natural attenuation (biodegradation) in the vadose zone. Natural attenuation generally can be defined as a reduction in the concentration or migration of contaminants in the environment, which occurs largely by biological degradation processes at the Norwalk site.

Figures 5, 6, and 7 present methane, oxygen, and carbon dioxide concentrations with increasing depth, respectively, at probes SVM-11 through SVM-16. In general, oxygen concentrations decrease with increasing depth. Conversely, carbon dioxide and methane concentrations increase with increasing depth. These trends are expected given the site conditions, and demonstrate that hydrocarbons are biodegrading under the following conditions:

- The generally low concentrations of carbon dioxide and methane, and high concentrations of oxygen at depths shallower than 15 feet bgs indicate that shallow soil media beneath the site is predominantly aerobic and that hydrocarbons in the shallower portion of the unsaturated zone and smear zone are biodegrading.
- The generally high concentrations of carbon dioxide and methane, and low concentrations of oxygen, at depths greater than 15 feet bgs indicate that deeper soil media beneath the site is predominantly

anaerobic and that hydrocarbons in the deeper portion of the unsaturated zone and smear zone are biodegrading.

Fixed Laboratory

Table 2 presents the fixed laboratory analytical results for VOCs using EPA Method TO-15, TPH-g using EPA Method TO-3, and fixed gases using ASTM Method D1946. The laboratory analytical reports are provided in Attachment B. EPA Method TO-15 can achieve much lower detection limits than those provided by the mobile laboratory. The results presented in Table 2 are for samples collected from the deeper probes (15-foot depth) at offsite monitoring points SVM-3, SVM-5, SVM-9, and SVM-15. As shown in Table 2, several COPCs were detected at all probes sampled, but at relatively low concentrations just above the laboratory minimum detection limit. All detected COPCs were below human health screening levels under residential and commercial scenarios. Results for fixed gases (methane, oxygen, and carbon dioxide) were generally consistent with results provided by the mobile laboratory.

Summary and Recommendations

The 2014 annual soil vapor monitoring was conducted at the Norwalk site between October 28 and October 31, 2014, and included the sampling of nested probes SVM-1 through SVM-3, and SVM-5 through SVM-16. Triple nested probes SVM-11 through SVM-16 were recently constructed to provide a more robust monitoring network for upcoming pilot testing of the horizontal biosparge well in the south-central area. Samples were not collected at the shallow probe at SVM-10 due to flow restrictions (excessive vacuum) or SVM-4 due to access restrictions with the new property owner.

Mobile laboratory detections of COPCs were reported in the deeper probes (22-foot depth) of SVM-12, SVM-14, and SVM-16 at concentrations greater than human health screening levels under residential and commercial scenarios. COPCs were not detected in the remaining probes. Depth to water across the site is between 25 and 30 feet bgs, with the hydrocarbon smear zone occurring at average depths of approximately 27 to 31 feet bgs in the south-central area. Therefore, it is not unexpected that soil vapor samples at the 22-foot depth probes have elevated COPCs at concentrations exceeding screening levels. With the exception of TPH-g detected in SVM-16 at the 15.5-foot depth, all COPCs shallower than 15.5 feet were nondetect and below human health screening levels.

The fixed laboratory results for samples collected at SVM-3, SVM-5, SVM-9, and SVM-15 showed detections of several COPCs. Most of the detections were below analytical reporting limits (J-qualified), and all detections were below the human health screening levels. Results for TPH-g and fixed gases were generally consistent with the mobile laboratory results at these locations.

The concentration trends of oxygen, carbon dioxide, and methane with depth are as expected given the site conditions, and demonstrate that hydrocarbons are biodegrading under aerobic conditions at depths shallower than 15 feet and under anaerobic conditions at deeper depths near the smear zone: The generally low concentrations of carbon dioxide and methane, and high concentrations of oxygen at depths shallower than 15 feet bgs indicate that shallow soil media beneath the site is predominantly aerobic. Lower oxygen and higher methane concentrations at greater depths indicate that the deeper soil media is approaching anaerobic conditions.

Monthly soil vapor sampling will be implemented as part of the upcoming pilot testing activities in the south-central area of the site. Pilot testing is anticipated to commence in the second quarter 2015. Details of the sampling are provided in the *Horizontal Biosparge System Construction and Pilot Test Work Plan* (CH2M HILL, 2013), submitted to the RWQCB on November 18, 2013. The next planned annual sampling event, which includes sampling in the southeastern area, is anticipated to occur in the fourth quarter 2015.

If you have any additional questions regarding this report, please contact Dan Jablonski at (213) 228-8271, or Mr. Stephen Defibaugh, KMEP's Remediation Project Manager, at (714) 560-4802.

Sincerely,

CH2M HILL, Inc.



Dan Jablonski
Project Manager



John Lowe, CIH
Vapor Intrusion Consultant

Attachments:

References

Table 1 – Mobile Laboratory Analytical Results

Table 2 – Fixed Laboratory Analytical Results

Figure 1 – Site Location Map

Figure 2 – Soil Vapor Monitoring Probe Locations

Figure 3 – Typical Nested Soil Vapor Monitoring Probe Completion Diagram

Figure 4 – Mobile Laboratory Soil Vapor Analytical Results

Figure 5 – Soil Methane Concentrations with Depth

Figure 6 – Soil Oxygen Concentrations with Depth

Figure 7 – Soil Carbon Dioxide Concentrations with Depth

Attachment A – Mobile Laboratory Analytical Reports

Attachment B – Fixed Laboratory Analytical Reports

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Tables

TABLE 1

Mobile Laboratory Analytical Results

SFPF Norwalk Pump Station, Norwalk, California

Analyte	Unit	RL	SVM-1-5 PV3 10/29/2014 SVM-1 5-5.5	SVM-1-14.5 PV3 10/29/2014 SVM-1 14.5-15	SVM-1-14.5 PV3 10/31/2014 SVM-1 14.5-15	SVM-1-14.5 DUP PV3 10/31/2014 SVM-1 14.5-15	SVM-2-5 PV3 10/29/2014 SVM-2 5-5.5	SVM-2-14.5 PV3 10/29/2014 SVM-2 14.5-15	SVM-2-14.5 PV3 10/31/2014 SVM-2 14.5-15	SVM-3-5 PV3 10/31/2014 SVM-3 5-5.5	SVM-3-15 PV3 10/31/2014 SVM-3 15-15.5	SVM-5-5 PV3 10/30/2014 SVM-5 5-5.5	Future Residential Soil Gas Screening Level ^{a, b}	Future Commercial Soil Gas Screening Level ^{a, b}
1,2,4-Trimethylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	14.6	62.0
1,2-Dichloroethane	µg/L	0.02	<0.02	<0.02	<0.02	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.22	0.94
1,3,5-Trimethylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	14.6	62.0
2-Propanol (leak test compound)	µg/L	0.29	<0.29	0.71	<0.29	---	<0.29	0.52	<0.29	<0.29	<0.29	<0.29	---	---
Benzene	µg/L	0.02	<0.02	<0.02	<0.02	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.17	0.84
Ethylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	2.2	9.8
Isopropylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	2,000	8,800
m,p-Xylenes	µg/L	0.02	<0.02	<0.02	<0.02	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	200	880
Methyl tert-butyl ether (MTBE)	µg/L	1.0	<1.0	<1.0	<1.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	22	94
n-Butylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	2,000	8,800
n-Propylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	2,000	8,800
o-Xylene	µg/L	0.02	<0.02	<0.02	<0.02	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	200	880
sec-Butylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	2,000	8,800
tert-Butanol (TBA)	µg/L	20	<20	<20	<20	---	<20	<20	<20	<20	<20	<20	62,000	260,000
Toluene	µg/L	0.02	<0.02	<0.02	<0.02	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	620	2,600
TPH-G (C6-C12)	µg/L	20	<20	<20	<20	---	<20	<20	<20	<20	<20	<20	1,260	5,200
Methane	% v/v	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	---	---
Oxygen	% v/v	0.1	18	15	15	15	16	16	17	16	11	13	---	---
Carbon Dioxide	% v/v	0.1	0.36	0.51	0.5	0.49	1	0.84	0.3	0.69	1.6	0.57	---	---

Analyte	Unit	RL	SVM-5-15.5 PV3 10/30/2014 SVM-5 15.5-16	SVM-5-15.5 DUP PV3 10/30/2014 SVM-5 15.5-16	SVM-6-6.5 PV3 10/29/2014 SVM-6 6.5-7	SVM-6-15.5 PV3 10/29/2014 SVM-6 15.5-16	SVM-6-6.5 PV3 10/31/2014 SVM-6 6.5-7	SVM-6-15.5 PV3 10/31/2014 SVM-6 15.5-16	SVM-7-7 PV3 10/29/2014 SVM-7 7-7.5	SVM-7-13 PV3 10/29/2014 SVM-7 13.25-13.75	SVM-8-5 PV3 10/30/2014 SVM-8 5-5.5	SVM-8-15 PV3 10/30/2014 SVM-8 15-15.5	Future Residential Soil Gas Screening Level ^{a, b}	Future Commercial Soil Gas Screening Level ^{a, b}
1,2,4-Trimethylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	14.6	62.0
1,2-Dichloroethane	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.22	0.94
1,3,5-Trimethylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	14.6	62.0
2-Propanol (leak test compound)	µg/L	0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	---	---
Benzene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.17	0.84
Ethylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	2.20	9.80
Isopropylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	2,000	8,800
m,p-Xylenes	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	200	880
Methyl tert-butyl ether (MTBE)	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	22.0	94.0
n-Butylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	2,000	8,800
n-Propylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	2000	8800
o-Xylene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	200	880
sec-Butylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	2,000	8,800
tert-Butanol (TBA)	µg/L	20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	62,000	260,000
Toluene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	620	2,600
TPH-G (C6-C12)	µg/L	20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	1,260	5,200
Methane	% v/v	0.1	<0.10	<0.10	0.13	0.12	<0.10	<0.10	0.11	<0.10	<0.10	<0.10	---	---
Oxygen	% v/v	0.1	14	14	16	7.1	16	7	16	15	15	12	---	---
Carbon Dioxide	% v/v	0.1	0.3	0.3	0.23	0.21	0.23	0.17	1	0.97	0.45	0.38	---	---

TABLE 1

Mobile Laboratory Analytical Results

SFPF Norwalk Pump Station, Norwalk, California

Analyte	Unit	RL	SVM-9-5 PV3 10/31/2014 SVM-9 5-5.5	SVM-9-14.5 PV3 10/31/2014 SVM-9 14.5-15	SVM-10-15.5 PV3 10/29/2014 SVM-10 15.5-16	SVM-11-7 PV3 10/28/2014 SVM-11 7-7.5	SVM-11-15 PV3 10/28/2014 SVM-11 15-15.5	SVM-11-15 DUP PV3 10/28/2014 SVM-11 15-15.5	SVM-11-21 PV10 10/28/2014 SVM-11 21-21.5	SVM-12-7 PV3 10/29/2014 SVM-12 7-7.5	SVM-12-7 DUP PV3 10/29/2014 SVM-12 7-7.5	SVM-12-15 PV3 10/29/2014 SVM-12 15-15.5	Future Residential Soil Gas Screening Level ^{a, b}	Future Commercial Soil Gas Screening Level ^{a, b}
1,2,4-Trimethylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	14.6	62.0
1,2-Dichloroethane	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.22	0.94
1,3,5-Trimethylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	14.6	62.0
2-Propanol (leak test compound)	µg/L	0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	0.42	0.45	1.3	---	---
Benzene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.17	0.84
Ethylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	2.2	9.8
Isopropylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	2,000	8,800
m,p-Xylenes	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	200	880
Methyl tert-butyl ether (MTBE)	µg/L	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	22	94
n-Butylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	2,000	8,800
n-Propylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	2,000	8,800
o-Xylene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	200	880
sec-Butylbenzene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	2,000	8,800
tert-Butanol (TBA)	µg/L	20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	62,000	260,000
Toluene	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	620	2,600
TPH-G (C6-C12)	µg/L	20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	1,260	5,200
Methane	% v/v	0.1	<0.10	<0.10	0.1	<0.10	<0.10	<0.10	0.1	<0.10	<0.10	<0.10	---	---
Oxygen	% v/v	0.1	17	13	8.7	17	16	16	15	17	18	12	---	---
Carbon Dioxide	% v/v	0.1	1	5.2	6.5	0.75	0.85	0.83	0.7	0.83	0.9	3.7	---	---

Analyte	Unit	RL	SVM-12-22 DUP PV10 10/29/2014 SVM-12 22-22.5	SVM-12-22 PV10 10/29/2014 SVM-12 22-22.5	SVM-12-7 RR PV3 10/31/2014 SVM-12 7-7.5	SVM-12-15 PV3 10/31/2014 SVM-12 15-15.5	SVM-13-7 PV3 10/28/2014 SVM-13 7-7.5	SVM-13-15.5 PV3 10/28/2014 SVM-13 15.5-16	SVM-13-22.5 PV10 10/28/2014 SVM-13 22.5-23	SVM-14-7 PV3 10/28/2014 SVM-14 7-7.5	SVM-14-15 PV3 10/28/2014 SVM-14 15-15.5	SMV-14-22 PV1 ^c 10/28/2014 SVM-14 22-22.5	Future Residential Soil Gas Screening Level ^{a, b}	Future Commercial Soil Gas Screening Level ^{a, b}
1,2,4-Trimethylbenzene	µg/L	0.02	<2.0	<2.0	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	690	14.6	62.0
1,2-Dichloroethane	µg/L	0.02	<2.0	<2.0	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40	0.22	0.94
1,3,5-Trimethylbenzene	µg/L	0.02	<2.0	<2.0	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	1700	14.6	62.0
2-Propanol (leak test compound)	µg/L	0.29	<29	<29	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<580	---	---
Benzene	µg/L	0.02	2.8	2.9	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	220	0.17	0.84
Ethylbenzene	µg/L	0.02	<2.0	<2.0	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	350	2.2	9.8
Isopropylbenzene	µg/L	0.02	<2.0	<2.0	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40	2,000	8,800
m,p-Xylenes	µg/L	0.02	<2.0	<2.0	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	2300	200	880
Methyl tert-butyl ether (MTBE)	µg/L	1.0	<100	<100	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2000	22	94
n-Butylbenzene	µg/L	0.02	<2.0	<2.0	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40	2,000	8,800
n-Propylbenzene	µg/L	0.02	<2.0	<2.0	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40	2,000	8,800
o-Xylene	µg/L	0.02	<2.0	<2.0	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	1700	200	880
sec-Butylbenzene	µg/L	0.02	<2.0	<2.0	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40	2,000	8,800
tert-Butanol (TBA)	µg/L	20	<2000	<2000	<20	<20	<20	<20	<20	<20	<20	<40000	62,000	260,000
Toluene	µg/L	0.02	<2.0	<2.0	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	1100	620	2,600
TPH-G (C6-C12)	µg/L	20	20000	21000	<20	<20	<20	<20	<20	<20	<20	170000	1,260	5,200
Methane	% v/v	0.1	---	0.73	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.47	---	---
Oxygen	% v/v	0.1	---	1.2	17	12	17	13	1.7	15	7.1	1.7	---	---
Carbon Dioxide	% v/v	0.1	---	16	0.75	3.8	0.18	0.18	6.1	0.74	2.3	12	---	---

TABLE 1

Mobile Laboratory Analytical Results

SFPF Norwalk Pump Station, Norwalk, California

Analyte	Unit	RL	SMV-14-22 PV3 ^c 10/28/2014 SVM-14 22-22.5	SMV-14-22 PV10 ^c 10/28/2014 SVM-14 22-22.5	SVM-15-7 PV3 10/30/2014 SVM-15 7-7.5	SVM-15-15-PV3 10/30/2014 SVM-15 15-15.5	SVM-15-22 PV10 10/30/2014 SVM-15 22-22.5	SVM-16-7 PV3 10/30/2014 SVM-16 7-7.5	SVM-16-15.5 PV3 10/30/2014 SVM-16 15.5-16	SVM-16-15.5 RR PV3 10/30/2014 SVM-16 15.5-16	SVM-16-22 PV10 10/30/2014 SVM-16 22-22.5	Future Residential Soil Gas Screening Level ^{a, b}	Future Commercial Soil Gas Screening Level ^{a, b}
1,2,4-Trimethylbenzene	µg/L	0.02	980	1300	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	11	14.6	62.0
1,2-Dichloroethane	µg/L	0.02	<40	<40	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<2.0	0.22	0.94
1,3,5-Trimethylbenzene	µg/L	0.02	2300	2800	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	32	14.6	62.0
2-Propanol (leak test compound)	µg/L	0.29	<580	<580	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	<29	---	---
Benzene	µg/L	0.02	220	230	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	180	0.17	0.84
Ethylbenzene	µg/L	0.02	460	580	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	10	2.2	9.8
Isopropylbenzene	µg/L	0.02	<40	<40	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	6	2,000	8,800
m,p-Xylenes	µg/L	0.02	2600	2900	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	46	200	880
Methyl tert-butyl ether (MTBE)	µg/L	1.0	<2000	<2000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<100	22	94
n-Butylbenzene	µg/L	0.02	<40	<40	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<2.0	2,000	8,800
n-Propylbenzene	µg/L	0.02	<40	<40	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	5	2,000	8,800
o-Xylene	µg/L	0.02	2200	2500	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	13	200	880
sec-Butylbenzene	µg/L	0.02	<40	<40	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<2.0	2,000	8,800
tert-Butanol (TBA)	µg/L	20	<40000	<40000	<20	<20	<20	<20	<20	<20	<2000	62,000	260,000
Toluene	µg/L	0.02	1200	1400	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	36	620	2,600
TPH-G (C6-C12)	µg/L	20	160000	160000	<20	<20	<20	<20	28	22	240000	1,260	5,200
Methane	% v/v	0.1	0.46	0.46	<0.10	0.13	0.1	<0.10	<0.10	<0.10	3.6	---	---
Oxygen	% v/v	0.1	1.1	1.1	16	15	9.5	15	4.2	4.3	1	---	---
Carbon Dioxide	% v/v	0.1	12	12	0.61	0.66	1.2	0.42	1.8	1.8	15	---	---

Notes:

^a Screening levels in soil gas are derived from indoor air screening levels (DTSC, 2014) using the attenuation factor for soil gas samples for future land use (DTSC, 2011, Table 2).

^b There are no screening levels for TBA; surrogate sec-butyl alcohol screening levels provided.

^c 1, 3, and 10 volume purge step test conducted at SVM-14, 22-foot to 22.5-foot probe depth.

1400 Concentration exceeds human health screening level under residential and/or commercial scenarios.

µg/L = micrograms per liter

RL = reporting limit

DUP = field duplicate

J = the analyte was positively detected but is estimated

% v/v = percent volume by volume

<0.02 = not detected at the minimum detection level

--- = not available

SVM-14-22 PV3 = sample ID

10/28/2014 = sample date

SVM-14 = sample location

22-22.5 = sample depth in feet below ground surface

TABLE 2

Fixed Laboratory Analytical Results

SFPP Norwalk Pump Station, Norwalk, California

Analyte	Unit	RL ^a	SVM-5-15.5 10/30/2014 SVM-5 15.5-16	SVM-15-15 10/30/2014 SVM-15 15-15.5	SVM-9-14.5 10/31/2014 SVM-9 14.5-15	SVM-3-15 10/31/2014 SVM-3 15-15.5	Future Residential Soil Gas Screening Level ^{b, c}	Future Commercial Soil Gas Screening Level ^{b, c}
1,2,4-Trimethylbenzene	µg/L	0.00728	<0.00369	<0.00728	<0.00352	<0.00347	14.6	62.0
1,2-Dichloroethane	µg/L	0.0060	<0.00303	<0.00598	<0.00289	<0.00285	0.22	0.94
1,3,5-Trimethylbenzene	µg/L	0.00728	<0.00369	<0.00728	<0.00352	<0.00347	14.6	62.0
2-Propanol (leak test compound)	µg/L	0.00364	<0.00185	<0.00364	<0.00176	<0.00173	---	---
Benzene	µg/L	0.00474	0.00125 J	0.00161 J	0.000959 J	0.000901 J	0.17	0.84
Ethylbenzene	µg/L	0.00642	<0.00326	<0.00642	0.00137 J	0.000980 J	2.2	9.8
Isopropylbenzene	µg/L	0.00773	<0.00590	<0.00538	<0.00633	<0.00773	2,000	8,800
m,p-Xylenes	µg/L	0.0128	0.00182 J	<0.0128	0.00354 J	0.00318 J	200	880
Methyl tert-butyl ether (MTBE)	µg/L	0.0213	<0.0108	<0.0213	<0.0103	<0.0102	22	94
n-Butylbenzene	µg/L	0.00863	<0.00659	<0.00601	<0.00707	<0.00863	2,000	8,800
n-Propylbenzene	µg/L	0.00773	<0.00590	<0.00538	<0.00633	<0.00773	2,000	8,800
o-Xylene	µg/L	0.00642	<0.00326	<0.00642	0.00149 J	0.00135 J	200	880
sec-Butylbenzene	µg/L	0.00863	<0.00659	<0.00601	<0.00707	<0.00863	2,000	8,800
tert-Butanol (TBA)	µg/L	0.00477	0.00371	0.00644	0.0151	0.0232	62,000	260,000
Toluene	µg/L	0.00556	0.00887	0.0177	0.0323	0.00632	620	2600
TPH-g (C5-C12)	µg/L	3.15	19	30.1	16.5	23.5	1,260	5,200
Methane	% v/v	0.001	0.0026	<0.001	<0.001	0.0023	---	---
Oxygen	% v/v	0.5	16	17	15	14	---	---
Carbon Dioxide	% v/v	0.01	0.35	0.72	5.8	1.7	---	---

Notes:

^a Maximum reporting limit.^b Screening levels in soil gas are derived from indoor air screening levels (DTSC, 2014) using the attenuation factor for soil gas samples for future land use (DTSC, 2011, Table 2).^c There are no screening levels for TBA; surrogate sec-butyl alcohol screening levels provided.

µg/L = micrograms per liter

RL = laboratory reporting limit

J = the analyte was positively detected but is estimated

% v/v = percent volume by volume

<0.00369 = not detected at the laboratory reporting limit

--- = not available

SVM-5-15.5 = sample ID**10/30/2014** = sample date**SVM-5** = sample location**15.5-16** = sample depth in feet below ground surface

Figures

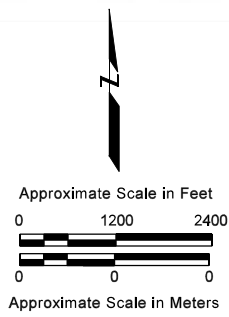
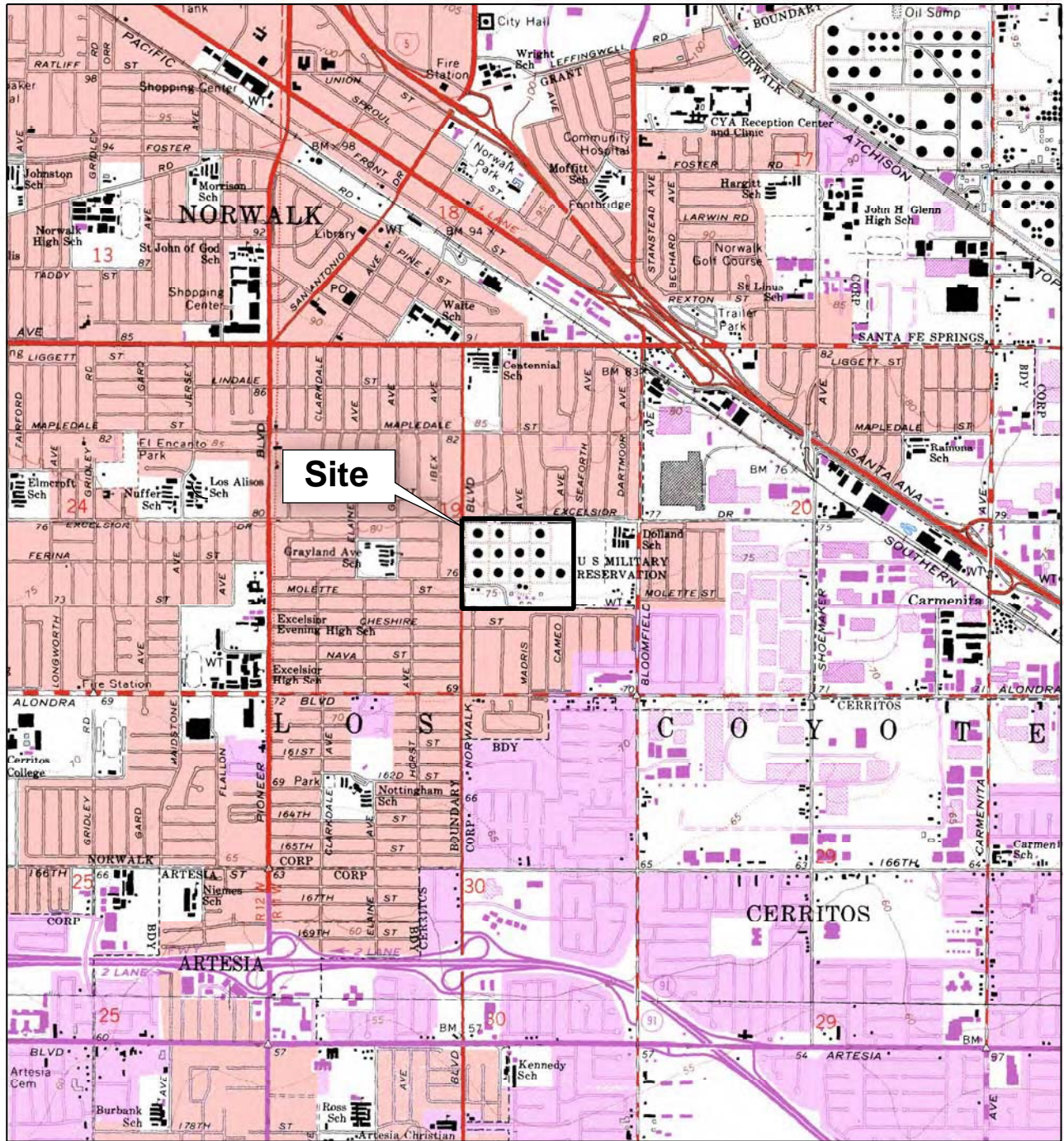
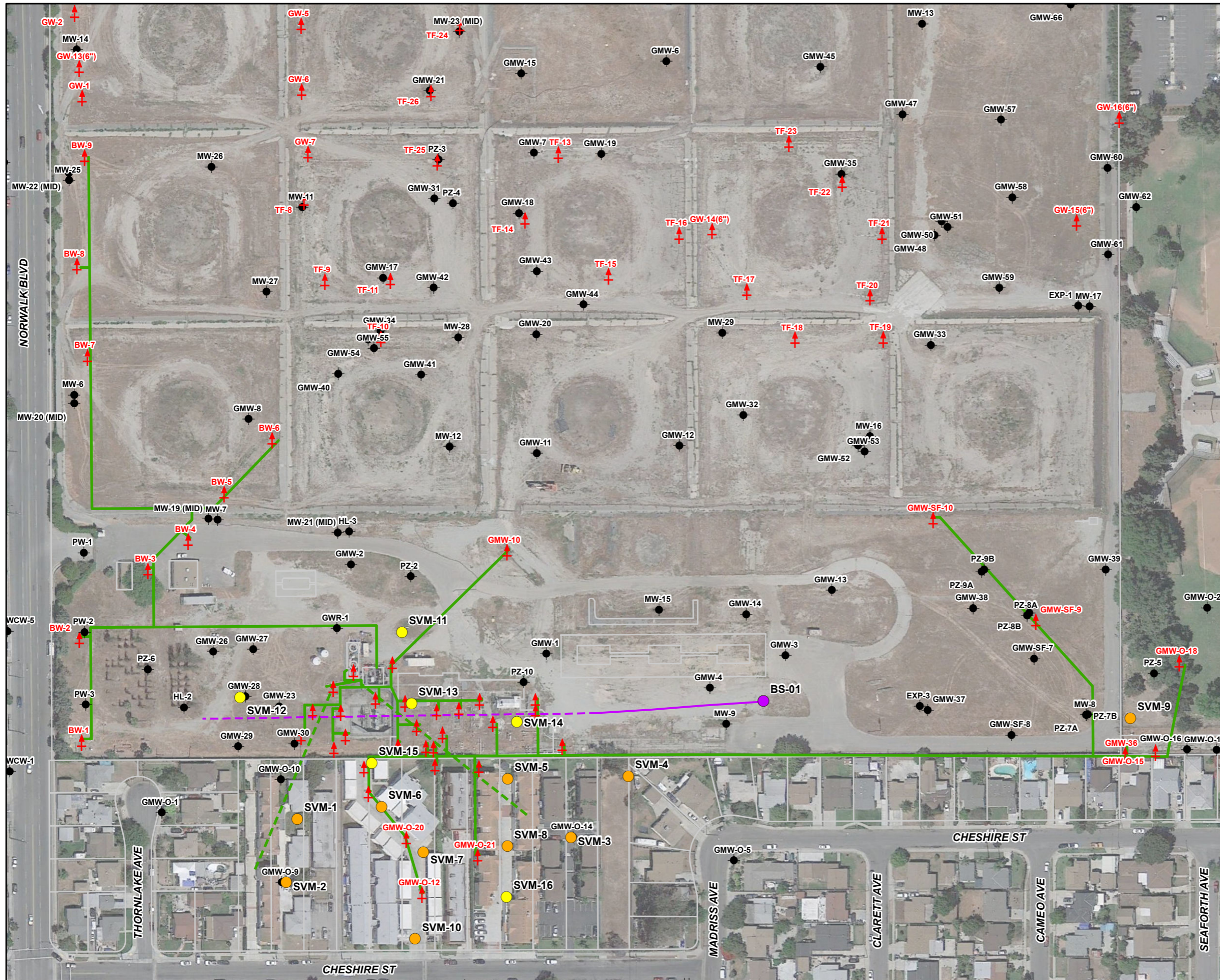


FIGURE 1
Site Location Map
SFPD Norwalk Pump Station
Norwalk, California

BASEMAP MODIFIED FROM U.S.G.S. 7.5 MINUTE QUADRANGLE MAP
LOS ALAMITOS 1964, CALIFORNIA, PHOTO-REVISED 1981.
WHITTIER 1965, CALIFORNIA, PHOTO-REVISED 1981.

SCO473164.A1.01 site_location_map.ai 8/13



Legend

- New Soil Vapor Monitoring Probes
- Previously Installed Soil Vapor Monitoring Probes
- Horizontal Biosparge Well Entry Point
- Existing Groundwater Monitoring Well
- + Existing Remediation Well
- Horizontal Biosparge Well
(dashed line depicts approximate lateral extent of well screen)
- KMEP Remediation Piping Layout
(above ground and below ground)
- Horizontal Vapor Extraction Well Piping

Imagery Source:
Google Earth April 17, 2013.

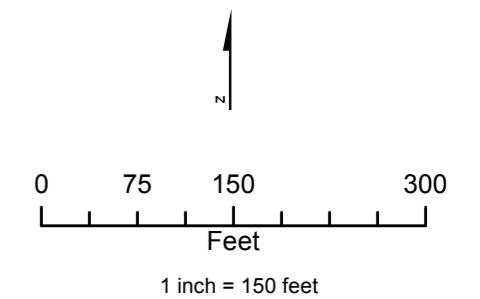


Figure 2
Soil Vapor Monitoring Probe Locations
SFPP Norwalk Pump Station
Norwalk, California

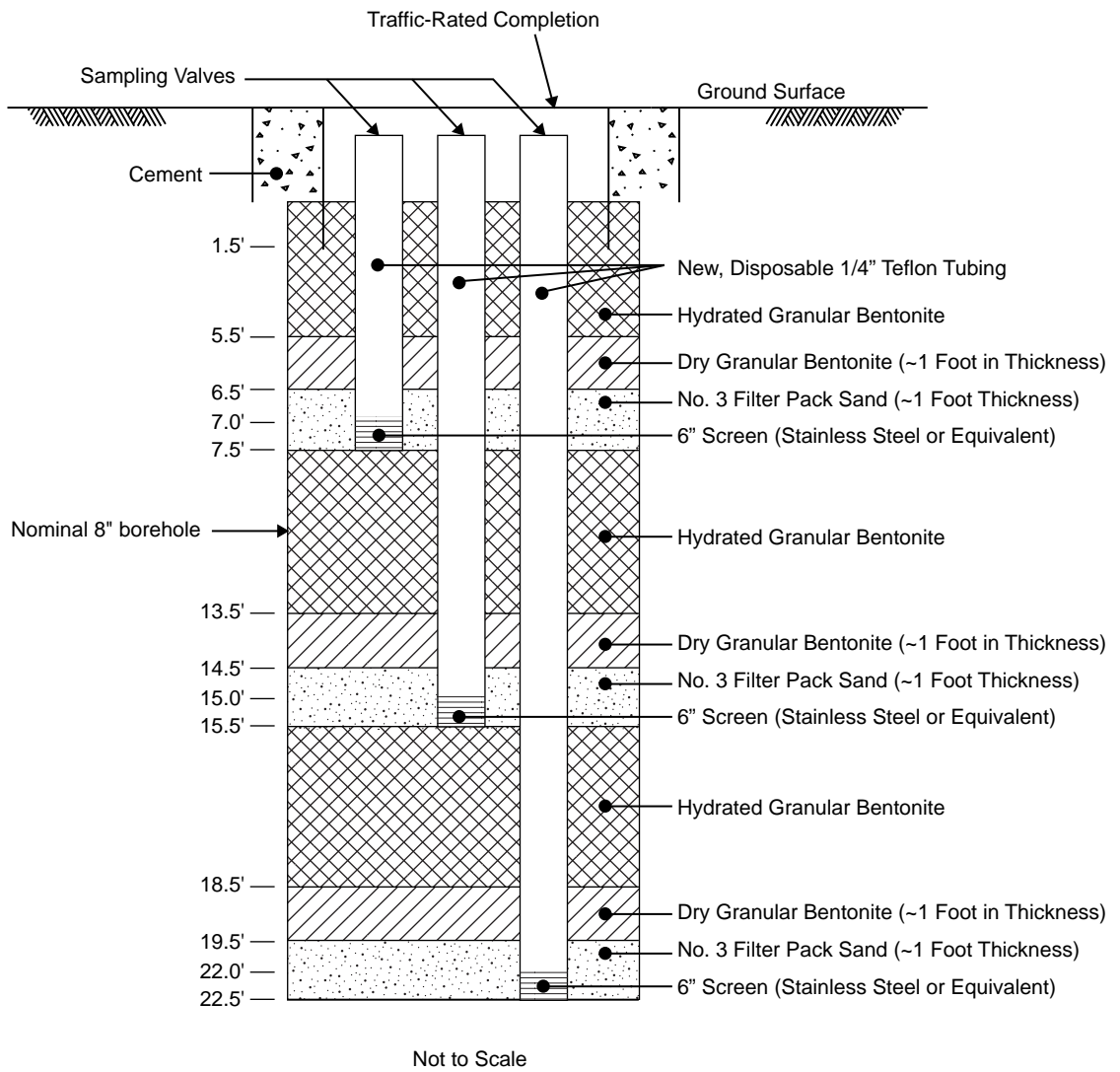
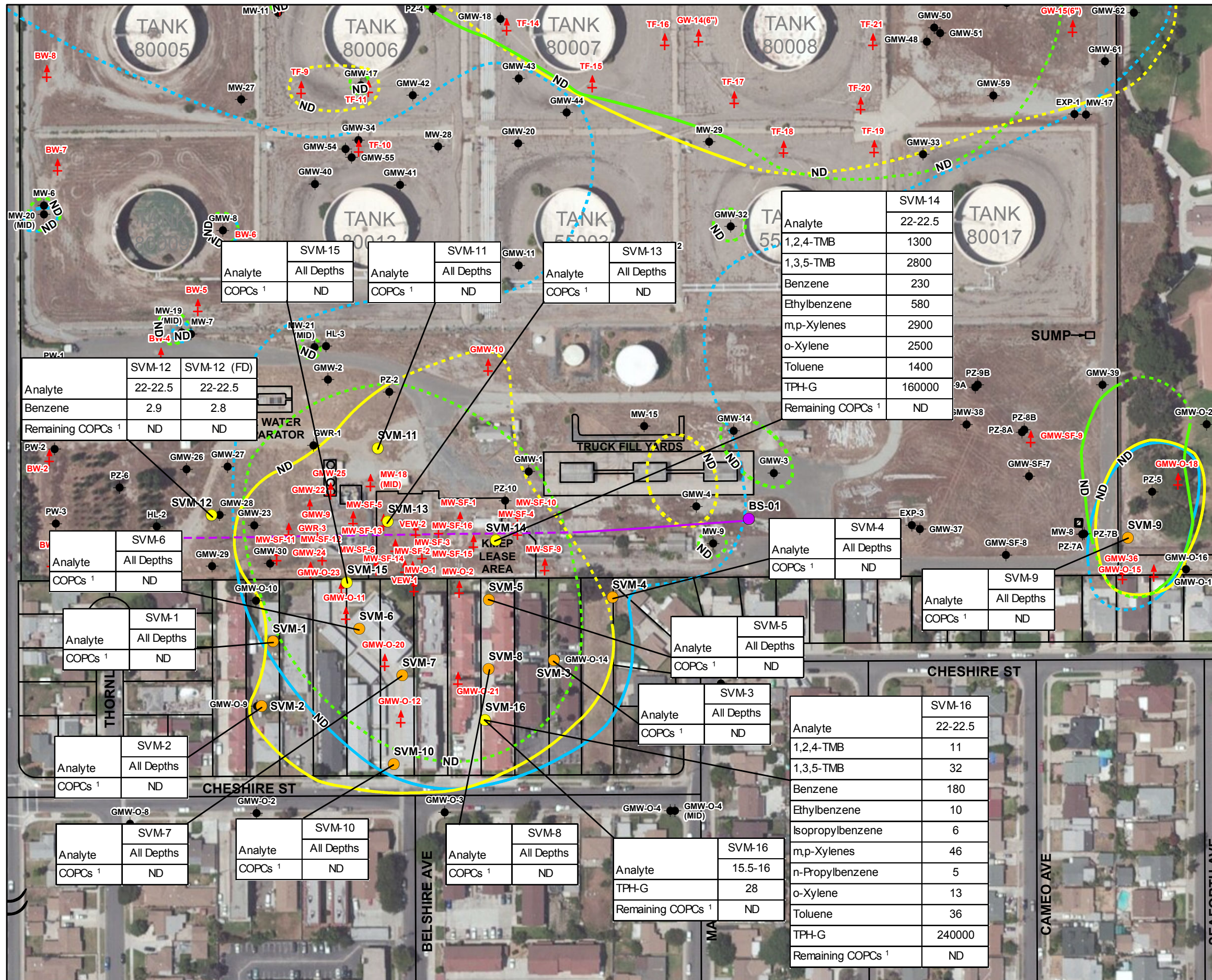


Figure 3
**Typical Nested Soil Vapor
 Monitoring Probe Completion Diagram**
*SFPP Norwalk Pump Station
 Norwalk, California*



LEGEND

- Monitoring Well Location
- Vapor extraction, groundwater extraction, total fluids, or free product extraction well used for site remediation
- Previously Installed Soil Vapor Monitoring Probes
- New Soil Vapor Monitoring Probes
- Horizontal Biosparge Well Entry Point
- Horizontal Biosparge Well (dashed line depicts approximate lateral extent of well screen)

2014 Groundwater plume extents (South-central and Southeastern Areas)

- Estimated extent of dissolved total petroleum hydrocarbons (TPH) in groundwater based on data from April 2014; dashed where inferred
- Estimated extent of dissolved methyl tert-butyl ether (MTBE) in groundwater based on data from April 2014; dashed where inferred
- Estimated extent of dissolved benzene in groundwater based on data from April 2014; dashed where inferred

- Notes:
- COPCs =
 - 1,2,4-Trimethylbenzene (1,2,4-TMB)
 - 1,2-Dichloroethane (1,2-DCA)
 - 1,3,5-Trimethylbenzene (1,3,5-TMB)
 - 2-Propanol
 - Benzene
 - Ethylbenzene
 - Isopropylbenzene
 - m,p-Xylenes
 - Methyl Tert-Butyl Ether (MTBE)
 - n-Butylbenzene
 - n-Propylbenzene
 - o-Xylene
 - sec-Butylbenzene
 - Tertiary Butyl Alcohol (TBA)
 - Toluene
 - Total petroleum hydrocarbons quantified as gas (TPH-G)
 - ND = non-detect at the laboratory minimum detection limits

SVM-16	= Soil Probe Location ID
15.5-16	= Sample Depth
28	= Result

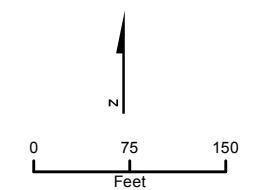


FIGURE 4
Mobile Laboratory Soil Vapor Analytical Results
 SFPP Norwalk Pump Station
 Norwalk, California

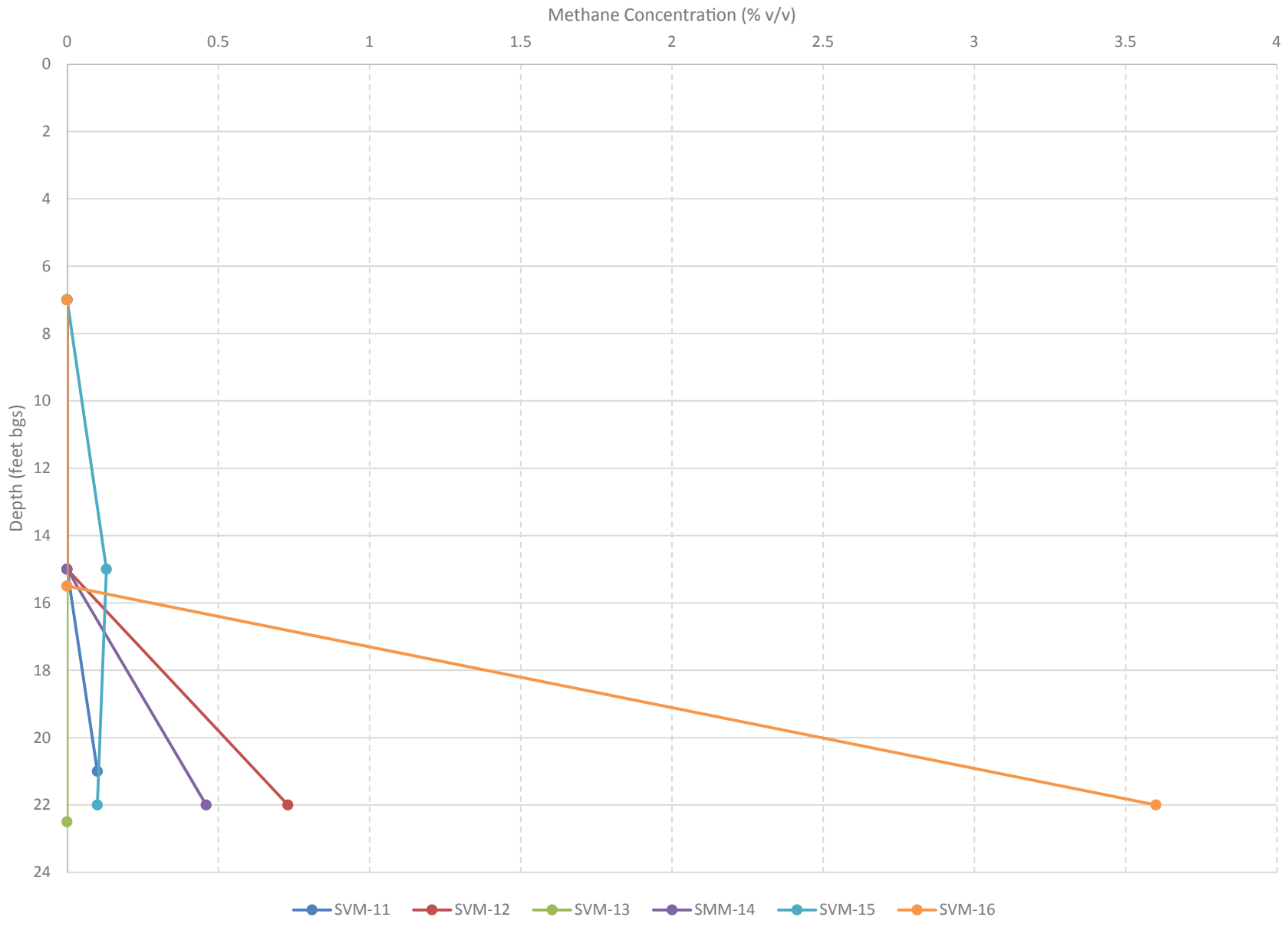


FIGURE 5
Soil Methane Concentrations with Depth
SFPP Norwalk Pump Station
Norwalk, California

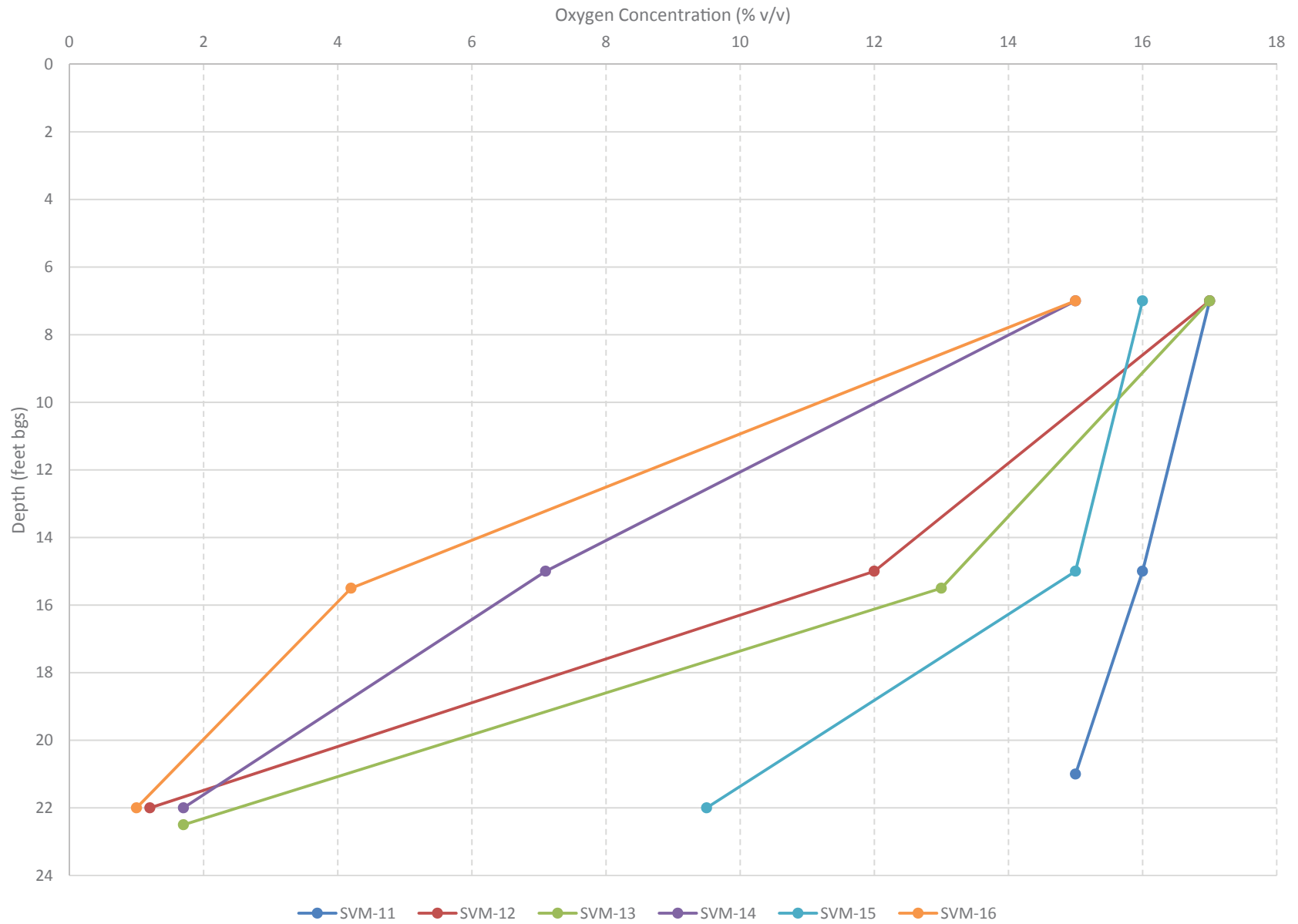


FIGURE 6
Soil Oxygen Concentrations with Depth
SFPP Norwalk Pump Station
Norwalk, California

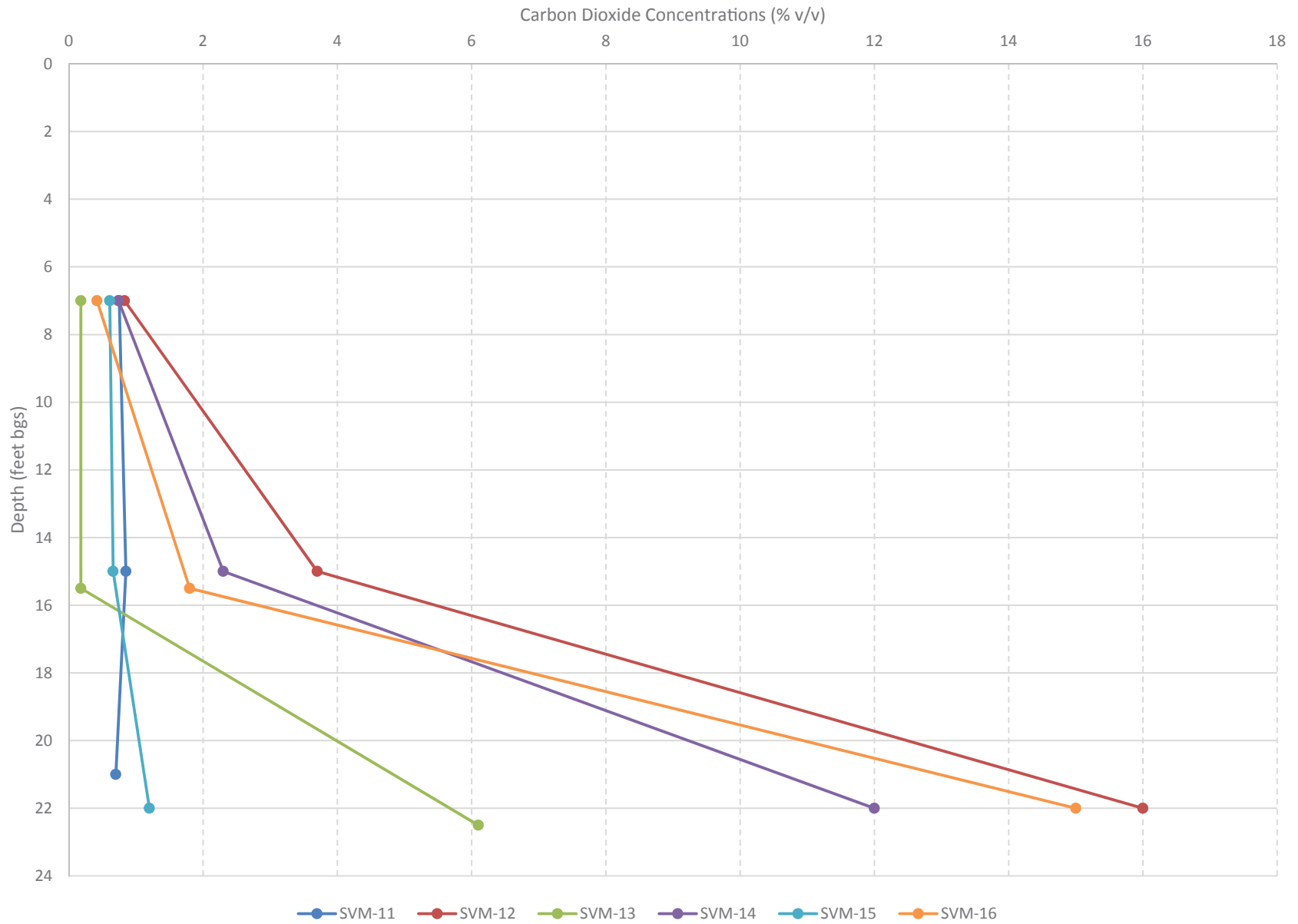


FIGURE 7
Soil Carbon Dioxide Concentrations with Depth
SFPP Norwalk Pump Station
Norwalk, California

Attachment A
Mobile Laboratory Analytical Reports



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November 13, 2014

Dan Jablonski
CH2M Hill, Inc.
1000 Wilshire Blvd., Suite 2100
Los Angeles, CA 90017-2457

**Re : KMEP Norwalk Biosparge Startup / 496965.A1.01
MB187295 / 4J29005**

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received on 10/28/14 17:00 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Assurance Program Manual, applicable standard operating procedures, and other related documentation. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report or require additional information please call me at American Analyticals.

Sincerely,

A handwritten signature in black ink that reads 'Eydie Schwartz'.

Eydie Schwartz
Project Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
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Fixed Gases - Field

SVM-14-22 PV1	4J29005-02	Vapor	5	10/28/14 07:55	10/28/14 17:00
SVM-14-22 PV3	4J29005-03	Vapor	5	10/28/14 08:37	10/28/14 17:00
SVM-14-22 PV10	4J29005-04	Vapor	5	10/28/14 09:18	10/28/14 17:00
SVM-14-15 PV3	4J29005-05	Vapor	5	10/28/14 09:52	10/28/14 17:00
SVM-14-7 PV3	4J29005-06	Vapor	5	10/28/14 10:50	10/28/14 17:00
SVM-13-7 PV3	4J29005-07	Vapor	5	10/28/14 11:25	10/28/14 17:00
SVM-13-15.5 PV3	4J29005-08	Vapor	5	10/28/14 11:48	10/28/14 17:00
SVM-13-22.5 PV10	4J29005-09	Vapor	5	10/28/14 12:23	10/28/14 17:00
SVM-11-7 PV3	4J29005-10	Vapor	5	10/28/14 12:30	10/28/14 17:00
SVM-11-21 PV10	4J29005-11	Vapor	5	10/28/14 13:20	10/28/14 17:00
SVM-11-15 PV3	4J29005-12	Vapor	5	10/28/14 14:07	10/28/14 17:00
SVM-11-15 DUP PV3	4J29005-13	Vapor	5	10/28/14 14:07	10/28/14 17:00

VOCs by GC/MS CH2M - FIELD

Ambient Air	4J29005-01	Vapor	5	10/28/14 07:10	10/28/14 17:00
SVM-14-22 PV1	4J29005-02	Vapor	5	10/28/14 07:55	10/28/14 17:00
SVM-14-22 PV3	4J29005-03	Vapor	5	10/28/14 08:37	10/28/14 17:00
SVM-14-22 PV10	4J29005-04	Vapor	5	10/28/14 09:18	10/28/14 17:00
SVM-14-15 PV3	4J29005-05	Vapor	5	10/28/14 09:52	10/28/14 17:00

Eydie Schwartz
Project Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-14-7 PV3	4J29005-06	Vapor	5	10/28/14 10:50	10/28/14 17:00
SVM-13-7 PV3	4J29005-07	Vapor	5	10/28/14 11:25	10/28/14 17:00
SVM-13-15.5 PV3	4J29005-08	Vapor	5	10/28/14 11:48	10/28/14 17:00
SVM-13-22.5 PV10	4J29005-09	Vapor	5	10/28/14 12:23	10/28/14 17:00
SVM-11-7 PV3	4J29005-10	Vapor	5	10/28/14 12:30	10/28/14 17:00
SVM-11-21 PV10	4J29005-11	Vapor	5	10/28/14 13:20	10/28/14 17:00
SVM-11-15 PV3	4J29005-12	Vapor	5	10/28/14 14:07	10/28/14 17:00
SVM-11-15 DUP PV3	4J29005-13	Vapor	5	10/28/14 14:07	10/28/14 17:00

VOCs Gasoline Range Organics GC/MS Vapor -

Ambient Air	4J29005-01	Vapor	5	10/28/14 07:10	10/28/14 17:00
SVM-14-22 PV1	4J29005-02	Vapor	5	10/28/14 07:55	10/28/14 17:00
SVM-14-22 PV3	4J29005-03	Vapor	5	10/28/14 08:37	10/28/14 17:00
SVM-14-22 PV10	4J29005-04	Vapor	5	10/28/14 09:18	10/28/14 17:00
SVM-14-15 PV3	4J29005-05	Vapor	5	10/28/14 09:52	10/28/14 17:00
SVM-14-7 PV3	4J29005-06	Vapor	5	10/28/14 10:50	10/28/14 17:00
SVM-13-7 PV3	4J29005-07	Vapor	5	10/28/14 11:25	10/28/14 17:00
SVM-13-15.5 PV3	4J29005-08	Vapor	5	10/28/14 11:48	10/28/14 17:00
SVM-13-22.5 PV10	4J29005-09	Vapor	5	10/28/14 12:23	10/28/14 17:00
SVM-11-7 PV3	4J29005-10	Vapor	5	10/28/14 12:30	10/28/14 17:00
SVM-11-21 PV10	4J29005-11	Vapor	5	10/28/14 13:20	10/28/14 17:00

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-11-15 PV3	4J29005-12	Vapor	5	10/28/14 14:07	10/28/14 17:00
SVM-11-15 DUP PV3	4J29005-13	Vapor	5	10/28/14 14:07	10/28/14 17:00

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Fixed Gases by TCD								
Methane	SVM-14-22 PV1	0.47	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Oxygen	SVM-14-22 PV1	1.7	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Carbon Dioxide	SVM-14-22 PV1	12	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Methane	SVM-14-22 PV3	0.46	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Oxygen	SVM-14-22 PV3	1.1	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Carbon Dioxide	SVM-14-22 PV3	12	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Methane	SVM-14-22 PV10	0.46	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Oxygen	SVM-14-22 PV10	1.1	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Carbon Dioxide	SVM-14-22 PV10	12	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Oxygen	SVM-14-15 PV3	7.1	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Carbon Dioxide	SVM-14-15 PV3	2.3	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Oxygen	SVM-14-7 PV3	15	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Carbon Dioxide	SVM-14-7 PV3	0.74	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Oxygen	SVM-13-7 PV3	17	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Carbon Dioxide	SVM-13-7 PV3	0.18	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Oxygen	SVM-13-15.5 PV3	13	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Carbon Dioxide	SVM-13-15.5 PV3	0.18	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Oxygen	SVM-13-22.5 PV10	1.7	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Carbon Dioxide	SVM-13-22.5 PV10	6.1	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Oxygen	SVM-11-7 PV3	17	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Carbon Dioxide	SVM-11-7 PV3	0.75	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD

Eydie Schwartz

Eydie Schwartz
Project Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Methane	SVM-11-21 PV10	0.10	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Oxygen	SVM-11-21 PV10	15	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Carbon Dioxide	SVM-11-21 PV10	0.70	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Oxygen	SVM-11-15 PV3	16	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Carbon Dioxide	SVM-11-15 PV3	0.85	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Oxygen	SVM-11-15 DUP PV3	16	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD
Carbon Dioxide	SVM-11-15 DUP PV3	0.83	0.10	% by Volume	1	10/28/14	10/28/14	VOCs by GC/TCD

Gasoline Range Organics in Vapor by GC/MS - Field

Gasoline Range Organics (GRO)	SVM-14-22 PV1	170000	2000	ug/L	100	10/28/14	10/28/14	EPA 8260M
Gasoline Range Organics (GRO)	SVM-14-22 PV3	160000	2000	ug/L	100	10/28/14	10/28/14	EPA 8260M
Gasoline Range Organics (GRO)	SVM-14-22 PV10	160000	2000	ug/L	100	10/28/14	10/28/14	EPA 8260M

VOCs in Vapor by GC/MS

Benzene	SVM-14-22 PV1	220	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
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Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Ethylbenzene	SVM-14-22 PV1	350	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
Toluene	SVM-14-22 PV1	1100	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
1,3,5-Trimethylbenzene	SVM-14-22 PV1	1700	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
1,2,4-Trimethylbenzene	SVM-14-22 PV1	690	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
o-Xylene	SVM-14-22 PV1	1700	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
m,p-Xylenes	SVM-14-22 PV1	2300	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
Benzene	SVM-14-22 PV3	220	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
Ethylbenzene	SVM-14-22 PV3	460	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
Toluene	SVM-14-22 PV3	1200	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
1,3,5-Trimethylbenzene	SVM-14-22 PV3	2300	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
1,2,4-Trimethylbenzene	SVM-14-22 PV3	980	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
o-Xylene	SVM-14-22 PV3	2200	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
m,p-Xylenes	SVM-14-22 PV3	2600	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
Benzene	SVM-14-22 PV10	230	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
Ethylbenzene	SVM-14-22 PV10	580	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
Toluene	SVM-14-22 PV10	1400	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
1,3,5-Trimethylbenzene	SVM-14-22 PV10	2800	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
1,2,4-Trimethylbenzene	SVM-14-22 PV10	1300	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
o-Xylene	SVM-14-22 PV10	2500	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID
m,p-Xylenes	SVM-14-22 PV10	2900	40	ug/L	2000	10/28/14	10/28/14	VOCs by GC/FID/PID

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14
Units: % by Volume

Date Sampled:	10/28/14	10/28/14	10/28/14	10/28/14
Date Prepared:	10/28/14	10/28/14	10/28/14	10/28/14
Date Analyzed:	10/28/14	10/28/14	10/28/14	10/28/14
AA ID No:	4J29005-02	4J29005-03	4J29005-04	4J29005-05
Client ID No:	SVM-14-22 PV1	SVM-14-22 PV3	SVM-14-22 PV10	SVM-14-15 PV3
Matrix:	Vapor	Vapor	Vapor	Vapor
Dilution Factor:	1	1	1	1

MRL

Fixed Gases - Field (VOCs by GC/TCD)

Methane	0.47	0.46	0.46	<0.10	0.10
Oxygen	1.7	1.1	1.1	7.1	0.10
Carbon Dioxide	12	12	12	2.3	0.10

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14
Units: % by Volume

Date Sampled:	10/28/14	10/28/14	10/28/14	10/28/14	
Date Prepared:	10/28/14	10/28/14	10/28/14	10/28/14	
Date Analyzed:	10/28/14	10/28/14	10/28/14	10/28/14	
AA ID No:	4J29005-06	4J29005-07	4J29005-08	4J29005-09	
Client ID No:	SVM-14-7 PV3	SVM-13-7 PV3	SVM-13-15.5 PV3	SVM-13-22.5 PV10	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (VOCs by GC/TCD)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	15	17	13	1.7	0.10
Carbon Dioxide	0.74	0.18	0.18	6.1	0.10

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14
Units: % by Volume

Date Sampled:	10/28/14	10/28/14	10/28/14	10/28/14	
Date Prepared:	10/28/14	10/28/14	10/28/14	10/28/14	
Date Analyzed:	10/28/14	10/28/14	10/28/14	10/28/14	
AA ID No:	4J29005-10	4J29005-11	4J29005-12	4J29005-13	
Client ID No:	SVM-11-7 PV3	SVM-11-21 PV10	SVM-11-15 PV3	SVM-11-15 DUP PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (VOCs by GC/TCD)

Methane	<0.10	0.10	<0.10	<0.10	0.10
Oxygen	17	15	16	16	0.10
Carbon Dioxide	0.75	0.70	0.85	0.83	0.10

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs in Vapor by GC/MS

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14
Units: ug/L

Date Sampled:	10/28/14	10/28/14	10/28/14	10/28/14	
Date Prepared:	10/28/14	10/28/14	10/28/14	10/28/14	
Date Analyzed:	10/28/14	10/28/14	10/28/14	10/28/14	
AA ID No:	4J29005-01	4J29005-02	4J29005-03	4J29005-04	
Client ID No:	Ambient Air	SVM-14-22 PV1	SVM-14-22 PV3	SVM-14-22 PV10	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	2000	2000	2000	MRL

VOCs by GC/MS CH2M - FIELD (VOCs by GC/FID/PID)

Benzene	<0.020	220	220	230	0.020
tert-Butyl alcohol (TBA)	<20	<40000	<40000	<40000	20
n-Butylbenzene	<0.020	<40	<40	<40	0.020
sec-Butylbenzene	<0.020	<40	<40	<40	0.020
1,2-Dichloroethane (EDC)	<0.020	<40	<40	<40	0.020
Ethylbenzene	<0.020	350	460	580	0.020
Isopropanol (IPA)	<0.29	<580	<580	<580	0.29
Isopropylbenzene	<0.020	<40	<40	<40	0.020
Methyl-tert-Butyl Ether (MTBE)	<1.0	<2000	<2000	<2000	1.0
n-Propylbenzene	<0.020	<40	<40	<40	0.020
Toluene	<0.020	1100	1200	1400	0.020
1,3,5-Trimethylbenzene	<0.020	1700	2300	2800	0.020
1,2,4-Trimethylbenzene	<0.020	690	980	1300	0.020
o-Xylene	<0.020	1700	2200	2500	0.020
m,p-Xylenes	<0.020	2300	2600	2900	0.020

<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	102%	102%	105%	102%	75-125

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs in Vapor by GC/MS

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14
Units: ug/L

Date Sampled:	10/28/14	10/28/14	10/28/14	10/28/14	
Date Prepared:	10/28/14	10/28/14	10/28/14	10/28/14	
Date Analyzed:	10/28/14	10/28/14	10/28/14	10/28/14	
AA ID No:	4J29005-05	4J29005-06	4J29005-07	4J29005-08	
Client ID No:	SVM-14-15 PV3	SVM-14-7 PV3	SVM-13-7 PV3	SVM-13-15.5 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

VOCs by GC/MS CH2M - FIELD (VOCs by GC/FID/PID)

Benzene	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.29	<0.29	<0.29	<0.29	0.29
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Methyl-tert-Butyl Ether (MTBE)	<1.0	<1.0	<1.0	<1.0	1.0
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020

Surrogates					%REC Limits
4-Bromofluorobenzene	107%	104%	94%	100%	75-125

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs in Vapor by GC/MS

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14
Units: ug/L

Date Sampled:	10/28/14	10/28/14	10/28/14	10/28/14	
Date Prepared:	10/28/14	10/28/14	10/28/14	10/28/14	
Date Analyzed:	10/28/14	10/28/14	10/28/14	10/28/14	
AA ID No:	4J29005-09	4J29005-10	4J29005-11	4J29005-12	
Client ID No:	SVM-13-22.5 PV10	SVM-11-7 PV3	SVM-11-21 PV10	SVM-11-15 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

VOCs by GC/MS CH2M - FIELD (VOCs by GC/FID/PID)

Benzene	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.29	<0.29	<0.29	<0.29	0.29
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Methyl-tert-Butyl Ether (MTBE)	<1.0	<1.0	<1.0	<1.0	1.0
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020

Surrogates					%REC Limits
4-Bromofluorobenzene	106%	105%	111%	97%	75-125

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs in Vapor by GC/MS

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14
Units: ug/L

Date Sampled:	10/28/14	
Date Prepared:	10/28/14	
Date Analyzed:	10/28/14	
AA ID No:	4J29005-13	
Client ID No:	SVM-11-15 DUP	
	PV3	
Matrix:	Vapor	
Dilution Factor:	1	MRL

VOCs by GC/MS CH2M - FIELD (VOCs by GC/FID/PID)

Benzene	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	20
n-Butylbenzene	<0.020	0.020
sec-Butylbenzene	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	0.020
Ethylbenzene	<0.020	0.020
Isopropanol (IPA)	<0.29	0.29
Isopropylbenzene	<0.020	0.020
Methyl-tert-Butyl Ether (MTBE)	<1.0	1.0
n-Propylbenzene	<0.020	0.020
Toluene	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	0.020
o-Xylene	<0.020	0.020
m,p-Xylenes	<0.020	0.020

<u>Surrogates</u>		<u>%REC Limits</u>
4-Bromofluorobenzene	106%	75-125

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187295
Project No:	496965.A1.01	Date Received:	10/28/14
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	11/13/14
Method:	Gasoline Range Organics in Vapor by GC/MS - Field	Units:	ug/L

Date Sampled:	10/28/14	10/28/14	10/28/14	10/28/14
Date Prepared:	10/28/14	10/28/14	10/28/14	10/28/14
Date Analyzed:	10/28/14	10/28/14	10/28/14	10/28/14
AA ID No:	4J29005-01	4J29005-02	4J29005-03	4J29005-04
Client ID No:	Ambient Air	SVM-14-22 PV1	SVM-14-22 PV3	SVM-14-22 PV10
Matrix:	Vapor	Vapor	Vapor	Vapor
Dilution Factor:	1	100	100	100

MRL

VOCs Gasoline Range Organics GC/MS Vapor - FIELD (EPA 8260M)

Gasoline Range Organics (GRO)	<20	170000	160000	160000	20
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Surrogates

4-Bromofluorobenzene	101%	102%	104%	101%	<u>%REC Limits</u> 70-130
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Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc. **AA Project No:** MB187295
Project No: 496965.A1.01 **Date Received:** 10/28/14
Project Name: KMEP Norwalk Biosparge Startup **Date Reported:** 11/13/14
Method: Gasoline Range Organics in Vapor by GC/MS - Field **Units:** ug/L

Date Sampled:	10/28/14	10/28/14	10/28/14	10/28/14	
Date Prepared:	10/28/14	10/28/14	10/28/14	10/28/14	
Date Analyzed:	10/28/14	10/28/14	10/28/14	10/28/14	
AA ID No:	4J29005-05	4J29005-06	4J29005-07	4J29005-08	
Client ID No:	SVM-14-15 PV3	SVM-14-7 PV3	SVM-13-7 PV3	SVM-13-15.5 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

VOCs Gasoline Range Organics GC/MS Vapor - FIELD (EPA 8260M)

Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
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<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	109%	106%	96%	101%	70-130

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc. **AA Project No:** MB187295
Project No: 496965.A1.01 **Date Received:** 10/28/14
Project Name: KMEP Norwalk Biosparge Startup **Date Reported:** 11/13/14
Method: Gasoline Range Organics in Vapor by GC/MS - Field **Units:** ug/L

Date Sampled:	10/28/14	10/28/14	10/28/14	10/28/14	
Date Prepared:	10/28/14	10/28/14	10/28/14	10/28/14	
Date Analyzed:	10/28/14	10/28/14	10/28/14	10/28/14	
AA ID No:	4J29005-09	4J29005-10	4J29005-11	4J29005-12	
Client ID No:	SVM-13-22.5 PV10	SVM-11-7 PV3	SVM-11-21 PV10	SVM-11-15 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

VOCs Gasoline Range Organics GC/MS Vapor - FIELD (EPA 8260M)

Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
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Surrogates

4-Bromofluorobenzene	108%	107%	113%	99%	%REC Limits 70-130
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Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187295
Project No:	496965.A1.01	Date Received:	10/28/14
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	11/13/14
Method:	Gasoline Range Organics in Vapor by GC/MS - Field	Units:	ug/L

Date Sampled:	10/28/14		
Date Prepared:	10/28/14		
Date Analyzed:	10/28/14		
AA ID No:	4J29005-13		
Client ID No:	SVM-11-15 DUP PV3		
Matrix:	Vapor		
Dilution Factor:	1		MRL

VOCs Gasoline Range Organics GC/MS Vapor - FIELD (EPA 8260M)

Gasoline Range Organics (GRO)	<20	20
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<u>Surrogates</u>		<u>%REC Limits</u>
4-Bromofluorobenzene	107%	70-130

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
<i>Batch B4K1017 - *** DEFAULT PREP ***</i>										
Blank (B4K1017-BLK1) Prepared & Analyzed: 10/28/14										
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B4K1017-BS1) Prepared & Analyzed: 10/28/14										
Methane	4.56	0.10	% by Volume	4.5		101	75-125			
Oxygen	3.84	0.10	% by Volume	4.0		96.1	75-125			
Carbon Dioxide	13.3	0.10	% by Volume	15		88.8	75-125			
LCS Dup (B4K1017-BSD1) Prepared & Analyzed: 10/28/14										
Methane	4.47	0.10	% by Volume	4.5		99.3	75-125	1.93	30	
Oxygen	3.86	0.10	% by Volume	4.0		96.4	75-125	0.312	30	
Carbon Dioxide	12.8	0.10	% by Volume	15		85.5	75-125	3.87	30	
Duplicate (B4K1017-DUP1) Source: 4J29005-12 Prepared & Analyzed: 10/28/14										
Methane	<0.10	0.10	% by Volume		<0.10				30	
Oxygen	16.3	0.10	% by Volume		16.2			0.129	30	
Carbon Dioxide	0.833	0.10	% by Volume		0.846			1.55	30	

VOCs in Vapor by GC/MS - Quality Control

*Batch B4K1008 - *** DEFAULT PREP ****

Blank (B4K1008-BLK1) Prepared & Analyzed: 10/28/14

Benzene <0.020 0.020 ug/L

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs in Vapor by GC/MS - Quality Control										
<i>Batch B4K1008 - *** DEFAULT PREP ***</i>										
Blank (B4K1008-BLK1) Continued										
Prepared & Analyzed: 10/28/14										
tert-Butyl alcohol (TBA)	<20	20	ug/L							
n-Butylbenzene	<0.020	0.020	ug/L							
sec-Butylbenzene	<0.020	0.020	ug/L							
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L							
Ethylbenzene	<0.020	0.020	ug/L							
Isopropanol (IPA)	<0.29	0.29	ug/L							
Isopropylbenzene	<0.020	0.020	ug/L							
Methyl-tert-Butyl Ether (MTBE)	<1.0	1.0	ug/L							
n-Propylbenzene	<0.020	0.020	ug/L							
Toluene	<0.020	0.020	ug/L							
1,3,5-Trimethylbenzene	<0.020	0.020	ug/L							
1,2,4-Trimethylbenzene	<0.020	0.020	ug/L							
o-Xylene	<0.020	0.020	ug/L							
m,p-Xylenes	<0.020	0.020	ug/L							
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>51.5</i>		<i>ug/L</i>	<i>50</i>		<i>103</i>	<i>75-125</i>			
LCS (B4K1008-BS1)										
Prepared & Analyzed: 10/28/14										
Benzene	21.4	0.020	ug/L	20		107	75-125			
tert-Butyl alcohol (TBA)	92.9	20	ug/L	100		92.9	75-125			
n-Butylbenzene	23.5	0.020	ug/L	20		117	75-125			
sec-Butylbenzene	23.0	0.020	ug/L	20		115	75-125			
1,2-Dichloroethane (EDC)	26.9	0.020	ug/L	20		134	75-125			AA-C1a
Ethylbenzene	21.5	0.020	ug/L	20		107	75-125			
Isopropylbenzene	22.4	0.020	ug/L	20		112	75-125			
Methyl-tert-Butyl Ether (MTBE)	23.8	1.0	ug/L	20		119	75-125			
n-Propylbenzene	22.5	0.020	ug/L	20		112	75-125			
Toluene	21.6	0.020	ug/L	20		108	75-125			
1,3,5-Trimethylbenzene	22.7	0.020	ug/L	20		113	75-125			
1,2,4-Trimethylbenzene	23.4	0.020	ug/L	20		117	75-125			
o-Xylene	23.5	0.020	ug/L	20		118	75-125			
m,p-Xylenes	46.0	0.020	ug/L	40		115	75-125			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>53.4</i>		<i>ug/L</i>	<i>50</i>		<i>107</i>	<i>75-125</i>			

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs in Vapor by GC/MS - Quality Control										
<i>Batch B4K1008 - *** DEFAULT PREP ***</i>										
LCS Dup (B4K1008-BSD1)										
Prepared & Analyzed: 10/28/14										
Benzene	19.9	0.020	ug/L	20		99.4	75-125	7.50	30	
tert-Butyl alcohol (TBA)	93.4	20	ug/L	100		93.4	75-125	0.494	30	
n-Butylbenzene	20.5	0.020	ug/L	20		102	75-125	13.5	30	
sec-Butylbenzene	20.3	0.020	ug/L	20		101	75-125	12.7	30	
1,2-Dichloroethane (EDC)	23.8	0.020	ug/L	20		119	75-125	12.0	30	
Ethylbenzene	19.4	0.020	ug/L	20		97.0	75-125	10.3	30	
Isopropylbenzene	20.8	0.020	ug/L	20		104	75-125	7.18	30	
Methyl-tert-Butyl Ether (MTBE)	23.5	1.0	ug/L	20		118	75-125	1.08	30	
n-Propylbenzene	20.3	0.020	ug/L	20		101	75-125	10.2	30	
Toluene	19.7	0.020	ug/L	20		98.4	75-125	9.07	30	
1,3,5-Trimethylbenzene	20.8	0.020	ug/L	20		104	75-125	8.74	30	
1,2,4-Trimethylbenzene	21.2	0.020	ug/L	20		106	75-125	10.0	30	
o-Xylene	21.2	0.020	ug/L	20		106	75-125	10.5	30	
m,p-Xylenes	40.7	0.020	ug/L	40		102	75-125	12.3	30	
<i>Surrogate: 4-Bromofluorobenzene</i>	53.5		ug/L	50		107	75-125			
<i>Batch B4K1013 - *** DEFAULT PREP ***</i>										
Blank (B4K1013-BLK1)										
Prepared & Analyzed: 10/28/14										
Benzene	<0.020	0.020	ug/L							
tert-Butyl alcohol (TBA)	<20	20	ug/L							
n-Butylbenzene	<0.020	0.020	ug/L							
sec-Butylbenzene	<0.020	0.020	ug/L							
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L							
Ethylbenzene	<0.020	0.020	ug/L							
Isopropanol (IPA)	<0.29	0.29	ug/L							
Isopropylbenzene	<0.020	0.020	ug/L							
Methyl-tert-Butyl Ether (MTBE)	<1.0	1.0	ug/L							
n-Propylbenzene	<0.020	0.020	ug/L							
Toluene	<0.020	0.020	ug/L							
1,3,5-Trimethylbenzene	<0.020	0.020	ug/L							
1,2,4-Trimethylbenzene	<0.020	0.020	ug/L							
o-Xylene	<0.020	0.020	ug/L							

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs in Vapor by GC/MS - Quality Control										
<i>Batch B4K1013 - *** DEFAULT PREP ***</i>										
Blank (B4K1013-BLK1) Continued										
Prepared & Analyzed: 10/28/14										
m,p-Xylenes	<0.020	0.020	ug/L							
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>4.78</i>		<i>ug/L</i>	<i>5.0</i>		<i>95.6</i>	<i>75-125</i>			
LCS (B4K1013-BS1)										
Prepared & Analyzed: 10/28/14										
Benzene	22.1	0.020	ug/L	20		110	75-125			
tert-Butyl alcohol (TBA)	91.8	20	ug/L	100		91.8	75-125			
n-Butylbenzene	18.9	0.020	ug/L	20		94.4	75-125			
sec-Butylbenzene	28.8	0.020	ug/L	20		144	75-125			AA-C1a
1,2-Dichloroethane (EDC)	21.6	0.020	ug/L	20		108	75-125			
Ethylbenzene	20.6	0.020	ug/L	20		103	75-125			
Isopropylbenzene	24.4	0.020	ug/L	20		122	75-125			
Methyl-tert-Butyl Ether (MTBE)	17.6	1.0	ug/L	20		88.1	75-125			
n-Propylbenzene	23.5	0.020	ug/L	20		117	75-125			
Toluene	21.6	0.020	ug/L	20		108	75-125			
1,3,5-Trimethylbenzene	26.7	0.020	ug/L	20		133	75-125			AA-C1a
1,2,4-Trimethylbenzene	29.2	0.020	ug/L	20		146	75-125			AA-C1a
o-Xylene	21.5	0.020	ug/L	20		108	75-125			
m,p-Xylenes	43.5	0.020	ug/L	40		109	75-125			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>5.10</i>		<i>ug/L</i>	<i>5.0</i>		<i>102</i>	<i>75-125</i>			
LCS Dup (B4K1013-BSD1)										
Prepared & Analyzed: 10/28/14										
Benzene	18.6	0.020	ug/L	20		92.9	75-125	17.1	30	
tert-Butyl alcohol (TBA)	89.2	20	ug/L	100		89.2	75-125	2.89	30	
n-Butylbenzene	20.9	0.020	ug/L	20		105	75-125	10.3	30	
sec-Butylbenzene	30.6	0.020	ug/L	20		153	75-125	5.99	30	AA-C1a
1,2-Dichloroethane (EDC)	19.1	0.020	ug/L	20		95.6	75-125	12.0	30	
Ethylbenzene	22.2	0.020	ug/L	20		111	75-125	7.39	30	
Isopropylbenzene	24.3	0.020	ug/L	20		122	75-125	0.328	30	
Methyl-tert-Butyl Ether (MTBE)	21.7	1.0	ug/L	20		109	75-125	20.8	30	
n-Propylbenzene	24.0	0.020	ug/L	20		120	75-125	2.27	30	
Toluene	25.2	0.020	ug/L	20		126	75-125	15.5	30	AA-C1a
1,3,5-Trimethylbenzene	25.2	0.020	ug/L	20		126	75-125	5.63	30	AA-C1a
1,2,4-Trimethylbenzene	31.1	0.020	ug/L	20		155	75-125	6.17	30	AA-C1a

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs in Vapor by GC/MS - Quality Control										
<i>Batch B4K1013 - *** DEFAULT PREP ***</i>										
LCS Dup (B4K1013-BSD1) Continued										
Prepared & Analyzed: 10/28/14										
o-Xylene	24.0	0.020	ug/L	20	120	75-125	11.0	30		
m,p-Xylenes	49.4	0.020	ug/L	40	123	75-125	12.7	30		
<i>Surrogate: 4-Bromofluorobenzene</i>	4.86		ug/L	5.0	97.2	75-125				
Duplicate (B4K1013-DUP1)										
Source: 4J29005-12 Prepared & Analyzed: 10/28/14										
Benzene	<0.020	0.020	ug/L		<0.020			30		
tert-Butyl alcohol (TBA)	<20	20	ug/L		<20			30		
n-Butylbenzene	<0.020	0.020	ug/L		<0.020			30		
sec-Butylbenzene	<0.020	0.020	ug/L		<0.020			30		
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L		<0.020			30		
Ethylbenzene	<0.020	0.020	ug/L		<0.020			30		
Isopropanol (IPA)	<0.29	0.29	ug/L		<0.29			30		
Isopropylbenzene	<0.020	0.020	ug/L		<0.020			30		
Methyl-tert-Butyl Ether (MTBE)	<1.0	1.0	ug/L		<1.0			30		
n-Propylbenzene	<0.020	0.020	ug/L		<0.020			30		
Toluene	<0.020	0.020	ug/L		<0.020			30		
1,3,5-Trimethylbenzene	<0.020	0.020	ug/L		<0.020			30		
1,2,4-Trimethylbenzene	<0.020	0.020	ug/L		<0.020			30		
o-Xylene	<0.020	0.020	ug/L		<0.020			30		
m,p-Xylenes	<0.020	0.020	ug/L		<0.020			30		
<i>Surrogate: 4-Bromofluorobenzene</i>	5.28		ug/L	5.0	106	75-125				
Gasoline Range Organics in Vapor by GC/MS - Field - Quality Control										
<i>Batch B4K1014 - *** DEFAULT PREP ***</i>										
Blank (B4K1014-BLK1)										
Prepared & Analyzed: 10/28/14										
Gasoline Range Organics (GRO)	<20	20	ug/L							
<i>Surrogate: 4-Bromofluorobenzene</i>	4.78		ug/L	5.0	95.6	70-130				
LCS (B4K1014-BS1)										
Prepared & Analyzed: 10/28/14										
Gasoline Range Organics (GRO)	1360	20	ug/L	1000	136	75-125				AA-C1
<i>Surrogate: 4-Bromofluorobenzene</i>	4.55		ug/L	5.0	91.0	70-130				
LCS Dup (B4K1014-BSD1)										
Prepared & Analyzed: 10/28/14										

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Gasoline Range Organics in Vapor by GC/MS - Field - Quality Control										
<i>Batch B4K1014 - *** DEFAULT PREP ***</i>										
LCS Dup (B4K1014-BSD1) Continued					Prepared & Analyzed: 10/28/14					
Gasoline Range Organics (GRO)	989	20	ug/L	1000		98.9	75-125	31.4	30	AA-C2
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>4.98</i>		<i>ug/L</i>	<i>5.0</i>		<i>99.6</i>	<i>70-130</i>			
Duplicate (B4K1014-DUP1)					Source: 4J29005-12 Prepared & Analyzed: 10/28/14					
Gasoline Range Organics (GRO)	<20	20	ug/L		<20				30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>5.37</i>		<i>ug/L</i>	<i>5.0</i>		<i>107</i>	<i>70-130</i>			
<i>Batch B4K1016 - *** DEFAULT PREP ***</i>										
Blank (B4K1016-BLK1)					Prepared & Analyzed: 10/28/14					
Gasoline Range Organics (GRO)	<20	20	ug/L							
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>51.0</i>		<i>ug/L</i>	<i>50</i>		<i>102</i>	<i>70-130</i>			
LCS (B4K1016-BS1)					Prepared & Analyzed: 10/28/14					
Gasoline Range Organics (GRO)	545	20	ug/L	500		109	75-125			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>50.1</i>		<i>ug/L</i>	<i>50</i>		<i>100</i>	<i>70-130</i>			
LCS Dup (B4K1016-BSD1)					Prepared & Analyzed: 10/28/14					
Gasoline Range Organics (GRO)	550	20	ug/L	500		110	75-125	0.818	30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>52.2</i>		<i>ug/L</i>	<i>50</i>		<i>104</i>	<i>70-130</i>			

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187295
Date Received: 10/28/14
Date Reported: 11/13/14

Special Notes

- [1] = **AA-C1** : The percent recovery exceeds acceptance criteria.
- [2] = **AA-C1** : The percent recovery for this analyte exceeds acceptance criteria.
- [3] = **AA-C2** : The RPD value exceeds acceptance criteria.

Eydie Schwartz

Eydie Schwartz
Project Manager



AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311
Tel: 818-998-5547 FAX: 818-998-7258

A.A. COC No.: 121097
70041363 of 1
Page

Client: ChRM Hill Project Name / No.: KINDER MORGAN NORWALK Sampler's Name: William J. Proctor
 Project Manager: DAN JARONSKI Site Address: 15306 NORWALK BLVD Sampler's Signature: [Signature]
 Phone: _____ P.O. No.: _____
 Fax: _____ State & Zip: CA Quote No.: _____

TAT Turnaround Codes **

- ① = Same Day Rush
- ② = 24 Hour Rush
- ③ = 48 Hour Rush
- ④ = 72 Hour Rush
- ⑤ = 5 Day Rush
- X = 10 Working Days (Standard TAT)

ANALYSIS REQUESTED (Test Name)

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Please enter the TAT Turnaround Codes ** below

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	Special Instructions
AMBIENT AIR	9529005-01	10-28-14	0710	V	2	X
SVM-14-22	2		0755	V	3	X
SVM-14-22	3		0837	V	3	X
SVM-14-22	4		0918	V	3	X
SVM-14-15	5		0952	V	3	X
SVM-14-7	6		1050	V	3	X
SVM-13-7	7		1125	V	3	X
SVM-13-15.5	8		1148	V	3	X
SVM-13-22.5	9		1223	V	3	X
SVM-11.7	10		1230	V	3	X
SVM-11-21	11		1320	V	3	X
SVM-11-15	12		1407	V	3	X
SVM-11-15 DUP	13		1407	V	3	X

Relinquished by	Date	Time	Received by	Time
<u>[Signature]</u>	10/28/14	1430	<u>[Signature]</u>	
<u>[Signature]</u>	10/28/14	1400	<u>[Signature]</u>	

A.A. Project No.: M1818295/9529005

Note: By relinquishing samples to American Analytix, client agrees to pay for the services requested on this chain of custody form and any additional client-requested analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 45 days following the submittal of the sample(s) to American Analytix.



9765 Eton Avenue
Chatsworth
California 91311
Tel: (818) 998-5547
Fax: (818) 998-7258

November 13, 2014

Dan Jablonski
CH2M Hill, Inc.
1000 Wilshire Blvd., Suite 2100
Los Angeles, CA 90017-2457

**Re : KMEP Norwalk Biosparge Startup / 496965.A1.01
MB187296 / 4J31003**

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received on 10/29/14 15:00 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Assurance Program Manual, applicable standard operating procedures, and other related documentation. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report or require additional information please call me at American Analyticals.

Sincerely,

A handwritten signature in black ink that reads 'Eydie Schwartz'.

Eydie Schwartz
Project Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
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Fixed Gases - Field

SVM-12-15 PV3	4J31003-01	Vapor	0	10/29/14 07:45	10/29/14 15:00
SVM-12-7 PV3	4J31003-03	Vapor	0	10/29/14 08:12	10/29/14 15:00
SVM-12-7 DUP PV3	4J31003-04	Vapor	0	10/29/14 08:12	10/29/14 15:00
SVM-12-22 PV10	4J31003-05	Vapor	0	10/29/14 08:42	10/29/14 15:00
SVM-2-5 PV3	4J31003-07	Vapor	0	10/29/14 09:55	10/29/14 15:00
SVM-2-14.5 PV3	4J31003-08	Vapor	0	10/29/14 10:21	10/29/14 15:00
SVM-1-14.5 PV3	4J31003-09	Vapor	0	10/29/14 11:10	10/29/14 15:00
SVM-1-5 PV3	4J31003-10	Vapor	0	10/29/14 11:36	10/29/14 15:00
SVM-10-15.5 PV3	4J31003-11	Vapor	0	10/29/14 12:05	10/29/14 15:00
SVM-7-13 PV3	4J31003-12	Vapor	0	10/29/14 12:45	10/29/14 15:00
SVM-7-7 PV3	4J31003-13	Vapor	0	10/29/14 13:22	10/29/14 15:00
SVM-6-6.5 PV3	4J31003-14	Vapor	0	10/29/14 14:03	10/29/14 15:00
SVM-6-15.5 PV3	4J31003-15	Vapor	0	10/29/14 14:55	10/29/14 15:00

VOCs by GC/MS CH2M - FIELD

SVM-12-15 PV3	4J31003-01	Vapor	0	10/29/14 07:45	10/29/14 15:00
Ambient Air	4J31003-02	Vapor	0	10/29/14 07:50	10/29/14 15:00
SVM-12-7 PV3	4J31003-03	Vapor	0	10/29/14 08:12	10/29/14 15:00
SVM-12-7 DUP PV3	4J31003-04	Vapor	0	10/29/14 08:12	10/29/14 15:00

Eydie Schwartz
Project Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-12-22 PV10	4J31003-05	Vapor	0	10/29/14 08:42	10/29/14 15:00
SVM-12-22 DUP PV10	4J31003-06	Vapor	0	10/29/14 08:42	10/29/14 15:00
SVM-2-5 PV3	4J31003-07	Vapor	0	10/29/14 09:55	10/29/14 15:00
SVM-2-14.5 PV3	4J31003-08	Vapor	0	10/29/14 10:21	10/29/14 15:00
SVM-1-14.5 PV3	4J31003-09	Vapor	0	10/29/14 11:10	10/29/14 15:00
SVM-1-5 PV3	4J31003-10	Vapor	0	10/29/14 11:36	10/29/14 15:00
SVM-10-15.5 PV3	4J31003-11	Vapor	0	10/29/14 12:05	10/29/14 15:00
SVM-7-13 PV3	4J31003-12	Vapor	0	10/29/14 12:45	10/29/14 15:00
SVM-7-7 PV3	4J31003-13	Vapor	0	10/29/14 13:22	10/29/14 15:00
SVM-6-6.5 PV3	4J31003-14	Vapor	0	10/29/14 14:03	10/29/14 15:00
SVM-6-15.5 PV3	4J31003-15	Vapor	0	10/29/14 14:55	10/29/14 15:00

VOCs Gasoline Range Organics GC/MS Vapor -

SVM-12-15 PV3	4J31003-01	Vapor	0	10/29/14 07:45	10/29/14 15:00
Ambient Air	4J31003-02	Vapor	0	10/29/14 07:50	10/29/14 15:00
SVM-12-7 PV3	4J31003-03	Vapor	0	10/29/14 08:12	10/29/14 15:00
SVM-12-7 DUP PV3	4J31003-04	Vapor	0	10/29/14 08:12	10/29/14 15:00
SVM-12-22 PV10	4J31003-05	Vapor	0	10/29/14 08:42	10/29/14 15:00
SVM-12-22 DUP PV10	4J31003-06	Vapor	0	10/29/14 08:42	10/29/14 15:00
SVM-2-5 PV3	4J31003-07	Vapor	0	10/29/14 09:55	10/29/14 15:00
SVM-2-14.5 PV3	4J31003-08	Vapor	0	10/29/14 10:21	10/29/14 15:00

Eydie Schwartz
Project Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-1-14.5 PV3	4J31003-09	Vapor	0	10/29/14 11:10	10/29/14 15:00
SVM-1-5 PV3	4J31003-10	Vapor	0	10/29/14 11:36	10/29/14 15:00
SVM-10-15.5 PV3	4J31003-11	Vapor	0	10/29/14 12:05	10/29/14 15:00
SVM-7-13 PV3	4J31003-12	Vapor	0	10/29/14 12:45	10/29/14 15:00
SVM-7-7 PV3	4J31003-13	Vapor	0	10/29/14 13:22	10/29/14 15:00
SVM-6-6.5 PV3	4J31003-14	Vapor	0	10/29/14 14:03	10/29/14 15:00
SVM-6-15.5 PV3	4J31003-15	Vapor	0	10/29/14 14:55	10/29/14 15:00

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Fixed Gases by TCD								
Oxygen	SVM-12-15 PV3	12	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Carbon Dioxide	SVM-12-15 PV3	3.7	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Oxygen	SVM-12-7 PV3	17	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Carbon Dioxide	SVM-12-7 PV3	0.83	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Oxygen	SVM-12-7 DUP PV3	18	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Carbon Dioxide	SVM-12-7 DUP PV3	0.90	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Methane	SVM-12-22 PV10	0.73	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Oxygen	SVM-12-22 PV10	1.2	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Carbon Dioxide	SVM-12-22 PV10	16	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Oxygen	SVM-2-5 PV3	16	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD

Eydie Schwartz

Eydie Schwartz
Project Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Carbon Dioxide	SVM-2-5 PV3	1.0	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Oxygen	SVM-2-14.5 PV3	16	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Carbon Dioxide	SVM-2-14.5 PV3	0.84	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Oxygen	SVM-1-14.5 PV3	15	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Carbon Dioxide	SVM-1-14.5 PV3	0.51	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Oxygen	SVM-1-5 PV3	18	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Carbon Dioxide	SVM-1-5 PV3	0.36	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Methane	SVM-10-15.5 PV3	0.10	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Oxygen	SVM-10-15.5 PV3	8.7	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Carbon Dioxide	SVM-10-15.5 PV3	6.5	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Oxygen	SVM-7-13 PV3	15	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD

Eydie Schwartz
Project Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Carbon Dioxide	SVM-7-13 PV3	0.97	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Methane	SVM-7-7 PV3	0.11	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Oxygen	SVM-7-7 PV3	16	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Carbon Dioxide	SVM-7-7 PV3	1.0	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Methane	SVM-6-6.5 PV3	0.13	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Oxygen	SVM-6-6.5 PV3	16	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Carbon Dioxide	SVM-6-6.5 PV3	0.23	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Methane	SVM-6-15.5 PV3	0.12	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Oxygen	SVM-6-15.5 PV3	7.1	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD
Carbon Dioxide	SVM-6-15.5 PV3	0.21	0.10	% by Volume	1	10/29/14	10/29/14	VOCs by GC/TCD

Gasoline Range Organics in Vapor by GC/MS - Field

Gasoline Range Organics (GRO)	SVM-12-22 PV10	21000	100	ug/L	5	10/29/14	10/29/14	EPA 8260M
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Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Gasoline Range Organics (GRO)	SVM-12-22 DUP PV10	20000	100	ug/L	5	10/29/14	10/29/14	EPA 8260M
VOCs in Vapor by GC/MS								
Isopropanol (IPA)	SVM-12-15 PV3	1.3	0.29	ug/L	1	10/29/14	10/29/14	VOCs by GC/FID/PID
Isopropanol (IPA)	SVM-12-7 PV3	0.42	0.29	ug/L	1	10/29/14	10/29/14	VOCs by GC/FID/PID
Isopropanol (IPA)	SVM-12-7 DUP PV3	0.45	0.29	ug/L	1	10/29/14	10/29/14	VOCs by GC/FID/PID
Benzene	SVM-12-22 PV10	2.9	2.0	ug/L	100	10/29/14	10/29/14	VOCs by GC/FID/PID
Benzene	SVM-12-22 DUP PV10	2.8	2.0	ug/L	100	10/29/14	10/29/14	VOCs by GC/FID/PID
Isopropanol (IPA)	SVM-2-14.5 PV3	0.52	0.29	ug/L	1	10/29/14	10/29/14	VOCs by GC/FID/PID
Isopropanol (IPA)	SVM-1-14.5 PV3	0.71	0.29	ug/L	1	10/29/14	10/29/14	VOCs by GC/FID/PID

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14
Units: % by Volume

Date Sampled:	10/29/14	10/29/14	10/29/14	10/29/14	
Date Prepared:	10/29/14	10/29/14	10/29/14	10/29/14	
Date Analyzed:	10/29/14	10/29/14	10/29/14	10/29/14	
AA ID No:	4J31003-01	4J31003-03	4J31003-04	4J31003-05	
Client ID No:	SVM-12-15 PV3	SVM-12-7 PV3	SVM-12-7 DUP PV3	SVM-12-22 PV10	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (VOCs by GC/TCD)

Methane	<0.10	<0.10	<0.10	0.73	0.10
Oxygen	12	17	18	1.2	0.10
Carbon Dioxide	3.7	0.83	0.90	16	0.10

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14
Units: % by Volume

Date Sampled:	10/29/14	10/29/14	10/29/14	10/29/14	
Date Prepared:	10/29/14	10/29/14	10/29/14	10/29/14	
Date Analyzed:	10/29/14	10/29/14	10/29/14	10/29/14	
AA ID No:	4J31003-07	4J31003-08	4J31003-09	4J31003-10	
Client ID No:	SVM-2-5 PV3	SVM-2-14.5 PV3	SVM-1-14.5 PV3	SVM-1-5 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (VOCs by GC/TCD)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	16	16	15	18	0.10
Carbon Dioxide	1.0	0.84	0.51	0.36	0.10

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14
Units: % by Volume

Date Sampled:	10/29/14	10/29/14	10/29/14	10/29/14	
Date Prepared:	10/29/14	10/29/14	10/29/14	10/29/14	
Date Analyzed:	10/29/14	10/29/14	10/29/14	10/29/14	
AA ID No:	4J31003-11	4J31003-12	4J31003-13	4J31003-14	
Client ID No:	SVM-10-15.5 PV3	SVM-7-13 PV3	SVM-7-7 PV3	SVM-6-6.5 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (VOCs by GC/TCD)

Methane	0.10	<0.10	0.11	0.13	0.10
Oxygen	8.7	15	16	16	0.10
Carbon Dioxide	6.5	0.97	1.0	0.23	0.10

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14
Units: % by Volume

Date Sampled:	10/29/14	
Date Prepared:	10/29/14	
Date Analyzed:	10/29/14	
AA ID No:	4J31003-15	
Client ID No:	SVM-6-15.5 PV3	
Matrix:	Vapor	
Dilution Factor:	1	MRL

Fixed Gases - Field (VOCs by GC/TCD)

Methane	0.12	0.10
Oxygen	7.1	0.10
Carbon Dioxide	0.21	0.10

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs in Vapor by GC/MS

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14
Units: ug/L

Date Sampled:	10/29/14	10/29/14	10/29/14	10/29/14	
Date Prepared:	10/29/14	10/29/14	10/29/14	10/29/14	
Date Analyzed:	10/29/14	10/29/14	10/29/14	10/29/14	
AA ID No:	4J31003-01	4J31003-02	4J31003-03	4J31003-04	
Client ID No:	SVM-12-15 PV3	Ambient Air	SVM-12-7 PV3	SVM-12-7 DUP PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

VOCs by GC/MS CH2M - FIELD (VOCs by GC/FID/PID)

Benzene	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	1.3	<0.29	0.42	0.45	0.29
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Methyl-tert-Butyl Ether (MTBE)	<1.0	<1.0	<1.0	<1.0	1.0
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020

<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	100%	95%	109%	95%	75-125

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs in Vapor by GC/MS

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14
Units: ug/L

Date Sampled:	10/29/14	10/29/14	10/29/14	10/29/14	
Date Prepared:	10/29/14	10/29/14	10/29/14	10/29/14	
Date Analyzed:	10/29/14	10/29/14	10/29/14	10/29/14	
AA ID No:	4J31003-05	4J31003-06	4J31003-07	4J31003-08	
Client ID No:	SVM-12-22 PV10	SVM-12-22 DUP PV10	SVM-2-5 PV3	SVM-2-14.5 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	100	100	1	1	MRL

VOCs by GC/MS CH2M - FIELD (VOCs by GC/FID/PID)

Benzene	2.9	2.8	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<2000	<2000	<20	<20	20
n-Butylbenzene	<2.0	<2.0	<0.020	<0.020	0.020
sec-Butylbenzene	<2.0	<2.0	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<2.0	<2.0	<0.020	<0.020	0.020
Ethylbenzene	<2.0	<2.0	<0.020	<0.020	0.020
Isopropanol (IPA)	<29	<29	<0.29	0.52	0.29
Isopropylbenzene	<2.0	<2.0	<0.020	<0.020	0.020
Methyl-tert-Butyl Ether (MTBE)	<100	<100	<1.0	<1.0	1.0
n-Propylbenzene	<2.0	<2.0	<0.020	<0.020	0.020
Toluene	<2.0	<2.0	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<2.0	<2.0	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<2.0	<2.0	<0.020	<0.020	0.020
o-Xylene	<2.0	<2.0	<0.020	<0.020	0.020
m,p-Xylenes	<2.0	<2.0	<0.020	<0.020	0.020

Surrogates					%REC Limits
4-Bromofluorobenzene	104%	102%	107%	99%	75-125

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs in Vapor by GC/MS

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14
Units: ug/L

Date Sampled:	10/29/14	10/29/14	10/29/14	10/29/14
Date Prepared:	10/29/14	10/29/14	10/29/14	10/29/14
Date Analyzed:	10/29/14	10/29/14	10/29/14	10/29/14
AA ID No:	4J31003-09	4J31003-10	4J31003-11	4J31003-12
Client ID No:	SVM-1-14.5 PV3	SVM-1-5 PV3	SVM-10-15.5 PV3	SVM-7-13 PV3
Matrix:	Vapor	Vapor	Vapor	Vapor
Dilution Factor:	1	1	1	1
				MRL

VOCs by GC/MS CH2M - FIELD (VOCs by GC/FID/PID)

Benzene	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	0.71	<0.29	<0.29	<0.29	0.29
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Methyl-tert-Butyl Ether (MTBE)	<1.0	<1.0	<1.0	<1.0	1.0
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020

<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	98%	97%	93%	96%	75-125

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs in Vapor by GC/MS

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14
Units: ug/L

Date Sampled:	10/29/14	10/29/14	10/29/14	
Date Prepared:	10/29/14	10/29/14	10/29/14	
Date Analyzed:	10/29/14	10/29/14	10/29/14	
AA ID No:	4J31003-13	4J31003-14	4J31003-15	
Client ID No:	SVM-7-7 PV3	SVM-6-6.5 PV3	SVM-6-15.5 PV3	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	MRL

VOCs by GC/MS CH2M - FIELD (VOCs by GC/FID/PID)

Benzene	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	20
n-Butylbenzene	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.29	<0.29	<0.29	0.29
Isopropylbenzene	<0.020	<0.020	<0.020	0.020
Methyl-tert-Butyl Ether (MTBE)	<1.0	<1.0	<1.0	1.0
n-Propylbenzene	<0.020	<0.020	<0.020	0.020
Toluene	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	0.020

Surrogates				%REC Limits
4-Bromofluorobenzene	100%	101%	100%	75-125

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187296
Project No:	496965.A1.01	Date Received:	10/29/14
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	11/13/14
Method:	Gasoline Range Organics in Vapor by GC/MS - Field	Units:	ug/L

Date Sampled:	10/29/14	10/29/14	10/29/14	10/29/14	
Date Prepared:	10/29/14	10/29/14	10/29/14	10/29/14	
Date Analyzed:	10/29/14	10/29/14	10/29/14	10/29/14	
AA ID No:	4J31003-01	4J31003-02	4J31003-03	4J31003-04	
Client ID No:	SVM-12-15 PV3	Ambient Air	SVM-12-7 PV3	SVM-12-7 DUP PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

VOCs Gasoline Range Organics GC/MS Vapor - FIELD (EPA 8260M)

Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
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<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	102%	95%	111%	96%	70-130

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187296
Project No:	496965.A1.01	Date Received:	10/29/14
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	11/13/14
Method:	Gasoline Range Organics in Vapor by GC/MS - Field	Units:	ug/L

Date Sampled:	10/29/14	10/29/14	10/29/14	10/29/14	
Date Prepared:	10/29/14	10/29/14	10/29/14	10/29/14	
Date Analyzed:	10/29/14	10/29/14	10/29/14	10/29/14	
AA ID No:	4J31003-05	4J31003-06	4J31003-07	4J31003-08	
Client ID No:	SVM-12-22 PV10	SVM-12-22 DUP PV10	SVM-2-5 PV3	SVM-2-14.5 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	5	5	1	1	MRL

VOCs Gasoline Range Organics GC/MS Vapor - FIELD (EPA 8260M)

Gasoline Range Organics (GRO)	21000	20000	<20	<20	20
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<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	103%	101%	109%	101%	70-130

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc. **AA Project No:** MB187296
Project No: 496965.A1.01 **Date Received:** 10/29/14
Project Name: KMEP Norwalk Biosparge Startup **Date Reported:** 11/13/14
Method: Gasoline Range Organics in Vapor by GC/MS - Field **Units:** ug/L

Date Sampled:	10/29/14	10/29/14	10/29/14	10/29/14	
Date Prepared:	10/29/14	10/29/14	10/29/14	10/29/14	
Date Analyzed:	10/29/14	10/29/14	10/29/14	10/29/14	
AA ID No:	4J31003-09	4J31003-10	4J31003-11	4J31003-12	
Client ID No:	SVM-1-14.5 PV3	SVM-1-5 PV3	SVM-10-15.5 PV3	SVM-7-13 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

VOCs Gasoline Range Organics GC/MS Vapor - FIELD (EPA 8260M)

Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
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<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	100%	99%	94%	98%	70-130

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187296
Project No:	496965.A1.01	Date Received:	10/29/14
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	11/13/14
Method:	Gasoline Range Organics in Vapor by GC/MS - Field	Units:	ug/L

Date Sampled:	10/29/14	10/29/14	10/29/14	
Date Prepared:	10/29/14	10/29/14	10/29/14	
Date Analyzed:	10/29/14	10/29/14	10/29/14	
AA ID No:	4J31003-13	4J31003-14	4J31003-15	
Client ID No:	SVM-7-7 PV3	SVM-6-6.5 PV3	SVM-6-15.5 PV3	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	MRL

VOCs Gasoline Range Organics GC/MS Vapor - FIELD (EPA 8260M)

Gasoline Range Organics (GRO)	<20	<20	<20	20
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Surrogates				%REC Limits
4-Bromofluorobenzene	102%	102%	102%	70-130

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
<i>Batch B4K1102 - *** DEFAULT PREP ***</i>										
Blank (B4K1102-BLK1) Prepared & Analyzed: 10/29/14										
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B4K1102-BS1) Prepared & Analyzed: 10/29/14										
Methane	4.57	0.10	% by Volume	4.5		102	75-125			
Oxygen	3.55	0.10	% by Volume	4.0		88.6	75-125			
Carbon Dioxide	13.5	0.10	% by Volume	15		90.1	75-125			
LCS Dup (B4K1102-BSD1) Prepared & Analyzed: 10/29/14										
Methane	4.63	0.10	% by Volume	4.5		103	75-125	1.20	30	
Oxygen	3.97	0.10	% by Volume	4.0		99.3	75-125	11.3	30	
Carbon Dioxide	13.6	0.10	% by Volume	15		90.4	75-125	0.236	30	
Duplicate (B4K1102-DUP1) Source: 4J31003-03 Prepared & Analyzed: 10/29/14										
Methane	<0.10	0.10	% by Volume		<0.10				30	
Oxygen	17.5	0.10	% by Volume		17.5			0.257	30	
Carbon Dioxide	0.897	0.10	% by Volume		0.827			8.12	30	

VOCs in Vapor by GC/MS - Quality Control

*Batch B4K1011 - *** DEFAULT PREP ****

Blank (B4K1011-BLK1)

Prepared & Analyzed: 10/29/14

Benzene	<0.020	0.020	ug/L	
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Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs in Vapor by GC/MS - Quality Control										
Batch B4K1011 - *** DEFAULT PREP ***										
Blank (B4K1011-BLK1) Continued										
Prepared & Analyzed: 10/29/14										
tert-Butyl alcohol (TBA)	<20	20	ug/L							
n-Butylbenzene	<0.020	0.020	ug/L							
sec-Butylbenzene	<0.020	0.020	ug/L							
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L							
Ethylbenzene	<0.020	0.020	ug/L							
Isopropanol (IPA)	<0.29	0.29	ug/L							
Isopropylbenzene	<0.020	0.020	ug/L							
Methyl-tert-Butyl Ether (MTBE)	<1.0	1.0	ug/L							
n-Propylbenzene	<0.020	0.020	ug/L							
Toluene	<0.020	0.020	ug/L							
1,3,5-Trimethylbenzene	<0.020	0.020	ug/L							
1,2,4-Trimethylbenzene	<0.020	0.020	ug/L							
o-Xylene	<0.020	0.020	ug/L							
m,p-Xylenes	<0.020	0.020	ug/L							
<i>Surrogate: 4-Bromofluorobenzene</i>	46.3		ug/L	50		92.6	75-125			
LCS (B4K1011-BS1)										
Prepared & Analyzed: 10/29/14										
Benzene	19.3	0.020	ug/L	20		96.3	75-125			
tert-Butyl alcohol (TBA)	86.0	20	ug/L	100		86.0	75-125			
n-Butylbenzene	25.7	0.020	ug/L	20		128	75-125			AA-C1
sec-Butylbenzene	21.7	0.020	ug/L	20		109	75-125			
1,2-Dichloroethane (EDC)	19.5	0.020	ug/L	20		97.3	75-125			
Ethylbenzene	17.2	0.020	ug/L	20		86.1	75-125			
Isopropylbenzene	19.6	0.020	ug/L	20		98.1	75-125			
Methyl-tert-Butyl Ether (MTBE)	18.6	1.0	ug/L	20		93.1	75-125			
n-Propylbenzene	18.0	0.020	ug/L	20		90.0	75-125			
Toluene	19.4	0.020	ug/L	20		97.1	75-125			
1,3,5-Trimethylbenzene	20.9	0.020	ug/L	20		104	75-125			
1,2,4-Trimethylbenzene	19.5	0.020	ug/L	20		97.5	75-125			
o-Xylene	18.6	0.020	ug/L	20		93.0	75-125			
m,p-Xylenes	35.0	0.020	ug/L	40		87.6	75-125			
<i>Surrogate: 4-Bromofluorobenzene</i>	51.0		ug/L	50		102	75-125			

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs in Vapor by GC/MS - Quality Control										
<i>Batch B4K1011 - *** DEFAULT PREP ***</i>										
LCS Dup (B4K1011-BSD1)					Prepared & Analyzed: 10/29/14					
Benzene	17.6	0.020	ug/L	20		88.0	75-125	9.01	30	
tert-Butyl alcohol (TBA)	93.7	20	ug/L	100		93.7	75-125	8.55	30	
n-Butylbenzene	23.8	0.020	ug/L	20		119	75-125	7.60	30	
sec-Butylbenzene	18.8	0.020	ug/L	20		93.8	75-125	14.6	30	
1,2-Dichloroethane (EDC)	19.1	0.020	ug/L	20		95.6	75-125	1.76	30	
Ethylbenzene	18.4	0.020	ug/L	20		92.2	75-125	6.84	30	
Isopropylbenzene	16.7	0.020	ug/L	20		83.6	75-125	16.0	30	
Methyl-tert-Butyl Ether (MTBE)	18.4	1.0	ug/L	20		92.1	75-125	1.08	30	
n-Propylbenzene	18.3	0.020	ug/L	20		91.3	75-125	1.43	30	
Toluene	23.2	0.020	ug/L	20		116	75-125	17.7	30	
1,3,5-Trimethylbenzene	18.2	0.020	ug/L	20		90.9	75-125	13.7	30	
1,2,4-Trimethylbenzene	19.2	0.020	ug/L	20		96.2	75-125	1.34	30	
o-Xylene	16.4	0.020	ug/L	20		82.2	75-125	12.3	30	
m,p-Xylenes	33.4	0.020	ug/L	40		83.5	75-125	4.79	30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>50.0</i>		<i>ug/L</i>	<i>50</i>		<i>100</i>	<i>75-125</i>			
Duplicate (B4K1011-DUP1)					Source: 4J31003-03 Prepared & Analyzed: 10/29/14					
Benzene	<0.020	0.020	ug/L		<0.020				30	
tert-Butyl alcohol (TBA)	<20	20	ug/L		<20				30	
n-Butylbenzene	<0.020	0.020	ug/L		<0.020				30	
sec-Butylbenzene	<0.020	0.020	ug/L		<0.020				30	
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L		<0.020				30	
Ethylbenzene	<0.020	0.020	ug/L		<0.020				30	
Isopropanol (IPA)	0.450	0.29	ug/L		0.420			6.90	30	
Isopropylbenzene	<0.020	0.020	ug/L		<0.020				30	
Methyl-tert-Butyl Ether (MTBE)	<1.0	1.0	ug/L		<1.0				30	
n-Propylbenzene	<0.020	0.020	ug/L		<0.020				30	
Toluene	<0.020	0.020	ug/L		<0.020				30	
1,3,5-Trimethylbenzene	<0.020	0.020	ug/L		<0.020				30	
1,2,4-Trimethylbenzene	<0.020	0.020	ug/L		<0.020				30	
o-Xylene	<0.020	0.020	ug/L		<0.020				30	
m,p-Xylenes	<0.020	0.020	ug/L		<0.020				30	

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs in Vapor by GC/MS - Quality Control										
<i>Batch B4K1011 - *** DEFAULT PREP ***</i>										
Duplicate (B4K1011-DUP1) Continued Source: 4J31003-03 Prepared & Analyzed: 10/29/14										
<i>Surrogate: 4-Bromofluorobenzene</i>	47.4		ug/L	50		94.8	75-125			
<i>Batch B4K1106 - *** DEFAULT PREP ***</i>										
Blank (B4K1106-BLK1) Prepared & Analyzed: 10/29/14										
Benzene	<0.020	0.020	ug/L							
tert-Butyl alcohol (TBA)	<20	20	ug/L							
n-Butylbenzene	<0.020	0.020	ug/L							
sec-Butylbenzene	<0.020	0.020	ug/L							
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L							
Ethylbenzene	<0.020	0.020	ug/L							
Isopropanol (IPA)	<0.29	0.29	ug/L							
Isopropylbenzene	<0.020	0.020	ug/L							
Methyl-tert-Butyl Ether (MTBE)	<1.0	1.0	ug/L							
n-Propylbenzene	<0.020	0.020	ug/L							
Toluene	<0.020	0.020	ug/L							
1,3,5-Trimethylbenzene	<0.020	0.020	ug/L							
1,2,4-Trimethylbenzene	<0.020	0.020	ug/L							
o-Xylene	<0.020	0.020	ug/L							
m,p-Xylenes	<0.020	0.020	ug/L							
<i>Surrogate: 4-Bromofluorobenzene</i>	50.7		ug/L	50		101	75-125			
LCS (B4K1106-BS1) Prepared & Analyzed: 10/29/14										
Benzene	21.8	0.020	ug/L	20		109	75-125			
tert-Butyl alcohol (TBA)	91.5	20	ug/L	100		91.5	75-125			
n-Butylbenzene	24.4	0.020	ug/L	20		122	75-125			
sec-Butylbenzene	24.1	0.020	ug/L	20		121	75-125			
1,2-Dichloroethane (EDC)	27.2	0.020	ug/L	20		136	75-125			AA-C1
Ethylbenzene	22.6	0.020	ug/L	20		113	75-125			
Isopropylbenzene	23.8	0.020	ug/L	20		119	75-125			
Methyl-tert-Butyl Ether (MTBE)	25.2	1.0	ug/L	20		126	75-125			AA-C1
n-Propylbenzene	23.8	0.020	ug/L	20		119	75-125			
Toluene	22.0	0.020	ug/L	20		110	75-125			
1,3,5-Trimethylbenzene	24.2	0.020	ug/L	20		121	75-125			

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs in Vapor by GC/MS - Quality Control										
<i>Batch B4K1106 - *** DEFAULT PREP ***</i>										
LCS (B4K1106-BS1) Continued					Prepared & Analyzed: 10/29/14					
1,2,4-Trimethylbenzene	24.5	0.020	ug/L	20		122	75-125			
o-Xylene	24.1	0.020	ug/L	20		120	75-125			
m,p-Xylenes	47.4	0.020	ug/L	40		119	75-125			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>54.2</i>		<i>ug/L</i>	<i>50</i>		<i>108</i>	<i>75-125</i>			
LCS Dup (B4K1106-BSD1)					Prepared & Analyzed: 10/29/14					
Benzene	20.4	0.020	ug/L	20		102	75-125	7.01	30	
tert-Butyl alcohol (TBA)	86.6	20	ug/L	100		86.6	75-125	5.58	30	
n-Butylbenzene	22.9	0.020	ug/L	20		114	75-125	6.43	30	
sec-Butylbenzene	22.4	0.020	ug/L	20		112	75-125	7.48	30	
1,2-Dichloroethane (EDC)	24.7	0.020	ug/L	20		124	75-125	9.63	30	
Ethylbenzene	19.8	0.020	ug/L	20		99.0	75-125	13.4	30	
Isopropylbenzene	21.8	0.020	ug/L	20		109	75-125	8.84	30	
Methyl-tert-Butyl Ether (MTBE)	24.0	1.0	ug/L	20		120	75-125	4.80	30	
n-Propylbenzene	22.0	0.020	ug/L	20		110	75-125	7.68	30	
Toluene	20.2	0.020	ug/L	20		101	75-125	8.15	30	
1,3,5-Trimethylbenzene	22.3	0.020	ug/L	20		111	75-125	8.27	30	
1,2,4-Trimethylbenzene	22.7	0.020	ug/L	20		113	75-125	7.55	30	
o-Xylene	22.1	0.020	ug/L	20		110	75-125	8.62	30	
m,p-Xylenes	42.6	0.020	ug/L	40		106	75-125	10.8	30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>53.8</i>		<i>ug/L</i>	<i>50</i>		<i>108</i>	<i>75-125</i>			
Duplicate (B4K1106-DUP1)					Source: 4J31003-05 Prepared & Analyzed: 10/29/14					
Benzene	2.85	2.0	ug/L		2.90			1.74	30	
tert-Butyl alcohol (TBA)	<2000	2000	ug/L		<2000				30	
n-Butylbenzene	<2.0	2.0	ug/L		<2.0				30	
sec-Butylbenzene	<2.0	2.0	ug/L		<2.0				30	
1,2-Dichloroethane (EDC)	<2.0	2.0	ug/L		<2.0				30	
Ethylbenzene	<2.0	2.0	ug/L		<2.0				30	
Isopropanol (IPA)	<29	29	ug/L		<29				30	
Isopropylbenzene	<2.0	2.0	ug/L		<2.0				30	
Methyl-tert-Butyl Ether (MTBE)	<100	100	ug/L		<100				30	
n-Propylbenzene	<2.0	2.0	ug/L		<2.0				30	

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs in Vapor by GC/MS - Quality Control										
<i>Batch B4K1106 - *** DEFAULT PREP ***</i>										
Duplicate (B4K1106-DUP1) Continued Source: 4J31003-05 Prepared & Analyzed: 10/29/14										
Toluene	<2.0	2.0	ug/L		<2.0				30	
1,3,5-Trimethylbenzene	<2.0	2.0	ug/L		<2.0				30	
1,2,4-Trimethylbenzene	<2.0	2.0	ug/L		<2.0				30	
o-Xylene	<2.0	2.0	ug/L		<2.0				30	
m,p-Xylenes	<2.0	2.0	ug/L		<2.0				30	
<i>Surrogate: 4-Bromofluorobenzene</i>	51.1		ug/L	50		102	75-125			
Gasoline Range Organics in Vapor by GC/MS - Field - Quality Control										
<i>Batch B4K1214 - *** DEFAULT PREP ***</i>										
Blank (B4K1214-BLK1) Prepared & Analyzed: 10/29/14										
Gasoline Range Organics (GRO)	<20	20	ug/L							
<i>Surrogate: 4-Bromofluorobenzene</i>	50.2		ug/L	50		100	70-130			
LCS (B4K1214-BS1) Prepared & Analyzed: 10/29/14										
Gasoline Range Organics (GRO)	520	20	ug/L	500		104	75-125			
<i>Surrogate: 4-Bromofluorobenzene</i>	51.3		ug/L	50		103	70-130			
LCS Dup (B4K1214-BSD1) Prepared & Analyzed: 10/29/14										
Gasoline Range Organics (GRO)	518	20	ug/L	500		104	75-125	0.218	30	
<i>Surrogate: 4-Bromofluorobenzene</i>	51.6		ug/L	50		103	70-130			
Duplicate (B4K1214-DUP1) Source: 4J31003-05 Prepared & Analyzed: 10/29/14										
Gasoline Range Organics (GRO)	19800	100	ug/L		21100			6.61	30	
<i>Surrogate: 4-Bromofluorobenzene</i>	50.6		ug/L	50		101	70-130			
<i>Batch B4K1215 - *** DEFAULT PREP ***</i>										
Blank (B4K1215-BLK1) Prepared & Analyzed: 10/29/14										
Gasoline Range Organics (GRO)	<20	20	ug/L							
<i>Surrogate: 4-Bromofluorobenzene</i>	47.1		ug/L	50		94.2	70-130			
LCS (B4K1215-BS1) Prepared & Analyzed: 10/29/14										
Gasoline Range Organics (GRO)	444	20	ug/L	500		88.8	75-125			
<i>Surrogate: 4-Bromofluorobenzene</i>	47.2		ug/L	50		94.4	70-130			
LCS Dup (B4K1215-BSD1) Prepared & Analyzed: 10/29/14										

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Gasoline Range Organics in Vapor by GC/MS - Field - Quality Control										
<i>Batch B4K1215 - *** DEFAULT PREP ***</i>										
LCS Dup (B4K1215-BSD1) Continued					Prepared & Analyzed: 10/29/14					
Gasoline Range Organics (GRO)	395	20	ug/L	500	79.1	75-125	11.6	30		
Surrogate: 4-Bromofluorobenzene	47.2		ug/L	50	94.4	70-130				
Duplicate (B4K1215-DUP1)					Source: 4J31003-03 Prepared & Analyzed: 10/29/14					
Gasoline Range Organics (GRO)	<20	20	ug/L	<20				30		
Surrogate: 4-Bromofluorobenzene	48.2		ug/L	50	96.4	70-130				

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187296
Date Received: 10/29/14
Date Reported: 11/13/14

Special Notes

[1] = **AA-C1** : The percent recovery for this analyte exceeds acceptance criteria.

Eydie Schwartz

Eydie Schwartz
Project Manager



AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311

Tel: 818-998-5547 FAX: 818-998-7258

A.A. COC No.: 121109

70041377

Page 1 of 1

Client: C. W. Hill Project Name / No.: KINDER MORGAN NORWALK Sampler's Name: William Schmitt
 Project Manager: DAN JABLONSKI Site Address: 15306 NORWALK BLVD Sampler's Signature: [Signature]
 Phone: _____ City: NORWALK P.O. No.: _____
 Fax: _____ State & Zip: CA Quote No.: _____

TAT Turnaround Codes **

- ① = Same Day Rush
- ② = 24 Hour Rush
- ③ = 48 Hour Rush
- ④ = 72 Hour Rush
- ⑤ = 5 Day Rush
- X = 10 Working Days (Standard TAT)

ANALYSIS REQUESTED (Test Name)

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	Please enter the TAT Turnaround Codes ** below										Special Instructions		
						①	②	③	④	⑤	X							
SVM-12-15	4331003-01	10-29-14	0745	V	3	X	X											PV3
AMBIENT AIR	2		0750	V	2	X												
SVM-12-7	3		0812	V	3	X	X											PV3
SVM-12-7 DUP	4		0812	V	3	X	X											PV3
SVM-12-22	5		0842	V	3	X	X											PV10
SVM-12-22 DUP	6		0842	V	1	X												PV10
SVM-2-5	7		0959	V	2	X	X											PV3
SVM-2-14.5	8		1021	V	2	X	X											PV3
SVM-1-14.5	9		1110	V	2	X	X											PV3
SVM-1-5	10		1136	V	2	X	X											PV3
SVM-10-15.5	11		1205	V	2	X	X											PV3
SVM-7-13	12		1245	V	2	X	X											PV3
SVM-7-7	13		1322	V	2	X	X											PV3
SVM-6-6.5	14		1403	V	2	X	X											PV3
SVM-6-15.5	15	0	1455	V	2	X	X											PV3

REVIEWED Date <u>10/31/14</u> Time <u>0853</u> TAT <u>N</u> Days Sign: <u>E. Schwarz</u>	Relinquished by <u>[Signature]</u>	Date <u>10-29-14</u>	Time <u>1500</u>	Received by <u>[Signature]</u>
	Relinquished by <u>[Signature]</u>	Date <u>10/29/14</u>	Time <u>1700</u>	Received by <u>Eydie Schwarz</u>
	Relinquished by	Date	Time	Received by

A.A. Project No.: mb187296/4331003

Note: By relinquishing samples to American Analytics, client agrees to pay for the services requested on this chain of custody form and any additional client-requested analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 45 days following the submittal of the sample(s) to American Analytics.



9765 Eton Avenue
Chatsworth
California 91311
Tel: (818) 998-5547
Fax: (818) 998-7258

November 25, 2014

Dan Jablonski
CH2M Hill, Inc.
1000 Wilshire Blvd., Suite 2100
Los Angeles, CA 90017-2457

Re : KMEP Norwalk Biosparge Startup / 496965.A1.01
MB187297 / 4K05008

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received on 10/31/14 14:45 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Assurance Program Manual, applicable standard operating procedures, and other related documentation. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report or require additional information please call me at American Analyticals.

Sincerely,

A handwritten signature in black ink that reads 'Eydie Schwartz'.

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187297
Date Received: 10/31/14
Date Reported: 11/25/14

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
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Fixed Gases - Field

SVM-12-15 PV3	4K05008-03	Vapor	0	10/31/14 08:13	10/31/14 14:45
SVM-12-7 RR PV3	4K05008-04	Vapor	0	10/31/14 08:40	10/31/14 14:45
SVM-9-14.5 PV3	4K05008-05	Vapor	0	10/31/14 09:22	10/31/14 14:45
SVM-9-5 PV3	4K05008-06	Vapor	0	10/31/14 09:55	10/31/14 14:45
SVM-3-15 PV3	4K05008-07	Vapor	0	10/31/14 10:35	10/31/14 14:45
SVM-3-5 PV3	4K05008-08	Vapor	0	10/31/14 11:18	10/31/14 14:45
SVM-6-6.5 PV3	4K05008-10	Vapor	0	10/31/14 12:43	10/31/14 14:45
SVM-6-15.5 PV3	4K05008-11	Vapor	0	10/31/14 13:10	10/31/14 14:45
SVM-2-14.5 PV3	4K05008-12	Vapor	0	10/31/14 13:45	10/31/14 14:45
SVM-1-14.5 PV3	4K05008-13	Vapor	0	10/31/14 14:20	10/31/14 14:45
SVM-1-14.5 DUP PV3	4K05008-14	Vapor	0	10/31/14 14:20	10/31/14 14:45

VOCs by GC/MS CH2M - FIELD

Ambient Air	4K05008-01	Vapor	0	10/31/14 07:35	10/31/14 14:45
SVM-12-15 PV3	4K05008-03	Vapor	0	10/31/14 08:13	10/31/14 14:45
SVM-12-7 RR PV3	4K05008-04	Vapor	0	10/31/14 08:40	10/31/14 14:45
SVM-9-14.5 PV3	4K05008-05	Vapor	0	10/31/14 09:22	10/31/14 14:45
SVM-9-5 PV3	4K05008-06	Vapor	0	10/31/14 09:55	10/31/14 14:45
SVM-3-15 PV3	4K05008-07	Vapor	0	10/31/14 10:35	10/31/14 14:45

Eydie Schwartz

Eydie Schwartz
Project Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187297
Date Received: 10/31/14
Date Reported: 11/25/14

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-3-5 PV3	4K05008-08	Vapor	0	10/31/14 11:18	10/31/14 14:45
SVM-6-6.5 PV3	4K05008-10	Vapor	0	10/31/14 12:43	10/31/14 14:45
SVM-6-15.5 PV3	4K05008-11	Vapor	0	10/31/14 13:10	10/31/14 14:45
SVM-2-14.5 PV3	4K05008-12	Vapor	0	10/31/14 13:45	10/31/14 14:45
SVM-1-14.5 PV3	4K05008-13	Vapor	0	10/31/14 14:20	10/31/14 14:45

VOCs Gasoline Range Organics GC/MS Vapor -

Ambient Air	4K05008-01	Vapor	0	10/31/14 07:35	10/31/14 14:45
SVM-12-15 PV3	4K05008-03	Vapor	0	10/31/14 08:13	10/31/14 14:45
SVM-12-7 RR PV3	4K05008-04	Vapor	0	10/31/14 08:40	10/31/14 14:45
SVM-9-14.5 PV3	4K05008-05	Vapor	0	10/31/14 09:22	10/31/14 14:45
SVM-9-5 PV3	4K05008-06	Vapor	0	10/31/14 09:55	10/31/14 14:45
SVM-3-15 PV3	4K05008-07	Vapor	0	10/31/14 10:35	10/31/14 14:45
SVM-3-5 PV3	4K05008-08	Vapor	0	10/31/14 11:18	10/31/14 14:45
SVM-6-6.5 PV3	4K05008-10	Vapor	0	10/31/14 12:43	10/31/14 14:45
SVM-6-15.5 PV3	4K05008-11	Vapor	0	10/31/14 13:10	10/31/14 14:45
SVM-2-14.5 PV3	4K05008-12	Vapor	0	10/31/14 13:45	10/31/14 14:45
SVM-1-14.5 PV3	4K05008-13	Vapor	0	10/31/14 14:20	10/31/14 14:45

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187297
Date Received: 10/31/14
Date Reported: 11/25/14

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Fixed Gases by TCD								
Oxygen	SVM-12-15 PV3	12	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Carbon Dioxide	SVM-12-15 PV3	3.8	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Oxygen	SVM-12-7 RR PV3	17	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Carbon Dioxide	SVM-12-7 RR PV3	0.75	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Oxygen	SVM-9-14.5 PV3	13	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Carbon Dioxide	SVM-9-14.5 PV3	5.2	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Oxygen	SVM-9-5 PV3	17	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Carbon Dioxide	SVM-9-5 PV3	1.0	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Oxygen	SVM-3-15 PV3	11	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Carbon Dioxide	SVM-3-15 PV3	1.6	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD

Eydie Schwartz

Eydie Schwartz
Project Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187297
Date Received: 10/31/14
Date Reported: 11/25/14

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-3-5 PV3	16	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Carbon Dioxide	SVM-3-5 PV3	0.69	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Oxygen	SVM-6-6.5 PV3	16	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Carbon Dioxide	SVM-6-6.5 PV3	0.23	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Oxygen	SVM-6-15.5 PV3	7.0	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Carbon Dioxide	SVM-6-15.5 PV3	0.17	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Oxygen	SVM-2-14.5 PV3	17	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Carbon Dioxide	SVM-2-14.5 PV3	0.30	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Oxygen	SVM-1-14.5 PV3	15	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Carbon Dioxide	SVM-1-14.5 PV3	0.50	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD
Oxygen	SVM-1-14.5 DUP PV3	15	0.10	% by Volume	1	10/31/14	10/31/14	VOCs by GC/TCD

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187297
Date Received: 10/31/14
Date Reported: 11/25/14

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Carbon Dioxide	SVM-1-14.5 DUP PV3	0.49	0.10	% by Volum e	1	10/31/14	10/31/14	VOCs by GC/TCD

Gasoline Range Organics in Vapor by GC/MS - Field

VOCs in Vapor by GC/MS

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187297
Date Received: 10/31/14
Date Reported: 11/25/14
Units: % by Volume

Date Sampled:	10/31/14	10/31/14	10/31/14	10/31/14	
Date Prepared:	10/31/14	10/31/14	10/31/14	10/31/14	
Date Analyzed:	10/31/14	10/31/14	10/31/14	10/31/14	
AA ID No:	4K05008-03	4K05008-04	4K05008-05	4K05008-06	
Client ID No:	SVM-12-15 PV3	SVM-12-7 RR PV3	SVM-9-14.5 PV3	SVM-9-5 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (VOCs by GC/TCD)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	12	17	13	17	0.10
Carbon Dioxide	3.8	0.75	5.2	1.0	0.10

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187297
Date Received: 10/31/14
Date Reported: 11/25/14
Units: % by Volume

Date Sampled:	10/31/14	10/31/14	10/31/14	10/31/14	
Date Prepared:	10/31/14	10/31/14	10/31/14	10/31/14	
Date Analyzed:	10/31/14	10/31/14	10/31/14	10/31/14	
AA ID No:	4K05008-07	4K05008-08	4K05008-10	4K05008-11	
Client ID No:	SVM-3-15 PV3	SVM-3-5 PV3	SVM-6-6.5 PV3	SVM-6-15.5 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (VOCs by GC/TCD)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	11	16	16	7.0	0.10
Carbon Dioxide	1.6	0.69	0.23	0.17	0.10

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187297
Date Received: 10/31/14
Date Reported: 11/25/14
Units: % by Volume

Date Sampled:	10/31/14	10/31/14	10/31/14	
Date Prepared:	10/31/14	10/31/14	10/31/14	
Date Analyzed:	10/31/14	10/31/14	10/31/14	
AA ID No:	4K05008-12	4K05008-13	4K05008-14	
Client ID No:	SVM-2-14.5 PV3	SVM-1-14.5 PV3	SVM-1-14.5 DUP PV3	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	MRL

Fixed Gases - Field (VOCs by GC/TCD)

Methane	<0.10	<0.10	<0.10	0.10
Oxygen	17	15	15	0.10
Carbon Dioxide	0.30	0.50	0.49	0.10

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs in Vapor by GC/MS

AA Project No: MB187297
Date Received: 10/31/14
Date Reported: 11/25/14
Units: ug/L

	10/31/14	10/31/14	10/31/14	10/31/14	
Date Sampled:	10/31/14	10/31/14	10/31/14	10/31/14	
Date Prepared:	10/31/14	10/31/14	10/31/14	10/31/14	
Date Analyzed:	10/31/14	10/31/14	10/31/14	10/31/14	
AA ID No:	4K05008-01	4K05008-03	4K05008-04	4K05008-05	
Client ID No:	Ambient Air	SVM-12-15 PV3	SVM-12-7 RR PV3	SVM-9-14.5 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

VOCs by GC/MS CH2M - FIELD (VOCs by GC/FID/PID)

Benzene	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.29	<0.29	<0.29	<0.29	0.29
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Methyl-tert-Butyl Ether (MTBE)	<1.0	<1.0	<1.0	<1.0	1.0
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020

<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	97%	96%	95%	98%	75-125

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs in Vapor by GC/MS

AA Project No: MB187297
Date Received: 10/31/14
Date Reported: 11/25/14
Units: ug/L

Date Sampled:	10/31/14	10/31/14	10/31/14	10/31/14	
Date Prepared:	10/31/14	10/31/14	10/31/14	10/31/14	
Date Analyzed:	10/31/14	10/31/14	10/31/14	10/31/14	
AA ID No:	4K05008-06	4K05008-07	4K05008-08	4K05008-10	
Client ID No:	SVM-9-5 PV3	SVM-3-15 PV3	SVM-3-5 PV3	SVM-6-6.5 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

VOCs by GC/MS CH2M - FIELD (VOCs by GC/FID/PID)

Benzene	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.29	<0.29	<0.29	<0.29	0.29
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Methyl-tert-Butyl Ether (MTBE)	<1.0	<1.0	<1.0	<1.0	1.0
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020

Surrogates					%REC Limits
4-Bromofluorobenzene	98%	98%	95%	94%	75-125

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs in Vapor by GC/MS

AA Project No: MB187297
Date Received: 10/31/14
Date Reported: 11/25/14
Units: ug/L

Date Sampled:	10/31/14	10/31/14	10/31/14	
Date Prepared:	10/31/14	10/31/14	10/31/14	
Date Analyzed:	10/31/14	10/31/14	10/31/14	
AA ID No:	4K05008-11	4K05008-12	4K05008-13	
Client ID No:	SVM-6-15.5 PV3	SVM-2-14.5 PV3	SVM-1-14.5 PV3	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	MRL

VOCs by GC/MS CH2M - FIELD (VOCs by GC/FID/PID)

Benzene	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	20
n-Butylbenzene	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.29	<0.29	<0.29	0.29
Isopropylbenzene	<0.020	<0.020	<0.020	0.020
Methyl-tert-Butyl Ether (MTBE)	<1.0	<1.0	<1.0	1.0
n-Propylbenzene	<0.020	<0.020	<0.020	0.020
Toluene	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	0.020

Surrogates				<u>%REC Limits</u>
4-Bromofluorobenzene	97%	95%	95%	75-125

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187297
Project No:	496965.A1.01	Date Received:	10/31/14
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	11/25/14
Method:	Gasoline Range Organics in Vapor by GC/MS - Field	Units:	ug/L

Date Sampled:	10/31/14	10/31/14	10/31/14	10/31/14	
Date Prepared:	10/31/14	10/31/14	10/31/14	10/31/14	
Date Analyzed:	10/31/14	10/31/14	10/31/14	10/31/14	
AA ID No:	4K05008-01	4K05008-03	4K05008-04	4K05008-05	
Client ID No:	Ambient Air	SVM-12-15 PV3	SVM-12-7 RR PV3	SVM-9-14.5 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

VOCs Gasoline Range Organics GC/MS Vapor - FIELD (EPA 8260M)

Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
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<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	96%	97%	96%	100%	70-130

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187297
Project No:	496965.A1.01	Date Received:	10/31/14
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	11/25/14
Method:	Gasoline Range Organics in Vapor by GC/MS - Field	Units:	ug/L

Date Sampled:	10/31/14	10/31/14	10/31/14	10/31/14	
Date Prepared:	10/31/14	10/31/14	10/31/14	10/31/14	
Date Analyzed:	10/31/14	10/31/14	10/31/14	10/31/14	
AA ID No:	4K05008-06	4K05008-07	4K05008-08	4K05008-10	
Client ID No:	SVM-9-5 PV3	SVM-3-15 PV3	SVM-3-5 PV3	SVM-6-6.5 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

VOCs Gasoline Range Organics GC/MS Vapor - FIELD (EPA 8260M)

Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
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<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	100%	99%	97%	96%	70-130

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187297
Project No:	496965.A1.01	Date Received:	10/31/14
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	11/25/14
Method:	Gasoline Range Organics in Vapor by GC/MS - Field	Units:	ug/L

Date Sampled:	10/31/14	10/31/14	10/31/14	
Date Prepared:	10/31/14	10/31/14	10/31/14	
Date Analyzed:	10/31/14	10/31/14	10/31/14	
AA ID No:	4K05008-11	4K05008-12	4K05008-13	
Client ID No:	SVM-6-15.5 PV3	SVM-2-14.5 PV3	SVM-1-14.5 PV3	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	MRL

VOCs Gasoline Range Organics GC/MS Vapor - FIELD (EPA 8260M)

Gasoline Range Organics (GRO)	<20	<20	<20	20
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<u>Surrogates</u>				<u>%REC Limits</u>
4-Bromofluorobenzene	98%	97%	97%	70-130

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187297
Date Received: 10/31/14
Date Reported: 11/25/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
<i>Batch B4K1119 - *** DEFAULT PREP ***</i>										
Blank (B4K1119-BLK1) Prepared & Analyzed: 10/31/14										
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B4K1119-BS1) Prepared & Analyzed: 10/31/14										
Methane	4.57	0.10	% by Volume	4.5		101	75-125			
Oxygen	3.92	0.10	% by Volume	4.0		98.1	75-125			
Carbon Dioxide	13.6	0.10	% by Volume	15		90.5	75-125			
LCS Dup (B4K1119-BSD1) Prepared & Analyzed: 10/31/14										
Methane	4.58	0.10	% by Volume	4.5		102	75-125	0.241	30	
Oxygen	4.07	0.10	% by Volume	4.0		102	75-125	3.78	30	
Carbon Dioxide	13.4	0.10	% by Volume	15		89.2	75-125	1.42	30	
Duplicate (B4K1119-DUP1) Source: 4K05008-13 Prepared & Analyzed: 10/31/14										
Methane	<0.10	0.10	% by Volume		<0.10				30	
Oxygen	15.0	0.10	% by Volume		15.2			0.881	30	
Carbon Dioxide	0.489	0.10	% by Volume		0.498			1.82	30	

VOCs in Vapor by GC/MS - Quality Control

*Batch B4K1012 - *** DEFAULT PREP ****

Blank (B4K1012-BLK1)

Prepared & Analyzed: 10/31/14

Benzene	<0.020	0.020	ug/L	
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Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187297
Date Received: 10/31/14
Date Reported: 11/25/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs in Vapor by GC/MS - Quality Control										
Batch B4K1012 - *** DEFAULT PREP ***										
Blank (B4K1012-BLK1) Continued										
Prepared & Analyzed: 10/31/14										
tert-Butyl alcohol (TBA)	<20	20	ug/L							
n-Butylbenzene	<0.020	0.020	ug/L							
sec-Butylbenzene	<0.020	0.020	ug/L							
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L							
Ethylbenzene	<0.020	0.020	ug/L							
Isopropanol (IPA)	<0.29	0.29	ug/L							
Isopropylbenzene	<0.020	0.020	ug/L							
Methyl-tert-Butyl Ether (MTBE)	<1.0	1.0	ug/L							
n-Propylbenzene	<0.020	0.020	ug/L							
Toluene	<0.020	0.020	ug/L							
1,3,5-Trimethylbenzene	<0.020	0.020	ug/L							
1,2,4-Trimethylbenzene	<0.020	0.020	ug/L							
o-Xylene	<0.020	0.020	ug/L							
m,p-Xylenes	<0.020	0.020	ug/L							
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>44.2</i>		<i>ug/L</i>	<i>50</i>		<i>88.4</i>	<i>75-125</i>			
LCS (B4K1012-BS1)										
Prepared & Analyzed: 10/31/14										
Benzene	19.3	0.020	ug/L	20		96.3	75-125			
tert-Butyl alcohol (TBA)	84.8	20	ug/L	100		84.8	75-125			
n-Butylbenzene	34.7	0.020	ug/L	20		174	75-125			AA-C1
sec-Butylbenzene	27.7	0.020	ug/L	20		139	75-125			AA-C1
1,2-Dichloroethane (EDC)	19.3	0.020	ug/L	20		96.4	75-125			
Ethylbenzene	19.5	0.020	ug/L	20		97.7	75-125			
Isopropylbenzene	24.0	0.020	ug/L	20		120	75-125			
Methyl-tert-Butyl Ether (MTBE)	17.3	1.0	ug/L	20		86.4	75-125			
n-Propylbenzene	23.0	0.020	ug/L	20		115	75-125			
Toluene	20.7	0.020	ug/L	20		104	75-125			
1,3,5-Trimethylbenzene	25.4	0.020	ug/L	20		127	75-125			AA-C1
1,2,4-Trimethylbenzene	27.4	0.020	ug/L	20		137	75-125			AA-C1
o-Xylene	21.9	0.020	ug/L	20		110	75-125			
m,p-Xylenes	43.2	0.020	ug/L	40		108	75-125			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>47.2</i>		<i>ug/L</i>	<i>50</i>		<i>94.4</i>	<i>75-125</i>			

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187297
Date Received: 10/31/14
Date Reported: 11/25/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs in Vapor by GC/MS - Quality Control										
<i>Batch B4K1012 - *** DEFAULT PREP ***</i>										
LCS Dup (B4K1012-BSD1)										
Prepared & Analyzed: 10/31/14										
Benzene	28.4	0.020	ug/L	20		142	75-125	38.3	30	AA-C1
tert-Butyl alcohol (TBA)	105	20	ug/L	100		105	75-125	21.1	30	
n-Butylbenzene	39.8	0.020	ug/L	20		199	75-125	13.5	30	AA-C1
sec-Butylbenzene	25.1	0.020	ug/L	20		126	75-125	9.76	30	AA-C1
1,2-Dichloroethane (EDC)	23.6	0.020	ug/L	20		118	75-125	20.3	30	
Ethylbenzene	18.8	0.020	ug/L	20		93.8	75-125	4.07	30	
Isopropylbenzene	20.0	0.020	ug/L	20		100	75-125	18.0	30	
Methyl-tert-Butyl Ether (MTBE)	18.8	1.0	ug/L	20		94.0	75-125	8.43	30	
n-Propylbenzene	23.0	0.020	ug/L	20		115	75-125	0.174	30	
Toluene	23.0	0.020	ug/L	20		115	75-125	10.6	30	
1,3,5-Trimethylbenzene	22.5	0.020	ug/L	20		112	75-125	12.1	30	
1,2,4-Trimethylbenzene	26.6	0.020	ug/L	20		133	75-125	3.11	30	AA-C1
o-Xylene	20.2	0.020	ug/L	20		101	75-125	8.07	30	
m,p-Xylenes	42.6	0.020	ug/L	40		107	75-125	1.30	30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>53.7</i>		<i>ug/L</i>	<i>50</i>		<i>107</i>	<i>75-125</i>			

Gasoline Range Organics in Vapor by GC/MS - Field - Quality Control

*Batch B4K1217 - *** DEFAULT PREP ****

Blank (B4K1217-BLK1)

Prepared & Analyzed: 10/31/14

Gasoline Range Organics (GRO)	<20	20	ug/L							
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>44.9</i>		<i>ug/L</i>	<i>50</i>		<i>89.8</i>	<i>70-130</i>			

LCS (B4K1217-BS1)

Prepared & Analyzed: 10/31/14

Gasoline Range Organics (GRO)	458	20	ug/L	500		91.5	75-125			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>50.8</i>		<i>ug/L</i>	<i>50</i>		<i>102</i>	<i>70-130</i>			

LCS Dup (B4K1217-BSD1)

Prepared & Analyzed: 10/31/14

Gasoline Range Organics (GRO)	413	20	ug/L	500		82.7	75-125	10.2	30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>53.6</i>		<i>ug/L</i>	<i>50</i>		<i>107</i>	<i>70-130</i>			

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187297
Date Received: 10/31/14
Date Reported: 11/25/14

Special Notes

[1] = **AA-C1** : The percent recovery for this analyte exceeds acceptance criteria.

Eydie Schwartz

Eydie Schwartz
Project Manager



AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311

Tel: 818-998-5547 FAX: 818-998-7258

A.A. COC No.: 12133

70041375

Page 1 of 1

Client: CH2M HILL Project Name/No.: KINDON MORGAN NORWALK Sampler's Name: William K. Korman

Project Manager: DAN JARON Site Address: 15306 NORWALK BLVD. Sampler's Signature: [Signature]

Phone: City: NORWALK P.O. No.:

Fax: State & Zip: CA Quote No.:

TAT Turnaround Codes **

- ① = Same Day Rush
- ② = 24 Hour Rush
- ③ = 48 Hour Rush
- ④ = 72 Hour Rush
- ⑤ = 5 Day Rush
- X = 10 Working Days (Standard TAT)

ANALYSIS REQUESTED (Test Name)

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	Please enter the TAT Turnaround Codes ** below										Special Instructions				
						1	2	3	4	5	X									
AMBIENT AIR	4K05008-01	10-31-14	0735	V	2	X														
SUM-12-7	2		0740	V	2	X														PV3 200
SUM-12-15	3		0813	V	2	X	X													PV3
SUM-12-7 RL	4		0840	V	2	X	X													PV3
SUM-9-14.5	5		0922	V	2	X	X													PV3
SUM-9-5	6		0955	V	2	X	X													PV3
SUM-3-15	7		1035	V	2	X	X													PV3
SUM-3-5	8		1118	V	2	X	X													PV3
SUM-3-15AA	9		1205	V	2	X	X													PV3
SUM-6-6.5	10		1243	V	2	X	X													PV3
SUM-6-15.5	11		1310	V	2	X	X													PV3
SUM-2-14.5	12		1345	V	2	X	X													PV3
SUM-1-14.5	13		1420	V	2	X	X													PV3
SUM-1-14.5	14	10-31-14	1420	V	2	X	X													PV3

For Laboratory Use
REVIEWED
 Date 11/3/14 Time 1521
 TAT N Days Sign: [Signature]

Relinquished by <u>[Signature]</u>	Date <u>10-31-14</u>	Time <u>1445</u>	Received by <u>[Signature]</u>
Relinquished by <u>[Signature]</u>	Date <u>10/31/14</u>	Time <u>1700</u>	Received by <u>[Signature]</u>
Relinquished by	Date	Time	Received by

A.A. Project No.: MB181297/4K05008

Note: By relinquishing samples to American Analytics, client agrees to pay for the services requested on this chain of custody form and any additional client-requested analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 45 days following the submittal of the sample(s) to American Analytics.



9765 Eton Avenue
Chatsworth
California 91311
Tel: (818) 998-5547
Fax: (818) 998-7258

November 25, 2014

Dan Jablonski
CH2M Hill, Inc.
1000 Wilshire Blvd., Suite 2100
Los Angeles, CA 90017-2457

Re : KMEP Norwalk Biosparge Startup / 496965.A1.01
MB187298 / 4K06002

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received on 10/30/14 14:25 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Assurance Program Manual, applicable standard operating procedures, and other related documentation. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report or require additional information please call me at American Analyticals.

Sincerely,

A handwritten signature in black ink that reads 'Eydie Schwartz'.

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
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Fixed Gases - Field

SVM-16-15.5 PV3	4K06002-01	Vapor	5	10/30/14 07:45	10/30/14 14:25
SVM-16-7 PV3	4K06002-03	Vapor	5	10/30/14 08:25	10/30/14 14:25
SVM-16-22 PV10	4K06002-04	Vapor	5	10/30/14 08:47	10/30/14 14:25
SVM-8-15 PV3	4K06002-05	Vapor	5	10/30/14 09:20	10/30/14 14:25
SVM-8-5 PV3	4K06002-06	Vapor	5	10/30/14 09:50	10/30/14 14:25
SVM-5-5 PV3	4K06002-07	Vapor	5	10/30/14 11:12	10/30/14 14:25
SVM-5-15.5 PV3	4K06002-08	Vapor	5	10/30/14 11:41	10/30/14 14:25
SVM-5-15.5 DUP PV3	4K06002-09	Vapor	5	10/30/14 11:41	10/30/14 14:25
SVM-16-15.5 RR PV3	4K06002-10	Vapor	5	10/30/14 12:55	10/30/14 14:25
SVM-15-7 PV3	4K06002-11	Vapor	5	10/30/14 13:30	10/30/14 14:25
SVM-15-15 PV3	4K06002-12	Vapor	5	10/30/14 14:05	10/30/14 14:25
SVM-15-22 PV10	4K06002-13	Vapor	5	10/30/14 14:25	10/30/14 14:25

VOCs by GC/MS CH2M - FIELD

SVM-16-15.5 PV3	4K06002-01	Vapor	5	10/30/14 07:45	10/30/14 14:25
Ambient Air	4K06002-02	Vapor	5	10/30/14 08:00	10/30/14 14:25
SVM-16-7 PV3	4K06002-03	Vapor	5	10/30/14 08:25	10/30/14 14:25
SVM-16-22 PV10	4K06002-04	Vapor	5	10/30/14 08:47	10/30/14 14:25
SVM-8-15 PV3	4K06002-05	Vapor	5	10/30/14 09:20	10/30/14 14:25

Eydie Schwartz

Eydie Schwartz
Project Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-8-5 PV3	4K06002-06	Vapor	5	10/30/14 09:50	10/30/14 14:25
SVM-5-5 PV3	4K06002-07	Vapor	5	10/30/14 11:12	10/30/14 14:25
SVM-5-15.5 PV3	4K06002-08	Vapor	5	10/30/14 11:41	10/30/14 14:25
SVM-5-15.5 DUP PV3	4K06002-09	Vapor	5	10/30/14 11:41	10/30/14 14:25
SVM-16-15.5 RR PV3	4K06002-10	Vapor	5	10/30/14 12:55	10/30/14 14:25
SVM-15-7 PV3	4K06002-11	Vapor	5	10/30/14 13:30	10/30/14 14:25
SVM-15-15 PV3	4K06002-12	Vapor	5	10/30/14 14:05	10/30/14 14:25
SVM-15-22 PV10	4K06002-13	Vapor	5	10/30/14 14:25	10/30/14 14:25

VOCs Gasoline Range Organics GC/MS Vapor -

SVM-16-15.5 PV3	4K06002-01	Vapor	5	10/30/14 07:45	10/30/14 14:25
Ambient Air	4K06002-02	Vapor	5	10/30/14 08:00	10/30/14 14:25
SVM-16-7 PV3	4K06002-03	Vapor	5	10/30/14 08:25	10/30/14 14:25
SVM-16-22 PV10	4K06002-04	Vapor	5	10/30/14 08:47	10/30/14 14:25
SVM-8-15 PV3	4K06002-05	Vapor	5	10/30/14 09:20	10/30/14 14:25
SVM-8-5 PV3	4K06002-06	Vapor	5	10/30/14 09:50	10/30/14 14:25
SVM-5-5 PV3	4K06002-07	Vapor	5	10/30/14 11:12	10/30/14 14:25
SVM-5-15.5 PV3	4K06002-08	Vapor	5	10/30/14 11:41	10/30/14 14:25
SVM-5-15.5 DUP PV3	4K06002-09	Vapor	5	10/30/14 11:41	10/30/14 14:25
SVM-16-15.5 RR PV3	4K06002-10	Vapor	5	10/30/14 12:55	10/30/14 14:25
SVM-15-7 PV3	4K06002-11	Vapor	5	10/30/14 13:30	10/30/14 14:25

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-15-15 PV3	4K06002-12	Vapor	5	10/30/14 14:05	10/30/14 14:25
SVM-15-22 PV10	4K06002-13	Vapor	5	10/30/14 14:25	10/30/14 14:25

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Fixed Gases by TCD								
Oxygen	SVM-16-15.5 PV3	4.2	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Carbon Dioxide	SVM-16-15.5 PV3	1.8	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Oxygen	SVM-16-7 PV3	15	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Carbon Dioxide	SVM-16-7 PV3	0.42	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Methane	SVM-16-22 PV10	3.6	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Oxygen	SVM-16-22 PV10	1.0	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Carbon Dioxide	SVM-16-22 PV10	15	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Oxygen	SVM-8-15 PV3	12	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Carbon Dioxide	SVM-8-15 PV3	0.38	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Oxygen	SVM-8-5 PV3	15	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD

Eydie Schwartz

Eydie Schwartz
Project Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Carbon Dioxide	SVM-8-5 PV3	0.45	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Oxygen	SVM-5-5 PV3	13	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Carbon Dioxide	SVM-5-5 PV3	0.57	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Oxygen	SVM-5-15.5 PV3	14	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Carbon Dioxide	SVM-5-15.5 PV3	0.30	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Oxygen	SVM-5-15.5 DUP PV3	14	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Carbon Dioxide	SVM-5-15.5 DUP PV3	0.30	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Oxygen	SVM-16-15.5 RR PV3	4.3	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Carbon Dioxide	SVM-16-15.5 RR PV3	1.8	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Oxygen	SVM-15-7 PV3	16	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Carbon Dioxide	SVM-15-7 PV3	0.61	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD

Eydie Schwartz
Project Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Methane	SVM-15-15 PV3	0.13	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Oxygen	SVM-15-15 PV3	15	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Carbon Dioxide	SVM-15-15 PV3	0.66	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Methane	SVM-15-22 PV10	0.10	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Oxygen	SVM-15-22 PV10	9.5	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD
Carbon Dioxide	SVM-15-22 PV10	1.2	0.10	% by Volume	1	10/30/14	10/30/14	VOCs by GC/TCD

Gasoline Range Organics in Vapor by GC/MS - Field

Gasoline Range Organics (GRO)	SVM-16-15.5 PV3	28	20	ug/L	1	10/30/14	10/30/14	EPA 8260M
Gasoline Range Organics (GRO)	SVM-16-22 PV10	240000	1000	ug/L	50	10/30/14	10/30/14	EPA 8260M
Gasoline Range Organics (GRO)	SVM-16-15.5 RR PV3	22	20	ug/L	1	10/30/14	10/30/14	EPA 8260M

VOCs in Vapor by GC/MS

Benzene	SVM-16-22 PV10	180	2.0	ug/L	100	10/30/14	10/30/14	VOCs by GC/FID/PID
Ethylbenzene	SVM-16-22 PV10	10	2.0	ug/L	100	10/30/14	10/30/14	VOCs by GC/FID/PID

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Isopropylbenzene	SVM-16-22 PV10	6.0	2.0	ug/L	100	10/30/14	10/30/14	VOCs by GC/FID/PID
n-Propylbenzene	SVM-16-22 PV10	5.0	2.0	ug/L	100	10/30/14	10/30/14	VOCs by GC/FID/PID
Toluene	SVM-16-22 PV10	36	2.0	ug/L	100	10/30/14	10/30/14	VOCs by GC/FID/PID
1,3,5-Trimethylbenzene	SVM-16-22 PV10	32	2.0	ug/L	100	10/30/14	10/30/14	VOCs by GC/FID/PID
1,2,4-Trimethylbenzene	SVM-16-22 PV10	11	2.0	ug/L	100	10/30/14	10/30/14	VOCs by GC/FID/PID
o-Xylene	SVM-16-22 PV10	13	2.0	ug/L	100	10/30/14	10/30/14	VOCs by GC/FID/PID
m,p-Xylenes	SVM-16-22 PV10	46	2.0	ug/L	100	10/30/14	10/30/14	VOCs by GC/FID/PID

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14
Units: % by Volume

Date Sampled:	10/30/14	10/30/14	10/30/14	10/30/14	
Date Prepared:	10/30/14	10/30/14	10/30/14	10/30/14	
Date Analyzed:	10/30/14	10/30/14	10/30/14	10/30/14	
AA ID No:	4K06002-01	4K06002-03	4K06002-04	4K06002-05	
Client ID No:	SVM-16-15.5 PV3	SVM-16-7 PV3	SVM-16-22 PV10	SVM-8-15 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (VOCs by GC/TCD)

Methane	<0.10	<0.10	3.6	<0.10	0.10
Oxygen	4.2	15	1.0	12	0.10
Carbon Dioxide	1.8	0.42	15	0.38	0.10

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14
Units: % by Volume

Date Sampled:	10/30/14	10/30/14	10/30/14	10/30/14	
Date Prepared:	10/30/14	10/30/14	10/30/14	10/30/14	
Date Analyzed:	10/30/14	10/30/14	10/30/14	10/30/14	
AA ID No:	4K06002-06	4K06002-07	4K06002-08	4K06002-09	
Client ID No:	SVM-8-5 PV3	SVM-5-5 PV3	SVM-5-15.5 PV3	SVM-5-15.5 DUP PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (VOCs by GC/TCD)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	15	13	14	14	0.10
Carbon Dioxide	0.45	0.57	0.30	0.30	0.10

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14
Units: % by Volume

Date Sampled:	10/30/14	10/30/14	10/30/14	10/30/14	
Date Prepared:	10/30/14	10/30/14	10/30/14	10/30/14	
Date Analyzed:	10/30/14	10/30/14	10/30/14	10/30/14	
AA ID No:	4K06002-10	4K06002-11	4K06002-12	4K06002-13	
Client ID No:	SVM-16-15.5 RR PV3	SVM-15-7 PV3	SVM-15-15 PV3	SVM-15-22 PV10	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (VOCs by GC/TCD)

Methane	<0.10	<0.10	0.13	0.10	0.10
Oxygen	4.3	16	15	9.5	0.10
Carbon Dioxide	1.8	0.61	0.66	1.2	0.10

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14
Units: % by Volume

Date Sampled:

Date Prepared:

Date Analyzed:

AA ID No:

Client ID No:

Matrix:

Dilution Factor:

MRL

Fixed Gases - Field (VOCs by GC/TCD)

Methane	0.10
Oxygen	0.10
Carbon Dioxide	0.10

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs in Vapor by GC/MS

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14
Units: ug/L

Date Sampled:	10/30/14	10/30/14	10/30/14	10/30/14	
Date Prepared:	10/30/14	10/30/14	10/30/14	10/30/14	
Date Analyzed:	10/30/14	10/30/14	10/30/14	10/30/14	
AA ID No:	4K06002-01	4K06002-02	4K06002-03	4K06002-04	
Client ID No:	SVM-16-15.5 PV3	Ambient Air	SVM-16-7 PV3	SVM-16-22 PV10	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	100	MRL

VOCs by GC/MS CH2M - FIELD (VOCs by GC/FID/PID)

Benzene	<0.020	<0.020	<0.020	180	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<2000	20
n-Butylbenzene	<0.020	<0.020	<0.020	<2.0	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<2.0	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<2.0	0.020
Ethylbenzene	<0.020	<0.020	<0.020	10	0.020
Isopropanol (IPA)	<0.29	<0.29	<0.29	<29	0.29
Isopropylbenzene	<0.020	<0.020	<0.020	6.0	0.020
Methyl-tert-Butyl Ether (MTBE)	<1.0	<1.0	<1.0	<100	1.0
n-Propylbenzene	<0.020	<0.020	<0.020	5.0	0.020
Toluene	<0.020	<0.020	<0.020	36	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	32	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	11	0.020
o-Xylene	<0.020	<0.020	<0.020	13	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	46	0.020

Surrogates					%REC Limits
4-Bromofluorobenzene	87%	97%	100%	100%	75-125

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs in Vapor by GC/MS

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14
Units: ug/L

Date Sampled:	10/30/14	10/30/14	10/30/14	10/30/14	
Date Prepared:	10/30/14	10/30/14	10/30/14	10/30/14	
Date Analyzed:	10/30/14	10/30/14	10/30/14	10/30/14	
AA ID No:	4K06002-05	4K06002-06	4K06002-07	4K06002-08	
Client ID No:	SVM-8-15 PV3	SVM-8-5 PV3	SVM-5-5 PV3	SVM-5-15.5 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

VOCs by GC/MS CH2M - FIELD (VOCs by GC/FID/PID)

Benzene	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.29	<0.29	<0.29	<0.29	0.29
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Methyl-tert-Butyl Ether (MTBE)	<1.0	<1.0	<1.0	<1.0	1.0
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020

Surrogates

4-Bromofluorobenzene	90%	94%	99%	99%	<u>%REC Limits</u> 75-125
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Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs in Vapor by GC/MS

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14
Units: ug/L

Date Sampled:	10/30/14	10/30/14	10/30/14	10/30/14
Date Prepared:	10/30/14	10/30/14	10/30/14	10/30/14
Date Analyzed:	10/30/14	10/30/14	10/30/14	10/30/14
AA ID No:	4K06002-09	4K06002-10	4K06002-11	4K06002-12
Client ID No:	SVM-5-15.5 DUP PV3	SVM-16-15.5 RR PV3	SVM-15-7 PV3	SVM-15-15 PV3
Matrix:	Vapor	Vapor	Vapor	Vapor
Dilution Factor:	1	1	1	1

MRL

VOCs by GC/MS CH2M - FIELD (VOCs by GC/FID/PID)

Benzene	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.29	<0.29	<0.29	<0.29	0.29
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Methyl-tert-Butyl Ether (MTBE)	<1.0	<1.0	<1.0	<1.0	1.0
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020

Surrogates

4-Bromofluorobenzene	102%	107%	98%	99%	<u>%REC Limits</u> 75-125
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Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs in Vapor by GC/MS

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14
Units: ug/L

Date Sampled:	10/30/14	
Date Prepared:	10/30/14	
Date Analyzed:	10/30/14	
AA ID No:	4K06002-13	
Client ID No:	SVM-15-22 PV10	
Matrix:	Vapor	
Dilution Factor:	1	MRL

VOCs by GC/MS CH2M - FIELD (VOCs by GC/FID/PID)

Benzene	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	20
n-Butylbenzene	<0.020	0.020
sec-Butylbenzene	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	0.020
Ethylbenzene	<0.020	0.020
Isopropanol (IPA)	<0.29	0.29
Isopropylbenzene	<0.020	0.020
Methyl-tert-Butyl Ether (MTBE)	<1.0	1.0
n-Propylbenzene	<0.020	0.020
Toluene	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	0.020
o-Xylene	<0.020	0.020
m,p-Xylenes	<0.020	0.020

<u>Surrogates</u>		<u>%REC Limits</u>
4-Bromofluorobenzene	95%	75-125

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187298
Project No:	496965.A1.01	Date Received:	10/30/14
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	11/25/14
Method:	Gasoline Range Organics in Vapor by GC/MS - Field	Units:	ug/L

Date Sampled:	10/30/14	10/30/14	10/30/14	10/30/14	
Date Prepared:	10/30/14	10/30/14	10/30/14	10/30/14	
Date Analyzed:	10/30/14	10/30/14	10/30/14	10/30/14	
AA ID No:	4K06002-01	4K06002-02	4K06002-03	4K06002-04	
Client ID No:	SVM-16-15.5 PV3	Ambient Air	SVM-16-7 PV3	SVM-16-22 PV10	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	50	MRL

VOCs Gasoline Range Organics GC/MS Vapor - FIELD (EPA 8260M)

Gasoline Range Organics (GRO)	28	<20	<20	240000	20
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<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	87%	97%	100%	100%	70-130

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187298
Project No:	496965.A1.01	Date Received:	10/30/14
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	11/25/14
Method:	Gasoline Range Organics in Vapor by GC/MS - Field	Units:	ug/L

Date Sampled:	10/30/14	10/30/14	10/30/14	10/30/14	
Date Prepared:	10/30/14	10/30/14	10/30/14	10/30/14	
Date Analyzed:	10/30/14	10/30/14	10/30/14	10/30/14	
AA ID No:	4K06002-05	4K06002-06	4K06002-07	4K06002-08	
Client ID No:	SVM-8-15 PV3	SVM-8-5 PV3	SVM-5-5 PV3	SVM-5-15.5 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

VOCs Gasoline Range Organics GC/MS Vapor - FIELD (EPA 8260M)

Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
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<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	90%	94%	99%	99%	70-130

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc. **AA Project No:** MB187298
Project No: 496965.A1.01 **Date Received:** 10/30/14
Project Name: KMEP Norwalk Biosparge Startup **Date Reported:** 11/25/14
Method: Gasoline Range Organics in Vapor by GC/MS - Field **Units:** ug/L

Date Sampled:	10/30/14	10/30/14	10/30/14	10/30/14	
Date Prepared:	10/30/14	10/30/14	10/30/14	10/30/14	
Date Analyzed:	10/30/14	10/30/14	10/30/14	10/30/14	
AA ID No:	4K06002-09	4K06002-10	4K06002-11	4K06002-12	
Client ID No:	SVM-5-15.5 DUP PV3	SVM-16-15.5 RR PV3	SVM-15-7 PV3	SVM-15-15 PV3	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

VOCs Gasoline Range Organics GC/MS Vapor - FIELD (EPA 8260M)

Gasoline Range Organics (GRO)	<20	22	<20	<20	20
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<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	102%	107%	98%	99%	70-130

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.	AA Project No: MB187298
Project No: 496965.A1.01	Date Received: 10/30/14
Project Name: KMEP Norwalk Biosparge Startup	Date Reported: 11/25/14
Method: Gasoline Range Organics in Vapor by GC/MS - Field	Units: ug/L

Date Sampled:	10/30/14	
Date Prepared:	10/30/14	
Date Analyzed:	10/30/14	
AA ID No:	4K06002-13	
Client ID No:	SVM-15-22 PV10	
Matrix:	Vapor	
Dilution Factor:	1	MRL

VOCs Gasoline Range Organics GC/MS Vapor - FIELD (EPA 8260M)

Gasoline Range Organics (GRO)	<20	20
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<u>Surrogates</u>		<u>%REC Limits</u>
4-Bromofluorobenzene	95%	70-130

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
<i>Batch B4K1115 - *** DEFAULT PREP ***</i>										
Blank (B4K1115-BLK1) Prepared & Analyzed: 10/30/14										
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B4K1115-BS1) Prepared & Analyzed: 10/30/14										
Methane	4.44	0.10	% by Volume	4.5		98.8	75-125			
Oxygen	3.73	0.10	% by Volume	4.0		93.2	75-125			
Carbon Dioxide	13.3	0.10	% by Volume	15		88.9	75-125			
LCS Dup (B4K1115-BSD1) Prepared & Analyzed: 10/30/14										
Methane	4.59	0.10	% by Volume	4.5		102	75-125	3.28	30	
Oxygen	3.68	0.10	% by Volume	4.0		92.1	75-125	1.13	30	
Carbon Dioxide	13.0	0.10	% by Volume	15		86.8	75-125	2.40	30	
Duplicate (B4K1115-DUP1) Source: 4K06002-08 Prepared & Analyzed: 10/30/14										
Methane	<0.10	0.10	% by Volume		<0.10				30	
Oxygen	13.6	0.10	% by Volume		13.8			0.759	30	
Carbon Dioxide	0.295	0.10	% by Volume		0.301			2.01	30	

VOCs in Vapor by GC/MS - Quality Control

*Batch B4K0708 - *** DEFAULT PREP ****

Blank (B4K0708-BLK1)

Prepared & Analyzed: 10/30/14

Benzene	<0.020	0.020	ug/L
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Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs in Vapor by GC/MS - Quality Control										
<i>Batch B4K0708 - *** DEFAULT PREP ***</i>										
Blank (B4K0708-BLK1) Continued										
Prepared & Analyzed: 10/30/14										
tert-Butyl alcohol (TBA)	<20	20	ug/L							
n-Butylbenzene	<0.020	0.020	ug/L							
sec-Butylbenzene	<0.020	0.020	ug/L							
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L							
Ethylbenzene	<0.020	0.020	ug/L							
Isopropanol (IPA)	<0.29	0.29	ug/L							
Isopropylbenzene	<0.020	0.020	ug/L							
Methyl-tert-Butyl Ether (MTBE)	<1.0	1.0	ug/L							
n-Propylbenzene	<0.020	0.020	ug/L							
Toluene	<0.020	0.020	ug/L							
1,3,5-Trimethylbenzene	<0.020	0.020	ug/L							
1,2,4-Trimethylbenzene	<0.020	0.020	ug/L							
o-Xylene	<0.020	0.020	ug/L							
m,p-Xylenes	<0.020	0.020	ug/L							
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>49.8</i>		<i>ug/L</i>	<i>50</i>		<i>99.6</i>	<i>75-125</i>			
LCS (B4K0708-BS1)										
Prepared & Analyzed: 10/30/14										
Benzene	19.1	0.020	ug/L	20		95.3	75-125			
tert-Butyl alcohol (TBA)	84.4	20	ug/L	100		84.4	75-125			
n-Butylbenzene	37.3	0.020	ug/L	20		187	75-125			AA-C1
sec-Butylbenzene	27.9	0.020	ug/L	20		140	75-125			AA-C1
1,2-Dichloroethane (EDC)	19.3	0.020	ug/L	20		96.6	75-125			
Ethylbenzene	17.9	0.020	ug/L	20		89.4	75-125			
Isopropylbenzene	22.1	0.020	ug/L	20		110	75-125			
Methyl-tert-Butyl Ether (MTBE)	19.7	1.0	ug/L	20		98.3	75-125			
n-Propylbenzene	22.7	0.020	ug/L	20		113	75-125			
Toluene	19.0	0.020	ug/L	20		95.0	75-125			
1,3,5-Trimethylbenzene	23.8	0.020	ug/L	20		119	75-125			
1,2,4-Trimethylbenzene	25.2	0.020	ug/L	20		126	75-125			AA-C1
o-Xylene	17.8	0.020	ug/L	20		88.9	75-125			
m,p-Xylenes	36.8	0.020	ug/L	40		92.0	75-125			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>49.8</i>		<i>ug/L</i>	<i>50</i>		<i>99.6</i>	<i>75-125</i>			

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs in Vapor by GC/MS - Quality Control										
<i>Batch B4K0708 - *** DEFAULT PREP ***</i>										
LCS Dup (B4K0708-BSD1)										
Prepared & Analyzed: 10/30/14										
Benzene	22.3	0.020	ug/L	20		112	75-125	15.8	30	
tert-Butyl alcohol (TBA)	86.9	20	ug/L	100		86.9	75-125	2.91	30	
n-Butylbenzene	39.8	0.020	ug/L	20		199	75-125	6.43	30	AA-C1
sec-Butylbenzene	27.2	0.020	ug/L	20		136	75-125	2.69	30	AA-C1
1,2-Dichloroethane (EDC)	21.8	0.020	ug/L	20		109	75-125	11.9	30	
Ethylbenzene	21.2	0.020	ug/L	20		106	75-125	17.0	30	
Isopropylbenzene	23.8	0.020	ug/L	20		119	75-125	7.76	30	
Methyl-tert-Butyl Ether (MTBE)	16.8	1.0	ug/L	20		83.8	75-125	15.9	30	
n-Propylbenzene	24.6	0.020	ug/L	20		123	75-125	8.13	30	
Toluene	20.9	0.020	ug/L	20		104	75-125	9.33	30	
1,3,5-Trimethylbenzene	26.4	0.020	ug/L	20		132	75-125	10.4	30	AA-C1
1,2,4-Trimethylbenzene	26.9	0.020	ug/L	20		134	75-125	6.54	30	AA-C1
o-Xylene	21.3	0.020	ug/L	20		106	75-125	18.0	30	
m,p-Xylenes	42.6	0.020	ug/L	40		106	75-125	14.6	30	
<i>Surrogate: 4-Bromofluorobenzene</i>	46.8		ug/L	50		93.6	75-125			
<i>Batch B4K1104 - *** DEFAULT PREP ***</i>										
Blank (B4K1104-BLK1)										
Prepared & Analyzed: 10/30/14										
Benzene	<0.020	0.020	ug/L							
tert-Butyl alcohol (TBA)	<20	20	ug/L							
n-Butylbenzene	<0.020	0.020	ug/L							
sec-Butylbenzene	<0.020	0.020	ug/L							
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L							
Ethylbenzene	<0.020	0.020	ug/L							
Isopropanol (IPA)	<0.29	0.29	ug/L							
Isopropylbenzene	<0.020	0.020	ug/L							
Methyl-tert-Butyl Ether (MTBE)	<1.0	1.0	ug/L							
n-Propylbenzene	<0.020	0.020	ug/L							
Toluene	<0.020	0.020	ug/L							
1,3,5-Trimethylbenzene	<0.020	0.020	ug/L							
1,2,4-Trimethylbenzene	<0.020	0.020	ug/L							
o-Xylene	<0.020	0.020	ug/L							

Eydie Schwartz

Eydie Schwartz
 Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs in Vapor by GC/MS - Quality Control										
<i>Batch B4K1104 - *** DEFAULT PREP ***</i>										
Blank (B4K1104-BLK1) Continued										
Prepared & Analyzed: 10/30/14										
m,p-Xylenes	<0.020	0.020	ug/L							
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>49.8</i>		<i>ug/L</i>	<i>50</i>		<i>99.5</i>	<i>75-125</i>			
LCS (B4K1104-BS1)										
Prepared & Analyzed: 10/30/14										
Benzene	17.5	0.020	ug/L	20		87.6	75-125			
tert-Butyl alcohol (TBA)	84.4	20	ug/L	100		84.4	75-125			
n-Butylbenzene	20.3	0.020	ug/L	20		101	75-125			
sec-Butylbenzene	20.6	0.020	ug/L	20		103	75-125			
1,2-Dichloroethane (EDC)	20.6	0.020	ug/L	20		103	75-125			
Ethylbenzene	19.8	0.020	ug/L	20		99.0	75-125			
Isopropylbenzene	21.2	0.020	ug/L	20		106	75-125			
Methyl-tert-Butyl Ether (MTBE)	17.6	1.0	ug/L	20		88.0	75-125			
n-Propylbenzene	20.7	0.020	ug/L	20		104	75-125			
Toluene	20.2	0.020	ug/L	20		101	75-125			
1,3,5-Trimethylbenzene	20.6	0.020	ug/L	20		103	75-125			
1,2,4-Trimethylbenzene	20.7	0.020	ug/L	20		103	75-125			
o-Xylene	21.0	0.020	ug/L	20		105	75-125			
m,p-Xylenes	42.8	0.020	ug/L	40		107	75-125			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>52.0</i>		<i>ug/L</i>	<i>50</i>		<i>104</i>	<i>75-125</i>			
LCS Dup (B4K1104-BSD1)										
Prepared & Analyzed: 10/30/14										
Benzene	17.5	0.020	ug/L	20		87.6	75-125	0.00	30	
tert-Butyl alcohol (TBA)	87.8	20	ug/L	100		87.8	75-125	3.93	30	
n-Butylbenzene	20.6	0.020	ug/L	20		103	75-125	1.57	30	
sec-Butylbenzene	20.6	0.020	ug/L	20		103	75-125	0.389	30	
1,2-Dichloroethane (EDC)	24.0	0.020	ug/L	20		120	75-125	15.3	30	
Ethylbenzene	18.2	0.020	ug/L	20		91.1	75-125	8.26	30	
Isopropylbenzene	20.1	0.020	ug/L	20		100	75-125	5.33	30	
Methyl-tert-Butyl Ether (MTBE)	22.8	1.0	ug/L	20		114	75-125	25.8	30	
n-Propylbenzene	20.3	0.020	ug/L	20		102	75-125	1.95	30	
Toluene	19.3	0.020	ug/L	20		96.6	75-125	4.40	30	
1,3,5-Trimethylbenzene	20.3	0.020	ug/L	20		102	75-125	1.42	30	
1,2,4-Trimethylbenzene	20.5	0.020	ug/L	20		103	75-125	0.680	30	

Eydie Schwartz

Eydie Schwartz
 Project Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs in Vapor by GC/MS - Quality Control										
<i>Batch B4K1104 - *** DEFAULT PREP ***</i>										
LCS Dup (B4K1104-BSD1) Continued										
Prepared & Analyzed: 10/30/14										
o-Xylene	20.8	0.020	ug/L	20		104	75-125	0.717	30	
m,p-Xylenes	40.3	0.020	ug/L	40		101	75-125	6.08	30	
Surrogate: 4-Bromofluorobenzene	53.2		ug/L	50		106	75-125			
Gasoline Range Organics in Vapor by GC/MS - Field - Quality Control										
<i>Batch B4K1105 - *** DEFAULT PREP ***</i>										
Blank (B4K1105-BLK1)										
Prepared & Analyzed: 10/30/14										
Gasoline Range Organics (GRO)	<20	20	ug/L							
Surrogate: 4-Bromofluorobenzene	49.8		ug/L	50		99.5	70-130			
LCS (B4K1105-BS1)										
Prepared & Analyzed: 10/30/14										
Gasoline Range Organics (GRO)	538	20	ug/L	500		108	75-125			
Surrogate: 4-Bromofluorobenzene	50.6		ug/L	50		101	70-130			
LCS Dup (B4K1105-BSD1)										
Prepared & Analyzed: 10/30/14										
Gasoline Range Organics (GRO)	528	20	ug/L	500		106	75-125	1.98	30	
Surrogate: 4-Bromofluorobenzene	53.2		ug/L	50		106	70-130			
<i>Batch B4K1107 - *** DEFAULT PREP ***</i>										
Blank (B4K1107-BLK1)										
Prepared & Analyzed: 10/30/14										
Gasoline Range Organics (GRO)	<20	20	ug/L							
Surrogate: 4-Bromofluorobenzene	49.8		ug/L	50		99.6	70-130			
LCS (B4K1107-BS1)										
Prepared & Analyzed: 10/30/14										
Gasoline Range Organics (GRO)	486	20	ug/L	500		97.2	75-125			
Surrogate: 4-Bromofluorobenzene	49.8		ug/L	50		99.6	70-130			
LCS Dup (B4K1107-BSD1)										
Prepared & Analyzed: 10/30/14										
Gasoline Range Organics (GRO)	427	20	ug/L	500		85.4	75-125	12.9	30	
Surrogate: 4-Bromofluorobenzene	46.8		ug/L	50		93.6	70-130			
Duplicate (B4K1107-DUP1)										
Source: 4K06002-08 Prepared & Analyzed: 10/30/14										
Gasoline Range Organics (GRO)	<20	20	ug/L			<20			30	
Surrogate: 4-Bromofluorobenzene	49.6		ug/L	50		99.2	70-130			

Eydie Schwartz

Eydie Schwartz
Project Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187298
Date Received: 10/30/14
Date Reported: 11/25/14

Special Notes

[1] = **AA-C1** : The percent recovery for this analyte exceeds acceptance criteria.

Eydie Schwartz

Eydie Schwartz
Project Manager



AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311

Tel: 818-998-5547 FAX: 818-998-7258

A.A. COC No.: 121145
70041376
Page 1 of 1

Client: CHILL Project Name / No.: KINDER MARCHAL MARCHAL Sampler's Name: William J. Beckwith
 Project Manager: DAN JABLONSKI Site Address: 15306 NORWALK BLVD Sampler's Signature: [Signature]
 Phone: City: NORWALK P.O. No.:
 Fax: State & Zip: CA. Quote No.:

TAT Turnaround Codes **

- ① = Same Day Rush
- ② = 24 Hour Rush
- ③ = 48 Hour Rush
- ④ = 72 Hour Rush
- ⑤ = 5 Day Rush
- X = 10 Working Days (Standard TAT)

ANALYSIS REQUESTED (Test Name)

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	Please enter the TAT Turnaround Codes ** below										Special Instructions		
						①	②	③	④	⑤	X							
SVM-16-15-S	4K06002-01	10-30-14	0745	V	3	X	X											PV3
AMBIENT AIR	02		0800	V	2	X												
SVM-16-7	03		0825	V	3	X	X											PV3
SVM-16-22	04		0847	V	3	X	X											pv10
SVM-8-1S	05		0920	V	3	X	X											
SVM-8-S	06		0950	V	3	X	X											
SVM-S-S	07		1112	V	2	X	X											
SVM-S-15-S	08		1141	V	2	X	X											
SVM-S-15S DP	09		1141	V	2	X	X											
SVM-16-15-S RR	10		1255	V	2	X	X											ok keep 11/2/14
SVM-15-7	11		1330	V	2	X	X											
SVM-15-1S	12		1425	V	2	X	X											
SVM-15-22	13		1425	V	2	X	X											pv10

For Laboratory Use	Relinquished by <u>[Signature]</u>	Date 10-30-14	Time 1425	Received by <u>[Signature]</u>
	Relinquished by <u>[Signature]</u>	Date	Time	Received by
	Relinquished by	Date	Time	Received by

A.A. Project No.: MB187298/4K06002

Note: By relinquishing samples to American Analytics, client agrees to pay for the services requested on this chain of custody form and any additional client-requested analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 45 days following the submittal of the sample(s) to American Analytics.

Attachment B
Fixed Laboratory Analytical Reports

December 03, 2014

Dan Jablonski
CH2MHill
1000 Wilshire Blvd.
Los Angeles, CA 90017

CA-ELAP No.:2676
NV Cert. No.:NV-00922

TEL:

FAX:

Workorder No.: N013771

RE: Norwalk

Attention: Dan Jablonski

Enclosed are the results for sample(s) received on November 01, 2014 by ASSET Laboratories .
The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in
accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (702) 307-2659 if I can be of further assistance to your company.

Sincerely,



Glen Gesmundo
QA Manager

The cover letter is an integral part of this analytical report. This Laboratory Report cannot be reproduced in part or in
its entirety without written permission from the client and Advanced Technology Laboratories - Las Vegas.



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NEVADA
3151 W. Post Rd., Las Vegas, NV 89118
P: 702.307.2659 F: 702.307.2691

"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
Project: Norwalk
Lab Order: N013771

CASE NARRATIVE

SAMPLE RECEIVING/GENERAL COMMENTS:

Samples were received intact with proper chain of custody documentation.

Cooler temperature and sample preservation were verified upon receipt of samples if applicable.

Information on sample receipt conditions including discrepancies can be found in attached Sample Receipt Checklist Form.

Samples were analyzed within method holding time.

Results were J-Flag. "J" is used to flag those results that are between the PQL (Practical Quantitation Limit) and the calculated MDL (Method Detection Limit). Results that are "J" Flagged are estimated values since it becomes difficult to accurately quantitate the analyte near the MDL.

Subcontracted Analyses:

ASTM D1946 was subcontracted to Air Technology Laboratories, Inc.



CLIENT: CH2MHill
Project: Norwalk
Lab Order: N013771
Contract No:

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N013771-001A	SVM-5-15.5	Air	10/30/2014 11:35:00 AM	11/1/2014	11/26/2014
N013771-001B	SVM-5-15.5	Air	10/30/2014 11:35:00 AM	11/1/2014	11/26/2014
N013771-002A	SVM-15-15	Air	10/30/2014 2:00:00 PM	11/1/2014	11/26/2014
N013771-002B	SVM-15-15	Air	10/30/2014 2:00:00 PM	11/1/2014	11/26/2014
N013771-003A	SVM-9-14.5	Air	10/31/2014 9:23:00 AM	11/1/2014	11/26/2014
N013771-003B	SVM-9-14.5	Air	10/31/2014 9:23:00 AM	11/1/2014	11/26/2014
N013771-004A	SVM-3-15	Air	10/31/2014 10:36:00 AM	11/1/2014	11/26/2014
N013771-004B	SVM-3-15	Air	10/31/2014 10:36:00 AM	11/1/2014	11/26/2014



ASSET Laboratories

ANALYTICAL RESULTS

Print Date: 03-Dec-14

CLIENT: CH2MHill
Lab Order: N013771
Project: Norwalk
Lab ID: N013771-001

Client Sample ID: SVM-5-15.5
Collection Date: 10/30/2014 11:35:00 AM
Matrix: AIR

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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VOCS IN AIR BY GCMS

EPA TO15

RunID: MS6_141120A	QC Batch: R96931	PrepDate:	Analyst: QBM
Isopropylbenzene	ND 0.00223	0.00590	ug/L 1 11/20/2014 10:23 PM
n-Butylbenzene	ND 0.000663	0.00659	ug/L 1 11/20/2014 10:23 PM
n-Propylbenzene	ND 0.00199	0.00590	ug/L 1 11/20/2014 10:23 PM
sec-Butylbenzene	ND 0.00156	0.00659	ug/L 1 11/20/2014 10:23 PM
Tert-Butanol	0.00371 0.000996	0.00364	ug/L 1 11/20/2014 10:23 PM
Surr: 4-Bromofluorobenzene	108 0	70-130	%REC 1 11/20/2014 10:23 PM

VOCS IN AIR BY GCMS

EPA TO15

RunID: MS6_141104A	QC Batch: R96664	PrepDate:	Analyst: JT
1,2,4-Trimethylbenzene	ND 0.000822	0.00369	ug/L 1 11/4/2014 03:33 PM
1,2-Dichloroethane	ND 0.000794	0.00303	ug/L 1 11/4/2014 03:33 PM
1,3,5-Trimethylbenzene	ND 0.00105	0.00369	ug/L 1 11/4/2014 03:33 PM
Benzene	0.00125 0.000648	0.00240	J ug/L 1 11/4/2014 03:33 PM
Ethylbenzene	ND 0.000746	0.00326	ug/L 1 11/4/2014 03:33 PM
Isopropyl Alcohol	ND 0.000495	0.00185	ug/L 1 11/4/2014 03:33 PM
m,p-Xylene	0.00182 0.00164	0.00651	J ug/L 1 11/4/2014 03:33 PM
MTBE	ND 0.000741	0.0108	ug/L 1 11/4/2014 03:33 PM
o-Xylene	ND 0.000834	0.00326	ug/L 1 11/4/2014 03:33 PM
Toluene	0.00887 0.000638	0.00282	ug/L 1 11/4/2014 03:33 PM
Surr: 4-Bromofluorobenzene	99.4 0	70-130	%REC 1 11/4/2014 03:33 PM

TPH GASOLINE IN AIR BY GC-FID

EPA TO3

RunID: GC9_141102A	QC Batch: R96651	PrepDate:	Analyst: JT
TPH-Gasoline (C5-C12)	19.0 0.728	3.15	ug/L 1 11/2/2014 02:42 PM
Surr: 4-Bromofluorobenzene	126 0	70-130	%REC 1 11/2/2014 02:42 PM

Qualifiers:	B Analyte detected in the associated Method Blank	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	S Spike/Surrogate outside of limits due to matrix interference
	Results are wet unless otherwise specified	DO Surrogate Diluted Out



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ANALYTICAL RESULTS

Print Date: 03-Dec-14

CLIENT: CH2MHill
Lab Order: N013771
Project: Norwalk
Lab ID: N013771-002

Client Sample ID: SVM-15-15
Collection Date: 10/30/2014 2:00:00 PM
Matrix: AIR

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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VOCS IN AIR BY GCMS

EPA TO15

RunID: MS6_141120A	QC Batch: R96931	PrepDate:	Analyst: QBM			
Isopropylbenzene	ND	0.00203	0.00538	ug/L	1	11/20/2014 11:04 PM
n-Butylbenzene	ND	0.000605	0.00601	ug/L	1	11/20/2014 11:04 PM
n-Propylbenzene	ND	0.00181	0.00538	ug/L	1	11/20/2014 11:04 PM
sec-Butylbenzene	ND	0.00142	0.00601	ug/L	1	11/20/2014 11:04 PM
Tert-Butanol	0.00644	0.000909	0.00332	ug/L	1	11/20/2014 11:04 PM
Surr: 4-Bromofluorobenzene	116	0	70-130	%REC	1	11/20/2014 11:04 PM

VOCS IN AIR BY GCMS

EPA TO15

RunID: MS6_141104A	QC Batch: R96664	PrepDate:	Analyst: JT			
1,2,4-Trimethylbenzene	ND	0.00162	0.00728	ug/L	2	11/4/2014 04:50 PM
1,2-Dichloroethane	ND	0.00157	0.00598	ug/L	2	11/4/2014 04:50 PM
1,3,5-Trimethylbenzene	ND	0.00207	0.00728	ug/L	2	11/4/2014 04:50 PM
Benzene	0.00161	0.00128	0.00474	J ug/L	2	11/4/2014 04:50 PM
Ethylbenzene	ND	0.00147	0.00642	ug/L	2	11/4/2014 04:50 PM
Isopropyl Alcohol	ND	0.000977	0.00364	ug/L	2	11/4/2014 04:50 PM
m,p-Xylene	ND	0.00324	0.0128	ug/L	2	11/4/2014 04:50 PM
MTBE	ND	0.00146	0.0213	ug/L	2	11/4/2014 04:50 PM
o-Xylene	ND	0.00165	0.00642	ug/L	2	11/4/2014 04:50 PM
Toluene	0.0177	0.00126	0.00556	ug/L	2	11/4/2014 04:50 PM
Surr: 4-Bromofluorobenzene	102	0	70-130	%REC	2	11/4/2014 04:50 PM

TPH GASOLINE IN AIR BY GC-FID

EPA TO3

RunID: GC9_141102A	QC Batch: R96651	PrepDate:	Analyst: JT			
TPH-Gasoline (C5-C12)	30.1	0.718	3.11	ug/L	1	11/2/2014 03:11 PM
Surr: 4-Bromofluorobenzene	117	0	70-130	%REC	1	11/2/2014 03:11 PM

Qualifiers:	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	S	Spike/Surrogate outside of limits due to matrix interference
		Results are wet unless otherwise specified	DO	Surrogate Diluted Out



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ANALYTICAL RESULTS

Print Date: 03-Dec-14

CLIENT: CH2MHill
Lab Order: N013771
Project: Norwalk
Lab ID: N013771-003

Client Sample ID: SVM-9-14.5
Collection Date: 10/31/2014 9:23:00 AM
Matrix: AIR

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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VOCS IN AIR BY GCMS

EPA TO15

RunID: MS6_141120A	QC Batch: R96931	PrepDate:	Analyst: QBM
Isopropylbenzene	ND 0.00239	0.00633	ug/L 1 11/20/2014 11:45 PM
n-Butylbenzene	ND 0.000711	0.00707	ug/L 1 11/20/2014 11:45 PM
n-Propylbenzene	ND 0.00213	0.00633	ug/L 1 11/20/2014 11:45 PM
sec-Butylbenzene	ND 0.00167	0.00707	ug/L 1 11/20/2014 11:45 PM
Tert-Butanol	0.0151 0.00107	0.00390	ug/L 1 11/20/2014 11:45 PM
Surr: 4-Bromofluorobenzene	113 0	70-130	%REC 1 11/20/2014 11:45 PM

VOCS IN AIR BY GCMS

EPA TO15

RunID: MS6_141104A	QC Batch: R96664	PrepDate:	Analyst: JT
1,2,4-Trimethylbenzene	ND 0.000784	0.00352	ug/L 1 11/4/2014 05:33 PM
1,2-Dichloroethane	ND 0.000756	0.00289	ug/L 1 11/4/2014 05:33 PM
1,3,5-Trimethylbenzene	ND 0.00100	0.00352	ug/L 1 11/4/2014 05:33 PM
Benzene	0.000959 0.000618	0.00229	J ug/L 1 11/4/2014 05:33 PM
Ethylbenzene	0.00137 0.000711	0.00310	J ug/L 1 11/4/2014 05:33 PM
Isopropyl Alcohol	ND 0.000472	0.00176	ug/L 1 11/4/2014 05:33 PM
m,p-Xylene	0.00354 0.00156	0.00621	J ug/L 1 11/4/2014 05:33 PM
MTBE	ND 0.000706	0.0103	ug/L 1 11/4/2014 05:33 PM
o-Xylene	0.00149 0.000795	0.00310	J ug/L 1 11/4/2014 05:33 PM
Toluene	0.0323 0.000608	0.00269	ug/L 1 11/4/2014 05:33 PM
Surr: 4-Bromofluorobenzene	98.6 0	70-130	%REC 1 11/4/2014 05:33 PM

TPH GASOLINE IN AIR BY GC-FID

EPA TO3

RunID: GC9_141102A	QC Batch: R96651	PrepDate:	Analyst: JT
TPH-Gasoline (C5-C12)	16.5 0.694	3.00	ug/L 1 11/2/2014 04:18 PM
Surr: 4-Bromofluorobenzene	83.7 0	70-130	%REC 1 11/2/2014 04:18 PM

Qualifiers:	B Analyte detected in the associated Method Blank	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	S Spike/Surrogate outside of limits due to matrix interference
	Results are wet unless otherwise specified	DO Surrogate Diluted Out



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ANALYTICAL RESULTS

Print Date: 03-Dec-14

CLIENT: CH2MHill
Lab Order: N013771
Project: Norwalk
Lab ID: N013771-004

Client Sample ID: SVM-3-15
Collection Date: 10/31/2014 10:36:00 AM
Matrix: AIR

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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VOCS IN AIR BY GCMS

EPA TO15

RunID: MS6_141120A	QC Batch: R96931	PrepDate:	Analyst: QBM
Isopropylbenzene	ND 0.00292	0.00773	ug/L 1 11/21/2014 12:26 AM
n-Butylbenzene	ND 0.000869	0.00863	ug/L 1 11/21/2014 12:26 AM
n-Propylbenzene	ND 0.00261	0.00773	ug/L 1 11/21/2014 12:26 AM
sec-Butylbenzene	ND 0.00205	0.00863	ug/L 1 11/21/2014 12:26 AM
Tert-Butanol	0.0232 0.00130	0.00477	ug/L 1 11/21/2014 12:26 AM
Surr: 4-Bromofluorobenzene	112 0	70-130	%REC 1 11/21/2014 12:26 AM

VOCS IN AIR BY GCMS

EPA TO15

RunID: MS6_141104A	QC Batch: R96664	PrepDate:	Analyst: JT
1,2,4-Trimethylbenzene	ND 0.000773	0.00347	ug/L 1 11/4/2014 06:15 PM
1,2-Dichloroethane	ND 0.000746	0.00285	ug/L 1 11/4/2014 06:15 PM
1,3,5-Trimethylbenzene	ND 0.000988	0.00347	ug/L 1 11/4/2014 06:15 PM
Benzene	0.000901 0.000609	0.00226	J ug/L 1 11/4/2014 06:15 PM
Ethylbenzene	0.000980 0.000701	0.00306	J ug/L 1 11/4/2014 06:15 PM
Isopropyl Alcohol	ND 0.000465	0.00173	ug/L 1 11/4/2014 06:15 PM
m,p-Xylene	0.00318 0.00154	0.00612	J ug/L 1 11/4/2014 06:15 PM
MTBE	ND 0.000697	0.0102	ug/L 1 11/4/2014 06:15 PM
o-Xylene	0.00135 0.000784	0.00306	J ug/L 1 11/4/2014 06:15 PM
Toluene	0.00632 0.000599	0.00265	ug/L 1 11/4/2014 06:15 PM
Surr: 4-Bromofluorobenzene	101 0	70-130	%REC 1 11/4/2014 06:15 PM

TPH GASOLINE IN AIR BY GC-FID

EPA TO3

RunID: GC9_141102A	QC Batch: R96651	PrepDate:	Analyst: JT
TPH-Gasoline (C5-C12)	23.5 0.684	2.96	ug/L 1 11/2/2014 04:44 PM
Surr: 4-Bromofluorobenzene	106 0	70-130	%REC 1 11/2/2014 04:44 PM

Qualifiers: B Analyte detected in the associated Method Blank
 H Holding times for preparation or analysis exceeded
 ND Not Detected at the Reporting Limit
 Results are wet unless otherwise specified

E Value above quantitation range
 J Analyte detected below quantitation limits
 S Spike/Surrogate outside of limits due to matrix interference
 DO Surrogate Diluted Out



ASSET LABORATORIES
 ANALYTICAL SUPPORT SERVICES FOR ENVIRONMENTAL TECHNOLOGIES

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NEVADA
 3151 W. Post Rd., Las Vegas, NV 89118
 P: 702.307.2659 F: 702.307.2691

"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
 Work Order: N013771
 Project: Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: TO15_ADD

Sample ID: LCS-R96931	SampType: LCS	TestCode: TO15_ADD	Units: ppbv	Prep Date:	RunNo: 96931						
Client ID: ZZZZZ	Batch ID: R96931	TestNo: EPA TO15		Analysis Date: 11/20/2014	SeqNo: 1881741						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Isopropylbenzene	4.310	0.500	5.000	0	86.2	70	130				
n-Butylbenzene	5.930	0.500	5.000	0	119	70	130				
n-Propylbenzene	4.880	0.500	5.000	0	97.6	70	130				
sec-Butylbenzene	5.200	0.500	5.000	0	104	70	130				
Tert-Butanol	4.500	0.500	5.000	0	90.0	70	130				
Surr: 4-Bromofluorobenzene	5.100		5.000		102	70	130				

Sample ID: LCSD-R96931	SampType: LCSD	TestCode: TO15_ADD	Units: ppbv	Prep Date:	RunNo: 96931						
Client ID: ZZZZZ	Batch ID: R96931	TestNo: EPA TO15		Analysis Date: 11/20/2014	SeqNo: 1881742						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Isopropylbenzene	4.430	0.500	5.000	0	88.6	70	130	4.310	2.75	25	
n-Butylbenzene	6.110	0.500	5.000	0	122	70	130	5.930	2.99	25	
n-Propylbenzene	4.950	0.500	5.000	0	99.0	70	130	4.880	1.42	25	
sec-Butylbenzene	5.210	0.500	5.000	0	104	70	130	5.200	0.192	25	
Tert-Butanol	4.710	0.500	5.000	0	94.2	70	130	4.500	4.56	25	
Surr: 4-Bromofluorobenzene	5.110		5.000		102	70	130		0		

Sample ID: MB-R96931	SampType: MBLK	TestCode: TO15_ADD	Units: ppbv	Prep Date:	RunNo: 96931						
Client ID: ZZZZZ	Batch ID: R96931	TestNo: EPA TO15		Analysis Date: 11/20/2014	SeqNo: 1881743						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Isopropylbenzene	ND	0.500									
n-Butylbenzene	ND	0.500									
n-Propylbenzene	ND	0.500									
sec-Butylbenzene	ND	0.500									
Tert-Butanol	ND	0.500									
Surr: 4-Bromofluorobenzene	5.160		5.000		103	70	130				

Qualifiers:

- B Analyte detected in the associated Method Blank
 - J Analyte detected below quantitation limits
 - S Spike/Surrogate outside of limits due to matrix interference
 - E Value above quantitation range
 - ND Not Detected at the Reporting Limit
 - DO Surrogate Diluted Out
 - H Holding times for preparation or analysis exceeded
 - R RPD outside accepted recovery limits
- Calculations are based on raw values



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"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
 Work Order: N013771
 Project: Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: TO15_FULL

Sample ID: LCS-R96664	SampType: LCS	TestCode: TO15_FULL	Units: ppbv	Prep Date:	RunNo: 96664
Client ID: ZZZZZ	Batch ID: R96664	TestNo: EPA TO15		Analysis Date: 11/4/2014	SeqNo: 1869284

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trimethylbenzene	4.890	0.500	5.000	0	97.8	70	130				
1,2-Dichloroethane	5.040	0.500	5.000	0	101	70	130				
1,3,5-Trimethylbenzene	4.890	0.500	5.000	0	97.8	70	130				
Benzene	4.980	0.500	5.000	0	99.6	70	130				
Ethylbenzene	4.810	0.500	5.000	0	96.2	70	130				
Isopropyl Alcohol	5.520	0.500	5.000	0	110	70	130				
m,p-Xylene	9.540	1.00	10.00	0	95.4	70	130				
MTBE	4.800	2.00	5.000	0	96.0	70	130				
o-Xylene	4.760	0.500	5.000	0	95.2	70	130				
Toluene	4.710	0.500	5.000	0	94.2	70	130				

Sample ID: LCS-D-R96664	SampType: LCS-D	TestCode: TO15_FULL	Units: ppbv	Prep Date:	RunNo: 96664
Client ID: ZZZZZ	Batch ID: R96664	TestNo: EPA TO15		Analysis Date: 11/4/2014	SeqNo: 1869285

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trimethylbenzene	4.920	0.500	5.000	0	98.4	70	130	4.890	0.612	25	
1,2-Dichloroethane	5.170	0.500	5.000	0	103	70	130	5.040	2.55	25	
1,3,5-Trimethylbenzene	4.940	0.500	5.000	0	98.8	70	130	4.890	1.02	25	
Benzene	5.090	0.500	5.000	0	102	70	130	4.980	2.18	25	
Ethylbenzene	4.940	0.500	5.000	0	98.8	70	130	4.810	2.67	25	
Isopropyl Alcohol	6.080	0.500	5.000	0	122	70	130	5.520	9.66	25	
m,p-Xylene	9.800	1.00	10.00	0	98.0	70	130	9.540	2.69	25	
MTBE	5.080	2.00	5.000	0	102	70	130	4.800	5.67	25	
o-Xylene	4.870	0.500	5.000	0	97.4	70	130	4.760	2.28	25	
Toluene	4.810	0.500	5.000	0	96.2	70	130	4.710	2.10	25	

Sample ID: MB-A8419	SampType: MBLK	TestCode: TO15_FULL	Units: ppbv	Prep Date:	RunNo: 96664
Client ID: ZZZZZ	Batch ID: R96664	TestNo: EPA TO15		Analysis Date: 11/4/2014	SeqNo: 1869286

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
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Qualifiers:

- | | | |
|--|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range | H Holding times for preparation or analysis exceeded |
| J Analyte detected below quantitation limits | ND Not Detected at the Reporting Limit | R RPD outside accepted recovery limits |
| S Spike/Surrogate outside of limits due to matrix interference | DO Surrogate Diluted Out | Calculations are based on raw values |



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"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
Work Order: N013771
Project: Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: TO15_FULL

Sample ID: MB-A8419	SampType: MBLK	TestCode: TO15_FULL	Units: ppbv	Prep Date:	RunNo: 96664
Client ID: ZZZZZ	Batch ID: R96664	TestNo: EPA TO15		Analysis Date: 11/4/2014	SeqNo: 1869286

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trimethylbenzene	ND	0.500									
1,2-Dichloroethane	ND	0.500									
1,3,5-Trimethylbenzene	ND	0.500									
Benzene	ND	0.500									
Ethylbenzene	ND	0.500									
Isopropyl Alcohol	ND	0.500									
m,p-Xylene	ND	1.00									
MTBE	ND	2.00									
o-Xylene	ND	0.500									
Toluene	ND	0.500									

Qualifiers:

- | | | |
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| B Analyte detected in the associated Method Blank | E Value above quantitation range | H Holding times for preparation or analysis exceeded |
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"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
 Work Order: N013771
 Project: Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: TO15_FULL

Sample ID: LCS-R96665	SampType: LCS	TestCode: TO15_FULL	Units: ppbv	Prep Date:	RunNo: 96665
Client ID: ZZZZZ	Batch ID: R96665	TestNo: EPA TO15		Analysis Date: 11/5/2014	SeqNo: 1869300

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trimethylbenzene	4.910	0.500	5.000	0	98.2	70	130				
1,2-Dichloroethane	5.270	0.500	5.000	0	105	70	130				
1,3,5-Trimethylbenzene	5.010	0.500	5.000	0	100	70	130				
Benzene	5.140	0.500	5.000	0	103	70	130				
Ethylbenzene	5.080	0.500	5.000	0	102	70	130				
m,p-Xylene	10.050	1.00	10.00	0	101	70	130				
MTBE	5.240	2.00	5.000	0	105	70	130				
o-Xylene	5.020	0.500	5.000	0	100	70	130				
Toluene	4.930	0.500	5.000	0	98.6	70	130				
Surr: 4-Bromofluorobenzene	4.760		5.000		95.2	70	130				

Sample ID: LCS-D-R96665	SampType: LCS-D	TestCode: TO15_FULL	Units: ppbv	Prep Date:	RunNo: 96665
Client ID: ZZZZZ	Batch ID: R96665	TestNo: EPA TO15		Analysis Date: 11/5/2014	SeqNo: 1869301

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trimethylbenzene	5.090	0.500	5.000	0	102	70	130	4.910	3.60	25	
1,2-Dichloroethane	5.420	0.500	5.000	0	108	70	130	5.270	2.81	25	
1,3,5-Trimethylbenzene	5.090	0.500	5.000	0	102	70	130	5.010	1.58	25	
Benzene	5.400	0.500	5.000	0	108	70	130	5.140	4.93	25	
Ethylbenzene	5.160	0.500	5.000	0	103	70	130	5.080	1.56	25	
m,p-Xylene	10.160	1.00	10.00	0	102	70	130	10.05	1.09	25	
MTBE	5.150	2.00	5.000	0	103	70	130	5.240	1.73	25	
o-Xylene	5.110	0.500	5.000	0	102	70	130	5.020	1.78	25	
Toluene	5.190	0.500	5.000	0	104	70	130	4.930	5.14	25	
Surr: 4-Bromofluorobenzene	4.770		5.000		95.4	70	130		0	25	

Sample ID: MB-R96665	SampType: MBLK	TestCode: TO15_FULL	Units: ppbv	Prep Date:	RunNo: 96665
Client ID: ZZZZZ	Batch ID: R96665	TestNo: EPA TO15		Analysis Date: 11/5/2014	SeqNo: 1869302

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
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Qualifiers:

- | | | |
|--|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range | H Holding times for preparation or analysis exceeded |
| J Analyte detected below quantitation limits | ND Not Detected at the Reporting Limit | R RPD outside accepted recovery limits |
| S Spike/Surrogate outside of limits due to matrix interference | DO Surrogate Diluted Out | Calculations are based on raw values |



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"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
Work Order: N013771
Project: Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: TO15_FULL

Sample ID: MB-R96665	SampType: MBLK	TestCode: TO15_FULL	Units: ppbv	Prep Date:	RunNo: 96665						
Client ID: ZZZZZ	Batch ID: R96665	TestNo: EPA TO15	Analysis Date: 11/5/2014	SeqNo: 1869302							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2,4-Trimethylbenzene	ND	0.500									
1,2-Dichloroethane	ND	0.500									
1,3,5-Trimethylbenzene	ND	0.500									
Benzene	ND	0.500									
Ethylbenzene	ND	0.500									
m,p-Xylene	ND	1.00									
MTBE	ND	2.00									
o-Xylene	ND	0.500									
Toluene	ND	0.500									
Surr: 4-Bromofluorobenzene	4.600		5.000		92.0	70	130				

Qualifiers:

- | | | |
|--|--|--|
| B Analyte detected in the associated Method Blank | E Value above quantitation range | H Holding times for preparation or analysis exceeded |
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| S Spike/Surrogate outside of limits due to matrix interference | DO Surrogate Diluted Out | Calculations are based on raw values |



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CLIENT: CH2MHill
Work Order: N013771
Project: Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: TO3_PPMV

Sample ID: LCS-R96651	SampType: LCS	TestCode: TO3_PPMV	Units: ppmv	Prep Date:	RunNo: 96651						
Client ID: ZZZZZ	Batch ID: R96651	TestNo: EPA TO3		Analysis Date: 11/2/2014	SeqNo: 1868305						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

TPH-Gasoline	4.678	0.500	5.000	0	93.6	70	130				
Surr: 4-Bromofluorobenzene	0.775		1.000		77.5	70	130				

Sample ID: LCSD-R96651	SampType: LCSD	TestCode: TO3_PPMV	Units: ppmv	Prep Date:	RunNo: 96651						
Client ID: ZZZZZ	Batch ID: R96651	TestNo: EPA TO3		Analysis Date: 11/2/2014	SeqNo: 1868306						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

TPH-Gasoline	4.824	0.500	5.000	0	96.5	70	130	4.678	3.07	20	
Surr: 4-Bromofluorobenzene	0.849		1.000		84.9	70	130		0	0	

Sample ID: MB1-R96651	SampType: MBLK	TestCode: TO3_PPMV	Units: ppmv	Prep Date:	RunNo: 96651						
Client ID: ZZZZZ	Batch ID: R96651	TestNo: EPA TO3		Analysis Date: 11/2/2014	SeqNo: 1868307						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

TPH-Gasoline	0.285	0.500									J
Surr: 4-Bromofluorobenzene	1.081		1.000		108	70	130				

Qualifiers:

- | | | |
|--|--|--|
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AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311

Tel: 818-998-5547 FAX: 818-998-7258

A.A. COC No.:

70041371

Page 1 of 1

Client: CH2M HILL Project Name / No.: Norwalk Sampler's Name: Tan Jablonski
 Project Manager: Dan Jablonski Site Address: 15306 Norwalk Blvd Sampler's Signature: [Signature]
 Phone: 818 257 3630 City: Norwalk P.O. No.:
 Fax: 714 424 2135 State & Zip: CA Quote No.:

TAT Turnaround Codes **

- ① = Same Day Rush
- ② = 24 Hour Rush
- ③ = 48 Hour Rush
- ④ = 72 Hour Rush
- ⑤ = 5 Day Rush
- X = 10 Working Days (Standard TAT)

ANALYSIS REQUESTED (Test Name)

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	Please enter the TAT Turnaround Codes ** below										Special Instructions		
						VOCs To-15	Fixed gases	TPH-g										
SVM-5-15.5	NO13771 - 01	10/30	1135	gas	2	X	X	X										P _L = -29" P _F = -4"
SVM-15-15	-02	10/30	1400	gas	2	X	X	X										P _L = -30" P _F = -5"
SVM-9-14.5	-03	10/31	0923	gas	2	X	X	X										P _L = -30" P _F = -4"
SVM-3-15	-04	10/31	1036	gas	2	X	X	X										P _L = -28" P _F = -3"

For Laboratory Use	Relinquished by <u>[Signature]</u>	Date <u>10/31/14</u>	Time <u>12:05 p</u>	Received by <u>[Signature]</u>
	Relinquished by <u>[Signature]</u>	Date <u>10/21/14</u>	Time <u>4:02 pm</u>	Received by <u>[Signature]</u>
	Relinquished by	Date	Time	Received by

A.A. Project No.:

Note: By relinquishing samples to American Analytics, client agrees to pay for the services requested on this chain of custody form and any additional client-requested analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 45 days following the submittal of the sample(s) to American Analytics.

ASSET Laboratories

Please review the checklist below. Any NO signifies non-compliance. Any non-compliance will be noted and must be understood as having an impact on the quality of the data. All tests will be performed as requested regardless of any compliance issues.

If you have any questions or further instruction, please contact our Project Coordinator at (702) 307-2659.

Cooler Received/Opened On: 11/1/2014 Workorder: N013771
 Rep sample Temp (Deg C): NA IR Gun ID: NA
 Temp Blank: Yes No
 Carrier name: Golden State Overnight
 Last 4 digits of Tracking No.: 6011 Packing Material Used: Bubble Wrap
 Cooling process: Ice Ice Pack Dry Ice Other None

Sample Receipt Checklist

- | | | | |
|---|--|--|--|
| 1. Shipping container/cooler in good condition? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | Not Present <input type="checkbox"/> |
| 2. Custody seals intact, signed, dated on shipping container/cooler? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Not Present <input checked="" type="checkbox"/> |
| 3. Custody seals intact on sample bottles? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Not Present <input checked="" type="checkbox"/> |
| 4. Chain of custody present? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| 5. Sampler's name present in COC? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| 6. Chain of custody signed when relinquished and received? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| 7. Chain of custody agrees with sample labels? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| 8. Samples in proper container/bottle? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| 9. Sample containers intact? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| 10. Sufficient sample volume for indicated test? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| 11. All samples received within holding time? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| 12. Temperature of rep sample or Temp Blank within acceptable limit? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | NA <input checked="" type="checkbox"/> |
| 13. Water - VOA vials have zero headspace? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | NA <input checked="" type="checkbox"/> |
| 14. Water - pH acceptable upon receipt?
Example: pH > 12 for (CN,S); pH<2 for Metals | Yes <input type="checkbox"/> | No <input type="checkbox"/> | NA <input checked="" type="checkbox"/> |
| 15. Did the bottle labels indicate correct preservatives used? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | NA <input checked="" type="checkbox"/> |
| 16. Were there Non-Conformance issues at login?
Was Client notified? | Yes <input type="checkbox"/>
Yes <input type="checkbox"/> | No <input type="checkbox"/>
No <input type="checkbox"/> | NA <input checked="" type="checkbox"/>
NA <input checked="" type="checkbox"/> |

Comments:

Checklist Completed By: JPG  11/03/14

Reviewed By:  11/10/14



ASSET Laboratories

3151-3153 W Post Rd., Las Vegas, NV 89118

www.atl-labs.com

TEL: 7023072659

FAX: 7023072691

CHAIN-OF-CUSTODY RECORD

QC Level: RTNE

Subcontractor:

ATL Air Labs
18501 E. Gale Ave, Suite 130
City of Industry, CA 91748

TEL: (626) 964-4032
FAX: (626) 964-5832
Acct #:

Field Sampler: None Specified

31-Oct-14

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests		
				ASTM D1946		
N013771-001A / SVM-5-15.5	Air	10/30/2014 11:35:00 AM	AIRB	1		
N013771-002A / SVM-15-15	Air	10/30/2014 2:00:00 PM	AIRB	1		
N013771-003A / SVM-9-14.5	Air	10/31/2014 9:23:00 AM	AIRB	1		
N013771-004A / SVM-3-15	Air	10/31/2014 10:36:00 AM	AIRB	1		

General Comments: Please email sample receipt acknowledgement to the PM.

Please use PO#: N13771A For questions, call Marlon at (702)-307-2659. Please e-mail results to reports.lv@assetlaboratories.com by: Normal TAT

Please analyze for Fixed Gases by ASTM D1946.

	Date/Time		Date/Time
Relinquished by:	10/31/14 @ 12:53	Received by: _____	
Relinquished by: _____		Received by: _____	

ASSET Laboratories

WORK ORDER Summary

04-Nov-14

WorkOrder: N013771

Client ID: CH2HI03

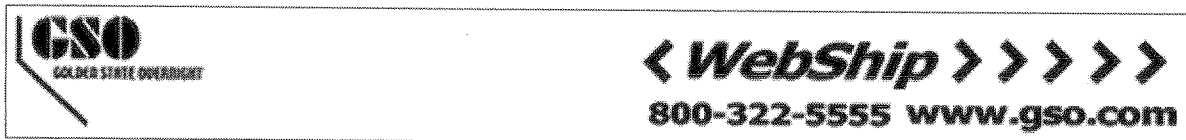
Project: Norwalk

QC Level: RTNE

Date Received: 11/1/2014

Comments:

Sample ID	Client Sample ID	Date Collected	Date Due	Matrix	Test No	Test Name	Hld	MS	Sub	Storage
N013771-001A	SVM-5-15.5	10/30/2014 11:35:00 AM	11/13/2014	Air	ASTM D1946	1946	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SUB
N013771-001B			11/13/2014		EPA TO15	VOCs in Air by GCMS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AIR
			11/13/2014		EPA TO3	TPH Gasoline in Air by GC-FID	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AIR
N013771-002A	SVM-15-15	10/30/2014 2:00:00 PM	11/13/2014		ASTM D1946	1946	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SUB
N013771-002B			11/13/2014		EPA TO15	VOCs in Air by GCMS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AIR
			11/13/2014		EPA TO3	TPH Gasoline in Air by GC-FID	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AIR
N013771-003A	SVM-9-14.5	10/31/2014 9:23:00 AM	11/13/2014		ASTM D1946	1946	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SUB
N013771-003B			11/13/2014		EPA TO15	VOCs in Air by GCMS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AIR
			11/13/2014		EPA TO3	TPH Gasoline in Air by GC-FID	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AIR
N013771-004A	SVM-3-15	10/31/2014 10:36:00 AM	11/13/2014		ASTM D1946	1946	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SUB
N013771-004B			11/13/2014		EPA TO15	VOCs in Air by GCMS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AIR
			11/13/2014		EPA TO3	TPH Gasoline in Air by GC-FID	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	AIR
N013771-005A	FOLDER		11/13/2014		Folder	Folder	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LAB



Ship From: MEYNARD LARIN ASSET LABORATORIES 11060 ARTESIA BLVD., SUITE C CERRITOS, CA 90703 Ship To: MARLON CARTIN ATL INC 3151 W. POST RD LAS VEGAS, NV 89118 COD: \$0.00 Reference: Delivery Instructions: TO HOLD FOR PICK UP Signature Type: SIGNATURE REQUIRED	Tracking #: 526036011 	SDS
	LVS LAS VEGAS D89103A 30382036	

Print Date : 10/31/14 16:53 PM

Package 2 of 2

Send Label To Printer	<input checked="" type="checkbox"/> Print All	Edit Shipment	Finish
-----------------------	---	---------------	--------

LABEL INSTRUCTIONS:

Do not copy or reprint this label for additional shipments - each package must have a unique barcode.

STEP 1 - Use the "Send Label to Printer" button on this page to print the shipping label on a laser or inkjet printer.

STEP 2 - Fold this page in half.

STEP 3 - Securely attach this label to your package, do not cover the barcode.

STEP 4 - Request an on-call pickup for your package, if you do not have scheduled daily pickup service or Drop-off your package at the nearest GSO drop box. Locate nearest GSO dropbox locations using this link.

ADDITIONAL OPTIONS:

Send Label Via Email	Create Return Label
----------------------	---------------------

TERMS AND CONDITIONS:

By giving us your shipment to deliver, you agree to all the service terms and conditions described in this section. Our liability for loss or damage to any package is limited to your actual damages or \$100 whichever is less, unless you pay for and declare a higher authorized value. If you declare a higher value and pay the additional charge, our liability will be the lesser of your declared value or the actual value of your loss or damage. In any event, we will not be liable for any damage, whether direct, incidental, special or consequential, in excess of the declared value of a shipment whether or not we had knowledge that such damage might be incurred including but not limited to loss of income or profit. We will not be liable for your acts or omissions, including but not limited to improper or insufficient packaging, securing, marking or addressing. Also, we will not be liable if you or the recipient violates any of the terms of our agreement. We will not be liable for loss, damage or delay caused by events we cannot control, including but not limited to acts of God, perils of the air, weather conditions, act of public enemies, war, strikes, or civil commotion. The highest declared value for our GSO Priority Letter or GSO Priority Package is \$500. For other shipments the highest declared value is \$10,000 unless your package contains items of "extraordinary value", in which case the highest declared value we allow is \$500. Items of "extraordinary value" include, but are not limited to, artwork, jewelry, furs, precious metals, tickets, negotiable instruments and other items with intrinsic value.

November 11, 2014

Asset Laboratories
ATTN: Marlon Cartin
3151-3153 W. Post Rd.
Las Vegas, NV 89118



DoD ELAP
ADE-1461
EPA Methods TO-3,
TO14A, TO15 SIM & Scan,
ASTM D1946



LA Cert 04140
EPA Methods TO3, TO14A, TO15, 25C/3C,
RSK-175
TX Cert T104704450-09-TX
EPA Methods TO14A, TO15
UT Cert CA0133332014-1
EPA Methods TO3, TO14A, TO15, RSK-175

LABORATORY TEST RESULTS

Project Reference: N013771
Lab Number: F103105-01/04

Enclosed are results for sample(s) received 10/31/14 by Air Technology Laboratories. Samples were received intact. Analyses were performed according to specifications on the chain of custody provided with the sample(s).

Report Narrative:

- Unless otherwise noted in the report, sample analyses were performed within method performance criteria and meet all requirements of the NELAC Standards.
- The enclosed results relate only to the sample(s).

ATL appreciates the opportunity to provide testing services to your company. If you have any questions regarding these results, please call me at (626) 964-4032.

Sincerely,

A handwritten signature in blue ink, appearing to read "Mark Johnson".

Mark Johnson
Operations Manager
MJohnson@AirTechLabs.com

Note: The cover letter is an integral part of this analytical report.

F103105-01/04



ASSET Laboratories

3151-3153 W Post Rd., Las Vegas, NV 89118
www.asset-labs.com
TEL: 7023072659 FAX: 7023072691

CHAIN-OF-CUSTODY RECORD

QC Level: RTNE

Subcontractor:

ATL Air Labs
18501 E. Gale Ave, Suite 130
City of Industry, CA 91748

TEL: (626) 964-4032
FAX: (626) 964-5832
Acct #:

Field Sampler: None Specified

31-Oct-14

01
02
03
04

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests		
				ASTM D1946		
N013771-001A / SVM-5-15.5	Air	10/30/2014 11:35:00 AM	AIRB	1		
N013771-002A / SVM-15-15	Air	10/30/2014 2:00:00 PM	AIRB	1		
N013771-003A / SVM-9-14.5	Air	10/31/2014 9:23:00 AM	AIRB	1		
N013771-004A / SVM-3-15	Air	10/31/2014 10:36:00 AM	AIRB	1		

General Comments: Please email sample receipt acknowledgement to the PM.

Please use PO#: N13771A For questions, call Marlon at (702)-307-2659. Please e-mail results to reports.lv@assetlaboratories.com by: Normal TAT

Please analyze for Fixed Gases by ASTM D1946.

Relinquished by: <u><i>JPGerman</i></u>	Date/Time: <u>10/31/14 @ 12:53</u>	Received by: <u><i>[Signature]</i></u>	Date/Time: <u>10/31/14</u>
Relinquished by: _____	Date/Time: _____	Received by: _____	Date/Time: _____

Client: Asset Laboratories
Attn: Marlon Cartin
Project Name: NA
Project No.: N013771
Date Received: 10/31/14
Matrix: Air
Reporting Units: % v/v

ASTM D1946

Lab No.:	F103105-01	F103105-02	F103105-03	F103105-04				
Client Sample I.D.:	N013771-001A / SVM-5-15.5	N013771-002A / SVM-15-15	N013771-003A / SVM-9-14.5	N013771-004A / SVM-3-15				
Date/Time Sampled:	10/30/14 11:35	10/30/14 14:00	10/31/14 9:23	10/31/14 10:36				
Date/Time Analyzed:	10/31/14 20:06	10/31/14 20:20	10/31/14 20:35	10/31/14 20:50				
QC Batch No.:	141031GC8A1	141031GC8A1	141031GC8A1	141031GC8A1				
Analyst Initials:	MJ	MJ	MJ	MJ				
Dilution Factor:	1.0	1.0	1.0	1.0				
ANALYTE	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v	Result % v/v	RL % v/v
Carbon Dioxide	0.35	0.010	0.72	0.010	5.8	0.010	1.7	0.010
Oxygen/Argon	16	0.50	17	0.50	15	0.50	14	0.50
Nitrogen	83	1.0	81	1.0	78	1.0	84	1.0
Methane	0.0026	0.0010	ND	0.0010	ND	0.0010	0.0023	0.0010

Results normalized including non-methane hydrocarbons
ND = Not Detected (below RL)
RL = Reporting Limit

Reviewed/Approved By: _____

Mark Johnson
Operations Manager

Date: 11/10/14

The cover letter is an integral part of this analytical report

QC Batch No.: 141031GC8A1

Matrix: Air

Units: % v/v

QC for ASTM D1946

Lab No.:	Method Blank	LCS	LCSD					
Date/Time Analyzed:	10/31/14 14:18	10/31/14 11:36	10/31/14 11:51					
Analyst Initials:	MJ	MJ	MJ					
Datafile:	31oct013	31oct007	31oct008					
Dilution Factor:	1.0	1.0	1.0					
ANALYTE	Results	RL	% Rec.	Criteria	% Rec.	Criteria	%RPD	Criteria
Carbon Dioxide	ND	0.010	97	70-130%	97	70-130%	0.2	<30
Oxygen/Argon	ND	0.50	105	70-130%	104	70-130%	0.1	<30
Nitrogen	ND	1.0	104	70-130%	104	70-130%	0.2	<30
Methane	ND	0.0010	97	70-130%	95	70-130%	1.9	<30

ND = Not Detected (Below RL)

Reviewed/Approved By: *Mark J. Johnson*
Mark J. Johnson
 Operations Manager

Date: 11/10/14

The cover letter is an integral part of this analytical report.

