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Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
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November 15, 2016

Subject: Results of August 2016 Soil Vapor Monitoring at the SFPP Norwalk Pump Station, Norwalk, California

Dear Mr. Cho,

This letter report presents the results of the soil vapor monitoring conducted in August 2016 at the SFPP Norwalk Pump Station, located at 15306 Norwalk Boulevard, Norwalk, California (the site; Figure 1). The soil vapor monitoring was performed by CH2M HILL Engineers, Inc. (CH2M), on behalf of SFPP, L.P. (SFPP), as part of the pilot testing program of SFPP's horizontal biosparge system located in the south-central area of the site. Soil vapor monitoring also included probe SVM-9 located in the southeastern area to satisfy the Los Angeles Regional Water Quality Control Board (RWQCB) requirement to monitor this area on an annual basis. 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.

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, April, May, and June 2016, were previously submitted to the RWQCB. 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 were obtained from sampling onsite and offsite soil vapor monitoring probes on August 29, 30, and 31, 2016. A mobile laboratory was used for onsite analysis of soil vapor samples. During sampling activities, the biosparge system was operating at flow rates ranging between 110 and 360 standard cubic feet per minute (scfm) and the SVE system was in full operation.

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 and SVM-5 through SVM-16). Probes SVM-11 through SVM-14 are located onsite; SVM-1 through SVM-3, SVM-5 through SVM-8, and SVM-10 are located in the south-central offsite area; SVM-9 is located in the southeastern offsite area in Holifield Park. 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 VOC measurements from the soil vapor probe network in the south-central area 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 their mobile laboratory under the direction of CH2M. Sampling was conducted from August 29 to 31, 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* (the Advisory), dated July 2015 (DTSC, 2015). The analytical results were evaluated by comparing the results to soil gas screening levels based on the most current DTSC guidance (*Human Health Risk Assessment [HHRA] Note 3*; DTSC, 2016). The soil gas screening levels are calculated from indoor air screening levels published by 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 and SVM-5 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.

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 samples were collected at a minimum frequency of 1 per every 20 primary samples collected. Duplicate soil vapor samples were collected at SVM-6 (16-foot depth), SVM-11 (22-foot depth), and SVM-16 (22-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 VOC measurements (using a PID) and vacuum measurements collected from the south-central area soil vapor monitoring network during the August 2016 event. The biosparge system flow rate during soil vapor monitoring ranged between 110 and 360 scfm; the SVE system was operational during monitoring. The following observations were made.

Offsite Probes

- Shallow, middle, and deep probe depths in all offsite soil vapor probes had VOC measurements of 0.0 parts per million by volume (ppmv).
- Vacuum (pressure) measurements in offsite probes ranged from 0 inches of water (in. H_2O) to negative 5.4 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

- All onsite soil vapor probes had VOC measurements of 0.0 ppmv, with the exception of the deepest probe (21-foot depth) of SVM-11 and the deepest probe (22-foot depth) of SVM-14. The respective VOC concentrations at these deep probes were 27.4 ppmv and >15,000 ppmv. 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 16.1 in. H_2O in the deepest probe (22.5-foot depth) of SVM-13 to positive 41.6 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 August 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, SVM-6, SVM-8, SVM-9, SVM-10, SVM-15, and SVM-16.
- Non-COPCs bromodichloromethane (0.02 micrograms per liter [μg/L]) and chloroform (0.067 μg/L) were detected in the shallow probe (5-foot depth) of SVM-3; bromodichloromethane (0.097 μg/L)

was also detected in the deep probe (15-foot depth) of SVM-3. These detections were just above the laboratory reporting limits and below screening levels under residential and commercial scenarios. TPH-g and remaining VOCs were nondetect at both depths of SVM-3.

- In the shallow probe (7-foot depth) of SVM-7, m,p-xylenes and toluene were detected at concentrations of 0.032 μg/L and 0.047 μg/L, respectively; these concentrations are below screening levels under residential and commercial scenarios. Non-COPC ethanol was detected at a concentration of 0.085 μg/L. There are no established screening levels for ethanol. TPH-g and remaining VOCs were nondetect in the 7-foot depth of SVM-3. VOCs and TPH-g were nondetect in the deep probe (13-foot depth) of SVM-7.

Onsite Probes

- VOCs and TPH-g were nondetect in onsite probes SVM-12 and SVM-13.
- VOCs and TPH-g were nondetect in the shallow probe (7-foot depth) and middle probe (15-foot depth) of SVM-11. In the deepest probe (22-foot depth), non-COPC tetrachloroethene (PCE) was detected in the primary and field duplicate samples at a concentration of 0.11 μg/L. This concentration is below screening levels under residential and commercial scenarios. TPH-g and remaining VOCs were nondetect in the 22-foot depth of SVM-11.
- 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 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. Two VOCs (1,2,4-trimethylbenzene and 1,3,5-trimethylbezene) and TPH-g were detected in the deep probe (22-foot depth) of SVM-14. Of these, 1,2,4-trimethylbenzene (10 μg/L) was detected at a concentration above the residential screening level of 7.3 μg/L, but below the commercial screening level of 31 μg/L. 1,3,5-Trimethylbenzene and TPH-g were detected at concentrations of 23 μg/L and 260 μg/L, respectively. There are no established screening levels for 1,3,5-trimethylbeznene.

Summary and Recommendations

Soil vapor monitoring was conducted in the south-central and southeastern area of the SFPP Norwalk Pump Station during biosparging operations in August 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 VOC 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 and SVM-5 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), but were monitored in August 2016 as part of the RWQCB's requirement to monitor this area of the site annually.

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-7. Non-COPCs bromodichloromethane and chloroform were detected in the shallow probe (5-foot depth) of SVM-3; bromodichloromethane was also detected in the deep probe (15-foot depth) of SVM-3. VOC detections in SVM-3 were below screening levels under residential and commercial scenarios. In the shallow probe (7-foot depth) of SVM-7, m,p-xylenes and toluene were detected but at concentrations below screening levels under residential and commercial scenarios. Non-COPC ethanol was also detected in the shallow probe of SVM-7. There are no established screening levels for ethanol.
- In the onsite area, VOCs and TPH-g were nondetect in SVM-12 and SVM-13. In the deepest probe (22-foot depth) of SVM-11, non COPC PCE was detected at a concentration below screening levels under residential and commercial scenarios. Three VOCs (m,p-xylenes, o-xylene, and toluene) were detected in the middle probe (15-foot depth) of SVM-14; two VOCs (1,2,4-trimethlybenzene and 1,3,5-trimethylbenzene) were detected in the deepest probe (22-foot depth) of SVM-14. All detected VOCs in SVM-14 were below residential and commercial screening levels with the exception that the 1,2,4-trimethybenzene detection in the deepest probe was above the residential screening level but below the commercial screening level. Elevated VOC concentrations in the deepest probe 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 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.

SFPP will resume soil vapor monitoring using the mobile laboratory on a quarterly basis as indicated in the approved work plan (CH2M, 2013). The next scheduled soil vapor monitoring event will be conducted in December 2016. 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 – August 2016
Table 2 – Mobile Laboratory Soil Vapor Analytical Results – August 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:

- Steve Defibaugh, Kinder Morgan Energy Partners, L.P.
- Carol Devier-Heeney, Defense Logistics Agency Energy (electronic only)
- Eugene N. Garcia, Ph.D.
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References

CH2M HILL (CH2M). 2013. *Horizontal Biosparge System Construction and Pilot Test Work Plan, SFPP Norwalk Pump Station, 15306 Norwalk Boulevard, Norwalk, California.* November 18.

CH2M HILL (CH2M). 2015. *Horizontal Biosparge Well and Soil Vapor Monitoring Probe Completion Report SFPP Norwalk Pump Station, 15306 Norwalk Boulevard, Norwalk, California*. February 18.

Department of Toxic Substances Control (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

Department of Toxic Substances Control (DTSC). 2015. *Advisory for Active Soil Gas Investigations.* July.

Department of Toxic Substances Control (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

Geomatrix. 2006. *Vapor Intrusion Sampling and Human Health Risk Assessment, DFSP Norwalk Facility, Norwalk, California*. December.

Tables

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

SFPP Norwalk Pump Station, Norwalk, California

			Date		8/29/16 to 8/31/16	
			SVE System		On	
			BS System		On	
			BS Flow Rate (scfm)		110-360	
			Screen Interval (feet bgs)		VOCs[1]	Vacuum
Probe	Location	Zone	From	To	(ppmv)	(in. H_2O)
SVM-1	Offsite	Shallow	5	5.5	0	-0.5
SVM-1	Offsite	Deep	14.5	15	0	-1.8
SVM-2	Offsite	Shallow	5	5.5	0	-0.5
SVM-2	Offsite	Deep	14.5	15	--	--
SVM-3	Offsite	Shallow	5	5.5	0	0
SVM-3	Offsite	Deep	15	15.5	0	-0.7
SVM-5	Offsite	Shallow	5	5.5	0	-0.7
SVM-5	Offsite	Deep	15.5	16	0	-4.4
SVM-6	Offsite	Shallow	6.5	7	0	-0.5
SVM-6	Offsite	Deep	15.5	16	0	-4
SVM-7	Offsite	Shallow	7	7.5	0	0
SVM-7	Offsite	Deep	13.25	13.75	0	-0.8
SVM-8	Offsite	Shallow	5	5.5	0	-0.5
SVM-8	Offsite	Deep	15	15.5	0	-1.7
SVM-9	Offsite	Shallow	5	5.5	0	0
SVM-9	Offsite	Deep	14.5	15	0	0
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	-0.5
SVM-11	Onsite	Deep	21	21.5	27.4	-0.6
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	-1.5
SVM-13	Onsite	Middle	15.5	16	0	-12.8
SVM-13	Onsite	Deep	22.5	23	0	-16.1
SVM-14	Onsite	Shallow	7	7.5	0	0
SVM-14	Onsite	Middle	15	15.5	0	1
SVM-14	Onsite	Deep	22	22.5	>15000	41.6
SVM-15	Offsite	Shallow	7	7.5	0	-0.5
SVM-15	Offsite	Middle	15	15.5	0	-0.5
SVM-15	Offsite	Deep	22	22.5	0	-5.4
SVM-16	Offsite	Shallow	7	7.5	0	0
SVM-16	Offsite	Middle	15.5	16	0	-1.2
SVM-16	Offsite	Deep	22	22.5	0	-1.6

Notes:

[1] MiniRae 3000 calibrated to 50 ppm hexane

-- data not available

bgs - below ground surface

BS - biosparge

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 - August 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 8/29/2016 SVM-1 5-5.5	SVM-1-15 8/29/2016 SVM-1 15-15.5	SVM-2-5 8/29/2016 SVM-2 5-5.5	SVM-3-5 8/30/2016 SVM-3 5-5.5	SVM-3-15 8/30/2016 SVM-3 15-15.5	SVM-5-5 8/30/2016 SVM-5 5-5.5	SVM-5-15 8/30/2016 SVM-5 15-15.5	SVM-6-7 8/29/2016 SVM-6 7-7.5	SVM-6-16 8/29/2016 SVM-6 16-16.5	SVM-6-16 DUP 8/29/2016 SVM-6 16-16.5	SVM-7-7 8/29/2016 SVM-7 7-7.5	SVM-7-13 8/29/2016 SVM-7 13-13.5
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
	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
	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
	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
	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
	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
	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
	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	**0.032**	<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
	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
	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
	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
	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
	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
	tert-Butanol (TBA)	µg/L	---	---	<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	**0.047**	<0.02
Other Detected Compounds	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
	Chloroform	µg/L	0.12	0.53	<0.02	<0.02	<0.02	**0.067**	**0.097**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Ethanol	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.085**	<0.02
	Tetrachloroethylene (PCE)	µg/L	0.48	2.1	<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
Fixed Gases	Methane	% v/v	---	---	<0.1	<0.1	<0.1	**0.11**	**0.15**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Oxygen	% v/v	---	---	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**18**
	Carbon Dioxide	% v/v	---	---	<0.1	<0.1	**0.16**	**0.22**	**0.26**	<0.1	<0.1	**0.12**	<0.1	<0.1	**0.31**	**0.43**

Table 2. Mobile Laboratory Soil Vapor Analytical Results - August 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-8-5 8/30/2016 SVM-8 5-5.5	SVM-8-15 8/30/2016 SVM-8 15-15.5	SVM-9-5 8/29/2016 SVM-9 5-5.5	SVM-9-15 8/29/2016 SVM-9 15-15.5	SVM-10-15 8/29/2016 SVM-10 15-15.5	SVM-11-7 8/31/2016 SVM-11 7-7.5	SVM-11-15 8/31/2016 SVM-11 15-15.5	SVM-11-22 8/31/2016 SVM-11 22-22.5	SVM-11-22 DUP 8/31/2016 SVM-11 22-22.5	SVM-12-7 8/31/2016 SVM-12 7-7.5	SVM-12-15 8/31/2016 SVM-12 15-15.5	SVM-12-22 8/31/2016 SVM-12 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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	tert-Butanol (TBA)	µg/L	---	---	<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
Other Detected Compounds	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
	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
	Ethanol	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
	Tetrachloroethylene (PCE)	µg/L	0.48	2.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.11**	**0.11**	<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
Fixed Gases	Methane	% v/v	---	---	<0.1	<0.1	**0.18**	**0.14**	<0.1	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Oxygen	% v/v	---	---	**18**	**18**	**19**	**17**	**17**	**18**	**18**	**1.6**	**2.5**	**18**	**17**	**13**
	Carbon Dioxide	% v/v	---	---	**0.2**	**0.14**	**1.1**	**0.92**	**1.8**	**0.72**	**0.82**	**11**	**11**	**0.79**	**1.4**	**4.2**

Table 2. Mobile Laboratory Soil Vapor Analytical Results - August 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-13-7 8/31/2016 SVM-13 7-7.5	SVM-13-15.5 8/31/2016 SVM-13 15.5-16	SVM-13-22.5 8/31/2016 SVM-13 22.5-23	SVM-14-7 8/31/2016 SVM-14 7-7.5	SVM-14-15 8/31/2016 SVM-14 15-15.5	SVM-14-22 8/31/2016 SVM-14 22-22.5	SVM-15-7 8/29/2016 SVM-15 7-7.5	SVM-15-15 8/29/2016 SVM-15 15-15.5	SVM-15-22 8/29/2016 SVM-15 22-22.5	SVM-16-7 8/30/2016 SVM-16 7-7.5	SVM-16-16 8/30/2016 SVM-16 16-16.5	SVM-16-22 8/30/2016 SVM-16 22-22.5
COPCs [4]	1,2,4-Trimethylbenzene	µg/L	7.3	31	<0.02	<0.02	<0.02	<0.02	<0.02	**10**	<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	<8	<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	**23**	<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	<80	<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	<8	<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	<8	<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	<8	<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	**0.069**	<8	<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	<8	<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	<8	<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	<8	<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	<8	<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	**0.03**	<8	<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	<8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	tert-Butanol (TBA)	µg/L	---	---	<20	<20	<20	<20	<20	<8000	<20	<20	<20	<20	<20	<20
	Toluene	µg/L	310	1300	<0.02	<0.02	<0.02	<0.02	**0.031**	<8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Other Detected Compounds	Bromodichloromethane	µg/L	0.076	0.33	<0.02	<0.02	<0.02	<0.02	<0.02	<8	<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	<8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Ethanol	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Tetrachloroethylene (PCE)	µg/L	0.48	2.1	<0.02	<0.02	<0.02	<0.02	<0.02	<8	<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	**260**	<20	<20	<20	<20	<20	<20
Fixed Gases	Methane	% v/v	---	---	<0.1	<0.1	<0.1	**0.1**	**0.11**	**0.15**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Oxygen	% v/v	---	---	**19**	**19**	**18**	**18**	**18**	**19**	**18**	**18**	**18**	**18**	**18**	**10**
	Carbon Dioxide	% v/v	---	---	<0.1	<0.1	**0.4**	**0.82**	**0.76**	**0.38**	**0.11**	**0.17**	**0.18**	**0.37**	**0.19**	**5.7**

Table 2. Mobile Laboratory Soil Vapor Analytical Results - August 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-16-22 DUP 8/30/2016 SVM-16 22-22.5	Ambient Air 8/29/2016	Ambient Air 8/30/2016	Ambient Air 8/31/2016
COPCs [4]	1,2,4-Trimethylbenzene	µg/L	7.3	31	<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
	1,3,5-Trimethylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02
	2-Propanol (leak test compound)	µg/L	---	---	<0.2	<0.2	<0.2	<0.2
	Benzene	µg/L	0.097	0.42	<0.02	<0.02	<0.02	<0.02
	Ethylbenzene	µg/L	1.1	4.9	<0.02	<0.02	<0.02	<0.02
	Isopropylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02
	m,p-Xylenes	µg/L	100	440	<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
	Naphthalene	µg/L	0.083	0.36	<0.02	<0.02	<0.02	<0.02
	n-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02
	n-Propylbenzene	µg/L	1000	4400	<0.02	<0.02	<0.02	<0.02
	o-Xylene	µg/L	100	440	<0.02	<0.02	<0.02	<0.02
	sec-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02
	tert-Butanol (TBA)	µg/L	---	---	<20	<20	<20	<20
	Toluene	µg/L	310	1300	<0.02	<0.02	<0.02	<0.02
Other Detected Compounds	Bromodichloromethane	µg/L	0.076	0.33	<0.02	<0.02	<0.02	<0.02
	Chloroform	µg/L	0.12	0.53	<0.02	<0.02	<0.02	<0.02
	Ethanol	µg/L	---	---	<0.02	<0.02	<0.02	0.03
	Tetrachloroethylene (PCE)	µg/L	0.48	2.1	<0.02	<0.02	<0.02	<0.02
	TPH-G (C4-C12)	µg/L	630	2600	<20	<20	<20	<20
Fixed Gases	Methane	% v/v	---	---	<0.1	---	---	---
	Oxygen	% v/v	---	---	**11**	**---**	**---**	---
	Carbon Dioxide	% v/v	---	---	**5.4**	**---**	**---**	**---**

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 HHRA 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

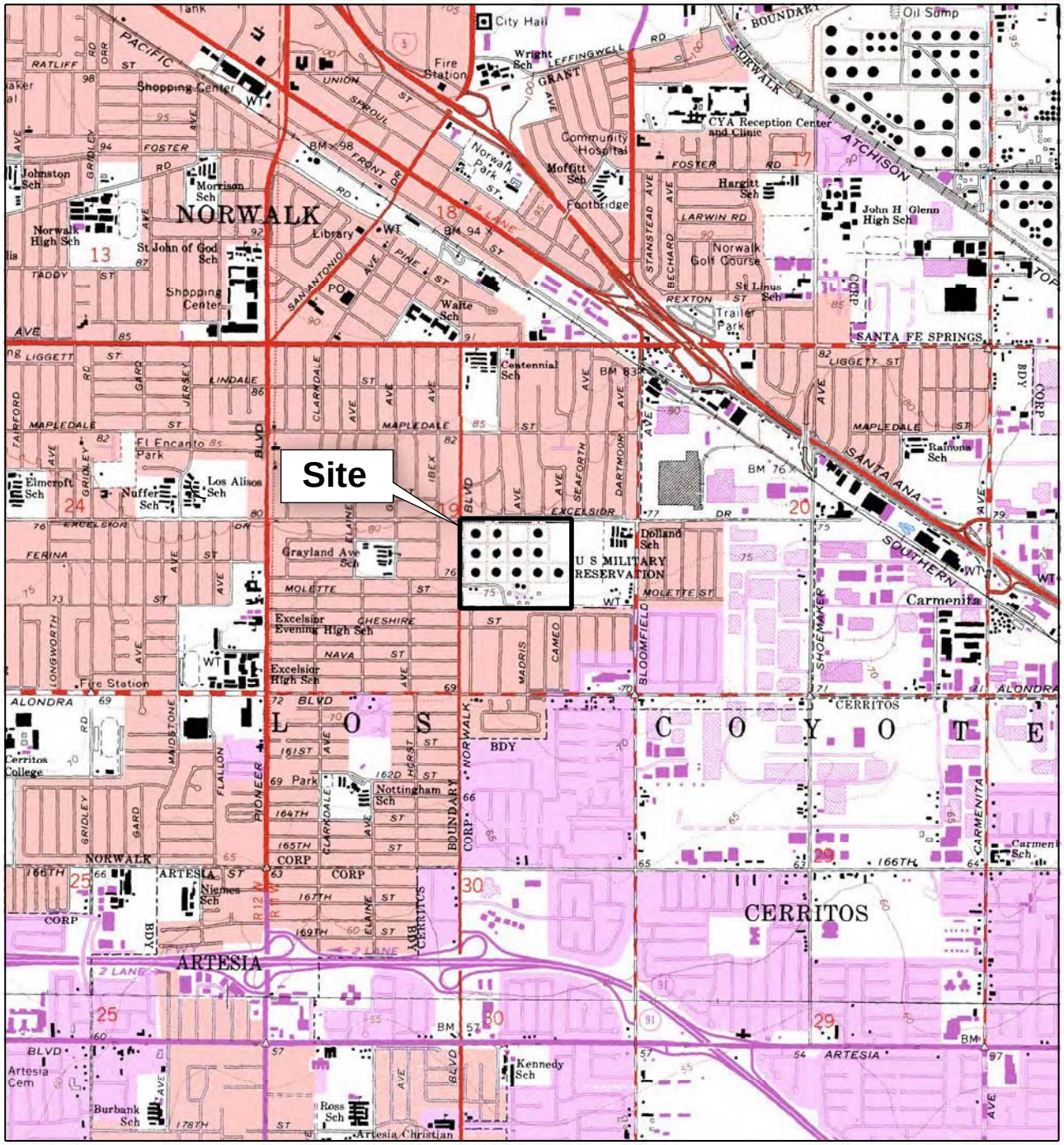
[4] Chemicals of potential concern identified from the 2006 soil gas investigation and HHRA (Geomatrix, 2006)

10 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 = micrograms per liter
COPC = chemical of potential concern
DUP = field duplicate
TPH-g = total petroleum hydrocarbons quantified as gasoline

8/29/2016 = sample date
SVM-1 = sample location
SVM-1-5 = sample ID
5-5.5 = sample depth in feet below ground surface

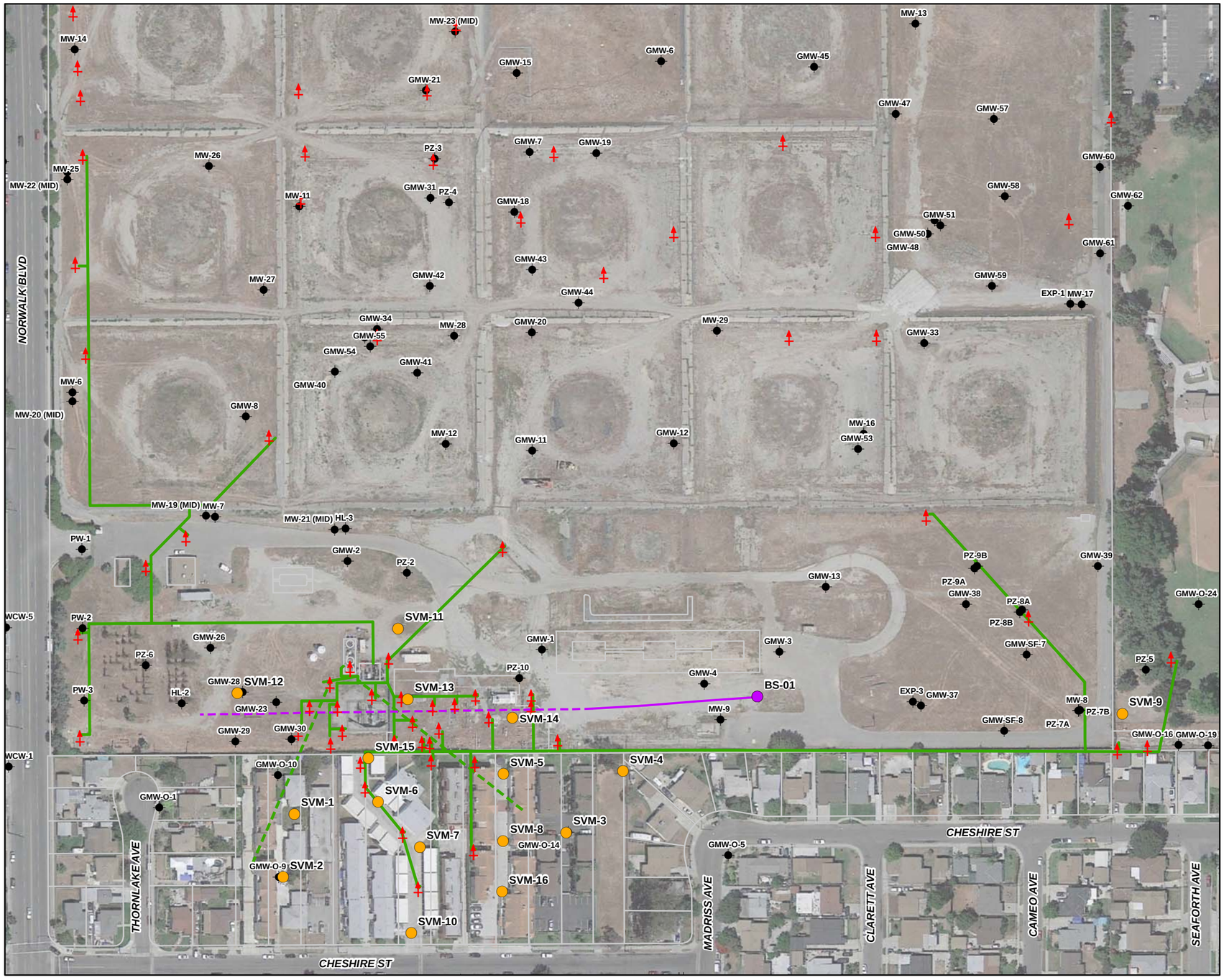
Figures



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)
- Kinder Morgan Remediation Piping Layout (above ground and below ground)
- Horizontal Vapor Extraction Well Piping

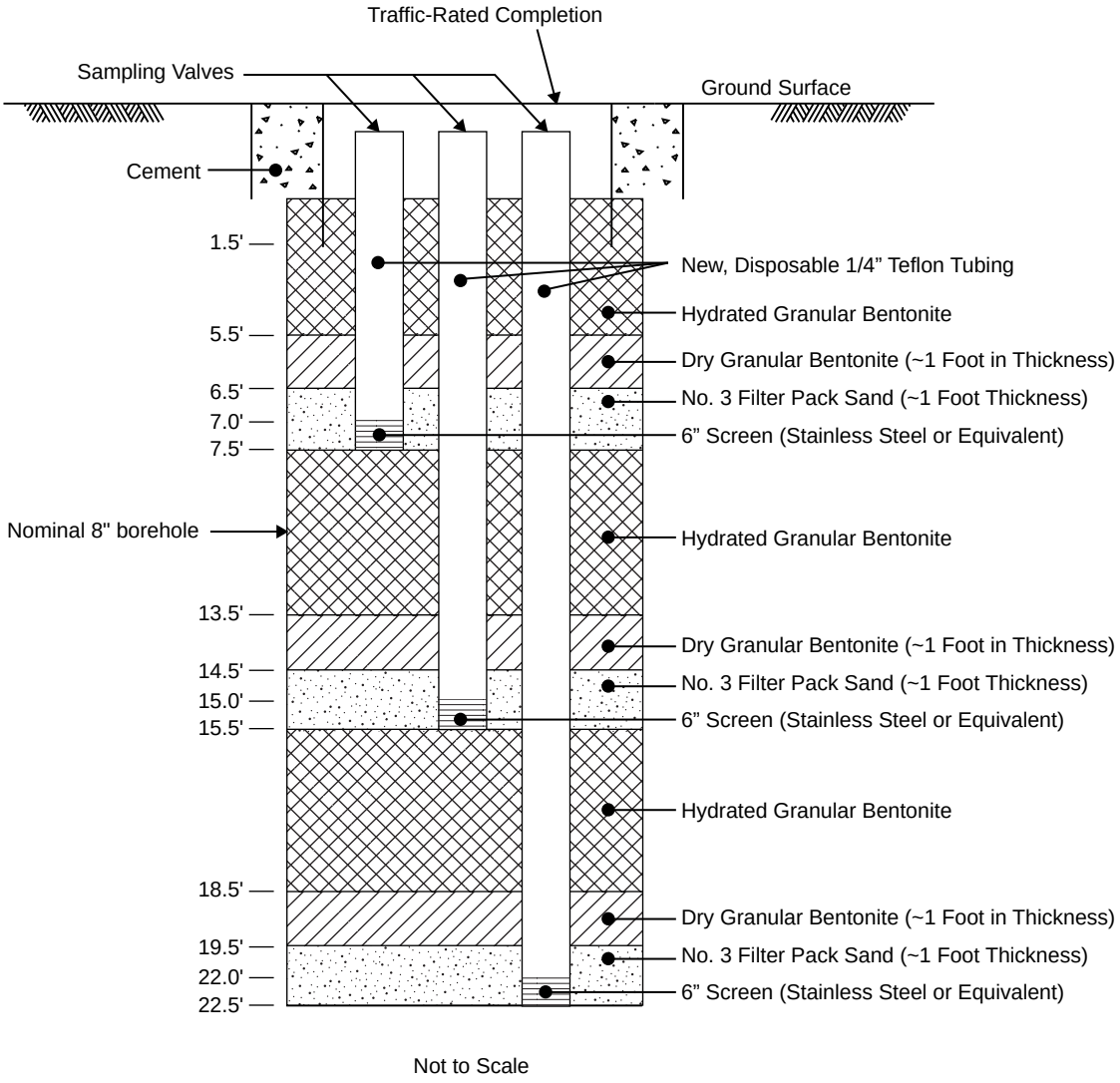
Imagery Source:
Google Earth April 17, 2013.

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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Tel: (818) 998-5547
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September 27, 2016

Dan Jablonski

CH2M Hill, Inc.

1000 Wilshire Blvd., Suite 2100

Los Angeles, CA 90017-2457

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

MB187312 / 6I07010

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received on 09/02/16 15:00 and analyzed in accordance with the attached chain-of-custody.

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

If you have any questions regarding this report or require additional information please call me at American 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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
Fixed Gases - Field					
SVM-1-15	6I07010-01	Vapor	10	08/29/16 08:03	09/02/16 15:00
SVM-1-5	6I07010-02	Vapor	10	08/29/16 08:13	09/02/16 15:00
SVM-2-5	6I07010-03	Vapor	10	08/29/16 08:46	09/02/16 15:00
SVM-15-7	6I07010-04	Vapor	10	08/29/16 09:44	09/02/16 15:00
SVM-15-15	6I07010-05	Vapor	10	08/29/16 09:45	09/02/16 15:00
SVM-15-22	6I07010-06	Vapor	10	08/29/16 09:46	09/02/16 15:00
SVM-6-7	6I07010-07	Vapor	10	08/29/16 10:17	09/02/16 15:00
SVM-6-16	6I07010-08	Vapor	10	08/29/16 10:18	09/02/16 15:00
SVM-6-16 DUP	6I07010-09	Vapor	10	08/29/16 10:18	09/02/16 15:00
SVM-7-7	6I07010-10	Vapor	10	08/29/16 10:35	09/02/16 15:00
SVM-7-13	6I07010-11	Vapor	10	08/29/16 10:53	09/02/16 15:00
SVM-10-15	6I07010-12	Vapor	10	08/29/16 12:38	09/02/16 15:00
SVM-9-5	6I07010-14	Vapor	10	08/29/16 13:44	09/02/16 15:00
SVM-9-15	6I07010-15	Vapor	10	08/29/16 13:45	09/02/16 15:00
SVM-5-15	6I07010-16	Vapor	10	08/30/16 08:30	09/02/16 15:00
SVM-5-5	6I07010-17	Vapor	10	08/30/16 08:48	09/02/16 15:00
SVM-8-15	6I07010-18	Vapor	10	08/30/16 09:30	09/02/16 15:00
SVM-8-5	6I07010-19	Vapor	10	08/30/16 09:43	09/02/16 15:00
SVM-16-16	6I07010-20	Vapor	10	08/30/16 10:11	09/02/16 15:00

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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-16-22	6I07010-21	Vapor	10	08/30/16 10:15	09/02/16 15:00
SVM-16-22 DUP	6I07010-22	Vapor	10	08/30/16 10:15	09/02/16 15:00
SVM-16-7	6I07010-23	Vapor	10	08/30/16 10:20	09/02/16 15:00
SVM-3-15	6I07010-24	Vapor	10	08/30/16 12:12	09/02/16 15:00
SVM-3-5	6I07010-25	Vapor	10	08/30/16 12:27	09/02/16 15:00
SVM-12-15	6I07010-27	Vapor	10	08/31/16 08:42	09/02/16 15:00
SVM-12-22	6I07010-28	Vapor	10	08/31/16 08:45	09/02/16 15:00
SVM-12-7	6I07010-29	Vapor	10	08/31/16 08:48	09/02/16 15:00
SVM-11-22	6I07010-31	Vapor	10	08/31/16 09:07	09/02/16 15:00
SVM-11-22 DUP	6I07010-32	Vapor	10	08/31/16 09:07	09/02/16 15:00
SVM-11-15	6I07010-33	Vapor	10	08/31/16 09:10	09/02/16 15:00
SVM-11-7	6I07010-34	Vapor	10	08/31/16 09:20	09/02/16 15:00
SVM-13-15.5	6I07010-35	Vapor	10	08/31/16 09:53	09/02/16 15:00
SVM-13-22.5	6I07010-36	Vapor	10	08/31/16 09:54	09/02/16 15:00
SVM-13-7	6I07010-37	Vapor	10	08/31/16 10:01	09/02/16 15:00
SVM-14-15	6I07010-38	Vapor	10	08/31/16 10:40	09/02/16 15:00
SVM-14-22	6I07010-39	Vapor	10	08/31/16 10:41	09/02/16 15:00
SVM-14-7	6I07010-40	Vapor	10	08/31/16 10:44	09/02/16 15:00
TO-15 (Mid Level)					
SVM-1-15	6I07010-01	Vapor	10	08/29/16 08:03	09/02/16 15:00

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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-1-5	6I07010-02	Vapor	10	08/29/16 08:13	09/02/16 15:00
SVM-2-5	6I07010-03	Vapor	10	08/29/16 08:46	09/02/16 15:00
SVM-15-7	6I07010-04	Vapor	10	08/29/16 09:44	09/02/16 15:00
SVM-15-15	6I07010-05	Vapor	10	08/29/16 09:45	09/02/16 15:00
SVM-15-22	6I07010-06	Vapor	10	08/29/16 09:46	09/02/16 15:00
SVM-6-7	6I07010-07	Vapor	10	08/29/16 10:17	09/02/16 15:00
SVM-6-16	6I07010-08	Vapor	10	08/29/16 10:18	09/02/16 15:00
SVM-6-16 DUP	6I07010-09	Vapor	10	08/29/16 10:18	09/02/16 15:00
SVM-7-7	6I07010-10	Vapor	10	08/29/16 10:35	09/02/16 15:00
SVM-7-13	6I07010-11	Vapor	10	08/29/16 10:53	09/02/16 15:00
SVM-10-15	6I07010-12	Vapor	10	08/29/16 12:38	09/02/16 15:00
Ambient Air	6I07010-13	Vapor	10	08/29/16 13:18	09/02/16 15:00
SVM-9-5	6I07010-14	Vapor	10	08/29/16 13:44	09/02/16 15:00
SVM-9-15	6I07010-15	Vapor	10	08/29/16 13:45	09/02/16 15:00
SVM-5-15	6I07010-16	Vapor	10	08/30/16 08:30	09/02/16 15:00
SVM-5-5	6I07010-17	Vapor	10	08/30/16 08:48	09/02/16 15:00
SVM-8-15	6I07010-18	Vapor	10	08/30/16 09:30	09/02/16 15:00
SVM-8-5	6I07010-19	Vapor	10	08/30/16 09:43	09/02/16 15:00
SVM-16-16	6I07010-20	Vapor	10	08/30/16 10:11	09/02/16 15:00
SVM-16-22	6I07010-21	Vapor	10	08/30/16 10:15	09/02/16 15:00

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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-16-22 DUP	6I07010-22	Vapor	10	08/30/16 10:15	09/02/16 15:00
SVM-16-7	6I07010-23	Vapor	10	08/30/16 10:20	09/02/16 15:00
SVM-3-15	6I07010-24	Vapor	10	08/30/16 12:12	09/02/16 15:00
SVM-3-5	6I07010-25	Vapor	10	08/30/16 12:27	09/02/16 15:00
Ambient Air	6I07010-26	Vapor	10	08/30/16 12:30	09/02/16 15:00
SVM-12-15	6I07010-27	Vapor	10	08/31/16 08:42	09/02/16 15:00
SVM-12-22	6I07010-28	Vapor	10	08/31/16 08:45	09/02/16 15:00
SVM-12-7	6I07010-29	Vapor	10	08/31/16 08:48	09/02/16 15:00
Ambient Air	6I07010-30	Vapor	10	08/31/16 08:53	09/02/16 15:00
SVM-11-22	6I07010-31	Vapor	10	08/31/16 09:07	09/02/16 15:00
SVM-11-22 DUP	6I07010-32	Vapor	10	08/31/16 09:07	09/02/16 15:00
SVM-11-15	6I07010-33	Vapor	10	08/31/16 09:10	09/02/16 15:00
SVM-11-7	6I07010-34	Vapor	10	08/31/16 09:20	09/02/16 15:00
SVM-13-15.5	6I07010-35	Vapor	10	08/31/16 09:53	09/02/16 15:00
SVM-13-22.5	6I07010-36	Vapor	10	08/31/16 09:54	09/02/16 15:00
SVM-13-7	6I07010-37	Vapor	10	08/31/16 10:01	09/02/16 15:00
SVM-14-15	6I07010-38	Vapor	10	08/31/16 10:40	09/02/16 15:00
SVM-14-22	6I07010-39	Vapor	10	08/31/16 10:41	09/02/16 15:00
SVM-14-7	6I07010-40	Vapor	10	08/31/16 10:44	09/02/16 15:00

TO-3

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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-1-15	6I07010-01	Vapor	10	08/29/16 08:03	09/02/16 15:00
SVM-1-5	6I07010-02	Vapor	10	08/29/16 08:13	09/02/16 15:00
SVM-2-5	6I07010-03	Vapor	10	08/29/16 08:46	09/02/16 15:00
SVM-15-7	6I07010-04	Vapor	10	08/29/16 09:44	09/02/16 15:00
SVM-15-15	6I07010-05	Vapor	10	08/29/16 09:45	09/02/16 15:00
SVM-15-22	6I07010-06	Vapor	10	08/29/16 09:46	09/02/16 15:00
SVM-6-7	6I07010-07	Vapor	10	08/29/16 10:17	09/02/16 15:00
SVM-6-16	6I07010-08	Vapor	10	08/29/16 10:18	09/02/16 15:00
SVM-6-16 DUP	6I07010-09	Vapor	10	08/29/16 10:18	09/02/16 15:00
SVM-7-7	6I07010-10	Vapor	10	08/29/16 10:35	09/02/16 15:00
SVM-7-13	6I07010-11	Vapor	10	08/29/16 10:53	09/02/16 15:00
SVM-10-15	6I07010-12	Vapor	10	08/29/16 12:38	09/02/16 15:00
Ambient Air	6I07010-13	Vapor	10	08/29/16 13:18	09/02/16 15:00
SVM-9-5	6I07010-14	Vapor	10	08/29/16 13:44	09/02/16 15:00
SVM-9-15	6I07010-15	Vapor	10	08/29/16 13:45	09/02/16 15:00
SVM-5-15	6I07010-16	Vapor	10	08/30/16 08:30	09/02/16 15:00
SVM-5-5	6I07010-17	Vapor	10	08/30/16 08:48	09/02/16 15:00
SVM-8-15	6I07010-18	Vapor	10	08/30/16 09:30	09/02/16 15:00
SVM-8-5	6I07010-19	Vapor	10	08/30/16 09:43	09/02/16 15:00
SVM-16-16	6I07010-20	Vapor	10	08/30/16 10:11	09/02/16 15:00

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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-16-22	6I07010-21	Vapor	10	08/30/16 10:15	09/02/16 15:00
SVM-16-22 DUP	6I07010-22	Vapor	10	08/30/16 10:15	09/02/16 15:00
SVM-16-7	6I07010-23	Vapor	10	08/30/16 10:20	09/02/16 15:00
SVM-3-15	6I07010-24	Vapor	10	08/30/16 12:12	09/02/16 15:00
SVM-3-5	6I07010-25	Vapor	10	08/30/16 12:27	09/02/16 15:00
Ambient Air	6I07010-26	Vapor	10	08/30/16 12:30	09/02/16 15:00
SVM-12-15	6I07010-27	Vapor	10	08/31/16 08:42	09/02/16 15:00
SVM-12-22	6I07010-28	Vapor	10	08/31/16 08:45	09/02/16 15:00
SVM-12-7	6I07010-29	Vapor	10	08/31/16 08:48	09/02/16 15:00
Ambient Air	6I07010-30	Vapor	10	08/31/16 08:53	09/02/16 15:00
SVM-11-22	6I07010-31	Vapor	10	08/31/16 09:07	09/02/16 15:00
SVM-11-22 DUP	6I07010-32	Vapor	10	08/31/16 09:07	09/02/16 15:00
SVM-11-15	6I07010-33	Vapor	10	08/31/16 09:10	09/02/16 15:00
SVM-11-7	6I07010-34	Vapor	10	08/31/16 09:20	09/02/16 15:00
SVM-13-15.5	6I07010-35	Vapor	10	08/31/16 09:53	09/02/16 15:00
SVM-13-22.5	6I07010-36	Vapor	10	08/31/16 09:54	09/02/16 15:00
SVM-13-7	6I07010-37	Vapor	10	08/31/16 10:01	09/02/16 15:00
SVM-14-15	6I07010-38	Vapor	10	08/31/16 10:40	09/02/16 15:00
SVM-14-22	6I07010-39	Vapor	10	08/31/16 10:41	09/02/16 15:00
SVM-14-7	6I07010-40	Vapor	10	08/31/16 10:44	09/02/16 15:00

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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
			Fixed Gases by TCD					
Oxygen	SVM-1-15	**18**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Oxygen	SVM-1-5	**18**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Oxygen	SVM-2-5	**18**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-2-5	**0.16**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Oxygen	SVM-15-7	**18**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-15-7	**0.11**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Oxygen	SVM-15-15	**18**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-15-15	**0.17**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Oxygen	SVM-15-22	**18**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-15-22	**0.18**	0.10	% by Volume	1	08/29/16	08/29/16	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-6-7	**18**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-6-7	**0.12**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Oxygen	SVM-6-16	**18**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Oxygen	SVM-6-16 DUP	**18**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Oxygen	SVM-7-7	**18**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-7-7	**0.31**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Oxygen	SVM-7-13	**18**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-7-13	**0.43**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Oxygen	SVM-10-15	**17**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-10-15	**1.8**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Methane	SVM-9-5	**0.18**	0.10	% by Volume	1	08/29/16	08/29/16	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-9-5	**19**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-9-5	**1.1**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Methane	SVM-9-15	**0.14**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Oxygen	SVM-9-15	**17**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-9-15	**0.92**	0.10	% by Volume	1	08/29/16	08/29/16	VOCs by GC/TCD
Oxygen	SVM-5-15	**18**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Oxygen	SVM-5-5	**18**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Oxygen	SVM-8-15	**18**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Carbon Dioxide	SVM-8-15	**0.14**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Oxygen	SVM-8-5	**18**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Carbon Dioxide	SVM-8-5	**0.20**	0.10	% by Volume	1	08/30/16	08/30/16	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-16-16	**18**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Carbon Dioxide	SVM-16-16	**0.19**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Oxygen	SVM-16-22	**10**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Carbon Dioxide	SVM-16-22	**5.7**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Oxygen	SVM-16-22 DUP	**11**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Carbon Dioxide	SVM-16-22 DUP	**5.4**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Oxygen	SVM-16-7	**18**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Carbon Dioxide	SVM-16-7	**0.37**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Methane	SVM-3-15	**0.15**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Oxygen	SVM-3-15	**18**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Carbon Dioxide	SVM-3-15	**0.26**	0.10	% by Volume	1	08/30/16	08/30/16	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Methane	SVM-3-5	**0.11**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Oxygen	SVM-3-5	**18**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Carbon Dioxide	SVM-3-5	**0.22**	0.10	% by Volume	1	08/30/16	08/30/16	VOCs by GC/TCD
Oxygen	SVM-12-15	**17**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Carbon Dioxide	SVM-12-15	**1.4**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Oxygen	SVM-12-22	**13**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Carbon Dioxide	SVM-12-22	**4.2**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Oxygen	SVM-12-7	**18**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Carbon Dioxide	SVM-12-7	**0.79**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Oxygen	SVM-11-22	**1.6**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Carbon Dioxide	SVM-11-22	**11**	0.10	% by Volume	1	08/31/16	08/31/16	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-11-22 DUP	**2.5**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Carbon Dioxide	SVM-11-22 DUP	**11**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Oxygen	SVM-11-15	**18**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Carbon Dioxide	SVM-11-15	**0.82**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Methane	SVM-11-7	**0.10**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Oxygen	SVM-11-7	**18**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Carbon Dioxide	SVM-11-7	**0.72**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Oxygen	SVM-13-15.5	**19**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Oxygen	SVM-13-22.5	**18**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Carbon Dioxide	SVM-13-22.5	**0.40**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Oxygen	SVM-13-7	**19**	0.10	% by Volume	1	08/31/16	08/31/16	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Methane	SVM-14-15	**0.11**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Oxygen	SVM-14-15	**18**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Carbon Dioxide	SVM-14-15	**0.76**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Methane	SVM-14-22	**0.15**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Oxygen	SVM-14-22	**19**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Carbon Dioxide	SVM-14-22	**0.38**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Methane	SVM-14-7	**0.10**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Oxygen	SVM-14-7	**18**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
Carbon Dioxide	SVM-14-7	**0.82**	0.10	% by Volume	1	08/31/16	08/31/16	VOCs by GC/TCD
VOCs by EPA TO-3								
Gasoline Range Organics (GRO)	SVM-14-22	**260**	80	ug/L	4	08/31/16	08/31/16	TO-3
VOCs by GCMS EPA 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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Ethanol	SVM-7-7	**0.085**	0.020	ug/L	1	08/29/16	08/29/16	TO-15
Toluene	SVM-7-7	**0.047**	0.020	ug/L	1	08/29/16	08/29/16	TO-15
m,p-Xylenes	SVM-7-7	**0.032**	0.020	ug/L	1	08/29/16	08/29/16	TO-15
Chloroform	SVM-3-15	**0.097**	0.020	ug/L	1	08/30/16	08/30/16	TO-15
Bromodichloromethane	SVM-3-5	**0.020**	0.020	ug/L	1	08/30/16	08/30/16	TO-15
Chloroform	SVM-3-5	**0.067**	0.020	ug/L	1	08/30/16	08/30/16	TO-15
Ethanol	Ambient Air	**0.030**	0.020	ug/L	1	08/31/16	08/31/16	TO-15
Tetrachloroethylene (PCE)	SVM-11-22	**0.11**	0.020	ug/L	1	08/31/16	08/31/16	TO-15
Tetrachloroethylene (PCE)	SVM-11-22 DUP	**0.11**	0.020	ug/L	1	08/31/16	08/31/16	TO-15
Toluene	SVM-14-15	**0.031**	0.020	ug/L	1	08/31/16	08/31/16	TO-15
o-Xylene	SVM-14-15	**0.030**	0.020	ug/L	1	08/31/16	08/31/16	TO-15
m,p-Xylenes	SVM-14-15	**0.069**	0.020	ug/L	1	08/31/16	08/31/16	TO-15
1,3,5-Trimethylbenzene	SVM-14-22	**23**	8.0	ug/L	400	08/31/16	08/31/16	TO-15
1,2,4-Trimethylbenzene	SVM-14-22	**10**	8.0	ug/L	400	08/31/16	08/31/16	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Prepared:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Analyzed:	09/27/16	09/27/16	09/27/16	09/27/16	
AA ID No:	6I07010-01	6I07010-02	6I07010-03	6I07010-04	
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
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	81%	79%	80%	79%	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Prepared:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Analyzed:	09/27/16	09/27/16	09/27/16	09/27/16	
AA ID No:	6I07010-05	6I07010-06	6I07010-07	6I07010-08	
Client ID No:	SVM-15-15	SVM-15-22	SVM-6-7	SVM-6-16	
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	78%	78%	79%	80%	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Prepared:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Analyzed:	09/27/16	09/27/16	09/27/16	09/27/16	
AA ID No:	6I07010-09	6I07010-10	6I07010-11	6I07010-12	
Client ID No:	SVM-6-16 DUP	SVM-7-7	SVM-7-13	SVM-10-15	
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	78%	75%	78%	77%	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/29/16	08/29/16	08/29/16	08/30/16	
Date Prepared:	08/30/16	08/29/16	08/29/16	08/30/16	
Date Analyzed:	08/30/16	09/27/16	09/27/16	08/30/16	
AA ID No:	6I07010-13	6I07010-14	6I07010-15	6I07010-16	
Client ID No:	Ambient Air	SVM-9-5	SVM-9-15	SVM-5-15	
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	78%	76%	77%	79%	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/30/2016	08/30/2016	08/30/2016	08/30/2016	
Date Prepared:	08/30/16	08/30/16	08/30/16	08/30/16	
Date Analyzed:	08/30/16	08/30/16	08/30/16	08/30/16	
AA ID No:	6I07010-17	6I07010-18	6I07010-19	6I07010-20	
Client ID No:	SVM-5-5	SVM-8-15	SVM-8-5	SVM-16-16	
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	77%	77%	77%	74%	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/30/16	08/30/16	08/30/16	08/30/16	
Date Prepared:	08/30/16	08/30/16	08/30/16	08/30/16	
Date Analyzed:	08/30/16	08/30/16	08/30/16	08/30/16	
AA ID No:	6I07010-21	6I07010-22	6I07010-23	6I07010-24	
Client ID No:	SVM-16-22	SVM-16-22 DUP	SVM-16-7	SVM-3-15	
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	76%	80%	73%	77%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187312
Project No:	496965.A1.01	**Date Received:**	09/02/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	09/27/16
Method:	VOCs by EPA TO-3	**Units:**	ug/L

Date Sampled:	08/30/16	08/30/16	08/31/16	08/31/16	
Date Prepared:	08/30/16	08/30/16	08/31/16	08/31/16	
Date Analyzed:	08/30/16	08/30/16	08/31/16	08/31/16	
AA ID No:	6I07010-25	6I07010-26	6I07010-27	6I07010-28	
Client ID No:	SVM-3-5	Ambient Air	SVM-12-15	SVM-12-22	
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	76%	79%	80%	76%	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Prepared:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Analyzed:	08/31/16	08/31/16	08/31/16	08/31/16	
AA ID No:	6I07010-29	6I07010-30	6I07010-31	6I07010-32	
Client ID No:	SVM-12-7	Ambient Air	SVM-11-22	SVM-11-22 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	78%	79%	76%	79%	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Prepared:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Analyzed:	08/31/16	08/31/16	08/31/16	08/31/16	
AA ID No:	6I07010-33	6I07010-34	6I07010-35	6I07010-36	
Client ID No:	SVM-11-15	SVM-11-7	SVM-13-15.5	SVM-13-22.5	
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	77%	78%	77%	77%	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Prepared:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Analyzed:	08/31/16	08/31/16	08/31/16	08/31/16	
AA ID No:	6I07010-37	6I07010-38	6I07010-39	6I07010-40	
Client ID No:	SVM-13-7	SVM-14-15	SVM-14-22	SVM-14-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	4	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	**260**	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	78%	78%	79%	76%	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Prepared:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Analyzed:	08/29/16	08/29/16	08/29/16	08/29/16	
AA ID No:	6I07010-01	6I07010-02	6I07010-03	6I07010-04	
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
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:**	MB187312
Project No:	496965.A1.01	**Date Received:**	09/02/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	09/27/16
Method:	VOCs by GCMS EPA TO-15	**Units:**	ug/L

Date Sampled:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Prepared:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Analyzed:	08/29/16	08/29/16	08/29/16	08/29/16	
AA ID No:	6I07010-01	6I07010-02	6I07010-03	6I07010-04	
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
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Prepared:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Analyzed:	08/29/16	08/29/16	08/29/16	08/29/16	
AA ID No:	6I07010-01	6I07010-02	6I07010-03	6I07010-04	
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
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	97%	94%	96%	94%	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Prepared:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Analyzed:	08/29/16	08/29/16	08/29/16	08/29/16	
AA ID No:	6I07010-05	6I07010-06	6I07010-07	6I07010-08	
Client ID No:	SVM-15-15	SVM-15-22	SVM-6-7	SVM-6-16	
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Prepared:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Analyzed:	08/29/16	08/29/16	08/29/16	08/29/16	
AA ID No:	6I07010-05	6I07010-06	6I07010-07	6I07010-08	
Client ID No:	SVM-15-15	SVM-15-22	SVM-6-7	SVM-6-16	
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:**	MB187312
Project No:	496965.A1.01	**Date Received:**	09/02/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	09/27/16
Method:	VOCs by GCMS EPA TO-15	**Units:**	ug/L

Date Sampled:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Prepared:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Analyzed:	08/29/16	08/29/16	08/29/16	08/29/16	
AA ID No:	6I07010-05	6I07010-06	6I07010-07	6I07010-08	
Client ID No:	SVM-15-15	SVM-15-22	SVM-6-7	SVM-6-16	
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	93%	93%	95%	95%	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Prepared:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Analyzed:	08/29/16	08/29/16	08/29/16	08/29/16	
AA ID No:	6I07010-09	6I07010-10	6I07010-11	6I07010-12	
Client ID No:	SVM-6-16 DUP	SVM-7-7	SVM-7-13	SVM-10-15	
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.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Prepared:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Analyzed:	08/29/16	08/29/16	08/29/16	08/29/16	
AA ID No:	6I07010-09	6I07010-10	6I07010-11	6I07010-12	
Client ID No:	SVM-6-16 DUP	SVM-7-7	SVM-7-13	SVM-10-15	
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	**0.085**	<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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Prepared:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Analyzed:	08/29/16	08/29/16	08/29/16	08/29/16	
AA ID No:	6I07010-09	6I07010-10	6I07010-11	6I07010-12	
Client ID No:	SVM-6-16 DUP	SVM-7-7	SVM-7-13	SVM-10-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	**0.047**	<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	**0.032**	<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	93%	90%	93%	92%	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/29/16	08/29/16	08/29/16	08/30/16	
Date Prepared:	08/30/16	08/29/16	08/29/16	08/30/16	
Date Analyzed:	08/30/16	08/29/16	08/29/16	08/30/16	
AA ID No:	6I07010-13	6I07010-14	6I07010-15	6I07010-16	
Client ID No:	Ambient Air	SVM-9-5	SVM-9-15	SVM-5-15	
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.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/29/16	08/29/16	08/29/16	08/30/16	
Date Prepared:	08/30/16	08/29/16	08/29/16	08/30/16	
Date Analyzed:	08/30/16	08/29/16	08/29/16	08/30/16	
AA ID No:	6I07010-13	6I07010-14	6I07010-15	6I07010-16	
Client ID No:	Ambient Air	SVM-9-5	SVM-9-15	SVM-5-15	
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	<0.020	<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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/29/16	08/29/16	08/29/16	08/30/16	
Date Prepared:	08/30/16	08/29/16	08/29/16	08/30/16	
Date Analyzed:	08/30/16	08/29/16	08/29/16	08/30/16	
AA ID No:	6I07010-13	6I07010-14	6I07010-15	6I07010-16	
Client ID No:	Ambient Air	SVM-9-5	SVM-9-15	SVM-5-15	
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	94%	91%	93%	95%	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/30/2016	08/30/2016	08/30/2016	08/30/2016	
Date Prepared:	08/30/16	08/30/16	08/30/16	08/30/16	
Date Analyzed:	08/30/16	08/30/16	08/30/16	08/30/16	
AA ID No:	6I07010-17	6I07010-18	6I07010-19	6I07010-20	
Client ID No:	SVM-5-5	SVM-8-15	SVM-8-5	SVM-16-16	
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/30/2016	08/30/2016	08/30/2016	08/30/2016	
Date Prepared:	08/30/16	08/30/16	08/30/16	08/30/16	
Date Analyzed:	08/30/16	08/30/16	08/30/16	08/30/16	
AA ID No:	6I07010-17	6I07010-18	6I07010-19	6I07010-20	
Client ID No:	SVM-5-5	SVM-8-15	SVM-8-5	SVM-16-16	
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/30/2016	08/30/2016	08/30/2016	08/30/2016	
Date Prepared:	08/30/16	08/30/16	08/30/16	08/30/16	
Date Analyzed:	08/30/16	08/30/16	08/30/16	08/30/16	
AA ID No:	6I07010-17	6I07010-18	6I07010-19	6I07010-20	
Client ID No:	SVM-5-5	SVM-8-15	SVM-8-5	SVM-16-16	
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	92%	92%	92%	89%	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/30/16	08/30/16	08/30/16	08/30/16	
Date Prepared:	08/30/16	08/30/16	08/30/16	08/30/16	
Date Analyzed:	08/30/16	08/30/16	08/30/16	08/30/16	
AA ID No:	6I07010-21	6I07010-22	6I07010-23	6I07010-24	
Client ID No:	SVM-16-22	SVM-16-22 DUP	SVM-16-7	SVM-3-15	
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	**0.097**	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/30/16	08/30/16	08/30/16	08/30/16	
Date Prepared:	08/30/16	08/30/16	08/30/16	08/30/16	
Date Analyzed:	08/30/16	08/30/16	08/30/16	08/30/16	
AA ID No:	6I07010-21	6I07010-22	6I07010-23	6I07010-24	
Client ID No:	SVM-16-22	SVM-16-22 DUP	SVM-16-7	SVM-3-15	
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	<0.020	<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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/30/16	08/30/16	08/30/16	08/30/16	
Date Prepared:	08/30/16	08/30/16	08/30/16	08/30/16	
Date Analyzed:	08/30/16	08/30/16	08/30/16	08/30/16	
AA ID No:	6I07010-21	6I07010-22	6I07010-23	6I07010-24	
Client ID No:	SVM-16-22	SVM-16-22 DUP	SVM-16-7	SVM-3-15	
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	91%	96%	88%	93%	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/30/16	08/30/16	08/31/16	08/31/16	
Date Prepared:	08/30/16	08/30/16	08/31/16	08/31/16	
Date Analyzed:	08/30/16	08/30/16	08/31/16	08/31/16	
AA ID No:	6I07010-25	6I07010-26	6I07010-27	6I07010-28	
Client ID No:	SVM-3-5	Ambient Air	SVM-12-15	SVM-12-22	
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	**0.067**	<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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/30/16	08/30/16	08/31/16	08/31/16	
Date Prepared:	08/30/16	08/30/16	08/31/16	08/31/16	
Date Analyzed:	08/30/16	08/30/16	08/31/16	08/31/16	
AA ID No:	6I07010-25	6I07010-26	6I07010-27	6I07010-28	
Client ID No:	SVM-3-5	Ambient Air	SVM-12-15	SVM-12-22	
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/30/16	08/30/16	08/31/16	08/31/16	
Date Prepared:	08/30/16	08/30/16	08/31/16	08/31/16	
Date Analyzed:	08/30/16	08/30/16	08/31/16	08/31/16	
AA ID No:	6I07010-25	6I07010-26	6I07010-27	6I07010-28	
Client ID No:	SVM-3-5	Ambient Air	SVM-12-15	SVM-12-22	
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	91%	94%	96%	91%	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Prepared:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Analyzed:	08/31/16	08/31/16	08/31/16	08/31/16	
AA ID No:	6I07010-29	6I07010-30	6I07010-31	6I07010-32	
Client ID No:	SVM-12-7	Ambient Air	SVM-11-22	SVM-11-22 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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Prepared:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Analyzed:	08/31/16	08/31/16	08/31/16	08/31/16	
AA ID No:	6I07010-29	6I07010-30	6I07010-31	6I07010-32	
Client ID No:	SVM-12-7	Ambient Air	SVM-11-22	SVM-11-22 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	**0.030**	<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	**0.11**	**0.11**	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Prepared:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Analyzed:	08/31/16	08/31/16	08/31/16	08/31/16	
AA ID No:	6I07010-29	6I07010-30	6I07010-31	6I07010-32	
Client ID No:	SVM-12-7	Ambient Air	SVM-11-22	SVM-11-22 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	93%	95%	91%	94%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187312
Project No:	496965.A1.01	**Date Received:**	09/02/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	09/27/16
Method:	VOCs by GCMS EPA TO-15	**Units:**	ug/L

Date Sampled:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Prepared:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Analyzed:	08/31/16	08/31/16	08/31/16	08/31/16	
AA ID No:	6I07010-33	6I07010-34	6I07010-35	6I07010-36	
Client ID No:	SVM-11-15	SVM-11-7	SVM-13-15.5	SVM-13-22.5	
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Prepared:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Analyzed:	08/31/16	08/31/16	08/31/16	08/31/16	
AA ID No:	6I07010-33	6I07010-34	6I07010-35	6I07010-36	
Client ID No:	SVM-11-15	SVM-11-7	SVM-13-15.5	SVM-13-22.5	
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Prepared:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Analyzed:	08/31/16	08/31/16	08/31/16	08/31/16	
AA ID No:	6I07010-33	6I07010-34	6I07010-35	6I07010-36	
Client ID No:	SVM-11-15	SVM-11-7	SVM-13-15.5	SVM-13-22.5	
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	92%	93%	92%	93%	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Prepared:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Analyzed:	08/31/16	08/31/16	08/31/16	08/31/16	
AA ID No:	6I07010-37	6I07010-38	6I07010-39	6I07010-40	
Client ID No:	SVM-13-7	SVM-14-15	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Prepared:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Analyzed:	08/31/16	08/31/16	08/31/16	08/31/16	
AA ID No:	6I07010-37	6I07010-38	6I07010-39	6I07010-40	
Client ID No:	SVM-13-7	SVM-14-15	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	<8.0	<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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: ug/L

Date Sampled:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Prepared:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Analyzed:	08/31/16	08/31/16	08/31/16	08/31/16	
AA ID No:	6I07010-37	6I07010-38	6I07010-39	6I07010-40	
Client ID No:	SVM-13-7	SVM-14-15	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	**0.031**	<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	**23**	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	**10**	<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	**0.030**	<8.0	<0.020	0.020
m,p-Xylenes	<0.020	**0.069**	<8.0	<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	94%	93%	79%	91%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187312
Project No:	496965.A1.01	**Date Received:**	09/02/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	09/27/16
Method:	Fixed Gases by TCD	**Units:**	% by Volume

Date Sampled:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Prepared:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Analyzed:	08/29/16	08/29/16	08/29/16	08/29/16	
AA ID No:	6I07010-01	6I07010-02	6I07010-03	6I07010-04	
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**	**18**	**18**	**18**	0.10
Carbon Dioxide	<0.10	<0.10	**0.16**	**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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: % by Volume

Date Sampled:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Prepared:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Analyzed:	08/29/16	08/29/16	08/29/16	08/29/16	
AA ID No:	6I07010-05	6I07010-06	6I07010-07	6I07010-08	
Client ID No:	SVM-15-15	SVM-15-22	SVM-6-7	SVM-6-16	
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	**0.17**	**0.18**	**0.12**	<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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: % by Volume

Date Sampled:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Prepared:	08/29/16	08/29/16	08/29/16	08/29/16	
Date Analyzed:	08/29/16	08/29/16	08/29/16	08/29/16	
AA ID No:	6I07010-09	6I07010-10	6I07010-11	6I07010-12	
Client ID No:	SVM-6-16 DUP	SVM-7-7	SVM-7-13	SVM-10-15	
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**	**18**	**17**	0.10
Carbon Dioxide	<0.10	**0.31**	**0.43**	**1.8**	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: % by Volume

Date Sampled:	08/29/16	08/29/16	08/30/16	08/30/16	
Date Prepared:	08/29/16	08/29/16	08/30/16	08/30/16	
Date Analyzed:	08/29/16	08/29/16	08/30/16	08/30/16	
AA ID No:	6I07010-14	6I07010-15	6I07010-16	6I07010-17	
Client ID No:	SVM-9-5	SVM-9-15	SVM-5-15	SVM-5-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	**0.18**	**0.14**	<0.10	<0.10	0.10
Oxygen	**19**	**17**	**18**	**18**	0.10
Carbon Dioxide	**1.1**	**0.92**	<0.10	<0.10	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187312
Project No:	496965.A1.01	**Date Received:**	09/02/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	09/27/16
Method:	Fixed Gases by TCD	**Units:**	% by Volume

Date Sampled:	08/30/2016	08/30/2016	08/30/2016	08/30/2016	
Date Prepared:	08/30/16	08/30/16	08/30/16	08/30/16	
Date Analyzed:	08/30/16	08/30/16	08/30/16	08/30/16	
AA ID No:	6I07010-18	6I07010-19	6I07010-20	6I07010-21	
Client ID No:	SVM-8-15	SVM-8-5	SVM-16-16	SVM-16-22	
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**	**18**	**18**	**10**	0.10
Carbon Dioxide	**0.14**	**0.20**	**0.19**	**5.7**	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187312
Project No:	496965.A1.01	**Date Received:**	09/02/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	09/27/16
Method:	Fixed Gases by TCD	**Units:**	% by Volume

Date Sampled:	08/30/16	08/30/16	08/30/16	08/30/16	
Date Prepared:	08/30/16	08/30/16	08/30/16	08/30/16	
Date Analyzed:	08/30/16	08/30/16	08/30/16	08/30/16	
AA ID No:	6I07010-22	6I07010-23	6I07010-24	6I07010-25	
Client ID No:	SVM-16-22 DUP	SVM-16-7	SVM-3-15	SVM-3-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	**0.15**	**0.11**	0.10
Oxygen	**11**	**18**	**18**	**18**	0.10
Carbon Dioxide	**5.4**	**0.37**	**0.26**	**0.22**	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: % by Volume

Date Sampled:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Prepared:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Analyzed:	08/31/16	08/31/16	08/31/16	08/31/16	
AA ID No:	6I07010-27	6I07010-28	6I07010-29	6I07010-31	
Client ID No:	SVM-12-15	SVM-12-22	SVM-12-7	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	**17**	**13**	**18**	**1.6**	0.10
Carbon Dioxide	**1.4**	**4.2**	**0.79**	**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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16
Units: % by Volume

Date Sampled:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Prepared:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Analyzed:	08/31/16	08/31/16	08/31/16	08/31/16	
AA ID No:	6I07010-32	6I07010-33	6I07010-34	6I07010-35	
Client ID No:	SVM-11-22 DUP	SVM-11-15	SVM-11-7	SVM-13-15.5	
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	**2.5**	**18**	**18**	**19**	0.10
Carbon Dioxide	**11**	**0.82**	**0.72**	<0.10	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187312
Project No:	496965.A1.01	**Date Received:**	09/02/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	09/27/16
Method:	Fixed Gases by TCD	**Units:**	% by Volume

Date Sampled:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Prepared:	08/31/16	08/31/16	08/31/16	08/31/16	
Date Analyzed:	08/31/16	08/31/16	08/31/16	08/31/16	
AA ID No:	6I07010-36	6I07010-37	6I07010-38	6I07010-39	
Client ID No:	SVM-13-22.5	SVM-13-7	SVM-14-15	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	**0.11**	**0.15**	0.10
Oxygen	**18**	**19**	**18**	**19**	0.10
Carbon Dioxide	**0.40**	<0.10	**0.76**	**0.38**	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187312
Project No:	496965.A1.01	**Date Received:**	09/02/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	09/27/16
Method:	Fixed Gases by TCD	**Units:**	% by Volume

Date Sampled:	08/31/16	
Date Prepared:	08/31/16	
Date Analyzed:	08/31/16	
AA ID No:	6I07010-40	
Client ID No:	SVM-14-7	
Matrix:	Vapor	
Dilution Factor:	1	MRL

Fixed Gases - Field (VOCs by GC/TCD)

Methane	**0.10**	0.10
Oxygen	**18**	0.10
Carbon Dioxide	**0.82**	0.10

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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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by EPA TO-3 - Quality Control										
*Batch B6I2718 - *** DEFAULT PREP ****										
Blank (B6I2718-BLK1)				Prepared: 08/29/16 Analyzed: 09/27/16						
Gasoline Range Organics (GRO)	<20	20	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.118*		*ug/L*	*0.14*		*82.3*	*70-130*			
LCS (B6I2718-BS1)				Prepared: 08/29/16 Analyzed: 09/27/16						
Gasoline Range Organics (GRO)	**0.904**	20	ug/L	0.82		110	70-130			
Surrogate: 4-Bromofluorobenzene	*0.106*		*ug/L*	*0.14*		*74.2*	*70-130*			
LCS Dup (B6I2718-BSD1)				Prepared: 08/29/16 Analyzed: 09/27/16						
Gasoline Range Organics (GRO)	**0.982**	20	ug/L	0.82		120	70-130	8.24	30	
Surrogate: 4-Bromofluorobenzene	*0.107*		*ug/L*	*0.14*		*74.8*	*70-130*			
Duplicate (B6I2718-DUP1)		**Source: 6I07010-08**		Prepared: 08/29/16 Analyzed: 09/27/16						
Gasoline Range Organics (GRO)	**<20**	20	ug/L		<20				30	
Surrogate: 4-Bromofluorobenzene	*0.111*		*ug/L*	*0.14*		*77.6*	*70-130*			
*Batch B6I2721 - *** DEFAULT PREP ****										
Blank (B6I2721-BLK1)				Prepared & Analyzed: 08/30/16						
Gasoline Range Organics (GRO)	<20	20	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.114*		*ug/L*	*0.14*		*79.4*	*70-130*			
LCS (B6I2721-BS1)				Prepared & Analyzed: 08/30/16						
Gasoline Range Organics (GRO)	**0.862**	20	ug/L	0.82		105	70-130			
Surrogate: 4-Bromofluorobenzene	*0.110*		*ug/L*	*0.14*		*76.6*	*70-130*			
LCS Dup (B6I2721-BSD1)				Prepared & Analyzed: 08/30/16						
Gasoline Range Organics (GRO)	**0.922**	20	ug/L	0.82		113	70-130	6.80	30	
Surrogate: 4-Bromofluorobenzene	*0.112*		*ug/L*	*0.14*		*78.2*	*70-130*			
Duplicate (B6I2721-DUP1)		**Source: 6I07010-21**		Prepared & Analyzed: 08/30/16						
Gasoline Range Organics (GRO)	**<20**	20	ug/L		<20				30	
Surrogate: 4-Bromofluorobenzene	*0.115*		*ug/L*	*0.14*		*80.2*	*70-130*			
*Batch B6I2722 - *** DEFAULT PREP ****										
Blank (B6I2722-BLK1)				Prepared & Analyzed: 08/31/16						
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by EPA TO-3 - Quality Control										
*Batch B6I2722 - *** DEFAULT PREP ****										
Blank (B6I2722-BLK1) Continued				Prepared & Analyzed: 08/31/16						
Surrogate: 4-Bromofluorobenzene	*0.113*		*ug/L*	*0.14*		*79.2*	*70-130*			
LCS (B6I2722-BS1)				Prepared & Analyzed: 08/31/16						
Gasoline Range Organics (GRO)	**0.838**	20	ug/L	0.82		102	70-130			
Surrogate: 4-Bromofluorobenzene	*0.114*		*ug/L*	*0.14*		*79.6*	*70-130*			
LCS Dup (B6I2722-BSD1)				Prepared & Analyzed: 08/31/16						
Gasoline Range Organics (GRO)	**0.879**	20	ug/L	0.82		108	70-130	4.76	30	
Surrogate: 4-Bromofluorobenzene	*0.115*		*ug/L*	*0.14*		*80.1*	*70-130*			
Duplicate (B6I2722-DUP1)		**Source: 6I07010-31**		Prepared & Analyzed: 08/31/16						
Gasoline Range Organics (GRO)	**<20**	20	ug/L		<20				30	
Surrogate: 4-Bromofluorobenzene	*0.113*		*ug/L*	*0.14*		*78.7*	*70-130*			
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6I2713 - *** DEFAULT PREP ****										
Blank (B6I2713-BLK1)				Prepared & Analyzed: 08/29/16						
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2713 - *** DEFAULT PREP ****										
Blank (B6I2713-BLK1) Continued				Prepared & Analyzed: 08/29/16						
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2713 - *** DEFAULT PREP ****										
Blank (B6I2713-BLK1) Continued				Prepared & Analyzed: 08/29/16						
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	*0.141*		*ug/L*	*0.14*		*98.4*	*70-130*			
LCS (B6I2713-BS1)				Prepared & Analyzed: 08/29/16						
Acetone	**0.0253**	0.020	ug/L	0.024		107	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2713 - *** DEFAULT PREP ****										
LCS (B6I2713-BS1) Continued				Prepared & Analyzed: 08/29/16						
Benzene	**0.0323**	0.020	ug/L	0.032		101	70-130		30	
Benzyl chloride	**0.0454**	0.020	ug/L	0.052		87.6	70-130		30	
Bromodichloromethane	**0.0658**	0.020	ug/L	0.067		98.2	70-130		30	
Bromoform	**0.106**	0.020	ug/L	0.10		103	70-130		30	
Bromomethane	**0.0448**	0.020	ug/L	0.039		116	70-130		30	
2-Butanone (MEK)	**0.0257**	0.020	ug/L	0.029		87.0	70-130		30	
Carbon Disulfide	**0.0229**	0.020	ug/L	0.031		73.5	70-130		30	
Carbon Tetrachloride	**0.0567**	0.020	ug/L	0.063		90.1	70-130		30	
Chlorobenzene	**0.0466**	0.020	ug/L	0.046		101	70-130		30	
Chloroethane	**0.0316**	0.020	ug/L	0.026		120	70-130		30	
Chloroform	**0.0501**	0.020	ug/L	0.049		103	70-130		30	
Chloromethane	**0.0210**	0.020	ug/L	0.021		102	70-130		30	
Dibromochloromethane	**0.0830**	0.020	ug/L	0.085		97.4	70-130		30	
1,2-Dibromoethane (EDB)	**0.0772**	0.020	ug/L	0.077		100	70-130		30	
1,2-Dichlorobenzene	**0.0549**	0.020	ug/L	0.060		91.3	70-130		30	
1,3-Dichlorobenzene	**0.0562**	0.020	ug/L	0.060		93.4	70-130		30	
1,4-Dichlorobenzene	**0.0547**	0.020	ug/L	0.060		91.0	70-130		30	
Dichlorodifluoromethane (R12)	**0.0469**	0.020	ug/L	0.049		94.8	70-130		30	
1,1-Dichloroethane	**0.0438**	0.020	ug/L	0.040		108	70-130		30	
1,2-Dichloroethane (EDC)	**0.0389**	0.020	ug/L	0.040		96.0	70-130		30	
cis-1,2-Dichloroethylene	**0.0359**	0.020	ug/L	0.040		90.6	70-130		30	
1,1-Dichloroethylene	**0.0500**	0.020	ug/L	0.040		126	70-130		30	
trans-1,2-Dichloroethylene	**0.0341**	0.020	ug/L	0.040		86.1	70-130		30	
1,2-Dichloropropane	**0.0465**	0.020	ug/L	0.046		101	70-130		30	
trans-1,3-Dichloropropylene	**0.0410**	0.020	ug/L	0.045		90.4	70-130		30	
cis-1,3-Dichloropropylene	**0.0413**	0.020	ug/L	0.045		91.1	70-130		30	
Dichlorotetrafluoroethane	**0.0770**	0.020	ug/L	0.070		110	70-130		30	
Ethylbenzene	**0.0387**	0.020	ug/L	0.043		89.2	70-130		30	
4-Ethyltoluene	**0.0479**	0.020	ug/L	0.049		97.5	70-130		30	
Hexachlorobutadiene	**0.0822**	0.020	ug/L	0.11		77.1	70-130		30	
2-Hexanone (MBK)	**0.0363**	0.020	ug/L	0.041		88.6	70-130		30	
Isopropanol (IPA)	**0.0298**	0.20	ug/L	0.025		121	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2713 - *** DEFAULT PREP ****										
LCS (B6I2713-BS1) Continued				Prepared & Analyzed: 08/29/16						
Methylene Chloride	**0.0390**	0.020	ug/L	0.035		112	70-130		30	
4-Methyl-2-pentanone (MIBK)	**0.0421**	0.020	ug/L	0.041		103	70-130		30	
Styrene	**0.0374**	0.020	ug/L	0.043		87.9	70-130		30	
1,1,2,2-Tetrachloroethane	**0.0728**	0.020	ug/L	0.069		106	70-130		30	
Tetrachloroethylene (PCE)	**0.0622**	0.020	ug/L	0.068		91.7	70-130		30	
Toluene	**0.0376**	0.020	ug/L	0.038		99.9	70-130		30	
1,2,4-Trichlorobenzene	**0.0599**	0.020	ug/L	0.074		80.7	70-130		30	
1,1,2-Trichloroethane	**0.0558**	0.020	ug/L	0.055		102	70-130		30	
1,1,1-Trichloroethane	**0.0520**	0.020	ug/L	0.055		95.3	70-130		30	
Trichloroethylene (TCE)	**0.0499**	0.020	ug/L	0.054		92.9	70-130		30	
Trichlorofluoromethane (R11)	**0.0675**	0.020	ug/L	0.056		120	70-130		30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0708**	0.020	ug/L	0.077		92.4	70-130		30	
1,3,5-Trimethylbenzene	**0.0517**	0.020	ug/L	0.049		105	70-130		30	
1,2,4-Trimethylbenzene	**0.0480**	0.020	ug/L	0.049		97.7	70-130		30	
Vinyl acetate	**0.0308**	0.020	ug/L	0.035		87.6	70-130		30	
Vinyl chloride	**0.0292**	0.020	ug/L	0.026		114	70-130		30	
o-Xylene	**0.0395**	0.020	ug/L	0.043		91.0	70-130		30	
m,p-Xylenes	**0.0764**	0.020	ug/L	0.087		88.0	70-130		30	
1,2,3-Trichloropropane	**0.0622**	0.020	ug/L	0.060		103	70-130		30	
sec-Butylbenzene	**0.0532**	0.020	ug/L	0.055		96.9	70-130		30	
Isopropylbenzene	**0.0474**	0.020	ug/L	0.049		96.5	70-130		30	
n-Propylbenzene	**0.0493**	0.020	ug/L	0.049		100	70-130		30	
4-Isopropyltoluene	**0.0519**	0.020	ug/L	0.055		94.5	70-130		30	
Surrogate: 4-Bromofluorobenzene	*0.132*		*ug/L*	*0.14*		*92.2*	*70-130*			
LCS Dup (B6I2713-BSD1)				Prepared & Analyzed: 08/29/16						
Acetone	**0.0274**	0.020	ug/L	0.024		115	70-130	7.66	30	
Benzene	**0.0355**	0.020	ug/L	0.032		111	70-130	9.51	30	
Benzyl chloride	**0.0479**	0.020	ug/L	0.052		92.5	70-130	5.44	30	
Bromodichloromethane	**0.0659**	0.020	ug/L	0.067		98.3	70-130	0.102	30	
Bromoform	**0.111**	0.020	ug/L	0.10		107	70-130	4.28	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2713 - *** DEFAULT PREP ****										
LCS Dup (B6I2713-BSD1) Continued				Prepared & Analyzed: 08/29/16						
Bromomethane	**0.0450**	0.020	ug/L	0.039		116	70-130	0.346	30	
2-Butanone (MEK)	**0.0306**	0.020	ug/L	0.029		104	70-130	17.5	30	
Carbon Disulfide	**0.0234**	0.020	ug/L	0.031		75.1	70-130	2.15	30	
Carbon Tetrachloride	**0.0584**	0.020	ug/L	0.063		92.9	70-130	3.06	30	
Chlorobenzene	**0.0481**	0.020	ug/L	0.046		104	70-130	3.21	30	
Chloroethane	**0.0315**	0.020	ug/L	0.026		119	70-130	0.418	30	
Chloroform	**0.0527**	0.020	ug/L	0.049		108	70-130	5.03	30	
Chloromethane	**0.0205**	0.020	ug/L	0.021		99.4	70-130	2.29	30	
Dibromochloromethane	**0.0840**	0.020	ug/L	0.085		98.6	70-130	1.22	30	
1,2-Dibromoethane (EDB)	**0.0780**	0.020	ug/L	0.077		102	70-130	0.990	30	
1,2-Dichlorobenzene	**0.0563**	0.020	ug/L	0.060		93.7	70-130	2.59	30	
1,3-Dichlorobenzene	**0.0572**	0.020	ug/L	0.060		95.2	70-130	1.91	30	
1,4-Dichlorobenzene	**0.0540**	0.020	ug/L	0.060		89.8	70-130	1.33	30	
Dichlorodifluoromethane (R12)	**0.0505**	0.020	ug/L	0.049		102	70-130	7.51	30	
1,1-Dichloroethane	**0.0461**	0.020	ug/L	0.040		114	70-130	5.04	30	
1,2-Dichloroethane (EDC)	**0.0425**	0.020	ug/L	0.040		105	70-130	8.86	30	
cis-1,2-Dichloroethylene	**0.0409**	0.020	ug/L	0.040		103	70-130	13.0	30	
1,1-Dichloroethylene	**0.0504**	0.020	ug/L	0.040		127	70-130	0.791	30	
trans-1,2-Dichloroethylene	**0.0407**	0.020	ug/L	0.040		103	70-130	17.5	30	
1,2-Dichloropropane	**0.0479**	0.020	ug/L	0.046		104	70-130	2.94	30	
trans-1,3-Dichloropropylene	**0.0453**	0.020	ug/L	0.045		99.8	70-130	9.88	30	
cis-1,3-Dichloropropylene	**0.0462**	0.020	ug/L	0.045		102	70-130	11.2	30	
Dichlorotetrafluoroethane	**0.0778**	0.020	ug/L	0.070		111	70-130	0.993	30	
Ethylbenzene	**0.0430**	0.020	ug/L	0.043		99.1	70-130	10.5	30	
4-Ethyltoluene	**0.0516**	0.020	ug/L	0.049		105	70-130	7.41	30	
Hexachlorobutadiene	**0.0815**	0.020	ug/L	0.11		76.4	70-130	0.912	30	
2-Hexanone (MBK)	**0.0533**	0.020	ug/L	0.041		130	70-130	37.9	30	QR-02
Isopropanol (IPA)	**0.0320**	0.20	ug/L	0.025		130	70-130	7.09	30	
Methylene Chloride	**0.0388**	0.020	ug/L	0.035		112	70-130	0.535	30	
4-Methyl-2-pentanone (MIBK)	**0.0515**	0.020	ug/L	0.041		126	70-130	20.0	30	
Styrene	**0.0416**	0.020	ug/L	0.043		97.7	70-130	10.6	30	
1,1,2,2-Tetrachloroethane	**0.0738**	0.020	ug/L	0.069		108	70-130	1.31	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2713 - *** DEFAULT PREP ****										
LCS Dup (B6I2713-BSD1) Continued				Prepared & Analyzed: 08/29/16						
Tetrachloroethylene (PCE)	**0.0641**	0.020	ug/L	0.068		94.4	70-130	2.90	30	
Toluene	**0.0387**	0.020	ug/L	0.038		103	70-130	2.67	30	
1,2,4-Trichlorobenzene	**0.0629**	0.020	ug/L	0.074		84.7	70-130	4.84	30	
1,1,2-Trichloroethane	**0.0563**	0.020	ug/L	0.055		103	70-130	0.974	30	
1,1,1-Trichloroethane	**0.0554**	0.020	ug/L	0.055		102	70-130	6.30	30	
Trichloroethylene (TCE)	**0.0518**	0.020	ug/L	0.054		96.4	70-130	3.70	30	
Trichlorofluoromethane (R11)	**0.0686**	0.020	ug/L	0.056		122	70-130	1.65	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0717**	0.020	ug/L	0.077		93.5	70-130	1.18	30	
1,3,5-Trimethylbenzene	**0.0548**	0.020	ug/L	0.049		112	70-130	5.91	30	
1,2,4-Trimethylbenzene	**0.0506**	0.020	ug/L	0.049		103	70-130	5.28	30	
Vinyl acetate	**0.0361**	0.020	ug/L	0.035		102	70-130	15.7	30	
Vinyl chloride	**0.0299**	0.020	ug/L	0.026		117	70-130	2.16	30	
o-Xylene	**0.0422**	0.020	ug/L	0.043		97.2	70-130	6.59	30	
m,p-Xylenes	**0.0818**	0.020	ug/L	0.087		94.2	70-130	6.86	30	
1,2,3-Trichloropropane	**0.0637**	0.020	ug/L	0.060		106	70-130	2.30	30	
sec-Butylbenzene	**0.0551**	0.020	ug/L	0.055		100	70-130	3.45	30	
Isopropylbenzene	**0.0510**	0.020	ug/L	0.049		104	70-130	7.19	30	
n-Propylbenzene	**0.0530**	0.020	ug/L	0.049		108	70-130	7.21	30	
4-Isopropyltoluene	**0.0537**	0.020	ug/L	0.055		97.8	70-130	3.43	30	
Surrogate: 4-Bromofluorobenzene	*0.131*		*ug/L*	*0.14*		*91.2*	*70-130*			
Duplicate (B6I2713-DUP1)		**Source: 6I07010-08**		Prepared & Analyzed: 08/29/16						
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2713 - *** DEFAULT PREP ****										
Duplicate (B6I2713-DUP1) Continued	**Source: 6I07010-08**		Prepared & Analyzed: 08/29/16							
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	

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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2713 - *** DEFAULT PREP ****										
Duplicate (B6I2713-DUP1) Continued	**Source: 6I07010-08**		Prepared & Analyzed: 08/29/16							
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	

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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2713 - *** DEFAULT PREP ****										
Duplicate (B6I2713-DUP1) Continued			**Source: 6I07010-08**	Prepared & Analyzed: 08/29/16						
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	*0.133*		*ug/L*	*0.14*		*92.9*	*70-130*			
*Batch B6I2714 - *** DEFAULT PREP ****										
Blank (B6I2714-BLK1)				Prepared & Analyzed: 08/30/16						
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2714 - *** DEFAULT PREP ****										
Blank (B6I2714-BLK1) Continued				Prepared & Analyzed: 08/30/16						
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2714 - *** DEFAULT PREP ****										
Blank (B6I2714-BLK1) Continued				Prepared & Analyzed: 08/30/16						
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	*0.136*		*ug/L*	*0.14*		*95.0*	*70-130*			
LCS (B6I2714-BS1)				Prepared & Analyzed: 08/30/16						
Acetone	**0.0249**	0.020	ug/L	0.024		105	70-130		30	
Benzene	**0.0322**	0.020	ug/L	0.032		101	70-130		30	
Benzyl chloride	**0.0448**	0.020	ug/L	0.052		86.5	70-130		30	
Bromodichloromethane	**0.0633**	0.020	ug/L	0.067		94.5	70-130		30	
Bromoform	**0.103**	0.020	ug/L	0.10		100	70-130		30	
Bromomethane	**0.0430**	0.020	ug/L	0.039		111	70-130		30	
2-Butanone (MEK)	**0.0266**	0.020	ug/L	0.029		90.1	70-130		30	
Carbon Disulfide	**0.0313**	0.020	ug/L	0.031		101	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2714 - *** DEFAULT PREP ****										
LCS (B6I2714-BS1) Continued				Prepared & Analyzed: 08/30/16						
Carbon Tetrachloride	**0.0552**	0.020	ug/L	0.063		87.8	70-130		30	
Chlorobenzene	**0.0452**	0.020	ug/L	0.046		98.2	70-130		30	
Chloroethane	**0.0303**	0.020	ug/L	0.026		115	70-130		30	
Chloroform	**0.0479**	0.020	ug/L	0.049		98.1	70-130		30	
Chloromethane	**0.0197**	0.020	ug/L	0.021		95.5	70-130		30	
Dibromochloromethane	**0.0810**	0.020	ug/L	0.085		95.1	70-130		30	
1,2-Dibromoethane (EDB)	**0.0747**	0.020	ug/L	0.077		97.2	70-130		30	
1,2-Dichlorobenzene	**0.0557**	0.020	ug/L	0.060		92.6	70-130		30	
1,3-Dichlorobenzene	**0.0556**	0.020	ug/L	0.060		92.4	70-130		30	
1,4-Dichlorobenzene	**0.0549**	0.020	ug/L	0.060		91.3	70-130		30	
Dichlorodifluoromethane (R12)	**0.0458**	0.020	ug/L	0.049		92.6	70-130		30	
1,1-Dichloroethane	**0.0419**	0.020	ug/L	0.040		103	70-130		30	
1,2-Dichloroethane (EDC)	**0.0367**	0.020	ug/L	0.040		90.6	70-130		30	
cis-1,2-Dichloroethylene	**0.0357**	0.020	ug/L	0.040		90.0	70-130		30	
1,1-Dichloroethylene	**0.0494**	0.020	ug/L	0.040		124	70-130		30	
trans-1,2-Dichloroethylene	**0.0345**	0.020	ug/L	0.040		87.0	70-130		30	
1,2-Dichloropropane	**0.0445**	0.020	ug/L	0.046		96.3	70-130		30	
trans-1,3-Dichloropropylene	**0.0399**	0.020	ug/L	0.045		88.0	70-130		30	
cis-1,3-Dichloropropylene	**0.0407**	0.020	ug/L	0.045		89.7	70-130		30	
Dichlorotetrafluoroethane	**0.0763**	0.020	ug/L	0.070		109	70-130		30	
Ethylbenzene	**0.0385**	0.020	ug/L	0.043		88.7	70-130		30	
4-Ethyltoluene	**0.0465**	0.020	ug/L	0.049		94.6	70-130		30	
Hexachlorobutadiene	**0.0868**	0.020	ug/L	0.11		81.4	70-130		30	
2-Hexanone (MBK)	**0.0628**	0.020	ug/L	0.041		153	70-130		30	**
Isopropanol (IPA)	**0.0307**	0.20	ug/L	0.025		125	70-130		30	
Methylene Chloride	**0.0381**	0.020	ug/L	0.035		110	70-130		30	
4-Methyl-2-pentanone (MIBK)	**0.0574**	0.020	ug/L	0.041		140	70-130		30	**
Styrene	**0.0363**	0.020	ug/L	0.043		85.3	70-130		30	
1,1,2,2-Tetrachloroethane	**0.0691**	0.020	ug/L	0.069		101	70-130		30	
Tetrachloroethylene (PCE)	**0.0606**	0.020	ug/L	0.068		89.3	70-130		30	
Toluene	**0.0373**	0.020	ug/L	0.038		99.1	70-130		30	
1,2,4-Trichlorobenzene	**0.0672**	0.020	ug/L	0.074		90.6	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2714 - *** DEFAULT PREP ****										
LCS (B6I2714-BS1) Continued				Prepared & Analyzed: 08/30/16						
1,1,2-Trichloroethane	**0.0554**	0.020	ug/L	0.055		102	70-130		30	
1,1,1-Trichloroethane	**0.0494**	0.020	ug/L	0.055		90.6	70-130		30	
Trichloroethylene (TCE)	**0.0494**	0.020	ug/L	0.054		91.9	70-130		30	
Trichlorofluoromethane (R11)	**0.0664**	0.020	ug/L	0.056		118	70-130		30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0958**	0.020	ug/L	0.077		125	70-130		30	
1,3,5-Trimethylbenzene	**0.0494**	0.020	ug/L	0.049		100	70-130		30	
1,2,4-Trimethylbenzene	**0.0466**	0.020	ug/L	0.049		94.8	70-130		30	
Vinyl acetate	**0.0298**	0.020	ug/L	0.035		84.6	70-130		30	
Vinyl chloride	**0.0287**	0.020	ug/L	0.026		112	70-130		30	
o-Xylene	**0.0373**	0.020	ug/L	0.043		86.0	70-130		30	
m,p-Xylenes	**0.0729**	0.020	ug/L	0.087		83.9	70-130		30	
1,2,3-Trichloropropane	**0.0570**	0.020	ug/L	0.060		94.6	70-130		30	
sec-Butylbenzene	**0.0502**	0.020	ug/L	0.055		91.5	70-130		30	
Isopropylbenzene	**0.0455**	0.020	ug/L	0.049		92.6	70-130		30	
n-Propylbenzene	**0.0469**	0.020	ug/L	0.049		95.4	70-130		30	
4-Isopropyltoluene	**0.0497**	0.020	ug/L	0.055		90.5	70-130		30	
Surrogate: 4-Bromofluorobenzene	*0.136*		*ug/L*	*0.14*		*95.1*	*70-130*			
LCS Dup (B6I2714-BSD1)				Prepared & Analyzed: 08/30/16						
Acetone	**0.0252**	0.020	ug/L	0.024		106	70-130	0.853	30	
Benzene	**0.0339**	0.020	ug/L	0.032		106	70-130	5.32	30	
Benzyl chloride	**0.0426**	0.020	ug/L	0.052		82.2	70-130	5.10	30	
Bromodichloromethane	**0.0622**	0.020	ug/L	0.067		92.9	70-130	1.71	30	
Bromoform	**0.102**	0.020	ug/L	0.10		99.1	70-130	1.00	30	
Bromomethane	**0.0418**	0.020	ug/L	0.039		108	70-130	2.75	30	
2-Butanone (MEK)	**0.0273**	0.020	ug/L	0.029		92.5	70-130	2.63	30	
Carbon Disulfide	**0.0224**	0.020	ug/L	0.031		71.8	70-130	33.4	30	QR-02
Carbon Tetrachloride	**0.0554**	0.020	ug/L	0.063		88.1	70-130	0.341	30	
Chlorobenzene	**0.0441**	0.020	ug/L	0.046		95.8	70-130	2.47	30	
Chloroethane	**0.0287**	0.020	ug/L	0.026		109	70-130	5.27	30	
Chloroform	**0.0490**	0.020	ug/L	0.049		100	70-130	2.32	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2714 - *** DEFAULT PREP ****										
LCS Dup (B6I2714-BSD1) Continued				Prepared & Analyzed: 08/30/16						
Chloromethane	**0.0232**	0.020	ug/L	0.021		112	70-130	16.2	30	
Dibromochloromethane	**0.0780**	0.020	ug/L	0.085		91.6	70-130	3.75	30	
1,2-Dibromoethane (EDB)	**0.0708**	0.020	ug/L	0.077		92.1	70-130	5.39	30	
1,2-Dichlorobenzene	**0.0506**	0.020	ug/L	0.060		84.2	70-130	9.50	30	
1,3-Dichlorobenzene	**0.0497**	0.020	ug/L	0.060		82.6	70-130	11.2	30	
1,4-Dichlorobenzene	**0.0492**	0.020	ug/L	0.060		81.9	70-130	10.9	30	
Dichlorodifluoromethane (R12)	**0.0461**	0.020	ug/L	0.049		93.2	70-130	0.646	30	
1,1-Dichloroethane	**0.0430**	0.020	ug/L	0.040		106	70-130	2.67	30	
1,2-Dichloroethane (EDC)	**0.0382**	0.020	ug/L	0.040		94.5	70-130	4.21	30	
cis-1,2-Dichloroethylene	**0.0387**	0.020	ug/L	0.040		97.6	70-130	8.10	30	
1,1-Dichloroethylene	**0.0465**	0.020	ug/L	0.040		117	70-130	6.04	30	
trans-1,2-Dichloroethylene	**0.0370**	0.020	ug/L	0.040		93.3	70-130	6.99	30	
1,2-Dichloropropane	**0.0444**	0.020	ug/L	0.046		96.0	70-130	0.312	30	
trans-1,3-Dichloropropylene	**0.0407**	0.020	ug/L	0.045		89.7	70-130	1.91	30	
cis-1,3-Dichloropropylene	**0.0419**	0.020	ug/L	0.045		92.3	70-130	2.86	30	
Dichlorotetrafluoroethane	**0.0731**	0.020	ug/L	0.070		105	70-130	4.30	30	
Ethylbenzene	**0.0389**	0.020	ug/L	0.043		89.5	70-130	0.898	30	
4-Ethyltoluene	**0.0467**	0.020	ug/L	0.049		94.9	70-130	0.317	30	
Hexachlorobutadiene	**0.0706**	0.020	ug/L	0.11		66.2	70-130	20.6	30	***
2-Hexanone (MBK)	**0.0350**	0.020	ug/L	0.041		85.5	70-130	56.7	30	QR-02
Isopropanol (IPA)	**0.0280**	0.20	ug/L	0.025		114	70-130	9.21	30	
Methylene Chloride	**0.0364**	0.020	ug/L	0.035		105	70-130	4.38	30	
4-Methyl-2-pentanone (MIBK)	**0.0297**	0.020	ug/L	0.041		72.6	70-130	63.5	30	QR-02
Styrene	**0.0369**	0.020	ug/L	0.043		86.6	70-130	1.51	30	
1,1,2,2-Tetrachloroethane	**0.0666**	0.020	ug/L	0.069		97.0	70-130	3.64	30	
Tetrachloroethylene (PCE)	**0.0582**	0.020	ug/L	0.068		85.8	70-130	4.00	30	
Toluene	**0.0354**	0.020	ug/L	0.038		93.9	70-130	5.39	30	
1,2,4-Trichlorobenzene	**0.0514**	0.020	ug/L	0.074		69.3	70-130	26.6	30	***
1,1,2-Trichloroethane	**0.0509**	0.020	ug/L	0.055		93.3	70-130	8.52	30	
1,1,1-Trichloroethane	**0.0519**	0.020	ug/L	0.055		95.2	70-130	4.95	30	
Trichloroethylene (TCE)	**0.0490**	0.020	ug/L	0.054		91.2	70-130	0.765	30	
Trichlorofluoromethane (R11)	**0.0633**	0.020	ug/L	0.056		113	70-130	4.68	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2714 - *** DEFAULT PREP ****										
LCS Dup (B6I2714-BSD1) Continued				Prepared & Analyzed: 08/30/16						
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0682**	0.020	ug/L	0.077		89.0	70-130	33.6	30	QR-02
1,3,5-Trimethylbenzene	**0.0480**	0.020	ug/L	0.049		97.7	70-130	2.83	30	
1,2,4-Trimethylbenzene	**0.0455**	0.020	ug/L	0.049		92.5	70-130	2.46	30	
Vinyl acetate	**0.0322**	0.020	ug/L	0.035		91.4	70-130	7.73	30	
Vinyl chloride	**0.0282**	0.020	ug/L	0.026		110	70-130	1.53	30	
o-Xylene	**0.0383**	0.020	ug/L	0.043		88.2	70-130	2.53	30	
m,p-Xylenes	**0.0730**	0.020	ug/L	0.087		84.0	70-130	0.119	30	
1,2,3-Trichloropropane	**0.0572**	0.020	ug/L	0.060		94.8	70-130	0.211	30	
sec-Butylbenzene	**0.0483**	0.020	ug/L	0.055		88.0	70-130	3.90	30	
Isopropylbenzene	**0.0454**	0.020	ug/L	0.049		92.4	70-130	0.216	30	
n-Propylbenzene	**0.0469**	0.020	ug/L	0.049		95.5	70-130	0.105	30	
4-Isopropyltoluene	**0.0467**	0.020	ug/L	0.055		85.0	70-130	6.27	30	
Surrogate: 4-Bromofluorobenzene	*0.132*		*ug/L*	*0.14*		*92.0*	*70-130*			
Duplicate (B6I2714-DUP1)		**Source: 6I07010-21**		Prepared & Analyzed: 08/30/16						
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2714 - *** DEFAULT PREP ****										
Duplicate (B6I2714-DUP1) Continued	**Source: 6I07010-21**		Prepared & Analyzed: 08/30/16							
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		0.0137			0.900	30	
Hexachlorobutadiene	**<0.020**	0.020	ug/L		<0.020				30	
n-Hexane	**<0.020**	0.020	ug/L		0.0148			1.44	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2714 - *** DEFAULT PREP ****										
Duplicate (B6I2714-DUP1) Continued	**Source: 6I07010-21**			Prepared & Analyzed: 08/30/16						
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	*0.137*		*ug/L*	*0.14*		*95.8*	*70-130*			
*Batch B6I2717 - *** DEFAULT PREP ****										

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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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2717 - *** DEFAULT PREP ****										
Blank (B6I2717-BLK1)				Prepared & Analyzed: 08/31/16						
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2717 - *** DEFAULT PREP ****										
Blank (B6I2717-BLK1) Continued				Prepared & Analyzed: 08/31/16						
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2717 - *** DEFAULT PREP ****										
Blank (B6I2717-BLK1) Continued				Prepared & Analyzed: 08/31/16						
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	*0.135*		*ug/L*	*0.14*		*94.6*	*70-130*			
LCS (B6I2717-BS1)				Prepared & Analyzed: 08/31/16						
Acetone	**0.0267**	0.020	ug/L	0.024		112	70-130		30	
Benzene	**0.0326**	0.020	ug/L	0.032		102	70-130		30	
Benzyl chloride	**0.0491**	0.020	ug/L	0.052		94.8	70-130		30	
Bromodichloromethane	**0.0621**	0.020	ug/L	0.067		92.7	70-130		30	
Bromoform	**0.102**	0.020	ug/L	0.10		98.7	70-130		30	
Bromomethane	**0.0429**	0.020	ug/L	0.039		110	70-130		30	
2-Butanone (MEK)	**0.0315**	0.020	ug/L	0.029		107	70-130		30	
Carbon Disulfide	**0.0323**	0.020	ug/L	0.031		104	70-130		30	
Carbon Tetrachloride	**0.0522**	0.020	ug/L	0.063		83.0	70-130		30	
Chlorobenzene	**0.0453**	0.020	ug/L	0.046		98.5	70-130		30	
Chloroethane	**0.0295**	0.020	ug/L	0.026		112	70-130		30	
Chloroform	**0.0471**	0.020	ug/L	0.049		96.5	70-130		30	
Chloromethane	**0.0245**	0.020	ug/L	0.021		119	70-130		30	
Dibromochloromethane	**0.0812**	0.020	ug/L	0.085		95.3	70-130		30	
1,2-Dibromoethane (EDB)	**0.0790**	0.020	ug/L	0.077		103	70-130		30	
1,2-Dichlorobenzene	**0.0611**	0.020	ug/L	0.060		102	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2717 - *** DEFAULT PREP ****										
LCS (B6I2717-BS1) Continued				Prepared & Analyzed: 08/31/16						
1,3-Dichlorobenzene	**0.0603**	0.020	ug/L	0.060		100	70-130		30	
1,4-Dichlorobenzene	**0.0600**	0.020	ug/L	0.060		99.8	70-130		30	
Dichlorodifluoromethane (R12)	**0.0460**	0.020	ug/L	0.049		93.1	70-130		30	
1,1-Dichloroethane	**0.0532**	0.020	ug/L	0.040		132	70-130		30	**
1,2-Dichloroethane (EDC)	**0.0372**	0.020	ug/L	0.040		91.9	70-130		30	
cis-1,2-Dichloroethylene	**0.0383**	0.020	ug/L	0.040		96.7	70-130		30	
1,1-Dichloroethylene	**0.0496**	0.020	ug/L	0.040		125	70-130		30	
trans-1,2-Dichloroethylene	**0.0517**	0.020	ug/L	0.040		130	70-130		30	
1,2-Dichloropropane	**0.0451**	0.020	ug/L	0.046		97.7	70-130		30	
trans-1,3-Dichloropropylene	**0.0406**	0.020	ug/L	0.045		89.4	70-130		30	
cis-1,3-Dichloropropylene	**0.0410**	0.020	ug/L	0.045		90.3	70-130		30	
Dichlorotetrafluoroethane	**0.0753**	0.020	ug/L	0.070		108	70-130		30	
Ethylbenzene	**0.0415**	0.020	ug/L	0.043		95.5	70-130		30	
4-Ethyltoluene	**0.0502**	0.020	ug/L	0.049		102	70-130		30	
Hexachlorobutadiene	**0.0886**	0.020	ug/L	0.11		83.1	70-130		30	
2-Hexanone (MBK)	**0.0435**	0.020	ug/L	0.041		106	70-130		30	
Isopropanol (IPA)	**0.0299**	0.20	ug/L	0.025		122	70-130		30	
Methylene Chloride	**0.0389**	0.020	ug/L	0.035		112	70-130		30	
4-Methyl-2-pentanone (MIBK)	**0.0338**	0.020	ug/L	0.041		82.5	70-130		30	
Styrene	**0.0408**	0.020	ug/L	0.043		95.7	70-130		30	
1,1,2,2-Tetrachloroethane	**0.0725**	0.020	ug/L	0.069		106	70-130		30	
Tetrachloroethylene (PCE)	**0.0615**	0.020	ug/L	0.068		90.6	70-130		30	
Toluene	**0.0422**	0.020	ug/L	0.038		112	70-130		30	
1,2,4-Trichlorobenzene	**0.0716**	0.020	ug/L	0.074		96.5	70-130		30	
1,1,2-Trichloroethane	**0.0573**	0.020	ug/L	0.055		105	70-130		30	
1,1,1-Trichloroethane	**0.0489**	0.020	ug/L	0.055		89.7	70-130		30	
Trichloroethylene (TCE)	**0.0478**	0.020	ug/L	0.054		88.9	70-130		30	
Trichlorofluoromethane (R11)	**0.0668**	0.020	ug/L	0.056		119	70-130		30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0923**	0.020	ug/L	0.077		120	70-130		30	
1,3,5-Trimethylbenzene	**0.0528**	0.020	ug/L	0.049		108	70-130		30	
1,2,4-Trimethylbenzene	**0.0501**	0.020	ug/L	0.049		102	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2717 - *** DEFAULT PREP ****										
LCS (B6I2717-BS1) Continued				Prepared & Analyzed: 08/31/16						
Vinyl acetate	**0.0403**	0.020	ug/L	0.035		114	70-130		30	
Vinyl chloride	**0.0286**	0.020	ug/L	0.026		112	70-130		30	
o-Xylene	**0.0403**	0.020	ug/L	0.043		92.9	70-130		30	
m,p-Xylenes	**0.0837**	0.020	ug/L	0.087		96.4	70-130		30	
1,2,3-Trichloropropane	**0.0612**	0.020	ug/L	0.060		102	70-130		30	
sec-Butylbenzene	**0.0565**	0.020	ug/L	0.055		103	70-130		30	
Isopropylbenzene	**0.0492**	0.020	ug/L	0.049		100	70-130		30	
n-Propylbenzene	**0.0509**	0.020	ug/L	0.049		104	70-130		30	
4-Isopropyltoluene	**0.0555**	0.020	ug/L	0.055		101	70-130		30	
Surrogate: 4-Bromofluorobenzene	*0.139*		*ug/L*	*0.14*		*97.2*	*70-130*			
LCS Dup (B6I2717-BSD1)				Prepared & Analyzed: 08/31/16						
Acetone	**0.0250**	0.020	ug/L	0.024		105	70-130	6.43	30	
Benzene	**0.0349**	0.020	ug/L	0.032		109	70-130	6.63	30	
Benzyl chloride	**0.0453**	0.020	ug/L	0.052		87.5	70-130	8.01	30	
Bromodichloromethane	**0.0612**	0.020	ug/L	0.067		91.4	70-130	1.41	30	
Bromoform	**0.0992**	0.020	ug/L	0.10		96.0	70-130	2.77	30	
Bromomethane	**0.0419**	0.020	ug/L	0.039		108	70-130	2.38	30	
2-Butanone (MEK)	**0.0284**	0.020	ug/L	0.029		96.2	70-130	10.4	30	
Carbon Disulfide	**0.0293**	0.020	ug/L	0.031		94.0	70-130	9.81	30	
Carbon Tetrachloride	**0.0527**	0.020	ug/L	0.063		83.8	70-130	0.959	30	
Chlorobenzene	**0.0442**	0.020	ug/L	0.046		96.0	70-130	2.57	30	
Chloroethane	**0.0285**	0.020	ug/L	0.026		108	70-130	3.37	30	
Chloroform	**0.0473**	0.020	ug/L	0.049		96.9	70-130	0.414	30	
Chloromethane	**0.0187**	0.020	ug/L	0.021		90.4	70-130	27.0	30	
Dibromochloromethane	**0.0785**	0.020	ug/L	0.085		92.2	70-130	3.31	30	
1,2-Dibromoethane (EDB)	**0.0763**	0.020	ug/L	0.077		99.3	70-130	3.46	30	
1,2-Dichlorobenzene	**0.0542**	0.020	ug/L	0.060		90.2	70-130	12.0	30	
1,3-Dichlorobenzene	**0.0547**	0.020	ug/L	0.060		90.9	70-130	9.83	30	
1,4-Dichlorobenzene	**0.0538**	0.020	ug/L	0.060		89.5	70-130	10.9	30	
Dichlorodifluoromethane (R12)	**0.0463**	0.020	ug/L	0.049		93.7	70-130	0.642	30	
1,1-Dichloroethane	**0.0517**	0.020	ug/L	0.040		128	70-130	2.85	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2717 - *** DEFAULT PREP ****										
LCS Dup (B6I2717-BSD1) Continued				Prepared & Analyzed: 08/31/16						
1,2-Dichloroethane (EDC)	**0.0368**	0.020	ug/L	0.040		91.0	70-130	0.984	30	
cis-1,2-Dichloroethylene	**0.0379**	0.020	ug/L	0.040		95.6	70-130	1.14	30	
1,1-Dichloroethylene	**0.0472**	0.020	ug/L	0.040		119	70-130	4.83	30	
trans-1,2-Dichloroethylene	**0.0495**	0.020	ug/L	0.040		125	70-130	4.39	30	
1,2-Dichloropropane	**0.0445**	0.020	ug/L	0.046		96.4	70-130	1.34	30	
trans-1,3-Dichloropropylene	**0.0420**	0.020	ug/L	0.045		92.6	70-130	3.52	30	
cis-1,3-Dichloropropylene	**0.0420**	0.020	ug/L	0.045		92.6	70-130	2.52	30	
Dichlorotetrafluoroethane	**0.0728**	0.020	ug/L	0.070		104	70-130	3.40	30	
Ethylbenzene	**0.0399**	0.020	ug/L	0.043		91.9	70-130	3.84	30	
4-Ethyltoluene	**0.0475**	0.020	ug/L	0.049		96.7	70-130	5.53	30	
Hexachlorobutadiene	**0.0759**	0.020	ug/L	0.11		71.2	70-130	15.4	30	
2-Hexanone (MBK)	**0.0369**	0.020	ug/L	0.041		90.0	70-130	16.6	30	
Isopropanol (IPA)	**0.0297**	0.20	ug/L	0.025		121	70-130	0.577	30	
Methylene Chloride	**0.0379**	0.020	ug/L	0.035		109	70-130	2.63	30	
4-Methyl-2-pentanone (MIBK)	**0.0420**	0.020	ug/L	0.041		103	70-130	21.7	30	
Styrene	**0.0391**	0.020	ug/L	0.043		91.9	70-130	4.05	30	
1,1,2,2-Tetrachloroethane	**0.0671**	0.020	ug/L	0.069		97.8	70-130	7.67	30	
Tetrachloroethylene (PCE)	**0.0613**	0.020	ug/L	0.068		90.4	70-130	0.221	30	
Toluene	**0.0405**	0.020	ug/L	0.038		107	70-130	4.10	30	
1,2,4-Trichlorobenzene	**0.0596**	0.020	ug/L	0.074		80.3	70-130	18.3	30	
1,1,2-Trichloroethane	**0.0555**	0.020	ug/L	0.055		102	70-130	3.19	30	
1,1,1-Trichloroethane	**0.0494**	0.020	ug/L	0.055		90.6	70-130	0.998	30	
Trichloroethylene (TCE)	**0.0481**	0.020	ug/L	0.054		89.6	70-130	0.784	30	
Trichlorofluoromethane (R11)	**0.0651**	0.020	ug/L	0.056		116	70-130	2.56	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0878**	0.020	ug/L	0.077		114	70-130	5.02	30	
1,3,5-Trimethylbenzene	**0.0496**	0.020	ug/L	0.049		101	70-130	6.33	30	
1,2,4-Trimethylbenzene	**0.0473**	0.020	ug/L	0.049		96.2	70-130	5.75	30	
Vinyl acetate	**0.0409**	0.020	ug/L	0.035		116	70-130	1.56	30	
Vinyl chloride	**0.0280**	0.020	ug/L	0.026		110	70-130	1.81	30	
o-Xylene	**0.0392**	0.020	ug/L	0.043		90.2	70-130	2.95	30	
m,p-Xylenes	**0.0772**	0.020	ug/L	0.087		88.9	70-130	8.04	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2717 - *** DEFAULT PREP ****										
LCS Dup (B6I2717-BSD1) Continued				Prepared & Analyzed: 08/31/16						
1,2,3-Trichloropropane	**0.0558**	0.020	ug/L	0.060		92.5	70-130	9.28	30	
sec-Butylbenzene	**0.0504**	0.020	ug/L	0.055		91.8	70-130	11.4	30	
Isopropylbenzene	**0.0474**	0.020	ug/L	0.049		96.5	70-130	3.66	30	
n-Propylbenzene	**0.0481**	0.020	ug/L	0.049		97.9	70-130	5.56	30	
4-Isopropyltoluene	**0.0497**	0.020	ug/L	0.055		90.6	70-130	11.0	30	
Surrogate: 4-Bromofluorobenzene	*0.134*		*ug/L*	*0.14*		*93.8*	*70-130*			
Duplicate (B6I2717-DUP1)		**Source: 6I07010-31**		Prepared & Analyzed: 08/31/16						
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2717 - *** DEFAULT PREP ****										
Duplicate (B6I2717-DUP1) Continued	**Source: 6I07010-31**		Prepared & Analyzed: 08/31/16							
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)	**0.111**	0.020	ug/L		0.111			0.122	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	

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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

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 B6I2717 - *** DEFAULT PREP ****										
Duplicate (B6I2717-DUP1) Continued			**Source: 6I07010-31**	Prepared & Analyzed: 08/31/16						
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	**<0.020**	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	*0.135*		*ug/L*	*0.14*		*94.1*	*70-130*			
Fixed Gases by TCD - Quality Control										
*Batch B6I2723 - *** DEFAULT PREP ****										
Blank (B6I2723-BLK1)				Prepared & Analyzed: 08/29/16						
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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
*Batch B6I2723 - *** DEFAULT PREP ****										
LCS (B6I2723-BS1)				Prepared & Analyzed: 08/29/16						
Methane	**4.24**	0.10	% by Volume	4.5		94.1	75-125			
Oxygen	**3.88**	0.10	% by Volume	4.0		97.0	75-125			
Carbon Dioxide	**13.0**	0.10	% by Volume	15		86.8	75-125			
LCS Dup (B6I2723-BSD1)				Prepared & Analyzed: 08/29/16						
Methane	**4.25**	0.10	% by Volume	4.5		94.4	75-125	0.236	30	
Oxygen	**4.02**	0.10	% by Volume	4.0		100	75-125	3.47	30	
Carbon Dioxide	**12.9**	0.10	% by Volume	15		86.1	75-125	0.756	30	
Duplicate (B6I2723-DUP1)				**Source: 6I07010-08**	Prepared & Analyzed: 08/29/16					
Methane	**<0.10**	0.10	% by Volume		<0.10				30	
Oxygen	**18.0**	0.10	% by Volume		18.1			0.310	30	
Carbon Dioxide	**<0.10**	0.10	% by Volume		<0.10				30	
*Batch B6I2724 - *** DEFAULT PREP ****										
Blank (B6I2724-BLK1)				Prepared & Analyzed: 08/30/16						
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B6I2724-BS1)				Prepared & Analyzed: 08/30/16						
Methane	**4.32**	0.10	% by Volume	4.5		95.9	75-125			

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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
*Batch B6I2724 - *** DEFAULT PREP ****										
LCS (B6I2724-BS1) Continued				Prepared & Analyzed: 08/30/16						
Oxygen	**4.09**	0.10	% by Volume	4.0		102	75-125			
Carbon Dioxide	**13.3**	0.10	% by Volume	15		88.4	75-125			
LCS Dup (B6I2724-BSD1)				Prepared & Analyzed: 08/30/16						
Methane	**4.34**	0.10	% by Volume	4.5		96.4	75-125	0.508	30	
Oxygen	**4.03**	0.10	% by Volume	4.0		101	75-125	1.43	30	
Carbon Dioxide	**12.9**	0.10	% by Volume	15		85.9	75-125	2.88	30	
Duplicate (B6I2724-DUP1)			**Source: 6I07010-21**	Prepared & Analyzed: 08/30/16						
Methane	**<0.10**	0.10	% by Volume		<0.10				30	
Oxygen	**10.7**	0.10	% by Volume		10.3			3.73	30	
Carbon Dioxide	**5.39**	0.10	% by Volume		5.69			5.45	30	
*Batch B6I2725 - *** DEFAULT PREP ****										
Blank (B6I2725-BLK1)				Prepared & Analyzed: 08/31/16						
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B6I2725-BS1)				Prepared & Analyzed: 08/31/16						
Methane	**4.52**	0.10	% by Volume	4.5		100	75-125			
Oxygen	**4.36**	0.10	% by Volume	4.0		109	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: MB187312
Date Received: 09/02/16
Date Reported: 09/27/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
*Batch B6I2725 - *** DEFAULT PREP ****										
LCS (B6I2725-BS1) Continued				Prepared & Analyzed: 08/31/16						
Carbon Dioxide	**13.3**	0.10	% by Volume	15		88.6	75-125			
LCS Dup (B6I2725-BSD1)				Prepared & Analyzed: 08/31/16						
Methane	**4.57**	0.10	% by Volume	4.5		101	75-125	1.10	30	
Oxygen	**4.27**	0.10	% by Volume	4.0		107	75-125	1.95	30	
Carbon Dioxide	**13.5**	0.10	% by Volume	15		89.8	75-125	1.34	30	
Duplicate (B6I2725-DUP1)		**Source: 6I07010-31**		Prepared & Analyzed: 08/31/16						
Methane	**<0.10**	0.10	% by Volume		<0.10				30	
Oxygen	**2.48**	0.10	% by Volume		1.63			41.4	30	QR-01
Carbon Dioxide	**10.8**	0.10	% by Volume		11.4			5.25	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187312
Project No:	496965.A1.01	**Date Received:**	09/02/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	09/27/16

Special Notes

[1] = ****** : Analyte recovery exceeded the upper control limits.

[2] = ******* : Analyte recovery exceeded the lower control limits.

[3] = **QR-01** : Analyses are not controlled on RPD values from sample concentrations less than 10 times the reporting limit. QC batch accepted based on LCS and/or LCSD QC results.

[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.: 125737

70046711

Page 1 of 1

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

Project Manager: DAN JABLONSKI | Site Address: 15306 NORWALK BLVD | Sampler's Signature: [signature]

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

Fax: | State & Zip: CA | Quote No.:

TAT Turnaround Codes **

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

ANALYSIS REQUESTED (Test Name) — 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-1-15	6I07010 -01	8-29-16	0803	V	2	X	X	X	
SVM-1-5	-02		0813	V	2	X	X	X	
SVM-2-5	-03		0846	V	2	X	X	X	
SVM-15-7	-04		0944	V	2	X	X	X	
SVM-15-15	-05		0945	V	2	X	X	X	
SVM-15-22	-06		0946	V	2	X	X	X	
SVM-6-7	-07		1017	V	2	X	X	X	
SVM-6-16	-08		1018	V	2	X	X	X	
SVM-6-16 DUP	-09		1018	V	2	X	X	X	
SVM-7-7	-10		1035	V	2	X	X	X	
SVM-7-13	-11		1053	V	2	X	X	X	
SVM-10-15	-12		1238	V	2	X	X	X	
AMBIENT AIR	-13		1318	V	1	X	X		
SVM-9-5	-14		1344	V	2	X	X	X	
SVM-9-15	-15	↓	1345	V	2	X	X	X	

For Laboratory Use

A.A. Project No.: MB187312/6I07010

Relinquished by	Date	Time	Received by
Jose Hermann	8-29-16	1410	[signature]
[signature]	9/2/16	1500	[signature]

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.: 125738

70046731

Page 1 of 1

Client: CH2M HILL
Project Name / No.: KINDER MORGAN NORWALK
Sampler's Name: William Scherer
Project Manager: DAN JABLONSKI
Site Address: 15306 NORWALK BLVD
Sampler's Signature: [signature]
Phone:
City: NORWALK
P.O. No.:
Fax:
State & Zip: CA.
Quote No.:

TAT Turnaround Codes **

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

ANALYSIS REQUESTED (Test Name)

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-8-15	6I07010-16	8-30-16	0830	V	2	X	X	X							
SVM-5-5	-17	↓	0848	V	2	X	X	X							
SVM-9-15	-18		0930	V	2	X	X	X							
SVM-8-5	-19		0943	V	2	X	X	X							
SVM-16-16	-20		1011	V	2	X	X	X							
SVM-16-22	-21		1015	V	2	X	X	X							
SVM-16-22 DUP	-22		1015	V	2	X	X	X							
SVM-16-7	-23		1020	V	2	X	X	X							
SVM-3-15	-24		1212	V	2	X	X	X							
SVM-3-5	-25		1227	V	2	X	X	X							
AMBIENT AIR	-26	↓	1230	V	1	X	X								

For Laboratory Use

Relinquished by	Date	Time	Received by
Jose Hernandez	8-30-16	1240	[signature]
[signature]	9/2/16	1400	[signature]

A.A. Project No.: MB187312/6I07010

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.: 125739

70046733 Page 1 of 1

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

Project Manager: DAN JABLONSKI | 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)

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	TO15	TO3	FIXED GASES	Please enter the TAT Turnaround Codes ** below	Special Instructions
SVM-12-15	6I07010-27	8/31-16	0842	V	2	X	X	X		
SVM-12-22	-28		0845	V	2	X	X	X		
SVM-12-7	-29		0848	V	2	X	X	X		
AMBIENT AIR	-30		0853	V	1	X	X			
SVM-11-22	-31		0907	V	2	X	X	X		
SVM-11-22 DUP	-32		0907	V	2	X	X	X		
SVM-11-15	-33		0910	V	2	X	X	X		
SVM-11-7	-34		0920	V	2	X	X	X		
SVM-13-15.5	-35		0953	V	2	X	X	X		
SVM-13-22.5	-36		0954	V	2	X	X	X		
SVM-13-7	-37		1001	V	2	X	X	X		
SVM-14-15	-38		1040	V	2	X	X	X		
SVM-14-22	-39		1041	V	2	X	X	X		
SVM-14-7	-40		1044	V	2	X	X	X		

For Laboratory Use

A.A. Project No.: MB187312/6I07010

	Relinquished by	Date	Time	Received by
		8-31-16	1100	
		9/2/16	1510	
		Date	Time	

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.