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Mr. Paul Cho
Regional Water Quality Control Board
Los Angeles Region
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September 6, 2016

Subject: Horizontal Pilot Testing Project – Results of May 2016 Soil Vapor Monitoring at the South-Central Area of the SFPP Norwalk Pump Station, Norwalk, California

Dear Mr. Cho,

This letter report presents the results of the soil vapor monitoring conducted in May 2016 at the SFPP Norwalk Pump Station, located at 15306 Norwalk Boulevard, Norwalk, California (the site; Figure 1). The soil vapor work was performed by CH2M HILL Engineers, Inc. (CH2M), on behalf of SFPP, L.P. (SFPP), as part of the pilot testing program for SFPP's horizontal biosparge system. Groundwater monitoring data collected as part of the pilot testing will be provided under separate cover in a comprehensive evaluation report that will be prepared after additional data are collected. Both soil vapor and groundwater monitoring are conducted in general accordance with the approved *Horizontal Biosparge System Construction and Pilot Test Work Plan* (CH2M, 2013). The project background, purpose, approach, and results of the soil vapor monitoring are presented below, followed by a summary and recommendations.

Background

In August 2014, SFPP completed installation of a horizontal biosparge system to enhance mass removal of hydrocarbon constituents beneath the south-central area of the site. Construction of the biosparge well is documented in the report titled, *Horizontal Biosparge Well and Soil Vapor Monitoring Probe Completion Report SFPP Norwalk Pump Station, 15306 Norwalk Boulevard, Norwalk, California* (CH2M, 2015). Pilot testing of the system was initiated on January 6, 2016, and is anticipated to continue for approximately 1 year in order to evaluate the feasibility of system expansion.

During biosparge system startup, ambient air was injected into the biosparge well, via a rotary screw air compressor, at increasing flow rates over several weeks until the maximum design rate of approximately 500 standard cubic feet per minute (scfm) was achieved. Soil vapor monitoring of onsite and offsite soil vapor probes has been performed to ensure that shallow subsurface vapors do not pose an unacceptable human health risk to residents in the offsite area south of the site during biosparge system operations. Soil vapor monitoring results for samples collected in January/February and April 2016 were previously submitted to the Regional Water Quality Control Board, Los Angeles Region (RWQCB) on April 19 and June 17, 2016, respectively. Soil vapor monitoring data were not collected in March 2016 due to downtime of SFPP's soil vapor extraction (SVE) and biosparge systems. The SVE system has an interlock, which ensures that biosparging cannot occur unless the SVE system is operating. Operation of the SVE system reduces the potential for offgassing of volatile organic compounds (VOCs) during biosparge operations.

The data presented in this report was obtained from sampling onsite and offsite soil vapor monitoring probes between May 25 and 27, 2016. A mobile laboratory was used for onsite analysis of soil vapor samples. During sampling activities, the biosparge system was operating at a flow rate of approximately 360 scfm and the SVE system was in full operation. Since June 3, 2016, the biosparge system has been operating at a flow rate of approximately 420 scfm.

Purpose

The purpose of the soil vapor monitoring is to ensure that shallow subsurface vapors do not pose an unacceptable human health risk to residents in the offsite area south of the site during biosparge system operations.

Approach

CH2M retained American Analytics of Chatsworth, California, to collect and analyze soil vapor samples from the soil vapor monitoring network (SVM-1 through SVM-3, SVM-5 through SVM-8, and SVM-10 through SVM-16). Probes SVM-11 through SVM-14 are located onsite; the remaining probes are in the offsite area. Figure 2 shows the location of soil vapor monitoring probes and the horizontal biosparge well. Figure 3 shows the completion details of a typical nested probe. A mobile laboratory was used by American Analytics for onsite analysis of soil vapor samples. Field photoionization detector (PID) and vacuum measurements were also taken by CH2M staff prior to sample collection. The technical approach and analytical results are discussed below.

PID and Vacuum Measurements

A CH2M engineer collected field VOCs measurements from the south-central area soil vapor probe network using a PID calibrated against hexane. Field readings were collected after each probe was purged approximately three system volumes using a hand-held portable vacuum pump. A vacuum measurement was also collected from each probe using a digital manometer.

Monitoring with Mobile Laboratory

Soil vapor samples were collected by American Analytics and analyzed onsite using its mobile laboratory under the direction of CH2M. Sampling was conducted from May 25 to May 27, 2016. The soil vapor probes at each monitoring location 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 July 2015 (DTSC, 2015). The analytical results were evaluated by comparison with soil gas screening levels based on the most current DTSC guidance (DTSC, 2016). The soil gas screening levels are calculated from indoor air screening levels published by DTSC in its Human Health Risk Assessment (HHRA) Note 3 (DTSC, 2016) using the default attenuation factors presented in DTSC's vapor intrusion guidance (DTSC, 2011).

Sampling and Analysis

As described above, soil vapor sampling was conducted from probes SVM-1 through SVM-3, SVM-5 through SVM-8, and SVM-10 through SVM-16. The soil vapor probes from each monitoring location were purged and sampled using a vacuum/pressure sampling pump calibrated to a flow rate of 200 milliliters per minute in accordance with recommended flow rates in the Advisory (DTSC, 2015).

A soil vapor sample was not collected at the deep probe of SVM-2 and shallow probe of SVM-10 due to flow restrictions (excessive vacuum) observed during purging activities with a hand-held sampling pump. Soil vapor samples also were not collected from the shallow or deep probes of SVM-4 due to property access restrictions. The shallow and deep probes of SVM-9 are located in the southeastern area (outside of the pilot testing area) and were therefore not monitored.

Soil vapor samples were collected using 1.4-liter Summa canisters and glass syringes, and were analyzed by the American Analytics onsite mobile laboratory for VOCs using U.S. Environmental Protection Agency (EPA) Method TO-15. Total petroleum hydrocarbons quantified as gasoline (TPH-g) were analyzed using EPA Method TO-3, and fixed gases (carbon dioxide, methane, and oxygen) were analyzed using EPA Method 3C. Included in the TO-15 list of analytes were benzene, toluene, ethylbenzene, and total xylenes (BTEX); methyl tert-butyl ether (MTBE); naphthalene; tert-butyl alcohol (TBA [also known as tert-butanol]); 1,2-dichloroethane; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; n-butylbenzene; sec-butylbenzene; isopropylbenzene; n-propylbenzene; and 2-propanol (the leak test compound). These constituents were identified as chemicals of potential concern (COPCs) based on the results of the 2006 soil gas investigation and HHRA (Geomatrix, 2006).

In accordance with the Advisory (DTSC, 2015), 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-7 (7-foot depth), SVM-14 (15-foot depth), and SVM-15 (15-foot depth). The duplicate samples were collected and analyzed in the same manner as the primary samples.

Ambient air samples were also collected each day of sampling and analyzed by the mobile laboratory for VOCs and TPH-g. The purpose of the ambient air samples is to quantify background concentrations of COPCs near select sampling locations.

Field PID and Vacuum Results

Table 1 presents a summary of field VOCs (using a PID) and vacuum measurements collected from the south-central area soil vapor monitoring network during the May 2016 event. The biosparge system flow rate during soil vapor monitoring was approximately 360 scfm; the SVE system was operational during monitoring. The following observations were made.

Offsite Probes

- Shallow, middle, and deep probe depths in the offsite soil vapor probes did not have detectable VOCs (concentration of 0.0 parts per million by volume [ppmv]), with the exception that the shallow probe (5-foot depth) of SVM-3 and the deepest probe (22-foot depth) of SVM-16 had VOC concentrations of 0.2 and 7.6 ppmv, respectively.
- Vacuum (pressure) measurements ranged from 0 inches of water (in. H_2O) in many offsite probes to negative 9.2 in. H_2O in the deep probe (22-foot depth) of SVM-15. Negative values are indicative of negative pressure created by nearby vapor extraction wells.

Onsite Probes

- Shallow, middle, and deep probe depths in the onsite soil vapor probes did not have detectable VOCs, with the exception that the deepest probe (22.5-foot depth) of SVM-13 and deepest probe (22-foot depth) of SVM-14 had VOCs concentrations of 0.8 ppmv and greater than 15,000 ppmv, respectively. SVM-14 is located less than 10 feet from the horizontal biosparge well; therefore, elevated VOC concentrations at this location were not unexpected.
- Vacuum measurements ranged from negative 20.1 in. H_2O in the deepest probe (22.5-foot depth) of SVM-13 to positive 22.9 in. H_2O in the deepest probe (22-foot depth) of SVM-14. The maximum positive pressure that was reported at the deepest probe of SVM-14 also was not unexpected due to its close lateral and vertical proximity to the biosparge well.

Mobile Laboratory Results

Table 2 presents the analytical results for samples collected during the May 2016 sampling event. Laboratory analytical reports are included in Attachment A. A summary of results is provided below.

Offsite Probes

- VOCs and TPH-g were nondetect at offsite probes SVM-1, SVM-2, SVM-5 through SVM-8, SVM-10, and SVM-15.
- Non-COPCs bromodichloromethane (0.022 micrograms per liter [μg/L]) and chloroform (0.044 μg/L) were detected in the shallow probe (5-foot depth) of SVM-3; chloroform (0.04 μg/L) was also detected in the deepest probe (15-foot depth) of SVM-3. These three detections were just above the laboratory reporting limits and below screening levels under residential and commercial scenarios. TPH-g was nondetect at both depths of SVM-3.
- VOCs and TPH-g were nondetect in the shallow probe (7-foot depth) and middle probe (16-foot depth) of SVM-16. In the deepest probe (22-foot depth) of SVM-16, non-COPCs heptane and n-hexane were detected at concentrations of 0.044 μg/L and 0.051 μg/L, respectively. There are no established screening levels for heptane. The reported concentration of n-hexane was below screening levels under residential and commercial scenarios. TPH-g was nondetect in the 22-foot depth of SVM-16.

Onsite Probes

- VOCs and TPH-g were nondetect at onsite probes SVM-11, SVM-12, and SVM-13.
- VOCs and TPH-g were nondetect in the shallow probe (7-foot depth) of SVM-14. Three VOCs (m,p-xylenes, o-xylene, and toluene) were detected in the primary and field duplicate samples of the middle probe (15-foot depth) of SVM-14 at concentrations below screening levels under residential and commercial scenarios. TPH-g and all other VOCs were nondetect at this depth. Five VOCs (1,2,4-trimethylbenzene, 1,3,5-trimethylbezene, m,p-xylenes, o-xylenes, and 4-ethyltoluene) and TPH-g were detected in the deep probe (22-foot depth) of SVM-14. Of these, 1,2,4-trimethylbenzene (59 μg/L) and TPH-g (2,200 μg/L) were detected at concentrations above screening levels under residential and/or commercial scenarios. 1,3,5-Trimethylbenzene and non-COPC 4-ethyltoluene were detected at concentrations of 56 μg/L and 31 μg/L, respectively, in the 22-foot depth of SVM-14. There are no established screening levels for 1,3,5-trimethylbeznene and 4-ethyltoluene.

Summary and Recommendations

Soil vapor monitoring was conducted in the south-central area of the SFPP Norwalk Pump Station during biosparging operations in May 2016. The purpose of the soil vapor monitoring is to ensure that shallow subsurface vapors do not pose an unacceptable human health risk to residents in the offsite area south of the site during biosparge system operations. The SVE remained online during biosparge operations (and soil vapor monitoring) to reduce the potential for offgassing of subsurface VOCs. Monitoring included the collection of field VOCs and vacuum measurements using hand-held field equipment (PID, digital manometer) and sampling and analysis of soil vapor samples using an onsite mobile laboratory.

The soil vapor probes monitored were SVM-1 through SVM-3, SVM-5 through SVM-8, and SVM-10 through SVM-16. The deep probe of SVM-2 and shallow probe of SVM-10 were not monitored due to flow restrictions (excessive vacuum) observed during purging activities. The shallow and deep probes of SVM-4 also were not monitored due to property access restrictions. The shallow and deep probes of SVM-9 are located in the southeastern area (outside of the pilot testing area) and were therefore not monitored.

Analytical results from the mobile laboratory were generally consistent with field PID measurements collected during this event.

- In the offsite area, VOCs and TPH-g were nondetect in all probes with the exception of SVM-3 and SVM-16. Non-COPCs bromodichloromethane and chloroform were detected in the shallow (5-foot depth) and/or deep probe (15-foot depth) of SVM-3; heptane and n-hexane were detected in the deep probe (22-foot depth) of SVM-16. These isolated detections were below established screening levels under residential and commercial scenarios.
- In the onsite area, VOCs and TPH-g were nondetect in SVM-11, SVM-12, and SVM-13. Detections of VOCs and/or TPH-g were reported in remaining onsite probe SVM-14 in the middle and deeper probe depths. Detections in the middle probe depth were below residential and commercial screening levels. 1,2,4-Trimethylbenzene and TPH-g detections in the deeper probe depth of SVM-14 were above residential and/or commercial screening levels. 1,3,5-Trimethylbenene and 4-ethyltoluene also were detected in the deeper probe depth of SVM-14, but there are no established screening levels for these constituents. Elevated VOC and TPH-g concentrations in the deepest probe (22-foot depth) of SVM-14 were not unexpected given that the hydrocarbon smear zone occurs at an average depth of approximately 27 to 31 feet below ground surface in the south-central area.

Based on the data collected thus far, SFPP recommends continued operation of the biosparge system and continued monthly sampling of the south-central soil vapor monitoring network using the mobile laboratory contractor. Shallow soil vapor in the offsite area does not pose an unacceptable human health risk to residents based on the data collected since startup. The SVE system will continue to remain online during biosparging operations. Additional soil vapor monitoring reports will be prepared and submitted to the RWQCB and Restoration Advisory Board as new data become available.

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

Regards,
CH2M HILL Engineers, Inc.

Dan Jablonski
Project Manager

John Lowe, CIH
Vapor Intrusion Consultant

Attachments:

References

Tables

Table 1 – Soil Vapor Probe Field VOCs and Vacuum Readings – May 2016
Table 2 – Mobile Laboratory Soil Vapor Analytical Results – May 2016

Figures

Figure 1 – Site Location Map
Figure 2 – Soil Vapor Monitoring Probe Locations
Figure 3 – Typical Nested Soil Vapor Monitoring Probe Completion Diagram

Attachment A – Mobile Laboratory Analytical Reports

Distribution:

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Tables

Table 1. Soil Vapor Probe Field VOCs and Vacuum Readings - May 2016

SFPP Norwalk Pump Station, Norwalk, California

			Date		5/25/16 to 5/27/16	
			SVE System		On	
			BS System		On	
			BS Flow Rate (scfm)		360	
			Screen Interval (feet bgs)			
Probe	Location	Zone	From	To	VOCs[a] (ppmv)	Vacuum (in. H_2O)
SVM-1	Offsite	Shallow	5	5.5	0	0
SVM-1	Offsite	Deep	14.5	15	0	-1.5
SVM-2	Offsite	Shallow	5	5.5	0	0
SVM-2	Offsite	Deep	14.5	15	--	--
SVM-3	Offsite	Shallow	5	5.5	0.2	-0.5
SVM-3	Offsite	Deep	15	15.5	0	-1.1
SVM-5	Offsite	Shallow	5	5.5	0	0
SVM-5	Offsite	Deep	15.5	16	0	-4.7
SVM-6	Offsite	Shallow	6.5	7	0	0
SVM-6	Offsite	Deep	15.5	16	0	-3.1
SVM-7	Offsite	Shallow	7	7.5	0	0
SVM-7	Offsite	Deep	13.25	13.75	0	-0.5
SVM-8	Offsite	Shallow	5	5.5	0	0
SVM-8	Offsite	Deep	15	15.5	0	-1.6
SVM-10	Offsite	Shallow	7.5	8	--	--
SVM-10	Offsite	Deep	15.5	16	0	0
SVM-11	Onsite	Shallow	7	7.5	0	0
SVM-11	Onsite	Middle	15	15.5	0	0
SVM-11	Onsite	Deep	21	21.5	0	0
SVM-12	Onsite	Shallow	7	7.5	0	0
SVM-12	Onsite	Middle	15	15.5	0	0
SVM-12	Onsite	Deep	22	22.5	0	0
SVM-13	Onsite	Shallow	7	7.5	0	-2.1
SVM-13	Onsite	Middle	15.5	16	0	-15
SVM-13	Onsite	Deep	22.5	23	0.8	-20.1
SVM-14	Onsite	Shallow	7	7.5	0	0
SVM-14	Onsite	Middle	15	15.5	0	0
SVM-14	Onsite	Deep	22	22.5	>15000	22.9
SVM-15	Offsite	Shallow	7	7.5	0	0
SVM-15	Offsite	Middle	15	15.5	0	0
SVM-15	Offsite	Deep	22	22.5	0	-9.2
SVM-16	Offsite	Shallow	7	7.5	0	0
SVM-16	Offsite	Middle	15.5	16	0	-1
SVM-16	Offsite	Deep	22	22.5	7.6	-1.5

Notes:

[a] MiniRae 3000 PID calibrated to 50 ppmv hexane

bgs - below ground surface

in. H_2O - inches of water

PID - photoionization detector

ppmv - parts per million by volume

scfm - standard cubic feet per minute

SVE - soil vapor extraction

VOC = volatile organic compound

Table 2. Mobile Laboratory Soil Vapor Analytical Results - May 2016

SFPP Norwalk Pump Station, Norwalk, California

Analyte Type	Analyte	Unit	Current Residential Soil Gas Screening Level [1, 2]	Current Commercial Soil Gas Screening Level [1, 2]	SVM-1-5 5/26/2016 SVM-1 5-5.5	SVM-1-15 5/26/2016 SVM-1 15-15.5	SVM-2-5 5/26/2016 SVM-2 5-5.5	SVM-3-5 5/25/2016 SVM-3 5-5.5	SVM-3-15 5/25/2016 SVM-3 15-15.5	SVM-5-5 5/25/2016 SVM-5 5-5.5	SVM-5-15 5/25/2016 SVM-5 15-15.5	SVM-6-7 5/26/2016 SVM-6 7-7.5	SVM-6-16 5/26/2016 SVM-6 16-16.5	SVM-7-7 5/25/2016 SVM-7 7-7.5	SVM-7-7 DUP 5/25/2016 SVM-7 7-7.5	SVM-7-13 5/25/2016 SVM-7 13-13.5	SVM-8-5 5/25/2016 SVM-8 5-5.5	SVM-8-15 5/25/2016 SVM-8 15-15.5	SVM-10-15 5/26/2016 SVM-10 15-15.5
COPCs [4]	1,2,4-Trimethylbenzene	µg/L	7.3	31	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	1,2-Dichloroethane	µg/L	0.11	0.47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	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	<0.02	<0.02	<0.02	<0.02
	2-Propanol (leak test compound)	µg/L	---	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Benzene	µg/L	0.097	0.42	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Ethylbenzene	µg/L	1.1	4.9	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	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	<0.02	<0.02	<0.02	<0.02
	m,p-Xylenes	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Methyl tert-butyl ether (MTBE)	µg/L	11	47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Naphthalene	µg/L	0.083	0.36	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	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	<0.02	<0.02	<0.02	<0.02
	n-Propylbenzene	µg/L	1000	4400	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	o-Xylene	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	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	<0.02	<0.02	<0.02	<0.02
	tert-Butanol (TBA)	µg/L	---	---	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	Toluene	µg/L	310	1300	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Other Detected Compounds	4-Ethyltoluene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Bromodichloromethane	µg/L	0.076	0.33	<0.02	<0.02	<0.02	**0.022**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Chloroform	µg/L	0.12	0.53	<0.02	<0.02	<0.02	**0.044**	**0.04**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Heptane	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Hexane	µg/L	730	3100	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	TPH-G (C4-C12)	µg/L	630	2600	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Fixed Gases	Methane	% v/v	---	---	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Oxygen	% v/v	---	---	**19**	**18**	**19**	**18**	**18**	**18**	**19**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**17**
	Carbon Dioxide	% v/v	---	---	<0.1	<0.1	**0.18**	**0.12**	**0.19**	<0.1	<0.1	<0.1	<0.1	**0.24**	**0.27**	**0.38**	**0.14**	**0.32**	**2.1**

Table 2. Mobile Laboratory Soil Vapor Analytical Results - May 2016

SFPP Norwalk Pump Station, Norwalk, California

Analyte Type	Analyte	Unit	Current Residential Soil Gas Screening Level [1, 2]	Current Commercial Soil Gas Screening Level [1, 2]	SVM-11-7 5/26/2016 SVM-11 7-7.5	SVM-11-15 5/26/2016 SVM-11 15-15.5	SVM-11-22 5/26/2016 SVM-11 22-22.5	SVM-12-7 5/27/2016 SVM-12 7-7.5	SVM-12-15 5/27/2016 SVM-12 15-15.5	SVM-12-22 5/27/2016 SVM-12 22-22.5	SVM-13-7 5/27/2016 SVM-13 7-7.5	SVM-13-15 5/27/2016 SVM-13 15-15.5	SVM-13-22 5/27/2016 SVM-13 22-22.5	SVM-14-7 5/27/2016 SVM-14 7-7.5	SVM-14-15 5/27/2016 SVM-14 15-15.5	SVM-14-15 DUP 5/27/2016 SVM-14 15-15.5	SVM-14-22 5/27/2016 SVM-14 22-22.5
COPCs [4]	1,2,4-Trimethylbenzene	µg/L	7.3	31	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**59**
	1,2-Dichloroethane	µg/L	0.11	0.47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<8
	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	<0.02	**56**
	2-Propanol (leak test compound)	µg/L	---	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<80
	Benzene	µg/L	0.097	0.42	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<8
	Ethylbenzene	µg/L	1.1	4.9	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<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	<0.02	<8
	m,p-Xylenes	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.083**	**0.085**	**62**
	Methyl tert-butyl ether (MTBE)	µg/L	11	47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<8
	Naphthalene	µg/L	0.083	0.36	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<8
	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	<0.02	<8
	n-Propylbenzene	µg/L	1000	4400	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<8
	o-Xylene	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.037**	**0.038**	**59**
	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	<0.02	<8
	tert-Butanol (TBA)	µg/L	---	---	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<8000
	Toluene	µg/L	310	1300	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.041**	**0.041**	<8
Other Detected Compounds	4-Ethyltoluene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**31**
	Bromodichloromethane	µg/L	0.076	0.33	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<8
	Chloroform	µg/L	0.12	0.53	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<8
	Heptane	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<8
	n-Hexane	µg/L	730	3100	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<8
	TPH-G (C4-C12)	µg/L	630	2600	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	**2200**
Fixed Gases	Methane	% v/v	---	---	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Oxygen	% v/v	---	---	**18**	**18**	**18**	**18**	**17**	**12**	**18**	**19**	**19**	**17**	**17**	**18**	**18**
	Carbon Dioxide	% v/v	---	---	**0.41**	**0.34**	<0.1	**0.52**	**1.7**	**4.9**	<0.1	<0.1	**0.14**	**1.1**	**0.87**	**0.89**	**0.71**

Table 2. Mobile Laboratory Soil Vapor Analytical Results - May 2016

SFPP Norwalk Pump Station, Norwalk, California

Analyte Type	Analyte	Unit	Current Residential Soil Gas Screening Level [1, 2]	Current Commercial Soil Gas Screening Level [1, 2]	SVM-15-7 5/26/2016 SVM-15 7-7.5	SVM-15-15 5/26/2016 SVM-15 15-15.5	SVM-15-15 DUP 5/26/2016 SVM-15 15-15.5	SVM-15-22 5/26/2016 SVM-15 22-22.5	SVM-16-7 5/25/2016 SVM-16 7-7.5	SVM-16-16 5/25/2016 SVM-16 16-16.5	SVM-16-22 5/25/2016 SVM-16 22-22.5	Ambient Air 5/25/2016	Ambient Air 5/26/2016	Ambient Air 5/27/2016
COPCs [4]	1,2,4-Trimethylbenzene	µg/L	7.3	31	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	1,2-Dichloroethane	µg/L	0.11	0.47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	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
	2-Propanol (leak test compound)	µg/L	---	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Benzene	µg/L	0.097	0.42	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Ethylbenzene	µg/L	1.1	4.9	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Isopropylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	m,p-Xylenes	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Methyl tert-butyl ether (MTBE)	µg/L	11	47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Naphthalene	µg/L	0.083	0.36	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Propylbenzene	µg/L	1000	4400	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	o-Xylene	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	sec-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	tert-Butanol (TBA)	µg/L	---	---	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	Toluene	µg/L	310	1300	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Other Detected Compounds	4-Ethyltoluene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Bromodichloromethane	µg/L	0.076	0.33	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Chloroform	µg/L	0.12	0.53	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Heptane	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.044**	<0.02	<0.02	<0.02
	n-Hexane	µg/L	730	3100	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.051**	<0.02	<0.02	<0.02
	TPH-G (C4-C12)	µg/L	630	2600	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Fixed Gases	Methane	% v/v	---	---	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	---	---	---
	Oxygen	% v/v	---	---	**19**	**19**	**19**	**19**	**18**	**18**	11	---	---	---
	Carbon Dioxide	% v/v	---	---	**0.11**	<0.1	<0.1	<0.1	**0.26**	**0.42**	**5.2**	---	---	---

Notes:

[1] Source for the Indoor Air Screening Levels: DTSC, 2016. Human Health Risk Assessment (HHRA) Note Number 3: DTSC Recommended Methodology for use of U.S. EPA Regional Screening Levels (RSLs) in the Human Health Risk Assessment Process at Hazardous Waste Sites and Permitted Facilities. https://www.dtsc.ca.gov/AssessingRisk/upload/HHRA-Note-3-2016-01.pdf

[2] Attenuation factor for current land use = 0.001. Source for the attenuation factors: DTSC, 2011. Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance). October. http://www.dtsc.ca.gov/AssessingRisk/upload/Final_VIG_Oct_2011.pdf

[3] TPH aliphatic low screening level used for TPH-g screening levels

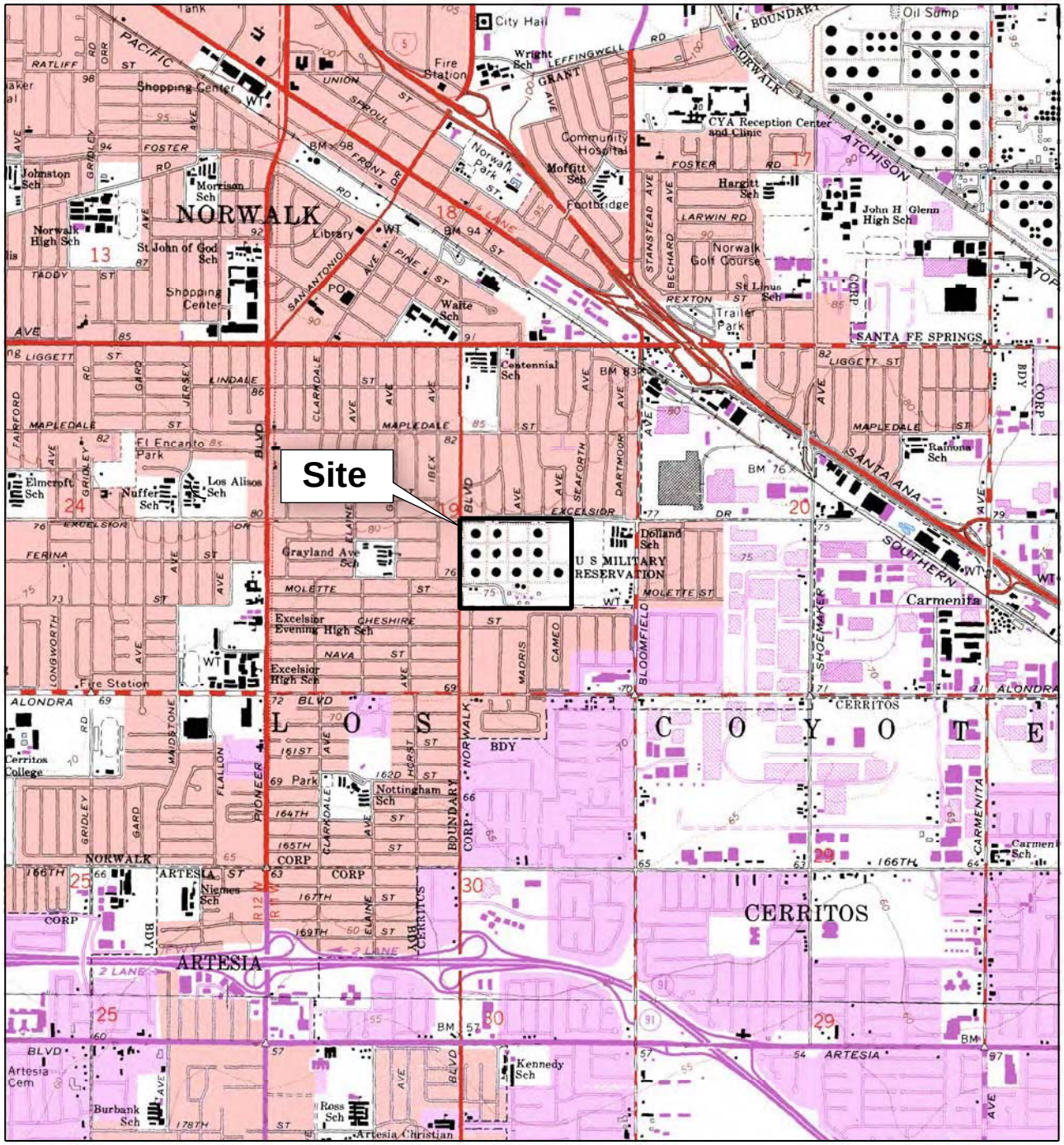
[4] Chemicals of potential concern identified from 2006 soil gas investigation and human health risk assessment (Geomatrix, 2006)

59 Yellow highlighting indicates concentration exceeds human health screening level under residential and/or commercial scenarios.

--- = not available
% v/v = percent volume by volume
<0.02 = not detected at the laboratory minimum reporting limit
µg/L = microgram(s) per liter
COPC = chemical of potential concern
DUP = field duplicate
TPH-g = total petroleum hydrocarbons quantified as gasoline

5-5.5 = sample depth in feet below ground surface
5/26/2016 = sample date
SVM-1 = sample location
SVM-1-5 = sample ID

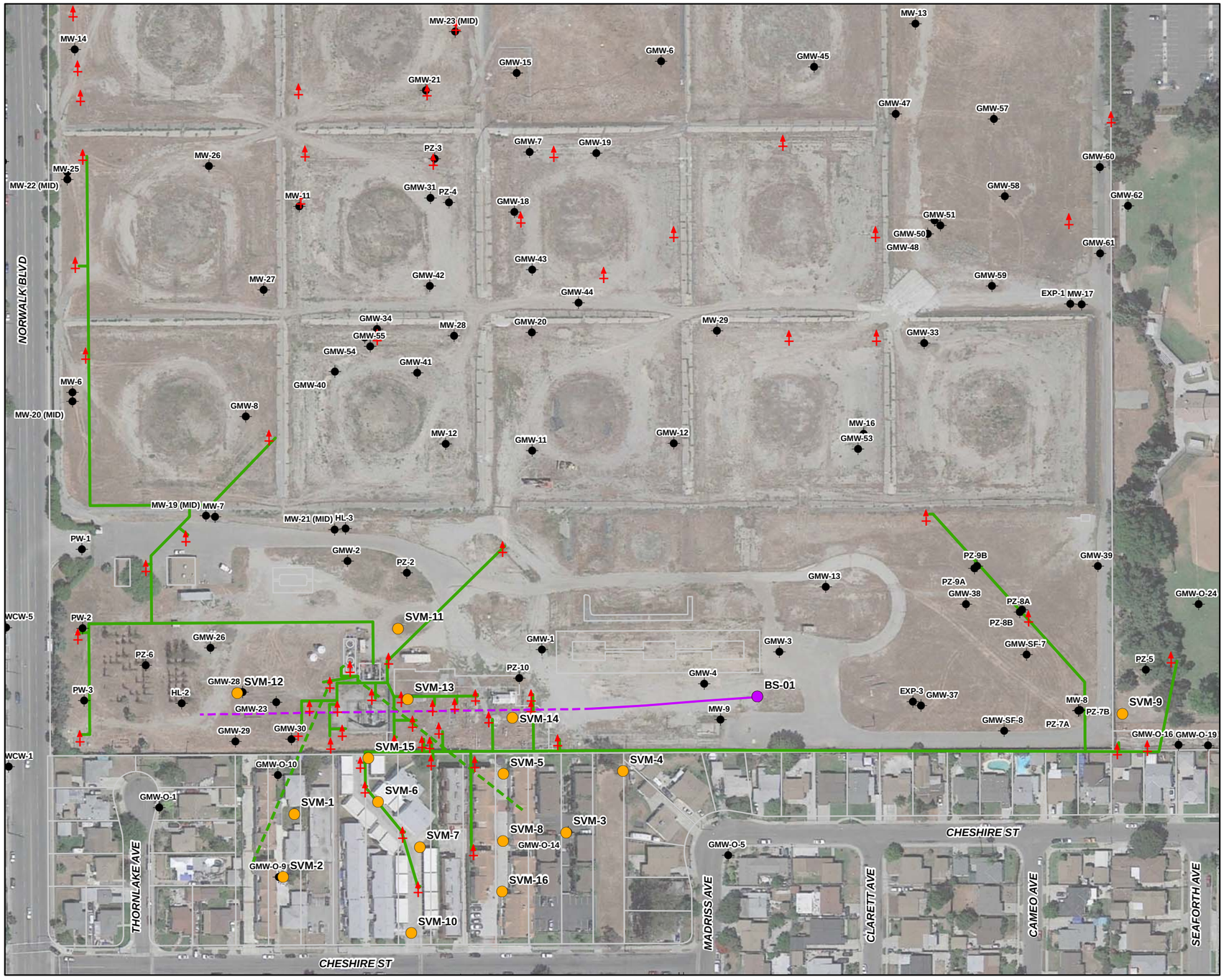
Figures



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.

Figure 1
Site Location Map
SFPP Norwalk Pump Station
Norwalk, California

ch2m



Legend

- 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

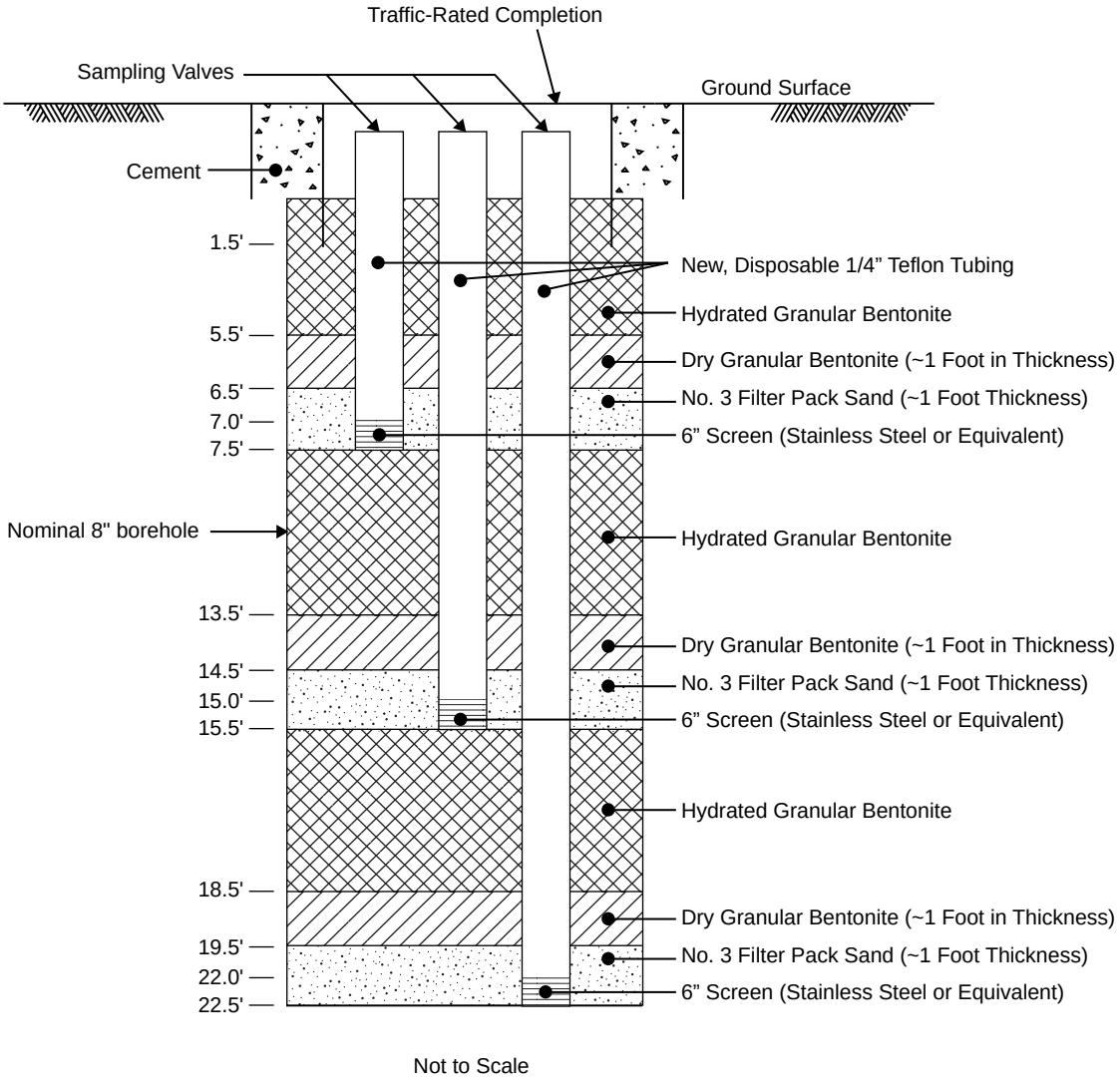
Imagery Source:
Google Earth April 17, 2013.

N

0 75 150 300
Feet

1 inch = 150 feet

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



Not to Scale

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

Attachment A
Mobile Laboratory Analytical Reports

AMERICAN ANALYTICS

9765 Eton Avenue
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June 07, 2016

Dan Jablonski

CH2M Hill, Inc.

1000 Wilshire Blvd., Suite 2100

Los Angeles, CA 90017-2457

Re : KMEP Norwalk Biosparge Startup / 496965.A1.01

MB187310 / 6F01022

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received on 06/01/16 15:55 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 Analytics.

Sincerely,

Allen Aminian

QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
Fixed Gases - Field					
SVM-16-22	6F01022-01	Vapor	10	05/25/16 07:58	06/01/16 15:55
SVM-16-7	6F01022-02	Vapor	10	05/25/16 08:00	06/01/16 15:55
SVM-16-16	6F01022-03	Vapor	10	05/25/16 08:13	06/01/16 15:55
SVM-8-15	6F01022-04	Vapor	10	05/25/16 08:43	06/01/16 15:55
SVM-8-5	6F01022-05	Vapor	10	05/25/16 08:57	06/01/16 15:55
SVM-5-15	6F01022-07	Vapor	10	05/25/16 09:21	06/01/16 15:55
SVM-5-5	6F01022-08	Vapor	10	05/25/16 09:45	06/01/16 15:55
SVM-3-15	6F01022-09	Vapor	10	05/25/16 10:27	06/01/16 15:55
SVM-3-5	6F01022-10	Vapor	10	05/25/16 10:44	06/01/16 15:55
SVM-7-7	6F01022-11	Vapor	10	05/25/16 12:35	06/01/16 15:55
SVM-7-7 DUP	6F01022-12	Vapor	10	05/25/16 12:35	06/01/16 15:55
SVM-7-13	6F01022-13	Vapor	10	05/25/16 12:55	06/01/16 15:55
SVM-1-15	6F01022-14	Vapor	10	05/26/16 08:00	06/01/16 15:55
SVM-1-5	6F01022-15	Vapor	10	05/26/16 08:14	06/01/16 15:55
SVM-2-5	6F01022-16	Vapor	10	05/26/16 08:39	06/01/16 15:55
SVM-15-7	6F01022-17	Vapor	10	05/26/16 09:25	06/01/16 15:55
SVM-15-22	6F01022-18	Vapor	10	05/26/16 09:28	06/01/16 15:55
SVM-15-15	6F01022-19	Vapor	10	05/26/16 09:50	06/01/16 15:55
SVM-15-15 DUP	6F01022-20	Vapor	10	05/26/16 09:50	06/01/16 15:55

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-6-7	6F01022-21	Vapor	10	05/26/16 10:24	06/01/16 15:55
SVM-6-16	6F01022-22	Vapor	10	05/26/16 10:24	06/01/16 15:55
SVM-10-15	6F01022-23	Vapor	10	05/26/16 10:43	06/01/16 15:55
SVM-11-7	6F01022-24	Vapor	10	05/26/16 12:30	06/01/16 15:55
SVM-11-22	6F01022-25	Vapor	10	05/26/16 12:32	06/01/16 15:55
SVM-11-15	6F01022-26	Vapor	10	05/26/16 12:51	06/01/16 15:55
SVM-12-7	6F01022-28	Vapor	10	05/27/16 07:49	06/01/16 15:55
SVM-12-22	6F01022-29	Vapor	10	05/27/16 07:51	06/01/16 15:55
SVM-12-15	6F01022-30	Vapor	10	05/27/16 08:03	06/01/16 15:55
SVM-13-7	6F01022-32	Vapor	10	05/27/16 08:50	06/01/16 15:55
SVM-13-22	6F01022-33	Vapor	10	05/27/16 08:56	06/01/16 15:55
SVM-13-15	6F01022-34	Vapor	10	05/27/16 08:58	06/01/16 15:55
SVM-14-22	6F01022-35	Vapor	10	05/27/16 10:04	06/01/16 15:55
SVM-14-7	6F01022-36	Vapor	10	05/27/16 10:11	06/01/16 15:55
SVM-14-15	6F01022-37	Vapor	10	05/27/16 10:20	06/01/16 15:55
SVM-14-15 DUP	6F01022-38	Vapor	10	05/27/16 10:20	06/01/16 15:55
TO-15 (Mid Level)					
SVM-16-22	6F01022-01	Vapor	10	05/25/16 07:58	06/01/16 15:55
SVM-16-7	6F01022-02	Vapor	10	05/25/16 08:00	06/01/16 15:55
SVM-16-16	6F01022-03	Vapor	10	05/25/16 08:13	06/01/16 15:55

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-8-15	6F01022-04	Vapor	10	05/25/16 08:43	06/01/16 15:55
SVM-8-5	6F01022-05	Vapor	10	05/25/16 08:57	06/01/16 15:55
Ambient Air	6F01022-06	Vapor	10	05/25/16 09:20	06/01/16 15:55
SVM-5-15	6F01022-07	Vapor	10	05/25/16 09:21	06/01/16 15:55
SVM-5-5	6F01022-08	Vapor	10	05/25/16 09:45	06/01/16 15:55
SVM-3-15	6F01022-09	Vapor	10	05/25/16 10:27	06/01/16 15:55
SVM-3-5	6F01022-10	Vapor	10	05/25/16 10:44	06/01/16 15:55
SVM-7-7	6F01022-11	Vapor	10	05/25/16 12:35	06/01/16 15:55
SVM-7-7 DUP	6F01022-12	Vapor	10	05/25/16 12:35	06/01/16 15:55
SVM-7-13	6F01022-13	Vapor	10	05/25/16 12:55	06/01/16 15:55
SVM-1-15	6F01022-14	Vapor	10	05/26/16 08:00	06/01/16 15:55
SVM-1-5	6F01022-15	Vapor	10	05/26/16 08:14	06/01/16 15:55
SVM-2-5	6F01022-16	Vapor	10	05/26/16 08:39	06/01/16 15:55
SVM-15-7	6F01022-17	Vapor	10	05/26/16 09:25	06/01/16 15:55
SVM-15-22	6F01022-18	Vapor	10	05/26/16 09:28	06/01/16 15:55
SVM-15-15	6F01022-19	Vapor	10	05/26/16 09:50	06/01/16 15:55
SVM-15-15 DUP	6F01022-20	Vapor	10	05/26/16 09:50	06/01/16 15:55
SVM-6-7	6F01022-21	Vapor	10	05/26/16 10:24	06/01/16 15:55
SVM-6-16	6F01022-22	Vapor	10	05/26/16 10:24	06/01/16 15:55
SVM-10-15	6F01022-23	Vapor	10	05/26/16 10:43	06/01/16 15:55

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-11-7	6F01022-24	Vapor	10	05/26/16 12:30	06/01/16 15:55
SVM-11-22	6F01022-25	Vapor	10	05/26/16 12:32	06/01/16 15:55
SVM-11-15	6F01022-26	Vapor	10	05/26/16 12:51	06/01/16 15:55
Ambient Air	6F01022-27	Vapor	10	05/26/16 13:04	06/01/16 15:55
SVM-12-7	6F01022-28	Vapor	10	05/27/16 07:49	06/01/16 15:55
SVM-12-22	6F01022-29	Vapor	10	05/27/16 07:51	06/01/16 15:55
SVM-12-15	6F01022-30	Vapor	10	05/27/16 08:03	06/01/16 15:55
Ambient Air	6F01022-31	Vapor	10	05/27/16 00:00	06/01/16 15:55
SVM-13-7	6F01022-32	Vapor	10	05/27/16 08:50	06/01/16 15:55
SVM-13-22	6F01022-33	Vapor	10	05/27/16 08:56	06/01/16 15:55
SVM-13-15	6F01022-34	Vapor	10	05/27/16 08:58	06/01/16 15:55
SVM-14-22	6F01022-35	Vapor	10	05/27/16 10:04	06/01/16 15:55
SVM-14-7	6F01022-36	Vapor	10	05/27/16 10:11	06/01/16 15:55
SVM-14-15	6F01022-37	Vapor	10	05/27/16 10:20	06/01/16 15:55
SVM-14-15 DUP	6F01022-38	Vapor	10	05/27/16 10:20	06/01/16 15:55
TO-3					
SVM-16-22	6F01022-01	Vapor	10	05/25/16 07:58	06/01/16 15:55
SVM-16-7	6F01022-02	Vapor	10	05/25/16 08:00	06/01/16 15:55
SVM-16-16	6F01022-03	Vapor	10	05/25/16 08:13	06/01/16 15:55
SVM-8-15	6F01022-04	Vapor	10	05/25/16 08:43	06/01/16 15:55

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-8-5	6F01022-05	Vapor	10	05/25/16 08:57	06/01/16 15:55
Ambient Air	6F01022-06	Vapor	10	05/25/16 09:20	06/01/16 15:55
SVM-5-15	6F01022-07	Vapor	10	05/25/16 09:21	06/01/16 15:55
SVM-5-5	6F01022-08	Vapor	10	05/25/16 09:45	06/01/16 15:55
SVM-3-15	6F01022-09	Vapor	10	05/25/16 10:27	06/01/16 15:55
SVM-3-5	6F01022-10	Vapor	10	05/25/16 10:44	06/01/16 15:55
SVM-7-7	6F01022-11	Vapor	10	05/25/16 12:35	06/01/16 15:55
SVM-7-7 DUP	6F01022-12	Vapor	10	05/25/16 12:35	06/01/16 15:55
SVM-7-13	6F01022-13	Vapor	10	05/25/16 12:55	06/01/16 15:55
SVM-1-15	6F01022-14	Vapor	10	05/26/16 08:00	06/01/16 15:55
SVM-1-5	6F01022-15	Vapor	10	05/26/16 08:14	06/01/16 15:55
SVM-2-5	6F01022-16	Vapor	10	05/26/16 08:39	06/01/16 15:55
SVM-15-7	6F01022-17	Vapor	10	05/26/16 09:25	06/01/16 15:55
SVM-15-22	6F01022-18	Vapor	10	05/26/16 09:28	06/01/16 15:55
SVM-15-15	6F01022-19	Vapor	10	05/26/16 09:50	06/01/16 15:55
SVM-15-15 DUP	6F01022-20	Vapor	10	05/26/16 09:50	06/01/16 15:55
SVM-6-7	6F01022-21	Vapor	10	05/26/16 10:24	06/01/16 15:55
SVM-6-16	6F01022-22	Vapor	10	05/26/16 10:24	06/01/16 15:55
SVM-10-15	6F01022-23	Vapor	10	05/26/16 10:43	06/01/16 15:55
SVM-11-7	6F01022-24	Vapor	10	05/26/16 12:30	06/01/16 15:55

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-11-22	6F01022-25	Vapor	10	05/26/16 12:32	06/01/16 15:55
SVM-11-15	6F01022-26	Vapor	10	05/26/16 12:51	06/01/16 15:55
Ambient Air	6F01022-27	Vapor	10	05/26/16 13:04	06/01/16 15:55
SVM-12-7	6F01022-28	Vapor	10	05/27/16 07:49	06/01/16 15:55
SVM-12-22	6F01022-29	Vapor	10	05/27/16 07:51	06/01/16 15:55
SVM-12-15	6F01022-30	Vapor	10	05/27/16 08:03	06/01/16 15:55
Ambient Air	6F01022-31	Vapor	10	05/27/16 00:00	06/01/16 15:55
SVM-13-7	6F01022-32	Vapor	10	05/27/16 08:50	06/01/16 15:55
SVM-13-22	6F01022-33	Vapor	10	05/27/16 08:56	06/01/16 15:55
SVM-13-15	6F01022-34	Vapor	10	05/27/16 08:58	06/01/16 15:55
SVM-14-22	6F01022-35	Vapor	10	05/27/16 10:04	06/01/16 15:55
SVM-14-7	6F01022-36	Vapor	10	05/27/16 10:11	06/01/16 15:55
SVM-14-15	6F01022-37	Vapor	10	05/27/16 10:20	06/01/16 15:55
SVM-14-15 DUP	6F01022-38	Vapor	10	05/27/16 10:20	06/01/16 15:55

Allen Aminian
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LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
		Fixed Gases by TCD						
Oxygen	SVM-16-22	**11**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-16-22	**5.2**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Oxygen	SVM-16-7	**18**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-16-7	**0.26**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Oxygen	SVM-16-16	**18**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-16-16	**0.42**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Oxygen	SVM-8-15	**18**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-8-15	**0.32**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Oxygen	SVM-8-5	**18**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-8-5	**0.14**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD

Allen Aminian
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LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-5-15	**19**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Oxygen	SVM-5-5	**18**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Oxygen	SVM-3-15	**18**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-3-15	**0.19**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Oxygen	SVM-3-5	**18**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-3-5	**0.12**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Oxygen	SVM-7-7	**18**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-7-7	**0.24**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Oxygen	SVM-7-7 DUP	**18**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-7-7 DUP	**0.27**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Oxygen	SVM-7-13	**18**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Carbon Dioxide	SVM-7-13	**0.38**	0.10	% by Volume	1	05/25/16	05/25/16	VOCs by GC/TCD
Oxygen	SVM-1-15	**18**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD
Oxygen	SVM-1-5	**19**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD
Oxygen	SVM-2-5	**19**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD
Carbon Dioxide	SVM-2-5	**0.18**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD
Oxygen	SVM-15-7	**19**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD
Carbon Dioxide	SVM-15-7	**0.11**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD
Oxygen	SVM-15-22	**19**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD
Oxygen	SVM-15-15	**19**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD
Oxygen	SVM-15-15 DUP	**19**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD
Oxygen	SVM-6-7	**18**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-6-16	**18**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD
Oxygen	SVM-10-15	**17**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD
Carbon Dioxide	SVM-10-15	**2.1**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD
Oxygen	SVM-11-7	**18**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD
Carbon Dioxide	SVM-11-7	**0.41**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD
Oxygen	SVM-11-22	**18**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD
Oxygen	SVM-11-15	**18**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD
Carbon Dioxide	SVM-11-15	**0.34**	0.10	% by Volume	1	05/26/16	05/26/16	VOCs by GC/TCD
Oxygen	SVM-12-7	**18**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD
Carbon Dioxide	SVM-12-7	**0.52**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD
Oxygen	SVM-12-22	**12**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Carbon Dioxide	SVM-12-22	**4.9**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD
Oxygen	SVM-12-15	**17**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD
Carbon Dioxide	SVM-12-15	**1.7**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD
Oxygen	SVM-13-7	**18**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD
Oxygen	SVM-13-22	**19**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD
Carbon Dioxide	SVM-13-22	**0.14**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD
Oxygen	SVM-13-15	**19**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD
Oxygen	SVM-14-22	**18**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD
Carbon Dioxide	SVM-14-22	**0.71**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD
Oxygen	SVM-14-7	**17**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD
Carbon Dioxide	SVM-14-7	**1.1**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-14-15	**17**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD
Carbon Dioxide	SVM-14-15	**0.87**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD
Oxygen	SVM-14-15 DUP	**18**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD
Carbon Dioxide	SVM-14-15 DUP	**0.89**	0.10	% by Volume	1	05/27/16	05/27/16	VOCs by GC/TCD
VOCs by EPA TO-3								
Gasoline Range Organics (GRO)	SVM-14-22	**2200**	800	ug/L	40	05/27/16	05/27/16	TO-3
VOCs by GCMS EPA TO-15								
Heptane	SVM-16-22	**0.044**	0.020	ug/L	1	05/25/16	05/25/16	TO-15
n-Hexane	SVM-16-22	**0.051**	0.020	ug/L	1	05/25/16	05/25/16	TO-15
Chloroform	SVM-3-15	**0.040**	0.020	ug/L	1	05/25/16	05/25/16	TO-15
Bromodichloromethane	SVM-3-5	**0.022**	0.020	ug/L	1	05/25/16	05/25/16	TO-15
Chloroform	SVM-3-5	**0.044**	0.020	ug/L	1	05/25/16	05/25/16	TO-15
4-Ethyltoluene	SVM-14-22	**31**	8.0	ug/L	400	05/27/16	05/27/16	TO-15
1,3,5-Trimethylbenzene	SVM-14-22	**56**	8.0	ug/L	400	05/27/16	05/27/16	TO-15
1,2,4-Trimethylbenzene	SVM-14-22	**59**	8.0	ug/L	400	05/27/16	05/27/16	TO-15
o-Xylene	SVM-14-22	**59**	8.0	ug/L	400	05/27/16	05/27/16	TO-15
m,p-Xylenes	SVM-14-22	**62**	8.0	ug/L	400	05/27/16	05/27/16	TO-15
Toluene	SVM-14-15	**0.041**	0.020	ug/L	1	05/27/16	05/27/16	TO-15
o-Xylene	SVM-14-15	**0.037**	0.020	ug/L	1	05/27/16	05/27/16	TO-15
m,p-Xylenes	SVM-14-15	**0.083**	0.020	ug/L	1	05/27/16	05/27/16	TO-15
Toluene	SVM-14-15 DUP	**0.041**	0.020	ug/L	1	05/27/16	05/27/16	TO-15

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
o-Xylene	SVM-14-15 DUP	**0.038**	0.020	ug/L	1	05/27/16	05/27/16	TO-15
m,p-Xylenes	SVM-14-15 DUP	**0.085**	0.020	ug/L	1	05/27/16	05/27/16	TO-15

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Prepared:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Analyzed:	05/25/16	05/25/16	05/25/16	05/25/16	
AA ID No:	6F01022-01	6F01022-02	6F01022-03	6F01022-04	
Client ID No:	SVM-16-22	SVM-16-7	SVM-16-16	SVM-8-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	104%	104%	105%	102%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Prepared:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Analyzed:	05/25/16	05/25/16	05/25/16	05/25/16	
AA ID No:	6F01022-05	6F01022-06	6F01022-07	6F01022-08	
Client ID No:	SVM-8-5	Ambient Air	SVM-5-15	SVM-5-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	104%	100%	103%	104%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Prepared:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Analyzed:	05/25/16	05/25/16	05/25/16	05/25/16	
AA ID No:	6F01022-09	6F01022-10	6F01022-11	6F01022-12	
Client ID No:	SVM-3-15	SVM-3-5	SVM-7-7	SVM-7-7 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	106%	106%	102%	101%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/25/16	05/26/16	05/26/16	05/26/16	
Date Prepared:	05/25/16	05/26/16	05/26/16	05/26/16	
Date Analyzed:	05/25/16	05/26/16	05/26/16	05/26/16	
AA ID No:	6F01022-13	6F01022-14	6F01022-15	6F01022-16	
Client ID No:	SVM-7-13	SVM-1-15	SVM-1-5	SVM-2-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	102%	106%	101%	102%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/26/2016	05/26/2016	05/26/2016	05/26/2016	
Date Prepared:	05/26/16	05/26/16	05/26/16	05/26/16	
Date Analyzed:	05/26/16	05/26/16	05/26/16	05/26/16	
AA ID No:	6F01022-17	6F01022-18	6F01022-19	6F01022-20	
Client ID No:	SVM-15-7	SVM-15-22	SVM-15-15	SVM-15-15 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	102%	102%	100%	101%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/26/16	05/26/16	05/26/16	05/26/16	
Date Prepared:	05/26/16	05/26/16	05/26/16	05/26/16	
Date Analyzed:	05/26/16	05/26/16	05/26/16	05/26/16	
AA ID No:	6F01022-21	6F01022-22	6F01022-23	6F01022-24	
Client ID No:	SVM-6-7	SVM-6-16	SVM-10-15	SVM-11-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	102%	104%	103%	104%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187310
Project No:	496965.A1.01	**Date Received:**	06/01/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	06/07/16
Method:	VOCs by EPA TO-3	**Units:**	ug/L

Date Sampled:	05/26/16	05/26/16	05/26/16	05/27/16	
Date Prepared:	05/26/16	05/26/16	05/26/16	05/27/16	
Date Analyzed:	05/26/16	05/26/16	05/26/16	05/27/16	
AA ID No:	6F01022-25	6F01022-26	6F01022-27	6F01022-28	
Client ID No:	SVM-11-22	SVM-11-15	Ambient Air	SVM-12-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	101%	105%	95%	103%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Prepared:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Analyzed:	05/27/16	05/27/16	05/27/16	05/27/16	
AA ID No:	6F01022-29	6F01022-30	6F01022-31	6F01022-32	
Client ID No:	SVM-12-22	SVM-12-15	Ambient Air	SVM-13-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	102%	102%	102%	103%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187310
Project No:	496965.A1.01	**Date Received:**	06/01/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	06/07/16
Method:	VOCs by EPA TO-3	**Units:**	ug/L

Date Sampled:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Prepared:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Analyzed:	05/27/16	05/27/16	05/27/16	05/27/16	
AA ID No:	6F01022-33	6F01022-34	6F01022-35	6F01022-36	
Client ID No:	SVM-13-22	SVM-13-15	SVM-14-22	SVM-14-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	40	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	**2200**	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	101%	103%	102%	99%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/27/16	05/27/16	
Date Prepared:	05/27/16	05/27/16	
Date Analyzed:	05/27/16	05/27/16	
AA ID No:	6F01022-37	6F01022-38	
Client ID No:	SVM-14-15	SVM-14-15 DUP	
Matrix:	Vapor	Vapor	
Dilution Factor:	1	1	MRL
TO-3 (TO-3)			
Gasoline Range Organics (GRO)	<20	<20	20
Surrogates			**%REC Limits**
4-Bromofluorobenzene	98%	97%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Prepared:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Analyzed:	05/25/16	05/25/16	05/25/16	05/25/16	
AA ID No:	6F01022-01	6F01022-02	6F01022-03	6F01022-04	
Client ID No:	SVM-16-22	SVM-16-7	SVM-16-16	SVM-8-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187310
Project No:	496965.A1.01	**Date Received:**	06/01/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	06/07/16
Method:	VOCs by GCMS EPA TO-15	**Units:**	ug/L

Date Sampled:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Prepared:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Analyzed:	05/25/16	05/25/16	05/25/16	05/25/16	
AA ID No:	6F01022-01	6F01022-02	6F01022-03	6F01022-04	
Client ID No:	SVM-16-22	SVM-16-7	SVM-16-16	SVM-8-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	**0.044**	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	**0.051**	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Prepared:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Analyzed:	05/25/16	05/25/16	05/25/16	05/25/16	
AA ID No:	6F01022-01	6F01022-02	6F01022-03	6F01022-04	
Client ID No:	SVM-16-22	SVM-16-7	SVM-16-16	SVM-8-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<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
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<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
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	103%	104%	104%	101%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Prepared:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Analyzed:	05/25/16	05/25/16	05/25/16	05/25/16	
AA ID No:	6F01022-05	6F01022-06	6F01022-07	6F01022-08	
Client ID No:	SVM-8-5	Ambient Air	SVM-5-15	SVM-5-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Prepared:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Analyzed:	05/25/16	05/25/16	05/25/16	05/25/16	
AA ID No:	6F01022-05	6F01022-06	6F01022-07	6F01022-08	
Client ID No:	SVM-8-5	Ambient Air	SVM-5-15	SVM-5-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187310
Project No:	496965.A1.01	**Date Received:**	06/01/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	06/07/16
Method:	VOCs by GCMS EPA TO-15	**Units:**	ug/L

Date Sampled:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Prepared:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Analyzed:	05/25/16	05/25/16	05/25/16	05/25/16	
AA ID No:	6F01022-05	6F01022-06	6F01022-07	6F01022-08	
Client ID No:	SVM-8-5	Ambient Air	SVM-5-15	SVM-5-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<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
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<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
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	104%	99%	103%	104%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Prepared:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Analyzed:	05/25/16	05/25/16	05/25/16	05/25/16	
AA ID No:	6F01022-09	6F01022-10	6F01022-11	6F01022-12	
Client ID No:	SVM-3-15	SVM-3-5	SVM-7-7	SVM-7-7 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	**0.022**	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	**0.040**	**0.044**	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Prepared:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Analyzed:	05/25/16	05/25/16	05/25/16	05/25/16	
AA ID No:	6F01022-09	6F01022-10	6F01022-11	6F01022-12	
Client ID No:	SVM-3-15	SVM-3-5	SVM-7-7	SVM-7-7 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187310
Project No:	496965.A1.01	**Date Received:**	06/01/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	06/07/16
Method:	VOCs by GCMS EPA TO-15	**Units:**	ug/L

Date Sampled:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Prepared:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Analyzed:	05/25/16	05/25/16	05/25/16	05/25/16	
AA ID No:	6F01022-09	6F01022-10	6F01022-11	6F01022-12	
Client ID No:	SVM-3-15	SVM-3-5	SVM-7-7	SVM-7-7 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<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
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<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
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	105%	105%	102%	100%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/25/16	05/26/16	05/26/16	05/26/16	
Date Prepared:	05/25/16	05/26/16	05/26/16	05/26/16	
Date Analyzed:	05/25/16	05/26/16	05/26/16	05/26/16	
AA ID No:	6F01022-13	6F01022-14	6F01022-15	6F01022-16	
Client ID No:	SVM-7-13	SVM-1-15	SVM-1-5	SVM-2-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/25/16	05/26/16	05/26/16	05/26/16	
Date Prepared:	05/25/16	05/26/16	05/26/16	05/26/16	
Date Analyzed:	05/25/16	05/26/16	05/26/16	05/26/16	
AA ID No:	6F01022-13	6F01022-14	6F01022-15	6F01022-16	
Client ID No:	SVM-7-13	SVM-1-15	SVM-1-5	SVM-2-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/25/16	05/26/16	05/26/16	05/26/16	
Date Prepared:	05/25/16	05/26/16	05/26/16	05/26/16	
Date Analyzed:	05/25/16	05/26/16	05/26/16	05/26/16	
AA ID No:	6F01022-13	6F01022-14	6F01022-15	6F01022-16	
Client ID No:	SVM-7-13	SVM-1-15	SVM-1-5	SVM-2-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<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
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<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
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	101%	105%	100%	102%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/26/2016	05/26/2016	05/26/2016	05/26/2016	
Date Prepared:	05/26/16	05/26/16	05/26/16	05/26/16	
Date Analyzed:	05/26/16	05/26/16	05/26/16	05/26/16	
AA ID No:	6F01022-17	6F01022-18	6F01022-19	6F01022-20	
Client ID No:	SVM-15-7	SVM-15-22	SVM-15-15	SVM-15-15 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/26/2016	05/26/2016	05/26/2016	05/26/2016	
Date Prepared:	05/26/16	05/26/16	05/26/16	05/26/16	
Date Analyzed:	05/26/16	05/26/16	05/26/16	05/26/16	
AA ID No:	6F01022-17	6F01022-18	6F01022-19	6F01022-20	
Client ID No:	SVM-15-7	SVM-15-22	SVM-15-15	SVM-15-15 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/26/2016	05/26/2016	05/26/2016	05/26/2016	
Date Prepared:	05/26/16	05/26/16	05/26/16	05/26/16	
Date Analyzed:	05/26/16	05/26/16	05/26/16	05/26/16	
AA ID No:	6F01022-17	6F01022-18	6F01022-19	6F01022-20	
Client ID No:	SVM-15-7	SVM-15-22	SVM-15-15	SVM-15-15 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<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
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<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
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	101%	101%	99%	100%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/26/16	05/26/16	05/26/16	05/26/16	
Date Prepared:	05/26/16	05/26/16	05/26/16	05/26/16	
Date Analyzed:	05/26/16	05/26/16	05/26/16	05/26/16	
AA ID No:	6F01022-21	6F01022-22	6F01022-23	6F01022-24	
Client ID No:	SVM-6-7	SVM-6-16	SVM-10-15	SVM-11-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/26/16	05/26/16	05/26/16	05/26/16	
Date Prepared:	05/26/16	05/26/16	05/26/16	05/26/16	
Date Analyzed:	05/26/16	05/26/16	05/26/16	05/26/16	
AA ID No:	6F01022-21	6F01022-22	6F01022-23	6F01022-24	
Client ID No:	SVM-6-7	SVM-6-16	SVM-10-15	SVM-11-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/26/16	05/26/16	05/26/16	05/26/16	
Date Prepared:	05/26/16	05/26/16	05/26/16	05/26/16	
Date Analyzed:	05/26/16	05/26/16	05/26/16	05/26/16	
AA ID No:	6F01022-21	6F01022-22	6F01022-23	6F01022-24	
Client ID No:	SVM-6-7	SVM-6-16	SVM-10-15	SVM-11-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<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
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<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
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	102%	103%	102%	103%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/26/16	05/26/16	05/26/16	05/27/16	
Date Prepared:	05/26/16	05/26/16	05/26/16	05/27/16	
Date Analyzed:	05/26/16	05/26/16	05/26/16	05/27/16	
AA ID No:	6F01022-25	6F01022-26	6F01022-27	6F01022-28	
Client ID No:	SVM-11-22	SVM-11-15	Ambient Air	SVM-12-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/26/16	05/26/16	05/26/16	05/27/16	
Date Prepared:	05/26/16	05/26/16	05/26/16	05/27/16	
Date Analyzed:	05/26/16	05/26/16	05/26/16	05/27/16	
AA ID No:	6F01022-25	6F01022-26	6F01022-27	6F01022-28	
Client ID No:	SVM-11-22	SVM-11-15	Ambient Air	SVM-12-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/26/16	05/26/16	05/26/16	05/27/16	
Date Prepared:	05/26/16	05/26/16	05/26/16	05/27/16	
Date Analyzed:	05/26/16	05/26/16	05/26/16	05/27/16	
AA ID No:	6F01022-25	6F01022-26	6F01022-27	6F01022-28	
Client ID No:	SVM-11-22	SVM-11-15	Ambient Air	SVM-12-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<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
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<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
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	100%	104%	95%	102%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Prepared:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Analyzed:	05/27/16	05/27/16	05/27/16	05/27/16	
AA ID No:	6F01022-29	6F01022-30	6F01022-31	6F01022-32	
Client ID No:	SVM-12-22	SVM-12-15	Ambient Air	SVM-13-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Prepared:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Analyzed:	05/27/16	05/27/16	05/27/16	05/27/16	
AA ID No:	6F01022-29	6F01022-30	6F01022-31	6F01022-32	
Client ID No:	SVM-12-22	SVM-12-15	Ambient Air	SVM-13-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Prepared:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Analyzed:	05/27/16	05/27/16	05/27/16	05/27/16	
AA ID No:	6F01022-29	6F01022-30	6F01022-31	6F01022-32	
Client ID No:	SVM-12-22	SVM-12-15	Ambient Air	SVM-13-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<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
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<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
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	101%	101%	102%	102%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Prepared:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Analyzed:	05/27/16	05/27/16	05/27/16	05/27/16	
AA ID No:	6F01022-33	6F01022-34	6F01022-35	6F01022-36	
Client ID No:	SVM-13-22	SVM-13-15	SVM-14-22	SVM-14-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	400	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<8.0	<0.020	0.020
Allyl chloride	<0.020	<0.020	<8.0	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<8.0	<0.020	0.020
Benzene	<0.020	<0.020	<8.0	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<8.0	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<8.0	<0.020	0.020
Bromoform	<0.020	<0.020	<8.0	<0.020	0.020
Bromomethane	<0.020	<0.020	<8.0	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<8.0	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<8.0	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<8000	<20	20
Carbon Disulfide	<0.020	<0.020	<8.0	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<8.0	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<8.0	<0.020	0.020
Chloroethane	<0.020	<0.020	<8.0	<0.020	0.020
Chloroform	<0.020	<0.020	<8.0	<0.020	0.020
Chloromethane	<0.020	<0.020	<8.0	<0.020	0.020
Cyclohexane	<0.020	<0.020	<8.0	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<8.0	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<8.0	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<8.0	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<8.0	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<8.0	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<8.0	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<8.0	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<8.0	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<8.0	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Prepared:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Analyzed:	05/27/16	05/27/16	05/27/16	05/27/16	
AA ID No:	6F01022-33	6F01022-34	6F01022-35	6F01022-36	
Client ID No:	SVM-13-22	SVM-13-15	SVM-14-22	SVM-14-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	400	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<8.0	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<8.0	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<8.0	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<8.0	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<8.0	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<8.0	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<8.0	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<8.0	<0.020	0.020
Ethanol	<0.020	<0.020	<8.0	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<8.0	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<8.0	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<8.0	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	**31**	<0.020	0.020
Heptane	<0.020	<0.020	<8.0	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<8.0	<0.020	0.020
n-Hexane	<0.020	<0.020	<8.0	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<8.0	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<80	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<8.0	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<8.0	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<8.0	<0.020	0.020
Naphthalene	<0.020	<0.020	<8.0	<0.020	0.020
Propylene	<0.020	<0.020	<8.0	<0.020	0.020
Styrene	<0.020	<0.020	<8.0	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<8.0	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<8.0	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<8.0	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Prepared:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Analyzed:	05/27/16	05/27/16	05/27/16	05/27/16	
AA ID No:	6F01022-33	6F01022-34	6F01022-35	6F01022-36	
Client ID No:	SVM-13-22	SVM-13-15	SVM-14-22	SVM-14-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	400	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<8.0	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<8.0	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<8.0	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<8.0	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<8.0	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<8.0	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<8.0	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	**56**	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	**59**	<0.020	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<8.0	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<8.0	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<8.0	<0.020	0.020
Vinyl chloride	<0.020	<0.020	<8.0	<0.020	0.020
o-Xylene	<0.020	<0.020	**59**	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	**62**	<0.020	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<8.0	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<8.0	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<8.0	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<8.0	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<8.0	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<8.0	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<8.0	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	101%	103%	102%	99%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/27/16	05/27/16	
Date Prepared:	05/27/16	05/27/16	
Date Analyzed:	05/27/16	05/27/16	
AA ID No:	6F01022-37	6F01022-38	
Client ID No:	SVM-14-15	SVM-14-15 DUP	
Matrix:	Vapor	Vapor	
Dilution Factor:	1	1	MRL
TO-15 (Mid Level) (TO-15)			
Acetone	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	20
Carbon Disulfide	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: ug/L

Date Sampled:	05/27/16	05/27/16	
Date Prepared:	05/27/16	05/27/16	
Date Analyzed:	05/27/16	05/27/16	
AA ID No:	6F01022-37	6F01022-38	
Client ID No:	SVM-14-15	SVM-14-15 DUP	
Matrix:	Vapor	Vapor	
Dilution Factor:	1	1	MRL

TO-15 (Mid Level) (TO-15) (continued)

1,1-Dichloroethylene	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187310
Project No:	496965.A1.01	**Date Received:**	06/01/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	06/07/16
Method:	VOCs by GCMS EPA TO-15	**Units:**	ug/L

Date Sampled:	05/27/16	05/27/16	
Date Prepared:	05/27/16	05/27/16	
Date Analyzed:	05/27/16	05/27/16	
AA ID No:	6F01022-37	6F01022-38	
Client ID No:	SVM-14-15	SVM-14-15 DUP	
Matrix:	Vapor	Vapor	
Dilution Factor:	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)			
Toluene	**0.041**	**0.041**	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	0.020
Vinyl chloride	<0.020	<0.020	0.020
o-Xylene	**0.037**	**0.038**	0.020
m,p-Xylenes	**0.083**	**0.085**	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	0.020
Surrogates			**%REC Limits**
4-Bromofluorobenzene	97%	97%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187310
Project No:	496965.A1.01	**Date Received:**	06/01/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	06/07/16
Method:	Fixed Gases by TCD	**Units:**	% by Volume

Date Sampled:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Prepared:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Analyzed:	05/25/16	05/25/16	05/25/16	05/25/16	
AA ID No:	6F01022-01	6F01022-02	6F01022-03	6F01022-04	
Client ID No:	SVM-16-22	SVM-16-7	SVM-16-16	SVM-8-15	
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**	**18**	**18**	**18**	0.10
Carbon Dioxide	**5.2**	**0.26**	**0.42**	**0.32**	0.10

Allen Aminian
QA/QC 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: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: % by Volume

Date Sampled:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Prepared:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Analyzed:	05/25/16	05/25/16	05/25/16	05/25/16	
AA ID No:	6F01022-05	6F01022-07	6F01022-08	6F01022-09	
Client ID No:	SVM-8-5	SVM-5-15	SVM-5-5	SVM-3-15	
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	**18**	**19**	**18**	**18**	0.10
Carbon Dioxide	**0.14**	<0.10	<0.10	**0.19**	0.10

Allen Aminian
QA/QC 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: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: % by Volume

Date Sampled:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Prepared:	05/25/16	05/25/16	05/25/16	05/25/16	
Date Analyzed:	05/25/16	05/25/16	05/25/16	05/25/16	
AA ID No:	6F01022-10	6F01022-11	6F01022-12	6F01022-13	
Client ID No:	SVM-3-5	SVM-7-7	SVM-7-7 DUP	SVM-7-13	
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	**18**	**18**	**18**	**18**	0.10
Carbon Dioxide	**0.12**	**0.24**	**0.27**	**0.38**	0.10

Allen Aminian
QA/QC 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: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: % by Volume

Date Sampled:	05/26/16	05/26/16	05/26/16	05/26/16	
Date Prepared:	05/26/16	05/26/16	05/26/16	05/26/16	
Date Analyzed:	05/26/16	05/26/16	05/26/16	05/26/16	
AA ID No:	6F01022-14	6F01022-15	6F01022-16	6F01022-17	
Client ID No:	SVM-1-15	SVM-1-5	SVM-2-5	SVM-15-7	
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	**18**	**19**	**19**	**19**	0.10
Carbon Dioxide	<0.10	<0.10	**0.18**	**0.11**	0.10

Allen Aminian
QA/QC 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: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: % by Volume

Date Sampled:	05/26/2016	05/26/2016	05/26/2016	05/26/2016	
Date Prepared:	05/26/16	05/26/16	05/26/16	05/26/16	
Date Analyzed:	05/26/16	05/26/16	05/26/16	05/26/16	
AA ID No:	6F01022-18	6F01022-19	6F01022-20	6F01022-21	
Client ID No:	SVM-15-22	SVM-15-15	SVM-15-15 DUP	SVM-6-7	
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	**19**	**19**	**19**	**18**	0.10
Carbon Dioxide	<0.10	<0.10	<0.10	<0.10	0.10

Allen Aminian
QA/QC 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: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: % by Volume

Date Sampled:	05/26/16	05/26/16	05/26/16	05/26/16	
Date Prepared:	05/26/16	05/26/16	05/26/16	05/26/16	
Date Analyzed:	05/26/16	05/26/16	05/26/16	05/26/16	
AA ID No:	6F01022-22	6F01022-23	6F01022-24	6F01022-25	
Client ID No:	SVM-6-16	SVM-10-15	SVM-11-7	SVM-11-22	
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	**18**	**17**	**18**	**18**	0.10
Carbon Dioxide	<0.10	**2.1**	**0.41**	<0.10	0.10

Allen Aminian
QA/QC 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: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: % by Volume

Date Sampled:	05/26/16	05/27/16	05/27/16	05/27/16	
Date Prepared:	05/26/16	05/27/16	05/27/16	05/27/16	
Date Analyzed:	05/26/16	05/27/16	05/27/16	05/27/16	
AA ID No:	6F01022-26	6F01022-28	6F01022-29	6F01022-30	
Client ID No:	SVM-11-15	SVM-12-7	SVM-12-22	SVM-12-15	
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	**18**	**18**	**12**	**17**	0.10
Carbon Dioxide	**0.34**	**0.52**	**4.9**	**1.7**	0.10

Allen Aminian
QA/QC 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: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: % by Volume

Date Sampled:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Prepared:	05/27/16	05/27/16	05/27/16	05/27/16	
Date Analyzed:	05/27/16	05/27/16	05/27/16	05/27/16	
AA ID No:	6F01022-32	6F01022-33	6F01022-34	6F01022-35	
Client ID No:	SVM-13-7	SVM-13-22	SVM-13-15	SVM-14-22	
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	**18**	**19**	**19**	**18**	0.10
Carbon Dioxide	<0.10	**0.14**	<0.10	**0.71**	0.10

Allen Aminian
QA/QC 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: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16
Units: % by Volume

Date Sampled:	05/27/16	05/27/16	05/27/16	
Date Prepared:	05/27/16	05/27/16	05/27/16	
Date Analyzed:	05/27/16	05/27/16	05/27/16	
AA ID No:	6F01022-36	6F01022-37	6F01022-38	
Client ID No:	SVM-14-7	SVM-14-15	SVM-14-15 DUP	
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**	**17**	**18**	0.10
Carbon Dioxide	**1.1**	**0.87**	**0.89**	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by EPA TO-3 - Quality Control										
*Batch B6F0648 - *** DEFAULT PREP ****										
Blank (B6F0648-BLK1)				Prepared & Analyzed: 05/25/16						
Gasoline Range Organics (GRO)	<20	20	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.150*		*ug/L*	*0.14*		*105*	*70-130*			
LCS (B6F0648-BS1)				Prepared & Analyzed: 05/25/16						
Gasoline Range Organics (GRO)	**0.775**	20	ug/L	0.82		94.8	70-130			
Surrogate: 4-Bromofluorobenzene	*0.140*		*ug/L*	*0.14*		*97.8*	*70-130*			
LCS Dup (B6F0648-BSD1)				Prepared & Analyzed: 05/25/16						
Gasoline Range Organics (GRO)	**0.806**	20	ug/L	0.82		98.5	70-130	3.88	30	
Surrogate: 4-Bromofluorobenzene	*0.141*		*ug/L*	*0.14*		*98.5*	*70-130*			
Duplicate (B6F0648-DUP1)		**Source: 6F01022-11**		Prepared & Analyzed: 05/25/16						
Gasoline Range Organics (GRO)	**<20**	20	ug/L		<20				30	
Surrogate: 4-Bromofluorobenzene	*0.144*		*ug/L*	*0.14*		*101*	*70-130*			
*Batch B6F0649 - *** DEFAULT PREP ****										
Blank (B6F0649-BLK1)				Prepared & Analyzed: 05/26/16						
Gasoline Range Organics (GRO)	<20	20	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.148*		*ug/L*	*0.14*		*103*	*70-130*			
LCS (B6F0649-BS1)				Prepared & Analyzed: 05/26/16						
Gasoline Range Organics (GRO)	**0.804**	20	ug/L	0.82		98.2	70-130			
Surrogate: 4-Bromofluorobenzene	*0.134*		*ug/L*	*0.14*		*93.9*	*70-130*			
LCS Dup (B6F0649-BSD1)				Prepared & Analyzed: 05/26/16						
Gasoline Range Organics (GRO)	**0.827**	20	ug/L	0.82		101	70-130	2.91	30	
Surrogate: 4-Bromofluorobenzene	*0.134*		*ug/L*	*0.14*		*93.5*	*70-130*			
Duplicate (B6F0649-DUP1)		**Source: 6F01022-19**		Prepared & Analyzed: 05/26/16						
Gasoline Range Organics (GRO)	**<20**	20	ug/L		<20				30	
Surrogate: 4-Bromofluorobenzene	*0.145*		*ug/L*	*0.14*		*101*	*70-130*			
*Batch B6F0650 - *** DEFAULT PREP ****										
Blank (B6F0650-BLK1)				Prepared & Analyzed: 05/27/16						
Gasoline Range Organics (GRO)	<20	20	ug/L							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by EPA TO-3 - Quality Control										
*Batch B6F0650 - *** DEFAULT PREP ****										
Blank (B6F0650-BLK1) Continued				Prepared & Analyzed: 05/27/16						
Surrogate: 4-Bromofluorobenzene	*0.147*		*ug/L*	*0.14*		*103*	*70-130*			
LCS (B6F0650-BS1)				Prepared & Analyzed: 05/27/16						
Gasoline Range Organics (GRO)	**0.900**	20	ug/L	0.82		110	70-130			
Surrogate: 4-Bromofluorobenzene	*0.142*		*ug/L*	*0.14*		*99.1*	*70-130*			
LCS Dup (B6F0650-BSD1)				Prepared & Analyzed: 05/27/16						
Gasoline Range Organics (GRO)	**0.941**	20	ug/L	0.82		115	70-130	4.44	30	
Surrogate: 4-Bromofluorobenzene	*0.149*		*ug/L*	*0.14*		*104*	*70-130*			
Duplicate (B6F0650-DUP1)		**Source: 6F01022-37**		Prepared & Analyzed: 05/27/16						
Gasoline Range Organics (GRO)	**<20**	20	ug/L		0.573			6.90	30	
Surrogate: 4-Bromofluorobenzene	*0.139*		*ug/L*	*0.14*		*97.3*	*70-130*			
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0645 - *** DEFAULT PREP ****										
Blank (B6F0645-BLK1)				Prepared & Analyzed: 05/25/16						
Acetone	<0.020	0.020	ug/L							
Allyl chloride	<0.020	0.020	ug/L							
tert-Amyl Methyl Ether (TAME)	<0.020	0.020	ug/L							
Benzene	<0.020	0.020	ug/L							
Benzyl chloride	<0.020	0.020	ug/L							
Bromodichloromethane	<0.020	0.020	ug/L							
Bromoform	<0.020	0.020	ug/L							
Bromomethane	<0.020	0.020	ug/L							
1,3-Butadiene	<0.020	0.020	ug/L							
2-Butanone (MEK)	<0.020	0.020	ug/L							
tert-Butyl alcohol (TBA)	<20	20	ug/L							
Carbon Disulfide	<0.020	0.020	ug/L							
Carbon Tetrachloride	<0.020	0.020	ug/L							
Chlorobenzene	<0.020	0.020	ug/L							
Chloroethane	<0.020	0.020	ug/L							
Chloroform	<0.020	0.020	ug/L							
Chloromethane	<0.020	0.020	ug/L							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0645 - *** DEFAULT PREP ****										
Blank (B6F0645-BLK1) Continued				Prepared & Analyzed: 05/25/16						
Cyclohexane	<0.020	0.020	ug/L							
Dibromochloromethane	<0.020	0.020	ug/L							
1,2-Dibromoethane (EDB)	<0.020	0.020	ug/L							
1,2-Dichlorobenzene	<0.020	0.020	ug/L							
1,3-Dichlorobenzene	<0.020	0.020	ug/L							
1,4-Dichlorobenzene	<0.020	0.020	ug/L							
Dichlorodifluoromethane (R12)	<0.020	0.020	ug/L							
1,1-Dichloroethane	<0.020	0.020	ug/L							
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L							
cis-1,2-Dichloroethylene	<0.020	0.020	ug/L							
1,1-Dichloroethylene	<0.020	0.020	ug/L							
trans-1,2-Dichloroethylene	<0.020	0.020	ug/L							
1,2-Dichloropropane	<0.020	0.020	ug/L							
trans-1,3-Dichloropropylene	<0.020	0.020	ug/L							
cis-1,3-Dichloropropylene	<0.020	0.020	ug/L							
Dichlorotetrafluoroethane	<0.020	0.020	ug/L							
Diisopropyl ether (DIPE)	<0.020	0.020	ug/L							
1,4-Dioxane	<0.020	0.020	ug/L							
Ethanol	<0.020	0.020	ug/L							
Ethyl Acetate	<0.020	0.020	ug/L							
Ethylbenzene	<0.020	0.020	ug/L							
Ethyl-tert-Butyl Ether (ETBE)	<0.020	0.020	ug/L							
4-Ethyltoluene	<0.020	0.020	ug/L							
Heptane	<0.020	0.020	ug/L							
Hexachlorobutadiene	<0.020	0.020	ug/L							
n-Hexane	<0.020	0.020	ug/L							
2-Hexanone (MBK)	<0.020	0.020	ug/L							
Isopropanol (IPA)	<0.20	0.20	ug/L							
Methyl-tert-Butyl Ether (MTBE)	<0.020	0.020	ug/L							
Methylene Chloride	<0.020	0.020	ug/L							
4-Methyl-2-pentanone (MIBK)	<0.020	0.020	ug/L							
Naphthalene	<0.020	0.020	ug/L							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0645 - *** DEFAULT PREP ****										
Blank (B6F0645-BLK1) Continued				Prepared & Analyzed: 05/25/16						
Propylene	<0.020	0.020	ug/L							
Styrene	<0.020	0.020	ug/L							
1,1,2,2-Tetrachloroethane	<0.020	0.020	ug/L							
Tetrachloroethylene (PCE)	<0.020	0.020	ug/L							
Tetrahydrofuran (THF)	<0.020	0.020	ug/L							
Toluene	<0.020	0.020	ug/L							
1,2,4-Trichlorobenzene	<0.020	0.020	ug/L							
1,1,2-Trichloroethane	<0.020	0.020	ug/L							
1,1,1-Trichloroethane	<0.020	0.020	ug/L							
Trichloroethylene (TCE)	<0.020	0.020	ug/L							
Trichlorofluoromethane (R11)	<0.020	0.020	ug/L							
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<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							
2,2,4-Trimethylpentane	<0.020	0.020	ug/L							
Vinyl acetate	<0.020	0.020	ug/L							
Vinyl bromide	<0.020	0.020	ug/L							
Vinyl chloride	<0.020	0.020	ug/L							
o-Xylene	<0.020	0.020	ug/L							
m,p-Xylenes	<0.020	0.020	ug/L							
1,1,1,2-Tetrachloroethane	<0.020	0.020	ug/L							
1,2,3-Trichloropropane	<0.020	0.020	ug/L							
sec-Butylbenzene	<0.020	0.020	ug/L							
Isopropylbenzene	<0.020	0.020	ug/L							
n-Propylbenzene	<0.020	0.020	ug/L							
4-Isopropyltoluene	<0.020	0.020	ug/L							
n-Butylbenzene	<0.020	0.020	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.149*		*ug/L*	*0.14*		*104*	*70-130*			
LCS (B6F0645-BS1)				Prepared & Analyzed: 05/25/16						
Acetone	**0.0286**	0.020	ug/L	0.024		120	70-130		30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0645 - *** DEFAULT PREP ****										
LCS (B6F0645-BS1) Continued				Prepared & Analyzed: 05/25/16						
Benzene	**0.0297**	0.020	ug/L	0.032		92.9	70-130		30	
Benzyl chloride	**0.0505**	0.020	ug/L	0.052		97.5	70-130		30	
Bromodichloromethane	**0.0787**	0.020	ug/L	0.067		117	70-130		30	
Bromoform	**0.116**	0.020	ug/L	0.10		112	70-130		30	
Bromomethane	**0.0483**	0.020	ug/L	0.039		124	70-130		30	
2-Butanone (MEK)	**0.0294**	0.020	ug/L	0.029		99.7	70-130		30	
Carbon Disulfide	**0.0399**	0.020	ug/L	0.031		128	70-130		30	
Carbon Tetrachloride	**0.0778**	0.020	ug/L	0.063		124	70-130		30	
Chlorobenzene	**0.0468**	0.020	ug/L	0.046		102	70-130		30	
Chloroethane	**0.0336**	0.020	ug/L	0.026		127	70-130		30	
Chloroform	**0.0555**	0.020	ug/L	0.049		114	70-130		30	
Chloromethane	**0.0291**	0.020	ug/L	0.021		141	70-130		30	**
Dibromochloromethane	**0.0870**	0.020	ug/L	0.085		102	70-130		30	
1,2-Dibromoethane (EDB)	**0.0717**	0.020	ug/L	0.077		93.3	70-130		30	
1,2-Dichlorobenzene	**0.0522**	0.020	ug/L	0.060		86.8	70-130		30	
1,3-Dichlorobenzene	**0.0555**	0.020	ug/L	0.060		92.3	70-130		30	
1,4-Dichlorobenzene	**0.0537**	0.020	ug/L	0.060		89.4	70-130		30	
Dichlorodifluoromethane (R12)	**0.0635**	0.020	ug/L	0.049		128	70-130		30	
1,1-Dichloroethane	**0.0487**	0.020	ug/L	0.040		120	70-130		30	
1,2-Dichloroethane (EDC)	**0.0453**	0.020	ug/L	0.040		112	70-130		30	
cis-1,2-Dichloroethylene	**0.0347**	0.020	ug/L	0.040		87.4	70-130		30	
1,1-Dichloroethylene	**0.0513**	0.020	ug/L	0.040		129	70-130		30	
trans-1,2-Dichloroethylene	**0.0404**	0.020	ug/L	0.040		102	70-130		30	
1,2-Dichloropropane	**0.0495**	0.020	ug/L	0.046		107	70-130		30	
trans-1,3-Dichloropropylene	**0.0418**	0.020	ug/L	0.045		92.1	70-130		30	
cis-1,3-Dichloropropylene	**0.0410**	0.020	ug/L	0.045		90.3	70-130		30	
Dichlorotetrafluoroethane	**0.0953**	0.020	ug/L	0.070		136	70-130		30	**
Ethylbenzene	**0.0422**	0.020	ug/L	0.043		97.2	70-130		30	
4-Ethyltoluene	**0.0464**	0.020	ug/L	0.049		94.4	70-130		30	
Hexachlorobutadiene	**0.0750**	0.020	ug/L	0.11		70.3	70-130		30	
2-Hexanone (MBK)	**0.0567**	0.020	ug/L	0.041		138	70-130		30	**
Isopropanol (IPA)	**0.0287**	0.20	ug/L	0.025		117	70-130		30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0645 - *** DEFAULT PREP ****										
LCS (B6F0645-BS1) Continued				Prepared & Analyzed: 05/25/16						
Methylene Chloride	**0.0440**	0.020	ug/L	0.035		127	70-130		30	
4-Methyl-2-pentanone (MIBK)	**0.0514**	0.020	ug/L	0.041		125	70-130		30	
Styrene	**0.0357**	0.020	ug/L	0.043		83.8	70-130		30	
1,1,2,2-Tetrachloroethane	**0.0752**	0.020	ug/L	0.069		110	70-130		30	
Tetrachloroethylene (PCE)	**0.0575**	0.020	ug/L	0.068		84.8	70-130		30	
Toluene	**0.0351**	0.020	ug/L	0.038		93.1	70-130		30	
1,2,4-Trichlorobenzene	**0.0519**	0.020	ug/L	0.074		70.0	70-130		30	
1,1,2-Trichloroethane	**0.0548**	0.020	ug/L	0.055		100	70-130		30	
1,1,1-Trichloroethane	**0.0601**	0.020	ug/L	0.055		110	70-130		30	
Trichloroethylene (TCE)	**0.0577**	0.020	ug/L	0.054		107	70-130		30	
Trichlorofluoromethane (R11)	**0.0741**	0.020	ug/L	0.056		132	70-130		30	**
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.101**	0.020	ug/L	0.077		131	70-130		30	**
1,3,5-Trimethylbenzene	**0.0464**	0.020	ug/L	0.049		94.4	70-130		30	
1,2,4-Trimethylbenzene	**0.0460**	0.020	ug/L	0.049		93.6	70-130		30	
Vinyl acetate	**0.0363**	0.020	ug/L	0.035		103	70-130		30	
Vinyl chloride	**0.0339**	0.020	ug/L	0.026		133	70-130		30	**
o-Xylene	**0.0435**	0.020	ug/L	0.043		100	70-130		30	
m,p-Xylenes	**0.0831**	0.020	ug/L	0.087		95.6	70-130		30	
1,2,3-Trichloropropane	**0.0564**	0.020	ug/L	0.060		93.5	70-130		30	
sec-Butylbenzene	**0.0419**	0.020	ug/L	0.055		76.3	70-130		30	
Isopropylbenzene	**0.0385**	0.020	ug/L	0.049		78.3	70-130		30	
n-Propylbenzene	**0.0400**	0.020	ug/L	0.049		81.3	70-130		30	
4-Isopropyltoluene	**0.0405**	0.020	ug/L	0.055		73.8	70-130		30	
Surrogate: 4-Bromofluorobenzene	*0.142*		*ug/L*	*0.14*		*98.9*	*70-130*			
LCS Dup (B6F0645-BSD1)				Prepared & Analyzed: 05/25/16						
Acetone	**0.0279**	0.020	ug/L	0.024		117	70-130	2.44	30	
Benzene	**0.0321**	0.020	ug/L	0.032		100	70-130	7.86	30	
Benzyl chloride	**0.0505**	0.020	ug/L	0.052		97.6	70-130	0.103	30	
Bromodichloromethane	**0.0783**	0.020	ug/L	0.067		117	70-130	0.427	30	
Bromoform	**0.114**	0.020	ug/L	0.10		110	70-130	1.71	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0645 - *** DEFAULT PREP ****										
LCS Dup (B6F0645-BSD1) Continued				Prepared & Analyzed: 05/25/16						
Bromomethane	**0.0488**	0.020	ug/L	0.039		126	70-130	1.04	30	
2-Butanone (MEK)	**0.0291**	0.020	ug/L	0.029		98.7	70-130	1.01	30	
Carbon Disulfide	**0.0417**	0.020	ug/L	0.031		134	70-130	4.58	30	**
Carbon Tetrachloride	**0.0780**	0.020	ug/L	0.063		124	70-130	0.242	30	
Chlorobenzene	**0.0465**	0.020	ug/L	0.046		101	70-130	0.790	30	
Chloroethane	**0.0354**	0.020	ug/L	0.026		134	70-130	5.35	30	**
Chloroform	**0.0558**	0.020	ug/L	0.049		114	70-130	0.614	30	
Chloromethane	**0.0279**	0.020	ug/L	0.021		135	70-130	4.27	30	**
Dibromochloromethane	**0.0877**	0.020	ug/L	0.085		103	70-130	0.780	30	
1,2-Dibromoethane (EDB)	**0.0743**	0.020	ug/L	0.077		96.7	70-130	3.58	30	
1,2-Dichlorobenzene	**0.0507**	0.020	ug/L	0.060		84.3	70-130	2.92	30	
1,3-Dichlorobenzene	**0.0543**	0.020	ug/L	0.060		90.3	70-130	2.19	30	
1,4-Dichlorobenzene	**0.0528**	0.020	ug/L	0.060		87.9	70-130	1.69	30	
Dichlorodifluoromethane (R12)	**0.0648**	0.020	ug/L	0.049		131	70-130	2.00	30	**
1,1-Dichloroethane	**0.0500**	0.020	ug/L	0.040		124	70-130	2.79	30	
1,2-Dichloroethane (EDC)	**0.0482**	0.020	ug/L	0.040		119	70-130	6.23	30	
cis-1,2-Dichloroethylene	**0.0394**	0.020	ug/L	0.040		99.3	70-130	12.7	30	
1,1-Dichloroethylene	**0.0568**	0.020	ug/L	0.040		143	70-130	10.1	30	**
trans-1,2-Dichloroethylene	**0.0435**	0.020	ug/L	0.040		110	70-130	7.27	30	
1,2-Dichloropropane	**0.0483**	0.020	ug/L	0.046		105	70-130	2.46	30	
trans-1,3-Dichloropropylene	**0.0455**	0.020	ug/L	0.045		100	70-130	8.52	30	
cis-1,3-Dichloropropylene	**0.0457**	0.020	ug/L	0.045		101	70-130	10.9	30	
Dichlorotetrafluoroethane	**0.0937**	0.020	ug/L	0.070		134	70-130	1.70	30	**
Ethylbenzene	**0.0435**	0.020	ug/L	0.043		100	70-130	3.04	30	
4-Ethyltoluene	**0.0462**	0.020	ug/L	0.049		94.0	70-130	0.425	30	
Hexachlorobutadiene	**0.0759**	0.020	ug/L	0.11		71.2	70-130	1.27	30	
2-Hexanone (MBK)	**0.0416**	0.020	ug/L	0.041		102	70-130	30.7	30	QR-02
Isopropanol (IPA)	**0.0286**	0.20	ug/L	0.025		116	70-130	0.344	30	
Methylene Chloride	**0.0464**	0.020	ug/L	0.035		134	70-130	5.46	30	**
4-Methyl-2-pentanone (MIBK)	**0.0417**	0.020	ug/L	0.041		102	70-130	20.7	30	
Styrene	**0.0368**	0.020	ug/L	0.043		86.5	70-130	3.17	30	
1,1,2,2-Tetrachloroethane	**0.0717**	0.020	ug/L	0.069		104	70-130	4.86	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0645 - *** DEFAULT PREP ****										
LCS Dup (B6F0645-BSD1) Continued				Prepared & Analyzed: 05/25/16						
Tetrachloroethylene (PCE)	**0.0592**	0.020	ug/L	0.068		87.2	70-130	2.79	30	
Toluene	**0.0357**	0.020	ug/L	0.038		94.6	70-130	1.60	30	
1,2,4-Trichlorobenzene	**0.0525**	0.020	ug/L	0.074		70.7	70-130	0.995	30	
1,1,2-Trichloroethane	**0.0529**	0.020	ug/L	0.055		97.0	70-130	3.54	30	
1,1,1-Trichloroethane	**0.0627**	0.020	ug/L	0.055		115	70-130	4.26	30	
Trichloroethylene (TCE)	**0.0586**	0.020	ug/L	0.054		109	70-130	1.57	30	
Trichlorofluoromethane (R11)	**0.0784**	0.020	ug/L	0.056		140	70-130	5.67	30	**
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.104**	0.020	ug/L	0.077		136	70-130	3.22	30	**
1,3,5-Trimethylbenzene	**0.0467**	0.020	ug/L	0.049		94.9	70-130	0.528	30	
1,2,4-Trimethylbenzene	**0.0457**	0.020	ug/L	0.049		92.9	70-130	0.751	30	
Vinyl acetate	**0.0383**	0.020	ug/L	0.035		109	70-130	5.38	30	
Vinyl chloride	**0.0347**	0.020	ug/L	0.026		136	70-130	2.24	30	**
o-Xylene	**0.0435**	0.020	ug/L	0.043		100	70-130	0.00	30	
m,p-Xylenes	**0.0824**	0.020	ug/L	0.087		94.9	70-130	0.787	30	
1,2,3-Trichloropropane	**0.0546**	0.020	ug/L	0.060		90.5	70-130	3.26	30	
sec-Butylbenzene	**0.0415**	0.020	ug/L	0.055		75.6	70-130	0.922	30	
Isopropylbenzene	**0.0392**	0.020	ug/L	0.049		79.7	70-130	1.77	30	
n-Propylbenzene	**0.0404**	0.020	ug/L	0.049		82.2	70-130	1.10	30	
4-Isopropyltoluene	**0.0406**	0.020	ug/L	0.055		74.0	70-130	0.271	30	
Surrogate: 4-Bromofluorobenzene	*0.143*		*ug/L*	*0.14*		*99.9*	*70-130*			
Duplicate (B6F0645-DUP1)			**Source: 6F01022-11**	Prepared & Analyzed: 05/25/16						
Acetone	**<0.020**	0.020	ug/L		<0.020				30	
Allyl chloride	**<0.020**	0.020	ug/L		<0.020				30	
tert-Amyl Methyl Ether (TAME)	**<0.020**	0.020	ug/L		<0.020				30	
Benzene	**<0.020**	0.020	ug/L		<0.020				30	
Benzyl chloride	**<0.020**	0.020	ug/L		<0.020				30	
Bromodichloromethane	**<0.020**	0.020	ug/L		<0.020				30	
Bromoform	**<0.020**	0.020	ug/L		<0.020				30	
Bromomethane	**<0.020**	0.020	ug/L		<0.020				30	
1,3-Butadiene	**<0.020**	0.020	ug/L		<0.020				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0645 - *** DEFAULT PREP ****										
Duplicate (B6F0645-DUP1) Continued	**Source: 6F01022-11**		Prepared & Analyzed: 05/25/16							
2-Butanone (MEK)	**<0.020**	0.020	ug/L		<0.020				30	
tert-Butyl alcohol (TBA)	**<20**	20	ug/L		<20				30	
Carbon Disulfide	**<0.020**	0.020	ug/L		<0.020				30	
Carbon Tetrachloride	**<0.020**	0.020	ug/L		<0.020				30	
Chlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
Chloroethane	**<0.020**	0.020	ug/L		<0.020				30	
Chloroform	**<0.020**	0.020	ug/L		<0.020				30	
Chloromethane	**<0.020**	0.020	ug/L		<0.020				30	
Cyclohexane	**<0.020**	0.020	ug/L		<0.020				30	
Dibromochloromethane	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dibromoethane (EDB)	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
1,3-Dichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
1,4-Dichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
Dichlorodifluoromethane (R12)	**<0.020**	0.020	ug/L		<0.020				30	
1,1-Dichloroethane	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dichloroethane (EDC)	**<0.020**	0.020	ug/L		<0.020				30	
cis-1,2-Dichloroethylene	**<0.020**	0.020	ug/L		<0.020				30	
1,1-Dichloroethylene	**<0.020**	0.020	ug/L		<0.020				30	
trans-1,2-Dichloroethylene	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dichloropropane	**<0.020**	0.020	ug/L		<0.020				30	
trans-1,3-Dichloropropylene	**<0.020**	0.020	ug/L		<0.020				30	
cis-1,3-Dichloropropylene	**<0.020**	0.020	ug/L		<0.020				30	
Dichlorotetrafluoroethane	**<0.020**	0.020	ug/L		<0.020				30	
Diisopropyl ether (DIPE)	**<0.020**	0.020	ug/L		<0.020				30	
1,4-Dioxane	**<0.020**	0.020	ug/L		<0.020				30	
Ethanol	**<0.020**	0.020	ug/L		<0.020				30	
Ethyl Acetate	**<0.020**	0.020	ug/L		<0.020				30	
Ethylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
Ethyl-tert-Butyl Ether (ETBE)	**<0.020**	0.020	ug/L		<0.020				30	
4-Ethyltoluene	**<0.020**	0.020	ug/L		<0.020				30	
Heptane	**<0.020**	0.020	ug/L		<0.020				30	

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QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0645 - *** DEFAULT PREP ****										
Duplicate (B6F0645-DUP1) Continued	**Source: 6F01022-11**	Prepared & Analyzed: 05/25/16								
Hexachlorobutadiene	**<0.020**	0.020	ug/L		<0.020				30	
n-Hexane	**<0.020**	0.020	ug/L		<0.020				30	
2-Hexanone (MBK)	**<0.020**	0.020	ug/L		<0.020				30	
Isopropanol (IPA)	**<0.20**	0.20	ug/L		<0.20				30	
Methyl-tert-Butyl Ether (MTBE)	**<0.020**	0.020	ug/L		<0.020				30	
Methylene Chloride	**<0.020**	0.020	ug/L		<0.020				30	
4-Methyl-2-pentanone (MIBK)	**<0.020**	0.020	ug/L		<0.020				30	
Naphthalene	**<0.020**	0.020	ug/L		<0.020				30	
Propylene	**<0.020**	0.020	ug/L		<0.020				30	
Styrene	**<0.020**	0.020	ug/L		<0.020				30	
1,1,2,2-Tetrachloroethane	**<0.020**	0.020	ug/L		<0.020				30	
Tetrachloroethylene (PCE)	**<0.020**	0.020	ug/L		<0.020				30	
Tetrahydrofuran (THF)	**<0.020**	0.020	ug/L		<0.020				30	
Toluene	**<0.020**	0.020	ug/L		<0.020				30	
1,2,4-Trichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
1,1,2-Trichloroethane	**<0.020**	0.020	ug/L		<0.020				30	
1,1,1-Trichloroethane	**<0.020**	0.020	ug/L		<0.020				30	
Trichloroethylene (TCE)	**<0.020**	0.020	ug/L		<0.020				30	
Trichlorofluoromethane (R11)	**<0.020**	0.020	ug/L		<0.020				30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**<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	
2,2,4-Trimethylpentane	**<0.020**	0.020	ug/L		<0.020				30	
Vinyl acetate	**<0.020**	0.020	ug/L		<0.020				30	
Vinyl bromide	**<0.020**	0.020	ug/L		<0.020				30	
Vinyl chloride	**<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	
1,1,1,2-Tetrachloroethane	**<0.020**	0.020	ug/L		<0.020				30	
1,2,3-Trichloropropane	**<0.020**	0.020	ug/L		<0.020				30	
sec-Butylbenzene	**<0.020**	0.020	ug/L		<0.020				30	

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LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0645 - *** DEFAULT PREP ****										
Duplicate (B6F0645-DUP1) Continued	**Source: 6F01022-11**			Prepared & Analyzed: 05/25/16						
Isopropylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
n-Propylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
4-Isopropyltoluene	**<0.020**	0.020	ug/L		<0.020				30	
n-Butylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
Surrogate: 4-Bromofluorobenzene	*0.143*		*ug/L*	*0.14*		*100*	*70-130*			
*Batch B6F0646 - *** DEFAULT PREP ****										
Blank (B6F0646-BLK1)				Prepared & Analyzed: 05/26/16						
Acetone	<0.020	0.020	ug/L							
Allyl chloride	<0.020	0.020	ug/L							
tert-Amyl Methyl Ether (TAME)	<0.020	0.020	ug/L							
Benzene	<0.020	0.020	ug/L							
Benzyl chloride	<0.020	0.020	ug/L							
Bromodichloromethane	<0.020	0.020	ug/L							
Bromoform	<0.020	0.020	ug/L							
Bromomethane	<0.020	0.020	ug/L							
1,3-Butadiene	<0.020	0.020	ug/L							
2-Butanone (MEK)	<0.020	0.020	ug/L							
tert-Butyl alcohol (TBA)	<20	20	ug/L							
Carbon Disulfide	<0.020	0.020	ug/L							
Carbon Tetrachloride	<0.020	0.020	ug/L							
Chlorobenzene	<0.020	0.020	ug/L							
Chloroethane	<0.020	0.020	ug/L							
Chloroform	<0.020	0.020	ug/L							
Chloromethane	<0.020	0.020	ug/L							
Cyclohexane	<0.020	0.020	ug/L							
Dibromochloromethane	<0.020	0.020	ug/L							
1,2-Dibromoethane (EDB)	<0.020	0.020	ug/L							
1,2-Dichlorobenzene	<0.020	0.020	ug/L							
1,3-Dichlorobenzene	<0.020	0.020	ug/L							
1,4-Dichlorobenzene	<0.020	0.020	ug/L							
Dichlorodifluoromethane (R12)	<0.020	0.020	ug/L							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0646 - *** DEFAULT PREP ****										
Blank (B6F0646-BLK1) Continued				Prepared & Analyzed: 05/26/16						
1,1-Dichloroethane	<0.020	0.020	ug/L							
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L							
cis-1,2-Dichloroethylene	<0.020	0.020	ug/L							
1,1-Dichloroethylene	<0.020	0.020	ug/L							
trans-1,2-Dichloroethylene	<0.020	0.020	ug/L							
1,2-Dichloropropane	<0.020	0.020	ug/L							
trans-1,3-Dichloropropylene	<0.020	0.020	ug/L							
cis-1,3-Dichloropropylene	<0.020	0.020	ug/L							
Dichlorotetrafluoroethane	<0.020	0.020	ug/L							
Diisopropyl ether (DIPE)	<0.020	0.020	ug/L							
1,4-Dioxane	<0.020	0.020	ug/L							
Ethanol	<0.020	0.020	ug/L							
Ethyl Acetate	<0.020	0.020	ug/L							
Ethylbenzene	<0.020	0.020	ug/L							
Ethyl-tert-Butyl Ether (ETBE)	<0.020	0.020	ug/L							
4-Ethyltoluene	<0.020	0.020	ug/L							
Heptane	<0.020	0.020	ug/L							
Hexachlorobutadiene	<0.020	0.020	ug/L							
n-Hexane	<0.020	0.020	ug/L							
2-Hexanone (MBK)	<0.020	0.020	ug/L							
Isopropanol (IPA)	<0.20	0.20	ug/L							
Methyl-tert-Butyl Ether (MTBE)	<0.020	0.020	ug/L							
Methylene Chloride	<0.020	0.020	ug/L							
4-Methyl-2-pentanone (MIBK)	<0.020	0.020	ug/L							
Naphthalene	<0.020	0.020	ug/L							
Propylene	<0.020	0.020	ug/L							
Styrene	<0.020	0.020	ug/L							
1,1,2,2-Tetrachloroethane	<0.020	0.020	ug/L							
Tetrachloroethylene (PCE)	<0.020	0.020	ug/L							
Tetrahydrofuran (THF)	<0.020	0.020	ug/L							
Toluene	<0.020	0.020	ug/L							
1,2,4-Trichlorobenzene	<0.020	0.020	ug/L							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0646 - *** DEFAULT PREP ****										
Blank (B6F0646-BLK1) Continued				Prepared & Analyzed: 05/26/16						
1,1,2-Trichloroethane	<0.020	0.020	ug/L							
1,1,1-Trichloroethane	<0.020	0.020	ug/L							
Trichloroethylene (TCE)	<0.020	0.020	ug/L							
Trichlorofluoromethane (R11)	<0.020	0.020	ug/L							
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<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							
2,2,4-Trimethylpentane	<0.020	0.020	ug/L							
Vinyl acetate	<0.020	0.020	ug/L							
Vinyl bromide	<0.020	0.020	ug/L							
Vinyl chloride	<0.020	0.020	ug/L							
o-Xylene	<0.020	0.020	ug/L							
m,p-Xylenes	<0.020	0.020	ug/L							
1,1,1,2-Tetrachloroethane	<0.020	0.020	ug/L							
1,2,3-Trichloropropane	<0.020	0.020	ug/L							
sec-Butylbenzene	<0.020	0.020	ug/L							
Isopropylbenzene	<0.020	0.020	ug/L							
n-Propylbenzene	<0.020	0.020	ug/L							
4-Isopropyltoluene	<0.020	0.020	ug/L							
n-Butylbenzene	<0.020	0.020	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.148*		*ug/L*	*0.14*		*103*	*70-130*			
LCS (B6F0646-BS1)				Prepared & Analyzed: 05/26/16						
Acetone	**0.0429**	0.020	ug/L	0.024		181	70-130		30	**
Benzene	**0.0278**	0.020	ug/L	0.032		86.9	70-130		30	
Benzyl chloride	**0.0585**	0.020	ug/L	0.052		113	70-130		30	
Bromodichloromethane	**0.0755**	0.020	ug/L	0.067		113	70-130		30	
Bromoform	**0.108**	0.020	ug/L	0.10		105	70-130		30	
Bromomethane	**0.0432**	0.020	ug/L	0.039		111	70-130		30	
2-Butanone (MEK)	**0.0336**	0.020	ug/L	0.029		114	70-130		30	
Carbon Disulfide	**0.139**	0.020	ug/L	0.031		448	70-130		30	**

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0646 - *** DEFAULT PREP ****										
LCS (B6F0646-BS1) Continued				Prepared & Analyzed: 05/26/16						
Carbon Tetrachloride	**0.0782**	0.020	ug/L	0.063		124	70-130		30	
Chlorobenzene	**0.0414**	0.020	ug/L	0.046		89.9	70-130		30	
Chloroethane	**0.0303**	0.020	ug/L	0.026		115	70-130		30	
Chloroform	**0.0525**	0.020	ug/L	0.049		108	70-130		30	
Chloromethane	**0.0237**	0.020	ug/L	0.021		115	70-130		30	
Dibromochloromethane	**0.0843**	0.020	ug/L	0.085		99.0	70-130		30	
1,2-Dibromoethane (EDB)	**0.0705**	0.020	ug/L	0.077		91.7	70-130		30	
1,2-Dichlorobenzene	**0.0584**	0.020	ug/L	0.060		97.1	70-130		30	
1,3-Dichlorobenzene	**0.0556**	0.020	ug/L	0.060		92.5	70-130		30	
1,4-Dichlorobenzene	**0.0565**	0.020	ug/L	0.060		93.9	70-130		30	
Dichlorodifluoromethane (R12)	**0.0604**	0.020	ug/L	0.049		122	70-130		30	
1,1-Dichloroethane	**0.0459**	0.020	ug/L	0.040		114	70-130		30	
1,2-Dichloroethane (EDC)	**0.0438**	0.020	ug/L	0.040		108	70-130		30	
cis-1,2-Dichloroethylene	**0.0414**	0.020	ug/L	0.040		104	70-130		30	
1,1-Dichloroethylene	**0.0486**	0.020	ug/L	0.040		123	70-130		30	
trans-1,2-Dichloroethylene	**0.0447**	0.020	ug/L	0.040		113	70-130		30	
1,2-Dichloropropane	**0.0465**	0.020	ug/L	0.046		101	70-130		30	
trans-1,3-Dichloropropylene	**0.0449**	0.020	ug/L	0.045		98.9	70-130		30	
cis-1,3-Dichloropropylene	**0.0440**	0.020	ug/L	0.045		97.0	70-130		30	
Dichlorotetrafluoroethane	**0.0859**	0.020	ug/L	0.070		123	70-130		30	
Ethylbenzene	**0.0467**	0.020	ug/L	0.043		108	70-130		30	
4-Ethyltoluene	**0.0545**	0.020	ug/L	0.049		111	70-130		30	
Hexachlorobutadiene	**0.121**	0.020	ug/L	0.11		114	70-130		30	
2-Hexanone (MBK)	**0.0427**	0.020	ug/L	0.041		104	70-130		30	
Isopropanol (IPA)	**0.0337**	0.20	ug/L	0.025		137	70-130		30	**
Methylene Chloride	**0.0423**	0.020	ug/L	0.035		122	70-130		30	
4-Methyl-2-pentanone (MIBK)	**0.0246**	0.020	ug/L	0.041		60.1	70-130		30	***
Styrene	**0.0378**	0.020	ug/L	0.043		88.7	70-130		30	
1,1,2,2-Tetrachloroethane	**0.0737**	0.020	ug/L	0.069		107	70-130		30	
Tetrachloroethylene (PCE)	**0.0575**	0.020	ug/L	0.068		84.7	70-130		30	
Toluene	**0.0490**	0.020	ug/L	0.038		130	70-130		30	
1,2,4-Trichlorobenzene	**0.0832**	0.020	ug/L	0.074		112	70-130		30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0646 - *** DEFAULT PREP ****										
LCS (B6F0646-BS1) Continued				Prepared & Analyzed: 05/26/16						
1,1,2-Trichloroethane	**0.0497**	0.020	ug/L	0.055		91.1	70-130		30	
1,1,1-Trichloroethane	**0.0570**	0.020	ug/L	0.055		104	70-130		30	
Trichloroethylene (TCE)	**0.0541**	0.020	ug/L	0.054		101	70-130		30	
Trichlorofluoromethane (R11)	**0.0726**	0.020	ug/L	0.056		129	70-130		30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0940**	0.020	ug/L	0.077		123	70-130		30	
1,3,5-Trimethylbenzene	**0.0505**	0.020	ug/L	0.049		103	70-130		30	
1,2,4-Trimethylbenzene	**0.0520**	0.020	ug/L	0.049		106	70-130		30	
Vinyl acetate	**0.0437**	0.020	ug/L	0.035		124	70-130		30	
Vinyl chloride	**0.0297**	0.020	ug/L	0.026		116	70-130		30	
o-Xylene	**0.0488**	0.020	ug/L	0.043		112	70-130		30	
m,p-Xylenes	**0.0944**	0.020	ug/L	0.087		109	70-130		30	
1,2,3-Trichloropropane	**0.0667**	0.020	ug/L	0.060		111	70-130		30	
sec-Butylbenzene	**0.0567**	0.020	ug/L	0.055		103	70-130		30	
Isopropylbenzene	**0.0489**	0.020	ug/L	0.049		99.5	70-130		30	
n-Propylbenzene	**0.0518**	0.020	ug/L	0.049		105	70-130		30	
4-Isopropyltoluene	**0.0570**	0.020	ug/L	0.055		104	70-130		30	
Surrogate: 4-Bromofluorobenzene	*0.144*		*ug/L*	*0.14*		*101*	*70-130*			
LCS Dup (B6F0646-BSD1)				Prepared & Analyzed: 05/26/16						
Acetone	**0.0291**	0.020	ug/L	0.024		122	70-130	38.6	30	QR-02
Benzene	**0.0285**	0.020	ug/L	0.032		89.1	70-130	2.50	30	
Benzyl chloride	**0.0559**	0.020	ug/L	0.052		108	70-130	4.62	30	
Bromodichloromethane	**0.0779**	0.020	ug/L	0.067		116	70-130	3.06	30	
Bromoform	**0.114**	0.020	ug/L	0.10		110	70-130	5.22	30	
Bromomethane	**0.0428**	0.020	ug/L	0.039		110	70-130	0.903	30	
2-Butanone (MEK)	**0.0299**	0.020	ug/L	0.029		101	70-130	11.6	30	
Carbon Disulfide	**0.0450**	0.020	ug/L	0.031		144	70-130	102	30	**
Carbon Tetrachloride	**0.0775**	0.020	ug/L	0.063		123	70-130	0.889	30	
Chlorobenzene	**0.0436**	0.020	ug/L	0.046		94.6	70-130	5.09	30	
Chloroethane	**0.0304**	0.020	ug/L	0.026		115	70-130	0.174	30	
Chloroform	**0.0518**	0.020	ug/L	0.049		106	70-130	1.40	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0646 - *** DEFAULT PREP ****										
LCS Dup (B6F0646-BSD1) Continued				Prepared & Analyzed: 05/26/16						
Chloromethane	**0.0239**	0.020	ug/L	0.021		116	70-130	0.868	30	
Dibromochloromethane	**0.0847**	0.020	ug/L	0.085		99.4	70-130	0.403	30	
1,2-Dibromoethane (EDB)	**0.0687**	0.020	ug/L	0.077		89.4	70-130	2.54	30	
1,2-Dichlorobenzene	**0.0540**	0.020	ug/L	0.060		89.8	70-130	7.81	30	
1,3-Dichlorobenzene	**0.0571**	0.020	ug/L	0.060		94.9	70-130	2.56	30	
1,4-Dichlorobenzene	**0.0547**	0.020	ug/L	0.060		90.9	70-130	3.25	30	
Dichlorodifluoromethane (R12)	**0.0581**	0.020	ug/L	0.049		118	70-130	3.84	30	
1,1-Dichloroethane	**0.0480**	0.020	ug/L	0.040		119	70-130	4.39	30	
1,2-Dichloroethane (EDC)	**0.0417**	0.020	ug/L	0.040		103	70-130	5.02	30	
cis-1,2-Dichloroethylene	**0.0417**	0.020	ug/L	0.040		105	70-130	0.668	30	
1,1-Dichloroethylene	**0.0480**	0.020	ug/L	0.040		121	70-130	1.31	30	
trans-1,2-Dichloroethylene	**0.0462**	0.020	ug/L	0.040		117	70-130	3.31	30	
1,2-Dichloropropane	**0.0478**	0.020	ug/L	0.046		104	70-130	2.74	30	
trans-1,3-Dichloropropylene	**0.0433**	0.020	ug/L	0.045		95.3	70-130	3.71	30	
cis-1,3-Dichloropropylene	**0.0434**	0.020	ug/L	0.045		95.7	70-130	1.35	30	
Dichlorotetrafluoroethane	**0.0851**	0.020	ug/L	0.070		122	70-130	0.981	30	
Ethylbenzene	**0.0485**	0.020	ug/L	0.043		112	70-130	3.83	30	
4-Ethyltoluene	**0.0501**	0.020	ug/L	0.049		102	70-130	8.36	30	
Hexachlorobutadiene	**0.0894**	0.020	ug/L	0.11		83.8	70-130	30.2	30	QR-02
2-Hexanone (MBK)	**0.0265**	0.020	ug/L	0.041		64.7	70-130	46.9	30	***
Isopropanol (IPA)	**0.0282**	0.20	ug/L	0.025		115	70-130	17.8	30	
Methylene Chloride	**0.0396**	0.020	ug/L	0.035		114	70-130	6.61	30	
4-Methyl-2-pentanone (MIBK)	**0.0424**	0.020	ug/L	0.041		104	70-130	53.1	30	QR-02
Styrene	**0.0398**	0.020	ug/L	0.043		93.4	70-130	5.16	30	
1,1,2,2-Tetrachloroethane	**0.0765**	0.020	ug/L	0.069		111	70-130	3.75	30	
Tetrachloroethylene (PCE)	**0.0536**	0.020	ug/L	0.068		79.0	70-130	6.96	30	
Toluene	**0.0388**	0.020	ug/L	0.038		103	70-130	23.2	30	
1,2,4-Trichlorobenzene	**0.0585**	0.020	ug/L	0.074		78.8	70-130	34.9	30	QR-02
1,1,2-Trichloroethane	**0.0504**	0.020	ug/L	0.055		92.4	70-130	1.42	30	
1,1,1-Trichloroethane	**0.0557**	0.020	ug/L	0.055		102	70-130	2.32	30	
Trichloroethylene (TCE)	**0.0547**	0.020	ug/L	0.054		102	70-130	1.09	30	
Trichlorofluoromethane (R11)	**0.0696**	0.020	ug/L	0.056		124	70-130	4.35	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0646 - *** DEFAULT PREP ****										
LCS Dup (B6F0646-BSD1) Continued				Prepared & Analyzed: 05/26/16						
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0922**	0.020	ug/L	0.077		120	70-130	1.89	30	
1,3,5-Trimethylbenzene	**0.0485**	0.020	ug/L	0.049		98.6	70-130	4.17	30	
1,2,4-Trimethylbenzene	**0.0473**	0.020	ug/L	0.049		96.2	70-130	9.50	30	
Vinyl acetate	**0.0415**	0.020	ug/L	0.035		118	70-130	5.29	30	
Vinyl chloride	**0.0302**	0.020	ug/L	0.026		118	70-130	1.71	30	
o-Xylene	**0.0494**	0.020	ug/L	0.043		114	70-130	1.24	30	
m,p-Xylenes	**0.0923**	0.020	ug/L	0.087		106	70-130	2.23	30	
1,2,3-Trichloropropane	**0.0661**	0.020	ug/L	0.060		110	70-130	0.817	30	
sec-Butylbenzene	**0.0525**	0.020	ug/L	0.055		95.6	70-130	7.65	30	
Isopropylbenzene	**0.0504**	0.020	ug/L	0.049		102	70-130	2.97	30	
n-Propylbenzene	**0.0509**	0.020	ug/L	0.049		104	70-130	1.63	30	
4-Isopropyltoluene	**0.0518**	0.020	ug/L	0.055		94.3	70-130	9.59	30	
Surrogate: 4-Bromofluorobenzene	*0.146*		*ug/L*	*0.14*		*102*	*70-130*			
Duplicate (B6F0646-DUP1)			**Source: 6F01022-19**	Prepared & Analyzed: 05/26/16						
Acetone	**<0.020**	0.020	ug/L		<0.020				30	
Allyl chloride	**<0.020**	0.020	ug/L		<0.020				30	
tert-Amyl Methyl Ether (TAME)	**<0.020**	0.020	ug/L		<0.020				30	
Benzene	**<0.020**	0.020	ug/L		<0.020				30	
Benzyl chloride	**<0.020**	0.020	ug/L		<0.020				30	
Bromodichloromethane	**<0.020**	0.020	ug/L		<0.020				30	
Bromoform	**<0.020**	0.020	ug/L		<0.020				30	
Bromomethane	**<0.020**	0.020	ug/L		<0.020				30	
1,3-Butadiene	**<0.020**	0.020	ug/L		<0.020				30	
2-Butanone (MEK)	**<0.020**	0.020	ug/L		<0.020				30	
tert-Butyl alcohol (TBA)	**<20**	20	ug/L		<20				30	
Carbon Disulfide	**<0.020**	0.020	ug/L		<0.020				30	
Carbon Tetrachloride	**<0.020**	0.020	ug/L		<0.020				30	
Chlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
Chloroethane	**<0.020**	0.020	ug/L		<0.020				30	
Chloroform	**<0.020**	0.020	ug/L		<0.020				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0646 - *** DEFAULT PREP ****										
Duplicate (B6F0646-DUP1) Continued	**Source: 6F01022-19**		Prepared & Analyzed: 05/26/16							
Chloromethane	**<0.020**	0.020	ug/L		<0.020				30	
Cyclohexane	**<0.020**	0.020	ug/L		<0.020				30	
Dibromochloromethane	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dibromoethane (EDB)	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
1,3-Dichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
1,4-Dichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
Dichlorodifluoromethane (R12)	**<0.020**	0.020	ug/L		<0.020				30	
1,1-Dichloroethane	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dichloroethane (EDC)	**<0.020**	0.020	ug/L		<0.020				30	
cis-1,2-Dichloroethylene	**<0.020**	0.020	ug/L		<0.020				30	
1,1-Dichloroethylene	**<0.020**	0.020	ug/L		<0.020				30	
trans-1,2-Dichloroethylene	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dichloropropane	**<0.020**	0.020	ug/L		<0.020				30	
trans-1,3-Dichloropropylene	**<0.020**	0.020	ug/L		<0.020				30	
cis-1,3-Dichloropropylene	**<0.020**	0.020	ug/L		<0.020				30	
Dichlorotetrafluoroethane	**<0.020**	0.020	ug/L		<0.020				30	
Diisopropyl ether (DIPE)	**<0.020**	0.020	ug/L		<0.020				30	
1,4-Dioxane	**<0.020**	0.020	ug/L		<0.020				30	
Ethanol	**<0.020**	0.020	ug/L		<0.020				30	
Ethyl Acetate	**<0.020**	0.020	ug/L		<0.020				30	
Ethylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
Ethyl-tert-Butyl Ether (ETBE)	**<0.020**	0.020	ug/L		<0.020				30	
4-Ethyltoluene	**<0.020**	0.020	ug/L		<0.020				30	
Heptane	**<0.020**	0.020	ug/L		<0.020				30	
Hexachlorobutadiene	**<0.020**	0.020	ug/L		<0.020				30	
n-Hexane	**<0.020**	0.020	ug/L		<0.020				30	
2-Hexanone (MBK)	**<0.020**	0.020	ug/L		<0.020				30	
Isopropanol (IPA)	**<0.20**	0.20	ug/L		<0.20				30	
Methyl-tert-Butyl Ether (MTBE)	**<0.020**	0.020	ug/L		<0.020				30	
Methylene Chloride	**<0.020**	0.020	ug/L		<0.020				30	
4-Methyl-2-pentanone (MIBK)	**<0.020**	0.020	ug/L		<0.020				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0646 - *** DEFAULT PREP ****										
Duplicate (B6F0646-DUP1) Continued	**Source: 6F01022-19**				Prepared & Analyzed: 05/26/16					
Naphthalene	**<0.020**	0.020	ug/L		<0.020				30	
Propylene	**<0.020**	0.020	ug/L		<0.020				30	
Styrene	**<0.020**	0.020	ug/L		<0.020				30	
1,1,2,2-Tetrachloroethane	**<0.020**	0.020	ug/L		<0.020				30	
Tetrachloroethylene (PCE)	**<0.020**	0.020	ug/L		<0.020				30	
Tetrahydrofuran (THF)	**<0.020**	0.020	ug/L		<0.020				30	
Toluene	**<0.020**	0.020	ug/L		<0.020				30	
1,2,4-Trichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
1,1,2-Trichloroethane	**<0.020**	0.020	ug/L		<0.020				30	
1,1,1-Trichloroethane	**<0.020**	0.020	ug/L		<0.020				30	
Trichloroethylene (TCE)	**<0.020**	0.020	ug/L		<0.020				30	
Trichlorofluoromethane (R11)	**<0.020**	0.020	ug/L		<0.020				30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**<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	
2,2,4-Trimethylpentane	**<0.020**	0.020	ug/L		<0.020				30	
Vinyl acetate	**<0.020**	0.020	ug/L		<0.020				30	
Vinyl bromide	**<0.020**	0.020	ug/L		<0.020				30	
Vinyl chloride	**<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	
1,1,1,2-Tetrachloroethane	**<0.020**	0.020	ug/L		<0.020				30	
1,2,3-Trichloropropane	**<0.020**	0.020	ug/L		<0.020				30	
sec-Butylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
Isopropylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
n-Propylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
4-Isopropyltoluene	**<0.020**	0.020	ug/L		<0.020				30	
n-Butylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
Surrogate: 4-Bromofluorobenzene	*0.144*		*ug/L*	*0.14*		*100*	*70-130*			
*Batch B6F0647 - *** DEFAULT PREP ****										

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0647 - *** DEFAULT PREP ****										
Blank (B6F0647-BLK1)				Prepared & Analyzed: 05/27/16						
Acetone	<0.020	0.020	ug/L							
Allyl chloride	<0.020	0.020	ug/L							
tert-Amyl Methyl Ether (TAME)	<0.020	0.020	ug/L							
Benzene	<0.020	0.020	ug/L							
Benzyl chloride	<0.020	0.020	ug/L							
Bromodichloromethane	<0.020	0.020	ug/L							
Bromoform	<0.020	0.020	ug/L							
Bromomethane	<0.020	0.020	ug/L							
1,3-Butadiene	<0.020	0.020	ug/L							
2-Butanone (MEK)	<0.020	0.020	ug/L							
tert-Butyl alcohol (TBA)	<20	20	ug/L							
Carbon Disulfide	<0.020	0.020	ug/L							
Carbon Tetrachloride	<0.020	0.020	ug/L							
Chlorobenzene	<0.020	0.020	ug/L							
Chloroethane	<0.020	0.020	ug/L							
Chloroform	<0.020	0.020	ug/L							
Chloromethane	<0.020	0.020	ug/L							
Cyclohexane	<0.020	0.020	ug/L							
Dibromochloromethane	<0.020	0.020	ug/L							
1,2-Dibromoethane (EDB)	<0.020	0.020	ug/L							
1,2-Dichlorobenzene	<0.020	0.020	ug/L							
1,3-Dichlorobenzene	<0.020	0.020	ug/L							
1,4-Dichlorobenzene	<0.020	0.020	ug/L							
Dichlorodifluoromethane (R12)	<0.020	0.020	ug/L							
1,1-Dichloroethane	<0.020	0.020	ug/L							
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L							
cis-1,2-Dichloroethylene	<0.020	0.020	ug/L							
1,1-Dichloroethylene	<0.020	0.020	ug/L							
trans-1,2-Dichloroethylene	<0.020	0.020	ug/L							
1,2-Dichloropropane	<0.020	0.020	ug/L							
trans-1,3-Dichloropropylene	<0.020	0.020	ug/L							
cis-1,3-Dichloropropylene	<0.020	0.020	ug/L							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0647 - *** DEFAULT PREP ****										
Blank (B6F0647-BLK1) Continued				Prepared & Analyzed: 05/27/16						
Dichlorotetrafluoroethane	<0.020	0.020	ug/L							
Diisopropyl ether (DIPE)	<0.020	0.020	ug/L							
1,4-Dioxane	<0.020	0.020	ug/L							
Ethanol	<0.020	0.020	ug/L							
Ethyl Acetate	<0.020	0.020	ug/L							
Ethylbenzene	<0.020	0.020	ug/L							
Ethyl-tert-Butyl Ether (ETBE)	<0.020	0.020	ug/L							
4-Ethyltoluene	<0.020	0.020	ug/L							
Heptane	<0.020	0.020	ug/L							
Hexachlorobutadiene	<0.020	0.020	ug/L							
n-Hexane	<0.020	0.020	ug/L							
2-Hexanone (MBK)	<0.020	0.020	ug/L							
Isopropanol (IPA)	<0.20	0.20	ug/L							
Methyl-tert-Butyl Ether (MTBE)	<0.020	0.020	ug/L							
Methylene Chloride	<0.020	0.020	ug/L							
4-Methyl-2-pentanone (MIBK)	<0.020	0.020	ug/L							
Naphthalene	<0.020	0.020	ug/L							
Propylene	<0.020	0.020	ug/L							
Styrene	<0.020	0.020	ug/L							
1,1,2,2-Tetrachloroethane	<0.020	0.020	ug/L							
Tetrachloroethylene (PCE)	<0.020	0.020	ug/L							
Tetrahydrofuran (THF)	<0.020	0.020	ug/L							
Toluene	<0.020	0.020	ug/L							
1,2,4-Trichlorobenzene	<0.020	0.020	ug/L							
1,1,2-Trichloroethane	<0.020	0.020	ug/L							
1,1,1-Trichloroethane	<0.020	0.020	ug/L							
Trichloroethylene (TCE)	<0.020	0.020	ug/L							
Trichlorofluoromethane (R11)	<0.020	0.020	ug/L							
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<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							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0647 - *** DEFAULT PREP ****										
Blank (B6F0647-BLK1) Continued				Prepared & Analyzed: 05/27/16						
2,2,4-Trimethylpentane	<0.020	0.020	ug/L							
Vinyl acetate	<0.020	0.020	ug/L							
Vinyl bromide	<0.020	0.020	ug/L							
Vinyl chloride	<0.020	0.020	ug/L							
o-Xylene	<0.020	0.020	ug/L							
m,p-Xylenes	<0.020	0.020	ug/L							
1,1,1,2-Tetrachloroethane	<0.020	0.020	ug/L							
1,2,3-Trichloropropane	<0.020	0.020	ug/L							
sec-Butylbenzene	<0.020	0.020	ug/L							
Isopropylbenzene	<0.020	0.020	ug/L							
n-Propylbenzene	<0.020	0.020	ug/L							
4-Isopropyltoluene	<0.020	0.020	ug/L							
n-Butylbenzene	<0.020	0.020	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.147*		*ug/L*	*0.14*		*103*	*70-130*			
LCS (B6F0647-BS1)				Prepared & Analyzed: 05/27/16						
Acetone	**0.0271**	0.020	ug/L	0.024		114	70-130		30	
Benzene	**0.0311**	0.020	ug/L	0.032		97.5	70-130		30	
Benzyl chloride	**0.0464**	0.020	ug/L	0.052		89.7	70-130		30	
Bromodichloromethane	**0.0808**	0.020	ug/L	0.067		121	70-130		30	
Bromoform	**0.115**	0.020	ug/L	0.10		112	70-130		30	
Bromomethane	**0.0509**	0.020	ug/L	0.039		131	70-130		30	**
2-Butanone (MEK)	**0.0217**	0.020	ug/L	0.029		73.6	70-130		30	
Carbon Disulfide	**0.0403**	0.020	ug/L	0.031		130	70-130		30	
Carbon Tetrachloride	**0.0801**	0.020	ug/L	0.063		127	70-130		30	
Chlorobenzene	**0.0468**	0.020	ug/L	0.046		102	70-130		30	
Chloroethane	**0.0348**	0.020	ug/L	0.026		132	70-130		30	**
Chloroform	**0.0575**	0.020	ug/L	0.049		118	70-130		30	
Chloromethane	**0.0291**	0.020	ug/L	0.021		141	70-130		30	**
Dibromochloromethane	**0.0888**	0.020	ug/L	0.085		104	70-130		30	
1,2-Dibromoethane (EDB)	**0.0731**	0.020	ug/L	0.077		95.1	70-130		30	
1,2-Dichlorobenzene	**0.0482**	0.020	ug/L	0.060		80.2	70-130		30	

Allen Aminian
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LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0647 - *** DEFAULT PREP ****										
LCS (B6F0647-BS1) Continued				Prepared & Analyzed: 05/27/16						
1,3-Dichlorobenzene	**0.0516**	0.020	ug/L	0.060		85.8	70-130		30	
1,4-Dichlorobenzene	**0.0506**	0.020	ug/L	0.060		84.1	70-130		30	
Dichlorodifluoromethane (R12)	**0.0676**	0.020	ug/L	0.049		137	70-130		30	**
1,1-Dichloroethane	**0.0506**	0.020	ug/L	0.040		125	70-130		30	
1,2-Dichloroethane (EDC)	**0.0461**	0.020	ug/L	0.040		114	70-130		30	
cis-1,2-Dichloroethylene	**0.0370**	0.020	ug/L	0.040		93.2	70-130		30	
1,1-Dichloroethylene	**0.0538**	0.020	ug/L	0.040		136	70-130		30	**
trans-1,2-Dichloroethylene	**0.0412**	0.020	ug/L	0.040		104	70-130		30	
1,2-Dichloropropane	**0.0499**	0.020	ug/L	0.046		108	70-130		30	
trans-1,3-Dichloropropylene	**0.0403**	0.020	ug/L	0.045		88.8	70-130		30	
cis-1,3-Dichloropropylene	**0.0419**	0.020	ug/L	0.045		92.3	70-130		30	
Dichlorotetrafluoroethane	**0.0989**	0.020	ug/L	0.070		142	70-130		30	**
Ethylbenzene	**0.0422**	0.020	ug/L	0.043		97.2	70-130		30	
4-Ethyltoluene	**0.0450**	0.020	ug/L	0.049		91.6	70-130		30	
Hexachlorobutadiene	**0.0610**	0.020	ug/L	0.11		57.2	70-130		30	***a
2-Hexanone (MBK)	**0.0328**	0.020	ug/L	0.041		80.0	70-130		30	
Isopropanol (IPA)	**0.0190**	0.20	ug/L	0.025		77.3	70-130		30	
Methylene Chloride	**0.0496**	0.020	ug/L	0.035		143	70-130		30	**
4-Methyl-2-pentanone (MIBK)	**0.0307**	0.020	ug/L	0.041		75.0	70-130		30	
Styrene	**0.0353**	0.020	ug/L	0.043		82.9	70-130		30	
1,1,2,2-Tetrachloroethane	**0.0772**	0.020	ug/L	0.069		112	70-130		30	
Tetrachloroethylene (PCE)	**0.0584**	0.020	ug/L	0.068		86.1	70-130		30	
Toluene	**0.0356**	0.020	ug/L	0.038		94.5	70-130		30	
1,2,4-Trichlorobenzene	**0.0373**	0.020	ug/L	0.074		50.3	70-130		30	***a
1,1,2-Trichloroethane	**0.0561**	0.020	ug/L	0.055		103	70-130		30	
1,1,1-Trichloroethane	**0.0620**	0.020	ug/L	0.055		114	70-130		30	
Trichloroethylene (TCE)	**0.0579**	0.020	ug/L	0.054		108	70-130		30	
Trichlorofluoromethane (R11)	**0.0794**	0.020	ug/L	0.056		141	70-130		30	**
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.109**	0.020	ug/L	0.077		142	70-130		30	**
1,3,5-Trimethylbenzene	**0.0431**	0.020	ug/L	0.049		87.6	70-130		30	
1,2,4-Trimethylbenzene	**0.0419**	0.020	ug/L	0.049		85.2	70-130		30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0647 - *** DEFAULT PREP ****										
LCS (B6F0647-BS1) Continued				Prepared & Analyzed: 05/27/16						
Vinyl acetate	**0.0358**	0.020	ug/L	0.035		102	70-130		30	
Vinyl chloride	**0.0351**	0.020	ug/L	0.026		137	70-130		30	**
o-Xylene	**0.0436**	0.020	ug/L	0.043		100	70-130		30	
m,p-Xylenes	**0.0815**	0.020	ug/L	0.087		93.9	70-130		30	
1,2,3-Trichloropropane	**0.0648**	0.020	ug/L	0.060		107	70-130		30	
sec-Butylbenzene	**0.0469**	0.020	ug/L	0.055		85.5	70-130		30	
Isopropylbenzene	**0.0457**	0.020	ug/L	0.049		93.0	70-130		30	
n-Propylbenzene	**0.0455**	0.020	ug/L	0.049		92.6	70-130		30	
4-Isopropyltoluene	**0.0450**	0.020	ug/L	0.055		81.9	70-130		30	
Surrogate: 4-Bromofluorobenzene	*0.142*		*ug/L*	*0.14*		*98.9*	*70-130*			
LCS Dup (B6F0647-BSD1)				Prepared & Analyzed: 05/27/16						
Acetone	**0.0332**	0.020	ug/L	0.024		140	70-130	20.4	30	**
Benzene	**0.0330**	0.020	ug/L	0.032		103	70-130	5.87	30	
Benzyl chloride	**0.0556**	0.020	ug/L	0.052		107	70-130	18.0	30	
Bromodichloromethane	**0.0827**	0.020	ug/L	0.067		123	70-130	2.30	30	
Bromoform	**0.118**	0.020	ug/L	0.10		114	70-130	2.22	30	
Bromomethane	**0.0509**	0.020	ug/L	0.039		131	70-130	0.00	30	**
2-Butanone (MEK)	**0.0352**	0.020	ug/L	0.029		119	70-130	47.5	30	QR-02
Carbon Disulfide	**0.0353**	0.020	ug/L	0.031		113	70-130	13.4	30	
Carbon Tetrachloride	**0.0807**	0.020	ug/L	0.063		128	70-130	0.782	30	
Chlorobenzene	**0.0476**	0.020	ug/L	0.046		103	70-130	1.76	30	
Chloroethane	**0.0349**	0.020	ug/L	0.026		132	70-130	0.303	30	**
Chloroform	**0.0591**	0.020	ug/L	0.049		121	70-130	2.76	30	
Chloromethane	**0.0266**	0.020	ug/L	0.021		129	70-130	8.97	30	
Dibromochloromethane	**0.0920**	0.020	ug/L	0.085		108	70-130	3.49	30	
1,2-Dibromoethane (EDB)	**0.0751**	0.020	ug/L	0.077		97.8	70-130	2.80	30	
1,2-Dichlorobenzene	**0.0510**	0.020	ug/L	0.060		84.8	70-130	5.58	30	
1,3-Dichlorobenzene	**0.0537**	0.020	ug/L	0.060		89.4	70-130	4.11	30	
1,4-Dichlorobenzene	**0.0525**	0.020	ug/L	0.060		87.3	70-130	3.73	30	
Dichlorodifluoromethane (R12)	**0.0662**	0.020	ug/L	0.049		134	70-130	2.07	30	**
1,1-Dichloroethane	**0.0494**	0.020	ug/L	0.040		122	70-130	2.43	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0647 - *** DEFAULT PREP ****										
LCS Dup (B6F0647-BSD1) Continued				Prepared & Analyzed: 05/27/16						
1,2-Dichloroethane (EDC)	**0.0514**	0.020	ug/L	0.040		127	70-130	10.8	30	
cis-1,2-Dichloroethylene	**0.0408**	0.020	ug/L	0.040		103	70-130	9.99	30	
1,1-Dichloroethylene	**0.0580**	0.020	ug/L	0.040		146	70-130	7.45	30	**
trans-1,2-Dichloroethylene	**0.0429**	0.020	ug/L	0.040		108	70-130	4.06	30	
1,2-Dichloropropane	**0.0503**	0.020	ug/L	0.046		109	70-130	0.738	30	
trans-1,3-Dichloropropylene	**0.0466**	0.020	ug/L	0.045		103	70-130	14.5	30	
cis-1,3-Dichloropropylene	**0.0475**	0.020	ug/L	0.045		105	70-130	12.5	30	
Dichlorotetrafluoroethane	**0.0956**	0.020	ug/L	0.070		137	70-130	3.38	30	**
Ethylbenzene	**0.0464**	0.020	ug/L	0.043		107	70-130	9.51	30	
4-Ethyltoluene	**0.0506**	0.020	ug/L	0.049		103	70-130	11.7	30	
Hexachlorobutadiene	**0.0750**	0.020	ug/L	0.11		70.3	70-130	20.5	30	
2-Hexanone (MBK)	**0.0328**	0.020	ug/L	0.041		80.0	70-130	0.00	30	
Isopropanol (IPA)	**0.0325**	0.20	ug/L	0.025		132	70-130	52.5	30	**
Methylene Chloride	**0.0502**	0.020	ug/L	0.035		144	70-130	1.18	30	**
4-Methyl-2-pentanone (MIBK)	**0.0369**	0.020	ug/L	0.041		90.0	70-130	18.2	30	
Styrene	**0.0396**	0.020	ug/L	0.043		93.0	70-130	11.5	30	
1,1,2,2-Tetrachloroethane	**0.0781**	0.020	ug/L	0.069		114	70-130	1.15	30	
Tetrachloroethylene (PCE)	**0.0610**	0.020	ug/L	0.068		89.9	70-130	4.32	30	
Toluene	**0.0369**	0.020	ug/L	0.038		97.9	70-130	3.53	30	
1,2,4-Trichlorobenzene	**0.0501**	0.020	ug/L	0.074		67.5	70-130	29.2	30	***a
1,1,2-Trichloroethane	**0.0559**	0.020	ug/L	0.055		102	70-130	0.487	30	
1,1,1-Trichloroethane	**0.0660**	0.020	ug/L	0.055		121	70-130	6.14	30	
Trichloroethylene (TCE)	**0.0594**	0.020	ug/L	0.054		111	70-130	2.56	30	
Trichlorofluoromethane (R11)	**0.0825**	0.020	ug/L	0.056		147	70-130	3.82	30	**
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0982**	0.020	ug/L	0.077		128	70-130	10.5	30	
1,3,5-Trimethylbenzene	**0.0498**	0.020	ug/L	0.049		101	70-130	14.6	30	
1,2,4-Trimethylbenzene	**0.0481**	0.020	ug/L	0.049		97.9	70-130	13.9	30	
Vinyl acetate	**0.0444**	0.020	ug/L	0.035		126	70-130	21.4	30	
Vinyl chloride	**0.0353**	0.020	ug/L	0.026		138	70-130	0.436	30	**
o-Xylene	**0.0475**	0.020	ug/L	0.043		109	70-130	8.68	30	
m,p-Xylenes	**0.0874**	0.020	ug/L	0.087		101	70-130	6.89	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0647 - *** DEFAULT PREP ****										
LCS Dup (B6F0647-BSD1) Continued				Prepared & Analyzed: 05/27/16						
1,2,3-Trichloropropane	**0.0684**	0.020	ug/L	0.060		113	70-130	5.43	30	
sec-Butylbenzene	**0.0532**	0.020	ug/L	0.055		96.9	70-130	12.5	30	
Isopropylbenzene	**0.0508**	0.020	ug/L	0.049		103	70-130	10.6	30	
n-Propylbenzene	**0.0518**	0.020	ug/L	0.049		105	70-130	12.9	30	
4-Isopropyltoluene	**0.0519**	0.020	ug/L	0.055		94.6	70-130	14.4	30	
Surrogate: 4-Bromofluorobenzene	*0.146*		*ug/L*	*0.14*		*102*	*70-130*			
Duplicate (B6F0647-DUP1)			**Source: 6F01022-37**	Prepared & Analyzed: 05/27/16						
Acetone	**<0.020**	0.020	ug/L		<0.020				30	
Allyl chloride	**<0.020**	0.020	ug/L		<0.020				30	
tert-Amyl Methyl Ether (TAME)	**<0.020**	0.020	ug/L		<0.020				30	
Benzene	**<0.020**	0.020	ug/L		<0.020				30	
Benzyl chloride	**<0.020**	0.020	ug/L		<0.020				30	
Bromodichloromethane	**<0.020**	0.020	ug/L		<0.020				30	
Bromoform	**<0.020**	0.020	ug/L		<0.020				30	
Bromomethane	**<0.020**	0.020	ug/L		<0.020				30	
1,3-Butadiene	**<0.020**	0.020	ug/L		<0.020				30	
2-Butanone (MEK)	**<0.020**	0.020	ug/L		<0.020				30	
tert-Butyl alcohol (TBA)	**<20**	20	ug/L		<20				30	
Carbon Disulfide	**<0.020**	0.020	ug/L		<0.020				30	
Carbon Tetrachloride	**<0.020**	0.020	ug/L		<0.020				30	
Chlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
Chloroethane	**<0.020**	0.020	ug/L		<0.020				30	
Chloroform	**<0.020**	0.020	ug/L		<0.020				30	
Chloromethane	**<0.020**	0.020	ug/L		<0.020				30	
Cyclohexane	**<0.020**	0.020	ug/L		<0.020				30	
Dibromochloromethane	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dibromoethane (EDB)	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
1,3-Dichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
1,4-Dichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
Dichlorodifluoromethane (R12)	**<0.020**	0.020	ug/L		<0.020				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0647 - *** DEFAULT PREP ****										
Duplicate (B6F0647-DUP1) Continued	**Source: 6F01022-37**	Prepared & Analyzed: 05/27/16								
1,1-Dichloroethane	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dichloroethane (EDC)	**<0.020**	0.020	ug/L		<0.020				30	
cis-1,2-Dichloroethylene	**<0.020**	0.020	ug/L		<0.020				30	
1,1-Dichloroethylene	**<0.020**	0.020	ug/L		<0.020				30	
trans-1,2-Dichloroethylene	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dichloropropane	**<0.020**	0.020	ug/L		<0.020				30	
trans-1,3-Dichloropropylene	**<0.020**	0.020	ug/L		<0.020				30	
cis-1,3-Dichloropropylene	**<0.020**	0.020	ug/L		<0.020				30	
Dichlorotetrafluoroethane	**<0.020**	0.020	ug/L		<0.020				30	
Diisopropyl ether (DIPE)	**<0.020**	0.020	ug/L		<0.020				30	
1,4-Dioxane	**<0.020**	0.020	ug/L		<0.020				30	
Ethanol	**<0.020**	0.020	ug/L		<0.020				30	
Ethyl Acetate	**<0.020**	0.020	ug/L		<0.020				30	
Ethylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
Ethyl-tert-Butyl Ether (ETBE)	**<0.020**	0.020	ug/L		<0.020				30	
4-Ethyltoluene	**<0.020**	0.020	ug/L		<0.020				30	
Heptane	**<0.020**	0.020	ug/L		<0.020				30	
Hexachlorobutadiene	**<0.020**	0.020	ug/L		<0.020				30	
n-Hexane	**<0.020**	0.020	ug/L		<0.020				30	
2-Hexanone (MBK)	**<0.020**	0.020	ug/L		<0.020				30	
Isopropanol (IPA)	**<0.20**	0.20	ug/L		<0.20				30	
Methyl-tert-Butyl Ether (MTBE)	**<0.020**	0.020	ug/L		<0.020				30	
Methylene Chloride	**<0.020**	0.020	ug/L		<0.020				30	
4-Methyl-2-pentanone (MIBK)	**<0.020**	0.020	ug/L		<0.020				30	
Naphthalene	**<0.020**	0.020	ug/L		<0.020				30	
Propylene	**<0.020**	0.020	ug/L		<0.020				30	
Styrene	**<0.020**	0.020	ug/L		<0.020				30	
1,1,2,2-Tetrachloroethane	**<0.020**	0.020	ug/L		<0.020				30	
Tetrachloroethylene (PCE)	**<0.020**	0.020	ug/L		<0.020				30	
Tetrahydrofuran (THF)	**<0.020**	0.020	ug/L		<0.020				30	
Toluene	**0.0413**	0.020	ug/L		0.0410			0.733	30	
1,2,4-Trichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6F0647 - *** DEFAULT PREP ****										
Duplicate (B6F0647-DUP1) Continued	**Source: 6F01022-37**		Prepared & Analyzed: 05/27/16							
1,1,2-Trichloroethane	**<0.020**	0.020	ug/L		<0.020				30	
1,1,1-Trichloroethane	**<0.020**	0.020	ug/L		<0.020				30	
Trichloroethylene (TCE)	**<0.020**	0.020	ug/L		<0.020				30	
Trichlorofluoromethane (R11)	**<0.020**	0.020	ug/L		<0.020				30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**<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	
2,2,4-Trimethylpentane	**<0.020**	0.020	ug/L		<0.020				30	
Vinyl acetate	**<0.020**	0.020	ug/L		<0.020				30	
Vinyl bromide	**<0.020**	0.020	ug/L		<0.020				30	
Vinyl chloride	**<0.020**	0.020	ug/L		<0.020				30	
o-Xylene	**0.0376**	0.020	ug/L		0.0373			1.04	30	
m,p-Xylenes	**0.0854**	0.020	ug/L		0.0833			2.47	30	
1,1,1,2-Tetrachloroethane	**<0.020**	0.020	ug/L		<0.020				30	
1,2,3-Trichloropropane	**<0.020**	0.020	ug/L		<0.020				30	
sec-Butylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
Isopropylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
n-Propylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
4-Isopropyltoluene	**<0.020**	0.020	ug/L		<0.020				30	
n-Butylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
Surrogate: 4-Bromofluorobenzene	*0.138*		*ug/L*	*0.14*		*96.7*	*70-130*			
Fixed Gases by TCD - Quality Control										
*Batch B6F0641 - *** DEFAULT PREP ****										
Blank (B6F0641-BLK1)			Prepared & Analyzed: 05/25/16							
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
*Batch B6F0641 - *** DEFAULT PREP ****										
LCS (B6F0641-BS1)				Prepared & Analyzed: 05/25/16						
Methane	**4.31**	0.10	% by Volume	4.5		95.8	75-125			
Oxygen	**3.90**	0.10	% by Volume	4.0		97.5	75-125			
Carbon Dioxide	**12.7**	0.10	% by Volume	15		84.9	75-125			
LCS Dup (B6F0641-BSD1)				Prepared & Analyzed: 05/25/16						
Methane	**4.61**	0.10	% by Volume	4.5		102	75-125	6.73	30	
Oxygen	**3.84**	0.10	% by Volume	4.0		96.0	75-125	1.50	30	
Carbon Dioxide	**13.5**	0.10	% by Volume	15		90.0	75-125	5.87	30	
Duplicate (B6F0641-DUP1)				**Source: 6F01022-11**	Prepared & Analyzed: 05/25/16					
Methane	**<0.10**	0.10	% by Volume		<0.10				30	
Oxygen	**17.6**	0.10	% by Volume		18.2			3.18	30	
Carbon Dioxide	**0.269**	0.10	% by Volume		0.242			10.6	30	
*Batch B6F0642 - *** DEFAULT PREP ****										
Blank (B6F0642-BLK1)				Prepared & Analyzed: 05/26/16						
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B6F0642-BS1)				Prepared & Analyzed: 05/26/16						
Methane	**4.60**	0.10	% by Volume	4.5		102	75-125			

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
*Batch B6F0642 - *** DEFAULT PREP ****										
LCS (B6F0642-BS1) Continued				Prepared & Analyzed: 05/26/16						
Oxygen	**3.75**	0.10	% by Volume	4.0		93.8	75-125			
Carbon Dioxide	**13.6**	0.10	% by Volume	15		90.9	75-125			
LCS Dup (B6F0642-BSD1)				Prepared & Analyzed: 05/26/16						
Methane	**4.51**	0.10	% by Volume	4.5		100	75-125	2.02	30	
Oxygen	**3.90**	0.10	% by Volume	4.0		97.5	75-125	3.84	30	
Carbon Dioxide	**13.8**	0.10	% by Volume	15		91.8	75-125	0.927	30	
Duplicate (B6F0642-DUP1)			**Source: 6F01022-19**	Prepared & Analyzed: 05/26/16						
Methane	**<0.10**	0.10	% by Volume		<0.10				30	
Oxygen	**18.8**	0.10	% by Volume		18.6			0.696	30	
Carbon Dioxide	**<0.10**	0.10	% by Volume		<0.10				30	
*Batch B6F0643 - *** DEFAULT PREP ****										
Blank (B6F0643-BLK1)				Prepared & Analyzed: 05/27/16						
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B6F0643-BS1)				Prepared & Analyzed: 05/27/16						
Methane	**4.48**	0.10	% by Volume	4.5		99.5	75-125			
Oxygen	**4.05**	0.10	% by Volume	4.0		101	75-125			

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

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

AA Project No: MB187310
Date Received: 06/01/16
Date Reported: 06/07/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
*Batch B6F0643 - *** DEFAULT PREP ****										
LCS (B6F0643-BS1) Continued				Prepared & Analyzed: 05/27/16						
Carbon Dioxide	**13.0**	0.10	% by Volume	15		86.5	75-125			
LCS Dup (B6F0643-BSD1)				Prepared & Analyzed: 05/27/16						
Methane	**4.61**	0.10	% by Volume	4.5		102	75-125	2.84	30	
Oxygen	**3.71**	0.10	% by Volume	4.0		92.6	75-125	8.82	30	
Carbon Dioxide	**13.4**	0.10	% by Volume	15		89.3	75-125	3.14	30	
Duplicate (B6F0643-DUP1)		**Source: 6F01022-37**		Prepared & Analyzed: 05/27/16						
Methane	**<0.10**	0.10	% by Volume		<0.10				30	
Oxygen	**17.6**	0.10	% by Volume		17.1			3.01	30	
Carbon Dioxide	**0.893**	0.10	% by Volume		0.872			2.38	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187310
Project No:	496965.A1.01	**Date Received:**	06/01/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	06/07/16

Special Notes

[1] = ****** : Analyte recovery exceeds the upper control limit.

[2] = ******* : Analyte recovery exceeds lower control limit.

[3] = *****a** : Analyte recovery exceeds the lower control limit.

[4] = **QR-02** : The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.

Allen Aminian
QA/QC 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.: 125205

70046100

Client: CH2M HILL | Project Name / No.: KINDER MORGAN NORWALK | Sampler's Name: WILLIAM SCHOONOVER

Project Manager: | Site Address: 15306 NORWALK BLVD | Sampler's 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)

Please enter the TAT Turnaround Codes ** below

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	TO15	TO3	FIXED GASES								Special Instructions
SVM-16-22	6F01022-01	5-25-16	0758	V	2	X	X	X								
SVM-16-7	02		0800	V	2	X	X	X								
SVM-16-16	03		0813	V	2	X	X	X								
SVM-8-15	04		0843	V	2	X	X	X								
SVM-8-5	05		0857	V	2	X	X	X								
AMBIENT AIR	06		0920	V	1	X	X	X								
SVM-5-15	07		0921	V	2	X	X	X								
SVM-5-5	08		0945	V	2	X	X	X								
SVM-3-15	09		1027	V	2	X	X	X								
SVM-3-5	10		1044	V	2	X	X	X								
SVM-7-7	11		1235	V	2	X	X	X								
SVM-7-7 DUP	12		1235	V	2	X	X	X								
SVM-7-13	13	↓	1255	V	2	X	X	X								

For Laboratory Use

REVIEWED

Date 6/1/16 Time 1610

TAT 5 Days Sign:

A.A. Project No.: MB187310 / 6F01022

Relinquished by	Date	Time	Received by
	5-25-16	1305	
	6/1/16	15:55	

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.

AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

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

A.A. COC No.: 125206

70046121

Page 1 of 1

Client: CH2MHILL | Project Name / No.: KINDER MORGAN NORWALK | Sampler's Name: WILLIAM SOMMERVILLE

Project Manager: | Site Address: 15306 NORWALK BLVD | Sampler's 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)

Please enter the TAT Turnaround Codes ** below

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	8015	8021	FIXED GASES								Special Instructions
SVM-1-15	14	5-26-16	0800	V	2	X	X	X								
SVM-1-5	15		0814	V	2	X	X	X								
SVM-2-5	16		0839	V	2	X	X	X								
SVM-15-7	17		0925	V	2	X	X	X								
SVM-15-22	18		0928	V	2	X	X	X								
SVM-15-5	19		0950	V	2	X	X	X								
SVM-15-15 DUP	20		0950	V	2	X	X	X								
SVM-6-7	21		1024	V	2	X	X	X								
SVM-6-16	22		1024	V	2	X	X	X								
SVM-10-15	23		1043	V	2	X	X	X								
SVM-11-7	24		1230	V	2	X	X	X								
SVM-11-22	25		1232	V	2	X	X	X								
SVM-11-15	26		1251	V	2	X	X	X								
AMBIENT AIR	27		1304	V	1	X	X									

For Laboratory Use

REVIEWED

Date 6/1/16 Time 16:00

TAT 5 Days Sign:

A.A. Project No.: MB107310/6F01022

	Date	Time	
Relinquished by	5-26-16	1310	Received by
Relinquished by	6/1/16	15:55	Received by
Relinquished by	Date	Time	Received by

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.

AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

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

A.A. COC No.: 125207

70046120 Page 1 of 1

Client: CH2M HILL | Project Name / No.: KINDER MORGAN NORWALK | Sampler's Name: William Schoonmaker

Project Manager: | Site Address: 15306 NORWALK BLVD | Sampler's 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)

Please enter the TAT Turnaround Codes ** below

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	TO15	TO3	FIXED GASES	Special Instructions
SVM-12-7	28	5-27-16	0749	V	2	X	X	X	
SVM-12-22	29		0751	V	2	X	X	X	
SVM-12-15	30		0803	V	2	X	X	X	
AMBIENT AIR	31		0803	V	1	X	X		
SVM-13-7	32		0850	V	2	X	X	X	
SVM-13-22	33		0856	V	2	X	X	X	
SVM-13-15	34		0853	V	2	X	X	X	
SVM-14-22	35		1004	V	2	X	X	X	
SVM-14-7	36		1011	V	2	X	X	X	
SVM-14-15	37		1020	V	2	X	X	X	
SVM-14-15 DUP	38		1020	V	2	X	X	X	

For Laboratory Use

REVIEWED
Date 6/1/16 Time 16:00
TAT 5 Days Sign:

A.A. Project No.: MB187310 / 6F01022

Relinquished by	Date	Time	Received by
	5-27-16	1040	
	6/1/16	1555	

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 not listed on this chain.