



SFPP Norwalk Pump Station
Norwalk, California

Second Quarter 2018 Remediation Progress Report

Final

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Kinder Morgan Energy Partners, L.P.



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The material and data presented in this report were prepared consistent with current and generally accepted consulting principles and practices. This work was supervised by the following Jacobs licensed professional.



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Acronyms and Abbreviations

µg/L	microgram(s) per liter
1,2-DCA	1,2-dichloroethane
Air Tech	Air Technology Laboratories
Asset	Asset Laboratories
ASTM	ASTM International
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CH2M	CH2M HILL Engineers, Inc., now Jacobs Engineering Group Inc.
COPC	chemical of potential concern
DFSP	Defense Fuel Support Point
DTSC	Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
GWE	groundwater extraction
GWTS	groundwater treatment system
in. H ₂ O	inches of water
Jacobs	Jacobs Engineering Group Inc.
Kinder Morgan	Kinder Morgan Energy Partners, L.P.
LGAC	liquid-phase granular activated carbon
MTBE	methyl tertiary butyl ether
No.	number
O&M	operations and maintenance
OWS	oil-water separator
ppmv	parts per million by volume
PVC	polyvinyl chloride
RTO	regenerative thermal oxidizer
SCE	Southern California Edison
scfm	standard cubic feet per minute
SFPP	SFPP, L.P.
SGI	Source Group, Inc.
SVE	soil vapor extraction
TBA	tertiary butyl alcohol
TFE	total fluids extraction
TPH	total petroleum hydrocarbons
TPH-d	total petroleum hydrocarbons quantified as diesel
TPH-g	total petroleum hydrocarbons quantified as gasoline
TPH-o	total petroleum hydrocarbons quantified as oil
TPH-total	total petroleum hydrocarbons quantified as gasoline, diesel, and oil

VOC	volatile organic compound
Water Board	California Regional Water Quality Control Board, Los Angeles Region
WSB	West Side Barrier

1. Introduction

On behalf of SFPP, L.P. (SFPP), an operating partnership of Kinder Morgan Energy Partners, L.P. (Kinder Morgan), CH2M HILL Engineers, Inc. (CH2M), now a wholly owned subsidiary of Jacobs Engineering Group Inc. (Jacobs) prepared this report to summarize remediation activities performed at the former SFPP Norwalk Pump Station located within the Defense Fuel Support Point (DFSP) Norwalk, at 15306 Norwalk Boulevard, Norwalk, California (the site; Figure 1) during the second quarter 2018 reporting period.

This progress report is submitted pursuant to a request from the California Regional Water Quality Control Board, Los Angeles Region (Water Board) in its letter dated October 25, 2006 (Water Board, 2006). Additional site background information can be found in the report titled, Conceptual Site Model and Proposed Alternate Interim Remedy for Soil, Groundwater, and LNAPL (CH2M, 2013), and in previously submitted semiannual groundwater monitoring reports.

This report summarizes the remediation systems present at the site and describes remediation activities for the period of April through June 2018 with documentation of the following tasks:

- Operations and maintenance (O&M) of remediation systems performed by Kinder Morgan field personnel
- Remediation system evaluation

The remediation activities performed from April through June 2018 and the progress achieved through those activities are summarized in the following sections.

2. Remediation Systems

Kinder Morgan operates remediation systems consisting of soil vapor extraction (SVE), total fluids extraction (TFE; extraction of free product and/or groundwater using a top-loading pump), groundwater extraction (GWE; extraction of groundwater using a bottom-loading pump), and treatment of extracted soil vapors and groundwater to address the south-central and southeastern areas of the site. Biosparging is also employed in the south-central area to enhance natural attenuation of hydrocarbon constituents.

Operation of the West Side Barrier (WSB) GWE system for remediation of the western offsite area was discontinued in August 2008 based on the reduced lateral extent and low concentrations of volatile organic compounds (VOCs) west of the site.

The objectives of the remediation systems are to contain and control the migration of hydrocarbon constituents in groundwater and soil vapor, and to remove hydrocarbon mass from soil and groundwater. The remediation systems include the following wells:

- South-Central Area
 - 20 TFE wells
 - 24 onsite and 6 offsite SVE wells (most collocated with TFE wells)
 - 2 horizontal SVE wells
 - 1 horizontal biosparge well
- Southeastern Area (24-inch Block Valve Area)
 - 4 TFE wells (GMW-O-15, GMW-O-18, GMW-36, and GMW-SF-9)
 - 3 SVE wells (collocated with TFE wells)
 - 1 GWE well (GMW-SF-10)

A summary of remediation wells in the south-central, southeastern, and WSB areas is presented in Table 1. Table 1 includes well identifications, well construction details, well function, and operational status at the end of the second quarter 2018. The remediation system layout is shown on Figure 2. A brief description of each system is provided in Sections 2.1 through 2.3.

Kinder Morgan currently operates three refined fuel pipelines (two 16-inch and one 24-inch) that traverse the southern border of the site. These pipelines previously supplied fuel products to the former tank farm, and various block valves and other connection points were identified as potential sources of subsurface releases in the south-central and southeastern areas of the site. Between the third quarter of 2016 and the second quarter of 2017, the pipelines were modified to remove all valves and connections so that the pipelines now span across the site in a continuous manner, reducing the potential for future releases that could have occurred at those connection points.

2.1 Soil Vapor Extraction System

SVE is performed using a blower to remove soil vapors from the south-central and southeastern areas of the site. The extracted vapors are conveyed to a knock-out tank that separates entrained moisture from the soil vapors. Accumulated moisture in the knock-out tank is treated by the main groundwater treatment system (GWTS) described in Section 2.2. The soil vapors are then treated in a regenerative thermal oxidizer (RTO) where VOCs are converted to carbon dioxide and water prior to being discharged to the atmosphere. Operation of the GWTS and SVE system is conducted in accordance with Permits to Operate (Permit Number [No.] G46188 A/N 578779 and No. G46187 A/N 578777) issued by the South Coast Air Quality Management District.

2.2 Groundwater Treatment System

The main GWTS processes free product and groundwater recovered from the south-central and southeastern parts of the site. Free product and groundwater recovered by pneumatically operated, top-loading total fluid pumps and bottom-loading groundwater pumps are piped to an oil-water separator (OWS). Free product, if any, from the OWS is collected in a storage tank and recycled at an offsite location. Water from the OWS is treated using liquid-phase granular activated carbon (LGAC). Treated water is routed through an onsite 3,000-gallon equalization tank. Two fluidized bed bioreactors installed downstream of the equalization tank treat fuel oxygenates such as tertiary butyl alcohol (TBA) and methyl tertiary butyl ether (MTBE). The treated groundwater then passes through polishing LGAC units prior to discharge to a storm drain that leads to Coyote Creek. Discharge to Coyote Creek is performed in accordance with a National Pollutant Discharge Elimination System permit (Permit No. CA0063509; Order No. R4-2016-0309).

2.3 Horizontal Biosparge System

In December 2015, Kinder Morgan completed installation of a horizontal biosparge system in the south-central area of the site. The biosparge well is constructed of 4-inch-diameter Schedule 80 polyvinyl chloride (PVC) casing and screen completed to a vertical depth of approximately 45 feet below ground surface. The lateral distance of the screen interval is 600 feet centered below the central portion of the south-central area hydrocarbon plume. Further details regarding the construction of the biosparge well are documented in the report titled, *Horizontal Biosparge Well and Soil Vapor Monitoring Probe Completion Report* (CH2M, 2015).

The air sparge compressor delivers ambient air to the biosparge well at a maximum design rate of approximately 500 standard cubic feet per minute (scfm). The SVE system has an interlock that ensures the biosparge system cannot operate unless the SVE system is operating. Operation of the SVE system reduces the potential for off-gassing of VOCs during biosparge operations. Pilot testing of the biosparge system commenced in early January 2016 and continued through October 2016. Soil vapor data collected as part of the pilot testing have been submitted to the Water Board and Restoration Advisory Board under separate covers. A comprehensive evaluation report that incorporates soil vapor and groundwater data was submitted to the Water Board in August 2017 (CH2M, 2017). The biosparge system was restarted on June 27, 2017, after installation and startup of the new RTO system.

Based on the favorable results of the pilot study, a second horizontal biosparge well was installed in the southeastern area of the site in November 2017. The design of the second biosparge well is similar to the south-central biosparge well, consisting of 4-inch-diameter Schedule 80 PVC casing and screen completed to a vertical depth of approximately 45 feet below ground surface. The lateral distance of the screen interval is 240 feet centered below the southeast area hydrocarbon plume. A construction completion report documenting construction activities and specifications will be submitted during the third quarter of 2018. A new air sparge compressor will be installed in 2018 to deliver ambient air to the new biosparge well, which will be appropriately sized to allow for future system expansion.

3. Operations and Maintenance

During the second quarter 2018 reporting period, O&M of the remediation systems included the following tasks:

- Performed ongoing weekly maintenance on the GWTS.
- Removed, inspected, and repaired existing TFE/GWE pumps and associated discharge lines.
- Installed pumps and associated equipment necessary for TFE at select wells with measurable free product.

The remediation systems operated continuously during the second quarter 2018, with the following exceptions:

- The GWTS and SVE systems were shut down from April 10 through April 20, 2018, to facilitate gauging and sampling activities during the DFSP first semiannual groundwater sampling event that was conducted April 16 to April 20, 2018.
- The SVE system shut down on April 20 and May 18, 2018, due to low supplied air from the air compressor. The system was restarted on April 22, 2018, and May 18, 2018, respectively.
- The air sparge system went down on April 22 and April 24, 2018, because the air sparge compressor overheated. The air sparge system was restarted on April 24 and April 26, 2018, respectively. On May 11, 2018, the temperature probe and a supporting temperature control equipment were replaced. The air sparge system shut down on May 15, 2018, due to a power overload, and on May 21, 2018, due to a fault with the air cooler fan. The systems were restarted on May 15 and May 22, 2018, respectively.
- The GWTS and SVE systems were shut down on June 5, 2018, to install a new chart recorder. The GWTS and SVE systems were down from June 9 to June 11, 2018, due to a power outage.
- The air sparge system was turned off from June 26 through June 29, 2018, during the biosparge radius-of-influence testing.

During this reporting period, and when the system was operating, GWTS inspections were performed on a weekly basis. For these inspections, volumes of extracted groundwater, hours of operation, and other system parameters were recorded during system operation.

During the second quarter 2018, the GWTS was operational approximately 85 percent of the time (100 percent of the time excluding planned shutdowns and power outages). The SVE system was operational approximately 85 percent of the time (97.3 percent of the time excluding planned shutdowns and power outages). The biosparge system was operational 78 percent of the time (98 percent of the time excluding planned shutdowns and power outages). Table 2 presents the SVE system operation summary. Photoionization detector (PID) measurements and analytical results for extracted vapor during the second quarter 2018 are summarized in Tables 3 and 4, respectively. The groundwater remediation system operation activities for the second quarter 2018 are summarized in Table 5. The extracted groundwater analytical results for the second quarter 2018 are summarized in Table 6. Table 7 presents the biosparge system operation summary. Tables 8 and 9 present the field measurements and soil vapor probe analytical results for March and June 2018, respectively. Historical (post-2007) gauging results of select TFE and SVE wells are provided in Table 10. Pre-2007 data can be found in previous semiannual groundwater monitoring reports.

Water samples from the GWTS influent were collected on April 24 and May 22, 2018. Water samples from the GWTS influent were not collected in June 2018, but were collected the first week of July 2018. Data from the July 2018 sampling event will be included in the Third Quarter 2018 Remediation Progress Report. The water samples were delivered to Asset Laboratories (Asset) of Las Vegas, Nevada, for analysis. Asset is certified by the California Department of Public Health Environmental Laboratory Accreditation Program.

Asset analyzed the water samples for the following:

- Total petroleum hydrocarbons (TPH) quantified as gasoline (TPH-g), TPH quantified as diesel (TPH-d), and TPH quantified as oil (TPH-o) (collectively referred to as TPH-total) using U.S. Environmental Protection Agency (EPA) Method 8015(M)
- VOCs using EPA Method 8260B

Vapor samples from the SVE influent were collected on April 15, May 11, and June 7, 2018. The vapor samples were delivered to Air Technology Laboratories (Air Tech), located in City of Industry, California, for analysis.

Air Tech analyzed the vapor samples for the following:

- Fixed gases (methane, carbon dioxide, oxygen, and argon) using ASTM International (ASTM) D1946
- VOCs using EPA Method TO-15
- Total VOCs using EPA Method TO-3

The laboratory analytical reports and chain-of-custody documents for these samples are included in Appendix A.

Soil vapor sampling was conducted from the soil vapor probes SVM-1 through SVM-3 and SVM-5 through SVM-16 in the south-central area 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 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 for Active Soil Gas Investigations* (DTSC, 2015). Prior to collecting a sample with a 1.4-liter summa canister, field VOC measurements were collected using a PID calibrated against hexane. A pressure measurement was also collected from each probe using a digital manometer. American Analytics mobile conducted these events on March 29 and March 30, 2018, and on June 6 through June 8, 2018. Results of these activities are presented in Tables 8 and 9, respectively.

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.

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-7 (13-foot depth), SVM-14 (23-foot depth), and SVM-16 (22-foot depth) during the March 2018 event. Duplicate soil vapor samples were collected at SVM-7 (13-foot depth), SVM-12 (22-foot depth), and SVM-14 (23-foot depth) during the June 2018 event. 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 chemicals of potential concern (COPCs) near select sampling locations.

American Analytics analyzed the soil vapor samples for the following:

- Fixed gases (methane, carbon dioxide, and oxygen) using EPA Method 3CM
- VOCs using EPA Method TO-15
- Gasoline-range organics using EPA Method TO-3

The laboratory analytical reports and chain-of-custody documents for these samples are included in Appendix A.

4. Summary of Remediation Progress

Based on weekly monitoring of the influent vapor concentration, vapor extraction flow rate, and hours of operation, the total mass of VOCs removed by SVE was 4,841 pounds during the second quarter 2018. The cumulative mass of VOCs removed since SVE was implemented in September 1995 is 3,532,511 pounds (Table 2). The cumulative mass removed by SVE does not include the mass removed by naturally occurring in situ biodegradation. The highest VOC concentration measured with a PID is from GMW-10 (Table 3). Laboratory analytical data (Table 4) shows that the influent VOC concentrations (benzene, toluene, ethylbenzene, and total xylenes [BTEX] and MTBE) have been generally decreasing from January 2018 to June 2018.

A total of 580,344 gallons of groundwater was extracted during the second quarter 2018 (Table 5). No water was extracted from the WSB area during the second quarter 2018. Approximately 103.8 million gallons of groundwater has been extracted from the south-central, southeastern, and WSB areas since GWTS operations first began in 1996.

GWE was discontinued in the WSB region during the third quarter 2008 based on the reduced lateral extent and low concentrations of MTBE and 1,2-dichloroethane (1,2-DCA) west of the site. 1,2-DCA, MTBE, and TBA concentrations in the western area during the semiannual groundwater monitoring event conducted in April 2018 did not warrant restarting the WSB system.

Free product did not accumulate in the product holding tank during the second quarter 2018. Since 1995, a total of 14,426 gallons of product has been removed by TFE, vacuum truck, or manual bailing operations. The estimated mass removal (pounds) of hydrocarbons by the GWTS is shown in Table 5. Mass removal estimates between 1996 and 2005 are based on BTEX and MTBE concentrations in the groundwater influent (TPH data were not available) and total volume of extracted groundwater. Mass removal estimates between 2006 and 2011 are based on groundwater influent concentrations of TPH-g and TPH quantified as fuel product, and the total volume of extracted groundwater. Mass removal estimates between 2012 and the second quarter 2018 are based on groundwater influent TPH-total concentrations (TPH-total includes TPH-g, TPH-d, and TPH-o) and the total volume of extracted groundwater.

Since GWE first began in 1996, hydrocarbon mass removed by the GWTS is estimated to be 18,425 pounds. During the second quarter 2018, the mass removal of hydrocarbons was estimated to be 3.4 pounds (Table 5). Table 6 shows the extracted groundwater analytical results for the samples collected on April 24 and May 22, 2018. TPH, BTEX, and MTBE concentrations during the second quarter 2018 were less than the concentrations reported in late 2015 and early 2016. This reduction in dissolved-phase hydrocarbon concentrations can be attributed to biosparge operations in the south-central area. Appendix B includes time series charts of select wells that show this general decrease in dissolved-phase hydrocarbons in the south-central area.

The biosparge system operated for 1,764 hours in the second quarter 2018 (Table 8). The biosparge system flow (air injection) rate ranged from 98 to 393 scfm during the second quarter 2018. Soil vapor samples were collected from 15 locations around the south-central area biosparge well in March and June 2018.

5. Soil Vapor Monitoring Results

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 EPA Method TO-15. TPH-g was 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 BTEX, MTBE, naphthalene, TBA, 1,2-DCA, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, n-butylbenzene, sec-butylbenzene, isopropylbenzene, n-propylbenzene, and 2-propanol (the leak test compound). These constituents were identified as COPCs based on the results of the 2006 soil gas investigation and human health risk assessment (Geomatrix, 2006).

5.1 Field Volatile Organic Compound and Vacuum Measurements

Tables 8 and 9 present a summary of field VOC measurements (using a PID) and vacuum measurements collected from the south-central area soil vapor monitoring network during the March and June 2018 events, respectively. The biosparge system flow rates during soil vapor monitoring were 403 and 385 scfm during the March and June 2018 monitoring event, respectively. The SVE system was operational during these monitoring events. The following observations were made.

5.1.1 Offsite Probes

- Shallow, middle, and deep intervals 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 a slightly positive pressure of 0.16 inch of water (in. H₂O) in the shallow probe (5-foot depth) of SVM-1 to negative 3.64 in. H₂O in the deep probe (22-foot depth) of SVM-15 during the March 2018 event. Vacuum measurements during the June 2018 event ranged from 0.11 in. H₂O in the shallow probe (5-foot depth) of SVM-1 to negative 3.49 in. H₂O in the deep probe (22-foot depth) of SVM-15. Negative values are indicative of negative pressure created by nearby vapor extraction wells.

5.1.2 Onsite Probes

- During the March 2018 monitoring event, VOCs were detected with a PID in all three probes for SVM-13 (7-foot, 15.5-foot, and 22.5-foot depths) ranging from 0.3 to 1.3 ppmv. In addition, VOCs were detected in the deepest probe of SVM-14R (22-foot depth) at a concentration of 201 ppmv. During the June 2018 monitoring event, VOCs were detected in the shallow probe for SVM-11 (7-foot depth), all three probes for SVM-12 (7-foot, 15-foot, and 22-foot depths), the middle and deep probes for SVM-13 (15.5-foot and 22.5-foot depths), and the deep probe for SVM-13 (23-foot depth). Detected VOCs ranged from 0.1 ppmv to 251 ppmv in the deep probe for SVM-14R.
- During the March 2018 monitoring event, vacuum measurements ranged from negative 17.9 to 0.0 in. H₂O in the soil vapor probes for SVM-11 to SVM-13. Positive pressure was detected in all the soil vapor probes for SVM-14R, ranging from 0.32 to 35.7 in. H₂O in the 23-foot depth probe. During the June 2018 monitoring event, vacuum measurements ranged from negative 19.28 to 0.0 in. H₂O in the soil vapor probes for SVM-11 and SVM-13. Positive pressure was detected in all the soil vapor probes for SVM-14R, ranging from 0.40 to 41.2 in. H₂O in the 23-foot depth probe. The maximum positive pressure that was reported at the deepest probe of SVM-14 was not unexpected due to its close lateral and vertical proximity to the biosparge well.

5.2 Mobile Laboratory Results

Tables 8 and 9 present the analytical results for samples collected during the March and June 2018 sampling events, respectively. Laboratory analytical reports are included in Appendix A. A summary of results is provided below.

5.2.1 Offsite Probes

- During the March 2018 monitoring event, VOCs and TPH-g were nondetect at offsite probes SVM-1, SVM-2, SVM-6, SVM-8, SVM-10, and SVM-15. During the June 2018 monitoring event, VOCs and TPH-g were nondetect at offsite probes SVM-1, SVM-2, SVM-5, SVM-6, SVM-7, SVM-8, SVM-10, and SVM-15.
- Chloroform, which is not a COPC, was detected slightly above the residential soil gas screening level of 0.12 microgram per liter (µg/L) in the 5-foot depth probe of SVM-3 (0.16 µg/L) during the March 2018 sampling event; however, during the June 2018 sampling event, chloroform was half the residential soil gas screening level at the same location. Other non-COPCs that were detected during the March 2018 sampling event include 2,2,4-trimethylpentane, ethanol, and heptane. Bromodichloromethane and heptane were also detected during the June 2018 sampling event. There are no established screening levels for 2,2,4-trimethylpentane, ethanol, and heptane. Bromodichloromethane was detected slightly above its reporting limit, but below the residential soil gas screening level of 0.076 µg/L.
- During the March 2018 sampling event, MTBE was detected in offsite probe SVM-9 (15-foot depth) in the southeastern area, but was below residential and commercial screening levels. There were no COPCs detected in the offsite probes during the June 2018 sampling event.

5.2.2 Onsite Probes

- VOCs and TPH-g were not detected in onsite probes SVM-13 and SVM-14 during the March 2018 sampling event. During June 2018 sampling event, VOCs and TPH-g were not detected in onsite probe SVM-13.
- COPCs were not detected in any of the onsite probes during the March and June 2018 sampling events.
- TPH-g was not detected in the onsite soil vapor monitoring probes during the March 2018 sampling event. During the June 2018 sampling event, chloroform and tetrachloroethylene were detected in onsite soil vapor monitoring probes, but were below residential and commercial screening levels. TPH-g was detected in the deep probe in SVM-14R (23-foot depth) at 34 and 35 µg/L. Methylene chloride, n-hexane, and tetrachloroethylene were detected in the onsite soil vapor probes, but were below residential and commercial screening levels.

Based on the analytical data and PID measurements, shallow soil vapor in the offsite area does not pose an unacceptable human health risk to residents. The SVE system will continue to remain online during biosparging operations.

6. System Evaluation and Optimization

During the second quarter 2018, SVE well valves in the south-central area were fully open to ensure maximum vapor extraction from the offsite area. The following repairs were conducted during this reporting period:

- The disconnected joint on the conveyance line for MW-SF-16 was repaired and the SVE well was restarted during the last week of April 2018.
- During the week of June 11, 2018, vacuum break points were installed for the conveyance line for GMW-9, GMW-22, GMW-24, GMW-25, and MW-SF-11 to allow entrained condensate to drain into the RTO knockout pot.
- The wellhead for VEW-2 was repaired and the SVE well was restarted during the first week of May 2018.
- The antiquated chart recorder was replaced on June 5, 2018.

The SVE wells in the southeastern area also were fully open to ensure maximum vapor extraction in that area.

The GWTS continued to operate during the second quarter 2018 for hydraulic control and product recovery in the south-central and southeastern areas. The GWTS was temporarily offline from April 10 to 20, 2018, during the DFSP semiannual groundwater monitoring event. The system was down on June 9, 2018, due to a power outage and was restarted on June 10, 2018.

Rehabilitation of MW-SF-15, GMW-O-18, GMW-O-15 and GMW-SF-9 was conducted June 19 to June 21, 2018. Wel-Chlor, a disinfectant and sanitizer, was used to slow biofouling in those wells. Approximately 500 gallons of purge water was generated and will be hauled offsite by a transportation and disposal company.

Gauging results from the semiannual monitoring event performed in the second quarter 2018 are provided in Table 10. Historical (post-2007) gauging data for all TFE and SVE wells are also provided in Table 10. During the second quarter 2018, three wells in the south-central area contained free product: GMW-10, MW-O-2, and GMW-O-12. The free product thickness in these wells was 0.13 foot, 0.02 foot, and 1.15 feet, respectively. The substantial decline in measurable product in the south-central area, relative to the fourth quarter 2015 (pre-biosparge conditions) (SGI, 2016), is directly attributable to biosparge system operations that were performed in 2016. Biosparge system operation was restarted during the second quarter 2017 on June 27, 2017, and has continued to operate through the second quarter 2018.

7. Planned Third Quarter 2018 Activities

During the third quarter 2018, Kinder Morgan plans to continue to focus remedial efforts on the south-central and southeastern areas. The following maintenance and other activities are planned:

- Continue operation of SVE and the south-central horizontal biosparge system.
- Conduct one quarterly soil vapor monitoring event for all soil vapor probes in the south-central area.
- Measure weekly VOC concentrations as hexane at the influent and effluent of the RTO system.
- Collect monthly vapor samples at the influent and effluent of the RTO system to be analyzed by TO-15 (VOCs), TO-3 (total VOCs as hexane), and ASTM-D 1946 (fixed gases).
- Continue weekly maintenance and monitoring of the south-central and southeastern SVE and TFE/GWE treatment systems, and the biosparge system.
- Measure quarterly individual well vapor concentrations with a PID at the manifold.
- Collect and analyze system influent vapor and groundwater samples.
- Perform as-needed carbon changeouts of the LGAC vessels.
- Perform as-needed monitoring and remediation well rehabilitation to remove biofouling and sediment occluding the well screens.
- Remove, inspect, and repair existing TFE/GWE pumps and associated discharge lines.
- Install pumps and associated equipment necessary for TFE at select wells with measurable free product.
- Continue to remove free product from wells without TFE pumps using manual bailing methods.
- Repair the conveyance lines for the SVE well network.

The TFE, GWE, and SVE systems for the south-central and southeastern areas will continue to operate. Operation of the TFE system in the southeastern area will be monitored closely and adjustments will be made to improve fluid recovery. System inspections will continue on a weekly basis; system evaluation parameters will be collected as needed. The remediation activities and progress for the third quarter 2018 will be described in the Third Quarter 2018 Remediation Progress Report, to be submitted by October 15, 2018.

Pilot testing of the horizontal biosparge system in the south-central area was completed during the fourth quarter 2016. A comprehensive evaluation report that incorporates soil vapor and groundwater data was submitted to the Water Board in August 2017 (CH2M, 2017). A recommendation for system expansion was included in the report, and an additional horizontal biosparge well was installed in the southeast area in November 2017. The horizontal biosparge system will continue to operate at ideal air flow to decrease product thickness in the south-central area.

8. References

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Tables

Table 1. Remediation Well Construction and Status

SFPP Norwalk Pump Station, Norwalk, California

Remediation Area	Remediation Well ID	Installation Date	Top of Well Casing Elevation	Well Screen Interval	Remediation Well Function	Well Operation Status at End of Second Quarter 2018	
			(feet msl)	(feet bgs)		SVE/BS	TFE/GWE
South-Central	MW-SF-1	6/18/1990	78.93	25 - 40	SVE	ON	--
	MW-SF-2	6/18/1990	78.53	25 - 40	SVE; TFE	ON	OFF
	MW-SF-3	6/18/1990	78.12	25 - 40	SVE; TFE	ON	ON
	MW-SF-4	6/19/1990	79.38	25 - 40	SVE	ON	--
	MW-SF-5	9/19/1990	79.74	23 - 38	SVE	ON	--
	MW-SF-6	9/19/1990	76.80	25 - 40	SVE; TFE	ON	OFF
	MW-SF-9	6/15/1995	74.10	--	SVE	ON	--
	MW-SF-10	9/23/2003	76.53	10 - 30	SVE	ON	--
	MW-SF-11	6/19/2007	78.56	20 - 40	SVE; TFE	ON	OFF
	MW-SF-12	6/18/2007	78.07	20 - 40	SVE; TFE	ON	OFF
	MW-SF-13	6/19/2007	73.40	20 - 40	SVE; TFE	ON	OFF
	MW-SF-14	6/21/2007	78.16	20 - 40	SVE; TFE	ON	OFF
	MW-SF-15	6/21/2007	78.27	20 - 40	SVE; TFE	ON	OFF
	MW-SF-16	6/20/2007	78.21	20 - 40	SVE; TFE	ON	OFF
	MW-SF-17	--	--	--	SVE	--	--
	GMW-9	7/8/1991	77.16	20 - 50	SVE; TFE	ON	OFF
	GMW-10	7/8/1991	N/A	25 - 50	SVE; TFE	ON	ON
	GMW-22	8/2/1991	77.24	25 - 60	SVE; TFE	ON	OFF
	GMW-24	8/5/1991	77.48	25 - 60	SVE; TFE	ON	OFF
	GMW-25	1/10/1992	78.14	20 - 50	SVE; TFE	ON	OFF
	GWR-3	1/10/1992	77.60	20 - 50	SVE; TFE	ON	OFF
	VEW-1	09/19/90	--	5 - 25	SVE	ON	--
	VEW-2	09/19/90	--	5 - 25	SVE	ON	--
	MW-O-1	1/22/1991	75.48	25 - 40	SVE; TFE	ON	OFF
	MW-O-2	1/23/1991	71.90	25 - 40	SVE; TFE	ON	OFF
	GMW-O-11	5/20/1992	74.17	20 - 50	SVE; TFE	ON	ON
	GMW-O-12	5/21/1992	73.49	20 - 50	SVE	ON	--
	GMW-O-20	6/15/1995	73.32	--	SVE; TFE	ON	ON
	GMW-O-21	10/1/1997	71.43	26 - 46	TFE	--	OFF
	GMW-O-23	6/25/2007	73.63	20 - 40	SVE; TFE	ON	ON
	MW-18 (MID)	6/10/1991	75.67	50 - 60	SVE	ON	--
	HW-1	09/06/92	--	--	SVE	ON	--
HW-2	09/06/92	--	--	SVE	ON	--	
BS-01	08/27/14	75.06	--	BIOSPARGE	ON	--	
Southeastern	GMW-O-15	4/19/1994	74.23	20 - 50	SVE; TFE	ON	OFF
	GMW-O-18	7/25/1994	74.36	21 - 40	SVE; TFE	ON	OFF
	GMW-36	4/11/1994	76.66	20 - 50	SVE; TFE	ON	OFF
	GMW-SF-9	4/1/2003	73.05	37 - 46	TFE	--	ON
	GMW-SF-10	4/2/2003	75.77	37 - 46	TFE	--	--
West Side Barrier	BW-2	5/20/1996	73.57	27 - 47	GWE	--	OFF
	BW-3	5/17/1996	74.16	31 - 50	GWE	--	OFF
	BW-4	5/20/1996	74.61	28 - 47	GWE	--	OFF
	BW-5	5/23/1996	73.59	27 - 46	GWE	--	OFF
	BW-6	5/22/1996	73.48	28 - 47	GWE	--	OFF
	BW-7	5/22/1996	74.65	27 - 46	GWE	--	OFF
	BW-8	5/21/1996	75.08	27 - 46	GWE	--	OFF
	BW-9	5/21/1996	76.19	27 - 46	GWE	--	OFF

Notes:

-- = information not available or not applicable

BS = biosparge

feet bgs = feet below ground surface

feet msl = feet above mean sea level based on the National Geodetic Vertical Datum of 1929

GWE = groundwater extraction

SVE = soil vapor extraction

TFE = total fluids extraction

Table 2. Vapor Remediation System Operation Summary

SFPP Norwalk Pump Station, Norwalk, California

System Inspection Date	Cumulative Hours of Operation (hours)	Incremental Hours of Operation (hours)	Influent PID Reading (ppmv as hexane)	System Flow (scfm)	Header Vacuum (in. H ₂ O)	Mass Removed (pounds) ^a
1995 Totals	1,240		--	--	--	281,065
1996 Totals	7,208	5,968	--	--	--	516,717
1997 Totals	12,865	5,657	--	--	--	489,526
1998 Totals	17,877	5,012	--	--	--	223,055
1999 Totals	23,600	5,723	--	--	--	390,836
2000 Totals	29,690	6,090	--	--	--	359,092
2001 Totals	33,671	3,981	--	--	--	224,091
2002 Totals	36,358	2,687	--	--	--	79,363
2003 Totals	39,676	3,319	--	--	--	64,671
2004 Totals	44,193	4,517	--	--	--	120,240
2005 Totals	49,750	5,557	--	--	--	212,175
2006 Totals	52,735	2,985	--	--	--	17,263
2007 Totals	58,319	2,058	--	--	--	7,378
2008 Totals	64,233	5,915	--	--	--	5,878
2009 Totals	68,858	4,625	--	--	--	9,387
2010 Totals	72,369	3,511	--	--	--	1,507
2011 Totals	77,489	5,120	--	--	--	14,629
2012 Totals	84,173	6,684	--	--	--	22,260
2013 Totals	90,414	6,241	--	--	--	90,880
2014 Totals	94,083	3,688	--	--	--	67,744
2015 Totals	98,408	4,325	--	--	--	122,706
2016 Totals	104,405	7,694	--	--	--	156,193
2017 Totals	108,262	3,857	--	--	--	42,194
1/2/2018	108,424	162	702	1,392	50	2,089
1/4/2018	108,474	50	681	1,479	50	626
1/9/2018	108,594	120	722	1,321	50	1,197
1/23/2018	108,668	74	238	1,343	50	272
1/30/2018	108,839	171	150	1,379	50	389
2/6/2018	109,000	161	162	1,329	50	408
2/8/2018	109,048	48	268	1,406	50	201
2/15/2018	109,215	167	212	1,480	50	553
2/20/2018	109,337	122	226	1,448	50	471
2/27/2018	109,485	148	196	1,449	50	540
3/6/2018	109,653	168	234	1,450	50	732
3/9/2018	109,653	0	210	1,450	50	0
3/13/2018	109,747	94	180	1,500	50	307
3/20/2018	109,906	159	162	1,471	50	479
3/27/2018	110,074	168	196	1,447	50	558
First Quarter 2018 Totals	110,074	1,812	--	--	--	8,821
4/3/2018	110,242	168	138	1,448	50	392
4/5/2018	110,291	49	146	1,476	50	121
4/20/2018	110,414	123	156	1,885	50	325
4/24/2018	110,459	45	150	1,739	50	149
5/1/2018	110,627	168	146	1,610	50	528
5/8/2018	110,793	166	180	1,474	50	511
5/11/2018	110,867	74	184	1,550	50	233
5/15/2018	110,963	96	138	1,525	50	245

Table 2. Vapor Remediation System Operation Summary

SFPP Norwalk Pump Station, Norwalk, California

System Inspection Date	Cumulative Hours of Operation (hours)	Incremental Hours of Operation (hours)	Influent PID Reading (ppmv as hexane)	System Flow (scfm)	Header Vacuum (in. H ₂ O)	Mass Removed (pounds) ^a
5/22/2018	111,127	164	158	1,417	50	416
5/29/2018	111,297	170	168	1,541	50	459
6/5/2018	111,463	166	158	1,496	50	462
6/12/2018	111,587	124	116	1,603	50	266
6/19/2018	111,754	167	115	1,538	50	347
6/26/2018	111,921	167	104	1,836	60	388
Second Quarter 2018 Totals	111,921	1,847	--	--	--	4,841
Cumulative Totals	111,921	--	--	--	--	3,532,511

Notes:

^aThe total mass removed is based on influent FID or PID readings, hours of operation, and flow rate.

-- = not applicable or not available

FID = flame ionization detector

in. H₂O = inches of water

PID = photoionization detector

ppmv = parts per million by volume

scfm = standard cubic feet per minute

TPH-g = total petroleum hydrocarbons quantified as gasoline (C4-C12)

Table 3. Remediation Well Vapor Concentrations

SFPP Norwalk Pump Station, Norwalk, California

Remediation Area	Remediation Well ID	Remediation Well Function	5/31/2018 (ppmv as Hexane) ^a
South-Central	MW-SF-1	SVE	0
	MW-SF-2	SVE; TFE	58
	MW-SF-3	SVE; TFE	8
	MW-SF-4	SVE	4
	MW-SF-5	SVE	0
	MW-SF-6	SVE; TFE	129
	MW-SF-9	SVE	0
	MW-SF-10	SVE	0
	MW-SF-11	SVE; TFE	0
	MW-SF-12	SVE; TFE	0
	MW-SF-13	SVE; TFE	0
	MW-SF-14	SVE; TFE	0
	MW-SF-15	SVE; TFE	0
	MW-SF-16	SVE; TFE	0
	MW-SF-17	SVE; TFE	--
	GMW-9	SVE; TFE	NM
	GMW-10	SVE	1,024
	GMW-22	SVE; TFE	NM
	GMW-24	SVE; TFE	134
	GMW-25	SVE; GWE	134
	GWR-3	SVE; GWE	630
	VEW-1	SVE	NM
	VEW-2	SVE	0
	MW-O-1	SVE; TFE	NM
	MW-O-2	SVE; TFE	158
	GMW-O-11	SVE; TFE	8
	GMW-O-12	SVE	0
	GMW-O-20	SVE; TFE	306
	GMW-O-23	SVE; TFE	0
	MW-18 (MID)	SVE	414
HW-1	SVE	440	
HW-2	SVE	708	
Southeastern	GMW-36	SVE; TFE	624
	GMW-O-15	SVE; TFE	624
	GMW-O-18	SVE; TFE	624

Notes:

^a Vapor readings measured in the field with an Eagle 2 photoionization detector (PID) calibrated using 50 ppmv of hexane.

-- = not applicable or not available

GWE = groundwater extraction

NM = Not measured due to condensation in the pipeline.

ppmv = parts per million by volume

SVE = soil vapor extraction

TFE = total fluids extraction

Table 4. Extracted Vapor Analytical Results^a

SFPP Norwalk Pump Station, Norwalk, California

Date Sampled	ASTM D-1946			EPA TO-3		SCAQMD 25.1	EPA TO-15 (VOCs) ^b				
	Methane (%v)	Carbon Dioxide (%v)	Oxygen and Argon (%v)	TPH-g (ppmv)	TVOC (ppmv)	TGNMOC (ppmv)	Benzene (ppbv)	Ethylbenzene (ppbv)	Toluene (ppbv)	Xylenes (ppbv)	MTBE (ppbv)
8/3/2007	<0.5	<0.5	22.0	63	---	---	650	220	1,100	1,420	55
9/5/2007	<0.5	<0.5	22.0	9	---	---	32	48	140	320	18
10/2/2007	<0.5	<0.5	21.9	27	---	---	250	75	430	610	20
11/2/2007	<0.5	<0.5	22.1	5	---	---	40	10	74	95	7
2/1/2008	<0.5	<0.5	21.8	100	---	---	830	260	2,200	1,850	<50
3/4/2008	<0.5	<0.5	21.7	50	---	---	380	98	570	1,250	36
4/8/2008	<0.5	<0.5	22.2	69	---	---	290	110	480	1,040	41
5/23/2008	<0.5	<0.5	21.8	14	---	---	180	24	190	280	23
6/3/2008	<0.5	<0.5	21.7	30	---	---	380	42	400	330	70
7/2/2008	<0.5	<0.5	21.4	49	---	---	32	6	34	45	10
8/19/2008	<0.5	1.7	20.8	50	---	---	390	63	230	450	40
9/5/2008	<0.5	2.0	21.2	22	---	---	130	39	130	340	42
10/7/2008	<0.5	1.43	21.4	10	---	---	41	15	54	181	6.8
11/4/2008	<0.5	2.08	21.1	7.5	---	---	31	47	190	242	<2.0
3/6/2009	<0.5	<0.5	22.0	83	---	---	1,900	180	990	770	240
4/17/2009	<0.5	<0.5	22.2	3.1	---	---	140	8	37	68	26
5/29/2009	<0.5	1.08	21.0	130	---	---	1,700	640	3,700	3,100	100
8/18/2009	<0.5	0.78	21.7	28	---	---	380	37	290	310	33
8/25/2009	<0.5	0.87	20.6	37	---	---	500	44	320	293	20
9/18/2009	<0.5	0.37	21.6	11	---	---	75	11	39	107	3
10/29/2009	<0.5	1.80	18.2	77	---	---	350	45	250	440	4
11/25/2009	<0.5	<0.5	21.1	14	---	---	110	12	110	164	11
12/15/2009	<0.5	<0.5	21.7	7	---	---	28	3	20	47	<3.2
2/26/2010	<0.5	0.4	21.2	20	---	---	300	18	220	260	21
3/26/2010	<0.5	1.0	20.2	18	---	---	380	20	110	90	5
5/4/2010	<0.5	0.4	21.4	13	---	---	100	42	170	222	3
6/29/2010	<0.5	0.4	21.3	9	---	---	74	13	66	82	<5.0
8/3/2010	<0.5	0.6	20.4	29	---	---	210	13	64	85	9
8/31/2010	0.0039 ^c	<0.5	21.4	11	---	---	72	12	66	87	8
9/14/2010	<0.5	<0.5	21.6	6	---	---	63	15	57	84	<3.2
11/2/2010	--	--	--	11	---	---	140	<10	31	28	<10
11/17/2010	0.00075	0.4	22.0	--	---	---	--	--	--	--	--
12/28/2010	0.0052	0.27	22.0	16	---	---	160	37	230	324	4.5
1/14/2011	0.016	0.20	22.0	68	---	---	340	34	89	183	<10
2/8/2011	0.026	0.24	21.0	210	---	---	3,000	1,700	11,000	7,400	110
3/29/2011	0.013	0.13	20.0	5	---	---	170	15	18	41.5	<2.5
4/26/2011	0.0011	0.079	20.0	1.9	---	---	16	2.4	8.8	7.7	<1.2
5/17/2011	0.021	0.65	22.0	90	---	---	2,600	140	2,200	1,100	220
6/17/2011	0.001	0.20	22.0	3	---	---	59	8.1	31	56	<0.25
7/19/2011	0.0056	0.49	22.0	80	---	---	1,800	130	2,200	1,000	<31
8/16/2011	0.0026	0.31	22.0	140	---	---	3,000	600	4,000	2,330	490
9/20/2011	--	--	--	100	---	---	2,100	740.0	2,700	2,040	660
11/22/2011	0.070	0.70	20.0	11	---	---	150	12.0	67	35	<5.0
12/20/2011	0.020	0.34	22.0	0	---	---	110	<25	260	216	<25
1/10/2012	0.010	0.66	20.0	11	---	---	150	14	86	160	<12
2/28/2012	0.0067	0.90	20.0	27	---	---	140	42	140	224	<25
3/13/2012	0.0044	0.71	20.0	27	---	---	440	38	450	241	<25
4/27/2012	0.0290	0.22	21.0	39	---	---	540	42	630	299	<25
5/22/2012	0.0100	0.31	20.0	65	---	---	590	350	770	2,070	<12
6/19/2012	0.0028	0.41	21.0	17	---	---	130	26	150	162	<12
7/27/2012	0.0059	0.40	21.0	13	---	---	46	<5	33	78	<5
8/30/2012	0.0049	0.56	21.0	69	---	---	150	<25	66	194	<25
9/25/2012	0.0073	0.80	21.0	57	---	---	190	19	120	283	<2.5
10/30/2012	0.0099	0.96	21.0	50	---	---	380	<50	230	130	<50
12/11/2012	0.0074	0.84	21.0	53	---	---	130	17	110	173	<5.0

Table 4. Extracted Vapor Analytical Results^a

SFPP Norwalk Pump Station, Norwalk, California

Date Sampled	ASTM D-1946			EPA TO-3		SCAQMD 25.1	EPA TO-15 (VOCs) ^b				
	Methane (%v)	Carbon Dioxide (%v)	Oxygen and Argon (%v)	TPH-g (ppmv)	TVOC (ppmv)	TGNMOC (ppmv)	Benzene (ppbv)	Ethylbenzene (ppbv)	Toluene (ppbv)	Xylenes (ppbv)	MTBE (ppbv)
1/29/2013	0.0028	0.29	22.0	1.4	---	---	8.7	<1.2	9.4	9.6	<1.2
2/12/2013	0.0057	0.88	21.0	60	---	---	500	<50	440	400	<50
3/19/2013	0.0058	0.80	21.0	77	---	---	560	66	490	520	<40
4/16/2013	0.0079	0.74	21.0	53	---	---	430	29	240	193	<25
5/14/2013	0.017	1.6	19	280	---	---	1,700	190	1,800	840	<12
6/28/2013	0.0068	<0.010	21	22	---	---	190	<25	130	131	<25
SVE system down for repair from July 16, 2013, to September 17, 2013.											
9/20/2013	0.014	1	21	590	---	---	4,200	520	3,600	2,830	<40
10/15/2013	0.011	0.68	21	410	---	---	3,500	360	2,800	1,970	<20
11/12/2013	0.012	0.66	21	430	---	---	2,900	440	2,600	1,930	<15
12/10/2013	0.013	0.92	21	910	---	---	8,400	920	7,200	5,500	<50
1/17/2014	0.0077	0.57	21	350	---	---	6,600	6,800	8,200	23,300	3,000
2/11/2014	0.011	0.60	21	640	---	---	6,600	570	6,000	3,800	<100
3/21/2014	0.0050	0.40	21	390	---	---	4,500	290	4,000	1,930	<50
4/21/2014	0.011	0.65	21	700	---	---	6,900	370	6,900	3,400	<40
SVE system down for repair from April 29, 2014, to May 13, 2014.											
5/27/2014	0.011	0.56	21	530	---	---	6,600	570	8,900	3,820	<50
6/13/2014	0.0076	0.49	21	780	---	---	10,000	1,200	15,000	7,100	<80
SVE system down for repair and permit modification from July 1, 2014, to March 27, 2015.											
3/31/2015	0.090	1.3	20	1,400	---	1,300	12,000	1,000	11,000	7,400	<200
4/7/2015	0.014	0.56	21	---	---	710	8,200	8,200	610	3,260	<160
5/5/2015	---	---	---	---	---	760	6,100	1,100	9,600	7,200	<140
6/30/2015	0.0065	0.37	21	---	---	270	3,100	380	3,800	2,820	<160
7/14/2015	0.0094	0.62	21	---	---	650	7,000	950	7,900	6,100	<200
8/4/2015	0.0053	0.49	21	---	---	560	6,200	710	7,700	4,800	<0.097
8/17/2015 ^c	---	---	---	---	---	470	4,800	500	5,400	3,600	<0.099
8/17/2015 ^c	---	---	---	---	---	470	5,000	520	5,800	3,870	<0.100
8/17/2015 ^c	---	---	---	---	---	480	5,100	580	6,100	4,000	<0.097
8/17/2015 ^c	---	---	---	---	---	480	5,200	580	6,300	4,100	<0.099
9/1/2015 ^c	---	---	---	---	---	670	7,000	850	8,700	6,900	<0.097
9/1/2015 ^c	---	---	---	---	---	930	12,000	1,500	14,000	11,400	<0.140
9/1/2015 ^c	---	---	---	---	---	890	12,000	2,300	20,000	14,300	<0.140
10/6/2015	0.0067	0.43	21	---	---	960	14,000	3,100	25,000	15,900	<200
11/10/2015	0.0028	0.30	21	---	860	---	9,100	1,800	15,000	9,400	<97
12/10/2016	0.004	0.41	21	---	580	---	6,400	1,200	10,000	7,600	<120
1/4/2016 ^c	0.0059	0.27	22	---	750	---	9,600	2,400	20,000	13,500	<220
2/4/2016 ^c	0.0038	0.58	21	---	2,000	---	16,000	2,600	29,000	19,300	<610
3/3/2016 ^c	0.004	0.64	21	---	1,200	---	11,000	3,000	27,000	27,500	<130
4/5/2016	0.033	0.49	21	---	400	---	3,900	5,500	7,300	4,600	<63
5/13/2016	0.0034	0.50	21	---	290	---	2,200	300	4,300	810	<23
6/7/2016	0.0065	0.32	21	---	150	---	1,000	25 J	1,100	117 J	<36
7/7/2016	0.014	0.48	21	---	170	---	1,000	220	2,500	1,630	<51
8/2/2016	0.0047	0.54	21	---	260	---	1,900	720	5,000	7,400	<22
9/7/2016	0.0066	0.53	21	---	250	---	1,600	680	3,800	5,000	<21
10/13/2016	0.0096	0.67	21	---	250	---	2,700	680	3,800	5,200	<36
11/1/2016	0.0025	0.62	21	---	260	---	1,600	540	3,800	4,600	<40
SVE system was offline for installation of new RTO from November 1, 2016, to June 6, 2017.											
6/7/2017	0.029	1.1	21	--	190	--	960	220	1,200	1,170	<42
7/13/2017	0.055	1.3	20	---	550	---	220	1,100	6,600	9,900	<44
8/3/2017	0.013	0.85	21	---	340	--	4,200	750	5,600	7,500	<110
9/12/2017	0.0079	0.89	21	--	290	---	3,000	530	4,600	5,500	510
10/13/2017	0.0091	0.85	21	---	280	--	3,400	540	4,100	5,500	830
11/10/2017	0.0064	0.87	21	---	230	---	3,200	320	2,400	3,050	<19
12/8/2017	0.0040	0.77	21	---	250	---	3,600	350	3,000	3,700	<18

Table 4. Extracted Vapor Analytical Results^a

SFPP Norwalk Pump Station, Norwalk, California

Date Sampled	ASTM D-1946			EPA TO-3		SCAQMD 25.1	EPA TO-15 (VOCs) ^b				
	Methane (%v)	Carbon Dioxide (%v)	Oxygen and Argon (%v)	TPH-g (ppmv)	TVOC (ppmv)	TGNMOC (ppmv)	Benzene (ppbv)	Ethylbenzene (ppbv)	Toluene (ppbv)	Xylenes (ppbv)	MTBE (ppbv)
1/4/2018	0.0047	0.72	21	--	230	--	3,900	440	3,100	4,000	970
2/6/2018	0.0042	0.42	22	--	27	--	140	23	150	310	<1.1
3/13/2018	0.0038	0.74	21	--	79	--	680	110	460	1,150	<11
4/15/2018	0.0034	0.49	22	--	33	--	460	53	280	400	<2.0
5/11/2018	0.0046	0.72	21	--	64	--	660	74	410	850	<11
6/7/2018	0.0031	0.65	21	--	58	--	570	83	320	504	<9.7

Notes:

^a Influent vapor samples were collected from the manifold conveying soil vapors extracted from the south-central and southeastern areas.

^b Other detected VOCs are included in the laboratory analytical reports in Appendix A.

^c Influent vapor samples were collected after dilution before entrance into the SVE combustion chamber.

%v = percent by volume

<0.5 = not detected at or above the laboratory reporting limit shown

ASTM = ASTM International

EPA = U.S. Environmental Protection Agency

J = Resulting analyte concentration is between the reporting limit and the method detection limit

MTBE = methyl tertiary butyl ether

ppbv = parts per billion by volume

ppmv = parts per million by volume

SCAQMD = South Coast Air Quality Management District

TGNMOC = total gaseous nonmethane organic carbon

TPH-g = total petroleum hydrocarbons quantified as gasoline (C4-C12)

TVOC = total volatile organic compound

VOC = volatile organic compound

Table 5. Groundwater Remediation System Operation Summary

SFPP Norwalk Pump Station, Norwalk, California

System Inspection Date	Groundwater Removed from the South-Central and Southeastern Areas (gallons)	Groundwater Removed from the West Side Barrier Area (gallons)	Total Groundwater Removed (gallons)	Influent TPH-total (TPH-g, TPH-d, TPH-o) Concentration (µg/L)	Estimated Hydrocarbon Mass Removed from the South-Central, Southeastern, and West Side Barrier Areas (pounds) ^a	Product Recovery (gallons)
1996 Totals	1,802,103	0	1,802,103	--	273	4,995
1997 Totals	7,031,533	0	7,031,533	--		2,204
1998 Totals	4,064,700	0	4,064,700	--		856
1999 Totals	3,891,600	2,338,129	6,229,729	--	385	450
2000 Totals	2,290,580	2,454,971	4,745,551	--	295	230
2001 Totals	1,401,473	1,131,700	2,533,173	--	229	0
2002 Totals	1,452,229	2,931,167	4,383,396	--	110	0
2003 Totals	1,607,095	2,281,956	3,889,051	--	65	10
2004 Totals	1,695,361	3,854,470	5,549,831	--	229	0
2005 Totals	1,537,925	4,244,674	5,782,599	--	273	0
2006 Totals	1,699,567	5,089,615	6,789,182	--	684	83
2007 Totals	3,368,481	2,167,724	5,536,205	--		89
2008 Totals ^b	4,283,026	405,954	4,688,980	--	520	0
2009 Totals	2,309,627	0	2,309,627	--	105	0
2010 Totals ^c	3,342,227	2,292	3,344,519	--	363	0
2011 Totals	5,530,317	0	5,530,317	--	585	0
2012 Totals	7,368,318	0	7,368,318	--	699	0
2013 Totals	6,439,733	0	6,439,733	--	568	2
2014 Totals	3,410,427	0	3,410,427	--	2,236	2,335
2015 Totals	4,817,906	0	4,817,906	--	5,959	2,928
2016 Totals	2,428,279	0	2,428,279	--	4,506	242
2017 Totals	3,858,644	0	3,858,644	--	325	2
1/1/2018	9,122	0	9,122	4,200	0.32	0
1/2/2018	9,938	0	9,938	4,200	0.35	0
1/3/2018	11,254	0	11,254	4,200	0.39	0
1/4/2018	11,090	0	11,090	4,200	0.39	0
1/5/2018	11,030	0	11,030	3,900	0.36	0
1/6/2018	11,184	0	11,184	3,900	0.36	0
1/7/2018	10,898	0	10,898	3,900	0.35	0
1/8/2018	11,314	0	11,314	3,900	0.37	0
1/9/2018	10,224	0	10,224	3,900	0.33	0
1/10/2018	1,812	0	1,812	3,900	0.06	0
1/11/2018	0	0	0	3,900	0.00	0

Table 5. Groundwater Remediation System Operation Summary

SFPP Norwalk Pump Station, Norwalk, California

System Inspection Date	Groundwater Removed from the South-Central and Southeastern Areas (gallons)	Groundwater Removed from the West Side Barrier Area (gallons)	Total Groundwater Removed (gallons)	Influent TPH-total (TPH-g, TPH-d, TPH-o) Concentration (µg/L)	Estimated Hydrocarbon Mass Removed from the South-Central, Southeastern, and West Side Barrier Areas (pounds) ^a	Product Recovery (gallons)
1/12/2018	62	0	62	3,900	0.00	0
1/13/2018	0	0	0	3,900	0.00	0
1/14/2018	0	0	0	3,900	0.00	0
1/15/2018	0	0	0	3,900	0.00	0
1/16/2018	0	0	0	3,900	0.00	0
1/17/2018	0	0	0	3,900	0.00	0
1/18/2018	0	0	0	3,900	0.00	0
1/19/2018	818	0	818	3,900	0.03	0
1/20/2018	0	0	0	3,900	0.00	0
1/21/2018	0	0	0	3,900	0.00	0
1/22/2018	0	0	0	3,900	0.00	0
1/23/2018	6,920	0	6,920	3,900	0.22	0
1/24/2018	8,208	0	8,208	3,900	0.27	0
1/25/2018	6,078	0	6,078	3,900	0.20	0
1/26/2018	5,782	0	5,782	3,900	0.19	0
1/27/2018	5,920	0	5,920	3,900	0.19	0
1/28/2018	5,660	0	5,660	3,900	0.18	0
1/29/2018	5,060	0	5,060	3,900	0.16	0
1/30/2018	2,720	0	2,720	3,900	0.09	0
1/31/2018	0	0	0	3,900	0.00	0
2/1/2018	0	0	0	3,900	0.00	0
2/2/2018	666	0	666	3,900	0.02	0
2/3/2018	0	0	0	3,900	0.00	0
2/4/2018	0	0	0	3,900	0.00	0
2/5/2018	0	0	0	3,900	0.00	0
2/6/2018	7,110	0	7,110	3,900	0.23	0
2/7/2018	15,888	0	15,888	3,900	0.52	0
2/8/2018	18,060	0	18,060	3,900	0.59	0
2/9/2018	14,340	0	14,340	1,200	0.14	0
2/10/2018	12,860	0	12,860	1,200	0.13	0
2/11/2018	12,436	0	12,436	1,200	0.12	0
2/12/2018	12,434	0	12,434	1,200	0.12	0
2/13/2018	11,720	0	11,720	1,200	0.12	0

Table 5. Groundwater Remediation System Operation Summary

SFPP Norwalk Pump Station, Norwalk, California

System Inspection Date	Groundwater Removed from the South-Central and Southeastern Areas (gallons)	Groundwater Removed from the West Side Barrier Area (gallons)	Total Groundwater Removed (gallons)	Influent TPH-total (TPH-g, TPH-d, TPH-o) Concentration (µg/L)	Estimated Hydrocarbon Mass Removed from the South-Central, Southeastern, and West Side Barrier Areas (pounds) ^a	Product Recovery (gallons)
2/14/2018	11,142	0	11,142	1,200	0.11	0
2/15/2018	11,732	0	11,732	1,200	0.12	0
2/16/2018	11,110	0	11,110	1,200	0.11	0
2/17/2018	11,016	0	11,016	1,200	0.11	0
2/18/2018	11,034	0	11,034	1,200	0.11	0
2/19/2018	10,856	0	10,856	1,200	0.11	0
2/20/2018	11,016	0	11,016	1,200	0.11	0
2/21/2018	11,160	0	11,160	1,200	0.11	0
2/22/2018	13,044	0	13,044	1,200	0.13	0
2/23/2018	11,404	0	11,404	1,200	0.11	0
2/24/2018	8,032	0	8,032	1,200	0.08	0
2/25/2018	11,108	0	11,108	1,200	0.11	0
2/26/2018	11,324	0	11,324	1,200	0.11	0
2/27/2018	11,820	0	11,820	1,200	0.12	0
2/28/2018	9,636	0	9,636	1,000	0.08	0
3/1/2018	9,010	0	9,010	1,000	0.08	0
3/2/2018	9,351	0	9,351	1,000	0.08	0
3/3/2018	9,351	0	9,351	1,000	0.08	0
3/4/2018	9,351	0	9,351	1,000	0.08	0
3/5/2018	9,351	0	9,351	1,000	0.08	0
3/6/2018	5,477	0	5,477	1,000	0.05	0
3/7/2018	4,635	0	4,635	1,000	0.04	0
3/8/2018	3,891	0	3,891	1,000	0.03	0
3/9/2018	1,520	0	1,520	1,000	0.01	0
3/10/2018	5,312	0	5,312	1,000	0.04	0
3/11/2018	6,076	0	6,076	1,000	0.05	0
3/12/2018	4,900	0	4,900	1,000	0.04	0
3/13/2018	8,768	0	8,768	1,000	0.07	0
3/14/2018	11,774	0	11,774	1,000	0.10	0
3/15/2018	9,454	0	9,454	1,000	0.08	0
3/16/2018	11,668	0	11,668	1,000	0.10	0
3/17/2018	12,380	0	12,380	1,000	0.10	0
3/18/2018	11,920	0	11,920	1,000	0.10	0

Table 5. Groundwater Remediation System Operation Summary

SFPP Norwalk Pump Station, Norwalk, California

System Inspection Date	Groundwater Removed from the South-Central and Southeastern Areas (gallons)	Groundwater Removed from the West Side Barrier Area (gallons)	Total Groundwater Removed (gallons)	Influent TPH-total (TPH-g, TPH-d, TPH-o) Concentration (µg/L)	Estimated Hydrocarbon Mass Removed from the South-Central, Southeastern, and West Side Barrier Areas (pounds) ^a	Product Recovery (gallons)
3/19/2018	12,050	0	12,050	1,000	0.10	0
3/20/2018	11,090	0	11,090	1,000	0.09	0
3/21/2018	11,600	0	11,600	1,000	0.10	0
3/22/2018	12,016	0	12,016	1,000	0.10	0
3/23/2018	11,612	0	11,612	1,000	0.10	0
3/24/2018	11,560	0	11,560	1,000	0.10	0
3/25/2018	11,616	0	11,616	1,000	0.10	0
3/26/2018	11,472	0	11,472	1,000	0.10	0
3/27/2018	11,420	0	11,420	1,000	0.10	0
3/28/2018	11,150	0	11,150	1,100	0.10	0
3/29/2018	11,150	0	11,150	1,100	0.10	0
3/30/2018	11,094	0	11,094	1,100	0.10	0
3/31/2018	10,686	0	10,686	1,100	0.10	0
First Quarter 2018 Totals	708,746	0	708,746	--	11	0
4/1/2018	9,822	0	9,822	1,100	0.09	0
4/2/2018	9,862	0	9,862	1,100	0.09	0
4/3/2018	6,556	0	6,556	1,100	0.06	0
4/4/2018	9,316	0	9,316	1,100	0.09	0
4/5/2018	6,642	0	6,642	1,100	0.06	0
4/6/2018	12,966	0	12,966	1,100	0.12	0
4/7/2018	8,464	0	8,464	1,100	0.08	0
4/8/2018	8,896	0	8,896	1,100	0.08	0
4/9/2018	8,500	0	8,500	1,100	0.08	0
4/10/2018	6,856	0	6,856	1,100	0.06	0
4/11/2018	0	0	0	1,100	0.00	0
4/12/2018	0	0	0	1,100	0.00	0
4/13/2018	0	0	0	1,100	0.00	0
4/14/2018	0	0	0	1,100	0.00	0
4/15/2018	0	0	0	1,100	0.00	0
4/16/2018	0	0	0	1,100	0.00	0
4/17/2018	0	0	0	1,100	0.00	0
4/18/2018	0	0	0	1,100	0.00	0
4/19/2018	0	0	0	1,100	0.00	0

Table 5. Groundwater Remediation System Operation Summary

SFPP Norwalk Pump Station, Norwalk, California

System Inspection Date	Groundwater Removed from the South-Central and Southeastern Areas (gallons)	Groundwater Removed from the West Side Barrier Area (gallons)	Total Groundwater Removed (gallons)	Influent TPH-total (TPH-g, TPH-d, TPH-o) Concentration (µg/L)	Estimated Hydrocarbon Mass Removed from the South-Central, Southeastern, and West Side Barrier Areas (pounds) ^a	Product Recovery (gallons)
4/20/2018	0	0	0	1,100	0.00	0
4/21/2018	5,194	0	5,194	1,100	0.05	0
4/22/2018	9,584	0	9,584	1,100	0.09	0
4/23/2018	9,520	0	9,520	1,100	0.09	0
4/24/2018	9,462	0	9,462	830	0.07	0
4/25/2018	11,820	0	11,820	830	0.08	0
4/26/2018	10,800	0	10,800	830	0.07	0
4/27/2018	10,760	0	10,760	830	0.07	0
4/28/2018	11,098	0	11,098	830	0.08	0
4/29/2018	10,798	0	10,798	830	0.07	0
4/30/2018	11,040	0	11,040	830	0.08	0
5/1/2018	10,096	0	10,096	830	0.07	0
5/2/2018	7,856	0	7,856	830	0.05	0
5/3/2018	7,952	0	7,952	830	0.05	0
5/4/2018	7,950	0	7,950	830	0.05	0
5/5/2018	7,954	0	7,954	830	0.06	0
5/6/2018	8,128	0	8,128	830	0.06	0
5/7/2018	10,420	0	10,420	830	0.07	0
5/8/2018	9,912	0	9,912	830	0.07	0
5/9/2018	10,036	0	10,036	830	0.07	0
5/10/2018	10,288	0	10,288	830	0.07	0
5/11/2018	10,400	0	10,400	830	0.07	0
5/12/2018	8,128	0	8,128	830	0.06	0
5/13/2018	7,936	0	7,936	830	0.05	0
5/14/2018	7,868	0	7,868	830	0.05	0
5/15/2018	6,076	0	6,076	830	0.04	0
5/16/2018	6,458	0	6,458	830	0.04	0
5/17/2018	8,434	0	8,434	830	0.06	0
5/18/2018	6,838	0	6,838	830	0.05	0
5/19/2018	7,798	0	7,798	830	0.05	0
5/20/2018	7,584	0	7,584	830	0.05	0
5/21/2018	7,520	0	7,520	830	0.05	0
5/22/2018	6,580	0	6,580	340	0.02	0

Table 5. Groundwater Remediation System Operation Summary

SFPP Norwalk Pump Station, Norwalk, California

System Inspection Date	Groundwater Removed from the South-Central and Southeastern Areas (gallons)	Groundwater Removed from the West Side Barrier Area (gallons)	Total Groundwater Removed (gallons)	Influent TPH-total (TPH-g, TPH-d, TPH-o) Concentration (µg/L)	Estimated Hydrocarbon Mass Removed from the South-Central, Southeastern, and West Side Barrier Areas (pounds) ^a	Product Recovery (gallons)
5/23/2018	7,202	0	7,202	340	0.02	0
5/24/2018	7,932	0	7,932	340	0.02	0
5/25/2018	6,792	0	6,792	340	0.02	0
5/26/2018	7,488	0	7,488	340	0.02	0
5/27/2018	7,962	0	7,962	340	0.02	0
5/28/2018	7,608	0	7,608	340	0.02	0
5/29/2018	8,216	0	8,216	340	0.02	0
5/30/2018	8,392	0	8,392	340	0.02	0
5/31/2018	7,368	0	7,368	340	0.02	0
6/1/2018	8,280	0	8,280	340	0.02	0
6/2/2018	3,980	0	3,980	340	0.01	0
6/3/2018	12,352	0	12,352	340	0.03	0
6/4/2018	8,284	0	8,284	340	0.02	0
6/5/2018	6,516	0	6,516	340	0.02	0
6/6/2018	7,672	0	7,672	340	0.02	0
6/7/2018	4,352	0	4,352	340	0.01	0
6/8/2018	6,228	0	6,228	340	0.02	0
6/9/2018	4,512	0	4,512	340	0.01	0
6/10/2018	0	0	0	340	0.00	0
6/11/2018	556	0	556	340	0.002	0
6/12/2018	4,474	0	4,474	340	0.01	0
6/13/2018	7,392	0	7,392	340	0.02	0
6/14/2018	7,462	0	7,462	340	0.02	0
6/15/2018	7,522	0	7,522	340	0.02	0
6/16/2018	7,586	0	7,586	340	0.02	0
6/17/2018	7,448	0	7,448	340	0.02	0
6/18/2018	7,414	0	7,414	340	0.02	0
6/19/2018	4,416	0	4,416	340	0.01	0
6/20/2018	3,610	0	3,610	340	0.01	0
6/21/2018	3,884	0	3,884	340	0.01	0
6/22/2018	3,888	0	3,888	340	0.01	0
6/23/2018	3,974	0	3,974	340	0.01	0
6/24/2018	3,862	0	3,862	340	0.01	0

Table 5. Groundwater Remediation System Operation Summary

SFPP Norwalk Pump Station, Norwalk, California

System Inspection Date	Groundwater Removed from the South-Central and Southeastern Areas (gallons)	Groundwater Removed from the West Side Barrier Area (gallons)	Total Groundwater Removed (gallons)	Influent TPH-total (TPH-g, TPH-d, TPH-o) Concentration (µg/L)	Estimated Hydrocarbon Mass Removed from the South-Central, Southeastern, and West Side Barrier Areas (pounds) ^a	Product Recovery (gallons)
6/25/2018	3,398	0	3,398	340	0.01	0
6/26/2018	690	0	690	340	0.002	0
6/27/2018	772	0	772	340	0.002	0
6/28/2018	0	0	0	340	0.000	0
6/29/2018	352	0	352	340	0.001	0
6/30/2018	340	0	340	340	0.001	0
Second Quarter 2018 Totals	580,344	0	580,344	--	3.4	0
Cumulative Total	76,920,241	26,902,652	103,822,893	--	18,425	14,426

Notes:

^a Estimated hydrocarbon mass removed (pounds) between 1996 and 2005 is based on concentrations of dissolved BTEX and MTBE in the groundwater influent and volume of groundwater extracted. Estimated hydrocarbon mass removed (pounds) between 2006 and 2011 is based on concentrations of TPH-g and TPH-fp in the groundwater influent and volume of groundwater extracted. Estimated hydrocarbon mass removed (pounds) between 2012 and 2015 is based on concentrations of dissolved TPH-total in the groundwater influent and volume of extracted groundwater.

^b Groundwater removal in the West Side Barrier area was discontinued in August 2008.

^c Groundwater extraction from West Side Barrier area wells BW-3 and BW-6 was resumed on May 14, 2010, to evaluate the efficacy of blending water with lower selenium concentrations from these wells with groundwater extracted from the south-central and southeastern areas. Groundwater removal from the West Side Barrier area was discontinued again on June 22, 2010.

-- = not applicable

µg/L = micrograms per liter

BTEX = benzene, toluene, ethylbenzene, and xylenes

MTBE = methyl tertiary butyl ether

TPH-d = total petroleum hydrocarbons quantified as diesel (C13-C22)

TPH-fp = total petroleum hydrocarbons quantified as fuel product (C7-C28)

TPH-g = total petroleum hydrocarbons quantified as gasoline (C4-C12)

TPH-o = total petroleum hydrocarbons quantified as oil (C23-C36)

TPH-total = total petroleum hydrocarbons quantified as gasoline, diesel, and oil (C4-C36)

Table 6. Extracted Groundwater Analytical Results^a

SFPP Norwalk Pump Station, Norwalk, California

Date Sampled	EPA 8015M					EPA 8260B Volatile Organic Compounds (VOCs) ^b									
	TPH-g (µg/L)	TPH-d (µg/L)	TPH-o (µg/L)	TPH-total (µg/L)	TPH-fp (µg/L)	Benzene (µg/L)	Ethylbenzene (µg/L)	Toluene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	
3/6/1996	--	--	--	--	--	2,600	790	7,200	9,100	---	--	--	--	--	
7/23/1998	--	--	--	--	--	750	<10	360	300	---	--	--	--	--	
8/27/1998	--	--	--	--	--	1,000	71	530	800	---	--	--	--	--	
10/1/1998	--	--	--	--	--	1,200	<10	1,400	1,680	---	--	--	--	--	
11/19/1998	--	--	--	--	--	1,600	140	2,600	2,900	---	--	--	--	--	
12/17/1998	--	--	--	--	--	4,500	380	4,500	3,900	---	--	--	--	--	
1/28/1999	--	--	--	--	--	520	79	660	840	---	--	--	--	--	
3/25/1999	--	--	--	--	--	540	160	1,800	4,100	---	--	--	--	--	
4/2/1999	--	--	--	--	--	620	76	520	1,200	---	--	--	--	--	
4/15/1999	--	--	--	--	--	1,400	99	800	1,480	---	--	--	--	--	
5/6/1999	--	--	--	--	--	1,340	180	1,240	1,730	---	--	--	--	--	
6/3/1999	--	--	--	--	--	3,410	343	2,240	2,770	---	--	--	--	--	
8/5/1999	--	--	--	--	--	3,200	780	5,400	5,200	---	--	--	--	--	
9/23/1999	--	--	--	--	--	2,700	130	1,200	720	---	--	--	--	--	
9/30/1999	--	--	--	--	--	1,300	77	480	560	---	--	--	--	--	
10/13/1999	--	--	--	--	--	1,400	100	660	720	---	--	--	--	--	
11/4/1999	--	--	--	--	--	3,000	500	5,600	4,500	---	--	--	--	--	
12/9/1999	--	--	--	--	--	4,500	280	1,400	1,480	---	--	--	--	--	
1/13/2000	--	--	--	--	--	9,000	7,600	14,000	44,000	---	--	--	--	--	
2/11/2000	--	--	--	--	--	2,300	<100	1,200	1,240	3,100	--	--	--	--	
3/10/2000	--	--	--	--	--	380	20	110	430	740	--	--	--	--	
4/13/2000	--	--	--	--	--	1,300	550	450	920	970	--	--	--	--	
6/2/2000	--	--	--	--	--	840	56	240	980	920	--	--	--	--	
6/15/2000	--	--	--	--	--	1,600	82	900	990	2,700	--	--	--	--	
8/3/2000	--	--	--	--	--	1,900	410	3,500	4,400	2,700	--	--	--	--	
8/28/2000	--	--	--	--	--	620	33	200	380	1,800	--	--	--	--	
9/20/2000	--	--	--	--	--	460	<20	73	255	1,300	--	--	--	--	
10/25/2000	--	--	--	--	--	20	<20	<20	216	6,700	--	--	--	--	
11/15/2000	--	--	--	--	--	560	24	210	490	3,700	--	--	--	--	
3/22/2001	--	--	--	--	--	3,800	360	3,900	3,160	5,500	--	--	--	--	
4/30/2001	--	--	--	--	--	4,100	710	5,800	5,600	8,300	--	--	--	--	
5/23/2001	--	--	--	--	--	3,400	160	1,100	1,070	3,900	--	--	--	--	
6/22/2001	--	--	--	--	--	1,700	85	680	680	2,200	--	--	--	--	
7/16/2001	--	--	--	--	--	2,300	130	1,100	1,350	2,100	--	--	--	--	
9/5/2001	--	--	--	--	--	1,500	170	1,200	1,890	1,100	--	--	--	--	

Table 6. Extracted Groundwater Analytical Results^a

SFPP Norwalk Pump Station, Norwalk, California

Date Sampled	EPA 8015M					EPA 8260B Volatile Organic Compounds (VOCs) ^b									
	TPH-g (µg/L)	TPH-d (µg/L)	TPH-o (µg/L)	TPH-total (µg/L)	TPH-fp (µg/L)	Benzene (µg/L)	Ethylbenzene (µg/L)	Toluene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	
1/23/2002	--	--	--	--	--	<0.5	<1	<1	<2	2	--	--	--	--	
2/28/2002	--	--	--	--	--	<0.5	<1	<1	<2	96	--	--	--	--	
3/25/2002	--	--	--	--	--	<0.5	<1	<1	<2	87	--	--	--	--	
5/1/2002	--	--	--	--	--	1,900	31	190	480	1,100	--	--	--	--	
5/17/2002	--	--	--	--	--	1,400	50	180	970	1,000	--	--	--	--	
6/4/2002	--	--	--	--	--	2,700	57	280	530	1,300	--	--	--	--	
7/18/2002	--	--	--	--	--	3,800	66	530	1,160	330	--	--	--	--	
8/8/2002	--	--	--	--	--	4,800	49	610	1,290	460	--	--	--	--	
9/3/2002	--	--	--	--	--	260	<5	5	71	600	--	--	--	--	
10/18/2002	--	--	--	--	--	1,200	70	490	820	570	--	--	--	--	
11/26/2002	--	--	--	--	--	1,300	68	130	590	860	--	--	--	--	
12/27/2002	--	--	--	--	--	1	<1	<1	<2	58	--	--	--	--	
1/30/2003	--	--	--	--	--	<0.5	<1	<1	<2	37	--	--	--	--	
2/26/2003	--	--	--	--	--	4	<1	<1	4	140	--	--	--	--	
3/17/2003	--	--	--	--	--	2,800	23	170	480	570	--	--	--	--	
4/30/2003	--	--	--	--	--	3,700	350	2,200	4,600	490	--	--	--	--	
6/13/2003	--	--	--	--	--	1,200	17	120	510	740	--	--	--	--	
6/19/2003	--	--	--	--	--	680	<10	35	239	680	--	--	--	--	
7/3/2003	--	--	--	--	--	2,600	160	610	2,290	450	--	--	--	--	
7/25/2003	--	--	--	--	--	300	6	3	39	230	--	--	--	--	
8/20/2003	--	--	--	--	--	830	19	130	350	290	--	--	--	--	
9/11/2003	--	--	--	--	--	270	<10	<10	46	420	--	--	--	--	
10/16/2003	--	--	--	--	--	380	<10	<10	121	490	--	--	--	--	
11/17/2003	--	--	--	--	--	93	6	22	106	200	--	--	--	--	
12/19/2003	--	--	--	--	--	300	27	110	1,010	62	--	--	--	--	
1/30/2004	--	--	--	--	--	700	140	740	1,740	22	--	--	--	--	
2/17/2004	--	--	--	--	--	300	47	440	1,150	19	--	--	--	--	
3/8/2004	--	--	--	--	--	52	<5.0	10	149	23	--	--	--	--	
3/21/2004	--	--	--	--	--	420	11	29	318	120	--	--	--	--	
6/28/2004	--	--	--	--	--	740	26	46	337	81	--	--	--	--	
7/30/2004	--	--	--	--	--	660	18	68	280	87	--	--	--	--	
8/27/2004	--	--	--	--	--	1,500	47	140	530	77	--	--	--	--	
9/28/2004	--	--	--	--	--	400	10	32	252	64	--	--	--	--	
10/15/2004	--	--	--	--	--	950	31	130	316	64	--	--	--	--	
11/12/2004	--	--	--	--	--	2,100	1,500	390	15,800	3,000	--	--	--	--	
12/10/2004	--	--	--	--	--	700	320	1,100	3,900	110	--	--	--	--	

Table 6. Extracted Groundwater Analytical Results^a

SFPP Norwalk Pump Station, Norwalk, California

Date Sampled	EPA 8015M					EPA 8260B Volatile Organic Compounds (VOCs) ^b									
	TPH-g (µg/L)	TPH-d (µg/L)	TPH-o (µg/L)	TPH-total (µg/L)	TPH-fp (µg/L)	Benzene (µg/L)	Ethylbenzene (µg/L)	Toluene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	
1/28/2005	--	--	--	--	--	460	140	520	2,260	610	--	--	--	--	
2/25/2005	--	--	--	--	--	5,700	200	650	1,560	1,300	--	--	--	--	
3/22/2005	--	--	--	--	--	<5	<10	<10	26	1,000	--	--	--	--	
4/21/2005	--	--	--	--	--	680	8	21	108	420	--	--	--	--	
5/20/2005	--	--	--	--	--	6	<5	9	50	<5	--	--	--	--	
6/28/2005	--	--	--	--	--	450	80	690	1,030	1,600	--	--	--	--	
7/27/2005	--	--	--	--	--	2,000	170	1,700	5,000	1,200	--	--	--	--	
8/31/2005	--	--	--	--	--	660	34	320	670	220	--	--	--	--	
9/28/2005	--	--	--	--	--	1,800	310	2,800	4,700	360	--	--	--	--	
10/26/2005	--	--	--	--	--	940	330	1,800	3,600	530	--	--	--	--	
11/30/2005	--	--	--	--	--	900	170	900	2,790	760	--	--	--	--	
12/20/2005	--	--	--	--	--	2,500	350	2,600	4,100	2,300	--	--	--	--	
7/11/2007	--	--	--	--	--	4,800	130	890	1,040	690	--	--	--	--	
8/7/2007	14,000	--	--	--	11,000	5,400	140	1,100	770	540	--	--	--	--	
9/25/2007	12,000	--	--	--	30,000	3,400	310	1,600	2,390	540	--	--	--	--	
10/16/2007	8,900	--	--	--	8,400	3,400	94	520	660	390	--	--	--	--	
11/2/2007	44,000	--	--	--	6,500	3,200	130	860	1,160	570	--	--	--	--	
11/30/2007	6,000	--	--	--	5,200	1,800	48	170	490	450	--	--	--	--	
12/21/2007	7,200	--	--	--	4,200	2,100	41	170	430	750	--	--	--	--	
1/4/2008	4,300	--	--	--	7,200	3,300	49	300	540	620	--	--	--	--	
1/18/2008	11,000	--	--	--	2,200	3,600	140	650	850	620	--	--	--	--	
2/1/2008	8,700	--	--	--	5,700	3,600	100	440	930	560	--	--	--	--	
3/4/2008	7,200	--	--	--	4,900	3,900	120	510	770	620	--	--	--	--	
4/8/2008	8,100	--	--	--	10,000	2,800	96	280	580	640	--	--	--	--	
5/6/2008	5,300	--	--	--	2,800	2,900	76	190	328	430	--	--	--	--	
6/3/2008	8,400	--	--	--	6,800	3,700	110	450	480	320	--	--	--	--	
7/2/2008	9,200	--	--	--	4,300 ^c	4,500	75	620	650	400	--	--	--	--	
8/19/2008	4,000	--	--	--	6,600	2,600	57	76	215	450	--	--	--	--	
9/5/2008	160	--	--	--	<500	<12	<25	<25	<25	<25	--	--	--	--	
10/7/2008	<100	--	--	--	<500	0.36 J	<1.0	<1.0	1.59	1.7	--	--	--	--	
11/4/2008	12,000	--	--	--	660,000	2,500	140	220	760	160	--	--	--	--	
12/4/2008	1,300	--	--	--	1,500	600	8.2	28	73	130	--	--	--	--	

Table 6. Extracted Groundwater Analytical Results^a

SFPP Norwalk Pump Station, Norwalk, California

Date Sampled	EPA 8015M					EPA 8260B Volatile Organic Compounds (VOCs) ^b								
	TPH-g (µg/L)	TPH-d (µg/L)	TPH-o (µg/L)	TPH-total (µg/L)	TPH-fp (µg/L)	Benzene (µg/L)	Ethylbenzene (µg/L)	Toluene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)
1/6/2009	1,500	--	--	--	980	560	23	41	110	320	--	--	--	--
3/6/2009	2,500	--	--	--	1,500	1,100	33	51	114	65	--	--	--	--
4/7/2009	3,100	--	--	--	6,900	1,100	36	230	207	210	--	--	--	--
5/13/2009	690	--	--	--	1,500	120	3.2	14	60	24	--	--	--	--
6/12/2009	150	--	--	--	<500	<0.50	<1.0	<1.0	0.71 J	44	--	--	--	--
7/10/2009	4,500	--	--	--	560	1,500	41	68	175	150	--	--	--	--
8/4/2009	2,000	--	--	--	1,000	1,200	16	18	64	100	--	--	--	--
9/1/2009	4,800	--	--	--	3,500	380	45	25	328	5.4 J	--	--	--	--
10/6/2009	3,900	--	--	--	4,600	3,200	21	15	35	82	--	--	--	--
10/27/2009	1,000	--	--	--	<500	520	4	15	10	180	--	--	--	--
11/3/2009	120	--	--	--	<500	2	0.55 J	0.61 J	3	40	--	--	--	--
11/25/2009	5,700	--	--	--	4,000	3,100	26	13	48	88	--	--	--	--
2/16/2010	8,000	--	--	--	5,900	4,700	110	1,300	800	1,800	--	--	--	--
3/9/2010	7,000	--	--	--	5,900	6,600	110	460	550	410	--	--	--	--
4/20/2010	10,000	--	--	--	11,000	6,000	44	230	174	130	--	--	--	--
5/14/2010	8,500	--	--	--	2,100	3,600	67	380	400	210	--	--	--	--
6/25/2010	4,600	--	--	--	2,600	2,200	61	540	380	170	--	--	--	--
7/20/2010	21,000	--	--	--	21,000	3,400	370	3,000	2,550	2,300	--	--	--	--
8/3/2010	3,400	--	--	--	1,500	1,400	17	140	161	390	--	--	--	--
8/10/2010	5,800	--	--	--	3,400	2,600	40	190	169	140	--	--	--	--
9/14/2010	9,400	--	--	--	10,000	4,900	170	1,100	1,340	380	--	--	--	--
10/12/2010	5,700	--	--	--	1,000	2,200	43	140	138	120	--	--	--	--
11/16/2010	1,100	--	--	--	1,600	290	4	15	78	84	--	--	--	--
12/14/2010	7,100	--	--	--	3,200	2,600	76	200	315	340	--	--	--	--
1/14/2011	7,400	--	--	--	3,500	3,700	56	110	220	280	--	--	--	--
2/8/2011	5,600	--	--	--	3,500	2,400	43	110	190	420	--	--	--	--
3/25/2011	3,100	--	--	--	1,200	1,300	51	92	200	300	--	--	--	--
4/26/2011	1,400	--	--	--	1,200	610	5.8	5.7	20	130	--	--	--	--
5/17/2011	3,300	--	--	--	1,700	3,600	82	180	300	240	--	--	--	--
6/21/2011	1,200	--	--	--	720	860	9.6	31	82	190	2,200	6.6	<0.07	<0.1
7/27/2011	14,000	10,000	44J	--	-- ^d	2,800	150	490	2,100	350	2,800	27	<0.07	<0.1
8/26/2011	7,400	--	--	--	57,000	1,400	120	480	1,300	270	1,600	16	<0.07	<0.1
9/23/2011	6,400	--	--	--	2,800	2,800	83.0	160	340	300	1,300	22	<0.07	<0.1
10/25/2011	6,000	--	--	--	2,300	3,000	52	93	200	200	970	20	<0.70	<1.0
11/22/2011	5,900	--	--	--	2,000	3,600	62	140	240	300	2,900	26	<0.07	<0.1
12/20/2011	780	--	--	--	2,000	330	8	14	43	160	1,000	18	<0.07	<0.1

Table 6. Extracted Groundwater Analytical Results^a

SFPP Norwalk Pump Station, Norwalk, California

Date Sampled	EPA 8015M					EPA 8260B Volatile Organic Compounds (VOCs) ^b								
	TPH-g (µg/L)	TPH-d (µg/L)	TPH-o (µg/L)	TPH-total (µg/L)	TPH-fp (µg/L)	Benzene (µg/L)	Ethylbenzene (µg/L)	Toluene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)
1/10/2012	5,300	--	--	--	1,900	3,400	36	70	170	200	960	26	<0.07	<0.1
2/21/2012	4,900	--	--	--	<13	3,400	19	16	48	120	2,200	21	<0.07	<0.1
3/13/2012	6,100	--	--	--	2,100	2,900	43	79	180	120	1,600	23	<0.07	<0.1
4/27/2012	5,100	--	--	--	2,200	3,800	49	61	150	150	500	38	<0.13	<0.12
5/22/2012	6,800	--	--	--	31,000	2,800	49	140	262	150	690	30	<0.13	<0.12
6/19/2012	5,300	--	--	--	36,000	3,200	45	230	200	220	2,800	33	<0.13	<0.12
7/20/2012	5,600	2,400	210	8,200	--	3,000	71	72	510	170	2,700	26	<0.13	<0.12
8/21/2012	3,600	1,100	140	4,900	--	2,400	26	41	80	110	1,500	22	<0.13	<0.12
9/25/2012	2,100	710	71	2,800	--	1,700	25	35	86	150	690	17	<1.0	<1.0
10/30/2012	2,600	700	74	3,374	--	1,400	15	13	52	54	1,200	14	<0.061	<0.054
11/30/2012	860	8,200	260	9,320	--	1,100	2.4	4.4	12	23	690	<0.038	<0.061	<0.054
12/27/2012	6,200	820	86	7,106	--	2,000	39	76	130	120	1,300	20	<0.061	<0.054
1/15/2013	3,400	14,000	400	17,800	--	800	12	25	130	43	1,200	8.7	<0.061	<0.054
2/12/2013	9,900	3,100	150	13,150	--	2,100	110	440	820	110	330	22	<0.061	<0.054
3/5/2013	3,954	970	80	5,004	--	1,400	21	23	87	63	1,200	15	<0.061	<0.054
3/15/2013	--	--	--	--	--	1,400	25	49	98	74	570	14	<0.061	<0.054
4/16/2013	1,100	1,300	270	2,670	--	370	6	19	56	73	530	17	<0.061	<0.054
5/14/2013	4,300	830	99	5,229	--	2,000	52	98	181	61	270	22	<0.061	<0.054
6/28/2013	2,900	870	150	3,920	--	1,100	18	58	76	92	500	11	<0.061	<0.054
7/16/2013	3,600	1,000	130	4,730	--	870	19	47	140	100	600	14	<0.061	<0.054
8/16/2013	3,800	5,900	530	10,230	--	1,400	13	32	85	77	550	27	<0.061	<0.054
9/24/2013	5,800	12,000	550	18,350	--	990	53	400	630	78	440	20	<0.061	<0.054
10/15/2013	3,300	650	120	4,070	--	1,400	11	37	150	43	250	15	<0.061	<0.054
11/12/2013	5,600	3,500	190	9,290	--	570	99	230	660	89	550	20	<0.061	<0.054
12/13/2013	12,500	14,000	400	26,900	--	560	170	690	1,500	52	220	17	<0.061	<0.054
1/17/2014	5,900	980	130	7,010	--	4,200	13	18	61	89	810	40	<0.061	<0.054
2/11/2014	12,000	63,000	2,500	77,500	--	640	130	560	1,990	45	290	12	<0.061	<0.054
3/21/2014	42,000	77,000	2,000	121,000	--	3,700	440	3,300	3,900	100	360	17	<0.061	<0.054
4/21/2014	100,000	30,000	880	130,000	--	6,000	1,300	9,800	9,000	<0.098	<1.0	12	<0.061	<0.054
5/20/2014	33,000	15,000	470	48,000	--	1,400	570	2,700	5,400	30	<0.40	16	<0.061	<0.054
6/13/2014	77,000	33,000	1,100	110,000	--	7,700	1,900	10,000	13,000	38	<0.40	12	<0.061	<0.054
7/12/2014	28,000	82	<52	28,082	--	2,800	820	3,700	6,800	34	<0.40	18J	<25	<25

The GWTS was down between July 29, 2014, and December 1, 2014, to facilitate processing of the modifications to SCAQMD Permit No. F14166 for the GWTS.

Table 6. Extracted Groundwater Analytical Results^a

SFPP Norwalk Pump Station, Norwalk, California

Date Sampled	EPA 8015M					EPA 8260B Volatile Organic Compounds (VOCs) ^b									
	TPH-g (µg/L)	TPH-d (µg/L)	TPH-o (µg/L)	TPH-total (µg/L)	TPH-fp (µg/L)	Benzene (µg/L)	Ethylbenzene (µg/L)	Toluene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	
1/15/2015	8,000	5,600	270	13,870	--	2,200	22	140	430	21	390	11	<0.12	<0.11	
2/20/2015	120,000	47,000	1,500	170,000	--	3,000	350	1,600	3,000	43	<0.80	17	<0.12	<0.11	
3/3/2015	65,000	480,000	15,000	560,000	--	6,600	1,700	9,300	12,000	670	<0.80	11	<0.12	<0.11	
4/7/2015	105,000	92,000	2,900	200,000	--	9,000	2,100	18,000	13,000	1,200	<0.80	8.7	<0.12	17	
5/19/2015	73,000	90,000	2,400	165,400	--	8,200	1,600	17,000	12,000	380	<0.60	25	<0.078	<0.078	
6/2/2015	78,000	89,000	3,100	170,100	--	3,200	530	3,700	7,100	1,100	<0.60	13	<0.078	8.3	
7/30/2015	31,000	16,000	570	47,570	--	3,100	720	5,100	6,200	820	<0.60	27	<0.078	6.2	
8/6/2015	30,000	17,000	570	37,570	--	2,600	500	3,100	6,200	700	<0.60	16	<0.078	6.4	
9/15/2015	50,000	79,000	2,700	129,000	--	3,200	1,800	6,500	14,000	820	<0.60	15	<0.078	7.7	
10/8/2015	51,000	55,000	1,800	107,800	--	5,700	1,400	11,000	11,000	680	<0.60	16	<0.078	6.2	
11/24/2015	45,000	74,000	2,800	121,800	--	3,400	1,100	7,000	7,800	<0.31	<1.5	16	<0.20	<0.20	
12/3/2015	40,000	120,000	4,000	164,000	--	4,800	1,100	7,700	8,300	580	<1.5	19	<0.20	5.9	
1/21/2016	88,000	2,500,000	97,000	2,685,000	--	4,200	1,700	10,000	14,000	380	<0.60	12	<0.078	<0.078	
2/2/2016	31,000	110,000	4,700	145,700	--	2,600	750	4,600	9,500	430	<0.60	8.6	<0.078	<0.078	
4/5/2016	32,000	31,000	1,100	64,100	--	1,500	450	2,200	12,000	390	<3.0	<0.17	<0.39	<0.39	
5/3/2016	2,600	20,000	680	23,280	--	990	18	83	260	6.0	100	7.1	<0.039	<0.039	
6/14/2016	1,900	4,400	280	6,580	--	290	21	110	400	8.6	<5.0	6.00	<1.0	<1.0	
The GWTS was down between June 24, 2016, and September 9, 2016, to facilitate installation of the new DAF/OWS.															
9/20/2016	32	230	130	390	--	<0.036	0.18 J	0.080 J	2.6	2.2	150	10	<0.039	<0.039	
10/21/2016	10,000	9,300	360	20,000	--	320	320	1,100	2,700	5.1	<0.30	5.3	<0.039	<0.039	
11/8/2016	1,100	1,500	130	2,800	--	2.5	<0.036	2.6	160	2.4	66	9.1	<0.039	<0.039	
12/27/2016	140	390	130	660	--	1.2	<0.042	<0.042	2.0 J	1.4	2200	8.7	<0.039	<0.039	
1/19/2017	190	340	120	640	--	6.9	0.24 J	0.15 J	<1.5	2.4	2300	8.1	<0.15	<0.12	
2/3/2017	390	490	170	1,000	--	4.2	0.89 J	3.5	30	3.5	1700	5.1	<0.15	<0.12	
3/3/2017	790	320	78	1,200	--	180	5	1.7 J	24	4.2	620	3.0	<0.15	<0.12	
4/7/2017	1,200	780	140	2,100	--	740	21	23	87	7.5	120	4.8	<0.15	<0.12	
5/4/2017	20	300	100	430	--	0.18 J	<0.036	0.12 J	<1.5	1.4	320	<0.017	<0.039	<0.039	
6/20/2017	11,000	54,000	3,000	68,000	--	1,400	100	400	2,300	15	<18	8.1 J	<1.5	<1.2	
7/20/2017	17 J	400	180	600	--	<1.0	<1.0	<2.0	<2.0	1.2	38	4.2	<1.0	<1.0	
8/3/2017	39 J	410	310	760	--	<1.0	<1.0	<2.0	<2.0	1.3	25	4.2	<1.0	<1.0	
9/20/2017	940	2,400	1,300	4,600	--	<1.0	0.15 J	0.17 J	4.4	0.59	5.4	0.70 J	<1.0	<1.0	
10/10/2017	860	1,200	240	2,300	--	<1.0	5.2	13	120	3.7	26	6.5	<1.0	<1.0	
11/8/2017	4,000	27,000	2,000	33,000	--	24	6.7	8.7	690	70	<5.0	8.8	<1.0	<1.0	
12/15/2017	1,400	2,300	500	4,200	--	6.0	1.6	5.9	52	120	200	<1.0	<1.0	<1.0	

Table 6. Extracted Groundwater Analytical Results^a

SFPP Norwalk Pump Station, Norwalk, California

Date Sampled	EPA 8015M					EPA 8260B Volatile Organic Compounds (VOCs) ^b									
	TPH-g (µg/L)	TPH-d (µg/L)	TPH-o (µg/L)	TPH-total (µg/L)	TPH-fp (µg/L)	Benzene (µg/L)	Ethylbenzene (µg/L)	Toluene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	
1/4/2018	1,800	1,500	560	3,900	--	190	4.9	30	410	160	240	5.4	<1.0	<1.0	
2/8/2018	36	640	530	1,200	--	0.53 J	<1.0	0.62 J	2.4	2.4	<5.0	2.1	<1.0	<1.0	
2/27/2018	220	560	240	100	--	3.9	0.55 J	1.6 J	9.3	2.3	26	5.5	<1.0	<1.0	
3/27/2018	430	380	330	1,100	--	5.3	0.83 J	<2.0	11	43	410	2.1	<1.0	<1.0	
4/24/2018	49 J	370	410	830 J	--	<1.0	<1.0	<2.0	<2.0	1.7	230	1.6	<1.0	<1.0	
5/22/2018	45 J	120	180	340	--	<1.0	<1.0	<2.0	<2.0	0.94 J	330	0.45 J	<1.0	<1.0	

Notes:

^a Influent samples were collected from the manifold conveying groundwater extracted from the south-central and southeastern areas.

^b Other detected VOCs are included in the laboratory analytical reports in Appendix A.

^c TPH-fp result from extracted groundwater sample collected on July 10, 2008.

^d The July 27, 2011, sample, and samples collected after July 20, 2012, were analyzed for TPH-g, TPH-d, and TPH-o.

-- = not analyzed

<500 = Not detected at or above the laboratory reporting limit (RL) shown

µg/L = micrograms per liter

DAF = dissolved air flotation

DIPE = di-isopropyl ether

ETBE = ethyl tertiary butyl ether

GWTS = groundwater treatment system

J = Analyte was detected above the laboratory method detection limit and below the laboratory RL

B = Analyte detected in the associated Method Blank

MTBE = methyl tertiary butyl ether

OWS = oil-water separator

SCAQMD = South Coast Air Quality Management District

TAME = tertiary amyl methyl ether

TBA = tertiary butyl alcohol

TPH-d = total petroleum hydrocarbons quantified as diesel (C13-C22)

TPH-fp = total petroleum hydrocarbons quantified as fuel product (C7-C28)

TPH-g = total petroleum hydrocarbons quantified as gasoline (C4-C12)

TPH-o = total petroleum hydrocarbons quantified as oil (C23-C36)

TPH-total = total petroleum hydrocarbons quantified as gasoline, diesel, and oil (C4-C36)

Table 7. Biosparge System Operation Summary
SFPP Norwalk Pump Station, Norwalk, California

System Inspection Date	Cumulative Hours of Operation (hours)	Incremental Hours of Operation (hours)	Incremental Uptime (%)	System Flow ^a (scfm)	BS-01 Sparge Leg Pressure (psi)
1/6/2016	0			60	10
2/16/2016	899	899	91.9	500	13
2/23/2016	1,071	172	99.1	500	14
2/29/2016	1,192	121	85.1	500	13
3/1/2016	1,214	22	98.5	500	13
3/8/2016	1,381	167	99.9	500	14
3/10/2016	1,426	45	98.5	500	14
3/22/2016	1,432	6	2.0	240	7
3/31/2016	1,524	92	42.5	180	8
First Quarter 2016 Totals	1,524	1,524	74.7	--	--
4/5/2016	1,644	120	99.2	120	7
4/15/2016	1,645	1	0.4	120	8
4/19/2016	1,735	90	99.4	240	9
4/25/2016	1,856	121	84.6	120	8
4/26/2016	1,881	25	87.7	240	8
4/29/2016	1,955	74	100.0	240	7
5/10/2016	1,955	0	0.0	240	8
5/17/2016	2,123	168	99.8	240	6
5/19/2016	2,140	17	36.9	120	5
5/24/2016	2,254	114	94.4	360	6
5/31/2016	2,422	168	98.7	360	7
6/7/2016	2,591	169	100.0	420	7
6/14/2016	2,754	163	95.3	420	8
6/21/2016	2,906	152	92.7	420	8
6/24/2016	2,982	76	99.6	420	8
Second Quarter 2016 Totals	2,982	1,458	71.5	--	--

Table 7. Biosparge System Operation Summary
SFPP Norwalk Pump Station, Norwalk, California

System Inspection Date	Cumulative Hours of Operation (hours)	Incremental Hours of Operation (hours)	Incremental Uptime (%)	System Flow ^a (scfm)	BS-01 Sparge Leg Pressure (psi)
7/1/2016	2,982	0	0.0	120	5
7/7/2016	3,121	139	97.9	250	8
7/12/2016	3,242	121	100.0	420	5
7/19/2016	3,410	168	97.1	420	8
7/26/2016	3,575	165	99.8	420	8
8/2/2016	3,744	169	99.6	425	8
8/11/2016	3,931	187	88.0	240	7
8/16/2016	3,961	30	24.7	220	8
8/24/2016	4,033	72	36.5	120	4
8/25/2016	4,053	20	89.9	220	8
8/26/2016	4,067	14	66.7	78	5
8/30/2016	4,157	90	96.8	300	9
9/6/2016	4,303	146	84.5	85	5
9/13/2016	4,440	137	81.7	400	8
9/20/2016	4,611	171	100.0	586	14
9/27/2016	4,775	164	100.0	559	13
Third Quarter 2016 Totals	4,775	1,793	78.7	--	--
10/7/2016	4,776	1	0.4	110	4
10/8/2016	4,797	21	98.7	170	6
10/11/2016	4,866	69	99.9	420	11
10/13/2016	4,916	50	99.9	563	15
10/18/2016	4,965	49	42.1	120	8
10/25/2016	5,133	168	100.0	585	14
11/1/2016	5,302	169	99.8	598	14
Fourth Quarter 2016 Totals	5,302	527	62.7	--	--
2016 Totals	5,302	5,302	--	--	--
First Quarter 2017 Totals	5,302	0	--	--	--
6/27/2017	5,302	0	0.0	220	6
6/30/2017	5,368	66	22.0	207	7
Second Quarter 2017 Totals	5,368	66	--	--	--

Table 7. Biosparge System Operation Summary
SFPP Norwalk Pump Station, Norwalk, California

System Inspection Date	Cumulative Hours of Operation (hours)	Incremental Hours of Operation (hours)	Incremental Uptime (%)	System Flow ^a (scfm)	BS-01 Sparge Leg Pressure (psi)
7/5/2017	5,490	122	92.7	300	9
7/10/2017	5,610	120	100.0	290	8
7/13/2017	5,679	69	95.8	421	11
7/20/2017	5,850	171	100.0	526	14
7/25/2017	5,971	121	100.0	694	14
8/3/2017	6,183	212	94.4	544	13
8/8/2017	6,302	119	99.1	545	15
8/15/2017	6,417	115	68.8	550	14
8/22/2017	6,588	171	100.0	541	14
8/29/2017	6,753	165	99.1	544	14
9/7/2017	6,826	73	33.1	240	7
9/12/2017	6,941	115	100.0	747	14
9/18/2017	7,065	124	85.2	240	7
9/19/2017	7,089	24	100.0	218	7
9/26/2017	7,255	166	99.3	544	15
Third Quarter 2017 Totals	7,255	1,887	89.1	--	--
10/6/2017	7,260	5	2.1	260	7
10/10/2017	7,354	94	97.9	521	15
10/12/2017	7,397	43	89.6	556	15
10/16/2017	7,482	85	88.5	250	6
11/2/2017	7,485	3	0.7	260	8
11/7/2017	7,604	119	99.2	549	15
11/21/2017	7,652	48	14.3	280	10
11/28/2017	7,751	99	58.9	594	15
12/5/2017	7,914	163	97.0	705	15
12/8/2017	7,964	50	69.4	697	14
12/12/2017	8,081	117	100.0	774	13
12/19/2017	8,247	166	98.8	782	14
1/2/2018	8,580	333	99.1	755	14
Fourth Quarter 2017 Totals	8,580	1,325	56.5		

Table 7. Biosparge System Operation Summary
SFPP Norwalk Pump Station, Norwalk, California

System Inspection Date	Cumulative Hours of Operation (hours)	Incremental Hours of Operation (hours)	Incremental Uptime (%)	System Flow ^a (scfm)	BS-01 Sparge Leg Pressure (psi)
1/9/2018	8,751	171	100.0	589	13
1/23/2018	8,823	72	21.4	625	14
1/30/2018	8,932	109	64.9	294	8
2/6/2018	9,005	73	43.5	295	8
2/15/2018	9,219	214	95.4	624	14
2/20/2018	9,342	123	100.0	624	14
2/27/2018	9,490	148	90.2	629	14
3/13/2018	9,751	261	79.3	359	8
3/20/2018	9,911	160	95.2	412	8
3/27/2018	10,078	167	99.4	403	8
First Quarter 2018 Totals	10,078	1,498	74.3	--	--
4/3/2018	10,247	169	100.0	374	8
4/5/2018	10,295	48	100.0	368	8
4/24/2018	10,419	124	27.2	190	7
4/27/2018	10,493	74	100.0	269	8
5/1/2018	10,585	92	95.8	279	8
5/8/2018	10,752	167	99.4	389	8
5/11/2018	10,826	74	100.0	393	9
5/14/2018	10,899	73	100.0	98	5
5/15/2018	10,900	1	4.2	117	5
5/18/2018	10,974	74	100.0	113	5
5/22/2018	11,049	75	78.1	104	5
5/25/2018	11,118	69	95.8	101	5
5/29/2018	11,217	99	100.0	209	6
6/5/2018	11,381	164	97.6	385	8
6/7/2018	11,431	50	100.0	386	9
6/12/2018	11,504	73	60.8	252	7
6/19/2018	11,673	169	100.0	336	8
6/26/2018	11,841	168	100.0	356	8
6/29/2018	11,842	1.0	1.4	101	5
Second Quarter 2018 Totals	11,842	1,764	78.2	--	--
Cumulative Totals	11,842	--	54.6	--	--

Notes:

^a Estimated system flow based on header flowmeter.

-- = not applicable or not available

psi = pounds per square inch

scfm = standard cubic feet per minute

Table 8. Field Measurements and Mobile Laboratory Soil Vapor Analytical Results - March 2018

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 3/29/2018 SVM-1 5-5.5	SVM-1-15 3/29/2018 SVM-1 15-15.5	SVM-2-5 3/29/2018 SVM-2 5-5.5	SVM-3-15 3/29/2018 SVM-3 15-15.5	SVM-3-5 3/29/2018 SVM-3 5-5.5	SVM-5-15 3/29/2018 SVM-5 15-15.5	SVM-5-5 3/29/2018 SVM-5 5-5.5	SVM-6-7 3/29/2018 SVM-6 7-7.5	SVM-6-15 3/29/2018 SVM-6 15-15.5	SVM-7-6 3/29/2018 SVM-7 6-6.5	SVM-7-13 DUP 3/29/2018 SVM-7 13-13.5	SVM-7-13 3/29/2018 SVM-7 13-13.5
Field Measurements	Pressure	inches H ₂ O	---	---	0.16	-1.66	-0.18	-0.44	-0.09	-2.19	-0.25	-0.04	-0.64	0.0	--	-0.12
	PID	ppmv	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0
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	2,2,4-Trimethylpentane	µg/L			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	1	<0.02	<0.02
	Chloroform	µg/L	0.12	0.53	<0.02	<0.02	<0.02	<0.02	0.16	<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	0.045	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Heptane	µg/L			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Oxygen	% v/v	---	---	19	19	19	19	19	19	19	18	18	17	16	15
	Carbon Dioxide	% v/v	---	---	0.1	<0.1	<0.1	0.15	0.15	<0.1	<0.1	0.94	2.3	0.42	1.9	1.9

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)

Biosparge Air Flow Rate during the field measurement event was **403** standard cubic feet per minute.

SVM-11-7 Blue highlighting indicates onsite soil vapor probe locations

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

COPCs = chemicals of potential concern

DUP = field duplicate

TPH-g = total petroleum hydrocarbons quantified as gasoline

3/29/2018 = sample date

SVM-1 = sample location

SVM-1-5 = sample ID

5-5.5 = sample depth in feet below ground surface

Table 8. Field Measurements and Mobile Laboratory Soil Vapor Analytical Results - March 2018

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 3/29/2018 SVM-8 5-5.5	SVM-8-15 3/29/2018 SVM-8 15-15.5	SVM-9-5 3/30/2018 SVM-9 5-5.5	SVM-9-15 3/30/2018 SVM-9 15-15.5	SVM-10-15 3/29/2018 SVM-10 15-15.5	SVM-11-7 3/30/2018 SVM-11 7-7.5	SVM-11-15 3/30/2018 SVM-11 15-15.5	SVM-11-22 3/30/2018 SVM-11 22-22.5	SVM-12-7 3/30/2018 SVM-12 7-7.5	SVM-12-15 3/30/2018 SVM-12 15-15.5	SVM-12-22 3/30/2018 SVM-12 22-22.5	SVM-13-7 3/30/2018 SVM-13 7-7.5
Field Measurements	Pressure	inches H ₂ O	---	---	-0.10	-0.71	0.0	0.0	0.0	0.0	-0.19	-0.32	0.0	0.0	0.0	-2.2
	PID	ppmv	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9
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	0.032	<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	2,2,4-Trimethylpentane	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
	Chloroform	µg/L	0.12	0.53	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.021	<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
	Heptane	µg/L			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Tetrachloroethylene (PCE)	µg/L	0.48	2.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.051	0.096	<0.02	<0.02	0.028	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Oxygen	% v/v	---	---	19	19	18	16	10	18	14	8.1	14	7.9	5.2	19
	Carbon Dioxide	% v/v	---	---	<0.1	<0.1	0.43	2.5	2.9	2.8	5.2	8.3	5.3	9.9	11	<0.1

Table 8. Field Measurements and Mobile Laboratory Soil Vapor Analytical Results - March 2018

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-13-15.5 3/30/2018 SVM-13 15.5-16	SVM-13-22.5 3/30/2018 SVM-13 22.5-23	SVM-14R-8 3/30/2018 SVM-14R 8-8.5	SVM-14R-16 3/30/2018 SVM-14R 16-16.5	SVM-14R-23 3/30/2018 SVM-14R 23-23.5	SVM-14R-23 DUP 3/30/2018 SVM-14R 23-23.5	SVM-15-7 3/29/2018 SVM-15 7-7.5	SVM-15-15 3/29/2018 SVM-15 15-15.5	SVM-15-22 3/29/2018 SVM-15 22-22.5	SVM-16-7 3/29/2018 SVM-16 7-7.5	SVM-16-16 3/29/2018 SVM-16 16-16.5
Field Measurements	Pressure	inches H ₂ O	---	---	-15.00	-17.9	0.32	0.47	35.7	---	-0.16	-0.08	-3.64	0.0	-0.45
	PID	ppmv	---	---	1.3	0.3	0.0	0.0	201	---	0.0	0.0	0.0	0.0	0.0
COPCs ⁴	1,2,4-Trimethylbenzene	µg/L	7.3	31	<0.02	<0.02	<0.02	<0.02	<0.4	<0.4	<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	<0.4	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02
	1,3,5-Trimethylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.4	<0.4	<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	<4	<4	<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	<0.4	<0.4	<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	<0.4	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02
	Isopropylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.4	<0.4	<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	<0.4	<0.4	<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	<0.4	<0.4	<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	<0.4	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.4	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Propylbenzene	µg/L	1000	4400	<0.02	<0.02	<0.02	<0.02	<0.4	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02
	o-Xylene	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.4	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02
	sec-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.4	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02
	tert-Butanol (TBA)	µg/L	---	---	<20	<20	<20	<20	<400	<400	<20	<20	<20	<20	<20
Toluene	µg/L	310	1300	<0.02	<0.02	<0.02	<0.02	<0.4	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02	
Other Detected Compounds	2,2,4-Trimethylpentane	µg/L			<0.02	<0.02	<0.02	<0.02	<0.4	<0.4	<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	<0.4	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02
	Ethanol	µg/L			<0.02	<0.02	<0.02	<0.02	<0.4	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02
	Heptane	µg/L			<0.02	<0.02	<0.02	<0.02	<0.4	<0.4	<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	<0.4	<0.4	<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	
Fixed Gases	Methane	% v/v	---	---	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Oxygen	% v/v	---	---	19	18	18	19	19	19	19	19	18	19	8.7
	Carbon Dioxide	% v/v	---	---	<0.1	0.88	0.34	0.32	0.34	0.32	0.11	0.17	0.34	0.28	7.4

Table 8. Field Measurements and Mobile Laboratory Soil Vapor Analytical Results - March 2018

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 3/29/2018 SVM-16 22-22.5	SVM-16-22 DUP 3/29/2018 SVM-16 22-22.5	Ambient Air 3/29/2018	Ambient Air 3/30/2018
Field Measurements	Pressure	inches H ₂ O	---	---	-0.72	---	---	---
	PID	ppmv	---	---	0.0	---	---	---
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	2,2,4-Trimethylpentane	µg/L			0.033	0.027	<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	<0.02
	Heptane	µg/L			0.029	0.023	<0.02	<0.02
	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	<0.1	---	---
	Oxygen	% v/v	---	---	9	9.1	---	---
	Carbon Dioxide	% v/v	---	---	7.4	7.5	---	---

Table 9. Field Measurements and Mobile Laboratory Soil Vapor Analytical Results - June 2018

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 6/6/2018 SVM-1 5-5.5	SVM-1-15 6/6/2018 SVM-1 15-15.5	SVM-2-5 6/6/2018 SVM-2 5-5.5	SVM-3-15 6/7/2018 SVM-3 15-15.5	SVM-3-5 6/7/2018 SVM-3 5-5.5	SVM-5-15 6/7/2018 SVM-5 15-15.5	SVM-5-5 6/7/2018 SVM-5 5-5.5	SVM-6-7 6/6/2018 SVM-6 7-7.5	SVM-6-13 6/6/2018 SVM-6 13-13.5	SVM-7-6 6/6/2018 SVM-7 6-6.5	SVM-7-13 6/6/2018 SVM-7 13-13.5	SVM-7-13 DUP 6/6/2018 SVM-7 13-13.5	SVM-8-5 6/7/2018 SVM-8 5-5.5
Field Measurements	Pressure	inches H ₂ O	---	---	0.11	-1.65	-0.13	-0.40	0.0	-2.68	-0.25	0.0	-0.41	0.0	0.0	--	-0.10
	PID	ppmv	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0
COPCs ⁴	1,2,4-Trimethylbenzene	µg/L	7.3	31	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	1,2-Dichloroethane	µg/L	0.11	0.47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	1,3,5-Trimethylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	2-Propanol (leak test compound)	µg/L	---	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Benzene	µg/L	0.097	0.42	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Ethylbenzene	µg/L	1.1	4.9	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Isopropylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	m,p-Xylenes	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Methyl tert-butyl ether (MTBE)	µg/L	11	47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Naphthalene	µg/L	0.083	0.36	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Propylbenzene	µg/L	1000	4400	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	o-Xylene	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	sec-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	tert-Butanol (TBA)	µg/L	---	---	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Toluene	µg/L	310	1300	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Other Detected Compounds	Bromodichloromethane	µg/L	0.076	0.33	<0.02	<0.02	<0.02	<0.02	0.027	<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	0.025	0.056	<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	<0.02
	Heptane	µg/L			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Methylene Chloride	µg/L			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Hexane	µg/L	730	3100	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	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	<0.02
Fixed Gases	Methane	% v/v	---	---	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Oxygen	% v/v	---	---	19	19	19	19	19	19	19	19	18	18	18	18	19
	Carbon Dioxide	% v/v	---	---	<0.1	<0.1	<0.1	0.29	0.2	<0.1	<0.1	0.35	0.9	0.78	0.91	0.92	0.16

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)

Biosparge Air Flow Rate during the field measurement event was **385** standard cubic feet per minute.

SVM-11-7 Blue highlighting indicates onsite soil vapor probe locations

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

COPCs = chemicals of potential concern

DUP = field duplicate

TPH-g = total petroleum hydrocarbons quantified as gasoline

6/7/2018 = sample date

SVM-1 = sample location

SVM-1-5 = sample ID

5-5.5 = sample depth in feet below ground surface

Table 9. Field Measurements and Mobile Laboratory Soil Vapor Analytical Results - June 2018

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-8-15 6/7/2018 SVM-8 15-15.5	SVM-10-15 6/6/2018 SVM-10 15-15.5	SVM-11-7 6/8/2018 SVM-11 7-7.5	SVM-11-15 6/8/2018 SVM-11 15-15.5	SVM-11-22 6/8/2018 SVM-11 22-22.5	SVM-12-7 6/7/2018 SVM-12 7-7.5	SVM-12-15 6/7/2018 SVM-12 15-15.5	SVM-12-22 6/7/2018 SVM-12 22-22.5	SVM-12-22 DUP 6/7/2018 SVM-12 22-22.5	SVM-13-7 6/8/2018 SVM-13 7-7.5	SVM-13-15.5 6/8/2018 SVM-13 15.5-16
Field Measurements	Pressure	inches H ₂ O	---	---	-0.84	0.0	0.0	-0.37	-0.77	0.0	0.0	0.0	--	-1.82	-15.41
	PID	ppmv	---	---	0.0	0.0	0.3	0.0	0.0	0.1	0.4	0.1	--	0.0	0.3
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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	tert-Butanol (TBA)	µg/L	---	---	<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	
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
	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
	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
	Heptane	µg/L			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Methylene Chloride	µg/L			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Hexane	µg/L	730	3100	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Tetrachloroethylene (PCE)	µg/L	0.48	2.1	<0.02	<0.02	<0.02	0.025	0.1	<0.02	<0.02	0.028	0.028	<0.02	<0.02
TPH-G (C4-C12)	µg/L	630	2600	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	
Fixed Gases	Methane	% v/v	---	---	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Oxygen	% v/v	---	---	19	11	19	18	8	18	15	11	11	19	19
	Carbon Dioxide	% v/v	---	---	0.14	3.5	0.9	2.9	9.6	3.3	7.5	7.6	7.6	<0.1	<0.1

Table 9. Field Measurements and Mobile Laboratory Soil Vapor Analytical Results - June 2018

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-13-22.5 6/8/2018 SVM-13 22.5-23	SVM-14R-8 6/8/2018 SVM-14R 8-8.5	SVM-14R-16 6/8/2018 SVM-14R 16-16.5	SVM-14R-23 6/8/2018 SVM-14R 23-23.5	SVM-14R-23 DUP 6/8/2018 SVM-14R 23-23.5	SVM-15-7 6/6/2018 SVM-15 7-7.5	SVM-15-15 6/6/2018 SVM-15 15-15.5	SVM-15-22 6/6/2018 SVM-15 22-22.5	SVM-16-7 6/7/2018 SVM-16 7-7.5	SVM-16-16 6/7/2018 SVM-16 16-16.5	SVM-16-22 6/7/2018 SVM-16 22-22.5
Field Measurements	Pressure	inches H ₂ O	---	---	-19.28	0.40	0.60	41.2	---	0.0	-0.11	-3.49	0.0	-0.54	-0.83
	PID	ppmv	---	---	0.7	0.0	0.0	251	---	0.0	0.0	0.0	0.0	0.0	0.0
COPCs ⁴	1,2,4-Trimethylbenzene	µg/L	7.3	31	<0.02	<0.02	<0.02	<0.2	<0.2	<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	<0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	1,3,5-Trimethylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.2	<0.2	<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	<2	<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	<0.2	<0.2	<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	<0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Isopropylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.2	<0.2	<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	<0.2	<0.2	<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	<0.2	<0.2	<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	<0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Propylbenzene	µg/L	1000	4400	<0.02	<0.02	<0.02	<0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	o-Xylene	µg/L	100	440	<0.02	<0.02	<0.02	<0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	sec-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	tert-Butanol (TBA)	µg/L	---	---	<20	<20	<20	<200	<200	<20	<20	<20	<20	<20	<20
Toluene	µg/L	310	1300	<0.02	<0.02	<0.02	<0.2	<0.2	<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	<0.2	<0.2	<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	<0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Ethanol	µg/L			<0.02	<0.02	<0.02	<0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Heptane	µg/L			<0.02	<0.02	<0.02	<0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	0.024
	Methylene Chloride	µg/L			<0.02	0.024	<0.02	<0.2	<0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Hexane	µg/L	730	3100	<0.02	0.032	<0.02	<0.2	<0.2	<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	0.37	0.37	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TPH-G (C4-C12)	µg/L	630	2600	<20	<20	<20	35	34	<20	<20	<20	<20	<20	<20	
Fixed Gases	Methane	% v/v	---	---	18	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Oxygen	% v/v	---	---	0.88	18	19	19	19	19	19	19	19	19	10
	Carbon Dioxide	% v/v	---	---	<0.1	0.55	0.5	0.26	0.22	0.15	0.19	<0.1	0.36	0.61	6.8

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
GMW-9	4/30/2007	74.44	26.71	---	---	47.73	Secor
	11/12/2007	74.44	27.32	27.04	0.28	47.34	Secor
	8/8/2008	74.44	28.01	27.96	0.05	46.47	Envent
	10/16/2008	74.44	28.36	28.35	0.01	46.09	Envent
	12/17/2008	74.44	27.61	---	---	46.83	Envent
	1/15/2009	74.44	28.91	---	---	45.53	Envent
	3/27/2009	74.44	29.04	---	---	45.40	Envent
	4/21/2009	74.44	28.16	---	---	46.28	Envent
	7/21/2009	74.44	28.31	---	---	46.13	Envent
	10/19/2009	74.44	NM	---	---	NC	Blaine Tech
	5/24/2010	74.44	30.47	---	---	43.97	Blaine Tech
	5/28/2010	74.44	30.35	---	---	44.09	Blaine Tech
	10/4/2010	74.44	30.30	---	---	44.14	Blaine Tech
	1/10/2011	74.44	32.02	---	---	42.42	Blaine Tech
	4/11/2011	74.44	25.41	---	---	49.03	Blaine Tech
	7/11/2011	74.44	NM	---	---	NC	
	10/10/2011	74.44	28.91	---	---	45.53	Blaine Tech
	4/16/2012	74.44	31.15	---	---	43.29	Blaine Tech
	7/9/2012	---	31.64	---	---	NC	Blaine Tech
	10/15/2012	77.16	31.82	---	---	45.34	Blaine Tech
	1/14/2013	77.16	31.88	---	---	45.28	Blaine Tech
	4/8/2013	77.16	31.83	---	---	45.33	Blaine Tech
	10/7/2013	77.16	35.30	31.25	4.05	45.02	Blaine Tech
	4/14/2014	77.16	37.66	31.65	6.01	44.19	Blaine Tech
	5/5/2014	77.16	37.81	31.76	6.05	44.07	Nieto & Sons
	5/12/2014	77.16	37.39	31.83	5.56	44.11	Nieto & Sons
	5/20/2014	77.16	37.70	33.85	3.85	42.46	Nieto & Sons
	5/27/2014	77.16	32.41	28.84	3.57	47.53	Nieto & Sons
	6/4/2014	77.16	33.20	---	---	43.96	Nieto & Sons
	6/10/2014	77.16	37.51	32.77	4.74	43.35	Nieto & Sons
	7/3/2014	77.16	39.26	32.59	6.67	43.10	Nieto & Sons
	7/8/2014	77.16	38.59	32.45	6.14	43.36	Blaine Tech
	7/18/2014	77.16	37.15	32.73	4.42	43.46	Blaine Tech
	7/24/2014	77.16	37.78	32.48	5.30	43.51	Blaine Tech
	8/1/2014	77.16	36.72	32.30	4.42	43.89	Blaine Tech
	8/8/2014	77.16	36.55	32.26	4.29	43.96	Blaine Tech
	8/13/2014	77.16	36.25	32.33	3.92	43.97	Blaine Tech
	8/19/2014	77.16	36.04	32.38	3.66	43.97	Blaine Tech
	8/29/2014	77.16	36.23	32.33	3.90	43.97	Blaine Tech
	9/5/2014	77.16	36.26	32.35	3.91	43.95	Blaine Tech
	9/11/2014	77.16	36.27	32.33	3.94	43.96	Blaine Tech
	9/18/2014	77.16	36.42	32.37	4.05	43.90	Blaine Tech
	9/26/2014	77.16	36.39	32.35	4.04	43.92	Blaine Tech
10/1/2014	77.16	36.11	32.42	3.69	43.93	Blaine Tech	
10/6/2014	77.16	35.99	32.42	3.57	43.95	Blaine Tech	
10/14/2014	77.16	36.24	32.34	3.90	43.96	Blaine Tech	
10/23/2014	77.16	36.32	32.35	3.97	43.94	Blaine Tech	
10/27/2014	77.16	36.04	32.42	3.62	43.94	Blaine Tech	
11/3/2014	77.16	36.40	32.35	4.05	43.92	Blaine Tech	
11/10/2014	77.16	36.32	32.41	3.91	43.89	Blaine Tech	
11/18/2014	77.16	36.28	32.43	3.85	43.88	Blaine Tech	
11/25/2014	77.16	36.21	32.49	3.72	43.85	Blaine Tech	
12/3/2014	77.16	36.18	32.43	3.75	43.90	Blaine Tech	
12/12/2014	77.16	36.58	32.74	3.84	43.58	Blaine Tech	
12/19/2014	77.16	37.05	32.76	4.29	43.46	Blaine Tech	
3/6/2015	77.16	39.40	33.13	6.27	42.65	Kinder Morgan	
4/20/2015	77.16	36.98	32.99	3.99	43.29	Blaine Tech	
10/20/2015	77.16	34.61	34.37	0.24	42.74	Kinder Morgan	

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	3/14/2016	77.16	36.10	---	---	41.06	Blaine Tech
	4/11/2016	77.16	36.20	---	---	40.96	Blaine Tech
	6/30/2016	77.16	31.02	---	---	46.14	Kinder Morgan
	8/22/2016	77.16	37.27	---	---	39.89	Kinder Morgan
	10/3/2016	77.16	38.02	---	---	39.14	Blaine Tech
	3/7/2017	77.16	35.13	---	---	42.03	CH2M
	4/17/2017	77.16	33.32	---	---	43.84	Blaine Tech
	10/2/2017	77.16	38.43	---	---	38.73	Blaine Tech
4/16/2018	77.16	37.98	---	---	39.18	Blaine Tech	
GMW-10	4/30/2007	74.67	25.90	---	---	48.77	Secor
	11/12/2007	74.67	25.02	25.82	0.83	50.33	Secor
	4/14/2008	74.67	25.38	25.44	0.06	49.34	Secor
	10/13/2008	74.67	24.16	---	---	50.51	Stantec
	4/20/2009	74.67	24.46	---	---	50.21	Blaine Tech
	10/19/2009	74.67	27.20	---	---	47.47	Blaine Tech
	5/24/2010	74.67	26.72	---	---	47.95	Blaine Tech
	5/28/2010	74.67	26.70	---	---	47.97	Blaine Tech
	10/4/2010	74.67	27.15	---	---	47.52	Blaine Tech
	4/11/2011	74.67	25.21	---	---	49.46	Blaine Tech
	10/10/2011	74.67	27.75	---	---	46.92	Blaine Tech
	4/27/2012	74.67	28.47	---	---	46.20	Blaine Tech
	7/9/2012	74.67	NM	---	---	NC	Blaine Tech
	10/15/2012	74.67	29.15	29.02	0.13	45.63	Blaine Tech
	4/8/2013	74.67	33.64	28.12	5.52	45.53	Blaine Tech
	9/26/2013	73.35	36.15	29.25	6.90	42.82	Blaine Tech
	10/7/2013	73.35	31.85	29.32	2.53	43.56	Blaine Tech
	4/14/2014	73.35	29.43	29.01	0.42	44.26	Blaine Tech
	8/19/2014	73.35	29.80	29.53	0.27	43.77	Blaine Tech
	8/29/2014	73.35	29.68	29.25	0.43	44.02	Blaine Tech
	9/26/2014	73.35	29.98	29.23	0.75	43.98	Blaine Tech
	10/1/2014	73.35	29.98	29.19	0.79	44.01	Blaine Tech
	10/6/2014	73.35	30.01	29.16	0.85	44.03	Blaine Tech
	10/14/2014	73.35	30.01	29.18	0.83	44.02	Blaine Tech
	10/23/2014	73.35	30.17	29.15	1.02	44.01	Blaine Tech
	10/27/2014	73.35	30.19	29.12	1.07	44.03	Blaine Tech
	11/3/2014	73.35	30.25	29.13	1.12	44.01	Blaine Tech
	11/10/2014	73.35	29.85	29.28	0.57	43.96	Blaine Tech
	11/18/2014	73.35	29.95	29.28	0.67	43.95	Blaine Tech
	11/25/2014	73.35	30.00	29.27	0.73	43.94	Blaine Tech
	12/3/2014	73.35	30.18	29.27	0.91	43.91	Blaine Tech
	12/12/2014	73.35	30.81	29.45	1.36	43.65	Blaine Tech
	12/19/2014	73.35	30.51	30.35	0.16	42.97	Blaine Tech
	4/20/2015	73.35	34.99	28.42	6.57	43.71	Blaine Tech
	7/17/2015	73.35	36.10	29.41	6.69	42.70	Blaine Tech
	10/20/2015	73.35	32.96	31.02	1.94	41.97	Kinder Morgan
	3/16/2016	73.35	34.47	33.42	1.05	39.74	Kinder Morgan
	4/11/2016	73.35	33.70	32.10	1.60	40.95	Blaine Tech
	6/29/2016	73.35	33.02	---	---	40.33	Blaine Tech
	8/22/2016	73.35	33.82	32.93	0.89	40.26	Blaine Tech
10/3/2016	73.35	35.10	33.65	1.45	39.43	Blaine Tech	
3/8/2017	73.35	32.75	---	---	40.60	CH2M	
04/17/17	73.35	31.15	---	---	42.20	Blaine Tech	
10/2/2017	73.35	33.48	---	---	39.87	Blaine Tech	
4/16/2018	73.35	33.87	33.74	0.13	39.58	Blaine Tech	
GMW-22	4/30/2007	74.17	25.79	---	---	48.38	Secor
	11/12/2007	74.17	26.45	25.91	0.54	48.16	Stantec
	8/12/2008	74.17	26.70	---	---	47.47	Envent
	10/31/2008	74.17	28.25	27.04	1.21	46.91	Envent

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	11/4/2008	74.17	26.97	---	---	47.20	Envent
	12/17/2008	74.17	26.65	---	---	47.52	Envent
	1/15/2009	74.17	27.18	---	---	46.99	Envent
	3/27/2009	74.17	27.86	---	---	46.31	Envent
	4/21/2009	74.17	27.30	27.20	0.10	46.95	Envent
	7/21/2009	74.17	27.70	---	---	46.47	Envent
	10/19/2009	74.17	NM	---	---	NC	Blaine Tech
	11/6/2009	74.17	28.12	---	---	46.05	Kinder Morgan
	9/3/2010	74.17	28.36	25.10	3.26	48.47	Kinder Morgan
	10/4/2010	74.17	27.65	---	---	46.52	Blaine Tech
	4/11/2011	74.17	26.45	---	---	47.72	Blaine Tech
	10/10/2011	74.17	29.68	---	---	44.49	Blaine Tech
	4/16/2012	74.17	31.15	---	---	43.02	Blaine Tech
	7/9/2012	---	NM	---	---	NC	Blaine Tech
	10/15/2012	77.24	31.05	---	---	46.19	Blaine Tech
	4/8/2013	77.24	31.92	---	---	45.32	Blaine Tech
	10/7/2013	77.24	34.28	31.65	2.63	45.10	Blaine Tech
	4/14/2014	77.24	35.59	32.30	3.29	44.33	Blaine Tech
	5/6/2014	77.24	35.87	32.35	3.52	44.24	Nieto & Sons
	5/12/2014	77.24	35.76	32.28	3.48	44.32	Nieto & Sons
	5/20/2014	77.24	37.90	32.70	5.20	43.58	Nieto & Sons
	5/27/2014	77.24	36.34	32.71	3.63	43.86	Nieto & Sons
	6/4/2014	77.24	33.36	---	---	43.88	Nieto & Sons
	6/10/2014	77.24	36.74	32.82	3.92	43.69	Nieto & Sons
	7/3/2014	77.24	37.66	32.91	4.75	43.45	Nieto & Sons
	7/8/2014	77.24	36.70	32.79	3.91	43.73	Blaine Tech
	7/18/2014	77.24	36.68	32.77	3.91	43.75	Blaine Tech
	7/24/2014	77.24	36.79	32.62	4.17	43.85	Blaine Tech
	8/1/2014	77.24	35.82	32.44	3.38	44.17	Blaine Tech
	8/8/2014	77.24	35.72	32.44	3.28	44.19	Blaine Tech
	8/13/2014	77.24	35.68	32.45	3.23	44.19	Blaine Tech
	8/19/2014	77.24	35.64	32.45	3.19	44.20	Blaine Tech
	8/29/2014	77.24	35.65	32.44	3.21	44.21	Blaine Tech
	9/5/2014	77.24	35.73	32.46	3.27	44.18	Blaine Tech
	9/11/2014	77.24	35.78	32.47	3.31	44.16	Blaine Tech
	9/18/2014	77.24	35.85	32.49	3.36	44.13	Blaine Tech
	9/26/2014	77.24	35.85	32.46	3.39	44.15	Blaine Tech
	10/1/2014	77.24	35.76	32.45	3.31	44.18	Blaine Tech
	10/6/2014	77.24	35.72	32.44	3.28	44.19	Blaine Tech
	10/14/2014	77.24	35.75	32.42	3.33	44.20	Blaine Tech
	10/23/2014	77.24	35.84	32.43	3.41	44.18	Blaine Tech
	10/27/2014	77.24	35.74	32.41	3.33	44.21	Blaine Tech
	11/3/2014	77.24	35.89	32.45	3.44	44.15	Blaine Tech
	11/10/2014	77.24	35.94	32.45	3.49	44.14	Blaine Tech
	11/18/2014	77.24	35.97	32.48	3.49	44.11	Blaine Tech
	11/25/2014	77.24	35.97	32.51	3.46	44.09	Blaine Tech
	12/3/2014	77.24	35.84	32.45	3.39	44.16	Blaine Tech
	12/12/2014	77.24	36.44	32.65	3.79	43.89	Blaine Tech
	12/19/2014	77.24	36.80	34.71	2.09	42.14	Blaine Tech
	4/20/2015	77.24	36.64	32.84	3.80	43.70	Blaine Tech
	7/24/2015	77.24	39.80	33.70	6.10	42.41	Northstar
	10/20/2015	77.24	36.10	34.92	1.18	42.10	Kinder Morgan
	3/16/2016	77.24	39.73	37.61	2.12	39.24	Kinder Morgan
	4/11/2016	77.24	38.59	35.50	3.09	41.17	Blaine Tech

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	6/30/2016	77.24	36.55	---	---	40.69	Blaine Tech
	10/3/2016	77.24	37.70	---	---	39.54	Blaine Tech
	4/17/2017	77.24	34.47	---	---	42.77	Blaine Tech
	10/2/2017	77.24	38.45	---	---	38.79	Blaine Tech
	4/16/2018	77.24	38.23	---	---	39.01	Blaine Tech
GMW-24	4/30/2007	74.04	27.07	---	---	46.97	Secor
	11/12/2007	74.04	27.50	27.46	0.04	46.57	Stantec
	8/12/2008	74.04	NM	---	---	NC	Envent
	8/19/2008	74.04	29.34	28.24	1.10	45.58	Envent
	10/17/2008	74.04	30.88	29.90	0.98	43.94	Envent
	10/21/2008	74.04	29.64	28.30	1.34	45.47	Envent
	12/18/2008	74.04	29.04	---	---	45.00	Envent
	1/15/2009	74.04	30.56	29.80	0.76	44.09	Envent
	3/20/2009	74.04	31.28	---	---	42.76	Envent
	3/27/2009	74.04	30.45	---	---	43.59	Envent
	4/21/2009	74.04	29.91	---	---	44.13	Envent
	7/21/2009	74.04	32.78	---	---	41.26	Envent
	10/19/2009	74.04	NM	---	---	NC	Blaine Tech
	2/4/2010	74.04	29.67	29.40	0.27	44.59	Kinder Morgan
	6/22/2010	74.04	29.47	---	---	44.57	Blaine Tech
	9/3/2010	74.04	29.90	---	---	44.14	Kinder Morgan
	10/4/2010	74.04	29.50	---	---	44.54	Blaine Tech
	4/11/2011	74.04	28.21	---	---	45.83	Blaine Tech
	10/10/2011	74.04	28.78	---	---	45.26	Blaine Tech
	4/16/2012	74.04	30.49	30.31	0.18	43.69	Blaine Tech
	7/9/2012	---	NM	---	---	NC	Blaine Tech
	10/15/2012	77.48	31.34	---	---	46.14	Blaine Tech
	4/8/2013	77.48	NM	---	---	NC	Blaine Tech
	6/14/2013	77.48	33.35	32.40	0.95	44.89	Blaine Tech
	10/7/2013	77.48	35.42	31.61	3.81	45.11	Blaine Tech
	4/14/2014	77.48	37.74	32.01	5.73	44.32	Blaine Tech
	5/5/2014	77.48	37.81	32.09	5.72	44.25	Nieto & Sons
	5/12/2014	77.48	37.52	32.14	5.38	44.26	Nieto & Sons
	5/20/2014	77.48	37.39	32.21	5.18	44.23	Nieto & Sons
	5/27/2014	77.48	37.95	32.90	5.05	43.57	Nieto & Sons
	6/4/2014	77.48	37.00	32.70	4.30	43.92	Nieto & Sons
	6/10/2014	77.48	37.85	32.98	4.87	43.53	Nieto & Sons
	7/3/2014	77.48	39.60	33.04	6.56	43.13	Nieto & Sons
	7/8/2014	77.48	38.67	32.89	5.78	43.43	Blaine Tech
	7/18/2014	77.48	38.64	32.86	5.78	43.46	Blaine Tech
	7/24/2014	77.48	38.27	32.82	5.45	43.57	Blaine Tech
	8/1/2014	77.48	37.00	32.55	4.45	44.04	Blaine Tech
	8/8/2014	77.48	36.97	32.51	4.46	44.08	Blaine Tech
	8/13/2014	77.48	36.82	32.54	4.28	44.08	Blaine Tech
	8/19/2014	77.48	36.92	32.55	4.37	44.06	Blaine Tech
8/29/2014	77.48	36.92	32.51	4.41	44.09	Blaine Tech	
9/5/2014	77.48	36.97	32.55	4.42	44.05	Blaine Tech	
9/11/2014	77.48	37.99	32.57	5.42	43.83	Blaine Tech	
9/18/2014	77.48	36.89	32.60	4.29	44.02	Blaine Tech	
9/26/2014	77.48	36.86	32.58	4.28	44.04	Blaine Tech	
10/1/2014	77.48	36.64	32.61	4.03	44.06	Blaine Tech	
10/6/2014	77.48	36.93	32.92	4.01	43.76	Blaine Tech	
10/14/2014	77.48	36.92	32.88	4.04	43.79	Blaine Tech	
10/23/2014	77.48	37.00	32.90	4.10	43.76	Blaine Tech	
10/27/2014	77.48	36.82	32.91	3.91	43.79	Blaine Tech	
11/3/2014	77.48	37.01	32.99	4.02	43.69	Blaine Tech	
11/10/2014	77.48	37.33	33.95	3.38	42.85	Blaine Tech	
11/18/2014	77.48	36.96	33.01	3.95	43.68	Blaine Tech	

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	11/25/2014	77.48	36.91	33.55	3.36	43.26	Blaine Tech
	12/3/2014	77.48	36.87	32.99	3.88	43.71	Blaine Tech
	12/12/2014	77.48	37.36	33.25	4.11	43.41	Blaine Tech
	12/19/2014	77.48	37.75	33.31	4.44	43.28	Blaine Tech
	3/10/2015	77.48	36.25	---	---	41.23	Kinder Morgan
	4/20/2015	77.48	36.29	33.82	2.47	43.17	Blaine Tech
	7/24/2015	77.48	39.80	33.70	6.10	42.56	Blaine Tech
	10/20/2015	77.48	35.44	---	---	42.04	Kinder Morgan
	3/16/2016	77.48	38.83	---	---	38.65	Kinder Morgan
	4/11/2016	77.48	37.10	---	---	40.38	Blaine Tech
	6/29/2016	77.48	38.20	---	---	39.28	Blaine Tech
	8/22/2016	77.48	38.40	---	---	39.08	Blaine Tech
	10/3/2016	77.48	38.70	---	---	39.44	Blaine Tech
	4/17/2017	77.48	35.64	35.09	0.55	42.28	Blaine Tech
10/2/2017	77.48	39.33	---	---	38.15	Blaine Tech	
4/16/2018	77.48	38.98	---	---	38.50	Blaine Tech	
GMW-25	4/30/2007	74.29	26.60	---	---	47.69	Secor
	11/12/2007	74.29	27.30	27.25	0.05	47.03	Stantec
	8/12/2008	74.29	27.81	---	---	46.48	Envent
	10/17/2008	74.29	28.26	---	---	46.03	Envent
	12/18/2008	74.29	29.01	---	---	45.28	Envent
	1/15/2009	74.29	28.62	---	---	45.67	Envent
	3/24/2009	74.29	28.79	---	---	45.50	Envent
	4/21/2009	74.29	28.35	---	---	45.94	Envent
	7/21/2009	74.29	29.80	---	---	44.49	Envent
	10/19/2009	74.29	30.28	---	---	44.01	Blaine Tech
	6/22/2010	74.29	31.64	---	---	42.65	Blaine Tech
	10/4/2010	74.29	29.25	---	---	45.04	Blaine Tech
	4/11/2011	74.29	26.21	---	---	48.08	Blaine Tech
	10/10/2011	74.29	30.02	---	---	44.27	Blaine Tech
	4/16/2012	74.29	31.30	---	---	42.99	Blaine Tech
	7/9/2012	---	NM	---	---	NC	Blaine Tech
	10/15/2012	78.14	31.88	---	---	46.26	Blaine Tech
	4/8/2013	78.14	32.11	---	---	46.03	Blaine Tech
	10/7/2013	78.14	33.23	33.10	0.13	45.01	Blaine Tech
	4/14/2014	78.14	37.40	33.00	4.40	44.13	Blaine Tech
	5/5/2014	78.14	37.51	33.06	4.45	44.06	Nieto & Sons
	5/12/2014	78.14	34.97	33.73	1.24	44.12	Nieto & Sons
	5/20/2014	78.14	36.75	34.30	2.45	43.28	Nieto & Sons
	5/27/2014	78.14	34.64	34.44	0.20	43.65	Nieto & Sons
	6/4/2014	78.14	35.00	---	---	43.14	Nieto & Sons
	6/10/2014	78.14	36.67	34.18	2.49	43.39	Nieto & Sons
	7/3/2014	78.14	34.21	---	---	43.93	Nieto & Sons
	7/24/2014	78.14	34.29	---	---	43.85	Blaine Tech
	8/1/2014	78.14	35.02	33.99	1.03	43.91	Blaine Tech
	8/8/2014	78.14	34.54	34.06	0.48	43.97	Blaine Tech
	8/14/2014	78.14	34.48	34.06	0.42	43.98	Blaine Tech
	8/19/2014	78.14	34.51	34.07	0.44	43.97	Blaine Tech
	8/29/2014	78.14	34.65	33.96	0.69	44.02	Blaine Tech
	9/18/2014	78.14	35.21	34.01	1.20	43.85	Blaine Tech
	9/26/2014	78.14	34.87	34.06	0.81	43.89	Blaine Tech
	10/1/2014	78.14	34.92	33.98	0.94	43.94	Blaine Tech
10/6/2014	78.14	34.93	33.99	0.94	43.93	Blaine Tech	
10/14/2014	78.14	35.10	33.91	1.19	43.96	Blaine Tech	
10/23/2014	78.14	35.34	33.91	1.43	43.90	Blaine Tech	
10/27/2014	78.14	34.78	33.95	0.83	44.00	Blaine Tech	
11/3/2014	78.14	34.92	33.98	0.94	43.94	Blaine Tech	
11/10/2014	78.14	35.12	34.02	1.10	43.87	Blaine Tech	

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	11/18/2014	78.14	34.90	34.11	0.79	43.85	Blaine Tech
	11/25/2014	78.14	35.07	34.07	1.00	43.84	Blaine Tech
	12/3/2014	78.14	35.10	33.98	1.12	43.90	Blaine Tech
	12/12/2014	78.14	35.22	34.30	0.92	43.63	Blaine Tech
	12/19/2014	78.14	35.05	34.50	0.55	43.51	Blaine Tech
	4/20/2015	78.14	35.19	34.47	0.72	43.50	Blaine Tech
	6/25/2015	78.14	36.35	35.40	0.95	42.52	Blaine Tech
	10/20/2015	78.14	35.40	35.38	0.02	42.76	Kinder Morgan
	3/16/2016	78.14	38.99	---	---	39.15	Kinder Morgan
	4/12/2016	78.14	37.15	---	---	40.99	Kinder Morgan
	6/29/2016	78.14	38.40	---	---	39.74	Blaine Tech
	8/22/2016	78.14	38.44	---	---	39.70	Blaine Tech
	10/3/2016	78.14	38.70	---	---	39.44	Blaine Tech
	4/17/2017	78.14	35.23	---	---	42.91	Blaine Tech
10/2/2017	78.14	39.22	---	---	38.92	Blaine Tech	
4/16/2018	78.14	38.85	---	---	39.29	Blaine Tech	
GMW-36	3/12/2007	74.53	24.29	---	---	50.24	Secor
	4/30/2007	74.53	24.40	---	---	50.13	Secor
	8/28/2007	74.53	24.31	---	---	50.22	Stantec
	11/12/2007	74.53	24.86	24.85	0.01	49.68	Stantec
	2/19/2008	74.53	25.50	---	---	49.03	Stantec
	4/14/2008	74.53	24.61	---	---	49.92	Stantec
	8/8/2008	74.53	26.20	26.14	0.06	48.38	Envent
	10/16/2008	74.77	26.11	26.09	0.02	48.68	Envent
	12/18/2008	74.53	28.70	28.65	0.05	45.87	Envent
	1/15/2009	74.53	27.73	27.45	0.28	47.02	Envent
	2/20/2009	74.53	26.39	26.35	0.04	48.17	Envent
	2/23/2009	74.53	26.13	25.80	0.33	48.66	Blaine Tech
	3/24/2009	74.53	29.83	---	---	44.70	Envent
	4/20/2009	74.53	25.63	25.59	0.04	48.93	Blaine Tech
	7/17/2009	74.53	27.40	---	---	47.13	Envent
	7/20/2009	74.53	25.90	---	---	48.63	Blaine Tech
	7/21/2009	74.53	26.03	---	---	48.50	Envent
	7/22/2009	74.53	25.90	---	---	48.63	Blaine Tech
	10/19/2009	74.53	26.56	26.45	0.11	48.06	Blaine Tech
	2/4/2010	74.53	26.93	26.80	0.13	47.70	Kinder Morgan
	3/15/2010	74.53	26.80	---	---	47.73	Blaine Tech
	4/16/2010	74.53	26.90	---	---	47.63	Blaine Tech
	5/24/2010	74.53	25.96	25.90	0.06	48.62	Blaine Tech
	5/28/2010	74.53	25.94	25.88	0.06	48.64	Blaine Tech
	6/22/2010	74.53	25.94	25.91	0.03	48.61	Blaine Tech
	7/12/2010	74.53	NM	---	---	NC	
	8/12/2010	74.53	NM	---	---	NC	
	9/20/2010	74.53	NM	---	---	NC	
	10/4/2010	74.53	26.90	---	---	47.63	
	10/24/2010	74.53	26.90	---	---	47.63	Blaine Tech
	11/23/2010	74.53	27.35	27.10	0.25	47.38	Blaine Tech
	12/22/2010	74.53	28.35	26.84	1.51	47.39	Blaine Tech
1/10/2011	74.53	29.10	27.70	1.40	46.55	Blaine Tech	
2/24/2011	74.53	NM	---	---	NC	Blaine Tech	
3/23/2011	74.53	NM	---	---	NC	Blaine Tech	
4/12/2011	74.53	26.98	25.05	1.93	49.09	Blaine Tech	
5/13/2011	74.53	NM	---	---	NC	Blaine Tech	
6/22/2011	74.53	NM	---	---	NC		
7/11/2011	74.53	NM	---	---	NC		
8/19/2011	74.53	NM	---	---	NC		
9/22/2011	74.53	NM	---	---	NC		
10/10/2011	74.53	25.96	---	---	48.57	Blaine Tech	

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	11/28/2011	74.53	NM	---	---	NC	
	12/2/2011	74.53	26.71	---	---	47.82	Kinder Morgan
	12/21/2011	74.53	28.17	---	---	46.36	Blaine Tech
	1/9/2012	74.53	27.26	---	---	47.27	Blaine Tech
	2/23/2012	74.53	27.85	---	---	46.68	Blaine Tech
	3/28/2012	74.53	NM	---	---	NC	Blaine Tech
	4/16/2012	74.53	27.34	---	---	47.19	Blaine Tech
	5/25/2012	74.53	NM	---	---	NC	Blaine Tech
	6/15/2012	---	33.27	---	---	NC	Blaine Tech
	7/9/2012	---	33.71	---	---	NC	Blaine Tech
	8/29/2012	---	NM	---	---	NC	Blaine Tech
	9/26/2012	---	NM	---	---	NC	Blaine Tech
	10/15/2012	76.66	32.11	---	---	44.55	Blaine Tech
	11/29/2012	76.66	33.93	31.68	2.25	44.53	Blaine Tech
	12/26/2012	76.66	34.86	30.36	4.50	45.40	Blaine Tech
	1/14/2013	76.66	34.12	30.42	3.70	45.50	Blaine Tech
	2/20/2013	76.66	NM	---	---	NC	Blaine Tech
	4/10/2013	76.66	32.42	29.75	2.67	46.38	Blaine Tech
	10/7/2013	76.66	34.65	30.72	3.93	45.15	Blaine Tech
	4/25/2014	76.66	34.71	31.12	3.59	44.82	Blaine Tech
	5/20/2014	76.66	34.95	31.50	3.45	44.47	Nieto & Sons
	5/27/2014	76.66	34.53	31.29	3.24	44.72	Nieto & Sons
	6/4/2014	76.66	34.93	31.50	3.43	44.47	Nieto & Sons
	8/13/2014	76.66	34.86	31.27	3.59	44.67	Blaine Tech
	8/19/2014	76.66	34.20	31.39	2.81	44.71	Blaine Tech
	8/29/2014	76.66	34.31	31.32	2.99	44.74	Blaine Tech
	9/5/2014	76.66	34.35	31.37	2.98	44.69	Blaine Tech
	9/11/2014	76.66	35.00	31.23	3.77	44.68	Blaine Tech
	9/18/2014	76.66	34.42	31.50	2.92	44.58	Blaine Tech
	9/26/2014	76.66	34.15	31.48	2.67	44.65	Blaine Tech
	10/1/2014	76.66	33.51	31.61	1.90	44.67	Blaine Tech
	10/6/2014	76.66	33.29	31.63	1.66	44.70	Blaine Tech
	10/14/2014	76.66	33.48	31.55	1.93	44.72	Blaine Tech
	10/23/2014	76.66	33.64	31.57	2.07	44.68	Blaine Tech
	10/27/2014	76.66	33.02	31.79	1.23	44.62	Blaine Tech
	11/3/2014	76.66	33.75	31.57	2.18	44.65	Blaine Tech
	11/18/2014	76.66	33.17	31.75	1.42	44.63	Blaine Tech
	11/25/2014	76.66	33.13	31.86	1.27	44.55	Blaine Tech
	12/3/2014	76.66	32.93	31.75	1.18	44.67	Blaine Tech
	4/20/2015	76.66	33.64	32.20	1.44	44.17	Blaine Tech
	10/21/2015	76.66	33.55	33.16	0.39	43.42	Blaine Tech
	4/12/2016	76.66	34.30	34.03	0.27	42.58	Kinder Morgan
	10/3/2016	76.66	35.05	34.65	0.40	41.93	Blaine Tech
	3/9/2017	76.66	33.45	---	---	43.21	CH2M
	4/17/2017	76.66	32.96	---	---	43.70	Blaine Tech
	10/2/2017	76.66	34.10	---	---	42.56	Blaine Tech
	4/16/2018	76.66	35.18	---	---	41.48	Blaine Tech
GMW-O-11	4/30/2007	74.17	23.91	23.90	0.01	50.27	Secor
	11/12/2007	74.17	24.40	---	---	49.77	Stantec
	8/15/2008	74.17	29.30	---	---	44.87	Envent
	10/17/2008	74.17	24.45	---	---	49.72	Envent
	12/19/2008	74.17	24.85	---	---	49.32	Envent
	1/15/2009	74.17	26.87	24.38	2.49	49.29	Envent
	2/24/2009	74.17	24.31	24.21	0.10	49.94	Envent
	3/27/2009	74.17	31.08	---	---	43.09	Envent
	4/21/2009	74.17	25.36	25.34	0.02	48.83	Envent
	7/21/2009	74.17	26.18	---	---	47.99	Envent
	10/19/2009	74.17	NM	---	---	NC	Blaine Tech

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	11/6/2009	74.17	26.33	26.18	0.15	47.96	Kinder Morgan
	10/4/2010	74.17	30.00	---	---	44.17	Blaine Tech
	4/13/2011	74.17	24.19	---	---	49.98	Blaine Tech
	10/10/2011	74.17	24.38	---	---	49.79	Blaine Tech
	4/16/2012	74.17	NM	---	---	NC	Blaine Tech
	7/9/2012	74.17	NM	---	---	NC	Blaine Tech
	10/15/2012	74.17	28.12	---	---	46.05	Blaine Tech
	4/8/2013	74.17	NM	---	---	NC	Blaine Tech
	9/24/2013	74.17	31.25	28.15	3.10	45.40	Blaine Tech
	10/7/2013	74.17	31.19	27.69	3.50	45.78	Blaine Tech
	4/25/2014	74.17	28.96	28.62	0.34	45.48	Blaine Tech
	9/5/2014	74.17	31.13	27.89	3.24	45.63	Blaine Tech
	9/11/2014	74.17	31.12	27.85	3.27	45.67	Blaine Tech
	9/18/2014	74.17	31.22	27.85	3.37	45.65	Blaine Tech
	9/26/2014	74.17	31.34	27.91	3.43	45.57	Blaine Tech
	10/1/2014	74.17	31.19	27.84	3.35	45.66	Blaine Tech
	10/6/2014	74.17	32.19	27.84	4.35	45.46	Blaine Tech
	10/14/2014	74.17	31.18	28.85	2.33	44.85	Blaine Tech
	10/23/2014	74.17	31.34	27.85	3.49	45.62	Blaine Tech
	10/27/2014	74.17	31.28	28.89	2.39	44.80	Blaine Tech
	11/3/2014	74.17	32.34	27.83	4.51	45.44	Blaine Tech
	11/10/2014	74.17	31.46	27.97	3.49	45.50	Blaine Tech
	11/18/2014	74.17	31.41	27.88	3.53	45.58	Blaine Tech
	11/25/2014	74.17	31.48	27.87	3.61	45.58	Blaine Tech
	12/3/2014	74.17	33.34	29.95	3.39	43.54	Blaine Tech
	12/12/2014	74.17	33.25	29.08	4.17	44.26	Blaine Tech
	12/19/2014	74.17	32.52	28.09	4.43	45.19	Blaine Tech
	4/22/2015	74.17	31.54	28.10	3.44	45.38	Blaine Tech
	10/22/2015	74.17	33.08	29.23	3.85	44.17	Kinder Morgan
	3/16/2016	74.17	33.39	33.16	0.23	40.96	Kinder Morgan
	4/12/2016	74.17	33.33	33.12	0.21	41.01	Kinder Morgan
	6/30/2016	74.17	31.50	---	---	42.67	Kinder Morgan
	8/22/2016	74.17	32.75	32.74	0.01	41.43	Kinder Morgan
	10/3/2016	74.17	32.72	32.71	0.01	41.46	Kinder Morgan
	3/24/2017	74.17	31.50	30.45	1.05	43.51	CH2M
	4/17/2017	74.17	30.12	29.96	0.16	44.18	Blaine Tech
	10/2/2017	74.17	33.54	---	---	40.63	Blaine Tech
	4/16/2018	74.17	NM	---	---	NC	Blaine Tech
GMW-O-12	4/30/2007	73.49	22.81	---	---	50.68	Secor
	11/12/2007	73.49	23.13	---	---	50.36	Stantec
	4/14/2008	73.49	23.36	---	---	50.13	Stantec
	10/13/2008	73.49	24.20	---	---	49.29	Stantec
	4/20/2009	73.49	24.21	---	---	49.28	Blaine Tech
	10/19/2009	73.49	25.08	---	---	48.41	Blaine Tech
	5/24/2010	73.49	24.80	---	---	48.69	Blaine Tech
	5/28/2010	73.49	24.74	---	---	48.75	Blaine Tech
	10/4/2010	73.49	25.31	25.20	0.11	48.27	Blaine Tech
	1/10/2011	73.49	26.42	26.32	0.10	47.15	Blaine Tech
	4/11/2011	73.49	24.04	---	---	49.45	Blaine Tech
	7/11/2011	73.49	NM	---	---	NC	
	10/10/2011	73.49	24.68	---	---	48.81	Blaine Tech
	1/9/2012	73.49	25.12	---	---	48.37	Blaine Tech
	4/16/2012	73.49	25.40	---	---	48.09	Blaine Tech
	7/9/2012	73.49	26.96	---	---	46.53	Blaine Tech
	10/15/2012	73.49	25.48	25.44	0.04	48.04	Blaine Tech
	1/14/2013	73.49	25.62	25.58	0.04	47.90	Blaine Tech
	4/8/2013	73.49	26.60	26.51	0.09	46.96	Blaine Tech
	9/24/2013	73.49	27.90	27.74	0.16	45.72	Blaine Tech

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	10/7/2013	73.49	27.34	27.28	0.06	46.20	Blaine Tech
	4/14/2014	73.49	30.34	26.80	3.54	45.96	Blaine Tech
	5/6/2014	73.49	30.93	26.74	4.19	45.89	Nieto & Sons
	5/12/2014	73.49	30.81	26.82	3.99	45.85	Nieto & Sons
	5/20/2014	73.49	31.78	27.32	4.46	45.26	Nieto & Sons
	5/27/2014	73.49	33.04	26.78	6.26	45.43	Nieto & Sons
	6/4/2014	73.49	33.00	27.75	5.25	44.66	Nieto & Sons
	6/10/2014	73.49	34.53	26.81	7.72	45.10	Nieto & Sons
	7/3/2014	73.49	34.27	26.94	7.33	45.05	Blaine Tech
	7/8/2014	73.49	33.87	26.87	7.00	45.19	Blaine Tech
	7/18/2014	73.49	33.36	27.07	6.29	45.13	Blaine Tech
	7/24/2014	73.49	33.00	26.98	6.02	45.28	Blaine Tech
	8/1/2014	73.49	31.80	26.83	4.97	45.64	Blaine Tech
	8/8/2014	73.49	31.26	26.91	4.35	45.69	Blaine Tech
	8/13/2014	73.49	31.18	26.88	4.30	45.73	Blaine Tech
	8/19/2014	73.49	31.01	26.86	4.15	45.78	Blaine Tech
	8/29/2014	73.49	31.03	26.89	4.14	45.75	Blaine Tech
	9/5/2014	73.49	31.19	26.88	4.31	45.73	Blaine Tech
	9/18/2014	73.49	31.30	26.82	4.48	45.75	Blaine Tech
	9/26/2014	73.49	31.33	26.89	4.44	45.69	Blaine Tech
	10/1/2014	73.49	31.21	26.85	4.36	45.75	Blaine Tech
	10/6/2014	73.49	31.20	29.84	1.36	43.37	Blaine Tech
	10/14/2014	73.49	31.14	26.86	4.28	45.75	Blaine Tech
	10/23/2014	73.49	31.30	26.85	4.45	45.73	Blaine Tech
	10/27/2014	73.49	31.28	26.90	4.38	45.69	Blaine Tech
	11/3/2014	73.49	32.30	26.84	5.46	45.53	Blaine Tech
	11/10/2014	73.49	31.45	26.91	4.54	45.65	Blaine Tech
	11/18/2014	73.49	32.34	26.90	5.44	45.47	Blaine Tech
	11/25/2014	73.49	31.57	27.87	3.70	44.86	Blaine Tech
	12/3/2014	73.49	33.87	28.81	5.06	43.64	Blaine Tech
	12/19/2014	73.49	32.78	26.97	5.81	45.33	Blaine Tech
	4/20/2015	73.49	33.35	26.91	6.44	45.26	Blaine Tech
	4/22/2015	73.49	33.35	26.91	6.44	45.26	Blaine Tech
	5/21/2015	73.49	34.31	27.35	6.96	44.71	Northstar
	5/29/2015	73.49	34.15	27.24	6.91	44.83	Northstar
	6/2/2015	73.49	34.00	27.27	6.73	44.84	Northstar
	6/5/2015	73.49	34.00	27.50	6.50	44.66	Northstar
	6/12/2015	73.49	33.96	27.35	6.61	44.78	Northstar
	6/19/2015	73.49	33.98	27.58	6.40	44.60	Northstar
	6/26/2015	73.49	33.97	28.15	5.82	44.15	Northstar
	7/2/2015	73.49	33.83	28.20	5.63	44.14	Northstar
	7/7/2015	73.49	33.60	27.93	5.67	44.40	Northstar
	7/17/2015	73.49	33.57	27.85	5.72	44.47	Northstar
	7/24/2015	73.49	33.15	28.25	4.90	44.24	Northstar
	7/29/2015	73.49	33.02	28.10	4.92	44.38	Northstar
	8/11/2015	73.49	33.00	28.90	4.10	43.75	Northstar
	8/18/2015	73.49	32.65	28.23	4.42	44.35	Northstar
	8/28/2015	73.49	32.41	28.17	4.24	44.45	Kinder Morgan
	9/1/2015	73.49	33.18	28.65	4.53	43.91	Kinder Morgan
	9/25/2015	73.49	34.69	28.03	6.66	44.09	Kinder Morgan
	10/16/2015	73.49	34.63	27.83	6.80	44.27	Kinder Morgan
	10/19/2015	73.49	34.65	27.82	6.83	44.27	Blaine Tech
	10/30/2015	73.49	39.38	28.11	11.27	43.07	Kinder Morgan
	3/14/2016	73.49	32.40	31.60	0.80	41.73	Blaine Tech
	4/11/2016	73.49	33.35	26.86	6.49	45.30	Blaine Tech
	6/29/2016	73.49	33.90	33.10	0.80	40.23	Blaine Tech
	8/22/2016	73.49	33.56	31.07	2.49	41.91	Blaine Tech
	10/3/2016	73.49	34.20	31.90	2.30	41.12	Blaine Tech

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	4/17/2017	73.49	32.90	28.70	4.20	43.95	Blaine Tech
	10/2/2017	73.49	33.20	32.00	1.20	41.25	Blaine Tech
	4/16/2018	73.49	33.04	31.89	1.15	41.37	Blaine Tech
GMW-O-15	4/30/2007	74.23	23.41	23.30	0.11	50.91	Secor
	11/12/2007	74.23	23.95	23.85	0.10	50.36	Stantec
	4/14/2008	74.23	23.64	---	---	50.59	Stantec
	8/8/2008	74.23	24.60	---	---	49.63	Envent
	8/11/2008	74.23	24.40	24.34	0.06	49.88	Stantec
	10/16/2008	74.23	24.53	---	---	49.70	Envent
	12/18/2008	74.23	24.86	---	---	49.37	Envent
	1/2/2009	74.23	24.82	---	---	49.41	Envent
	1/15/2009	74.23	26.01	---	---	48.22	Envent
	2/20/2009	74.23	24.80	---	---	49.43	Envent
	2/23/2009	74.23	24.76	24.74	0.02	49.49	Blaine Tech
	3/24/2009	74.23	25.55	---	---	48.68	Envent
	4/20/2009	74.23	24.66	24.61	0.05	49.61	Blaine Tech
	7/17/2009	74.23	25.01	---	---	49.22	Envent
	7/20/2009	74.23	24.99	24.94	0.05	49.28	Blaine Tech
	7/22/2009	74.23	24.99	24.94	0.05	49.28	Blaine Tech
	10/19/2009	74.23	25.55	25.43	0.12	48.78	Blaine Tech
	2/4/2010	74.23	25.50	25.48	0.02	48.75	Kinder Morgan
	3/15/2010	74.23	NM	---	---	NC	
	4/16/2010	74.23	23.10	---	---	51.13	Blaine Tech
	5/24/2010	74.23	25.67	---	---	48.56	Blaine Tech
	5/28/2010	74.23	25.35	---	---	48.88	Blaine Tech
	6/22/2010	74.23	25.81	---	---	48.42	Blaine Tech
	7/12/2010	74.23	NM	---	---	NC	
	8/12/2010	74.23	NM	---	---	NC	
	9/20/2010	74.23	NM	---	---	NC	
	10/4/2010	74.23	25.85	25.80	0.05	48.42	Blaine Tech
	11/23/2010	74.23	NM	---	---	NC	Blaine Tech
	12/22/2010	74.23	26.31	---	---	47.92	Blaine Tech
	1/10/2011	74.23	25.97	---	---	48.26	Blaine Tech
	2/24/2011	74.23	NM	---	---	NC	Blaine Tech
	3/23/2011	74.23	NM	---	---	NC	Blaine Tech
	4/12/2011	74.23	22.55	22.53	0.02	51.70	Blaine Tech
	5/13/2011	74.23	NM	---	---	NC	Blaine Tech
	6/22/2011	74.23	NM	---	---	NC	
	7/11/2011	74.23	NM	---	---	NC	
	8/19/2011	74.23	NM	---	---	NC	
	9/22/2011	74.23	NM	---	---	NC	
	10/10/2011	74.23	23.79	23.22	0.57	50.90	Blaine Tech
	11/28/2011	74.23	NM	---	---	NC	
12/2/2011	74.23	23.92	23.86	0.06	50.36	Kinder Morgan	
12/21/2011	74.23	31.13	---	---	43.10	Blaine Tech	
1/9/2012	74.23	27.67	---	---	46.56	Blaine Tech	
2/23/2012	74.23	31.82	---	---	42.41	Blaine Tech	
3/28/2012	74.23	30.30	---	---	43.93	Blaine Tech	
4/16/2012	74.23	26.56	26.51	0.05	47.71	Blaine Tech	
5/25/2012	74.23	26.64	---	---	47.59	Blaine Tech	
6/15/2012	74.23	26.93	---	---	47.30	Blaine Tech	
7/9/2012	74.23	25.47	---	---	48.76	Blaine Tech	
8/29/2012	74.23	NM	---	---	NC	Blaine Tech	
9/26/2012	74.23	30.64	---	---	43.59	Blaine Tech	
10/15/2012	74.23	31.82	---	---	42.41	Blaine Tech	
11/29/2012	74.23	NM	---	---	NC	Blaine Tech	
12/26/2012	74.23	27.41	---	---	46.82	Blaine Tech	
1/14/2013	74.23	27.62	---	---	46.61	Blaine Tech	

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	2/20/2013	74.23	NM	---	---	NC	Blaine Tech
	4/10/2013	74.23	NM	---	---	NC	Blaine Tech
	4/26/2013	74.23	27.90	---	---	46.33	Kinder Morgan
	10/7/2013	74.23	29.03	28.26	0.77	45.82	Blaine Tech
	4/18/2014	74.23	28.40	28.08	0.32	46.09	Blaine Tech
	8/14/2014	74.23	32.59	28.26	4.33	45.10	Blaine Tech
	8/19/2014	74.23	32.34	28.23	4.11	45.18	Blaine Tech
	8/29/2014	74.23	31.84	28.25	3.59	45.26	Blaine Tech
	9/5/2014	74.23	31.91	28.29	3.62	45.22	Blaine Tech
	9/11/2014	74.23	32.16	28.79	3.37	44.77	Blaine Tech
	9/18/2014	74.23	32.50	28.23	4.27	45.15	Blaine Tech
	9/26/2014	74.23	32.20	28.27	3.93	45.17	Blaine Tech
	10/1/2014	74.23	31.93	28.28	3.65	45.22	Blaine Tech
	10/6/2014	74.23	31.91	28.27	3.64	45.23	Blaine Tech
	10/14/2014	74.23	31.85	28.29	3.56	45.23	Blaine Tech
	10/23/2014	74.23	32.10	28.30	3.80	45.17	Blaine Tech
	10/27/2014	74.23	31.89	28.30	3.59	45.21	Blaine Tech
	11/18/2014	74.23	31.86	28.39	3.47	45.15	Blaine Tech
	11/25/2014	74.23	32.36	28.35	4.01	45.08	Blaine Tech
	12/3/2014	74.23	31.73	28.36	3.37	45.20	Blaine Tech
	12/12/2014	74.23	32.61	28.54	4.07	44.88	Blaine Tech
	12/19/2014	74.23	32.62	28.37	4.25	45.01	Blaine Tech
	4/20/2015	74.23	31.93	28.82	3.11	44.79	Blaine Tech
	10/19/2015	74.23	31.91	28.89	3.02	44.74	Blaine Tech
	4/12/2016	74.23	29.78	---	---	44.45	Kinder Morgan
	10/3/2016	74.86	31.00	30.92	0.08	43.92	Kinder Morgan
	3/9/2017	74.86	29.94	---	---	44.92	CH2M
	4/17/2017	74.86	29.65	29.52	0.13	45.31	Blaine Tech
	10/2/2017	74.86	31.92	30.33	1.59	44.21	Blaine Tech
	4/16/2018	74.86	31.79	31.67	0.12	43.17	Blaine Tech
GMW-O-18	4/30/2007	74.36	24.21	---	---	50.15	Secor
	11/12/2007	74.36	22.46	---	---	51.90	Secor
	4/14/2008	74.36	24.50	---	---	49.86	Secor
	10/13/2008	74.36	25.46	---	---	48.90	Stantec
	4/20/2009	74.36	25.59	---	---	48.77	Blaine Tech
	10/19/2009	74.36	26.31	---	---	48.05	Blaine Tech
	3/15/2010	74.36	26.54	---	---	47.82	Blaine Tech
	4/16/2010	74.36	24.25	---	---	50.11	Blaine Tech
	5/24/2010	74.36	26.26	---	---	48.10	Blaine Tech
	5/28/2010	74.36	26.03	---	---	48.33	Blaine Tech
	6/22/2010	74.36	26.41	---	---	47.95	
	7/12/2010	74.36	NM	---	---	NC	
	8/12/2010	74.36	NM	---	---	NC	
	9/20/2010	74.36	NM	---	---	NC	
	10/4/2010	74.36	29.95	---	---	44.41	Blaine Tech
	11/16/2010	74.36	NM	---	---	NC	
	12/22/2010	74.36	NM	---	---	NC	
	1/10/2011	74.36	NM	---	---	NC	
	2/24/2011	74.36	NM	---	---	NC	Blaine Tech
	3/23/2011	74.36	NM	---	---	NC	Blaine Tech
	4/12/2011	74.36	NM	---	---	NC	Blaine Tech
	5/13/2011	74.36	NM	---	---	NC	Blaine Tech
	6/22/2011	74.36	NM	---	---	NC	
7/11/2011	74.36	NM	---	---	NC		
8/19/2011	74.36	NM	---	---	NC		
9/22/2011	74.36	NM	---	---	NC		
10/10/2011	74.36	23.68	---	---	50.68	Blaine Tech	
11/28/2011	74.36	NM	---	---	NC		

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	12/2/2011	74.36	24.22	---	---	50.14	Blaine Tech
	12/21/2011	74.36	27.14	---	---	47.22	Blaine Tech
	2/23/2012	74.36	31.18	---	---	43.18	Blaine Tech
	3/28/2012	74.36	NM	---	---	NC	Blaine Tech
	4/16/2012	74.36	27.10	---	---	47.26	Blaine Tech
	5/25/2012	74.36	27.31	---	---	47.05	Blaine Tech
	6/15/2012	74.36	35.13	---	---	39.23	Blaine Tech
	7/9/2012	74.36	29.51	---	---	44.85	Blaine Tech
	8/29/2012	74.36	NM	---	---	NC	Blaine Tech
	9/26/2012	74.36	30.83	---	---	43.53	Blaine Tech
	10/15/2012	74.36	29.73	---	---	44.63	Blaine Tech
	11/29/2012	74.36	NM	---	---	NC	Blaine Tech
	12/26/2012	74.36	28.87	---	---	45.49	Blaine Tech
	1/14/2013	74.36	28.92	---	---	45.44	Blaine Tech
	2/20/2013	74.36	NM	---	---	NC	Blaine Tech
	4/10/2013	74.36	28.10	---	---	46.26	Blaine Tech
	10/7/2013	74.36	26.67	---	---	47.69	Blaine Tech
	4/18/2014	74.36	29.43	29.37	0.06	44.98	Blaine Tech
	8/14/2014	74.36	29.87	29.45	0.42	44.83	Blaine Tech
	8/19/2014	74.36	29.97	29.58	0.39	44.70	Blaine Tech
	8/29/2014	74.36	29.77	29.34	0.43	44.93	Blaine Tech
	9/11/2014	74.36	29.96	29.61	0.35	44.68	Blaine Tech
	9/18/2014	74.36	29.95	29.56	0.39	44.72	Blaine Tech
	9/26/2014	74.36	29.97	29.55	0.42	44.73	Blaine Tech
	10/1/2014	74.36	29.90	29.52	0.38	44.76	Blaine Tech
	10/6/2014	74.36	29.94	29.56	0.38	44.72	Blaine Tech
	10/14/2014	74.36	29.94	29.58	0.36	44.71	Blaine Tech
	10/23/2014	74.36	30.00	29.62	0.38	44.66	Blaine Tech
	10/27/2014	74.36	29.95	29.52	0.43	44.75	Blaine Tech
	4/20/2015	74.36	28.53	---	---	45.83	Blaine Tech
	10/19/2015	74.36	30.90	---	---	43.46	Blaine Tech
	4/12/2016	74.36	31.63	---	---	42.73	Blaine Tech
	12/13/2016	74.32	35.95	31.01	4.94	42.32	Blaine Tech
	12/14/2016	74.32	32.60	---	---	41.72	Blaine Tech
	3/6/2017	74.32	33.40	32.60	0.80	41.56	CH2M
	4/17/2017	74.32	31.83	31.80	0.03	42.51	Blaine Tech
	10/2/2017	74.32	31.32	31.30	0.02	43.02	Blaine Tech
	4/16/2018	74.32	NM	--	--	NC	Blaine Tech
GMW-O-20	8/15/2008	73.32	25.90	---	---	47.42	Envent
	10/17/2008	73.32	25.82	---	---	47.50	Envent
	12/19/2008	73.32	27.15	---	---	46.17	Envent
	1/15/2009	73.32	26.53	26.09	0.44	47.15	Envent
	2/24/2009	73.32	27.85	---	---	45.47	Envent
	3/20/2009	73.32	28.81	---	---	44.51	Envent
	3/27/2009	73.32	27.84	---	---	45.48	Envent
	4/21/2009	73.32	28.70	---	---	44.62	Envent
	7/21/2009	73.32	24.10	---	---	49.22	Envent
	10/19/2009	73.32	NM	---	---	NC	Blaine Tech
	11/9/2009	73.32	25.60	25.40	0.20	47.88	Kinder Morgan
	6/22/2010	73.32	24.76	24.66	0.10	48.64	Blaine Tech
	10/4/2010	73.32	31.20	31.10	0.10	42.20	Blaine Tech
	1/10/2011	73.32	26.62	26.48	0.14	46.81	Blaine Tech
	4/11/2011	73.32	23.82	---	---	49.50	Blaine Tech
	7/11/2011	73.32	NM	---	---	NC	
	10/10/2011	73.32	24.05	---	---	49.27	Blaine Tech
	1/9/2012	73.32	24.68	---	---	48.64	Blaine Tech
	4/16/2012	73.32	26.18	---	---	47.14	Blaine Tech
	7/9/2012	73.32	32.92	---	---	40.40	Blaine Tech

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	10/15/2012	73.32	32.97	32.95	0.02	40.37	Blaine Tech
	1/14/2013	73.32	32.98	32.93	0.05	40.38	Blaine Tech
	4/8/2013	73.32	29.63	26.46	3.17	46.27	Blaine Tech
	9/24/2013	73.32	31.10	27.20	3.90	45.40	Blaine Tech
	10/7/2013	73.32	32.09	27.06	5.03	45.33	Blaine Tech
	4/25/2014	73.32	28.48	28.40	0.08	44.91	Blaine Tech
	9/18/2014	73.32	30.71	27.72	2.99	45.05	Blaine Tech
	9/26/2014	73.32	30.87	27.75	3.12	44.99	Blaine Tech
	10/1/2014	73.32	30.52	27.65	2.87	45.14	Blaine Tech
	10/6/2014	73.32	30.50	27.66	2.84	45.13	Blaine Tech
	10/14/2014	73.32	30.63	27.62	3.01	45.14	Blaine Tech
	10/23/2014	73.32	30.80	27.70	3.10	45.05	Blaine Tech
	10/27/2014	73.32	30.70	27.76	2.94	45.02	Blaine Tech
	11/3/2014	73.32	30.81	27.62	3.19	45.11	Blaine Tech
	11/10/2014	73.32	30.94	27.75	3.19	44.98	Blaine Tech
	11/18/2014	73.32	30.91	27.65	3.26	45.07	Blaine Tech
	11/25/2014	73.32	30.95	27.65	3.30	45.06	Blaine Tech
	12/3/2014	73.32	32.56	27.83	4.73	44.61	Blaine Tech
	12/19/2014	73.32	31.72	27.93	3.79	44.69	Blaine Tech
	4/22/2015	73.32	32.25	27.98	4.27	44.55	Blaine Tech
	10/22/2015	73.32	31.36	29.38	1.98	43.57	Kinder Morgan
	3/16/2016	73.32	32.54	---	---	40.78	Kinder Morgan
	4/12/2016	73.32	32.48	---	---	40.84	Kinder Morgan
	6/29/2016	73.32	32.50	---	---	40.82	Blaine Tech
	8/22/2016	73.32	32.18	---	---	41.14	Blaine Tech
	10/3/2016	73.32	33.12	---	---	40.20	Blaine Tech
	3/23/2017	73.32	30.35	---	---	42.97	CH2M
	4/17/2017	73.32	29.70	---	---	43.62	Blaine Tech
	10/2/2017	73.32	33.03	---	---	40.29	Blaine Tech
	4/16/2018	73.32	32.67	---	---	40.65	Blaine Tech
GMW-O-21	12/28/2007	71.43	27.67	---	---	43.76	Geomatrix
	8/15/2008	73.94	NM	---	---	NC	Envent
	10/17/2008	71.43	26.00	---	---	45.43	Envent
	12/19/2008	71.43	24.82	---	---	46.61	Envent
	3/27/2009	71.43	26.41	---	---	45.02	Envent
	7/21/2009	71.43	24.88	---	---	46.55	Envent
	10/19/2009	71.43	NM	---	---	NC	Blaine Tech
	11/9/2009	71.43	25.02	---	---	46.41	Kinder Morgan
	10/4/2010	71.43	25.40	---	---	46.03	Blaine Tech
	4/13/2011	71.43	23.72	---	---	47.71	Blaine Tech
	10/10/2011	71.43	24.65	---	---	46.78	Blaine Tech
	4/16/2012	71.43	NM	---	---	NC	Blaine Tech
	7/9/2012	71.43	NM	---	---	NC	Blaine Tech
	10/15/2012	71.43	32.50	---	---	38.93	Blaine Tech
	4/8/2013	71.43	NM	---	---	NC	Blaine Tech
	9/25/2013	71.43	29.25	---	---	42.18	Blaine Tech
	10/7/2013	71.43	NM	---	---	NC	Blaine Tech
	4/14/2014	71.43	28.65	28.61	0.04	42.81	Blaine Tech
	9/5/2014	71.43	29.61	28.78	0.83	42.48	Blaine Tech
	9/26/2014	71.43	29.85	28.77	1.08	42.44	Blaine Tech
	10/1/2014	71.43	29.79	28.64	1.15	42.56	Blaine Tech
	10/6/2014	71.43	29.40	28.72	0.68	42.57	Blaine Tech
	10/27/2014	71.43	29.75	28.93	0.82	42.34	Blaine Tech
	11/10/2014	71.43	29.98	28.95	1.03	42.27	Blaine Tech
	11/18/2014	71.43	30.05	28.92	1.13	42.28	Blaine Tech
	11/25/2014	71.43	29.73	28.85	0.88	42.40	Blaine Tech
	12/12/2014	71.43	30.61	29.02	1.59	42.09	Blaine Tech
	12/19/2014	71.43	30.62	29.04	1.58	42.07	Blaine Tech

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	4/20/2015	71.43	30.15	28.99	1.16	42.21	Blaine Tech
	6/10/2015	71.43	31.00	30.70	0.30	40.67	Blaine Tech
	7/2/2015	71.43	32.30	29.88	2.42	41.07	Northstar
	7/7/2015	71.43	30.65	30.06	0.59	41.25	Northstar
	7/17/2015	71.43	30.40	30.10	0.30	41.27	Northstar
	7/29/2015	71.43	30.40	30.10	0.30	41.27	Northstar
	8/11/2015	71.43	31.00	30.70	0.30	40.67	Northstar
	10/19/2015	71.43	31.43	31.20	0.23	40.18	Blaine Tech
	3/14/2016	71.43	33.20	33.17	0.03	38.25	Blaine Tech
	4/11/2016	71.43	32.17	31.84	0.33	39.52	Blaine Tech
	6/29/2016	71.43	33.03	32.83	0.20	38.56	Blaine Tech
	8/22/2016	71.43	33.72	---	---	37.71	Blaine Tech
	10/3/2016	71.43	33.45	---	---	37.98	Blaine Tech
	4/17/2017	71.43	30.48	---	---	40.95	Blaine Tech
10/2/2017	71.43	33.45	---	---	37.98	Blaine Tech	
4/16/2018	71.43	33.13	---	---	38.30	Blaine Tech	
GMW-O-23	8/14/2007	73.63	23.33	---	---	50.30	Geomatrix
	8/21/2007	73.63	23.31	---	---	50.32	Geomatrix
	8/28/2007	73.63	23.00	---	---	50.63	Stantec
	9/11/2007	73.63	23.42	---	---	50.21	Geomatrix
	10/5/2007	73.63	27.79	---	---	45.84	Geomatrix
	11/2/2007	73.63	25.15	---	---	48.48	Geomatrix
	11/13/2007	73.63	23.90	---	---	49.73	Stantec
	12/28/2007	73.63	24.91	---	---	48.72	Geomatrix
	8/15/2008	73.63	26.28	---	---	47.35	Envent
	10/17/2008	73.63	27.16	---	---	46.47	Envent
	12/19/2008	73.63	27.60	---	---	46.03	Envent
	1/15/2009	73.63	27.54	---	---	46.09	Envent
	2/24/2009	73.63	26.19	---	---	47.44	Envent
	3/27/2009	73.63	23.74	---	---	49.89	Envent
	4/21/2009	73.63	27.30	---	---	46.33	Envent
	10/19/2009	73.63	NM	---	---	NC	Blaine Tech
	11/9/2009	73.63	27.50	---	---	46.13	Kinder Morgan
	6/22/2010	73.63	32.10	---	---	41.53	Blaine Tech
	10/4/2010	73.63	25.92	---	---	47.71	Blaine Tech
	1/10/2011	73.63	27.45	---	---	46.18	Blaine Tech
	4/11/2011	73.63	25.03	---	---	48.60	Blaine Tech
	7/11/2011	73.63	NM	---	---	NC	
	10/10/2011	73.63	25.25	---	---	48.38	Blaine Tech
	1/9/2012	73.63	25.91	---	---	47.72	Blaine Tech
	4/16/2012	73.63	27.38	---	---	46.25	Blaine Tech
	7/9/2012	73.63	27.41	---	---	46.22	Blaine Tech
	10/15/2012	73.63	26.48	---	---	47.15	Blaine Tech
	1/14/2013	73.63	29.35	---	---	44.28	Blaine Tech
	4/8/2013	73.63	29.81	27.74	2.07	45.48	Blaine Tech
	9/23/2013	73.63	29.90	---	---	43.73	Blaine Tech
	10/7/2013	73.63	32.86	28.30	4.56	44.42	Blaine Tech
	4/25/2014	73.63	29.81	29.66	0.15	43.94	Blaine Tech
	9/5/2014	73.63	32.57	28.76	3.81	44.11	Blaine Tech
9/11/2014	73.63	32.94	28.63	4.31	44.14	Blaine Tech	
9/18/2014	73.63	32.80	28.65	4.15	44.15	Blaine Tech	
9/26/2014	73.63	32.87	28.70	4.17	44.10	Blaine Tech	
10/1/2014	73.63	32.56	28.75	3.81	44.12	Blaine Tech	
10/6/2014	73.63	32.50	28.73	3.77	44.15	Blaine Tech	
10/14/2014	73.63	32.75	28.20	4.55	44.52	Blaine Tech	
10/23/2014	73.63	32.80	28.69	4.11	44.12	Blaine Tech	
10/27/2014	73.63	32.51	28.80	3.71	44.09	Blaine Tech	
11/3/2014	73.63	32.82	29.68	3.14	43.32	Blaine Tech	

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	11/10/2014	73.63	32.80	28.78	4.02	44.05	Blaine Tech
	11/18/2014	73.63	32.78	29.78	3.00	43.25	Blaine Tech
	11/25/2014	73.63	32.64	28.78	3.86	44.08	Blaine Tech
	12/3/2014	73.63	33.25	28.94	4.31	43.83	Blaine Tech
	12/12/2014	73.63	32.58	29.33	3.25	43.65	Blaine Tech
	12/19/2014	73.63	32.71	29.37	3.34	43.59	Blaine Tech
	3/17/2015	73.63	30.40	30.00	0.40	43.55	Kinder Morgan
	4/22/2015	73.63	33.08	30.36	2.72	42.73	Blaine Tech
	10/22/2015	73.63	32.82	30.46	2.36	42.70	Kinder Morgan
	3/16/2016	73.63	34.43	---	---	39.20	Kinder Morgan
	4/12/2016	73.63	32.59	---	---	41.04	Kinder Morgan
	6/29/2016	73.63	33.90	---	---	39.73	Blaine Tech
	8/22/2016	73.63	33.89	---	---	39.74	Blaine Tech
	10/3/2016	73.63	34.90	---	---	38.73	Blaine Tech
	3/23/2017	73.63	31.65	---	---	41.98	CH2M
4/17/2017	73.63	30.88	---	---	42.75	Blaine Tech	
10/2/2017	73.63	34.70	---	---	38.93	Blaine Tech	
4/16/2018	73.63	34.05	---	---	39.58	Blaine Tech	
GMW-SF-9	4/21/2009	73.00	24.19	---	---	48.81	Envent
	5/24/2010	73.00	28.31	---	---	44.69	Blaine Tech
	5/28/2010	73.00	28.37	---	---	44.63	Blaine Tech
	10/4/2010	73.00	25.28	---	---	47.72	Blaine Tech
	4/11/2011	73.00	23.90	---	---	49.10	Blaine Tech
	10/10/2011	73.00	24.70	---	---	48.30	Blaine Tech
	4/16/2012	73.00	26.99	---	---	46.01	Blaine Tech
	7/9/2012	73.00	NM	---	---	NC	Blaine Tech
	10/15/2012	73.05	34.21	---	---	38.84	Blaine Tech
	1/14/2013	73.05	34.32	---	---	38.73	Blaine Tech
	4/10/2013	73.05	27.37	---	---	45.68	Blaine Tech
	8/14/2014	73.05	29.35	28.37	0.98	44.48	Blaine Tech
	8/19/2014	73.05	28.46	28.44	0.02	44.61	Blaine Tech
	8/29/2014	73.05	29.32	28.31	1.01	44.54	Blaine Tech
	9/5/2014	73.05	29.33	28.29	1.04	44.55	Blaine Tech
9/11/2014	73.05	29.49	28.47	1.02	44.38	Blaine Tech	
9/18/2014	73.05	28.95	28.91	0.04	44.13	Blaine Tech	
9/26/2014	73.05	28.93	28.59	0.34	44.39	Blaine Tech	
4/20/2015	73.05	29.01	---	---	44.04	Blaine Tech	
10/21/2015	73.05	29.69	---	---	43.36	Blaine Tech	
3/6/2017	73.05	28.88	---	---	44.17	CH2M	
GMW-SF-10	4/21/2009	75.77	27.10	---	---	48.67	Envent
	10/4/2010	75.77	28.03	---	---	47.74	Blaine Tech
	4/11/2011	75.77	26.80	---	---	48.97	Blaine Tech
	10/10/2011	75.77	27.60	---	---	48.17	Blaine Tech
	4/16/2012	75.77	28.81	---	---	46.96	Blaine Tech
	7/9/2012	75.77	NM	---	---	NC	Blaine Tech
	10/15/2012	75.77	29.88	---	---	45.89	Blaine Tech
	4/8/2013	75.77	DRY	---	---	NC	Blaine Tech
GWR-3	4/30/2007	74.93	27.97	---	---	46.96	Secor
	11/12/2007	74.93	27.90	---	---	47.03	Stantec
	10/17/2008	74.93	29.88	---	---	45.05	Envent
	12/17/2008	74.93	19.71	---	---	55.22	Envent
	1/15/2009	74.93	29.27	29.26	0.26	45.88	Envent
	3/27/2009	74.93	27.18	---	---	47.75	Envent
	4/21/2009	74.93	29.97	---	---	44.96	Envent
	7/21/2009	74.93	28.77	---	---	46.16	Envent
	10/19/2009	74.93	NM	---	---	NC	Blaine Tech
	10/4/2010	74.93	30.67	---	---	44.26	Blaine Tech
4/11/2011	74.93	29.94	---	---	44.99	Blaine Tech	

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	10/10/2011	74.93	29.22	---	---	45.71	Blaine Tech
	4/16/2012	74.93	29.56	---	---	45.37	Blaine Tech
	7/9/2012	---	NM	---	---	NC	Blaine Tech
	10/15/2012	77.6	31.21	---	---	46.39	Blaine Tech
	4/8/2013	77.6	29.21	29.18	0.03	48.41	Blaine Tech
	10/7/2013	77.6	36.20	31.67	4.53	45.16	Blaine Tech
	4/14/2014	77.6	38.80	32.23	6.57	44.25	Blaine Tech
	5/5/2014	77.6	38.81	32.31	6.50	44.18	Nieto & Sons
	5/12/2014	77.6	36.34	32.77	3.57	44.22	Nieto & Sons
	5/27/2014	77.6	36.11	33.20	2.91	43.91	Nieto & Sons
	6/4/2014	77.6	34.57	31.61	2.96	45.49	Nieto & Sons
	8/8/2014	77.6	37.92	33.38	4.54	43.45	Blaine Tech
	8/13/2014	77.6	35.38	33.18	2.20	44.05	Blaine Tech
	8/19/2014	77.6	35.28	33.25	2.03	44.00	Blaine Tech
	8/29/2014	77.6	35.72	33.12	2.60	44.04	Blaine Tech
	9/5/2014	77.6	35.68	33.19	2.49	43.99	Blaine Tech
	9/11/2014	77.6	36.05	33.04	3.01	44.05	Blaine Tech
	9/18/2014	77.60	35.34	33.27	2.07	43.98	Blaine Tech
	9/26/2014	77.60	35.25	33.24	2.01	44.02	Blaine Tech
	10/1/2014	77.60	36.44	34.01	2.43	43.18	Blaine Tech
	10/6/2014	77.60	34.71	33.33	1.38	44.04	Blaine Tech
	10/14/2014	77.60	35.15	33.20	1.95	44.07	Blaine Tech
	10/23/2014	77.60	35.36	33.20	2.16	44.03	Blaine Tech
	10/27/2014	77.60	34.68	33.49	1.19	43.91	Blaine Tech
	11/3/2014	77.60	35.43	33.18	2.25	44.04	Blaine Tech
	11/10/2014	77.60	35.02	33.32	1.70	43.99	Blaine Tech
	11/18/2014	77.60	35.05	33.34	1.71	43.97	Blaine Tech
	11/25/2014	77.60	35.04	33.36	1.68	43.95	Blaine Tech
	12/3/2014	77.60	34.95	33.34	1.61	43.99	Blaine Tech
	12/12/2014	77.60	35.11	33.64	1.47	43.71	Blaine Tech
	12/19/2014	77.60	35.55	33.67	1.88	43.61	Blaine Tech
	4/20/2015	77.60	37.25	33.34	3.91	43.60	Blaine Tech
	7/24/2015	77.60	41.30	33.95	7.35	42.40	Northstar
	8/12/2015	77.60	37.03	34.42	2.61	42.74	Northstar
	10/20/2015	77.60	35.98	34.65	1.33	42.72	Blaine Tech
	3/16/2016	77.60	38.60	---	---	39.00	Kinder Morgan
	4/11/2016	77.60	36.90	---	---	40.70	Blaine Tech
	6/29/2016	77.60	37.77	---	---	39.83	Blaine Tech
	8/22/2016	77.60	38.24	---	---	39.36	Blaine Tech
	10/3/2016	77.60	39.20	39.15	0.05	38.44	Blaine Tech
	3/7/2017	77.60	35.62	---	---	41.98	CH2M
	4/17/2017	77.60	34.88	---	---	42.72	Blaine Tech
	10/2/2017	77.60	38.92	---	---	38.68	Blaine Tech
	4/16/2018	77.60	38.73	---	---	38.87	Blaine Tech
MW-18 (MID)	4/30/2007	75.67	29.77	---	---	45.90	Secor
	11/12/2007	75.67	30.23	---	---	45.44	Secor
	4/14/2008	75.67	30.45	---	---	45.22	Secor
	10/13/2008	75.67	31.15	---	---	44.52	Stantec
	4/20/2009	75.67	31.49	---	---	44.18	Blaine Tech
	10/19/2009	75.67	32.62	---	---	43.05	Blaine Tech
	5/24/2010	75.67	32.26	---	---	43.41	Blaine Tech
	5/28/2010	75.67	32.17	---	---	43.50	Blaine Tech
	10/4/2010	75.67	32.30	---	---	43.37	Blaine Tech
	4/11/2011	75.67	31.28	---	---	44.39	Blaine Tech
	10/10/2011	75.67	31.51	---	---	44.16	Blaine Tech
	4/16/2012	75.67	31.75	---	---	43.92	Blaine Tech
	7/9/2012	75.67	NM	---	---	NC	Blaine Tech
	10/15/2012	75.67	33.41	---	---	42.26	Blaine Tech

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	4/8/2013	75.67	30.68	---	---	44.99	Blaine Tech
	10/7/2013	75.67	35.33	---	---	40.34	Blaine Tech
	4/14/2014	75.67	35.40	---	---	40.27	Blaine Tech
	10/27/2014	75.67	35.81	---	---	39.86	Blaine Tech
	4/20/2015	75.67	36.29	---	---	39.38	Blaine Tech
	10/19/2015	75.67	36.99	---	---	38.68	Blaine Tech
	3/14/2016	75.67	40.70	---	---	34.97	Blaine Tech
	4/11/2016	75.67	38.89	---	---	36.78	Blaine Tech
	6/29/2016	75.67	39.94	---	---	35.73	Blaine Tech
	8/22/2016	75.67	40.14	---	---	35.53	Blaine Tech
	10/3/2016	75.67	40.93	---	---	34.74	Blaine Tech
	4/17/2017	75.67	37.50	---	---	38.17	Blaine Tech
	10/2/2017	75.67	40.26	---	---	35.41	Blaine Tech
4/16/2018	75.67	40.46	---	---	35.21	Blaine Tech	
MW-O-1	4/30/2007	75.48	24.10	23.98	0.12	51.48	Secor
	8/14/2007	75.48	25.31	23.78	1.53	51.39	Geomatrix
	8/21/2007	75.48	23.84	23.58	0.26	51.85	Geomatrix
	8/28/2007	75.48	23.07	23.06	0.01	52.42	Stantec
	9/11/2007	75.48	23.86	23.48	0.38	51.92	Geomatrix
	10/5/2007	75.48	24.67	---	---	50.81	Geomatrix
	11/2/2007	75.48	24.25	---	---	51.23	Geomatrix
	11/12/2007	75.48	24.27	24.25	0.02	51.23	Stantec
	12/28/2007	75.48	25.54	25.51	0.03	49.96	Geomatrix
	8/15/2008	75.48	NM	---	---	NC	Envent
	8/19/2008	75.48	25.18	25.13	0.05	50.34	Envent
	10/17/2008	75.48	25.30	---	---	50.18	Envent
	12/19/2008	75.48	26.31	---	---	49.17	Envent
	1/15/2009	75.48	25.84	---	---	49.64	Envent
	4/21/2009	75.48	25.41	---	---	50.07	Envent
	10/19/2009	75.48	26.30	---	---	49.18	Blaine Tech
	10/4/2010	75.48	26.90	---	---	48.58	Blaine Tech
	4/11/2011	75.48	25.59	---	---	49.89	Blaine Tech
	10/10/2011	75.48	26.52	---	---	48.96	Blaine Tech
	4/16/2012	75.48	27.25	---	---	48.23	Blaine Tech
	7/9/2012	75.48	NM	---	---	NC	Blaine Tech
	10/15/2012	75.48	28.94	---	---	46.54	Blaine Tech
	4/8/2013	75.48	28.81	---	---	46.67	Blaine Tech
	10/7/2013	75.48	29.21	---	---	46.27	Blaine Tech
	4/14/2014	75.48	29.82	---	---	45.66	Blaine Tech
	10/27/2014	75.48	29.92	---	---	45.56	Blaine Tech
	4/20/2015	75.48	30.39	---	---	45.09	Blaine Tech
	10/27/2015	75.48	27.67	---	---	47.81	Blaine Tech
	3/14/2016	75.48	DRY	---	---	NC	Blaine Tech
	4/11/2016	75.48	DRY	---	---	NC	Blaine Tech
6/29/2016	75.48	DRY	---	---	NC	Blaine Tech	
8/22/2016	75.48	DRY	---	---	NC	Blaine Tech	
10/3/2016	75.48	DRY	---	---	NC	Blaine Tech	
4/17/2017	75.48	DRY	---	---	NC	Blaine Tech	
10/2/2017	75.48	DRY	---	---	NC	Blaine Tech	
4/16/2018	75.48	DRY	---	---	NC	Blaine Tech	
MW-O-2	4/30/2007	74.31	22.53	---	---	51.78	Secor
	11/12/2007	71.90	23.10	---	---	48.80	Stantec
	8/15/2008	71.90	NM	---	---	NC	Envent
	10/17/2008	71.90	24.85	---	---	47.05	Envent
	12/19/2008	71.90	25.51	---	---	46.39	Envent
	3/27/2009	71.90	25.22	---	---	46.68	Envent
	4/21/2009	71.90	NM	---	---	NC	Envent
7/21/2009	71.90	23.63	---	---	48.27	Envent	

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	10/19/2009	71.90	NM	---	---	NC	Blaine Tech
	11/9/2009	71.90	25.39	---	---	46.51	Kinder Morgan
	10/4/2010	71.90	26.05	---	---	45.85	Blaine Tech
	4/13/2011	71.9	23.31	---	---	48.59	Blaine Tech
	10/10/2011	71.9	27.53	---	---	44.37	Blaine Tech
	1/9/2012	71.9	28.13	---	---	43.77	Blaine Tech
	4/16/2012	71.9	NM	---	---	NC	Blaine Tech
	7/9/2012	71.9	26.53	---	---	45.37	Blaine Tech
	10/15/2012	71.9	26.89	---	---	45.01	Blaine Tech
	1/14/2013	71.9	26.93	---	---	44.97	Blaine Tech
	4/8/2013	71.9	NM	---	---	NC	Blaine Tech
	6/6/2013	71.9	28.99	---	---	42.91	Blaine Tech
	10/7/2013	71.9	29.06	---	---	42.84	Blaine Tech
	4/14/2014	71.9	29.36	---	---	42.54	Blaine Tech
	10/27/2014	71.9	29.81	29.65	0.16	42.22	Blaine Tech
	4/20/2015	71.9	30.94	29.34	1.60	42.24	Blaine Tech
	5/21/2015	71.9	32.50	27.31	5.19	43.55	Northstar
	5/29/2015	71.9	31.52	30.20	1.32	41.44	Northstar
	6/5/2015	71.9	31.45	30.57	0.88	41.15	Northstar
	6/12/2015	71.9	31.05	30.60	0.45	41.21	Northstar
	6/19/2015	71.9	31.10	30.90	0.20	40.96	Northstar
	6/26/2015	71.9	31.66	31.37	0.29	40.47	Northstar
	10/19/2015	71.9	32.39	30.53	1.86	41.00	Blaine Tech
	3/14/2016	71.9	35.49	34.86	0.63	36.91	Blaine Tech
	4/11/2016	71.9	33.03	32.54	0.49	39.26	Blaine Tech
	6/30/2016	71.9	34.20	---	---	37.70	Kinder Morgan
	8/22/2016	71.9	33.93	---	---	37.97	Kinder Morgan
	10/3/2016	71.9	34.30	34.22	0.08	37.66	Blaine Tech
4/17/2017	71.9	30.91	30.85	0.06	41.04	Blaine Tech	
10/2/2017	71.9	34.67	---	---	37.23	Blaine Tech	
4/16/2018	71.9	34.18	34.16	0.02	37.74	Blaine Tech	
MW-SF-1	3/12/2007	78.93	28.71	---	---	50.22	Secor
	4/30/2007	78.93	28.44	---	---	50.49	Secor
	8/28/2007	78.93	27.94	---	---	50.99	Stantec
	11/12/2007	78.93	28.76	---	---	50.17	Stantec
	2/19/2008	78.93	29.50	---	---	49.43	Stantec
	4/14/2008	78.93	29.16	---	---	49.77	Stantec
	8/11/2008	78.93	29.75	---	---	49.18	Stantec
	10/13/2008	78.93	29.86	---	---	49.07	Stantec
	2/23/2009	78.93	30.00	---	---	48.93	Blaine Tech
	4/20/2009	78.93	29.97	---	---	48.96	Blaine Tech
	7/20/2009	78.93	30.98	---	---	47.95	Blaine Tech
	7/22/2009	78.93	30.98	---	---	47.95	Blaine Tech
	10/19/2009	78.93	31.11	---	---	47.82	Blaine Tech
	3/15/2010	78.93	31.74	---	---	47.19	Blaine Tech
	5/24/2010	78.93	30.79	---	---	48.14	Blaine Tech
	5/28/2010	78.93	30.57	---	---	48.36	Blaine Tech
	6/22/2010	78.93	30.84	---	---	48.09	Blaine Tech
	7/12/2010	78.93	30.51	---	---	48.42	Blaine Tech
	10/4/2010	78.93	30.88	---	---	48.05	Blaine Tech
	1/10/2011	78.93	32.51	---	---	46.42	Blaine Tech
	4/11/2011	78.93	29.87	---	---	49.06	Blaine Tech
	7/11/2011	78.93	29.84	---	---	49.09	Blaine Tech
	10/10/2011	78.93	29.60	---	---	49.33	Blaine Tech
1/9/2012	78.93	31.25	---	---	47.68	Blaine Tech	
4/16/2012	78.93	32.59	---	---	46.34	Blaine Tech	
7/9/2012	78.93	31.24	---	---	47.69	Blaine Tech	
10/15/2012	78.93	32.23	---	---	46.70	Blaine Tech	

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	1/14/2013	78.93	33.88	---	---	45.05	Blaine Tech
	4/8/2013	78.93	33.38	---	---	45.55	Blaine Tech
	10/7/2013	78.93	37.14	31.72	5.42	46.13	Blaine Tech
	4/14/2014	78.93	37.40	32.69	4.71	45.30	Blaine Tech
	5/6/2014	78.93	39.99	32.82	7.17	44.68	Nieto & Sons
	5/12/2014	78.93	37.31	33.55	3.76	44.63	Nieto & Sons
	5/20/2014	78.93	37.10	34.60	2.50	43.83	Nieto & Sons
	5/27/2014	78.93	36.62	34.30	2.32	44.17	Nieto & Sons
	6/4/2014	78.93	35.98	35.27	0.71	43.52	Nieto & Sons
	6/10/2014	78.93	36.91	34.48	2.43	43.96	Nieto & Sons
	7/3/2014	78.93	36.72	34.71	2.01	43.82	Nieto & Sons
	7/8/2014	78.93	36.60	34.45	2.15	44.05	Blaine Tech
	7/18/2014	78.93	35.18	34.77	0.41	44.08	Blaine Tech
	7/24/2014	78.93	35.30	34.62	0.68	44.17	Blaine Tech
	8/1/2014	78.93	34.74	34.44	0.30	44.43	Blaine Tech
	8/14/2014	78.93	34.75	34.41	0.34	44.45	Blaine Tech
	8/19/2014	78.93	34.66	34.37	0.29	44.50	Blaine Tech
	8/29/2014	78.93	35.65	35.38	0.27	43.50	Blaine Tech
	9/18/2014	78.93	34.85	34.49	0.36	44.37	Blaine Tech
	9/26/2014	78.93	34.78	34.45	0.33	44.41	Blaine Tech
	10/1/2014	78.93	34.77	34.41	0.36	44.45	Blaine Tech
	10/6/2014	78.93	34.78	34.42	0.36	44.44	Blaine Tech
	10/14/2014	78.93	34.65	34.41	0.24	44.47	Blaine Tech
	10/23/2014	78.93	34.84	34.45	0.39	44.40	Blaine Tech
	10/27/2014	78.93	34.80	34.43	0.37	44.43	Blaine Tech
	11/10/2014	78.93	34.91	34.51	0.40	44.34	Blaine Tech
	11/18/2014	78.93	34.80	34.43	0.37	44.43	Blaine Tech
	11/25/2014	78.93	34.53	34.51	0.02	44.42	Blaine Tech
	12/12/2014	78.93	35.18	34.78	0.40	44.07	Blaine Tech
	12/19/2014	78.93	35.34	34.88	0.46	43.96	Blaine Tech
	4/20/2015	78.93	34.89	34.48	0.41	44.37	Blaine Tech
	5/19/2015	78.93	38.45	34.55	3.90	43.60	Northstar
	5/29/2015	78.93	36.36	35.22	1.14	43.48	Northstar
	6/5/2015	78.93	36.50	35.43	1.07	43.29	Northstar
	6/12/2015	78.93	35.80	35.41	0.39	43.44	Northstar
	6/19/2015	78.93	36.02	35.42	0.60	43.39	Northstar
	6/26/2015	78.93	36.60	36.45	0.15	42.45	Northstar
	10/19/2015	78.93	36.35	35.53	0.82	43.24	Blaine Tech
	11/17/2015	78.93	35.65	---	---	43.28	Kinder Morgan
	3/14/2016	78.93	40.40	---	---	38.53	Blaine Tech
	4/11/2016	78.93	37.96	---	---	40.97	Blaine Tech
	6/29/2016	78.93	39.05	---	---	39.88	Blaine Tech
	8/22/2016	78.93	39.04	---	---	39.87	Blaine Tech
	10/3/2016	78.93	39.20	---	---	39.73	Blaine Tech
	4/17/2017	78.93	35.75	---	---	43.18	Blaine Tech
	10/2/2017	78.93	39.98	---	---	38.95	Blaine Tech
	4/16/2018	78.93	39.43	---	---	39.50	Blaine Tech
MW-SF-2	4/30/2007	78.45	28.35	28.34	0.01	50.11	Secor
	11/12/2007	78.45	29.18	28.71	0.47	49.65	Stantec
	8/12/2008	78.45	31.11	---	---	47.34	Envent
	10/17/2008	78.45	31.55	31.50	0.05	46.94	Envent
	12/18/2008	78.53	32.75	32.55	0.20	45.94	Envent
	1/15/2009	78.53	30.84	30.57	0.27	47.91	Envent
	3/24/2009	78.53	28.85	---	---	49.68	Envent
	4/21/2009	78.53	29.98	---	---	48.55	Envent
	7/21/2009	78.53	29.85	---	---	48.68	Envent
	10/19/2009	78.53	NM	---	---	NC	Blaine Tech
	12/9/2009	78.53	31.45	---	---	47.08	Kinder Morgan

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	10/4/2010	78.53	30.96	30.75	0.21	47.74	Blaine Tech
	1/10/2011	78.53	32.62	32.50	0.12	46.01	Blaine Tech
	4/11/2011	78.53	29.83	---	---	48.70	Blaine Tech
	7/11/2011	78.53	NM	---	---	NC	
	10/10/2011	78.53	29.82	---	---	48.71	Blaine Tech
	1/9/2012	78.53	30.52	---	---	48.01	Blaine Tech
	4/16/2012	78.53	31.28	---	---	47.25	Blaine Tech
	7/9/2012	78.53	33.18	---	---	45.35	Blaine Tech
	10/15/2012	78.53	32.11	---	---	46.42	Blaine Tech
	1/14/2013	78.53	33.59	---	---	44.94	Blaine Tech
	4/8/2013	78.53	33.32	---	---	45.21	Blaine Tech
	10/7/2013	78.53	34.58	33.08	1.50	45.15	Blaine Tech
	4/14/2014	78.53	37.50	33.27	4.23	44.41	Blaine Tech
	5/6/2014	78.53	37.71	33.24	4.47	44.40	Nieto & Sons
	5/12/2014	78.53	37.53	33.34	4.19	44.35	Nieto & Sons
	5/20/2014	78.53	37.62	33.51	4.11	44.20	Nieto & Sons
	5/27/2014	78.53	38.24	33.77	4.47	43.87	Nieto & Sons
	6/4/2014	78.53	34.63	---	---	43.90	Nieto & Sons
	6/10/2014	78.53	38.49	34.00	4.49	43.63	Nieto & Sons
	8/8/2014	78.53	36.23	33.82	2.41	44.23	Blaine Tech
	8/13/2014	78.53	36.75	33.59	3.16	44.31	Blaine Tech
	8/19/2014	78.53	36.90	33.60	3.30	44.27	Blaine Tech
	8/29/2014	78.53	37.11	33.53	3.58	44.28	Blaine Tech
	9/5/2014	78.53	37.09	33.51	3.58	44.30	Blaine Tech
	9/11/2014	78.53	37.12	33.51	3.61	44.30	Blaine Tech
	9/18/2014	78.53	36.89	33.60	3.29	44.27	Blaine Tech
	9/26/2014	78.53	37.28	33.54	3.74	44.24	Blaine Tech
	10/1/2014	78.53	37.18	33.56	3.62	44.25	Blaine Tech
	10/6/2014	78.53	37.16	33.59	3.57	44.23	Blaine Tech
	10/14/2014	78.53	37.15	33.64	3.51	44.19	Blaine Tech
	10/23/2014	78.53	37.24	33.61	3.63	44.19	Blaine Tech
	10/27/2014	78.53	37.04	33.54	3.50	44.29	Blaine Tech
	11/3/2014	78.53	37.14	33.55	3.59	44.26	Blaine Tech
	11/10/2014	78.53	37.33	33.56	3.77	44.22	Blaine Tech
	11/18/2014	78.53	37.21	33.64	3.57	44.18	Blaine Tech
	11/25/2014	78.53	37.40	33.69	3.71	44.10	Blaine Tech
	12/3/2014	78.53	37.16	33.60	3.56	44.22	Blaine Tech
	12/12/2014	78.53	38.05	33.91	4.14	43.79	Blaine Tech
	12/19/2014	78.53	38.40	33.95	4.45	43.69	Blaine Tech
	4/20/2015	78.53	36.15	34.73	1.42	43.52	Blaine Tech
	6/25/2015	78.53	38.95	35.57	3.38	42.28	Blaine Tech
	10/21/2015	78.53	36.32	36.13	0.19	42.36	Kinder Morgan
	3/16/2016	78.53	39.27	---	---	39.26	Kinder Morgan
	4/11/2016	78.53	37.47	---	---	41.06	Blaine Tech
	6/29/2016	78.53	38.08	---	---	40.45	Blaine Tech
	8/22/2016	78.53	38.83	---	---	39.70	Blaine Tech
	10/3/2016	78.53	39.60	---	---	38.93	Blaine Tech
	3/10/2017	78.53	36.47	---	---	42.06	CH2M
	4/17/2017	78.53	35.78	---	---	42.75	Blaine Tech
	10/2/2017	78.53	39.68	---	---	38.85	Blaine Tech
	4/16/2018	78.53	39.47	---	---	39.06	Blaine Tech
MW-SF-3	4/30/2007	77.62	27.72	27.45	0.27	50.12	Secor
	11/12/2007	77.62	29.34	28.28	1.06	49.13	Stantec
	8/12/2008	77.62	30.30	29.05	1.25	48.32	Envent
	10/17/2008	77.62	29.45	---	---	48.17	Envent
	12/18/2008	78.12	31.08	30.82	0.26	47.25	Envent
	1/15/2009	78.12	29.96	29.94	0.02	48.18	Envent
	3/20/2009	78.12	31.10	---	---	47.02	Envent

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	3/24/2009	78.12	27.82	---	---	50.30	Envent
	4/21/2009	78.12	29.51	29.50	0.01	48.62	Envent
	7/21/2009	78.12	30.07	---	---	48.05	Envent
	10/19/2009	78.12	NM	---	---	NC	Blaine Tech
	11/6/2009	78.12	30.37	30.35	0.02	47.77	Kinder Morgan
	12/9/2009	78.12	30.53	---	---	47.59	Kinder Morgan
	9/3/2010	78.12	30.97	30.42	0.55	47.59	Kinder Morgan
	10/4/2010	78.12	30.88	30.30	0.58	47.70	Blaine Tech
	4/12/2011	78.12	29.44	---	---	48.68	Blaine Tech
	10/10/2011	78.12	30.75	---	---	47.37	Blaine Tech
	4/16/2012	78.12	NM	---	---	NC	Blaine Tech
	7/9/2012	78.12	NM	---	---	NC	Blaine Tech
	10/15/2012	78.12	32.47	---	---	45.65	Blaine Tech
	5/24/2013	78.12	33.35	32.51	0.84	45.44	Blaine Tech
	9/25/2013	78.12	34.40	---	---	43.72	Blaine Tech
	10/7/2013	78.12	NM	---	---	NC	Blaine Tech
	11/14/2013	78.12	33.26	---	---	44.86	Blaine Tech
	4/18/2014	78.12	33.72	33.62	0.10	44.48	Blaine Tech
	8/8/2014	78.12	34.07	33.71	0.36	44.34	Blaine Tech
	10/14/2014	78.12	34.55	33.92	0.63	44.07	Blaine Tech
	10/23/2014	78.12	34.57	33.94	0.63	44.05	Blaine Tech
	10/27/2014	78.12	34.49	33.85	0.64	44.14	Blaine Tech
	11/10/2014	78.12	34.65	33.94	0.71	44.04	Blaine Tech
	11/18/2014	78.12	34.62	33.88	0.74	44.09	Blaine Tech
	11/25/2014	78.12	34.22	33.94	0.28	44.12	Blaine Tech
	12/12/2014	78.12	34.89	34.38	0.51	43.64	Blaine Tech
	12/19/2014	78.12	35.04	34.43	0.61	43.57	Blaine Tech
	4/20/2015	78.12	34.52	---	---	43.60	Blaine Tech
	10/21/2015	78.12	35.18	---	---	42.94	Kinder Morgan
	3/14/2016	78.12	39.43	39.40	0.03	38.71	Blaine Tech
	4/11/2016	78.12	37.17	---	---	40.95	Blaine Tech
	6/30/2016	78.12	38.28	---	---	39.84	Kinder Morgan
	8/22/2016	78.12	38.33	---	---	39.79	Kinder Morgan
	10/3/2016	78.12	39.40	---	---	38.72	Kinder Morgan
3/8/2017	78.12	35.75	---	---	42.37	CH2M	
4/17/2017	78.12	35.15	---	---	42.97	Blaine Tech	
10/2/2017	78.12	39.20	---	---	38.92	Blaine Tech	
4/16/2018	78.12	38.81	---	---	39.31	Blaine Tech	
MW-SF-4	3/12/2007	79.38	30.01	29.41	0.60	49.85	Secor
	4/30/2007	79.38	29.96	29.11	0.85	50.10	Secor
	8/14/2007	79.38	30.34	28.38	1.96	50.60	Geomatrix
	8/28/2007	79.38	29.95	28.30	1.65	50.74	Stantec
	9/11/2007	79.38	29.98	28.43	1.55	50.63	Geomatrix
	10/5/2007	79.38	30.68	28.85	1.83	50.15	Geomatrix
	10/12/2007	79.38	30.27	29.96	0.31	49.36	Geomatrix
	10/19/2007	79.38	30.28	---	---	49.10	Geomatrix
	10/26/2007	79.38	30.52	---	---	48.86	Geomatrix
	11/2/2007	79.38	30.68	---	---	48.70	Geomatrix
	11/12/2007	79.38	29.70	29.69	0.01	49.69	Stantec
	12/21/2007	79.38	30.69	---	---	48.69	Geomatrix
	2/19/2008	79.38	30.22	---	---	49.16	Stantec
	3/21/2008	79.38	30.07	---	---	49.31	Envent
	4/14/2008	79.38	29.95	---	---	49.43	Stantec
	8/8/2008	79.38	30.51	---	---	48.87	Envent
	8/11/2008	79.38	30.57	---	---	48.81	Stantec
	10/16/2008	79.38	30.77	---	---	48.61	Envent
	1/15/2009	79.38	31.14	---	---	48.24	Envent
	2/20/2009	79.38	30.84	---	---	48.54	Envent

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	2/23/2009	79.38	30.96	---	---	48.42	Blaine Tech
	4/20/2009	79.38	30.02	29.94	0.08	49.42	Blaine Tech
	4/28/2009	79.38	30.78	---	---	48.60	Envent
	7/17/2009	79.38	31.85	---	---	47.53	Envent
	7/20/2009	79.38	31.65	31.61	0.04	47.76	Blaine Tech
	7/22/2009	79.38	31.65	31.61	0.04	47.76	Blaine Tech
	10/19/2009	79.38	31.93	31.90	0.03	47.47	Blaine Tech
	3/15/2010	79.38	31.95	31.91	0.04	47.46	Blaine Tech
	5/24/2010	79.38	31.60	---	---	47.78	Blaine Tech
	5/28/2010	79.38	26.40	---	---	52.98	Blaine Tech
	6/22/2010	79.38	31.63	---	---	47.75	Blaine Tech
	7/12/2010	79.38	31.37	---	---	48.01	Blaine Tech
	10/4/2010	79.38	31.81	---	---	47.57	Blaine Tech
	1/10/2011	79.38	32.99	---	---	46.39	Blaine Tech
	4/11/2011	79.38	30.85	---	---	48.53	Blaine Tech
	7/11/2011	79.38	30.35	---	---	49.03	Blaine Tech
	10/10/2011	79.38	NM	---	---	NC	Blaine Tech
	1/9/2012	79.38	32.07	---	---	47.31	Blaine Tech
	4/16/2012	79.38	33.35	---	---	46.03	Blaine Tech
	7/9/2012	79.38	32.11	---	---	47.27	Blaine Tech
	10/15/2012	79.38	34.04	---	---	45.34	Blaine Tech
	1/14/2013	79.38	34.52	---	---	44.86	Blaine Tech
	4/8/2013	79.38	DRY	---	---	NC	Blaine Tech
	10/7/2013	79.38	DRY	---	---	NC	Blaine Tech
	4/25/2014	79.38	40.03	34.23	5.80	43.96	Blaine Tech
	5/6/2014	79.38	39.78	33.91	5.87	44.27	Nieto & Sons
	5/12/2014	79.38	37.02	34.64	2.38	44.25	Nieto & Sons
	5/20/2014	79.38	36.60	35.60	1.00	43.58	Nieto & Sons
	5/27/2014	79.38	36.12	35.45	0.67	43.79	Nieto & Sons
	6/4/2014	79.38	36.54	35.91	0.63	43.34	Nieto & Sons
	6/10/2014	79.38	37.02	35.38	1.64	43.66	Nieto & Sons
	7/3/2014	79.38	36.98	35.63	1.35	43.47	Nieto & Sons
	7/8/2014	79.38	36.78	35.34	1.44	43.74	Blaine Tech
	7/18/2014	79.38	35.88	35.55	0.33	43.76	Blaine Tech
	7/24/2014	79.38	35.98	35.42	0.56	43.85	Blaine Tech
	8/1/2014	79.38	35.57	35.30	0.27	44.02	Blaine Tech
	8/14/2014	79.38	35.42	35.23	0.19	44.11	Blaine Tech
	8/19/2014	79.38	35.36	35.21	0.15	44.14	Blaine Tech
	8/29/2014	79.38	35.32	35.20	0.12	44.16	Blaine Tech
	9/18/2014	79.38	35.55	35.30	0.25	44.03	Blaine Tech
	9/26/2014	79.38	35.56	35.30	0.26	44.03	Blaine Tech
	10/1/2014	79.38	35.56	35.24	0.32	44.07	Blaine Tech
	10/6/2014	79.38	35.48	35.22	0.26	44.11	Blaine Tech
	10/14/2014	79.38	35.33	35.20	0.13	44.15	Blaine Tech
	10/23/2014	79.38	35.51	35.22	0.29	44.10	Blaine Tech
	10/27/2014	79.38	35.54	35.25	0.29	44.07	Blaine Tech
	11/18/2014	79.38	35.56	35.25	0.31	44.07	Blaine Tech
	11/25/2014	79.38	35.66	35.32	0.34	43.99	Blaine Tech
	12/12/2014	79.38	35.81	35.58	0.23	43.75	Blaine Tech
	12/19/2014	79.38	35.75	35.62	0.13	43.73	Blaine Tech
	4/20/2015	79.38	37.78	35.29	2.49	43.58	Blaine Tech
	5/19/2015	79.38	39.22	35.28	3.94	43.29	Northstar
	5/29/2015	79.38	37.10	35.80	1.30	43.31	Northstar
	6/5/2015	79.38	36.85	36.15	0.70	43.09	Northstar
	6/12/2015	79.38	36.55	36.15	0.40	43.15	Northstar
	6/19/2015	79.38	36.68	36.42	0.26	42.91	Northstar
	6/26/2015	79.38	37.23	36.96	0.27	42.36	Northstar
	10/19/2015	79.38	38.12	36.25	1.87	42.75	Blaine Tech

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	11/17/2015	79.38	37.83	35.98	1.85	43.02	Kinder Morgan
	3/14/2016	79.38	40.80	---	---	38.58	Kinder Morgan
	4/11/2016	79.38	37.76	---	---	41.62	Blaine Tech
	6/29/2016	79.38	39.54	---	---	39.84	Blaine Tech
	8/22/2016	79.38	39.76	---	---	39.62	Blaine Tech
	10/3/2016	79.38	41.05	---	---	38.33	Blaine Tech
	4/17/2017	79.38	36.67	---	---	42.71	Blaine Tech
	10/2/2017	79.38	40.07	---	---	39.31	Blaine Tech
	4/16/2018	79.38	39.90	---	---	39.48	Blaine Tech
MW-SF-5	4/30/2007	79.74	29.54	---	---	50.20	Secor
	8/21/2007	79.74	28.36	---	---	51.38	Geomatrix
	8/28/2007	79.74	28.84	---	---	50.90	Stantec
	10/5/2007	79.74	29.50	---	---	50.24	Geomatrix
	11/2/2007	79.74	31.50	---	---	48.24	Geomatrix
	11/12/2007	79.74	29.93	---	---	49.81	Stantec
	12/21/2007	79.74	31.00	---	---	48.74	Geomatrix
	4/14/2008	79.74	30.20	---	---	49.54	Stantec
	8/11/2008	79.74	30.85	---	---	48.89	Stantec
	10/13/2008	79.74	30.93	---	---	48.81	Stantec
	4/20/2009	79.74	30.99	---	---	48.75	Blaine Tech
	10/19/2009	79.74	NM	---	---	NC	Blaine Tech
	5/24/2010	79.74	31.55	---	---	48.19	Blaine Tech
	5/28/2010	79.74	31.44	---	---	48.30	Blaine Tech
	6/22/2010	79.74	31.57	---	---	48.17	Blaine Tech
	10/4/2010	79.74	31.39	---	---	48.35	Blaine Tech
	1/10/2011	79.74	33.80	---	---	45.94	Blaine Tech
	4/11/2011	79.74	31.03	---	---	48.71	Blaine Tech
	7/11/2011	79.74	NM	---	---	NC	
	10/10/2011	79.74	31.28	---	---	48.46	Blaine Tech
	1/9/2012	79.74	32.12	---	---	47.62	Blaine Tech
	4/16/2012	79.74	33.30	---	---	46.44	Blaine Tech
	7/9/2012	79.74	34.45	---	---	45.29	Blaine Tech
	10/15/2012	79.74	33.28	---	---	46.46	Blaine Tech
	1/14/2013	79.74	33.37	---	---	46.37	Blaine Tech
	4/8/2013	79.74	34.28	---	---	45.46	Blaine Tech
	10/7/2013	79.74	34.58	---	---	45.16	Blaine Tech
	4/14/2014	79.74	35.33	---	---	44.41	Blaine Tech
	10/27/2014	79.74	35.48	---	---	44.26	Blaine Tech
	4/20/2015	79.74	36.05	---	---	43.69	Blaine Tech
	10/19/2015	79.74	36.82	---	---	42.92	Blaine Tech
	3/14/2016	79.74	DRY	---	---	NC	Blaine Tech
4/11/2016	79.74	DRY	---	---	NC	Blaine Tech	
6/29/2016	79.74	DRY	---	---	NC	Blaine Tech	
8/22/2016	79.74	DRY	---	---	NC	Blaine Tech	
10/3/2016	79.74	DRY	---	---	NC	Blaine Tech	
4/17/2017	79.74	36.88	---	---	42.86	Blaine Tech	
10/2/2017	79.74	DRY	---	---	NC	Blaine Tech	
4/16/2018	79.74	DRY	---	---	NC	Blaine Tech	
MW-SF-6	4/30/2007	79.96	27.44	27.20	0.24	52.71	Secor
	11/12/2007	79.96	27.14	---	---	52.82	Stantec
	8/12/2008	79.96	29.82	---	---	50.14	Envent
	10/17/2008	79.96	29.75	---	---	50.21	Envent
	12/18/2008	76.8	30.73	---	---	46.07	Envent
	1/15/2009	76.8	31.35	---	---	45.45	Envent
	3/24/2009	76.80	30.50	---	---	46.30	Envent
	4/21/2009	76.80	28.45	---	---	48.35	Envent
	7/21/2009	76.80	27.22	---	---	49.58	Envent
10/19/2009	76.80	NM	---	---	NC	Blaine Tech	

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	11/6/2009	76.80	29.10	---	---	47.70	Kinder Morgan
	12/9/2009	76.80	31.35	---	---	45.45	Kinder Morgan
	10/4/2010	76.80	29.09	---	---	47.71	Blaine Tech
	1/10/2011	76.80	30.87	---	---	45.93	Blaine Tech
	4/11/2011	76.80	28.16	---	---	48.64	Blaine Tech
	7/11/2011	76.80	NM	---	---	NC	
	10/10/2011	76.80	28.21	---	---	48.59	Blaine Tech
	1/9/2012	76.80	29.03	---	---	47.77	Blaine Tech
	4/16/2012	76.80	29.66	---	---	47.14	Blaine Tech
	7/9/2012	76.80	31.46	---	---	45.34	Blaine Tech
	10/15/2012	76.80	31.44	---	---	45.36	Blaine Tech
	1/14/2013	76.80	31.53	---	---	45.27	Blaine Tech
	4/8/2013	76.80	30.21	28.81	1.40	47.71	Blaine Tech
	10/7/2013	76.80	NM	---	---	NC	Blaine Tech
	11/14/2013	76.80	31.90	---	---	44.90	Blaine Tech
	4/18/2014	76.80	33.30	32.15	1.15	44.42	Blaine Tech
	8/8/2014	76.8	34.50	33.31	1.19	43.25	Blaine Tech
	8/13/2014	76.8	32.95	32.54	0.41	44.18	Blaine Tech
	8/19/2014	76.8	32.87	32.62	0.25	44.13	Blaine Tech
	8/29/2014	76.8	32.79	32.56	0.23	44.19	Blaine Tech
	9/5/2014	76.8	32.81	32.59	0.22	44.17	Blaine Tech
	9/18/2014	76.8	32.95	32.65	0.30	44.09	Blaine Tech
	9/26/2014	76.8	32.94	32.61	0.33	44.12	Blaine Tech
	10/1/2014	76.8	32.91	32.60	0.31	44.14	Blaine Tech
	10/6/2014	76.8	32.90	32.61	0.29	44.13	Blaine Tech
	10/14/2014	76.8	33.72	33.60	0.12	43.18	Blaine Tech
	10/23/2014	76.8	34.57	33.94	0.63	42.73	Blaine Tech
	10/27/2014	76.8	32.92	32.58	0.34	44.15	Blaine Tech
	11/18/2014	76.8	32.99	32.62	0.37	44.11	Blaine Tech
	11/25/2014	76.8	32.66	32.58	0.08	44.20	Blaine Tech
	12/12/2014	76.8	33.45	33.07	0.38	43.65	Blaine Tech
	12/19/2014	76.8	33.60	33.15	0.45	43.56	Blaine Tech
	4/20/2015	76.8	33.23	33.11	0.12	43.67	Blaine Tech
	10/21/2015	76.8	34.28	---	---	42.52	Kinder Morgan
	3/14/2016	76.8	38.10	38.08	0.02	38.72	Blaine Tech
	4/11/2016	76.8	35.83	---	---	40.97	Blaine Tech
	6/29/2016	76.8	36.89	---	---	39.91	Blaine Tech
	8/22/2016	76.8	37.11	---	---	39.69	Blaine Tech
	10/3/2016	76.8	38.45	---	---	38.35	Blaine Tech
	4/17/2017	76.8	34.03	---	---	42.77	Blaine Tech
	10/2/2017	76.8	37.89	---	---	38.91	Blaine Tech
	4/16/2018	76.8	37.65	---	---	39.15	Blaine Tech
MW-SF-9	4/30/2007	74.1	22.66	---	---	51.44	Secor
	8/14/2007	74.1	28.73	28.61	0.12	45.47	Geomatrix
	8/21/2007	74.1	26.55	---	---	47.55	Geomatrix
	8/28/2007	74.1	20.55	---	---	53.55	Stantec
	9/11/2007	74.1	19.40	---	---	54.70	Geomatrix
	10/5/2007	74.1	26.84	---	---	47.26	Geomatrix
	11/2/2007	74.1	22.76	---	---	51.34	Geomatrix
	11/12/2007	74.1	22.96	---	---	51.14	Stantec
	12/21/2007	74.1	24.05	---	---	50.05	Geomatrix
	4/14/2008	74.1	24.23	---	---	49.87	Stantec
	10/13/2008	74.1	24.83	---	---	49.27	Stantec
	4/20/2009	74.10	25.27	---	---	48.83	Blaine Tech
	10/19/2009	74.10	26.45	---	---	47.65	Blaine Tech
	5/24/2010	74.10	25.80	---	---	48.30	Blaine Tech
	5/28/2010	74.10	25.66	---	---	48.44	Blaine Tech
	6/22/2010	74.10	25.84	---	---	48.26	Blaine Tech

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	10/4/2010	74.10	26.10	---	---	48.00	Blaine Tech
	1/10/2011	74.10	27.41	---	---	46.69	Blaine Tech
	4/11/2011	74.10	24.16	---	---	49.94	Blaine Tech
	7/11/2011	74.10	NM	---	---	NC	
	10/10/2011	74.10	25.02	---	---	49.08	Blaine Tech
	1/9/2012	74.10	25.98	---	---	48.12	Blaine Tech
	4/16/2012	74.10	25.92	---	---	48.18	Blaine Tech
	7/9/2012	74.10	26.44	---	---	47.66	Blaine Tech
	10/15/2012	74.10	NM	---	---	NC	Blaine Tech
	4/8/2013	74.10	DRY	---	---	NC	Blaine Tech
	6/6/2013	74.10	28.53	---	---	45.57	Blaine Tech
	10/7/2013	74.10	28.95	---	---	45.15	Blaine Tech
	4/25/2014	74.10	34.75	27.95	6.80	44.89	Blaine Tech
	5/5/2014	74.10	37.81	31.76	6.05	41.22	Nieto & Sons
	5/12/2014	74.10	32.32	29.11	3.21	44.40	Nieto & Sons
	5/20/2014	74.10	30.75	29.95	0.80	44.00	Nieto & Sons
	5/27/2014	74.1	38.08	32.32	5.76	40.71	Nieto & Sons
	6/4/2014	74.1	32.19	28.61	3.58	44.83	Nieto & Sons
	6/10/2014	74.1	36.27	28.85	7.42	43.88	Nieto & Sons
	7/3/2014	74.1	39.26	32.59	6.67	40.28	Nieto & Sons
	7/8/2014	74.1	36.40	28.60	7.80	44.06	Blaine Tech
	7/18/2014	74.1	31.04	29.66	1.38	44.18	Blaine Tech
	7/24/2014	74.1	31.15	29.85	1.30	44.01	Blaine Tech
	8/1/2014	74.1	30.25	29.85	0.40	44.18	Blaine Tech
	8/14/2014	74.1	30.13	29.82	0.31	44.22	Blaine Tech
	8/19/2014	74.1	30.08	29.85	0.23	44.21	Blaine Tech
	8/29/2014	74.1	30.10	29.81	0.29	44.24	Blaine Tech
	9/5/2014	74.1	30.13	29.84	0.29	44.21	Blaine Tech
	9/11/2014	74.1	29.49	28.47	1.02	45.44	Blaine Tech
	9/18/2014	74.1	30.29	29.90	0.39	44.13	Blaine Tech
	9/26/2014	74.1	30.25	29.84	0.41	44.18	Blaine Tech
	10/1/2014	74.1	30.24	29.84	0.40	44.19	Blaine Tech
	10/6/2014	74.1	30.24	29.83	0.41	44.19	Blaine Tech
	10/14/2014	74.1	30.12	29.81	0.31	44.23	Blaine Tech
	10/23/2014	74.1	30.27	29.85	0.42	44.17	Blaine Tech
	10/27/2014	74.1	30.29	29.89	0.40	44.14	Blaine Tech
	11/18/2014	74.1	30.35	29.86	0.49	44.15	Blaine Tech
	11/25/2014	74.1	30.42	29.91	0.51	44.10	Blaine Tech
	12/12/2014	74.1	30.65	30.10	0.55	43.90	Blaine Tech
	12/19/2014	74.1	30.80	30.13	0.67	43.85	Blaine Tech
	4/20/2015	74.1	36.69	27.67	9.02	44.76	Blaine Tech
	5/19/2015	74.1	35.68	26.83	8.85	45.63	Blaine Tech
	5/21/2015	74.1	32.50	27.31	5.19	45.83	Northstar
	5/29/2015	74.1	32.95	30.10	2.85	43.47	Northstar
	6/2/2015	74.1	31.67	30.45	1.22	43.42	Northstar
	6/5/2015	74.10	31.85	30.60	1.25	43.27	Northstar
	6/12/2015	74.10	31.28	30.75	0.53	43.25	Northstar
	6/19/2015	74.10	31.30	31.00	0.30	43.04	Northstar
	6/26/2015	74.10	31.20	29.50	1.70	44.29	Northstar
	8/11/2015	74.10	36.90	29.90	7.00	42.90	Northstar
	8/18/2015	74.10	35.19	30.25	4.94	42.94	Northstar
	8/28/2015	74.10	31.60	30.75	0.85	43.19	Kinder Morgan
	9/1/2015	74.10	31.78	30.90	0.88	43.04	Kinder Morgan
	10/16/2015	74.10	31.60	31.09	0.51	42.92	Blaine Tech
	10/19/2015	74.10	31.44	31.04	0.40	42.99	Kinder Morgan
	10/30/2015	74.10	32.60	32.06	0.54	41.94	Kinder Morgan
	11/17/2015	74.10	31.71	31.68	0.03	42.41	Kinder Morgan
	3/14/2016	74.10	34.14	---	---	39.96	Blaine Tech

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
MW-SF-10	4/11/2016	74.10	32.89	---	---	41.21	Blaine Tech
	6/29/2016	74.10	34.00	---	---	40.10	Blaine Tech
	10/17/2008	76.53	27.49	---	---	49.04	Envent
	10/19/2009	76.53	28.61	---	---	47.92	Blaine Tech
	10/4/2010	76.53	28.50	28.36	0.14	48.14	Blaine Tech
	4/11/2011	76.53	27.41	27.37	0.04	49.15	Blaine Tech
	10/10/2011	76.53	27.60	---	---	48.93	Blaine Tech
	4/16/2012	76.53	28.81	---	---	47.72	Blaine Tech
	7/9/2012	76.53	NM	---	---	NC	Blaine Tech
	10/15/2012	76.53	29.27	---	---	47.26	Blaine Tech
	4/8/2013	76.53	DRY	---	---	NC	Blaine Tech
	10/7/2013	76.53	DRY	---	---	NC	Blaine Tech
	4/14/2014	76.53	DRY	---	---	NC	Blaine Tech
	10/27/2014	76.53	DRY	---	---	NC	Blaine Tech
	4/20/2015	76.53	DRY	---	---	NC	Blaine Tech
	10/19/2015	76.53	DRY	---	---	NC	Blaine Tech
	3/14/2016	76.53	DRY	---	---	NC	Blaine Tech
	4/11/2016	76.53	DRY	---	---	NC	Blaine Tech
	6/29/2016	76.53	DRY	---	---	NC	Blaine Tech
	8/22/2016	76.53	DRY	---	---	NC	Blaine Tech
10/3/2016	76.53	DRY	---	---	NC	Blaine Tech	
4/17/2017	76.53	DRY	---	---	NC	Blaine Tech	
10/2/2017	76.53	DRY	---	---	NC	Blaine Tech	
4/16/2018	76.53	DRY	---	---	NC	Blaine Tech	
MW-SF-11	8/14/2007	78.56	28.58	28.30	0.28	50.20	Geomatrix
	8/21/2007	78.56	28.76	28.63	0.13	49.90	Geomatrix
	8/28/2007	78.56	28.22	---	---	50.34	Stantec
	9/11/2007	78.56	26.90	---	---	51.66	Geomatrix
	10/5/2007	78.56	28.43	---	---	50.13	Geomatrix
	11/2/2007	78.56	29.48	29.38	0.10	49.16	Geomatrix
	11/12/2007	78.56	29.03	---	---	49.53	Stantec
	8/15/2008	78.56	30.13	---	---	48.43	Envent
	10/17/2008	78.56	30.50	---	---	48.06	Envent
	12/18/2008	78.56	29.92	---	---	48.64	Envent
	1/15/2009	78.56	30.32	---	---	48.24	Envent
	3/24/2009	78.56	31.05	---	---	47.51	Envent
	4/21/2009	78.56	30.03	---	---	48.53	Envent
	7/21/2009	78.56	30.89	---	---	47.67	Envent
	10/19/2009	78.56	NM	---	---	NC	Blaine Tech
	11/9/2009	78.56	31.00	---	---	47.56	Kinder Morgan
	9/3/2010	78.56	31.22	---	---	47.34	Kinder Morgan
	10/4/2010	78.56	30.94	---	---	47.62	Blaine Tech
	4/12/2011	78.56	30.82	---	---	47.74	Blaine Tech
	10/10/2011	78.56	30.10	---	---	48.46	Blaine Tech
	4/16/2012	78.56	NM	---	---	NC	Blaine Tech
	7/9/2012	78.56	NM	---	---	NC	Blaine Tech
	10/15/2012	78.56	33.28	---	---	45.28	Blaine Tech
	4/8/2013	78.56	33.11	---	---	45.45	Blaine Tech
	10/7/2013	78.56	33.91	---	---	44.65	Blaine Tech
	4/14/2014	78.56	35.20	34.95	0.25	43.56	Blaine Tech
	5/5/2014	78.56	36.52	33.71	2.81	44.29	Nieto & Sons
	5/12/2014	78.56	35.45	33.87	1.58	44.37	Nieto & Sons
	5/27/2014	78.56	35.38	34.65	0.73	43.76	Nieto & Sons
	6/4/2014	78.56	35.40	35.32	0.08	43.22	Nieto & Sons
	8/8/2014	78.56	36.22	33.11	3.11	44.83	Blaine Tech
	8/13/2014	78.56	36.22	33.47	2.75	44.54	Blaine Tech
8/19/2014	78.56	36.46	33.94	2.52	44.12	Blaine Tech	
8/29/2014	78.56	36.68	33.83	2.85	44.16	Blaine Tech	

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	9/5/2014	78.56	36.62	33.80	2.82	44.20	Blaine Tech
	9/11/2014	78.56	37.15	33.78	3.37	44.11	Blaine Tech
	9/18/2014	78.56	36.79	33.93	2.86	44.06	Blaine Tech
	9/26/2014	78.56	36.89	33.88	3.01	44.08	Blaine Tech
	10/1/2014	78.56	34.95	33.32	1.63	44.91	Blaine Tech
	10/6/2014	78.56	36.36	33.95	2.41	44.13	Blaine Tech
	10/14/2014	78.56	36.67	33.86	2.81	44.14	Blaine Tech
	10/23/2014	78.56	36.86	33.86	3.00	44.10	Blaine Tech
	10/27/2014	78.56	36.20	33.99	2.21	44.13	Blaine Tech
	11/3/2014	78.56	36.91	33.84	3.07	44.11	Blaine Tech
	11/18/2014	78.56	36.78	33.95	2.83	44.04	Blaine Tech
	11/25/2014	78.56	36.65	34.03	2.62	44.01	Blaine Tech
	12/3/2014	78.56	36.71	33.94	2.77	44.07	Blaine Tech
	12/12/2014	78.56	37.29	34.08	3.21	43.84	Blaine Tech
	12/19/2014	78.56	38.03	34.04	3.99	43.72	Blaine Tech
	3/17/2015	78.56	35.94	35.50	0.44	42.97	Kinder Morgan
	4/20/2015	78.56	38.89	34.86	4.03	42.89	Kinder Morgan
	10/20/2015	78.56	37.42	35.38	2.04	42.77	Kinder Morgan
	3/16/2016	78.56	39.56	---	---	39.00	Kinder Morgan
	4/11/2016	78.56	37.62	---	---	40.94	Blaine Tech
6/29/2016	78.56	37.06	---	---	41.50	Blaine Tech	
8/22/2016	78.56	39.25	---	---	39.31	Blaine Tech	
10/3/2016	78.56	40.05	---	---	38.51	Blaine Tech	
3/10/2017	78.56	36.56	---	---	42.00	CH2M	
4/17/2017	78.56	35.91	---	---	42.65	Blaine Tech	
10/2/2017	78.56	40.09	---	---	38.47	Blaine Tech	
4/16/2018	78.56	39.90	---	---	38.66	Blaine Tech	
MW-SF-12	8/14/2007	78.07	27.76	---	---	50.31	Geomatrix
	8/21/2007	78.07	27.43	---	---	50.64	Geomatrix
	8/28/2007	78.07	27.58	---	---	50.49	Stantec
	9/11/2007	78.07	27.73	---	---	50.34	Geomatrix
	10/5/2007	78.07	28.06	---	---	50.01	Geomatrix
	11/2/2007	78.07	29.59	---	---	48.48	Geomatrix
	11/12/2007	78.07	28.33	---	---	49.74	Stantec
	8/12/2008	78.07	30.02	---	---	48.05	Envent
	10/17/2008	78.07	30.42	---	---	47.65	Envent
	12/18/2008	78.07	31.55	---	---	46.52	Envent
	1/15/2009	78.07	30.11	---	---	47.96	Envent
	3/24/2009	78.07	29.41	---	---	48.66	Envent
	4/21/2009	78.07	29.52	---	---	48.55	Envent
	7/21/2009	78.07	28.58	---	---	49.49	Envent
	10/19/2009	78.07	NM	---	---	NC	Blaine Tech
	11/4/2009	78.07	30.36	---	---	47.71	Kinder Morgan
	2/4/2010	78.07	29.20	---	---	48.87	Kinder Morgan
	10/4/2010	78.07	30.70	---	---	47.37	Blaine Tech
	4/11/2011	78.07	29.47	---	---	48.60	Blaine Tech
	10/10/2011	78.07	26.60	---	---	51.47	Blaine Tech
	4/16/2012	78.07	31.40	---	---	46.67	Blaine Tech
	7/9/2012	78.07	NM	---	---	NC	Blaine Tech
	10/15/2012	78.07	32.12	---	---	45.95	Blaine Tech
	4/8/2013	78.07	DRY	---	---	NC	Blaine Tech
	10/7/2013	78.07	NM	---	---	NC	Blaine Tech
	4/14/2014	78.07	38.04	32.67	5.37	44.33	Blaine Tech
	5/20/2014	78.07	37.80	32.90	4.90	44.19	Nieto & Sons
	5/27/2014	78.07	33.27	---	---	44.80	Nieto & Sons
	6/4/2014	78.07	32.78	---	---	45.29	Nieto & Sons
	6/10/2014	78.07	33.76	---	---	44.31	Nieto & Sons
7/3/2014	78.07	NM	33.58	---	NC	Nieto & Sons	

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	7/24/2014	78.07	NM	33.35	3.97	NC	Blaine Tech
	8/1/2014	78.07	37.20	33.17	4.03	44.09	Blaine Tech
	9/5/2014	78.07	38.52	32.93	5.59	44.02	Blaine Tech
	9/11/2014	78.07	38.56	32.98	5.58	43.97	Blaine Tech
	9/18/2014	78.07	38.25	33.09	5.16	43.95	Blaine Tech
	9/26/2014	78.07	38.03	33.03	5.00	44.04	Blaine Tech
	10/1/2014	78.07	37.82	33.08	4.74	44.04	Blaine Tech
	10/6/2014	78.07	37.63	33.07	4.56	44.09	Blaine Tech
	10/14/2014	78.07	37.56	33.13	4.43	44.05	Blaine Tech
	10/23/2014	78.07	37.56	33.06	4.50	44.11	Blaine Tech
	10/27/2014	78.07	37.40	33.08	4.32	44.13	Blaine Tech
	11/3/2014	78.07	37.48	33.09	4.39	44.10	Blaine Tech
	11/18/2014	78.07	37.44	33.15	4.29	44.06	Blaine Tech
	11/25/2014	78.07	37.35	33.21	4.14	44.03	Blaine Tech
	12/3/2014	78.07	37.31	33.12	4.19	44.11	Blaine Tech
	12/12/2014	78.07	37.92	33.45	4.47	43.73	Blaine Tech
	12/19/2014	78.07	38.25	33.50	4.75	43.62	Blaine Tech
	3/17/2015	78.07	36.42	34.05	2.37	43.55	Kinder Morgan
	4/20/2015	78.07	36.42	34.05	2.37	43.55	Blaine Tech
	10/20/2015	78.07	36.78	34.84	1.94	42.84	Kinder Morgan
	3/16/2016	78.07	39.03	---	---	39.04	Kinder Morgan
	4/11/2016	78.07	37.13	---	---	40.94	Blaine Tech
	6/29/2016	78.07	38.34	38.28	0.06	39.78	Blaine Tech
	8/22/2016	78.07	38.60	---	---	39.47	Blaine Tech
	10/3/2016	78.07	39.45	---	---	38.62	Blaine Tech
	3/10/2017	78.07	36.09	---	---	41.98	CH2M
	4/17/2017	78.07	35.12	---	---	42.95	Blaine Tech
	10/2/2017	78.07	39.31	---	---	38.76	Blaine Tech
	4/16/2018	78.07	39.09	---	---	38.98	Blaine Tech
	MW-SF-13	8/14/2007	73.40	22.98	---	---	50.42
8/21/2007		73.40	23.11	---	---	50.29	Geomatrix
8/28/2007		73.40	22.85	---	---	50.55	Stantec
9/11/2007		73.40	23.10	---	---	50.30	Geomatrix
10/5/2007		73.40	28.11	---	---	45.29	Geomatrix
11/2/2007		73.40	25.43	25.41	0.02	47.99	Geomatrix
11/12/2007		73.40	23.70	---	---	49.70	Stantec
12/21/2007		73.40	24.45	24.42	0.03	48.97	Geomatrix
8/15/2008		73.40	27.38	24.11	3.27	48.47	Envent
10/17/2008		73.40	27.28	24.33	2.95	48.33	Envent
10/21/2008		73.40	27.14	24.26	2.88	48.42	Envent
12/17/2008		73.40	26.21	24.70	1.51	48.32	Envent
1/15/2009		73.40	26.90	24.80	2.10	48.08	Envent
3/27/2009		73.40	26.46	25.49	0.97	47.67	Envent
4/21/2009		73.40	24.86	24.78	0.08	48.60	Envent
7/21/2009		73.40	25.72	25.48	0.24	47.86	Envent
10/19/2009		73.40	NM	---	---	NC	Blaine Tech
11/6/2009		73.40	25.72	---	---	47.68	Kinder Morgan
2/4/2010		73.40	25.43	25.30	0.13	48.07	Kinder Morgan
9/3/2010		73.40	27.40	25.71	1.69	47.27	Kinder Morgan
10/4/2010		73.40	26.95	25.92	1.03	47.22	Blaine Tech
4/12/2011		73.40	24.79	24.78	0.01	48.62	Blaine Tech
10/10/2011		73.40	26.00	---	---	47.40	Blaine Tech
4/16/2012		73.40	27.19	---	---	46.21	Blaine Tech
7/9/2012		73.40	NM	---	---	NC	Blaine Tech
10/15/2012	73.40	27.01	---	---	46.39	Blaine Tech	
4/8/2013	73.40	27.90	---	---	45.50	Blaine Tech	
10/7/2013	73.40	NM	---	---	NC	Blaine Tech	
11/14/2013	73.40	29.95	28.25	1.70	44.73	Blaine Tech	

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	4/14/2014	73.40	31.36	28.47	2.89	44.21	Blaine Tech
	5/5/2014	73.40	31.62	28.49	3.13	44.13	Nieto & Sons
	5/12/2014	73.40	30.02	28.88	1.14	44.24	Nieto & Sons
	5/20/2014	73.40	31.10	29.77	1.33	43.30	Nieto & Sons
	5/27/2014	73.40	30.17	29.48	0.69	43.75	Nieto & Sons
	6/4/2014	73.40	30.22	---	---	43.18	Nieto & Sons
	6/10/2014	73.40	30.20	29.76	0.44	43.53	Nieto & Sons
	7/3/2014	73.40	30.49	29.88	0.61	43.37	Nieto & Sons
	7/24/2014	73.40	30.50	29.54	0.96	43.62	Blaine Tech
	8/1/2014	73.40	29.82	29.25	0.57	44.01	Blaine Tech
	8/8/2014	73.40	34.07	33.71	0.36	39.60	Blaine Tech
	8/14/2014	73.40	29.96	29.13	0.83	44.06	Blaine Tech
	8/19/2014	73.40	29.91	29.15	0.76	44.06	Blaine Tech
	8/29/2014	73.40	30.15	29.02	1.13	44.10	Blaine Tech
	9/5/2014	73.40	30.19	29.08	1.11	44.04	Blaine Tech
	9/11/2014	73.40	30.66	28.91	1.75	44.05	Blaine Tech
	9/18/2014	73.40	30.41	29.15	1.26	43.94	Blaine Tech
	9/26/2014	73.40	30.18	29.14	1.04	44.00	Blaine Tech
	10/1/2014	73.40	30.38	29.05	1.33	44.02	Blaine Tech
	10/6/2014	73.40	30.10	29.12	0.98	44.04	Blaine Tech
	10/13/2014	73.40	30.28	29.07	1.21	44.03	Blaine Tech
	10/23/2014	73.40	30.72	28.95	1.77	44.01	Blaine Tech
	10/27/2014	73.40	30.21	29.06	1.15	44.05	Blaine Tech
	11/3/2014	73.40	30.62	28.93	1.69	44.05	Blaine Tech
	11/18/2014	73.40	30.54	29.11	1.43	43.93	Blaine Tech
	11/25/2014	73.40	29.48	29.14	0.34	44.18	Blaine Tech
	12/3/2014	73.40	31.02	28.93	2.09	43.95	Blaine Tech
	12/12/2014	73.40	31.05	29.40	1.65	43.59	Blaine Tech
	12/19/2014	73.40	31.11	29.40	1.71	43.57	Blaine Tech
	4/20/2015	73.40	32.44	29.04	3.40	43.51	Blaine Tech
	10/19/2015	73.40	35.16	29.31	5.85	42.63	Blaine Tech
	3/14/2016	73.40	34.72	---	---	38.68	Blaine Tech
	4/11/2016	73.40	32.28	---	---	41.12	Blaine Tech
6/29/2016	73.40	33.62	---	---	39.78	Blaine Tech	
8/22/2016	73.40	33.66	---	---	39.74	Blaine Tech	
10/3/2016	73.40	34.20	---	---	39.20	Blaine Tech	
3/24/2017	73.40	31.25	---	---	42.15	CH2M	
4/17/2017	73.40	30.40	---	---	43.00	Blaine Tech	
10/2/2017	73.40	34.52	---	---	38.88	Blaine Tech	
4/16/2018	73.40	34.26	---	---	39.14	Blaine Tech	
MW-SF-14	8/14/2007	78.16	27.68	---	---	50.48	Geomatrix
	8/21/2007	78.16	27.60	---	---	50.56	Geomatrix
	8/28/2007	78.16	27.53	---	---	50.63	Stantec
	9/11/2007	78.16	27.66	---	---	50.50	Geomatrix
	10/5/2007	78.16	27.75	---	---	50.41	Geomatrix
	11/2/2007	78.16	29.83	---	---	48.33	Geomatrix
	11/12/2007	78.16	NM	---	---	NC	Secor
	8/15/2008	78.16	29.77	29.24	0.53	48.81	Envent
	10/17/2008	78.16	29.52	29.50	0.02	48.66	Envent
	12/18/2008	78.16	30.62	---	---	47.54	Envent
	1/15/2009	78.16	30.08	---	---	48.08	Envent
	3/24/2009	78.16	29.73	---	---	48.43	Envent
	4/21/2009	78.16	29.61	---	---	48.55	Envent
	7/21/2009	78.16	29.20	---	---	48.96	Envent
	10/19/2009	78.16	NM	---	---	NC	Blaine Tech
11/6/2009	78.16	30.48	---	---	47.68	Kinder Morgan	
12/9/2009	78.16	30.68	---	---	47.48	Kinder Morgan	
6/22/2010	78.16	26.17	---	---	51.99	Blaine Tech	

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	10/4/2010	78.16	30.54	---	---	47.62	Blaine Tech
	4/12/2011	78.16	29.55	---	---	48.61	Blaine Tech
	10/10/2011	78.16	29.84	---	---	48.32	Blaine Tech
	4/16/2012	78.16	NM	---	---	NC	Blaine Tech
	7/9/2012	78.16	NM	---	---	NC	Blaine Tech
	10/15/2012	78.16	30.02	---	---	48.14	Blaine Tech
	4/8/2013	78.16	32.75	---	---	45.41	Blaine Tech
	5/24/2013	78.16	32.75	---	---	45.41	Blaine Tech
	9/26/2013	78.16	34.50	34.25	0.25	43.86	Blaine Tech
	10/7/2013	78.16	NM	---	---	NC	Blaine Tech
	11/14/2013	78.16	33.57	33.19	0.38	44.89	Blaine Tech
	4/14/2014	78.16	34.81	33.56	1.25	44.35	Blaine Tech
	8/8/2014	78.16	34.24	33.98	0.26	44.13	Blaine Tech
	10/14/2014	78.16	34.36	33.80	0.56	44.25	Blaine Tech
	10/23/2014	78.16	34.49	34.43	0.06	43.72	Blaine Tech
	10/27/2014	78.16	34.40	33.97	0.43	44.10	Blaine Tech
	11/18/2014	78.16	34.27	34.07	0.20	44.05	Blaine Tech
	4/20/2015	78.16	34.48	---	---	43.68	Blaine Tech
	10/21/2015	78.16	35.25	---	---	42.91	Blaine Tech
	3/14/2016	78.16	36.21	---	---	41.95	Blaine Tech
	4/11/2016	78.16	37.14	---	---	41.02	Blaine Tech
6/29/2016	78.16	37.36	---	---	40.80	Blaine Tech	
8/22/2016	78.16	DRY	---	---	NC	Blaine Tech	
10/3/2016	78.16	DRY	---	---	NC	Blaine Tech	
4/17/2017	78.16	35.40	---	---	42.76	Blaine Tech	
10/2/2017	78.16	DRY	---	---	NC	Blaine Tech	
4/16/2018	78.16	DRY	---	---	NC	Blaine Tech	
MW-SF-15	8/14/2007	78.27	27.78	27.75	0.03	50.51	Geomatrix
	8/21/2007	78.27	27.69	27.65	0.04	50.61	Geomatrix
	8/28/2007	78.27	27.65	27.61	0.04	50.65	Stantec
	9/11/2007	78.27	27.62	---	---	50.65	Geomatrix
	10/5/2007	78.27	28.15	---	---	50.12	Geomatrix
	11/2/2007	78.27	30.45	30.20	0.25	48.02	Geomatrix
	11/12/2007	78.27	28.75	---	---	49.52	Stantec
	8/15/2008	78.27	30.12	29.35	0.77	48.77	Envent
	10/17/2008	78.27	30.80	29.44	1.36	48.56	Envent
	10/21/2008	78.27	30.80	29.31	1.49	48.66	Envent
	12/18/2008	78.27	32.11	30.56	1.55	47.40	Envent
	1/15/2009	78.27	31.75	29.70	2.05	48.16	Envent
	3/24/2009	78.27	30.32	29.93	0.39	48.26	Envent
	4/21/2009	78.27	29.96	29.60	0.36	48.60	Envent
	7/21/2009	78.27	30.45	---	---	47.82	Envent
	10/19/2009	78.27	NM	---	---	NC	Blaine Tech
	11/4/2009	78.27	31.10	30.45	0.36	47.46	Kinder Morgan
	12/9/2009	78.27	30.87	---	---	47.40	Kinder Morgan
	10/4/2010	78.27	30.66	30.65	0.01	47.62	Blaine Tech
	4/12/2011	78.27	30.50	29.40	1.10	48.65	Blaine Tech
	10/10/2011	78.27	29.60	---	---	48.67	Blaine Tech
	12/2/2011	78.27	31.40	30.05	1.35	47.95	Blaine Tech
	4/16/2012	78.27	32.48	32.39	0.09	45.86	Blaine Tech
	7/9/2012	78.27	NM	---	---	NC	Blaine Tech
	10/15/2012	78.16	33.04	---	---	45.12	Blaine Tech
	4/8/2013	78.27	33.90	---	---	44.37	Blaine Tech
	5/24/2013	78.27	33.90	---	---	44.37	Blaine Tech
	10/7/2013	78.27	NM	---	---	NC	Blaine Tech
11/14/2013	78.27	33.41	33.38	0.03	44.88	Blaine Tech	
4/18/2014	78.27	33.85	---	---	44.42	Blaine Tech	
8/8/2014	78.27	34.87	33.96	0.91	44.13	Blaine Tech	

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	8/13/2014	78.27	34.89	33.95	0.94	44.13	Blaine Tech
	8/19/2014	78.27	34.90	33.94	0.96	44.14	Blaine Tech
	8/29/2014	78.27	35.65	35.38	0.27	42.84	Blaine Tech
	10/27/2014	78.27	35.82	---	---	42.45	Blaine Tech
	4/20/2015	78.27	36.63	34.12	2.51	43.65	Blaine Tech
	10/19/2015	78.27	37.90	34.87	3.03	42.79	Blaine Tech
	11/17/2015	78.27	37.71	35.36	2.35	42.44	Kinder Morgan
	3/14/2016	78.27	39.70	---	---	38.57	Blaine Tech
	4/11/2016	78.27	37.24	---	---	41.03	Blaine Tech
	6/29/2016	78.27	38.70	---	---	39.57	Blaine Tech
	8/22/2016	78.27	38.78	---	---	39.49	Blaine Tech
	10/3/2016	78.27	39.56	---	---	38.71	Blaine Tech
	3/23/2017	78.27	36.10	---	---	42.17	CH2M
	4/17/2017	78.27	35.39	---	---	42.88	Blaine Tech
10/2/2017	78.27	39.40	---	---	38.87	Blaine Tech	
4/16/2018	78.27	39.10	---	---	39.17	Blaine Tech	
MW-SF-16	8/14/2007	78.21	27.68	---	---	50.53	Geomatrix
	8/21/2007	78.21	27.33	---	---	50.88	Geomatrix
	8/28/2007	78.21	27.51	---	---	50.70	Stantec
	9/11/2007	78.21	27.59	---	---	50.62	Geomatrix
	10/5/2007	78.21	28.10	---	---	50.11	Geomatrix
	11/2/2007	78.21	29.81	---	---	48.40	Geomatrix
	11/12/2007	78.21	28.40	---	---	49.81	Stantec
	8/15/2008	78.21	29.36	---	---	48.85	Envent
	10/17/2008	78.21	29.51	---	---	48.70	Envent
	12/18/2008	78.21	30.94	---	---	47.27	Envent
	1/15/2009	78.21	30.01	30.00	0.01	48.21	Envent
	3/24/2009	78.21	29.82	---	---	48.39	Envent
	4/21/2009	78.21	29.60	---	---	48.61	Envent
	7/21/2009	78.21	30.36	---	---	47.85	Envent
	10/19/2009	78.21	NM	---	---	NC	Blaine Tech
	11/4/2009	78.21	30.58	---	---	47.63	Kinder Morgan
	2/4/2010	78.21	30.36	---	---	47.85	Kinder Morgan
	9/3/2010	78.21	30.25	---	---	47.96	Kinder Morgan
	10/4/2010	78.21	30.49	---	---	47.72	Blaine Tech
	4/12/2011	78.21	29.52	---	---	48.69	Blaine Tech
	10/10/2011	78.21	29.85	---	---	48.36	Blaine Tech
	4/16/2012	78.21	NM	---	---	NC	Blaine Tech
	7/9/2012	78.21	NM	---	---	NC	Blaine Tech
	10/15/2012	78.21	32.47	---	---	45.74	Blaine Tech
	4/8/2013	78.21	32.97	32.73	0.24	45.43	Blaine Tech
	5/24/2013	78.21	32.97	32.73	0.24	45.43	Blaine Tech
	10/7/2013	78.21	NM	---	---	NC	Blaine Tech
	11/14/2013	78.21	33.80	33.21	0.59	44.88	Blaine Tech
	4/18/2014	78.21	34.20	33.65	0.55	44.45	Blaine Tech
	8/8/2014	78.21	34.06	34.05	0.01	44.16	Blaine Tech
	10/27/2014	78.21	34.25	---	---	43.96	Blaine Tech
	4/20/2015	78.21	34.52	---	---	43.69	Blaine Tech
6/8/2015	78.21	35.17	35.00	0.17	43.18	Blaine Tech	
10/21/2015	78.21	34.56	---	---	43.65	Kinder Morgan	

Table 10. Groundwater and Product Measurements and Elevations for Total Fluids, Groundwater, and Soil Vapor Extraction Wells

SFPP Norwalk Pump Station, Norwalk, California

Well ID	Date Gauged	Top of Well Casing Elevation	Measured Depth to Groundwater	Measured Depth to Product	Apparent Product Thickness	Corrected Groundwater Elevation	Gauged By
		(feet msl)	(feet btoc)	(feet btoc)	(feet)	(feet msl)	
	3/14/2016	78.21	39.60	---	---	38.61	Blaine Tech
	4/11/2016	78.21	37.15	---	---	41.06	Blaine Tech
	6/29/2016	78.21	38.35	---	---	39.86	Blaine Tech
	8/22/2016	78.21	38.51	---	---	39.70	Blaine Tech
	10/3/2016	78.21	39.35	---	---	38.86	Blaine Tech
	4/17/2017	78.21	35.20	---	---	43.01	Blaine Tech
	10/2/2017	78.21	DRY	---	---	NC	Blaine Tech
	4/16/2018	78.21	DRY	---	---	NC	Blaine Tech

Notes:

Corrected groundwater elevations are based on specific gravity data collected during baildown testing, or a default value of 0.8 feet msl was used for wells not tested.

--- = not detected or not applicable

DRY = No measurable water observed in the well.

feet btoc = feet below top of casing

feet msl = feet above mean sea level based on National Geodetic Vertical Datum of 1929

NC = not calculated

NM = not measured

Figures

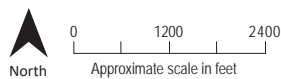
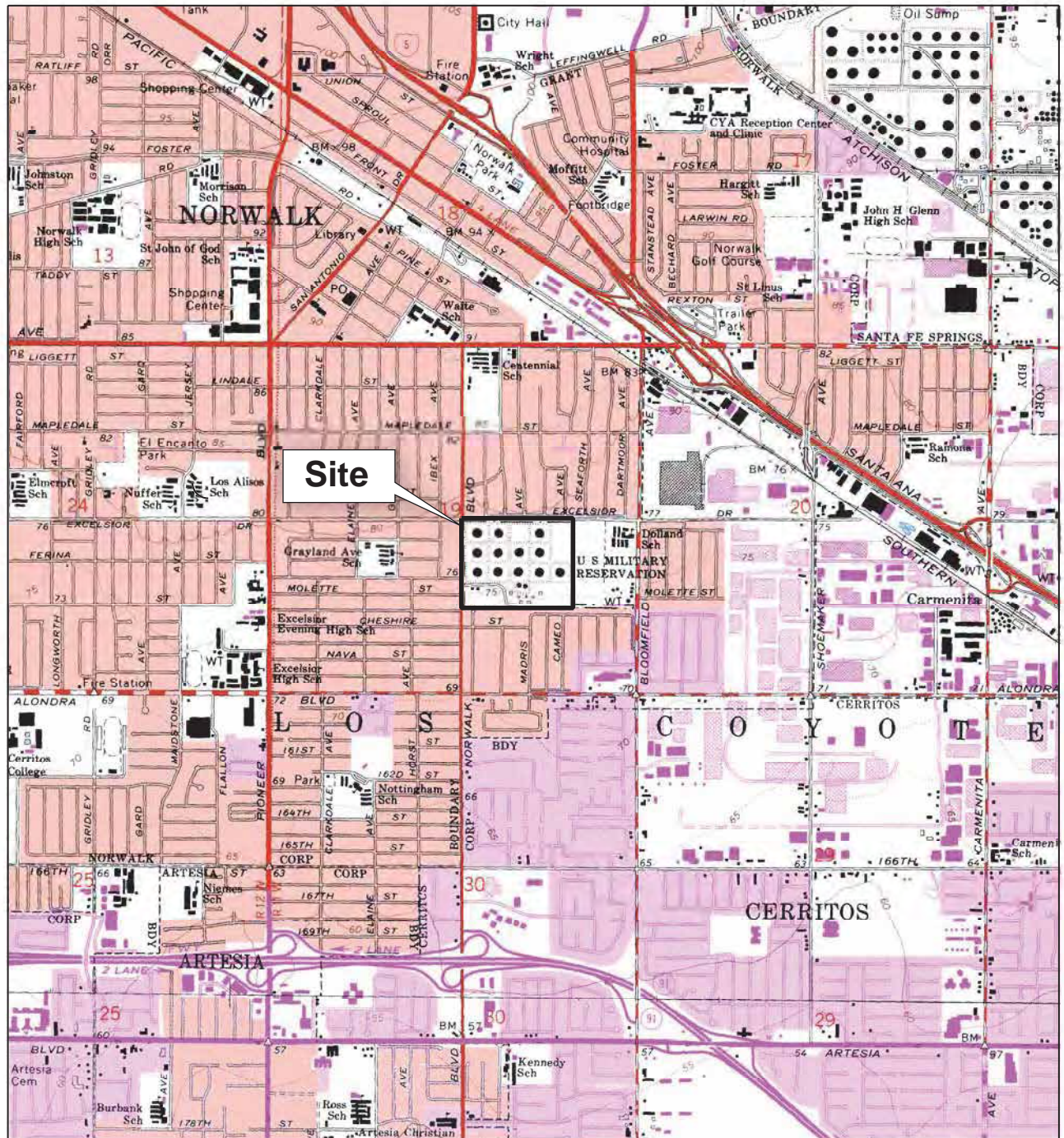
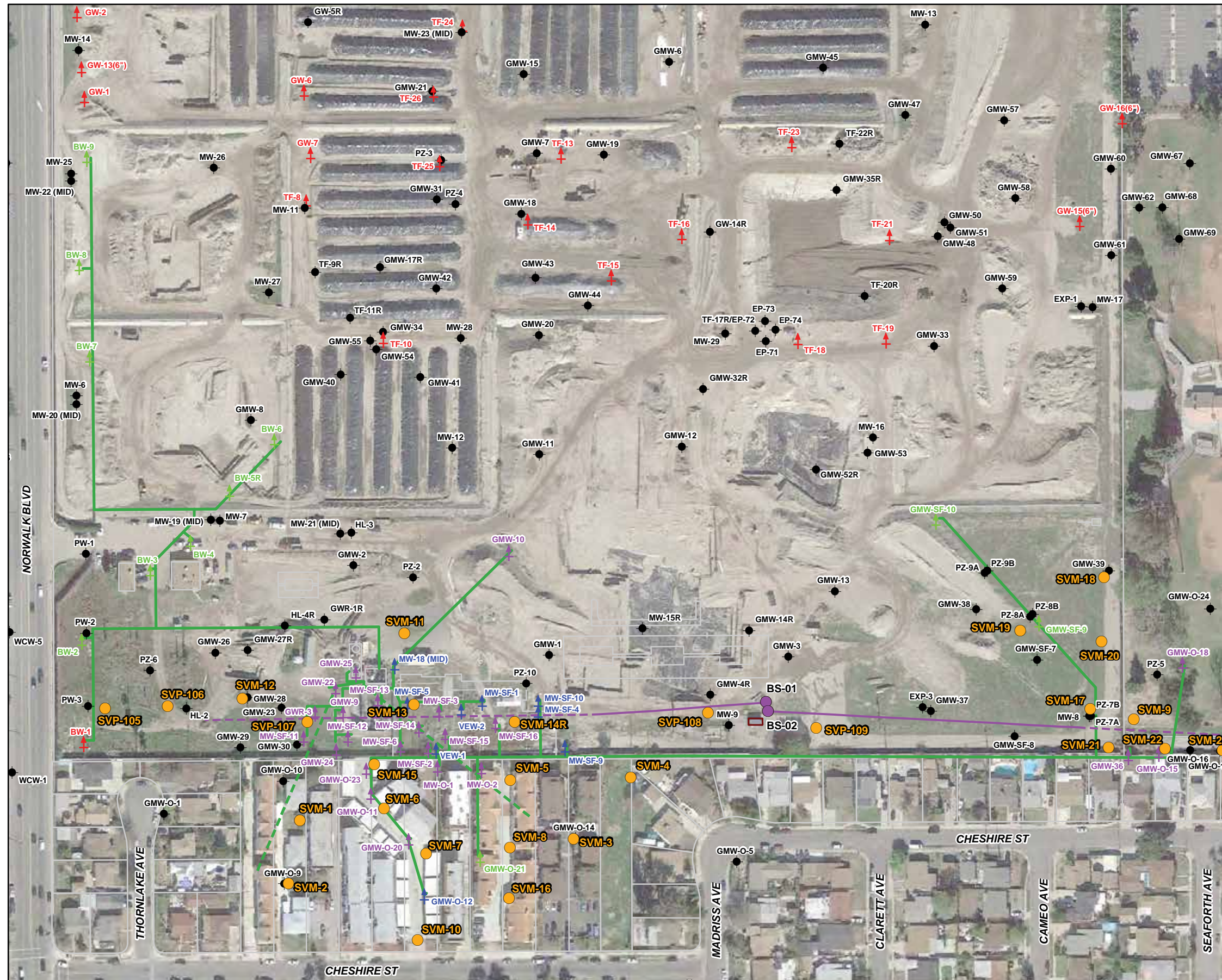


Figure 1. Site Location Map
SFPP Norwalk Pump Station
Norwalk, California

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



- LEGEND**
- Soil Vapor Probe/Soil Vapor Monitoring Probe
 - Horizontal Biosparge Well Entry Point
 - Existing Groundwater Monitoring Well
 - ↑ Existing Remediation Well
 - ↑ Kinder Morgan Combined Soil Vapor and Total Fluids Extraction Wells
 - ↑ Kinder Morgan Soil Vapor Extraction Wells
 - ↑ Kinder Morgan Total Fluids and/or Groundwater Extraction Wells
 - Kinder Morgan Remediation Piping Layout (Above Ground and Below Ground)
 - - - Horizontal Vapor Extraction Well Piping
 - - - Horizontal Biosparge Well (Dashed Line Depicts Approximate Lateral Extent of Well Screen)
 - Air Compressor System

Imagery Source:
Google Earth October 18, 2016.

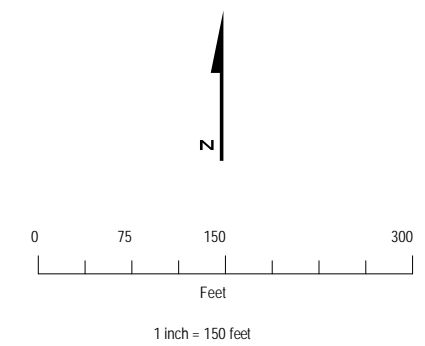


Figure 2. Remediation System Layout
SFPP Norwalk Pump Station
Norwalk, California

Appendix A
Laboratory Analytical Reports



April 18, 2018

CH2M Hill
ATTN: Eric Davis
1000 Wilshire Blvd., Suite 2100
Los Angeles, CA 90017



LA Cert #04140
EPA Methods TO3, TO14A, TO15, 25C/3C,
RSK-175

TX Cert T104704450-14-6
EPA Methods TO14A, TO15

UT Cert CA0133332015-3
EPA Methods TO3, TO14A, TO15, RSK-175

LABORATORY TEST RESULTS

Project Reference: SFPP Norwalk
Lab Number: J040601-01/04

Enclosed are results for sample(s) received 4/06/18 by Air Technology Laboratories. Samples were received intact. Analyses were performed according to specifications on the chain of custody provided with the sample(s).

Report Narrative:

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

Preliminary results were e-mailed to Eric Davis and Vladimir Carino 4/17/18.

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

Sincerely,

A handwritten signature in blue ink, appearing to read "Mark Johnson", with a checkmark to the right.

Mark Johnson
Operations Manager
MJohnson@AirTechLabs.com

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

Air Technology Laboratories, Inc.
 18501 Gale Ave. #130
 City of Industry, CA 91748
 Tel: 626-964-4032
 Joann De La Ossa (JDeLaOssa@airtechlabs.com)

J040601-01/04

CHAIN OF CUSTODY RECORD

DATE: 4/15/18
 PAGE: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:		Section D Sampler Information:	
Company: CH2M HILL Attention: Eric Davis		Report To: Eric Davis (eric.davis@ch2m.com)		Attention: Eric Davis		Sampler Name: James Dye	
Address: 1000 Wilshire Blvd. Suite 2100 Los Angeles, CA 90017		Copy To: Vladimir Carino (vcarino@ch2m.com)		Company Name: CH2M		Sampler Signature:	
Email To: eric.davis@ch2m.com vcarino@ch2m.com		Purchase Order No.:		Address: 1000 Wilshire Blvd. Suite 2100 Los Angeles, CA 90017		Sample Date: 4/15/18	
Phone: 404-323-1600 Fax:		Project Name: SFPP Norwalk		Project Manager: Joann De La Ossa			

ITEM #	SAMPLE ID	LOCATION/ DESCRIPTION	MATRIX	SAMPLE TYPE (G-GIMB, C-COMP)	CONTAINER TYPE		TOTAL # OF CONTAINERS	Analysis Test	PRESERVATIVE			COMMENTS
					# OF CONTAINERS	VOLUME (mL)			SAMPLING			
									DATE	TIME	TO-1 (Total VOCs as Heptane)	
1	VEFF-04-02	Effluent (stack)	Vapo	G	4/15/18	0850	1	X	X		Individually Certified 6-Liter SUMMA	
2	VEFF-04-D2D	Effluent (stack) (duplicate)	Vapo	G	4/15/18	0850	1	X	X		Individually Certified 6-Liter SUMMA	
3	VPOST-04-05	Influent (post-dilution)	Vapo	G	4/15/18	0850	1	X	X		Individually Certified 1-Liter SUMMA	
4	VINF-04-05	Influent (pre-dilution)	Vapo	G	4/15/18	0850	1	X	X	X	Batch Certified 1-Liter Summa	
5											Target analytes includes Historical VOCs and remaining ATU list per subcontract	
6												
7												
8												
9												
10												
11												
12												

01
02
03
04

Relinquished by (Signature and Printed Name): James Dye	Date / Time: 4/15/18 1530	Relinquished by (Signature and Printed Name): FELIX	Date / Time: 4/15/18 1530	Turn Around Time (TAT): <input type="checkbox"/> A = Same Day <input type="checkbox"/> B = 24 Hours <input type="checkbox"/> C = 48 Hours <input type="checkbox"/> D = 72 Hours <input type="checkbox"/> E = 5 Workdays <input checked="" type="checkbox"/> E = 10 Workdays TAT Starts at 8 AM the following day if samples received after 3:00 PM.	Special Instruction:
Relinquished by (Signature and Printed Name): FELIX	Date / Time:	Relinquished by (Signature and Printed Name):	Date / Time: 4/6/18 1053		
Relinquished by (Signature and Printed Name):	Date / Time:	Relinquished by (Signature and Printed Name):	Date / Time:		

Matrix:		Preservatives:			Container Type:			
W = Water	WW = Wastewater	H = HCl	N = HNO3	S = H2SO4	T = Tube	V = VOA	P = Pint	A = Amber
O = Oil	P = Product	S = Soil	Z = Zn(AC)2	O = NaOH	T = Na2S2O3	J = Jar	B = Tedlar	G = Glass
Others/Specify:		Others/Specify:			M = Metal P = Plastic C = Can			

Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 04/06/18
 Matrix: Air
 Reporting Units: ppmv

EPA Method TO15

Lab No.:	J040601-01			J040601-02			J040601-03			J040601-04		
Client Sample I.D.:	VEFF-04-05			VEFF-04-05D			VPOST-04-05			VINP-04-05		
Date/Time Sampled:	4/5/18 8:00			4/5/18 8:00			4/5/18 8:01			4/5/18 8:06		
Date/Time Analyzed:	4/6/18 17:18			4/6/18 17:58			4/6/18 18:37			4/6/18 19:18		
QC Batch No.:	180406MS2A1			180406MS2A1			180406MS2A1			180406MS2A1		
Analyst Initials:	VM			VM			VM			VM		
Dilution Factor:	2.3			2.4			11			2.0		
ANALYTE	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv
Dichlorodifluoromethane (12)	ND	0.0023	0.00035	ND	0.0024	0.00036	ND	0.011	0.0016	0.00056 J	0.0020	0.00031
Chloromethane	ND	0.0046	0.00051	ND	0.0047	0.00052	ND	0.021	0.0023	ND	0.0040	0.00044
1,2-CI-1,1,2,2-F ethane (114)	ND	0.0023	0.00046	ND	0.0024	0.00047	ND	0.011	0.0021	ND	0.0020	0.00041
Vinyl Chloride	ND	0.0023	0.00037	ND	0.0024	0.00038	ND	0.011	0.0017	ND	0.0020	0.00033
Bromomethane	ND	0.0023	0.00067	ND	0.0024	0.00069	ND	0.011	0.0031	ND	0.0020	0.00059
Chloroethane	ND	0.0023	0.0019	ND	0.0024	0.0020	ND	0.011	0.0088	ND	0.0020	0.0017
Trichlorofluoromethane (11)	ND	0.0023	0.00049	ND	0.0024	0.00051	ND	0.011	0.0023	ND	0.0020	0.00044
1,1-Dichloroethene	ND	0.0023	0.00052	ND	0.0024	0.00053	ND	0.011	0.0024	ND	0.0020	0.00046
Carbon Disulfide	0.0045 J	0.011	0.00055	0.0042 J	0.012	0.00056	0.018 J	0.053	0.0025	0.0035 J	0.010	0.00048
1,1,2-CI 1,2,2-F ethane (113)	ND	0.0023	0.00062	ND	0.0024	0.00063	ND	0.011	0.0028	ND	0.0020	0.00054
Acetone	0.015	0.011	0.00066	0.013	0.012	0.00068	ND	0.053	0.0030	0.0081 J	0.010	0.00058
Methylene Chloride	ND	0.0023	0.00066	ND	0.0024	0.00067	ND	0.011	0.0030	ND	0.0020	0.00058
t-1,2-Dichloroethene	ND	0.0023	0.00069	ND	0.0024	0.00070	ND	0.011	0.0031	ND	0.0020	0.00060
1,1-Dichloroethane	ND	0.0023	0.00031	ND	0.0024	0.00032	0.0016 J	0.011	0.0014	ND	0.0020	0.00028
c-1,2-Dichloroethene	ND	0.0023	0.00044	ND	0.0024	0.00045	ND	0.011	0.0020	ND	0.0020	0.00039
2-Butanone	0.014	0.0023	0.0014	0.013	0.0024	0.0015	0.013	0.011	0.0065	0.0081	0.0020	0.0012
t-Butyl Methyl Ether (MTBE)	0.00060 J	0.0023	0.00051	0.00062 J	0.0024	0.00053	ND	0.011	0.0024	ND	0.0020	0.00045
Chloroform	ND	0.0023	0.00032	ND	0.0024	0.00033	ND	0.011	0.0015	ND	0.0020	0.00028
1,1,1-Trichloroethane	ND	0.0023	0.00023	ND	0.0024	0.00024	ND	0.011	0.0011	ND	0.0020	0.00020
Carbon Tetrachloride	ND	0.0023	0.00040	ND	0.0024	0.00041	ND	0.011	0.0018	ND	0.0020	0.00035
Benzene	0.0049	0.0023	0.00022	0.0050	0.0024	0.00023	0.55	0.011	0.0010	0.46	0.0020	0.00019
1,2-Dichloroethane	ND	0.0023	0.00017	ND	0.0024	0.00017	ND	0.011	0.00078	0.0022	0.0020	0.00015
Trichloroethene	0.00037 J	0.0023	0.00033	ND	0.0024	0.00033	ND	0.011	0.0015	0.00032 J	0.0020	0.00029
1,2-Dichloropropane	ND	0.0023	0.00042	ND	0.0024	0.00042	ND	0.011	0.0019	ND	0.0020	0.00037
Bromodichloromethane	ND	0.0023	0.00014	ND	0.0024	0.00014	ND	0.011	0.00063	ND	0.0020	0.00012
c-1,3-Dichloropropene	ND	0.0023	0.00028	ND	0.0024	0.00028	ND	0.011	0.0013	ND	0.0020	0.00024
4-Methyl-2-Pentanone	ND	0.0023	0.00015	ND	0.0024	0.00016	ND	0.011	0.00071	ND	0.0020	0.00014
Toluene	0.020	0.0023	0.00018	0.020	0.0024	0.00019	0.27	0.011	0.00084	0.28	0.0020	0.00016
t-1,3-Dichloropropene	ND	0.0023	0.00024	ND	0.0024	0.00024	ND	0.011	0.0011	ND	0.0020	0.00021
1,1,2-Trichloroethane	ND	0.0023	0.00037	ND	0.0024	0.00038	ND	0.011	0.0017	ND	0.0020	0.00033
1,3-Dichloropropane	ND	0.0023	0.00011	ND	0.0024	0.00012	ND	0.011	0.00052	ND	0.0020	0.00010
Tetrachloroethene	ND	0.0023	0.00028	ND	0.0024	0.00028	ND	0.011	0.0013	0.00037 J	0.0020	0.00024
2-Hexanone	ND	0.0023	0.00047	ND	0.0024	0.00048	0.0026 J	0.011	0.0022	ND	0.0020	0.00042
Dibromochloromethane	ND	0.0023	0.00042	ND	0.0024	0.00043	ND	0.011	0.0019	ND	0.0020	0.00037
1,2-Dibromoethane	ND	0.0023	0.00021	ND	0.0024	0.00021	ND	0.011	0.00096	ND	0.0020	0.00018
Chlorobenzene	ND	0.0023	0.00018	ND	0.0024	0.00018	ND	0.011	0.00082	0.0037	0.0020	0.00016
Ethylbenzene	0.012	0.0023	0.00013	0.011	0.0024	0.00014	0.039	0.011	0.00061	0.053	0.0020	0.00012
p,&m-Xylene	0.061	0.0023	0.00026	0.058	0.0024	0.00027	0.18	0.011	0.0012	0.27	0.0020	0.00023
o-Xylene	0.018	0.0023	0.00028	0.017	0.0024	0.00029	0.073	0.011	0.0013	0.13	0.0020	0.00025



Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 04/06/18
 Matrix: Air
 Reporting Units: ppmv

EPA Method TO15

Lab No.:	J040601-01			J040601-02			J040601-03			J040601-04		
Client Sample I.D.:	VEFF-04-05			VEFF-04-05D			YPOST-04-05			VINP-04-05		
Date/Time Sampled:	4/5/18 8:00			4/5/18 8:00			4/5/18 8:01			4/5/18 8:06		
Date/Time Analyzed:	4/6/18 17:18			4/6/18 17:58			4/6/18 18:37			4/6/18 19:18		
QC Batch No.:	180406MS2A1			180406MS2A1			180406MS2A1			180406MS2A1		
Analyst Initials:	VM			VM			VM			VM		
Dilution Factor:	2.3			2.4			11			2.0		
ANALYTE	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv
Styrene	0.0012 J	0.0023	0.00030	0.00050 J	0.0024	0.00030	0.0037 J	0.011	0.0014	ND	0.0020	0.00026
Bromoform	ND	0.0023	0.00013	ND	0.0024	0.00013	ND	0.011	0.00059	ND	0.0020	0.00011
Isopropyl benzene	0.00082 J	0.0023	0.00024	0.00078 J	0.0024	0.00025	0.0022 J	0.011	0.0011	0.0026	0.0020	0.00021
1,1,2,2-Tetrachloroethane	ND	0.0046	0.00014	ND	0.0047	0.00014	ND	0.021	0.00064	ND	0.0040	0.00012
Benzyl Chloride	ND	0.0023	0.00042	ND	0.0024	0.00043	ND	0.011	0.0019	ND	0.0020	0.00037
1,2,3-Trichloropropane	ND	0.0023	0.00062	ND	0.0024	0.00063	ND	0.011	0.0028	ND	0.0020	0.00054
n-Propyl Benzene	0.0047	0.0023	0.00013	0.0042	0.0024	0.00014	0.0051 J	0.011	0.00061	0.0056	0.0020	0.00012
4-Ethyl Toluene	0.020	0.0023	0.00015	0.019	0.0024	0.00015	0.020	0.011	0.00067	0.038	0.0020	0.00013
1,3,5-Trimethylbenzene	0.0046	0.0046	0.00040	0.0044 J	0.0047	0.00041	0.011 J	0.021	0.0018	0.032	0.0040	0.00035
4-Chlorotoluene	ND	0.0023	0.00027	ND	0.0024	0.00028	ND	0.011	0.0013	ND	0.0020	0.00024
tert-Butylbenzene	ND	0.0023	0.00021	ND	0.0024	0.00021	ND	0.011	0.00095	ND	0.0020	0.00018
1,2,4-Trimethylbenzene	0.015	0.0046	0.00026	0.015	0.0047	0.00027	0.012 J	0.021	0.0012	0.018	0.0040	0.00023
sec-Butylbenzene	0.00029 J	0.0023	0.00022	ND	0.0024	0.00023	ND	0.011	0.0010	0.00054 J	0.0020	0.00020
p-Isopropyltoluene	0.0033	0.0023	0.00030	0.0013 J	0.0024	0.00031	ND	0.011	0.0014	0.00066 J	0.0020	0.00026
1,3-Dichlorobenzene	ND	0.0023	0.00028	ND	0.0024	0.00029	ND	0.011	0.0013	ND	0.0020	0.00025
1,4-Dichlorobenzene	ND	0.0023	0.00034	ND	0.0024	0.00034	ND	0.011	0.0015	ND	0.0020	0.00030
n-Butylbenzene	0.0014 J	0.0023	0.00017	0.0013 J	0.0024	0.00017	0.0011 J	0.011	0.00077	ND	0.0020	0.00015
1,2-Dichlorobenzene	ND	0.0023	0.00029	ND	0.0024	0.00029	ND	0.011	0.0013	ND	0.0020	0.00025
1,2,4-Trichlorobenzene	ND	0.0046	0.00038	ND	0.0047	0.00039	ND	0.021	0.0017	ND	0.0040	0.00033
Hexachlorobutadiene	ND	0.0023	0.00013	ND	0.0024	0.00014	ND	0.011	0.00062	ND	0.0020	0.00012
t-Butanol	ND	0.011	0.00044	ND	0.012	0.00045	0.0096 J	0.053	0.0020	0.0075 J	0.010	0.00039
n-Hexane	0.011	0.011	0.00031	0.011 J	0.012	0.00032	2.1	0.053	0.0014	1.5 d	0.010	0.00027
Isopropyl ether	ND	0.011	0.00026	ND	0.012	0.00026	ND	0.053	0.0012	ND	0.010	0.00022
t-Butyl ethyl ether	ND	0.011	0.00046	ND	0.012	0.00047	ND	0.053	0.0021	ND	0.010	0.00040
2,2-Dichloropropane	ND	0.011	0.00022	ND	0.012	0.00022	ND	0.053	0.0010	ND	0.010	0.00019
t-Amyl methyl ether	ND	0.011	0.00016	ND	0.012	0.00017	ND	0.053	0.00074	0.00089 J	0.010	0.00014
1,4-Dioxane	ND	0.011	0.00040	ND	0.012	0.00041	ND	0.053	0.0018	ND	0.010	0.00035
Naphthalene	0.0012 J	0.011	0.00088	ND	0.012	0.00090	ND	0.053	0.0040	ND	0.010	0.00078
1,2,3-Trichlorobenzene (TIC)	ND	--	--	ND	--	--	ND	--	--	ND	--	--

MDL = Method Detection Limit
 ND= Not Detected (below MDL)
 RL = Reporting Limit
 J = Trace amount. Analyte concentration between RL and MDL.
 d = Analyte reported from secondary dilution. Batch ID #: 180416MS2A1

Reviewed/Approved By: 
 Mark Johnson
 Operations Manager

Date: 4-16-18

The cover letter is an integral part of this analytical report



Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 04/06/18
 Matrix: Air
 Reporting Units: ppmv

EPA Method TO15

Lab No.:	METHOD BLANK			METHOD BLANK								
Client Sample I.D.:	-			-								
Date/Time Sampled:	-			-								
Date/Time Analyzed:	4/6/18 8:49			4/16/18 12:54								
QC Batch No.:	180406MS2A1			180416MS2A1								
Analyst Initials:	VM			VM								
Dilution Factor:	0.20			0.20								
ANALYTE	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv						
Dichlorodifluoromethane (12)	ND	0.00020	0.000031	ND	0.00020	0.000031						
Chloromethane	ND	0.00040	0.000044	ND	0.00040	0.000044						
1,2-CI-1,1,2,2-F ethane (114)	ND	0.00020	0.000040	ND	0.00020	0.000040						
Vinyl Chloride	ND	0.00020	0.000032	ND	0.00020	0.000032						
Bromomethane	ND	0.00020	0.000059	ND	0.00020	0.000059						
Chloroethane	ND	0.00020	0.00017	ND	0.00020	0.00017						
Trichlorofluoromethane (11)	ND	0.00020	0.000043	ND	0.00020	0.000043						
1,1-Dichloroethene	ND	0.00020	0.000045	ND	0.00020	0.000045						
Carbon Disulfide	ND	0.0010	0.000048	ND	0.0010	0.000048						
1,1,2-CI 1,2,2-F ethane (113)	ND	0.00020	0.000054	ND	0.00020	0.000054						
Acetone	ND	0.0010	0.000058	ND	0.0010	0.000058						
Methylene Chloride	ND	0.00020	0.000057	ND	0.00020	0.000057						
t-1,2-Dichloroethene	ND	0.00020	0.000060	ND	0.00020	0.000060						
1,1-Dichloroethane	ND	0.00020	0.000027	ND	0.00020	0.000027						
c-1,2-Dichloroethene	ND	0.00020	0.000039	ND	0.00020	0.000039						
2-Butanone	ND	0.00020	0.00012	ND	0.00020	0.00012						
t-Butyl Methyl Ether (MTBE)	ND	0.00020	0.000045	ND	0.00020	0.000045						
Chloroform	ND	0.00020	0.000028	ND	0.00020	0.000028						
1,1,1-Trichloroethane	ND	0.00020	0.000020	ND	0.00020	0.000020						
Carbon Tetrachloride	ND	0.00020	0.000035	ND	0.00020	0.000035						
Benzene	0.000038 J	0.00020	0.000019	0.000079 J	0.00020	0.000019						
1,2-Dichloroethane	ND	0.00020	0.000015	ND	0.00020	0.000015						
Trichloroethene	ND	0.00020	0.000028	ND	0.00020	0.000028						
1,2-Dichloropropane	ND	0.00020	0.000036	ND	0.00020	0.000036						
Bromodichloromethane	ND	0.00020	0.000012	ND	0.00020	0.000012						
c-1,3-Dichloropropene	ND	0.00020	0.000024	ND	0.00020	0.000024						
4-Methyl-2-Pentanone	ND	0.00020	0.000013	ND	0.00020	0.000013						
Toluene	ND	0.00020	0.000016	0.000017 J	0.00020	0.000016						
t-1,3-Dichloropropene	ND	0.00020	0.000021	ND	0.00020	0.000021						
1,1,2-Trichloroethane	ND	0.00020	0.000032	ND	0.00020	0.000032						
1,3-Dichloropropane	ND	0.00020	0.000099	ND	0.00020	0.000099						
Tetrachloroethene	ND	0.00020	0.000024	ND	0.00020	0.000024						
2-Hexanone	ND	0.00020	0.000041	ND	0.00020	0.000041						
Dibromochloromethane	ND	0.00020	0.000036	ND	0.00020	0.000036						
1,2-Dibromoethane	ND	0.00020	0.000018	ND	0.00020	0.000018						
Chlorobenzene	ND	0.00020	0.000016	ND	0.00020	0.000016						
Ethylbenzene	ND	0.00020	0.000011	ND	0.00020	0.000011						
p.&m-Xylene	ND	0.00020	0.000023	ND	0.00020	0.000023						
o-Xylene	ND	0.00020	0.000024	ND	0.00020	0.000024						



Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 04/06/18
 Matrix: Air
 Reporting Units: ppmv

EPA Method TO15

Lab No.:	METHOD BLANK			METHOD BLANK									
Client Sample I.D.:	-			-									
Date/Time Sampled:	-			-									
Date/Time Analyzed:	4/6/18 8:49			4/16/18 12:54									
QC Batch No.:	180406MS2A1			180416MS2A1									
Analyst Initials:	VM			VM									
Dilution Factor:	0.20			0.20									
ANALYTE	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv							
Styrene	ND	0.00020	0.000026	ND	0.00020	0.000026							
Bromoform	ND	0.00020	0.000011	ND	0.00020	0.000011							
Isopropyl benzene	ND	0.00020	0.000021	ND	0.00020	0.000021							
1,1,2,2-Tetrachloroethane	ND	0.00040	0.000012	ND	0.00040	0.000012							
Benzyl Chloride	ND	0.00020	0.000037	ND	0.00020	0.000037							
1,2,3-Trichloropropane	ND	0.00020	0.000054	ND	0.00020	0.000054							
n-Propyl Benzene	ND	0.00020	0.000012	ND	0.00020	0.000012							
4-Ethyl Toluene	ND	0.00020	0.000013	ND	0.00020	0.000013							
1,3,5-Trimethylbenzene	ND	0.00040	0.000035	ND	0.00040	0.000035							
4-Chlorotoluene	ND	0.00020	0.000024	ND	0.00020	0.000024							
tert-Butylbenzene	ND	0.00020	0.000018	ND	0.00020	0.000018							
1,2,4-Trimethylbenzene	ND	0.00040	0.000023	ND	0.00040	0.000023							
sec-Butylbenzene	ND	0.00020	0.000019	ND	0.00020	0.000019							
p-Isopropyltoluene	ND	0.00020	0.000026	ND	0.00020	0.000026							
1,3-Dichlorobenzene	ND	0.00020	0.000024	ND	0.00020	0.000024							
1,4-Dichlorobenzene	ND	0.00020	0.000029	ND	0.00020	0.000029							
n-Butylbenzene	ND	0.00020	0.000015	ND	0.00020	0.000015							
1,2-Dichlorobenzene	ND	0.00020	0.000025	ND	0.00020	0.000025							
1,2,4-Trichlorobenzene	ND	0.00040	0.000033	ND	0.00040	0.000033							
Hexachlorobutadiene	ND	0.00020	0.000012	ND	0.00020	0.000012							
t-Butanol	ND	0.0010	0.000038	ND	0.0010	0.000038							
n-Hexane	ND	0.0010	0.000027	ND	0.0010	0.000027							
Isopropyl ether	ND	0.0010	0.000022	ND	0.0010	0.000022							
t-Butyl ethyl ether	ND	0.0010	0.000040	ND	0.0010	0.000040							
2,2-Dichloropropane	ND	0.0010	0.000019	ND	0.0010	0.000019							
t-Amyl methyl ether	ND	0.0010	0.000014	ND	0.0010	0.000014							
1,4-Dioxane	ND	0.0010	0.000035	ND	0.0010	0.000035							
Naphthalene	ND	0.0010	0.000077	ND	0.0010	0.000077							
1,2,3-Trichlorobenzene (TIC)	ND	--	--	ND	--	--							

MDL = Method Detection Limit
 ND= Not Detected (below MDL)
 RL = Reporting Limit
 J = Trace amount. Analyte concentration between RL and MDL.
 d = Analyte reported from secondary dilution. Batch ID #: 180416MS2A1

Reviewed/Approved By: 
 Mark Johnson
 Operations Manager

Date: 4-16-18

The cover letter is an integral part of this analytical report



LCS/LCSD Recovery and RPD Summary Report

QC Batch #: 180406MS2A1

Matrix: Air

EPA Method TO-14/TO-15											
Lab No:	Method Blank		LCS		LCSD						
Date/Time Analyzed:	4/6/18 8:49		4/6/18 7:27		4/6/18 8:06						
Data File ID:	06APR012.D		06APR010.D		06APR011.D						
Analyst Initials:	DT		DT		DT						
Dilution Factor:	0.2		1.0		1.0		Limits				
ANALYTE	Result ppbv	Spike Amount	Result ppbv	% Rec	Result ppbv	% Rec	RPD	Low %Rec	High %Rec	Max. RPD	Pass/Fail
1,1-Dichloroethene	0.0	10.0	8.8	88	8.7	87	1.6	70	130	30	Pass
Methylene Chloride	0.0	10.0	9.7	97	8.9	89	8.6	70	130	30	Pass
Trichloroethene	0.0	10.0	9.7	97	9.3	93	4.2	70	130	30	Pass
Toluene	0.0	10.0	10.0	100	9.8	98	1.8	70	130	30	Pass
1,1,2,2-Tetrachloroethane	0.0	10.0	10.5	105	10.2	102	3.0	70	130	30	Pass

RPD = Relative Percent Difference

Reviewed/Approved By: 
 Mark Johnson
 Operations Manager

Date: 4-16-18

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



LCS/LCSD Recovery and RPD Summary Report

QC Batch #: 180416MS2A1

Matrix: Air

EPA Method TO-14/TO-15												
Lab No:	Method Blank		LCS		LCSD							
Date/Time Analyzed:	4/16/18 12:54		4/16/18 10:04	4/16/18 10:45								
Data File ID:	16APR006.D		16APR003.D	16APR004.D								
Analyst Initials:	DT		DT	DT								
Dilution Factor:	0.2		1.0	1.0								
ANALYTE		Result ppbv	Spike Amount	Result ppbv	% Rec	Result ppbv	% Rec	RPD	Limits			Pass/Fail
									Low %Rec	High %Rec	Max. RPD	
1,1-Dichloroethene	0.0	10.0	8.5	85	8.7	87	2.5	70	130	30	Pass	
Methylene Chloride	0.0	10.0	9.1	91	9.1	91	0.2	70	130	30	Pass	
Trichloroethene	0.0	10.0	8.9	89	8.7	87	2.6	70	130	30	Pass	
Toluene	0.0	10.0	9.6	96	9.2	92	4.4	70	130	30	Pass	
1,1,2,2-Tetrachloroethane	0.0	10.0	10.0	100	10.3	103	2.8	70	130	30	Pass	

RPD = Relative Percent Difference

Reviewed/Approved By:



Mark Johnson
Operations Manager

Date:

4-16-18

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




Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 04/06/18
 Matrix: Air
 Reporting Units: ppmv

EPA METHOD TO3

Lab No.:	J040601-01	J040601-02	J040601-03	J040601-04								
Client Sample I.D.:	VEFF-04-05	VEFF-04-05D	VPOST-04-05	VINF-04-05								
Date/Time Sampled:	4/5/18 8:00	4/5/18 8:00	4/5/18 8:01	4/5/18 8:06								
Date/Time Analyzed:	4/10/18 13:24	4/10/18 13:47	4/10/18 16:05	4/10/18 16:27								
QC Batch No.:	180410GC11A1	180410GC11A1	180410GC11A1	180410GC11A1								
Analyst Initials:	AS	AS	AS	AS								
Dilution Factor:	2.3	2.4	2.1	2.0								
ANALYTE	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv
TVOC as Hexane	0.45 J	2.3	0.40	0.58 J	2.4	0.41	51	2.1	0.37	33	2.0	0.36

MDL = Method Detection Limit
 ND= Not Detected (below MDL)
 RL = Reporting Limit
 J = Trace amount. Analyte concentration between RL and MDL.

Reviewed/Approved By: 
 Mark Johnson
 Operations Manager

Date 4-13-18

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



QC Batch No: 180410GC11A1
 Matrix: Air
 Reporting Units: ppmv

**EPA METHOD TO3
 LABORATORY CONTROL SAMPLE SUMMARY**

Lab No.:	METHOD BLANK	LCS	LCSD								
Date Analyzed:	4/10/18 12:17	4/10/18 11:20	4/10/18 11:40								
Analyst Initials:	AS	AS	AS								
Dilution Factor:	1.0	1.0	1.0								
ANALYTE	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	% Rec.	Result ppmv	% Rec.	RPD %	Low %Rec	High %Rec	Max. RPD
TVOC as Hexane	ND	1.0	0.18	4.57	91	4.75	95	3.9	70	130	25

MDL = Method Detection Limit
 ND= Not Detected (below MDL)
 RL = Reporting Limit
 J = Trace amount. Analyte concentration between RL and MDL.

Reviewed/Approved By: 

Date 4-13-18

Mark Johnson
 Operations Manager

The cover letter is an integral part of this analytical report



Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 04/06/18
 Matrix: Air
 Reporting Units: % v/v

ASTM D1946

Lab No.:	J040601-04													
Client Sample I.D.:	VINF-04-05													
Date/Time Sampled:	4/5/18 8:06													
Date/Time Analyzed:	4/9/18 12:09													
QC Batch No.:	180409GC8A1													
Analyst Initials:	AS													
Dilution Factor:	2.0													
ANALYTE	Result % v/v	RL % v/v	MDL % v/v											
Carbon Dioxide	0.49	0.020	0.00086											
Oxygen/Argon	22	1.0	0.074											
Nitrogen	78	2.0	0.29											
Methane	0.0034	0.0020	0.000092											

Results normalized including non-methane hydrocarbons
 MDL = Method Detection Limit
 ND= Not Detected (below MDL)
 RL = Reporting Limit
 J = Trace amount. Analyte concentration between RL and MDL.

Reviewed/Approved By: Mark Johnson
 Mark Johnson
 Operations Manager

Date 4/16/18

The cover letter is an integral part of this analytical report





June 4, 2018

CH2M Hill
ATTN: Eric Davis
1000 Wilshire Blvd., Suite 2100
Los Angeles, CA 90017



LA Cert #04140
EPA Methods TO3, TO14A, TO15, 25C/3C,
RSK-175

TX Cert T104704450-14-6
EPA Methods TO14A, TO15

UT Cert CA0133332015-3
EPA Methods TO3, TO14A, TO15, RSK-175

LABORATORY TEST RESULTS

Project Reference: SFPP Norwalk
Lab Number: J051405-01/04

Enclosed are results for sample(s) received 5/14/18 by Air Technology Laboratories. Samples were received intact. Analyses were performed according to specifications on the chain of custody provided with the sample(s).

Report Narrative:

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

Preliminary results were e-mailed to Eric Davis and Vladimir Carino 6/01/18.

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

Sincerely,

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

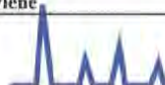
Mark Johnson
Operations Manager
MJohnson@AirTechLabs.com

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

Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 05/14/18
 Matrix: Air
 Reporting Units: ppmv

EPA Method TO15

Lab No.:	J051405-01			J051405-02			J051405-03			J051405-04					
Client Sample I.D.:	VEFF-05-11			VEFF-05-11D			VPOST-05-11			VINP-05-11					
Date/Time Sampled:	5/11/18 8:50			5/11/18 8:50			5/11/18 9:00			5/11/18 9:15					
Date/Time Analyzed:	5/30/18 17:36			5/30/18 20:25			5/31/18 14:03			5/31/18 14:43					
QC Batch No.:	180530MS2A1			180530MS2A1			180531MS2A1			180531MS2A1					
Analyst Initials:	DT			DT			DT			DT					
Dilution Factor:	2.0			1.9			19			11					
ANALYTE	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv			
Dichlorodifluoromethane (12)	ND	0.0020	0.00030	ND	0.0019	0.00030	ND	0.019	0.0030	ND	0.011	0.0016			
Chloromethane	ND	0.0040	0.00044	ND	0.0039	0.00043	ND	0.039	0.0043	ND	0.021	0.0024			
1,2-CI-1,1,2,2-F ethane (114)	ND	0.0020	0.00040	ND	0.0019	0.00039	ND	0.019	0.0039	ND	0.011	0.0021			
Vinyl Chloride	ND	0.0020	0.00032	ND	0.0019	0.00032	ND	0.019	0.0032	ND	0.011	0.0017			
Bromomethane	ND	0.0020	0.00058	ND	0.0019	0.00057	ND	0.019	0.0057	ND	0.011	0.0031			
Chloroethane	ND	0.0020	0.0017	ND	0.0019	0.0016	ND	0.019	0.016	ND	0.011	0.0090			
Trichlorofluoromethane (11)	ND	0.0020	0.00043	ND	0.0019	0.00042	ND	0.019	0.0042	ND	0.011	0.0023			
1,1-Dichloroethene	ND	0.0020	0.00045	ND	0.0019	0.00044	ND	0.019	0.0044	ND	0.011	0.0024			
Carbon Disulfide	0.63	d	0.0099	0.00048	0.078	0.0097	0.00047	0.035	J	0.097	0.0047	0.032	J	0.053	0.0026
1,1,2-CI 1,2,2-F ethane (113)	ND	0.0020	0.00053	ND	0.0019	0.00052	ND	0.019	0.0052	ND	0.011	0.0029			
Acetone	0.021		0.0099	0.00057	0.033	0.0097	0.00056	0.046	J	0.097	0.0056	0.042	J	0.053	0.0031
Methylene Chloride	ND	0.0020	0.00057	ND	0.0019	0.00055	ND	0.019	0.0055	ND	0.011	0.0031			
t-1,2-Dichloroethene	ND	0.0020	0.00059	ND	0.0019	0.00058	ND	0.019	0.0058	ND	0.011	0.0032			
1,1-Dichloroethane	ND	0.0020	0.00027	ND	0.0019	0.00026	ND	0.019	0.0026	ND	0.011	0.0015			
c-1,2-Dichloroethene	ND	0.0020	0.00038	ND	0.0019	0.00038	ND	0.019	0.0038	ND	0.011	0.0021			
2-Butanone	0.0054		0.0020	0.0012	0.017	0.0019	0.0012	0.019	0.012	ND	0.011	0.0066			
t-Butyl Methyl Ether (MTBE)	ND	0.0020	0.00044	0.00074	J	0.0019	0.00043	ND	0.019	0.0043	ND	0.011	0.0024		
Chloroform	ND	0.0020	0.00028	ND	0.0019	0.00027	ND	0.019	0.0027	0.0026	J	0.011	0.0015		
1,1,1-Trichloroethane	ND	0.0020	0.00020	ND	0.0019	0.00019	ND	0.019	0.0019	ND	0.011	0.0011			
Carbon Tetrachloride	ND	0.0020	0.00034	ND	0.0019	0.00034	ND	0.019	0.0034	ND	0.011	0.0019			
Benzene	0.0068		0.0020	0.00019	0.0070	0.0019	0.00019	0.78	0.019	0.0019	0.66	0.011	0.0010		
1,2-Dichloroethane	ND	0.0020	0.00015	ND	0.0019	0.00014	ND	0.019	0.0014	0.0029	J	0.011	0.00079		
Trichloroethene	ND	0.0020	0.00028	ND	0.0019	0.00027	ND	0.019	0.0027	ND	0.011	0.0015			
1,2-Dichloropropane	ND	0.0020	0.00036	ND	0.0019	0.00035	ND	0.019	0.0035	ND	0.011	0.0019			
Bromodichloromethane	ND	0.0020	0.00012	ND	0.0019	0.00012	ND	0.019	0.0012	ND	0.011	0.00064			
c-1,3-Dichloropropene	ND	0.0020	0.00024	ND	0.0019	0.00023	ND	0.019	0.0023	ND	0.011	0.0013			
4-Methyl-2-Pentanone	ND	0.0020	0.00013	ND	0.0019	0.00013	ND	0.019	0.0013	ND	0.011	0.00072			
Toluene	0.0074		0.0020	0.00016	0.0091	0.0019	0.00015	0.51	0.019	0.0015	0.41	0.011	0.00085		
t-1,3-Dichloropropene	ND	0.0020	0.00020	ND	0.0019	0.00020	ND	0.019	0.0020	ND	0.011	0.0011			
1,1,2-Trichloroethane	ND	0.0020	0.00032	ND	0.0019	0.00031	ND	0.019	0.0031	ND	0.011	0.0017			
1,3-Dichloropropane	ND	0.0020	0.000099	ND	0.0019	0.000097	ND	0.019	0.00097	ND	0.011	0.00053			
Tetrachloroethene	ND	0.0020	0.00024	ND	0.0019	0.00023	ND	0.019	0.0023	ND	0.011	0.0013			
2-Hexanone	ND	0.0020	0.00041	ND	0.0019	0.00040	ND	0.019	0.0040	ND	0.011	0.0022			
Dibromochloromethane	ND	0.0020	0.00036	ND	0.0019	0.00035	ND	0.019	0.0035	ND	0.011	0.0019			
1,2-Dibromoethane	ND	0.0020	0.00018	ND	0.0019	0.00018	ND	0.019	0.0018	ND	0.011	0.00097			
Chlorobenzene	ND	0.0020	0.00015	ND	0.0019	0.00015	ND	0.019	0.0015	0.0051	J	0.011	0.00083		
Ethylbenzene	0.0017	J	0.0020	0.00011	0.0025	0.0019	0.00011	0.092	0.019	0.0011	0.074	0.011	0.00061		
p,&m-Xylene	0.014		0.0020	0.00022	0.014	0.0019	0.00022	0.73	0.019	0.0022	0.52	0.011	0.0012		
o-Xylene	0.0069		0.0020	0.00024	0.0091	0.0019	0.00024	0.48	0.019	0.0024	0.33	0.011	0.0013		



Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 05/14/18
 Matrix: Air
 Reporting Units: ppmv

EPA Method TO15

Lab No.:	J051405-01			J051405-02			J051405-03			J051405-04		
Client Sample I.D.:	VEFF-05-11			VEFF-05-11D			VPOST-05-11			VINP-05-11		
Date/Time Sampled:	5/11/18 8:50			5/11/18 8:50			5/11/18 9:00			5/11/18 9:15		
Date/Time Analyzed:	5/30/18 17:36			5/30/18 20:25			5/31/18 14:03			5/31/18 14:43		
QC Batch No.:	180530MS2A1			180530MS2A1			180531MS2A1			180531MS2A1		
Analyst Initials:	DT			DT			DT			DT		
Dilution Factor:	2.0			1.9			19			11		
ANALYTE	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv
Styrene	ND	0.0020	0.00025	0.00067 J	0.0019	0.00025	0.016 J	0.019	0.0025	0.013	0.011	0.0014
Bromoform	ND	0.0020	0.00011	ND	0.0019	0.00011	ND	0.019	0.0011	ND	0.011	0.00060
Isopropyl benzene	0.00026 J	0.0020	0.00021	0.00047 J	0.0019	0.00020	0.0058 J	0.019	0.0020	0.0049 J	0.011	0.0011
1,1,2,2-Tetrachloroethane	ND	0.0040	0.00012	ND	0.0039	0.00012	ND	0.039	0.0012	ND	0.021	0.00065
Benzyl Chloride	ND	0.0020	0.00036	ND	0.0019	0.00036	ND	0.019	0.0036	ND	0.011	0.0020
1,2,3-Trichloropropane	ND	0.0020	0.00053	ND	0.0019	0.00052	ND	0.019	0.0052	ND	0.011	0.0029
n-Propyl Benzene	0.0011 J	0.0020	0.00012	0.0015 J	0.0019	0.00011	0.014 J	0.019	0.0011	0.0100 J	0.011	0.00062
4-Ethyl Toluene	0.0078	0.0020	0.00013	0.0085	0.0019	0.00012	0.17	0.019	0.0012	0.12	0.011	0.00068
1,3,5-Trimethylbenzene	0.0039 J	0.0040	0.00034	0.0040	0.0039	0.00034	0.17	0.039	0.0034	0.11	0.021	0.0018
4-Chlorotoluene	ND	0.0020	0.00024	ND	0.0019	0.00023	ND	0.019	0.0023	ND	0.011	0.0013
tert-Butylbenzene	ND	0.0020	0.00018	ND	0.0019	0.00018	ND	0.019	0.0018	ND	0.011	0.00097
1,2,4-Trimethylbenzene	0.012	0.0040	0.00022	0.012	0.0039	0.00022	0.11	0.039	0.0022	0.063	0.021	0.0012
sec-Butylbenzene	ND	0.0020	0.00019	ND	0.0019	0.00019	ND	0.019	0.0019	0.0019 J	0.011	0.0010
p-Isopropyltoluene	0.00082 J	0.0020	0.00026	0.0018 J	0.0019	0.00025	0.0043 J	0.019	0.0025	0.0043 J	0.011	0.0014
1,3-Dichlorobenzene	ND	0.0020	0.00024	ND	0.0019	0.00024	ND	0.019	0.0024	ND	0.011	0.0013
1,4-Dichlorobenzene	ND	0.0020	0.00029	ND	0.0019	0.00028	ND	0.019	0.0028	ND	0.011	0.0016
n-Butylbenzene	0.0014 J	0.0020	0.00014	0.0015 J	0.0019	0.00014	0.0035 J	0.019	0.0014	ND	0.011	0.00078
1,2-Dichlorobenzene	ND	0.0020	0.00025	ND	0.0019	0.00024	ND	0.019	0.0024	ND	0.011	0.0013
1,2,4-Trichlorobenzene	ND	0.0040	0.00033	ND	0.0039	0.00032	ND	0.039	0.0032	ND	0.021	0.0018
Hexachlorobutadiene	ND	0.0020	0.00012	ND	0.0019	0.00011	ND	0.019	0.0011	ND	0.011	0.00063
t-Butanol	ND	0.0099	0.00038	ND	0.0097	0.00037	ND	0.097	0.0037	ND	0.053	0.0021
n-Hexane	0.013	0.0099	0.00027	0.013	0.0097	0.00026	2.9	0.097	0.0026	2.9 d	0.053	0.0014
Isopropyl ether	ND	0.0099	0.00022	ND	0.0097	0.00022	ND	0.097	0.0022	ND	0.053	0.0012
t-Butyl ethyl ether	ND	0.0099	0.00040	ND	0.0097	0.00039	ND	0.097	0.0039	ND	0.053	0.0021
2,2-Dichloropropane	ND	0.0099	0.00019	ND	0.0097	0.00018	ND	0.097	0.0018	ND	0.053	0.0010
t-Amyl methyl ether	ND	0.0099	0.00014	ND	0.0097	0.00014	ND	0.097	0.0014	ND	0.053	0.00075
1,4-Dioxane	ND	0.0099	0.00035	ND	0.0097	0.00034	ND	0.097	0.0034	ND	0.053	0.0019
Naphthalene	ND	0.0099	0.00076	0.0012 J	0.0097	0.00075	ND	0.097	0.0075	ND	0.053	0.0041
1,2,3-Trichlorobenzene (TIC)	ND	--	--	ND	--	--	ND	--	--	ND	--	--

MDL = Method Detection Limit
 ND= Not Detected (below MDL)
 RL = Reporting Limit
 J = Trace amount. Analyte concentration between RL and MDL.
 d = Analyte reported from secondary dilution.

Reviewed/Approved By: Mark Johnson
 Operations Manager

Date 6/1/18

The cover letter is an integral part of this analytical report



Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 05/14/18
 Matrix: Air
 Reporting Units: ppmv

EPA Method TO15

Lab No.:	METHOD BLANK			METHOD BLANK								
Client Sample I.D.:	-			-								
Date/Time Sampled:	-			-								
Date/Time Analyzed:	5/30/18 6:57			5/31/18 5:28								
QC Batch No.:	180530MS2A1			180531MS2A1								
Analyst Initials:	DT			DT								
Dilution Factor:	0.20			0.20								
ANALYTE	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv						
Dichlorodifluoromethane (12)	ND	0.00020	0.000031	ND	0.00020	0.000031						
Chloromethane	ND	0.00040	0.000044	ND	0.00040	0.000044						
1,2-CI-1,1,2,2-F ethane (114)	ND	0.00020	0.000040	ND	0.00020	0.000040						
Vinyl Chloride	ND	0.00020	0.000032	ND	0.00020	0.000032						
Bromomethane	ND	0.00020	0.000059	ND	0.00020	0.000059						
Chloroethane	ND	0.00020	0.00017	ND	0.00020	0.00017						
Trichlorofluoromethane (11)	ND	0.00020	0.000043	ND	0.00020	0.000043						
1,1-Dichloroethene	ND	0.00020	0.000045	ND	0.00020	0.000045						
Carbon Disulfide	0.00028	J 0.0010	0.000048	0.00047	J 0.0010	0.000048						
1,1,2-CI 1,2,2-F ethane (113)	ND	0.00020	0.000054	ND	0.00020	0.000054						
Acetone	ND	0.0010	0.000058	0.00020	J 0.0010	0.000058						
Methylene Chloride	ND	0.00020	0.000057	ND	0.00020	0.000057						
t-1,2-Dichloroethene	ND	0.00020	0.000060	ND	0.00020	0.000060						
1,1-Dichloroethane	ND	0.00020	0.000027	ND	0.00020	0.000027						
c-1,2-Dichloroethene	ND	0.00020	0.000039	ND	0.00020	0.000039						
2-Butanone	ND	0.00020	0.00012	ND	0.00020	0.00012						
t-Butyl Methyl Ether (MTBE)	ND	0.00020	0.000045	ND	0.00020	0.000045						
Chloroform	ND	0.00020	0.000028	ND	0.00020	0.000028						
1,1,1-Trichloroethane	ND	0.00020	0.000020	ND	0.00020	0.000020						
Carbon Tetrachloride	ND	0.00020	0.000035	ND	0.00020	0.000035						
Benzene	0.000022	J 0.00020	0.000019	0.000028	J 0.00020	0.000019						
1,2-Dichloroethane	ND	0.00020	0.000015	ND	0.00020	0.000015						
Trichloroethene	ND	0.00020	0.000028	ND	0.00020	0.000028						
1,2-Dichloropropane	ND	0.00020	0.000036	ND	0.00020	0.000036						
Bromodichloromethane	ND	0.00020	0.000012	ND	0.00020	0.000012						
c-1,3-Dichloropropene	ND	0.00020	0.000024	ND	0.00020	0.000024						
4-Methyl-2-Pentanone	ND	0.00020	0.000013	ND	0.00020	0.000013						
Toluene	0.000017	J 0.00020	0.000016	ND	0.00020	0.000016						
t-1,3-Dichloropropene	ND	0.00020	0.000021	ND	0.00020	0.000021						
1,1,2-Trichloroethane	ND	0.00020	0.000032	ND	0.00020	0.000032						
1,3-Dichloropropane	ND	0.00020	0.000009	ND	0.00020	0.000009						
Tetrachloroethene	ND	0.00020	0.000024	ND	0.00020	0.000024						
2-Hexanone	ND	0.00020	0.000041	ND	0.00020	0.000041						
Dibromochloromethane	ND	0.00020	0.000036	ND	0.00020	0.000036						
1,2-Dibromoethane	ND	0.00020	0.000018	ND	0.00020	0.000018						
Chlorobenzene	ND	0.00020	0.000016	ND	0.00020	0.000016						
Ethylbenzene	ND	0.00020	0.000011	ND	0.00020	0.000011						
p,&m-Xylene	ND	0.00020	0.000023	ND	0.00020	0.000023						
o-Xylene	ND	0.00020	0.000024	ND	0.00020	0.000024						



Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 05/14/18
 Matrix: Air
 Reporting Units: ppmv

EPA Method TO15

Lab No.:	METHOD BLANK			METHOD BLANK								
Client Sample I.D.:	-			-								
Date/Time Sampled:	-			-								
Date/Time Analyzed:	5/30/18 6:57			5/31/18 5:28								
QC Batch No.:	180530MS2A1			180531MS2A1								
Analyst Initials:	DT			DT								
Dilution Factor:	0.20			0.20								
ANALYTE	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv						
Styrene	ND	0.00020	0.000026	ND	0.00020	0.000026						
Bromoform	ND	0.00020	0.000011	ND	0.00020	0.000011						
Isopropyl benzene	ND	0.00020	0.000021	ND	0.00020	0.000021						
1,1,2,2-Tetrachloroethane	ND	0.00040	0.000012	ND	0.00040	0.000012						
Benzyl Chloride	ND	0.00020	0.000037	ND	0.00020	0.000037						
1,2,3-Trichloropropane	ND	0.00020	0.000054	ND	0.00020	0.000054						
n-Propyl Benzene	ND	0.00020	0.000012	ND	0.00020	0.000012						
4-Ethyl Toluene	ND	0.00020	0.000013	ND	0.00020	0.000013						
1,3,5-Trimethylbenzene	ND	0.00040	0.000035	ND	0.00040	0.000035						
4-Chlorotoluene	ND	0.00020	0.000024	ND	0.00020	0.000024						
tert-Butylbenzene	ND	0.00020	0.000018	ND	0.00020	0.000018						
1,2,4-Trimethylbenzene	ND	0.00040	0.000023	ND	0.00040	0.000023						
sec-Butylbenzene	ND	0.00020	0.000019	ND	0.00020	0.000019						
p-Isopropyltoluene	ND	0.00020	0.000026	ND	0.00020	0.000026						
1,3-Dichlorobenzene	ND	0.00020	0.000024	ND	0.00020	0.000024						
1,4-Dichlorobenzene	ND	0.00020	0.000029	ND	0.00020	0.000029						
n-Butylbenzene	ND	0.00020	0.000015	ND	0.00020	0.000015						
1,2-Dichlorobenzene	ND	0.00020	0.000025	ND	0.00020	0.000025						
1,2,4-Trichlorobenzene	ND	0.00040	0.000033	0.000049 J	0.00040	0.000033						
Hexachlorobutadiene	ND	0.00020	0.000012	ND	0.00020	0.000012						
t-Butanol	ND	0.0010	0.000038	ND	0.0010	0.000038						
n-Hexane	ND	0.0010	0.000027	ND	0.0010	0.000027						
Isopropyl ether	ND	0.0010	0.000022	ND	0.0010	0.000022						
t-Butyl ethyl ether	ND	0.0010	0.000040	ND	0.0010	0.000040						
2,2-Dichloropropane	ND	0.0010	0.000019	ND	0.0010	0.000019						
t-Amyl methyl ether	ND	0.0010	0.000014	ND	0.0010	0.000014						
1,4-Dioxane	ND	0.0010	0.000035	ND	0.0010	0.000035						
Naphthalene	ND	0.0010	0.000077	ND	0.0010	0.000077						
1,2,3-Trichlorobenzene (TIC)	ND	--	--	ND	--	--						

MDL = Method Detection Limit
 ND= Not Detected (below MDL)
 RL = Reporting Limit
 J = Trace amount. Analyte concentration between RL and MDL.

Reviewed/Approved By: Mark Johnson
 Mark Johnson
 Operations Manager

Date: 6/1/18

The cover letter is an integral part of this analytical report



LCS/LCSD Recovery and RPD Summary Report

QC Batch #: 180530MS2A1

Matrix: Air

EPA Method TO-14/TO-15											
Lab No:	Method Blank		LCS		LCSD						
Date/Time Analyzed:	5/30/18 6:57		5/30/18 5:34	% Rec	5/30/18 6:15	% Rec					
Data File ID:	30MAY009.D		30MAY007.D		30MAY008.D						
Analyst Initials:	DT		DT		DT						
Dilution Factor:	0.2		1.0		1.0		Limits				
ANALYTE	Result ppbv	Spike Amount	Result ppbv	% Rec	Result ppbv	% Rec	RPD	Low %Rec	High %Rec	Max. RPD	Pass/Fail
1,1-Dichloroethene	0.0	10.0	9.1	91	9.9	99	8.1	70	130	30	Pass
Methylene Chloride	0.0	10.0	9.9	99	10.5	105	6.7	70	130	30	Pass
Trichloroethene	0.0	10.0	11.2	112	11.0	110	0.9	70	130	30	Pass
Toluene	0.0	10.0	11.1	111	10.9	109	1.7	70	130	30	Pass
1,1,2,2-Tetrachloroethane	0.0	10.0	11.4	114	11.2	112	1.6	70	130	30	Pass

RPD = Relative Percent Difference

Reviewed/Approved By: _____

Mark Johnson
Operations Manager

Date: _____

The cover letter is an integral part of this analytical report



LCS/LCSD Recovery and RPD Summary Report

QC Batch #: 180531MS2A1

Matrix: Air

EPA Method TO-14/TO-15											
Lab No:	Method Blank		LCS		LCSD						
Date/Time Analyzed:	5/31/18 5:28		5/31/18 4:02		5/31/18 4:43						
Data File ID:	31MAY007.D		31MAY005.D		31MAY006.D						
Analyst Initials:	DT		DT		DT						
Dilution Factor:	0.2		1.0		1.0		Limits				
ANALYTE	Result ppbv	Spike Amount	Result ppbv	% Rec	Result ppbv	% Rec	RPD	Low %Rec	High %Rec	Max. RPD	Pass/Fail
1,1-Dichloroethene	0.0	10.0	9.7	97	9.3	93	4.8	70	130	30	Pass
Methylene Chloride	0.0	10.0	10.0	100	9.3	93	7.3	70	130	30	Pass
Trichloroethene	0.0	10.0	11.2	112	11.3	113	0.3	70	130	30	Pass
Toluene	0.0	10.0	11.0	110	11.1	111	1.2	70	130	30	Pass
1,1,2,2-Tetrachloroethane	0.0	10.0	10.6	106	10.8	108	1.6	70	130	30	Pass

RPD = Relative Percent Difference

Reviewed/Approved By: _____

Mark Johnson
Operations Manager

Date: _____

6/1/18

The cover letter is an integral part of this analytical report



Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 05/14/18
 Matrix: Air
 Reporting Units: ppmv

EPA METHOD TO3

Lab No.:	J051405-01			J051405-02			J051405-03			J051405-04		
Client Sample I.D.:	VEFF-05-11			VEFF-05-11D			VPOST-05-11			VINP-05-11		
Date/Time Sampled:	5/11/18 8:50			5/11/18 8:50			5/11/18 9:00			5/11/18 9:15		
Date/Time Analyzed:	5/16/18 11:22			5/16/18 13:15			5/16/18 12:07			5/16/18 12:30		
QC Batch No.:	180516GC11A1			180516GC11A1			180516GC11A1			180516GC11A1		
Analyst Initials:	AS			AS			AS			AS		
Dilution Factor:	2.0			1.9			1.9			1.9		
ANALYTE	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv
TVOC as Hexane	0.94 J	2.0	0.35	1.8 J	1.9	0.34	67	1.9	0.34	64	1.9	0.34

MDL = Method Detection Limit
 ND= Not Detected (below MDL)
 RL = Reporting Limit
 J = Trace amount. Analyte concentration between RL and MDL.

Reviewed/Approved By: 
 Mark Johnson
 Operations Manager

Date 5-29-18

The cover letter is an integral part of this analytical report



QC Batch No: 180516GC11A1

Matrix: Air

Reporting Units: ppmv

**EPA METHOD TO3
LABORATORY CONTROL SAMPLE SUMMARY**

Lab No.:	METHOD BLANK	LCS	LCSD								
Date Analyzed:	5/16/18 10:59	5/16/18 10:13	5/16/18 10:36								
Analyst Initials:	AS	AS	AS								
Dilution Factor:	1.0	1.0	1.0								
ANALYTE	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	% Rec.	Result ppmv	% Rec.	RPD %	Low %Rec	High %Rec	Max. RPD
TVOC as Hexane	ND	1.0	0.18	4.71	94	4.53	91	3.9	70	130	25

MDL = Method Detection Limit

ND= Not Detected (below MDL)

RL = Reporting Limit

J = Trace amount. Analyte concentration between RL and MDL.

Reviewed/Approved By:  _____

Date 5-29-18

Mark Johnson
Operations Manager

The cover letter is an integral part of this analytical report



Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 05/14/18
 Matrix: Air
 Reporting Units: % v/v

ASTM D1946

Lab No.:	J051405-04												
Client Sample I.D.:	VINF-05-11												
Date/Time Sampled:	5/11/18 9:15												
Date/Time Analyzed:	5/15/18 23:53												
QC Batch No.:	180515GC8A1												
Analyst Initials:	AS												
Dilution Factor:	1.9												
ANALYTE	Result % v/v	RL % v/v	MDL % v/v										
Carbon Dioxide	0.72	0.019	0.00082										
Oxygen/Argon	21	0.97	0.071										
Nitrogen	78	1.9	0.28										
Methane	0.0046	0.0019	0.000089										

Results normalized including non-methane hydrocarbons

MDL = Method Detection Limit
 ND= Not Detected (below MDL)
 RL = Reporting Limit
 J = Trace amount. Analyte concentration between RL and MDL.

Reviewed/Approved By: 
 Mark Johnson
 Operations Manager

Date 5-29-18

The cover letter is an integral part of this analytical report



QC Batch No: 180515GC8A1
 Matrix: Air
 Reporting Units: % v/v

**ASTM D1946
 LABORATORY CONTROL SAMPLE SUMMARY**

Lab No.:	METHOD BLANK				LCS		LCSD					
Date Analyzed:	5/15/18 15:19				5/15/18 14:36		5/15/18 14:50					
Analyst Initials:	AS				AS		AS					
Dilution Factor:	1.0				1.0		1.0		Limits			
ANALYTE	Result % v/v	RL % v/v	MDL % v/v	SPIKE AMT. % v/v	Result % v/v	% Rec.	Result % v/v	% Rec.	RPD %	Low %Rec	High %Rec	Max. RPD
Carbon Dioxide	0.0012	J 0.010	0.00042	10	9.00	90	8.84	88	1.8	70	130	30
Oxygen/Argon	0.16	J 0.50	0.037	15	16.0	107	15.7	105	1.9	70	130	30
Nitrogen	0.48	J 1.0	0.14	70	71.2	101	69.9	99	1.8	70	130	30
Methane	0.00031	J 0.0010	0.000046	0.10	0.104	104	0.104	103	0.7	70	130	30

ND = Not Detected (below RL)
 RL = Reporting Limit

Reviewed/Approved By: 
 Mark Jol Mark Johnson
 Operatio Operations Manager

Date: 5-29-18

The cover letter is an integral part of this analytical report





June 21, 2018

CH2M Hill
ATTN: Eric Davis
1000 Wilshire Blvd., Suite 2100
Los Angeles, CA 90017



LA Cert #04140
EPA Methods TO3, TO14A, TO15, 25C/3C,
RSK-175

TX Cert T104704450-14-6
EPA Methods TO14A, TO15

UT Cert CA0133332015-3
EPA Methods TO3, TO14A, TO15, RSK-175

LABORATORY TEST RESULTS

Project Reference: SFPP Norwalk
Lab Number: J060808-01/04

Enclosed are results for sample(s) received 6/08/18 by Air Technology Laboratories. Samples were received intact. Analyses were performed according to specifications on the chain of custody provided with the sample(s).

Report Narrative:

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

Preliminary results were e-mailed to Eric Davis and Vladimir Carino 6/20/18.

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

Sincerely,

A handwritten signature in blue ink, appearing to read "Mark Johnson", with a checkmark to the right.

Mark Johnson
Operations Manager
MJohnson@AirTechLabs.com

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

Air Technology Laboratories, Inc.
 18501 Gale Ave. #130
 City of Industry, CA 91748
 Tel: 626-964-4032
 Joann De La Ossa (JDeLaOssa@airtechlabs.com)

J060808-01/04

CHAIN OF CUSTODY RECORD

DATE: 6/7/18
 PAGE: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:		Section D Sampler Information:	
Company: CH2M HILL Attention: Eric Davis		Report To: Eric Davis (eric.davis@ch2m.com)		Attention: Eric Davis		Sampler Name: James Dye	
Address: 1000 Wilshire Blvd, Suite 2100 Los Angeles, CA 90017		Copy To: Vladimir Carino (vcarino@ch2m.com)		Company: CH2M		Sampler Name: [Signature]	
Email To: eric.davis@ch2m.com vcarino@ch2m.com		Purchase Order No.:		Address: 1000 Wilshire Blvd, Suite 2100 Los Angeles, CA 90017		Signature: [Signature]	
Phone: 404-323-1600 Fax:		Project Name: SFPP Norwalk		Project Manager: Joann De La Ossa		Sample Date: 6/7/18	

ITEM #	SAMPLE ID	LOCATION/ DESCRIPTION	MATRIX	SAMPLE TYPE (GUGRAB C-COMP)	CONTAINER TYPE		TOTAL # OF CONTAINERS	Analysis Test	TDS (Total VOCs as Hexane)	TD-15 (VOCs, Target Analytes)	ASTM-D 1946 (O2, Argon, CO2, CH4, H2)	Comments
					# OF CONTAINERS	VOLUME (mL)						
					DATE	TIME						
01	VEFF- 06-07	Effluent (stack)	Vapor	G			1	X	X			Individually Certified 6-Liter SUMMA
02	VEFF- 06-07 D	Effluent (stack) (duplicate)	Vapor	G			1	X	X			Individually Certified 6-Liter SUMMA
03	VPOST- 06-07	Influent (post-dilution)	Vapor	G			1	X	X			Individually Certified 1-Liter SUMMA
04	VINF- 06-07	Influent (pre-dilution)	Vapor	G			1	X	X	X		Batch Certified 1-Liter Summa
05												Target analytes includes Historical VOCs and remaining ATU list per subcontract
06												
07												
08												
09												
10												
11												
12												

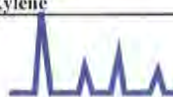
Authorized by (Signature and Printed Name): [Signature] Date / Time: 6/7/18 1530	Authorized by (Signature and Printed Name): FEDRET Date / Time: 6/7/18 1530	Turn Around Time (TAT): <input type="checkbox"/> A = Same Day <input type="checkbox"/> B = 24 Hours <input type="checkbox"/> C = 48 Hours <input type="checkbox"/> D = 72 Hours <input type="checkbox"/> E = 5 Workdays <input checked="" type="checkbox"/> F = 10 Workdays TAT Starts at 8 AM the following day if samples received after 5:00 PM.	Special Instructions:
Authorized by (Signature and Printed Name): FEDREX Date / Time: 6/8/18 1054	Authorized by (Signature and Printed Name): Joann De La Ossa ATU Date / Time: 6/8/18 1054		

Matrix:		Preservatives:			Container Type:				
W = Water	WW = Wastewater	H = HCl	N = HNO3	S = H2SO4	T = Tube	V = VOA	P = Pin	A = Amber	
O = Oil	P = Product	S = Soil	Z = Zn(Ac2)	O = NaOH	T = Na2S2O3	J = Jar	B = Tedlar	G = Glass	
Others/Specify:		Others/Specify:			M = Metal			P = Plastic	C = Can

Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 06/08/18
 Matrix: Air
 Reporting Units: ppmv

EPA Method TO15

Lab No.:	J060808-01			J060808-02			J060808-03			J060808-04		
Client Sample I.D.:	VEFF-06-07			VEFF-06-07D			VPOST-06-07			VINP-06-07		
Date/Time Sampled:	6/7/18 8:45			6/7/18 8:45			6/7/18 9:50			6/7/18 10:00		
Date/Time Analyzed:	6/15/18 18:47			6/15/18 19:27			6/15/18 20:08			6/15/18 20:49		
QC Batch No.:	180615MS2A1			180615MS2A1			180615MS2A1			180615MS2A1		
Analyst Initials:	DT			DT			DT			DT		
Dilution Factor:	2.0			2.0			19			9.7		
ANALYTE	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv
Dichlorodifluoromethane (12)	ND	0.0020	0.00031	ND	0.0020	0.00030	ND	0.019	0.0030	ND	0.0097	0.0015
Chloromethane	ND	0.0040	0.00044	ND	0.0040	0.00044	ND	0.039	0.0043	ND	0.019	0.0021
1,2-Di-1,1,2,2-F ethane (114)	ND	0.0020	0.00041	ND	0.0020	0.00040	ND	0.019	0.0039	ND	0.0097	0.0020
Vinyl Chloride	ND	0.0020	0.00033	ND	0.0020	0.00032	ND	0.019	0.0032	ND	0.0097	0.0016
Bromomethane	ND	0.0020	0.00059	ND	0.0020	0.00058	ND	0.019	0.0057	ND	0.0097	0.0028
Chloroethane	ND	0.0020	0.0017	ND	0.0020	0.0017	ND	0.019	0.016	ND	0.0097	0.0082
Trichlorofluoromethane (11)	ND	0.0020	0.00044	ND	0.0020	0.00043	ND	0.019	0.0042	ND	0.0097	0.0021
1,1-Dichloroethene	ND	0.0020	0.00046	ND	0.0020	0.00045	ND	0.019	0.0044	ND	0.0097	0.0022
Carbon Disulfide	0.18	0.010	0.00048	0.062	0.0099	0.00048	ND	0.097	0.0047	0.0097 J	0.049	0.0023
1,1,2-Di-1,2,2-F ethane (113)	ND	0.0020	0.00054	ND	0.0020	0.00053	ND	0.019	0.0052	ND	0.0097	0.0026
Acetone	0.0093 J	0.010	0.00058	0.0084 J	0.0099	0.00057	0.10	0.097	0.0056	ND	0.049	0.0028
Methylene Chloride	ND	0.0020	0.00058	ND	0.0020	0.00057	ND	0.019	0.0055	ND	0.0097	0.0028
t-1,2-Dichloroethene	ND	0.0020	0.00060	ND	0.0020	0.00059	ND	0.019	0.0058	ND	0.0097	0.0029
1,1-Dichloroethane	ND	0.0020	0.00028	ND	0.0020	0.00027	ND	0.019	0.0026	ND	0.0097	0.0013
c-1,2-Dichloroethene	ND	0.0020	0.00039	ND	0.0020	0.00038	ND	0.019	0.0038	ND	0.0097	0.0019
2-Butanone	ND	0.0020	0.0012	ND	0.0020	0.0012	ND	0.019	0.012	0.011	0.0097	0.0060
t-Butyl Methyl Ether (MTBE)	ND	0.0020	0.00045	0.00048 J	0.0020	0.00044	ND	0.019	0.0043	ND	0.0097	0.0022
Chloroform	ND	0.0020	0.00028	ND	0.0020	0.00028	ND	0.019	0.0027	ND	0.0097	0.0014
1,1,1-Trichloroethane	ND	0.0020	0.00020	ND	0.0020	0.00020	ND	0.019	0.0019	ND	0.0097	0.00097
Carbon Tetrachloride	ND	0.0020	0.00035	ND	0.0020	0.00034	ND	0.019	0.0034	ND	0.0097	0.0017
Benzene	0.0028	0.0020	0.00019	0.0037	0.0020	0.00019	0.72	0.019	0.0019	0.57	0.0097	0.00093
1,2-Dichloroethane	ND	0.0020	0.00015	ND	0.0020	0.00015	0.0028 J	0.019	0.0014	0.0026 J	0.0097	0.00072
Trichloroethene	ND	0.0020	0.00029	ND	0.0020	0.00028	ND	0.019	0.0027	ND	0.0097	0.0014
1,2-Dichloropropane	ND	0.0020	0.00037	ND	0.0020	0.00036	ND	0.019	0.0035	ND	0.0097	0.0018
Bromodichloromethane	ND	0.0020	0.00012	ND	0.0020	0.00012	0.0082 J	0.019	0.0012	ND	0.0097	0.00058
c-1,3-Dichloropropene	ND	0.0020	0.00024	ND	0.0020	0.00024	ND	0.019	0.0023	ND	0.0097	0.0012
4-Methyl-2-Pentanone	ND	0.0020	0.00014	ND	0.0020	0.00013	ND	0.019	0.0013	ND	0.0097	0.00065
Toluene	0.0033	0.0020	0.00016	0.0044	0.0020	0.00016	0.41	0.019	0.0015	0.32	0.0097	0.00077
t-1,3-Dichloropropene	ND	0.0020	0.00021	ND	0.0020	0.00020	ND	0.019	0.0020	ND	0.0097	0.0010
1,1,2-Trichloroethane	ND	0.0020	0.00033	ND	0.0020	0.00032	ND	0.019	0.0031	ND	0.0097	0.0016
1,3-Dichloropropane	ND	0.0020	0.00010	ND	0.0020	0.000099	ND	0.019	0.00097	ND	0.0097	0.00048
Tetrachloroethene	ND	0.0020	0.00024	ND	0.0020	0.00024	ND	0.019	0.0023	ND	0.0097	0.0012
2-Hexanone	ND	0.0020	0.00042	ND	0.0020	0.00041	ND	0.019	0.0040	ND	0.0097	0.0020
Dibromochloromethane	ND	0.0020	0.00037	ND	0.0020	0.00036	ND	0.019	0.0035	ND	0.0097	0.0018
1,2-Dibromoethane	ND	0.0020	0.00018	ND	0.0020	0.00018	ND	0.019	0.0018	ND	0.0097	0.00089
Chlorobenzene	ND	0.0020	0.00016	ND	0.0020	0.00015	ND	0.019	0.0015	0.0043 J	0.0097	0.00076
Ethylbenzene	0.00071 J	0.0020	0.00012	0.00082 J	0.0020	0.00011	0.091	0.019	0.0011	0.083	0.0097	0.00056
p,&m-Xylene	0.0053	0.0020	0.00023	0.0066	0.0020	0.00022	0.56	0.019	0.0022	0.41	0.0097	0.0011
o-Xylene	0.0037	0.0020	0.00025	0.0039	0.0020	0.00024	0.28	0.019	0.0024	0.094	0.0097	0.0012



Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 06/08/18
 Matrix: Air
 Reporting Units: ppmv

EPA Method TO15

Lab No.:	J060808-01			J060808-02			J060808-03			J060808-04		
Client Sample I.D.:	VEFF-06-07			VEFF-06-07D			VPOST-06-07			VINP-06-07		
Date/Time Sampled:	6/7/18 8:45			6/7/18 8:45			6/7/18 9:50			6/7/18 10:00		
Date/Time Analyzed:	6/15/18 18:47			6/15/18 19:27			6/15/18 20:08			6/15/18 20:49		
QC Batch No.:	180615MS2A1			180615MS2A1			180615MS2A1			180615MS2A1		
Analyst Initials:	DT			DT			DT			DT		
Dilution Factor:	2.0			2.0			19			9.7		
ANALYTE	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv
Styrene	ND	0.0020	0.00026	ND	0.0020	0.00025	0.011 J	0.019	0.0025	0.0040 J	0.0097	0.0012
Bromoform	ND	0.0020	0.00011	ND	0.0020	0.00011	ND	0.019	0.0011	ND	0.0097	0.00054
Isopropyl benzene	ND	0.0020	0.00021	ND	0.0020	0.00021	0.0055 J	0.019	0.0020	0.0046 J	0.0097	0.0010
1,1,2,2-Tetrachloroethane	ND	0.0040	0.00012	ND	0.0040	0.00012	ND	0.039	0.0012	ND	0.019	0.00059
Benzyl Chloride	ND	0.0020	0.00037	ND	0.0020	0.00036	ND	0.019	0.0036	ND	0.0097	0.0018
1,2,3-Trichloropropane	ND	0.0020	0.00054	ND	0.0020	0.00053	ND	0.019	0.0052	ND	0.0097	0.0026
n-Propyl Benzene	0.00030 J	0.0020	0.00012	0.00037 J	0.0020	0.00012	0.011 J	0.019	0.0011	0.0087 J	0.0097	0.00057
4-Ethyl Toluene	0.0023	0.0020	0.00013	0.0028	0.0020	0.00013	0.12	0.019	0.0012	0.11	0.0097	0.00061
1,3,5-Trimethylbenzene	0.0017 J	0.0040	0.00035	0.0018 J	0.0040	0.00034	0.12	0.039	0.0034	0.11	0.019	0.0017
4-Chlorotoluene	ND	0.0020	0.00024	ND	0.0020	0.00024	ND	0.019	0.0023	ND	0.0097	0.0012
tert-Butylbenzene	ND	0.0020	0.00018	ND	0.0020	0.00018	ND	0.019	0.0018	ND	0.0097	0.00088
1,2,4-Trimethylbenzene	0.0039 J	0.0040	0.00023	0.0047	0.0040	0.00022	0.066	0.039	0.0022	0.045	0.019	0.0011
sec-Butylbenzene	ND	0.0020	0.00020	ND	0.0020	0.00019	ND	0.019	0.0019	0.0016 J	0.0097	0.00094
p-Isopropyltoluene	0.0023	0.0020	0.00026	0.00036 J	0.0020	0.00026	0.0064 J	0.019	0.0025	0.0057 J	0.0097	0.0013
1,3-Dichlorobenzene	ND	0.0020	0.00025	ND	0.0020	0.00024	ND	0.019	0.0024	ND	0.0097	0.0012
1,4-Dichlorobenzene	ND	0.0020	0.00030	ND	0.0020	0.00029	ND	0.019	0.0028	ND	0.0097	0.0014
n-Butylbenzene	0.00051 J	0.0020	0.00015	0.00056 J	0.0020	0.00014	ND	0.019	0.0014	ND	0.0097	0.00071
1,2-Dichlorobenzene	ND	0.0020	0.00025	ND	0.0020	0.00025	ND	0.019	0.0024	ND	0.0097	0.0012
1,2,4-Trichlorobenzene	ND	0.0040	0.00033	ND	0.0040	0.00033	ND	0.039	0.0032	ND	0.019	0.0016
Hexachlorobutadiene	ND	0.0020	0.00012	ND	0.0020	0.00012	ND	0.019	0.0011	ND	0.0097	0.00057
t-Butanol	ND	0.010	0.00039	0.00055 J	0.0099	0.00038	0.0095 J	0.097	0.0037	0.017 J	0.049	0.0019
n-Hexane	0.0048 J	0.010	0.00027	0.0087 J	0.0099	0.00027	2.7	0.097	0.0026	2.4	0.049	0.0013
Isopropyl ether	ND	0.010	0.00022	ND	0.0099	0.00022	ND	0.097	0.0022	ND	0.049	0.0011
t-Butyl ethyl ether	ND	0.010	0.00040	ND	0.0099	0.00040	ND	0.097	0.0039	ND	0.049	0.0019
2,2-Dichloropropane	ND	0.010	0.00019	ND	0.0099	0.00019	ND	0.097	0.0018	ND	0.049	0.00092
t-Amyl methyl ether	ND	0.010	0.00014	ND	0.0099	0.00014	ND	0.097	0.0014	ND	0.049	0.00069
1,4-Dioxane	ND	0.010	0.00035	ND	0.0099	0.00035	ND	0.097	0.0034	ND	0.049	0.0017
Naphthalene	0.0012 J	0.010	0.00078	0.0010 J	0.0099	0.00076	ND	0.097	0.0075	ND	0.049	0.0037
1,2,3-Trichlorobenzene (TIC)	ND	-	-	ND	-	-	ND	-	-	ND	-	-

MDL = Method Detection Limit
 ND= Not Detected (below MDL)
 RL = Reporting Limit
 J = Trace amount. Analyte concentration between RL and MDL.

Reviewed/Approved By: Mark Johnson
 Mark Johnson
 Operations Manager

Date: 6/20/18

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



Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 06/08/18
 Matrix: Air
 Reporting Units: ppmv

EPA Method TO15

Lab No.:	METHOD BLANK													
Client Sample I.D.:	-													
Date/Time Sampled:	-													
Date/Time Analyzed:	6/15/18 12:41													
QC Batch No.:	180615MS2A1													
Analyst Initials:	DT													
Dilution Factor:	0.20													
ANALYTE	Result ppmv	RL ppmv	MDL ppmv											
Dichlorodifluoromethane (12)	ND	0.00020	0.000031											
Chloromethane	ND	0.00040	0.000044											
1,2-CI-1,1,2,2-F ethane (114)	ND	0.00020	0.000040											
Vinyl Chloride	ND	0.00020	0.000032											
Bromomethane	ND	0.00020	0.000059											
Chloroethane	ND	0.00020	0.00017											
Trichlorofluoromethane (11)	ND	0.00020	0.000043											
1,1-Dichloroethene	ND	0.00020	0.000045											
Carbon Disulfide	ND	0.0010	0.000048											
1,1,2-CI 1,2,2-F ethane (113)	ND	0.00020	0.000054											
Acetone	ND	0.0010	0.000058											
Methylene Chloride	ND	0.00020	0.000057											
t-1,2-Dichloroethene	ND	0.00020	0.000060											
1,1-Dichloroethane	ND	0.00020	0.000027											
c-1,2-Dichloroethene	ND	0.00020	0.000039											
2-Butanone	ND	0.00020	0.00012											
t-Butyl Methyl Ether (MTBE)	ND	0.00020	0.000045											
Chloroform	ND	0.00020	0.000028											
1,1,1-Trichloroethane	ND	0.00020	0.000020											
Carbon Tetrachloride	ND	0.00020	0.000035											
Benzene	0.000025 J	0.00020	0.000019											
1,2-Dichloroethane	ND	0.00020	0.000015											
Trichloroethene	ND	0.00020	0.000028											
1,2-Dichloropropane	ND	0.00020	0.000036											
Bromodichloromethane	ND	0.00020	0.000012											
c-1,3-Dichloropropene	ND	0.00020	0.000024											
4-Methyl-2-Pentanone	ND	0.00020	0.000013											
Toluene	ND	0.00020	0.000016											
t-1,3-Dichloropropene	ND	0.00020	0.000021											
1,1,2-Trichloroethane	ND	0.00020	0.000032											
1,3-Dichloropropane	ND	0.00020	0.0000099											
Tetrachloroethene	ND	0.00020	0.000024											
2-Hexanone	ND	0.00020	0.000041											
Dibromochloromethane	ND	0.00020	0.000036											
1,2-Dibromoethane	ND	0.00020	0.000018											
Chlorobenzene	ND	0.00020	0.000016											
Ethylbenzene	ND	0.00020	0.000011											
p,&m-Xylene	ND	0.00020	0.000023											
o-Xylene	ND	0.00020	0.000024											



Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 06/08/18
 Matrix: Air
 Reporting Units: ppmv

EPA Method TO15

Lab No.:	METHOD BLANK														
Client Sample I.D.:	-														
Date/Time Sampled:	-														
Date/Time Analyzed:	6/15/18 12:41														
QC Batch No.:	180615MS2A1														
Analyst Initials:	DT														
Dilution Factor:	0.20														
ANALYTE	Result ppmv	RL ppmv	MDL ppmv												
Styrene	ND	0.00020	0.000026												
Bromoform	ND	0.00020	0.000011												
Isopropyl benzene	ND	0.00020	0.000021												
1,1,2,2-Tetrachloroethane	ND	0.00040	0.000012												
Benzyl Chloride	ND	0.00020	0.000037												
1,2,3-Trichloropropane	ND	0.00020	0.000054												
n-Propyl Benzene	ND	0.00020	0.000012												
4-Ethyl Toluene	ND	0.00020	0.000013												
1,3,5-Trimethylbenzene	ND	0.00040	0.000035												
4-Chlorotoluene	ND	0.00020	0.000024												
tert-Butylbenzene	ND	0.00020	0.000018												
1,2,4-Trimethylbenzene	ND	0.00040	0.000023												
sec-Butylbenzene	ND	0.00020	0.000019												
p-Isopropyltoluene	ND	0.00020	0.000026												
1,3-Dichlorobenzene	ND	0.00020	0.000024												
1,4-Dichlorobenzene	ND	0.00020	0.000029												
n-Butylbenzene	ND	0.00020	0.000015												
1,2-Dichlorobenzene	ND	0.00020	0.000025												
1,2,4-Trichlorobenzene	ND	0.00040	0.000033												
Hexachlorobutadiene	ND	0.00020	0.000012												
t-Butanol	ND	0.0010	0.000038												
n-Hexane	ND	0.0010	0.000027												
Isopropyl ether	ND	0.0010	0.000022												
t-Butyl ethyl ether	ND	0.0010	0.000040												
2,2-Dichloropropane	ND	0.0010	0.000019												
t-Amyl methyl ether	ND	0.0010	0.000014												
1,4-Dioxane	ND	0.0010	0.000035												
Naphthalene	ND	0.0010	0.000077												
1,2,3-Trichlorobenzene (TIC)	ND	--	--												

MDL = Method Detection Limit
 ND= Not Detected (below MDL)
 RL = Reporting Limit
 J = Trace amount. Analyte concentration between RL and MDL.

Reviewed/Approved By: Mark Johnson
 Mark Johnson
 Operations Manager

Date: 6/20/18

The cover letter is an integral part of this analytical report



LCS/LCSD Recovery and RPD Summary Report

QC Batch #: 180615MS2A1

Matrix: Air

EPA Method TO-14/TO-15											
Lab No:	Method Blank		LCS		LCSD						
Date/Time Analyzed:	6/15/18 12:41		6/15/18 11:24		6/15/18 12:03						
Data File ID:	15JUN005.D		15JUN003.D		15JUN004.D						
Analyst Initials:	DT		DT		DT						
Dilution Factor:	0.2		1.0		1.0		Limits				
ANALYTE	Result ppbv	Spike Amount	Result ppbv	% Rec	Result ppbv	% Rec	RPD	Low %Rec	High %Rec	Max. RPD	Pass/Fail
1,1-Dichloroethene	0.0	10.0	10.6	106	9.8	98	7.3	70	130	30	Pass
Methylene Chloride	0.0	10.0	8.9	89	8.7	87	2.1	70	130	30	Pass
Trichloroethene	0.0	10.0	11.6	116	12.0	120	3.1	70	130	30	Pass
Toluene	0.0	10.0	9.5	95	9.5	95	0.0	70	130	30	Pass
1,1,2,2-Tetrachloroethane	0.0	10.0	9.0	90	8.8	88	2.1	70	130	30	Pass

RPD = Relative Percent Difference

Reviewed/Approved By: _____

Mark Johnson
Operations Manager

Date: _____

6/15/18

The cover letter is an integral part of this analytical report



Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 06/08/18
 Matrix: Air
 Reporting Units: ppmv

EPA METHOD TO3

Lab No.:	J060808-01	J060808-02	J060808-03	J060808-04								
Client Sample I.D.:	VEFF-06-07	VEFF-06-07D	VPOST-06-07	VINF-06-07								
Date/Time Sampled:	6/7/18 8:45	6/7/18 8:45	6/7/18 9:50	6/7/18 10:00								
Date/Time Analyzed:	6/12/18 9:38	6/12/18 10:01	6/12/18 10:24	6/12/18 10:46								
QC Batch No.:	180612GC11A1	180612GC11A1	180612GC11A1	180612GC11A1								
Analyst Initials:	AS	AS	AS	AS								
Dilution Factor:	2.0	2.0	1.9	1.9								
ANALYTE	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	RL ppmv	MDL ppmv
TVOC as Hexane	ND	2.0	0.36	ND	2.0	0.35	66	1.9	0.34	58	1.9	0.34

MDL = Method Detection Limit
 ND= Not Detected (below MDL)
 RL = Reporting Limit
 J = Trace amount. Analyte concentration between RL and MDL.

Reviewed/Approved By: Mark Johnson
 Mark Johnson
 Operations Manager

Date 6/20/18

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QC Batch No: 180612GC11A1

Matrix: Air

Reporting Units: ppmv

**EPA METHOD TO3
LABORATORY CONTROL SAMPLE SUMMARY**

Lab No.:	METHOD BLANK			LCS		LCSD					
Date Analyzed:	6/12/18 9:16			6/12/18 8:29		6/12/18 8:52					
Analyst Initials:	AS			AS		AS					
Dilution Factor:	1.0			1.0		1.0					
ANALYTE	Result ppmv	RL ppmv	MDL ppmv	Result ppmv	% Rec.	Result ppmv	% Rec.	RPD %	Low %Rec	High %Rec	Max. RPD
TVOC as Hexane	ND	1.0	0.18	5.82	116	6.00	120	3.0	70	130	25

MDL = Method Detection Limit

ND= Not Detected (below MDL)

RL = Reporting Limit

J = Trace amount. Analyte concentration between RL and MDL.

Reviewed/Approved By: _____

Mark Johnson
Mark Johnson
Operations Manager

Date 6/20/18

The cover letter is an integral part of this analytical report



Client: CH2M Hill
 Attn: Eric Davis
 Project Name: SFPP Norwalk
 Project No.: NA
 Date Received: 06/08/18
 Matrix: Air
 Reporting Units: % v/v

ASTM D1946

Lab No.:	J060808-04												
Client Sample I.D.:	VINP-06-07												
Date/Time Sampled:	6/7/18 10:00												
Date/Time Analyzed:	6/12/18 16:53												
QC Batch No.:	180612GC8A1												
Analyst Initials:	AS												
Dilution Factor:	1.9												
ANALYTE	Result % v/v	RL % v/v	MDL % v/v										
Carbon Dioxide	0.65	0.019	0.00082										
Oxygen/Argon	21	0.97	0.071										
Nitrogen	78	1.9	0.28										
Methane	0.0031	0.0019	0.000089										

Results normalized including non-methane hydrocarbons

MDL = Method Detection Limit

ND= Not Detected (below MDL)

RL = Reporting Limit

J = Trace amount. Analyte concentration between RL and MDL.

Reviewed/Approved By: Mark Johnson
 Mark Johnson
 Operations Manager

Date 6/20/18

The cover letter is an integral part of this analytical report



April 27, 2018

Eric Davis
CH2MHill
1000 Wilshire Blvd.
Los Angeles, CA 90017

TEL:

FAX:

Workorder No.: N029977

RE: SFPP Norwalk

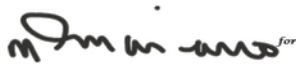
Attention: Eric Davis

Enclosed are the results for sample(s) received on April 24, 2018 by ASSET Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

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

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

Sincerely,



Quennie Manimtim
Laboratory Director

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3151 W. Post Rd., Las Vegas, NV 89118
ELAP Cert 2676 | NV Cert NV00922
ORELAP/NELAP Cert 4046

CLIENT: CH2MHill
Project: SFPP Norwalk
Lab Order: N029977

CASE NARRATIVE

SAMPLE RECEIVING/GENERAL COMMENTS:

All sample containers were received intact with proper chain of custody documentation.

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

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

Samples were analyzed within method holding time.

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

Analytical Comment for EPA 8015B_Total TPH:

Method Blank (MB) has hit above the reporting limit for Total TPH.



CLIENT: CH2MHill
Project: SFPP Norwalk
Lab Order: N029977
Contract No:

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N029977-001A	INF-04-24	Wastewater	4/24/2018 12:35:00 PM	4/24/2018	4/27/2018
N029977-001B	INF-04-24	Wastewater	4/24/2018 12:35:00 PM	4/24/2018	4/27/2018



ASSET Laboratories

ANALYTICAL RESULTS

Print Date: 27-Apr-18

CLIENT: CH2MHill
Lab Order: N029977
Project: SFPP Norwalk
Lab ID: N029977-001

Client Sample ID: INF-04-24
Collection Date: 4/24/2018 12:35:00 PM
Matrix: WASTEWATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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VOLATILE ORGANIC COMPOUNDS BY GC/MS

EPA 8260B

RunID: NV00922-MS5_180426A	QC Batch: P18VW076	PrepDate:	Analyst: QBM
1,1,1,2-Tetrachloroethane	ND 0.38	1.0	ug/L 4/26/2018 03:21 PM
1,1,1-Trichloroethane	ND 0.38	1.0	ug/L 4/26/2018 03:21 PM
1,1,2,2-Tetrachloroethane	ND 0.34	1.0	ug/L 4/26/2018 03:21 PM
1,1,2-Trichloroethane	ND 0.29	1.0	ug/L 4/26/2018 03:21 PM
1,1-Dichloroethane	ND 0.45	0.50	ug/L 4/26/2018 03:21 PM
1,1-Dichloroethene	ND 0.34	1.0	ug/L 4/26/2018 03:21 PM
1,1-Dichloropropene	ND 0.32	1.0	ug/L 4/26/2018 03:21 PM
1,2,3-Trichlorobenzene	ND 0.28	1.0	ug/L 4/26/2018 03:21 PM
1,2,3-Trichloropropane	ND 0.26	1.0	ug/L 4/26/2018 03:21 PM
1,2,4-Trichlorobenzene	ND 0.21	1.0	ug/L 4/26/2018 03:21 PM
1,2,4-Trimethylbenzene	ND 0.33	1.0	ug/L 4/26/2018 03:21 PM
1,2-Dibromo-3-chloropropane	ND 0.67	2.0	ug/L 4/26/2018 03:21 PM
1,2-Dibromoethane	ND 0.31	1.0	ug/L 4/26/2018 03:21 PM
1,2-Dichlorobenzene	ND 0.29	1.0	ug/L 4/26/2018 03:21 PM
1,2-Dichloroethane	ND 0.29	0.50	ug/L 4/26/2018 03:21 PM
1,2-Dichloropropane	ND 0.24	1.0	ug/L 4/26/2018 03:21 PM
1,3,5-Trimethylbenzene	ND 0.27	1.0	ug/L 4/26/2018 03:21 PM
1,3-Dichlorobenzene	ND 0.28	1.0	ug/L 4/26/2018 03:21 PM
1,3-Dichloropropane	ND 0.32	1.0	ug/L 4/26/2018 03:21 PM
1,4-Dichlorobenzene	ND 0.32	1.0	ug/L 4/26/2018 03:21 PM
2,2-Dichloropropane	ND 0.32	1.0	ug/L 4/26/2018 03:21 PM
2-Butanone	ND 4.9	10	ug/L 4/26/2018 03:21 PM
2-Chlorotoluene	ND 0.28	1.0	ug/L 4/26/2018 03:21 PM
4-Chlorotoluene	ND 0.30	1.0	ug/L 4/26/2018 03:21 PM
4-Isopropyltoluene	ND 0.33	1.0	ug/L 4/26/2018 03:21 PM
4-Methyl-2-pentanone	ND 3.2	10	ug/L 4/26/2018 03:21 PM
Benzene	ND 0.34	1.0	ug/L 4/26/2018 03:21 PM
Bromobenzene	ND 0.25	1.0	ug/L 4/26/2018 03:21 PM
Bromochloromethane	ND 0.41	1.0	ug/L 4/26/2018 03:21 PM
Bromodichloromethane	ND 0.38	1.0	ug/L 4/26/2018 03:21 PM
Bromoform	ND 0.39	1.0	ug/L 4/26/2018 03:21 PM
Bromomethane	ND 0.79	1.0	ug/L 4/26/2018 03:21 PM
Carbon disulfide	ND 0.81	1.0	ug/L 4/26/2018 03:21 PM
Carbon tetrachloride	ND 0.40	0.50	ug/L 4/26/2018 03:21 PM
Chlorobenzene	ND 0.30	1.0	ug/L 4/26/2018 03:21 PM
Chloroethane	ND 0.97	1.0	ug/L 4/26/2018 03:21 PM

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



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ANALYTICAL RESULTS

Print Date: 27-Apr-18

CLIENT: CH2MHill
Lab Order: N029977
Project: SFPP Norwalk
Lab ID: N029977-001

Client Sample ID: INF-04-24
Collection Date: 4/24/2018 12:35:00 PM
Matrix: WASTEWATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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VOLATILE ORGANIC COMPOUNDS BY GC/MS

EPA 8260B

RunID: NV00922-MS5_180426A	QC Batch: P18VW076				PrepDate:	Analyst: QBM
Chloroform	ND	0.27	1.0	ug/L	1	4/26/2018 03:21 PM
Chloromethane	ND	0.36	1.0	ug/L	1	4/26/2018 03:21 PM
cis-1,2-Dichloroethene	ND	0.32	1.0	ug/L	1	4/26/2018 03:21 PM
cis-1,3-Dichloropropene	ND	0.28	1.0	ug/L	1	4/26/2018 03:21 PM
Di-isopropyl ether	1.6	0.079	1.0	ug/L	1	4/26/2018 03:21 PM
Dibromochloromethane	ND	0.41	1.0	ug/L	1	4/26/2018 03:21 PM
Dibromomethane	ND	0.28	1.0	ug/L	1	4/26/2018 03:21 PM
Dichlorodifluoromethane	ND	0.29	1.0	ug/L	1	4/26/2018 03:21 PM
Ethyl tert-butyl ether	ND	0.30	1.0	ug/L	1	4/26/2018 03:21 PM
Ethylbenzene	ND	0.31	1.0	ug/L	1	4/26/2018 03:21 PM
Freon-113	ND	0.35	1.0	ug/L	1	4/26/2018 03:21 PM
Hexachlorobutadiene	ND	0.30	1.0	ug/L	1	4/26/2018 03:21 PM
Isopropylbenzene	ND	0.26	1.0	ug/L	1	4/26/2018 03:21 PM
m,p-Xylene	ND	0.23	1.0	ug/L	1	4/26/2018 03:21 PM
Methylene chloride	ND	1.9	2.0	ug/L	1	4/26/2018 03:21 PM
MTBE	1.7	0.34	1.0	ug/L	1	4/26/2018 03:21 PM
n-Butylbenzene	ND	0.34	1.0	ug/L	1	4/26/2018 03:21 PM
n-Propylbenzene	ND	0.32	1.0	ug/L	1	4/26/2018 03:21 PM
Naphthalene	ND	0.42	1.0	ug/L	1	4/26/2018 03:21 PM
o-Xylene	ND	0.31	1.0	ug/L	1	4/26/2018 03:21 PM
sec-Butylbenzene	ND	0.32	1.0	ug/L	1	4/26/2018 03:21 PM
Styrene	ND	0.21	1.0	ug/L	1	4/26/2018 03:21 PM
Tert-amyl methyl ether	ND	0.26	1.0	ug/L	1	4/26/2018 03:21 PM
Tert-Butanol	230	2.4	5.0	ug/L	1	4/26/2018 03:21 PM
tert-Butylbenzene	ND	0.28	1.0	ug/L	1	4/26/2018 03:21 PM
Tetrachloroethene	ND	0.30	1.0	ug/L	1	4/26/2018 03:21 PM
Toluene	ND	0.46	2.0	ug/L	1	4/26/2018 03:21 PM
trans-1,2-Dichloroethene	ND	0.40	1.0	ug/L	1	4/26/2018 03:21 PM
trans-1,3-Dichloropropene	ND	0.25	1.0	ug/L	1	4/26/2018 03:21 PM
Trichloroethene	ND	0.37	1.0	ug/L	1	4/26/2018 03:21 PM
Trichlorofluoromethane	ND	0.37	1.0	ug/L	1	4/26/2018 03:21 PM
Vinyl chloride	ND	0.29	0.50	ug/L	1	4/26/2018 03:21 PM
Xylenes, Total	ND	1.5	2.0	ug/L	1	4/26/2018 03:21 PM
Surr: 1,2-Dichloroethane-d4	104	0	72-119	%REC	1	4/26/2018 03:21 PM
Surr: 4-Bromofluorobenzene	99.8	0	76-119	%REC	1	4/26/2018 03:21 PM
Surr: Dibromofluoromethane	102	0	85-115	%REC	1	4/26/2018 03:21 PM

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



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ANALYTICAL RESULTS

Print Date: 27-Apr-18

CLIENT: CH2MHill	Client Sample ID: INF-04-24
Lab Order: N029977	Collection Date: 4/24/2018 12:35:00 PM
Project: SFPP Norwalk	Matrix: WASTEWATER
Lab ID: N029977-001	

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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VOLATILE ORGANIC COMPOUNDS BY GC/MS

EPA 8260B

RunID: NV00922-MS5_180426A	QC Batch: P18VW076	PrepDate:	Analyst: QBM
Surr: Toluene-d8	103 0	81-120 %REC	1 4/26/2018 03:21 PM

TPH EXTRACTABLE BY GC/FID

EPA 3510C

EPA 8015B

RunID: NV00922-GC3_180426B	QC Batch: 67855	PrepDate: 4/26/2018	Analyst: JJS
TPH-Diesel (C13-C22)	370 16	26 ug/L	1 4/27/2018 01:44 AM
TPH-Oil (C23-C36)	410 14	26 ug/L	1 4/27/2018 01:44 AM
Surr: Octacosane	124 0	26-152 %REC	1 4/27/2018 01:44 AM
Surr: p-Terphenyl	122 0	57-132 %REC	1 4/27/2018 01:44 AM

GASOLINE RANGE ORGANICS BY GC/FID

EPA 8015B

RunID: NV00922-GC4_180425B	QC Batch: E18VW030	PrepDate:	Analyst: QBM
TPH-Gasoline (C4-C12)	49 16	50 J ug/L	1 4/26/2018 12:29 AM
Surr: Chlorobenzene - d5	102 0	74-138 %REC	1 4/26/2018 12:29 AM

TOTAL TPH

EPA 8015B

RunID: NV00922-GC3_180426B	QC Batch: R123676	PrepDate:	Analyst: JJS
Total TPH	830 16	50 B ug/L	1 4/26/2018

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



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CLIENT: CH2MHill
Work Order: N029977
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_W_FP_SFPP

Sample ID: MB-67855	SampType: MBLK	TestCode: 8015_W_FP_	Units: ug/L	Prep Date: 4/26/2018	RunNo: 123676						
Client ID: PBW	Batch ID: 67855	TestNo: EPA 8015B EPA 3510C		Analysis Date: 4/26/2018	SeqNo: 3010178						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH-Diesel (C13-C22)	ND	25									
TPH-Oil (C23-C36)	21.615	25									J
Surr: Octacosane	85.191		80.00		106	26	152				
Surr: p-Terphenyl	84.366		80.00		105	57	132				

Qualifiers:

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



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CLIENT: CH2MHill
Work Order: N029977
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_W_SFPTOT

Sample ID: MB-R123676	SampType: MBLK	TestCode: 8015_W_SFP	Units: ug/L	Prep Date:	RunNo: 123676						
Client ID: PBW	Batch ID: R123676	TestNo: EPA 8015B		Analysis Date: 4/26/2018	SeqNo: 3010660						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total TPH	58.615	50									

Qualifiers:

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



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Work Order: N029977
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015GAS_WSFPP

Sample ID: E180425LCS2	SampType: LCS	TestCode: 8015GAS_WS	Units: ug/L	Prep Date:	RunNo: 123643						
Client ID: LCSW	Batch ID: E18VW030	TestNo: EPA 8015B	Analysis Date: 4/25/2018	SeqNo: 3008298							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH-Gasoline (C4-C12)	1121.000	50	1000	0	112	67	136				
Surr: Chlorobenzene - d5	54460.000		50000		109	74	138				

Sample ID: E180425MB2	SampType: MBLK	TestCode: 8015GAS_WS	Units: ug/L	Prep Date:	RunNo: 123643						
Client ID: PBW	Batch ID: E18VW030	TestNo: EPA 8015B	Analysis Date: 4/25/2018	SeqNo: 3008299							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH-Gasoline (C4-C12)	37.000	50									J
Surr: Chlorobenzene - d5	48281.000		50000		96.6	74	138				

Sample ID: N029976-005AMS	SampType: MS	TestCode: 8015GAS_WS	Units: ug/L	Prep Date:	RunNo: 123643						
Client ID: ZZZZZ	Batch ID: E18VW030	TestNo: EPA 8015B	Analysis Date: 4/25/2018	SeqNo: 3008365							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH-Gasoline (C4-C12)	977.000	50	1000	36.00	94.1	67	136				
Surr: Chlorobenzene - d5	50356.000		50000		101	74	138				

Sample ID: N029976-005AMSD	SampType: MSD	TestCode: 8015GAS_WS	Units: ug/L	Prep Date:	RunNo: 123643						
Client ID: ZZZZZ	Batch ID: E18VW030	TestNo: EPA 8015B	Analysis Date: 4/25/2018	SeqNo: 3008366							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH-Gasoline (C4-C12)	974.000	50	1000	36.00	93.8	67	136	977.0	0.308	30	
Surr: Chlorobenzene - d5	50545.000		50000		101	74	138		0	0	

Qualifiers:

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



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CLIENT: CH2MHill
Work Order: N029977
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: P180426LCS	SampType: LCS	TestCode: 8260_WP_SF	Units: ug/L	Prep Date:	RunNo: 123664						
Client ID: LCSW	Batch ID: P18VW076	TestNo: EPA 8260B		Analysis Date: 4/26/2018	SeqNo: 3009459						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	19.950	1.0	20.00	0	99.8	81	129				
1,1,1-Trichloroethane	20.030	1.0	20.00	0	100	67	132				
1,1,2,2-Tetrachloroethane	19.890	1.0	20.00	0	99.4	63	128				
1,1,2-Trichloroethane	18.940	1.0	20.00	0	94.7	75	125				
1,1-Dichloroethane	21.310	0.50	20.00	0	107	69	133				
1,1-Dichloroethene	20.310	1.0	20.00	0	102	68	130				
1,1-Dichloropropene	21.030	1.0	20.00	0	105	73	132				
1,2,3-Trichlorobenzene	19.720	1.0	20.00	0	98.6	67	137				
1,2,3-Trichloropropane	19.950	1.0	20.00	0	99.8	73	124				
1,2,4-Trichlorobenzene	20.030	1.0	20.00	0	100	66	134				
1,2,4-Trimethylbenzene	22.740	1.0	20.00	0	114	74	132				
1,2-Dibromo-3-chloropropane	17.440	2.0	20.00	0	87.2	50	132				
1,2-Dibromoethane	19.380	1.0	20.00	0	96.9	80	121				
1,2-Dichlorobenzene	20.050	1.0	20.00	0	100	71	122				
1,2-Dichloroethane	20.100	0.50	20.00	0	101	69	132				
1,2-Dichloropropane	20.360	1.0	20.00	0	102	75	125				
1,3,5-Trimethylbenzene	21.910	1.0	20.00	0	110	74	131				
1,3-Dichlorobenzene	20.980	1.0	20.00	0	105	75	124				
1,3-Dichloropropane	19.020	1.0	20.00	0	95.1	73	126				
1,4-Dichlorobenzene	20.260	1.0	20.00	0	101	74	123				
2,2-Dichloropropane	20.980	1.0	20.00	0	105	69	137				
2-Butanone	175.940	10	200.0	0	88.0	49	136				
2-Chlorotoluene	21.720	1.0	20.00	0	109	73	126				
4-Chlorotoluene	21.630	1.0	20.00	0	108	74	128				
4-Isopropyltoluene	22.130	1.0	20.00	0	111	73	130				
4-Methyl-2-pentanone	196.380	10	200.0	0	98.2	58	134				
Benzene	21.100	1.0	20.00	0	106	81	122				
Bromobenzene	20.130	1.0	20.00	0	101	76	124				
Bromochloromethane	18.430	1.0	20.00	0	92.2	65	129				
Bromodichloromethane	21.410	1.0	20.00	0	107	76	121				

Qualifiers:

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



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CLIENT: CH2MHill
Work Order: N029977
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: P180426LCS	SampType: LCS	TestCode: 8260_WP_SF	Units: ug/L	Prep Date:	RunNo: 123664						
Client ID: LCSW	Batch ID: P18VW076	TestNo: EPA 8260B		Analysis Date: 4/26/2018	SeqNo: 3009459						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bromoform	17.310	1.0	20.00	0	86.6	69	128				
Bromomethane	29.640	1.0	20.00	0	148	53	141				S
Carbon disulfide	24.280	1.0	20.00	0	121	75	125				
Carbon tetrachloride	21.480	0.50	20.00	0	107	66	138				
Chlorobenzene	20.130	1.0	20.00	0	101	81	122				
Chloroethane	36.250	1.0	20.00	0	181	58	133				S
Chloroform	20.230	1.0	20.00	0	101	69	128				
Chloromethane	20.980	1.0	20.00	0	105	56	131				
cis-1,2-Dichloroethene	19.950	1.0	20.00	0	99.8	72	126				
cis-1,3-Dichloropropene	20.710	1.0	20.00	0	104	69	131				
Di-isopropyl ether	21.180	1.0	20.00	0	106	70	130				
Dibromochloromethane	17.770	1.0	20.00	0	88.8	66	133				
Dibromomethane	19.120	1.0	20.00	0	95.6	76	125				
Dichlorodifluoromethane	19.660	1.0	20.00	0	98.3	53	153				
Ethyl tert-butyl ether	20.480	1.0	20.00	0	102	70	130				
Ethylbenzene	20.830	1.0	20.00	0	104	73	127				
Freon-113	21.940	1.0	20.00	0	110	75	125				
Hexachlorobutadiene	21.590	1.0	20.00	0	108	67	131				
Isopropylbenzene	21.770	1.0	20.00	0	109	75	127				
m,p-Xylene	42.220	1.0	40.00	0	106	76	128				
Methylene chloride	19.920	2.0	20.00	0	99.6	63	137				
MTBE	19.050	1.0	20.00	0	95.2	65	123				
n-Butylbenzene	22.700	1.0	20.00	0	114	69	137				
n-Propylbenzene	22.050	1.0	20.00	0	110	72	129				
Naphthalene	16.380	1.0	20.00	0	81.9	54	138				
o-Xylene	20.560	1.0	20.00	0	103	80	121				
sec-Butylbenzene	22.380	1.0	20.00	0	112	72	127				
Styrene	20.490	1.0	20.00	0	102	65	134				
Tert-amyl methyl ether	18.570	1.0	20.00	0	92.8	70	130				
Tert-Butanol	72.300	5.0	100.0	0	72.3	70	130				

Qualifiers:

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



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CLIENT: CH2MHill
Work Order: N029977
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: P180426LCS		SampType: LCS		TestCode: 8260_WP_SF Units: ug/L		Prep Date:		RunNo: 123664			
Client ID: LCSW		Batch ID: P18VW076		TestNo: EPA 8260B		Analysis Date: 4/26/2018		SeqNo: 3009459			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
tert-Butylbenzene	21.590	1.0	20.00	0	108	70	129				
Tetrachloroethene	20.940	1.0	20.00	0	105	66	128				
Toluene	20.220	2.0	20.00	0	101	77	122				
trans-1,2-Dichloroethene	19.490	1.0	20.00	0	97.5	63	137				
trans-1,3-Dichloropropene	20.160	1.0	20.00	0	101	59	135				
Trichloroethene	20.950	1.0	20.00	0	105	70	127				
Trichlorofluoromethane	21.190	1.0	20.00	0	106	57	129				
Vinyl chloride	21.710	0.50	20.00	0	109	50	134				
Xylenes, Total	62.780	2.0	60.00	0	105	75	125				
Surr: 1,2-Dichloroethane-d4	26.670		25.00		107	72	119				
Surr: 4-Bromofluorobenzene	25.500		25.00		102	76	119				
Surr: Dibromofluoromethane	26.330		25.00		105	85	115				
Surr: Toluene-d8	26.710		25.00		107	81	120				

Sample ID: P180426MB3		SampType: MBLK		TestCode: 8260_WP_SF Units: ug/L		Prep Date:		RunNo: 123664			
Client ID: PBW		Batch ID: P18VW076		TestNo: EPA 8260B		Analysis Date: 4/26/2018		SeqNo: 3009462			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1.0									
1,1,1-Trichloroethane	ND	1.0									
1,1,2,2-Tetrachloroethane	ND	1.0									
1,1,2-Trichloroethane	ND	1.0									
1,1-Dichloroethane	ND	0.50									
1,1-Dichloroethene	ND	1.0									
1,1-Dichloropropene	ND	1.0									
1,2,3-Trichlorobenzene	ND	1.0									
1,2,3-Trichloropropane	ND	1.0									
1,2,4-Trichlorobenzene	ND	1.0									
1,2,4-Trimethylbenzene	ND	1.0									
1,2-Dibromo-3-chloropropane	ND	2.0									

Qualifiers:

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



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CLIENT: CH2MHill
Work Order: N029977
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: P180426MB3	SampType: MBLK	TestCode: 8260_WP_SF	Units: ug/L	Prep Date:	RunNo: 123664						
Client ID: PBW	Batch ID: P18VW076	TestNo: EPA 8260B		Analysis Date: 4/26/2018	SeqNo: 3009462						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2-Dibromoethane	ND	1.0									
1,2-Dichlorobenzene	ND	1.0									
1,2-Dichloroethane	ND	0.50									
1,2-Dichloropropane	ND	1.0									
1,3,5-Trimethylbenzene	ND	1.0									
1,3-Dichlorobenzene	ND	1.0									
1,3-Dichloropropane	ND	1.0									
1,4-Dichlorobenzene	ND	1.0									
2,2-Dichloropropane	ND	1.0									
2-Butanone	ND	10									
2-Chlorotoluene	ND	1.0									
4-Chlorotoluene	ND	1.0									
4-Isopropyltoluene	ND	1.0									
4-Methyl-2-pentanone	ND	10									
Benzene	ND	1.0									
Bromobenzene	ND	1.0									
Bromochloromethane	ND	1.0									
Bromodichloromethane	ND	1.0									
Bromoform	ND	1.0									
Bromomethane	ND	1.0									
Carbon disulfide	ND	1.0									
Carbon tetrachloride	ND	0.50									
Chlorobenzene	ND	1.0									
Chloroethane	ND	1.0									
Chloroform	ND	1.0									
Chloromethane	ND	1.0									
cis-1,2-Dichloroethene	ND	1.0									
cis-1,3-Dichloropropene	ND	1.0									
Di-isopropyl ether	ND	1.0									
Dibromochloromethane	ND	1.0									

Qualifiers:

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



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 ORELAP/NELAP Cert 4046

CLIENT: CH2MHill
Work Order: N029977
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

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Client ID: PBW	Batch ID: P18VW076	TestNo: EPA 8260B		Analysis Date: 4/26/2018	SeqNo: 3009462						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dibromomethane	ND	1.0									
Dichlorodifluoromethane	ND	1.0									
Ethyl tert-butyl ether	ND	1.0									
Ethylbenzene	ND	1.0									
Freon-113	ND	1.0									
Hexachlorobutadiene	ND	1.0									
Isopropylbenzene	ND	1.0									
m,p-Xylene	ND	1.0									
Methylene chloride	ND	2.0									
MTBE	ND	1.0									
n-Butylbenzene	ND	1.0									
n-Propylbenzene	ND	1.0									
Naphthalene	ND	1.0									
o-Xylene	ND	1.0									
sec-Butylbenzene	ND	1.0									
Styrene	ND	1.0									
Tert-amyl methyl ether	ND	1.0									
Tert-Butanol	ND	5.0									
tert-Butylbenzene	ND	1.0									
Tetrachloroethene	ND	1.0									
Toluene	ND	2.0									
trans-1,2-Dichloroethene	ND	1.0									
trans-1,3-Dichloropropene	ND	1.0									
Trichloroethene	ND	1.0									
Trichlorofluoromethane	ND	1.0									
Vinyl chloride	ND	0.50									
Xylenes, Total	ND	2.0									
Surr: 1,2-Dichloroethane-d4	27.710		25.00		111	72	119				
Surr: 4-Bromofluorobenzene	25.540		25.00		102	76	119				
Surr: Dibromofluoromethane	25.860		25.00		103	85	115				

Qualifiers:

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CLIENT: CH2MHill
Work Order: N029977
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: P180426MB3	SampType: MBLK	TestCode: 8260_WP_SF	Units: ug/L	Prep Date:	RunNo: 123664						
Client ID: PBW	Batch ID: P18VW076	TestNo: EPA 8260B		Analysis Date: 4/26/2018	SeqNo: 3009462						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Surr: Toluene-d8 25.800 25.00 103 81 120

Sample ID: N029976-005AMS	SampType: MS	TestCode: 8260_WP_SF	Units: ug/L	Prep Date:	RunNo: 123664						
Client ID: ZZZZZ	Batch ID: P18VW076	TestNo: EPA 8260B		Analysis Date: 4/26/2018	SeqNo: 3009581						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

1,1,1,2-Tetrachloroethane	21.330	1.0	20.00	0	107	81	129				
1,1,1-Trichloroethane	18.560	1.0	20.00	0	92.8	67	132				
1,1,2,2-Tetrachloroethane	20.750	1.0	20.00	0	104	63	128				
1,1,2-Trichloroethane	19.100	1.0	20.00	0	95.5	75	125				
1,1-Dichloroethane	20.030	0.50	20.00	0	100	69	133				
1,1-Dichloroethene	18.850	1.0	20.00	0	94.3	68	130				
1,1-Dichloropropene	19.570	1.0	20.00	0	97.9	73	132				
1,2,3-Trichlorobenzene	19.150	1.0	20.00	0	95.8	67	137				
1,2,3-Trichloropropane	19.810	1.0	20.00	0	99.0	73	124				
1,2,4-Trichlorobenzene	18.990	1.0	20.00	0	95.0	66	134				
1,2,4-Trimethylbenzene	21.280	1.0	20.00	0	106	74	132				
1,2-Dibromo-3-chloropropane	19.040	2.0	20.00	0	95.2	50	132				
1,2-Dibromoethane	18.180	1.0	20.00	0	90.9	80	121				
1,2-Dichlorobenzene	19.540	1.0	20.00	0	97.7	71	122				
1,2-Dichloroethane	19.720	0.50	20.00	0	98.6	69	132				
1,2-Dichloropropane	20.530	1.0	20.00	0	103	75	125				
1,3,5-Trimethylbenzene	21.420	1.0	20.00	0	107	74	131				
1,3-Dichlorobenzene	20.400	1.0	20.00	0	102	75	124				
1,3-Dichloropropane	20.970	1.0	20.00	0	105	73	126				
1,4-Dichlorobenzene	20.390	1.0	20.00	0	102	74	123				
2,2-Dichloropropane	19.270	1.0	20.00	0	96.4	69	137				
2-Butanone	173.260	10	200.0	0	86.6	49	136				
2-Chlorotoluene	21.000	1.0	20.00	0	105	73	126				
4-Chlorotoluene	20.950	1.0	20.00	0	105	74	128				

Qualifiers:

- | | | |
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CLIENT: CH2MHill
Work Order: N029977
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: N029976-005AMS	SampType: MS	TestCode: 8260_WP_SF	Units: ug/L	Prep Date:	RunNo: 123664						
Client ID: ZZZZZ	Batch ID: P18VW076	TestNo: EPA 8260B		Analysis Date: 4/26/2018	SeqNo: 3009581						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4-Isopropyltoluene	20.240	1.0	20.00	0	101	73	130				
4-Methyl-2-pentanone	206.240	10	200.0	0	103	58	134				
Benzene	20.600	1.0	20.00	0	103	81	122				
Bromobenzene	19.240	1.0	20.00	0	96.2	76	124				
Bromochloromethane	18.980	1.0	20.00	0	94.9	65	129				
Bromodichloromethane	21.020	1.0	20.00	0	105	76	121				
Bromoform	18.090	1.0	20.00	0	90.4	69	128				
Bromomethane	32.530	1.0	20.00	0	163	53	141				S
Carbon disulfide	22.720	1.0	20.00	0	114	75	125				
Carbon tetrachloride	20.260	0.50	20.00	0	101	66	138				
Chlorobenzene	20.580	1.0	20.00	0	103	81	122				
Chloroethane	32.310	1.0	20.00	0	162	58	133				S
Chloroform	19.120	1.0	20.00	0	95.6	69	128				
Chloromethane	19.340	1.0	20.00	0	96.7	56	131				
cis-1,2-Dichloroethene	19.370	1.0	20.00	0	96.9	72	126				
cis-1,3-Dichloropropene	20.610	1.0	20.00	0	103	69	131				
Di-isopropyl ether	20.500	1.0	20.00	0	103	70	130				
Dibromochloromethane	18.220	1.0	20.00	0	91.1	66	133				
Dibromomethane	18.120	1.0	20.00	0	90.6	76	125				
Dichlorodifluoromethane	17.610	1.0	20.00	0	88.0	53	153				
Ethyl tert-butyl ether	20.190	1.0	20.00	0	101	70	130				
Ethylbenzene	21.010	1.0	20.00	0	105	73	127				
Freon-113	19.870	1.0	20.00	0	99.4	75	125				
Hexachlorobutadiene	19.310	1.0	20.00	0	96.6	67	131				
Isopropylbenzene	20.990	1.0	20.00	0	105	75	127				
m,p-Xylene	43.090	1.0	40.00	0	108	76	128				
Methylene chloride	20.680	2.0	20.00	0	103	63	137				
MTBE	18.870	1.0	20.00	0	94.4	65	123				
n-Butylbenzene	21.240	1.0	20.00	0	106	69	137				
n-Propylbenzene	21.410	1.0	20.00	0	107	72	129				

Qualifiers:

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: N029976-005AMS	SampType: MS	TestCode: 8260_WP_SF	Units: ug/L	Prep Date:	RunNo: 123664						
Client ID: ZZZZZ	Batch ID: P18VW076	TestNo: EPA 8260B		Analysis Date: 4/26/2018	SeqNo: 3009581						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	14.890	1.0	20.00	0	74.4	54	138				
o-Xylene	20.730	1.0	20.00	0	104	80	121				
sec-Butylbenzene	21.550	1.0	20.00	0	108	72	127				
Styrene	18.870	1.0	20.00	0	94.4	65	134				
Tert-amyl methyl ether	19.250	1.0	20.00	0	96.2	70	130				
Tert-Butanol	79.570	5.0	100.0	0	79.6	70	130				
tert-Butylbenzene	20.460	1.0	20.00	0	102	70	129				
Tetrachloroethene	20.580	1.0	20.00	0	103	66	128				
Toluene	19.820	2.0	20.00	0	99.1	77	122				
trans-1,2-Dichloroethene	17.780	1.0	20.00	0	88.9	63	137				
trans-1,3-Dichloropropene	20.150	1.0	20.00	0	101	59	135				
Trichloroethene	20.450	1.0	20.00	0	102	70	127				
Trichlorofluoromethane	19.560	1.0	20.00	0	97.8	57	129				
Vinyl chloride	20.530	0.50	20.00	0	103	50	134				
Xylenes, Total	63.820	2.0	60.00	0	106	75	125				
Surr: 1,2-Dichloroethane-d4	25.780		25.00		103	72	119				
Surr: 4-Bromofluorobenzene	25.830		25.00		103	76	119				
Surr: Dibromofluoromethane	25.550		25.00		102	85	115				
Surr: Toluene-d8	26.000		25.00		104	81	120				

Sample ID: N029976-005AMSD	SampType: MSD	TestCode: 8260_WP_SF	Units: ug/L	Prep Date:	RunNo: 123664						
Client ID: ZZZZZ	Batch ID: P18VW076	TestNo: EPA 8260B		Analysis Date: 4/26/2018	SeqNo: 3009582						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	20.800	1.0	20.00	0	104	81	129	21.33	2.52	20	
1,1,1-Trichloroethane	20.150	1.0	20.00	0	101	67	132	18.56	8.21	20	
1,1,2,2-Tetrachloroethane	21.310	1.0	20.00	0	107	63	128	20.75	2.66	20	
1,1,2-Trichloroethane	19.750	1.0	20.00	0	98.8	75	125	19.10	3.35	20	
1,1-Dichloroethane	21.230	0.50	20.00	0	106	69	133	20.03	5.82	20	
1,1-Dichloroethene	20.350	1.0	20.00	0	102	68	130	18.85	7.65	20	

Qualifiers:

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CLIENT: CH2MHill
Work Order: N029977
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: N029976-005AMSD SampType: MSD TestCode: 8260_WP_SF Units: ug/L		Prep Date:		RunNo: 123664							
Client ID: ZZZZZ Batch ID: P18VW076 TestNo: EPA 8260B		Analysis Date: 4/26/2018		SeqNo: 3009582							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloropropene	21.130	1.0	20.00	0	106	73	132	19.57	7.67	20	
1,2,3-Trichlorobenzene	20.370	1.0	20.00	0	102	67	137	19.15	6.17	20	
1,2,3-Trichloropropane	20.340	1.0	20.00	0	102	73	124	19.81	2.64	20	
1,2,4-Trichlorobenzene	20.990	1.0	20.00	0	105	66	134	18.99	10.0	20	
1,2,4-Trimethylbenzene	21.380	1.0	20.00	0	107	74	132	21.28	0.469	20	
1,2-Dibromo-3-chloropropane	19.440	2.0	20.00	0	97.2	50	132	19.04	2.08	20	
1,2-Dibromoethane	19.890	1.0	20.00	0	99.4	80	121	18.18	8.98	20	
1,2-Dichlorobenzene	19.900	1.0	20.00	0	99.5	71	122	19.54	1.83	20	
1,2-Dichloroethane	19.960	0.50	20.00	0	99.8	69	132	19.72	1.21	20	
1,2-Dichloropropane	20.910	1.0	20.00	0	105	75	125	20.53	1.83	20	
1,3,5-Trimethylbenzene	22.290	1.0	20.00	0	111	74	131	21.42	3.98	20	
1,3-Dichlorobenzene	20.660	1.0	20.00	0	103	75	124	20.40	1.27	20	
1,3-Dichloropropane	20.230	1.0	20.00	0	101	73	126	20.97	3.59	20	
1,4-Dichlorobenzene	20.630	1.0	20.00	0	103	74	123	20.39	1.17	20	
2,2-Dichloropropane	19.180	1.0	20.00	0	95.9	69	137	19.27	0.468	20	
2-Butanone	184.310	10	200.0	0	92.2	49	136	173.3	6.18	20	
2-Chlorotoluene	21.800	1.0	20.00	0	109	73	126	21.00	3.74	20	
4-Chlorotoluene	21.530	1.0	20.00	0	108	74	128	20.95	2.73	20	
4-Isopropyltoluene	21.450	1.0	20.00	0	107	73	130	20.24	5.80	20	
4-Methyl-2-pentanone	214.540	10	200.0	0	107	58	134	206.2	3.95	20	
Benzene	21.230	1.0	20.00	0	106	81	122	20.60	3.01	20	
Bromobenzene	20.370	1.0	20.00	0	102	76	124	19.24	5.71	20	
Bromochloromethane	19.620	1.0	20.00	0	98.1	65	129	18.98	3.32	20	
Bromodichloromethane	21.680	1.0	20.00	0	108	76	121	21.02	3.09	20	
Bromoform	18.480	1.0	20.00	0	92.4	69	128	18.09	2.13	20	
Bromomethane	30.650	1.0	20.00	0	153	53	141	32.53	5.95	20	S
Carbon disulfide	23.750	1.0	20.00	0	119	75	125	22.72	4.43	20	
Carbon tetrachloride	21.060	0.50	20.00	0	105	66	138	20.26	3.87	20	
Chlorobenzene	20.950	1.0	20.00	0	105	81	122	20.58	1.78	20	
Chloroethane	36.630	1.0	20.00	0	183	58	133	32.31	12.5	20	S

Qualifiers:

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CLIENT: CH2MHill
Work Order: N029977
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: N029976-005AMSD	SampType: MSD	TestCode: 8260_WP_SF	Units: ug/L	Prep Date:	RunNo: 123664						
Client ID: ZZZZZ	Batch ID: P18VW076	TestNo: EPA 8260B		Analysis Date: 4/26/2018	SeqNo: 3009582						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloroform	19.730	1.0	20.00	0	98.6	69	128	19.12	3.14	20	
Chloromethane	20.980	1.0	20.00	0	105	56	131	19.34	8.13	20	
cis-1,2-Dichloroethene	20.200	1.0	20.00	0	101	72	126	19.37	4.20	20	
cis-1,3-Dichloropropene	20.810	1.0	20.00	0	104	69	131	20.61	0.966	20	
Di-isopropyl ether	21.330	1.0	20.00	0	107	70	130	20.50	3.97	20	
Dibromochloromethane	18.190	1.0	20.00	0	91.0	66	133	18.22	0.165	20	
Dibromomethane	19.540	1.0	20.00	0	97.7	76	125	18.12	7.54	20	
Dichlorodifluoromethane	19.760	1.0	20.00	0	98.8	53	153	17.61	11.5	20	
Ethyl tert-butyl ether	20.980	1.0	20.00	0	105	70	130	20.19	3.84	20	
Ethylbenzene	21.690	1.0	20.00	0	108	73	127	21.01	3.19	20	
Freon-113	21.680	1.0	20.00	0	108	75	125	19.87	8.71	20	
Hexachlorobutadiene	21.270	1.0	20.00	0	106	67	131	19.31	9.66	20	
Isopropylbenzene	21.930	1.0	20.00	0	110	75	127	20.99	4.38	20	
m,p-Xylene	43.420	1.0	40.00	0	109	76	128	43.09	0.763	20	
Methylene chloride	22.380	2.0	20.00	0	112	63	137	20.68	7.90	20	
MTBE	19.230	1.0	20.00	0	96.2	65	123	18.87	1.89	20	
n-Butylbenzene	22.250	1.0	20.00	0	111	69	137	21.24	4.64	20	
n-Propylbenzene	22.620	1.0	20.00	0	113	72	129	21.41	5.50	20	
Naphthalene	16.860	1.0	20.00	0	84.3	54	138	14.89	12.4	20	
o-Xylene	21.280	1.0	20.00	0	106	80	121	20.73	2.62	20	
sec-Butylbenzene	22.200	1.0	20.00	0	111	72	127	21.55	2.97	20	
Styrene	18.990	1.0	20.00	0	95.0	65	134	18.87	0.634	20	
Tert-amyl methyl ether	19.460	1.0	20.00	0	97.3	70	130	19.25	1.08	20	
Tert-Butanol	77.710	5.0	100.0	0	77.7	70	130	79.57	2.37	20	
tert-Butylbenzene	21.560	1.0	20.00	0	108	70	129	20.46	5.24	20	
Tetrachloroethene	22.200	1.0	20.00	0	111	66	128	20.58	7.57	20	
Toluene	20.540	2.0	20.00	0	103	77	122	19.82	3.57	20	
trans-1,2-Dichloroethene	19.270	1.0	20.00	0	96.4	63	137	17.78	8.04	20	
trans-1,3-Dichloropropene	20.070	1.0	20.00	0	100	59	135	20.15	0.398	20	
Trichloroethene	20.680	1.0	20.00	0	103	70	127	20.45	1.12	20	

Qualifiers:

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



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 ORELAP/NELAP Cert 4046

CLIENT: CH2MHill
Work Order: N029977
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: N029976-005AMSD		SampType: MSD		TestCode: 8260_WP_SF		Units: ug/L		Prep Date:		RunNo: 123664	
Client ID: ZZZZZ		Batch ID: P18VW076		TestNo: EPA 8260B		Analysis Date: 4/26/2018				SeqNo: 3009582	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Trichlorofluoromethane	21.680	1.0	20.00	0	108	57	129	19.56	10.3	20	
Vinyl chloride	23.250	0.50	20.00	0	116	50	134	20.53	12.4	20	
Xylenes, Total	64.700	2.0	60.00	0	108	75	125	63.82	1.37	20	
Surr: 1,2-Dichloroethane-d4	25.650		25.00		103	72	119		0		
Surr: 4-Bromofluorobenzene	25.860		25.00		103	76	119		0		
Surr: Dibromofluoromethane	26.400		25.00		106	85	115		0		
Surr: Toluene-d8	26.290		25.00		105	81	120		0		

Qualifiers:

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



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

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

Cooler Received/Opened On: 4/24/2018 Workorder: N029977
 Rep sample Temp (Deg C): 2.7 IR Gun ID: 2
 Temp Blank: Yes No
 Carrier name: Golden State Overnight
 Last 4 digits of Tracking No.: 1322 Packing Material Used: Bubble Wrap
 Cooling process: Ice Ice Pack Dry Ice Other None

Sample Receipt Checklist

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

Comments:

Checklist Completed By: YR  4/25/2018

Reviewed By:  04/27/2018

ASSET Laboratories

WORK ORDER Summary

25-Apr-18

WorkOrder: N029977

Client ID: CH2HI03

Project: SFPP Norwalk

QC Level: RTNE

Date Received: 4/24/2018

Comments:

Sample ID	Client Sample ID	Date Collected	Date Due	Matrix	Test No	Test Name	Hld	MS	Sub	Storage
N029977-001A	INF-04-24	4/24/2018 12:35:00 PM	5/1/2018	Wastewater	EPA 8015B	GASOLINE RANGE ORGANICS BY GC/FID	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	VW
			5/1/2018		EPA 8260B	VOLATILE ORGANIC COMPOUNDS BY GC/MS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	VW
N029977-001B			5/1/2018		EPA 3510C	SEPARATORY FUNNEL EXTRACTION: EXTRACTABLE FUELS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	WW
			5/1/2018		EPA 8015B	TPH EXTRACTABLE BY GC/FID	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	WW
			5/1/2018		EPA 8015B	Total TPH	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	WW
N029977-002A	FOLDER	5/1/2018	5/1/2018		Folder	Folder	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LAB
			5/1/2018		Folder	Folder	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LAB

May 30, 2018

Eric Davis
CH2MHill
1000 Wilshire Blvd.
Los Angeles, CA 90017

TEL:

FAX:

Workorder No.: N030447

RE: SFPP Norwalk

Attention: Eric Davis

Enclosed are the results for sample(s) received on May 22, 2018 by ASSET Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

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

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

Sincerely,



Quennie Manimtim
Laboratory Director

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CLIENT: CH2MHill
Project: SFPP Norwalk
Lab Order: N030447

CASE NARRATIVE

SAMPLE RECEIVING/GENERAL COMMENTS:

All sample containers were received intact with proper chain of custody documentation.

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

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

Sample was analyzed within method holding time.

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



CLIENT: CH2MHill
Project: SFPP Norwalk
Lab Order: N030447
Contract No:

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N030447-001A	INF-05-22	Wastewater	5/22/2018 2:05:00 PM	5/22/2018	5/24/2018
N030447-001B	INF-05-22	Wastewater	5/22/2018 2:05:00 PM	5/22/2018	5/24/2018



ASSET Laboratories

ANALYTICAL RESULTS

Print Date: 30-May-18

CLIENT: CH2MHill
Lab Order: N030447
Project: SFPP Norwalk
Lab ID: N030447-001

Client Sample ID: INF-05-22
Collection Date: 5/22/2018 2:05:00 PM
Matrix: WASTEWATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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VOLATILE ORGANIC COMPOUNDS BY GC/MS

EPA 8260B

RunID: MS8_180523A	QC Batch: R18VW023	PrepDate:	Analyst: QBM			
1,1,1,2-Tetrachloroethane	ND	0.38	1.0	ug/L	1	5/23/2018 04:12 PM
1,1,1-Trichloroethane	ND	0.38	1.0	ug/L	1	5/23/2018 04:12 PM
1,1,2,2-Tetrachloroethane	ND	0.34	1.0	ug/L	1	5/23/2018 04:12 PM
1,1,2-Trichloroethane	ND	0.29	1.0	ug/L	1	5/23/2018 04:12 PM
1,1-Dichloroethane	ND	0.45	0.50	ug/L	1	5/23/2018 04:12 PM
1,1-Dichloroethene	ND	0.34	1.0	ug/L	1	5/23/2018 04:12 PM
1,1-Dichloropropene	ND	0.32	1.0	ug/L	1	5/23/2018 04:12 PM
1,2,3-Trichlorobenzene	ND	0.28	1.0	ug/L	1	5/23/2018 04:12 PM
1,2,3-Trichloropropane	ND	0.26	1.0	ug/L	1	5/23/2018 04:12 PM
1,2,4-Trichlorobenzene	ND	0.21	1.0	ug/L	1	5/23/2018 04:12 PM
1,2,4-Trimethylbenzene	ND	0.33	1.0	ug/L	1	5/23/2018 04:12 PM
1,2-Dibromo-3-chloropropane	ND	0.67	2.0	ug/L	1	5/23/2018 04:12 PM
1,2-Dibromoethane	ND	0.31	1.0	ug/L	1	5/23/2018 04:12 PM
1,2-Dichlorobenzene	ND	0.29	1.0	ug/L	1	5/23/2018 04:12 PM
1,2-Dichloroethane	ND	0.29	0.50	ug/L	1	5/23/2018 04:12 PM
1,2-Dichloropropane	ND	0.24	1.0	ug/L	1	5/23/2018 04:12 PM
1,3,5-Trimethylbenzene	ND	0.27	1.0	ug/L	1	5/23/2018 04:12 PM
1,3-Dichlorobenzene	ND	0.28	1.0	ug/L	1	5/23/2018 04:12 PM
1,3-Dichloropropane	ND	0.32	1.0	ug/L	1	5/23/2018 04:12 PM
1,4-Dichlorobenzene	ND	0.32	1.0	ug/L	1	5/23/2018 04:12 PM
2,2-Dichloropropane	ND	0.32	1.0	ug/L	1	5/23/2018 04:12 PM
2-Butanone	ND	4.9	10	ug/L	1	5/23/2018 04:12 PM
2-Chlorotoluene	ND	0.28	1.0	ug/L	1	5/23/2018 04:12 PM
4-Chlorotoluene	ND	0.30	1.0	ug/L	1	5/23/2018 04:12 PM
4-Isopropyltoluene	ND	0.33	1.0	ug/L	1	5/23/2018 04:12 PM
4-Methyl-2-pentanone	ND	3.2	10	ug/L	1	5/23/2018 04:12 PM
Acetone	ND	9.7	10	ug/L	1	5/23/2018 04:12 PM
Benzene	ND	0.34	1.0	ug/L	1	5/23/2018 04:12 PM
Bromobenzene	ND	0.25	1.0	ug/L	1	5/23/2018 04:12 PM
Bromochloromethane	ND	0.41	1.0	ug/L	1	5/23/2018 04:12 PM
Bromodichloromethane	ND	0.38	1.0	ug/L	1	5/23/2018 04:12 PM
Bromoform	ND	0.39	1.0	ug/L	1	5/23/2018 04:12 PM
Bromomethane	ND	0.79	1.0	ug/L	1	5/23/2018 04:12 PM
Carbon disulfide	ND	0.81	1.0	ug/L	1	5/23/2018 04:12 PM
Carbon tetrachloride	ND	0.40	0.50	ug/L	1	5/23/2018 04:12 PM
Chlorobenzene	ND	0.30	1.0	ug/L	1	5/23/2018 04:12 PM

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

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



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ANALYTICAL RESULTS

Print Date: 30-May-18

ASSET Laboratories

CLIENT: CH2MHill
Lab Order: N030447
Project: SFPP Norwalk
Lab ID: N030447-001

Client Sample ID: INF-05-22
Collection Date: 5/22/2018 2:05:00 PM
Matrix: WASTEWATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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VOLATILE ORGANIC COMPOUNDS BY GC/MS

EPA 8260B

RunID: MS8_180523A	QC Batch: R18VW023				PrepDate:	Analyst: QBM
Chloroethane	ND	0.97	1.0		ug/L	1 5/23/2018 04:12 PM
Chloroform	ND	0.27	1.0		ug/L	1 5/23/2018 04:12 PM
Chloromethane	ND	0.36	1.0		ug/L	1 5/23/2018 04:12 PM
cis-1,2-Dichloroethene	ND	0.32	1.0		ug/L	1 5/23/2018 04:12 PM
cis-1,3-Dichloropropene	ND	0.28	1.0		ug/L	1 5/23/2018 04:12 PM
Di-isopropyl ether	0.45	0.079	1.0	J	ug/L	1 5/23/2018 04:12 PM
Dibromochloromethane	ND	0.41	1.0		ug/L	1 5/23/2018 04:12 PM
Dibromomethane	ND	0.28	1.0		ug/L	1 5/23/2018 04:12 PM
Dichlorodifluoromethane	ND	0.29	1.0		ug/L	1 5/23/2018 04:12 PM
Ethyl tert-butyl ether	ND	0.30	1.0		ug/L	1 5/23/2018 04:12 PM
Ethylbenzene	ND	0.31	1.0		ug/L	1 5/23/2018 04:12 PM
Freon-113	ND	0.35	1.0		ug/L	1 5/23/2018 04:12 PM
Hexachlorobutadiene	ND	0.30	1.0		ug/L	1 5/23/2018 04:12 PM
Isopropylbenzene	ND	0.26	1.0		ug/L	1 5/23/2018 04:12 PM
m,p-Xylene	ND	0.23	1.0		ug/L	1 5/23/2018 04:12 PM
Methylene chloride	ND	1.9	2.0		ug/L	1 5/23/2018 04:12 PM
MTBE	0.94	0.34	1.0	J	ug/L	1 5/23/2018 04:12 PM
n-Butylbenzene	ND	0.34	1.0		ug/L	1 5/23/2018 04:12 PM
n-Propylbenzene	ND	0.32	1.0		ug/L	1 5/23/2018 04:12 PM
Naphthalene	ND	0.42	1.0		ug/L	1 5/23/2018 04:12 PM
o-Xylene	ND	0.31	1.0		ug/L	1 5/23/2018 04:12 PM
sec-Butylbenzene	ND	0.32	1.0		ug/L	1 5/23/2018 04:12 PM
Styrene	ND	0.21	1.0		ug/L	1 5/23/2018 04:12 PM
Tert-amyl methyl ether	ND	0.26	1.0		ug/L	1 5/23/2018 04:12 PM
Tert-Butanol	330	2.4	5.0		ug/L	1 5/23/2018 04:12 PM
tert-Butylbenzene	ND	0.28	1.0		ug/L	1 5/23/2018 04:12 PM
Tetrachloroethene	ND	0.30	1.0		ug/L	1 5/23/2018 04:12 PM
Toluene	ND	0.46	2.0		ug/L	1 5/23/2018 04:12 PM
trans-1,2-Dichloroethene	ND	0.40	1.0		ug/L	1 5/23/2018 04:12 PM
trans-1,3-Dichloropropene	ND	0.25	1.0		ug/L	1 5/23/2018 04:12 PM
Trichloroethene	ND	0.37	1.0		ug/L	1 5/23/2018 04:12 PM
Trichlorofluoromethane	ND	0.37	1.0		ug/L	1 5/23/2018 04:12 PM
Vinyl chloride	ND	0.29	0.50		ug/L	1 5/23/2018 04:12 PM
Xylenes, Total	ND	1.5	2.0		ug/L	1 5/23/2018 04:12 PM
Surr: 1,2-Dichloroethane-d4	112	0	72-119		%REC	1 5/23/2018 04:12 PM
Surr: 4-Bromofluorobenzene	97.6	0	76-119		%REC	1 5/23/2018 04:12 PM

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

Print Date: 30-May-18

CLIENT: CH2MHill	Client Sample ID: INF-05-22
Lab Order: N030447	Collection Date: 5/22/2018 2:05:00 PM
Project: SFPP Norwalk	Matrix: WASTEWATER
Lab ID: N030447-001	

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
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VOLATILE ORGANIC COMPOUNDS BY GC/MS

EPA 8260B

RunID: MS8_180523A	QC Batch: R18VW023	PrepDate:	Analyst: QBM
Surr: Dibromofluoromethane	110 0	85-115	%REC 1 5/23/2018 04:12 PM
Surr: Toluene-d8	105 0	81-120	%REC 1 5/23/2018 04:12 PM

TPH EXTRACTABLE BY GC/FID

EPA 3510C

EPA 8015B

RunID: NV00922-GC1_180523A	QC Batch: 68160	PrepDate: 5/23/2018	Analyst: JJS
TPH-Diesel (C13-C22)	120 16	26	ug/L 1 5/23/2018 04:32 PM
TPH-Oil (C23-C36)	180 14	26	ug/L 1 5/23/2018 04:32 PM
Surr: Octacosane	108 0	26-152	%REC 1 5/23/2018 04:32 PM
Surr: p-Terphenyl	105 0	57-132	%REC 1 5/23/2018 04:32 PM

GASOLINE RANGE ORGANICS BY GC/FID

EPA 8015B

RunID: NV00922-GC4_180523B	QC Batch: E18VW039	PrepDate:	Analyst: QBM
TPH-Gasoline (C4-C12)	45 16	50	J ug/L 1 5/24/2018 12:06 AM
Surr: Chlorobenzene - d5	91.0 0	74-138	%REC 1 5/24/2018 12:06 AM

TOTAL TPH

EPA 8015B

RunID: NV00922-GC1_180523A	QC Batch: R124189	PrepDate:	Analyst: JJS
Total TPH	340 16	50	ug/L 1 5/23/2018

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



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CLIENT: CH2MHill
Work Order: N030447
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_W_FP_SFPP

Sample ID: MB-68160	SampType: MBLK	TestCode: 8015_W_FP_	Units: ug/L	Prep Date: 5/23/2018	RunNo: 124189						
Client ID: PBW	Batch ID: 68160	TestNo: EPA 8015B EPA 3510C		Analysis Date: 5/23/2018	SeqNo: 3034068						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH-Diesel (C13-C22)	ND	25									
TPH-Oil (C23-C36)	ND	25									
Surr: Octacosane	85.363		80.00		107	26	152				
Surr: p-Terphenyl	83.472		80.00		104	57	132				

Qualifiers:

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



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ANALYTICAL SERVICES FOR CHEMICAL, ENVIRONMENTAL, AND FORENSIC

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"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
Work Order: N030447
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_W_SFPPTOT

Sample ID: MB-R124189	SampType: MBLK	TestCode: 8015_W_SFP	Units: ug/L	Prep Date:	RunNo: 124189						
Client ID: PBW	Batch ID: R124189	TestNo: EPA 8015B		Analysis Date: 5/23/2018	SeqNo: 3034741						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total TPH	24.000	50									J

Qualifiers:

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



ASSET LABORATORIES
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"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
Work Order: N030447
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015GAS_WSFP

Sample ID: E180523LCS2	SampType: LCS	TestCode: 8015GAS_WS Units: ug/L	Prep Date:	RunNo: 124204							
Client ID: LCSW	Batch ID: E18VW039	TestNo: EPA 8015B	Analysis Date: 5/23/2018	SeqNo: 3034339							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH-Gasoline (C4-C12)	889.000	50	1000	0	88.9	67	136				
Surr: Chlorobenzene - d5	47282.000		50000		94.6	74	138				

Sample ID: E180523MB2	SampType: MBLK	TestCode: 8015GAS_WS Units: ug/L	Prep Date:	RunNo: 124204							
Client ID: PBW	Batch ID: E18VW039	TestNo: EPA 8015B	Analysis Date: 5/23/2018	SeqNo: 3034340							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH-Gasoline (C4-C12)	24.000	50									J
Surr: Chlorobenzene - d5	47019.000		50000		94.0	74	138				

Sample ID: N030449-004AMS	SampType: MS	TestCode: 8015GAS_WS Units: ug/L	Prep Date:	RunNo: 124204							
Client ID: ZZZZZ	Batch ID: E18VW039	TestNo: EPA 8015B	Analysis Date: 5/23/2018	SeqNo: 3034347							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH-Gasoline (C4-C12)	922.000	50	1000	25.00	89.7	67	136				
Surr: Chlorobenzene - d5	52287.000		50000		105	74	138				

Sample ID: N030449-004AMSD	SampType: MSD	TestCode: 8015GAS_WS Units: ug/L	Prep Date:	RunNo: 124204							
Client ID: ZZZZZ	Batch ID: E18VW039	TestNo: EPA 8015B	Analysis Date: 5/23/2018	SeqNo: 3034348							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPH-Gasoline (C4-C12)	962.000	50	1000	25.00	93.7	67	136	922.0	4.25	30	
Surr: Chlorobenzene - d5	55201.000		50000		110	74	138		0	0	

Qualifiers:

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



ASSET LABORATORIES
ANALYTICAL SERVICES FOR THE ENERGY AND PETROLEUM INDUSTRIES

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"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
Work Order: N030447
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: R180523LCS	SampType: LCS	TestCode: 8260_WP_SF	Units: ug/L	Prep Date:	RunNo: 124202						
Client ID: LCSW	Batch ID: R18VW023	TestNo: EPA 8260B		Analysis Date: 5/23/2018	SeqNo: 3034103						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	22.050	1.0	20.00	0	110	81	129				
1,1,1-Trichloroethane	19.800	1.0	20.00	0	99.0	67	132				
1,1,2,2-Tetrachloroethane	21.400	1.0	20.00	0	107	63	128				
1,1,2-Trichloroethane	20.560	1.0	20.00	0	103	75	125				
1,1-Dichloroethane	19.350	0.50	20.00	0	96.8	69	133				
1,1-Dichloroethene	20.080	1.0	20.00	0	100	68	130				
1,1-Dichloropropene	19.540	1.0	20.00	0	97.7	73	132				
1,2,3-Trichlorobenzene	20.610	1.0	20.00	0	103	67	137				
1,2,3-Trichloropropane	20.830	1.0	20.00	0	104	73	124				
1,2,4-Trichlorobenzene	20.670	1.0	20.00	0	103	66	134				
1,2,4-Trimethylbenzene	20.130	1.0	20.00	0	101	74	132				
1,2-Dibromo-3-chloropropane	22.310	2.0	20.00	0	112	50	132				
1,2-Dibromoethane	20.330	1.0	20.00	0	102	80	121				
1,2-Dichlorobenzene	20.360	1.0	20.00	0	102	71	122				
1,2-Dichloroethane	20.160	0.50	20.00	0	101	69	132				
1,2-Dichloropropane	20.430	1.0	20.00	0	102	75	125				
1,3,5-Trimethylbenzene	19.930	1.0	20.00	0	99.7	74	131				
1,3-Dichlorobenzene	20.320	1.0	20.00	0	102	75	124				
1,3-Dichloropropane	20.560	1.0	20.00	0	103	73	126				
1,4-Dichlorobenzene	20.280	1.0	20.00	0	101	74	123				
2,2-Dichloropropane	21.550	1.0	20.00	0	108	69	137				
2-Butanone	188.590	10	200.0	0	94.3	49	136				
2-Chlorotoluene	20.150	1.0	20.00	0	101	73	126				
4-Chlorotoluene	20.230	1.0	20.00	0	101	74	128				
4-Isopropyltoluene	20.070	1.0	20.00	0	100	73	130				
4-Methyl-2-pentanone	207.100	10	200.0	0	104	58	134				
Acetone	206.030	10	200.0	0	103	40	135				
Benzene	19.760	1.0	20.00	0	98.8	81	122				
Bromobenzene	20.090	1.0	20.00	0	100	76	124				
Bromochloromethane	19.920	1.0	20.00	0	99.6	65	129				

Qualifiers:

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



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"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
Work Order: N030447
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: R180523LCS	SampType: LCS	TestCode: 8260_WP_SF	Units: ug/L	Prep Date:	RunNo: 124202						
Client ID: LCSW	Batch ID: R18VW023	TestNo: EPA 8260B		Analysis Date: 5/23/2018	SeqNo: 3034103						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bromodichloromethane	21.570	1.0	20.00	0	108	76	121				
Bromoform	23.410	1.0	20.00	0	117	69	128				
Bromomethane	21.080	1.0	20.00	0	105	53	141				
Carbon disulfide	21.490	1.0	20.00	0	107	75	125				
Carbon tetrachloride	21.460	0.50	20.00	0	107	66	138				
Chlorobenzene	20.210	1.0	20.00	0	101	81	122				
Chloroethane	22.130	1.0	20.00	0	111	58	133				
Chloroform	18.270	1.0	20.00	0	91.4	69	128				
Chloromethane	19.040	1.0	20.00	0	95.2	56	131				
cis-1,2-Dichloroethene	19.100	1.0	20.00	0	95.5	72	126				
cis-1,3-Dichloropropene	22.060	1.0	20.00	0	110	69	131				
Di-isopropyl ether	17.210	1.0	20.00	0	86.1	70	130				
Dibromochloromethane	22.700	1.0	20.00	0	114	66	133				
Dibromomethane	20.240	1.0	20.00	0	101	76	125				
Dichlorodifluoromethane	19.890	1.0	20.00	0	99.4	53	153				
Ethyl tert-butyl ether	18.820	1.0	20.00	0	94.1	70	130				
Ethylbenzene	19.420	1.0	20.00	0	97.1	73	127				
Freon-113	20.890	1.0	20.00	0	104	75	125				
Hexachlorobutadiene	19.650	1.0	20.00	0	98.2	67	131				
Isopropylbenzene	19.760	1.0	20.00	0	98.8	75	127				
m,p-Xylene	39.540	1.0	40.00	0	98.8	76	128				
Methylene chloride	20.340	2.0	20.00	0	102	63	137				
MTBE	20.860	1.0	20.00	0	104	65	123				
n-Butylbenzene	20.510	1.0	20.00	0	103	69	137				
n-Propylbenzene	20.150	1.0	20.00	0	101	72	129				
Naphthalene	19.900	1.0	20.00	0	99.5	54	138				
o-Xylene	19.530	1.0	20.00	0	97.6	80	121				
sec-Butylbenzene	20.170	1.0	20.00	0	101	72	127				
Styrene	20.270	1.0	20.00	0	101	65	134				
Tert-amyl methyl ether	19.520	1.0	20.00	0	97.6	70	130				

Qualifiers:

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



ASSET LABORATORIES
ANALYTICAL SERVICES FOR THE ENVIRONMENT, ENERGY & CHEMICALS

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"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
Work Order: N030447
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: R180523LCS		SampType: LCS		TestCode: 8260_WP_SF Units: ug/L		Prep Date:		RunNo: 124202			
Client ID: LCSW		Batch ID: R18VW023		TestNo: EPA 8260B		Analysis Date: 5/23/2018		SeqNo: 3034103			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Tert-Butanol	98.660	5.0	100.0	0	98.7	70	130				
tert-Butylbenzene	19.650	1.0	20.00	0	98.2	70	129				
Tetrachloroethene	19.720	1.0	20.00	0	98.6	66	128				
Toluene	19.570	2.0	20.00	0	97.9	77	122				
trans-1,2-Dichloroethene	20.290	1.0	20.00	0	101	63	137				
trans-1,3-Dichloropropene	24.640	1.0	20.00	0	123	59	135				
Trichloroethene	19.420	1.0	20.00	0	97.1	70	127				
Trichlorofluoromethane	20.850	1.0	20.00	0	104	57	129				
Vinyl chloride	20.100	0.50	20.00	0	101	50	134				
Xylenes, Total	59.070	2.0	60.00	0	98.4	75	125				
Surr: 1,2-Dichloroethane-d4	25.720		25.00		103	72	119				
Surr: 4-Bromofluorobenzene	25.770		25.00		103	76	119				
Surr: Dibromofluoromethane	25.770		25.00		103	85	115				
Surr: Toluene-d8	26.400		25.00		106	81	120				

Sample ID: N030449-005AMS		SampType: MS		TestCode: 8260_WP_SF Units: ug/L		Prep Date:		RunNo: 124202			
Client ID: ZZZZZ		Batch ID: R18VW023		TestNo: EPA 8260B		Analysis Date: 5/23/2018		SeqNo: 3034104			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	23.080	1.0	20.00	0	115	81	129				
1,1,1-Trichloroethane	21.120	1.0	20.00	0	106	67	132				
1,1,2,2-Tetrachloroethane	21.080	1.0	20.00	0	105	63	128				
1,1,2-Trichloroethane	19.710	1.0	20.00	0	98.6	75	125				
1,1-Dichloroethane	19.350	0.50	20.00	0	96.8	69	133				
1,1-Dichloroethene	21.250	1.0	20.00	0	106	68	130				
1,1-Dichloropropene	21.630	1.0	20.00	0	108	73	132				
1,2,3-Trichlorobenzene	20.520	1.0	20.00	0	103	67	137				
1,2,3-Trichloropropane	20.370	1.0	20.00	0	102	73	124				
1,2,4-Trichlorobenzene	20.660	1.0	20.00	0	103	66	134				
1,2,4-Trimethylbenzene	21.120	1.0	20.00	0	106	74	132				

Qualifiers:

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



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ANALYTICAL SERVICES FOR THE ENVIRONMENT, ENERGY & CHEMICALS

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"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
Work Order: N030447
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: N030449-005AMS	SampType: MS	TestCode: 8260_WP_SF	Units: ug/L	Prep Date:	RunNo: 124202						
Client ID: ZZZZZZ	Batch ID: R18VW023	TestNo: EPA 8260B		Analysis Date: 5/23/2018	SeqNo: 3034104						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2-Dibromo-3-chloropropane	21.540	2.0	20.00	0	108	50	132				
1,2-Dibromoethane	19.970	1.0	20.00	0	99.8	80	121				
1,2-Dichlorobenzene	20.400	1.0	20.00	0	102	71	122				
1,2-Dichloroethane	19.790	0.50	20.00	0	99.0	69	132				
1,2-Dichloropropane	20.140	1.0	20.00	0	101	75	125				
1,3,5-Trimethylbenzene	21.740	1.0	20.00	0	109	74	131				
1,3-Dichlorobenzene	21.100	1.0	20.00	0	106	75	124				
1,3-Dichloropropane	20.420	1.0	20.00	0	102	73	126				
1,4-Dichlorobenzene	20.810	1.0	20.00	0	104	74	123				
2,2-Dichloropropane	23.200	1.0	20.00	0	116	69	137				
2-Butanone	164.210	10	200.0	0	82.1	49	136				
2-Chlorotoluene	21.360	1.0	20.00	0	107	73	126				
4-Chlorotoluene	21.270	1.0	20.00	0	106	74	128				
4-Isopropyltoluene	22.130	1.0	20.00	0	111	73	130				
4-Methyl-2-pentanone	193.450	10	200.0	0	96.7	58	134				
Acetone	173.420	10	200.0	0	86.7	40	135				
Benzene	20.540	1.0	20.00	0	103	81	122				
Bromobenzene	20.620	1.0	20.00	0	103	76	124				
Bromochloromethane	18.540	1.0	20.00	0	92.7	65	129				
Bromodichloromethane	21.340	1.0	20.00	0	107	76	121				
Bromoform	23.020	1.0	20.00	0	115	69	128				
Bromomethane	20.570	1.0	20.00	0	103	53	141				
Carbon disulfide	22.560	1.0	20.00	0	113	75	125				
Carbon tetrachloride	23.580	0.50	20.00	0	118	66	138				
Chlorobenzene	21.210	1.0	20.00	0	106	81	122				
Chloroethane	22.710	1.0	20.00	0	114	58	133				
Chloroform	17.830	1.0	20.00	0	89.2	69	128				
Chloromethane	18.670	1.0	20.00	0	93.4	56	131				
cis-1,2-Dichloroethene	18.470	1.0	20.00	0	92.4	72	126				
cis-1,3-Dichloropropene	21.570	1.0	20.00	0	108	69	131				

Qualifiers:

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



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"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
Work Order: N030447
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: N030449-005AMS	SampType: MS	TestCode: 8260_WP_SF	Units: ug/L	Prep Date:	RunNo: 124202						
Client ID: ZZZZZ	Batch ID: R18VW023	TestNo: EPA 8260B		Analysis Date: 5/23/2018	SeqNo: 3034104						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Di-isopropyl ether	16.560	1.0	20.00	0	82.8	70	130				
Dibromochloromethane	22.520	1.0	20.00	0	113	66	133				
Dibromomethane	20.120	1.0	20.00	0	101	76	125				
Dichlorodifluoromethane	20.840	1.0	20.00	0	104	53	153				
Ethyl tert-butyl ether	17.880	1.0	20.00	0	89.4	70	130				
Ethylbenzene	21.450	1.0	20.00	0	107	73	127				
Freon-113	22.940	1.0	20.00	0	115	75	125				
Hexachlorobutadiene	20.740	1.0	20.00	0	104	67	131				
Isopropylbenzene	21.830	1.0	20.00	0	109	75	127				
m,p-Xylene	43.050	1.0	40.00	0	108	76	128				
Methylene chloride	20.040	2.0	20.00	0	100	63	137				
MTBE	19.170	1.0	20.00	0	95.9	65	123				
n-Butylbenzene	22.700	1.0	20.00	0	114	69	137				
n-Propylbenzene	22.400	1.0	20.00	0	112	72	129				
Naphthalene	19.270	1.0	20.00	0	96.4	54	138				
o-Xylene	20.830	1.0	20.00	0	104	80	121				
sec-Butylbenzene	22.490	1.0	20.00	0	112	72	127				
Styrene	20.250	1.0	20.00	0	101	65	134				
Tert-amyl methyl ether	19.010	1.0	20.00	0	95.1	70	130				
Tert-Butanol	74.790	5.0	100.0	0	74.8	70	130				
tert-Butylbenzene	21.850	1.0	20.00	0	109	70	129				
Tetrachloroethene	22.320	1.0	20.00	0	112	66	128				
Toluene	20.600	2.0	20.00	0	103	77	122				
trans-1,2-Dichloroethene	21.010	1.0	20.00	0	105	63	137				
trans-1,3-Dichloropropene	23.910	1.0	20.00	0	120	59	135				
Trichloroethene	20.960	1.0	20.00	0	105	70	127				
Trichlorofluoromethane	22.250	1.0	20.00	0	111	57	129				
Vinyl chloride	21.020	0.50	20.00	0	105	50	134				
Xylenes, Total	63.880	2.0	60.00	0	106	75	125				
Surr: 1,2-Dichloroethane-d4	24.520		25.00		98.1	72	119				

Qualifiers:

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



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"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
Work Order: N030447
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: N030449-005AMS	SampType: MS	TestCode: 8260_WP_SF	Units: ug/L	Prep Date:	RunNo: 124202						
Client ID: ZZZZZ	Batch ID: R18VW023	TestNo: EPA 8260B	Analysis Date: 5/23/2018	SeqNo: 3034104							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	26.570		25.00		106	76	119				
Surr: Dibromofluoromethane	24.540		25.00		98.2	85	115				
Surr: Toluene-d8	26.340		25.00		105	81	120				

Sample ID: N030449-005AMSD	SampType: MSD	TestCode: 8260_WP_SF	Units: ug/L	Prep Date:	RunNo: 124202						
Client ID: ZZZZZ	Batch ID: R18VW023	TestNo: EPA 8260B	Analysis Date: 5/23/2018	SeqNo: 3034105							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	22.590	1.0	20.00	0	113	81	129	23.08	2.15	20	
1,1,1-Trichloroethane	20.050	1.0	20.00	0	100	67	132	21.12	5.20	20	
1,1,2,2-Tetrachloroethane	20.790	1.0	20.00	0	104	63	128	21.08	1.39	20	
1,1,2-Trichloroethane	19.850	1.0	20.00	0	99.2	75	125	19.71	0.708	20	
1,1-Dichloroethane	18.690	0.50	20.00	0	93.5	69	133	19.35	3.47	20	
1,1-Dichloroethene	20.110	1.0	20.00	0	101	68	130	21.25	5.51	20	
1,1-Dichloropropene	20.230	1.0	20.00	0	101	73	132	21.63	6.69	20	
1,2,3-Trichlorobenzene	20.210	1.0	20.00	0	101	67	137	20.52	1.52	20	
1,2,3-Trichloropropane	20.200	1.0	20.00	0	101	73	124	20.37	0.838	20	
1,2,4-Trichlorobenzene	20.490	1.0	20.00	0	102	66	134	20.66	0.826	20	
1,2,4-Trimethylbenzene	19.600	1.0	20.00	0	98.0	74	132	21.12	7.47	20	
1,2-Dibromo-3-chloropropane	21.050	2.0	20.00	0	105	50	132	21.54	2.30	20	
1,2-Dibromoethane	19.840	1.0	20.00	0	99.2	80	121	19.97	0.653	20	
1,2-Dichlorobenzene	20.100	1.0	20.00	0	101	71	122	20.40	1.48	20	
1,2-Dichloroethane	19.590	0.50	20.00	0	98.0	69	132	19.79	1.02	20	
1,2-Dichloropropane	20.070	1.0	20.00	0	100	75	125	20.14	0.348	20	
1,3,5-Trimethylbenzene	20.420	1.0	20.00	0	102	74	131	21.74	6.26	20	
1,3-Dichlorobenzene	20.410	1.0	20.00	0	102	75	124	21.10	3.32	20	
1,3-Dichloropropane	20.380	1.0	20.00	0	102	73	126	20.42	0.196	20	
1,4-Dichlorobenzene	20.440	1.0	20.00	0	102	74	123	20.81	1.79	20	
2,2-Dichloropropane	21.930	1.0	20.00	0	110	69	137	23.20	5.63	20	
2-Butanone	166.880	10	200.0	0	83.4	49	136	164.2	1.61	20	

Qualifiers:

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



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"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
Work Order: N030447
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: N030449-005AMSD		SampType: MSD		TestCode: 8260_WP_SF		Units: ug/L		Prep Date:		RunNo: 124202	
Client ID: ZZZZZ		Batch ID: R18VW023		TestNo: EPA 8260B		Analysis Date: 5/23/2018		SeqNo: 3034105			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2-Chlorotoluene	20.670	1.0	20.00	0	103	73	126	21.36	3.28	20	
4-Chlorotoluene	20.620	1.0	20.00	0	103	74	128	21.27	3.10	20	
4-Isopropyltoluene	20.770	1.0	20.00	0	104	73	130	22.13	6.34	20	
4-Methyl-2-pentanone	195.910	10	200.0	0	98.0	58	134	193.4	1.26	20	
Acetone	172.940	10	200.0	0	86.5	40	135	173.4	0.277	20	
Benzene	20.160	1.0	20.00	0	101	81	122	20.54	1.87	20	
Bromobenzene	20.070	1.0	20.00	0	100	76	124	20.62	2.70	20	
Bromochloromethane	18.490	1.0	20.00	0	92.5	65	129	18.54	0.270	20	
Bromodichloromethane	21.040	1.0	20.00	0	105	76	121	21.34	1.42	20	
Bromoform	23.240	1.0	20.00	0	116	69	128	23.02	0.951	20	
Bromomethane	19.800	1.0	20.00	0	99.0	53	141	20.57	3.81	20	
Carbon disulfide	21.450	1.0	20.00	0	107	75	125	22.56	5.04	20	
Carbon tetrachloride	22.590	0.50	20.00	0	113	66	138	23.58	4.29	20	
Chlorobenzene	20.530	1.0	20.00	0	103	81	122	21.21	3.26	20	
Chloroethane	21.770	1.0	20.00	0	109	58	133	22.71	4.23	20	
Chloroform	17.380	1.0	20.00	0	86.9	69	128	17.83	2.56	20	
Chloromethane	18.090	1.0	20.00	0	90.4	56	131	18.67	3.16	20	
cis-1,2-Dichloroethene	18.360	1.0	20.00	0	91.8	72	126	18.47	0.597	20	
cis-1,3-Dichloropropene	21.800	1.0	20.00	0	109	69	131	21.57	1.06	20	
Di-isopropyl ether	16.600	1.0	20.00	0	83.0	70	130	16.56	0.241	20	
Dibromochloromethane	22.480	1.0	20.00	0	112	66	133	22.52	0.178	20	
Dibromomethane	19.740	1.0	20.00	0	98.7	76	125	20.12	1.91	20	
Dichlorodifluoromethane	19.400	1.0	20.00	0	97.0	53	153	20.84	7.16	20	
Ethyl tert-butyl ether	17.770	1.0	20.00	0	88.8	70	130	17.88	0.617	20	
Ethylbenzene	20.460	1.0	20.00	0	102	73	127	21.45	4.72	20	
Freon-113	21.470	1.0	20.00	0	107	75	125	22.94	6.62	20	
Hexachlorobutadiene	20.000	1.0	20.00	0	100	67	131	20.74	3.63	20	
Isopropylbenzene	20.810	1.0	20.00	0	104	75	127	21.83	4.78	20	
m,p-Xylene	41.020	1.0	40.00	0	103	76	128	43.05	4.83	20	
Methylene chloride	20.250	2.0	20.00	0	101	63	137	20.04	1.04	20	

Qualifiers:

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



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"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
Work Order: N030447
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: N030449-005AMSD		SampType: MSD		TestCode: 8260_WP_SF		Units: ug/L		Prep Date:		RunNo: 124202	
Client ID: ZZZZZZ		Batch ID: R18VW023		TestNo: EPA 8260B		Analysis Date: 5/23/2018		SeqNo: 3034105			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
MTBE	19.320	1.0	20.00	0	96.6	65	123	19.17	0.779	20	
n-Butylbenzene	21.390	1.0	20.00	0	107	69	137	22.70	5.94	20	
n-Propylbenzene	21.030	1.0	20.00	0	105	72	129	22.40	6.31	20	
Naphthalene	19.340	1.0	20.00	0	96.7	54	138	19.27	0.363	20	
o-Xylene	20.110	1.0	20.00	0	101	80	121	20.83	3.52	20	
sec-Butylbenzene	21.010	1.0	20.00	0	105	72	127	22.49	6.80	20	
Styrene	18.140	1.0	20.00	0	90.7	65	134	20.25	11.0	20	
Tert-amyl methyl ether	18.870	1.0	20.00	0	94.4	70	130	19.01	0.739	20	
Tert-Butanol	90.370	5.0	100.0	0	90.4	70	130	74.79	18.9	20	
tert-Butylbenzene	20.610	1.0	20.00	0	103	70	129	21.85	5.84	20	
Tetrachloroethene	21.050	1.0	20.00	0	105	66	128	22.32	5.86	20	
Toluene	19.910	2.0	20.00	0	99.6	77	122	20.60	3.41	20	
trans-1,2-Dichloroethene	20.340	1.0	20.00	0	102	63	137	21.01	3.24	20	
trans-1,3-Dichloropropene	24.000	1.0	20.00	0	120	59	135	23.91	0.376	20	
Trichloroethene	20.120	1.0	20.00	0	101	70	127	20.96	4.09	20	
Trichlorofluoromethane	20.900	1.0	20.00	0	104	57	129	22.25	6.26	20	
Vinyl chloride	19.950	0.50	20.00	0	99.8	50	134	21.02	5.22	20	
Xylenes, Total	61.130	2.0	60.00	0	102	75	125	63.88	4.40	20	
Surr: 1,2-Dichloroethane-d4	23.920		25.00		95.7	72	119		0		
Surr: 4-Bromofluorobenzene	25.570		25.00		102	76	119		0		
Surr: Dibromofluoromethane	24.080		25.00		96.3	85	115		0		
Surr: Toluene-d8	25.460		25.00		102	81	120		0		

Sample ID: R180523MB3		SampType: MBLK		TestCode: 8260_WP_SF		Units: ug/L		Prep Date:		RunNo: 124202	
Client ID: PBW		Batch ID: R18VW023		TestNo: EPA 8260B		Analysis Date: 5/23/2018		SeqNo: 3034108			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1.0									
1,1,1-Trichloroethane	ND	1.0									
1,1,2,2-Tetrachloroethane	ND	1.0									

Qualifiers:

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



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"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
Work Order: N030447
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: R180523MB3	SampType: MBLK	TestCode: 8260_WP_SF Units: ug/L	Prep Date:	RunNo: 124202							
Client ID: PBW	Batch ID: R18VW023	TestNo: EPA 8260B	Analysis Date: 5/23/2018	SeqNo: 3034108							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,2-Trichloroethane	ND	1.0									
1,1-Dichloroethane	ND	0.50									
1,1-Dichloroethene	ND	1.0									
1,1-Dichloropropene	ND	1.0									
1,2,3-Trichlorobenzene	ND	1.0									
1,2,3-Trichloropropane	ND	1.0									
1,2,4-Trichlorobenzene	ND	1.0									
1,2,4-Trimethylbenzene	ND	1.0									
1,2-Dibromo-3-chloropropane	ND	2.0									
1,2-Dibromoethane	ND	1.0									
1,2-Dichlorobenzene	ND	1.0									
1,2-Dichloroethane	ND	0.50									
1,2-Dichloropropane	ND	1.0									
1,3,5-Trimethylbenzene	ND	1.0									
1,3-Dichlorobenzene	ND	1.0									
1,3-Dichloropropane	ND	1.0									
1,4-Dichlorobenzene	ND	1.0									
2,2-Dichloropropane	ND	1.0									
2-Butanone	ND	10									
2-Chlorotoluene	ND	1.0									
4-Chlorotoluene	ND	1.0									
4-Isopropyltoluene	ND	1.0									
4-Methyl-2-pentanone	ND	10									
Acetone	ND	10									
Benzene	ND	1.0									
Bromobenzene	ND	1.0									
Bromochloromethane	ND	1.0									
Bromodichloromethane	ND	1.0									
Bromoform	ND	1.0									
Bromomethane	ND	1.0									

Qualifiers:

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



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CLIENT: CH2MHill
Work Order: N030447
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: R180523MB3	SampType: MBLK	TestCode: 8260_WP_SF Units: ug/L	Prep Date:	RunNo: 124202							
Client ID: PBW	Batch ID: R18VW023	TestNo: EPA 8260B	Analysis Date: 5/23/2018	SeqNo: 3034108							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Carbon disulfide	ND	1.0									
Carbon tetrachloride	ND	0.50									
Chlorobenzene	ND	1.0									
Chloroethane	ND	1.0									
Chloroform	ND	1.0									
Chloromethane	ND	1.0									
cis-1,2-Dichloroethene	ND	1.0									
cis-1,3-Dichloropropene	ND	1.0									
Di-isopropyl ether	ND	1.0									
Dibromochloromethane	ND	1.0									
Dibromomethane	ND	1.0									
Dichlorodifluoromethane	ND	1.0									
Ethyl tert-butyl ether	ND	1.0									
Ethylbenzene	ND	1.0									
Freon-113	ND	1.0									
Hexachlorobutadiene	ND	1.0									
Isopropylbenzene	ND	1.0									
m,p-Xylene	ND	1.0									
Methylene chloride	ND	2.0									
MTBE	ND	1.0									
n-Butylbenzene	ND	1.0									
n-Propylbenzene	ND	1.0									
Naphthalene	ND	1.0									
o-Xylene	ND	1.0									
sec-Butylbenzene	ND	1.0									
Styrene	ND	1.0									
Tert-amyl methyl ether	ND	1.0									
Tert-Butanol	ND	5.0									
tert-Butylbenzene	ND	1.0									
Tetrachloroethene	ND	1.0									

Qualifiers:

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



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"Serving Clients with Passion and Professionalism"

CLIENT: CH2MHill
Work Order: N030447
Project: SFPP Norwalk

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_WP_SFPP

Sample ID: R180523MB3	SampType: MBLK	TestCode: 8260_WP_SF	Units: ug/L	Prep Date:	RunNo: 124202						
Client ID: PBW	Batch ID: R18VW023	TestNo: EPA 8260B		Analysis Date: 5/23/2018	SeqNo: 3034108						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toluene	ND	2.0									
trans-1,2-Dichloroethene	ND	1.0									
trans-1,3-Dichloropropene	ND	1.0									
Trichloroethene	ND	1.0									
Trichlorofluoromethane	ND	1.0									
Vinyl chloride	ND	0.50									
Xylenes, Total	ND	2.0									
Surr: 1,2-Dichloroethane-d4	27.760		25.00		111	72	119				
Surr: 4-Bromofluorobenzene	25.200		25.00		101	76	119				
Surr: Dibromofluoromethane	27.240		25.00		109	85	115				
Surr: Toluene-d8	27.240		25.00		109	81	120				

Qualifiers:

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



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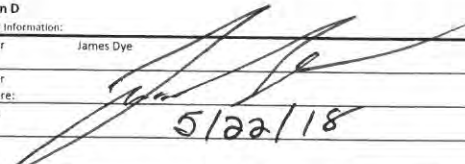
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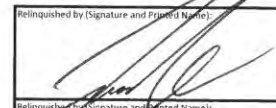
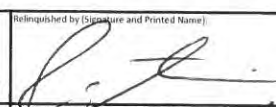




Asset Laboratories
 3151 W. Post Road
 Las Vegas, NV 89118
 Tel: 702-307-2659 Fax: 702-307-2691
 Marlon Cartin (marlon@assetlaboratories.com)

CHAIN OF CUSTODY RECORD

DATE: 5/22/18
 PAGE: () of ()

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:		Section D Sampler Information:	
Company: Kinder Morgan Energy Partners Attention: Steve Defibaugh	Report To: Eric Davis	Attention: Steve Defibaugh - Ref. AFE# 81195	Sampler Name: James Dye	Address: 1100 Town & Country Road Orange, CA 92868	Copy To: Steve Defibaugh	Company Name: Kinder Morgan Energy Partners	Name: 
Email To: steve_defibaugh@kindermorgan.com eric_davis@ch2m.com	Purchase Order No.:	Address: 1100 Town & Country Road Orange, CA 92868	Signature:	Phone: 714-560-4802 Fax: 714-560-4801	Project Name: SFPP Norwalk	ATL Project Manager: Marlon Cartin	Date: 5/22/18

ITEM #	SAMPLE ID	LOCATION/ DESCRIPTION	MATRIX	SAMPLE TYPE (G=GRAB C=COMP)	SAMPLING		TOTAL # OF CONTAINERS	Analysis Test	CONTAINER TYPE			Full VOCs + Organometals List (8260B)	TPH-gas (8015B)	TPH-l, TPH-oil, Total TPH (8015B)	Comments
					DATE	TIME			V	V	A				
1	INF-02-22	INFLUENT	WW	G	5/22/18	1405	8	X	X	X					N030447-01
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															

Relinquished by (Signature and Printed Name):  Date / Time: 5/22/18 1500	Relinquished by (Signature and Printed Name):  Date / Time: 5/22/18 5:30	Turn Around Time (TAT): <input type="checkbox"/> A = Same Day <input type="checkbox"/> B = 24 Hours <input type="checkbox"/> C = 48 Hours <input type="checkbox"/> D = 72 Hours <input checked="" type="checkbox"/> E = 5 Workdays <input type="checkbox"/> E = 10 Workdays TAT Starts at 8 AM the following day if samples received after 3:00 PM.	Special Instruction:
Relinquished by (Signature and Printed Name):  Date / Time: 5/22/18 6:00	Relinquished by (Signature and Printed Name):  Date / Time: 5/22/18 @ 2:00		
Relinquished by (Signature and Printed Name):  Date / Time: 5/22/18 @ 2:30	Relinquished by (Signature and Printed Name):  Date / Time: 5/22/18 @ 2:30		

4.8°C ICE 1RA#2

Matrix:			Preservatives:			Container Type:			
W = Water	WW = Wastewater		H = HCl	N = HNO3	S = H2SO4	T = Tube	V = VOA	P = Pint	A = Amber
O = Oil	P = Product	S = Soil	Z = Zn(AC)2	O = NaOH	T = Na2S2O3	J = Jar	B = Tedlar	G = Glass	
Others/Specify:			Others/Specify:			M = Metal	P = Plastic	C = Can	

ASSET Laboratories

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

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

Cooler Received/Opened On: 5/22/2018 Workorder: N030447
 Rep sample Temp (Deg C): 4.8 IR Gun ID: 2
 Temp Blank: Yes No
 Carrier name: ASSET
 Last 4 digits of Tracking No.: NA Packing Material Used: Bubble Wrap
 Cooling process: Ice Ice Pack Dry Ice Other None

Sample Receipt Checklist

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

Comments:

For:

Checklist Completed By: MBC  5/23/2018

Reviewed By:  05/23/2018

ASSET Laboratories

WORK ORDER Summary

23-May-18

WorkOrder: N030447

Client ID: CH2HI03

Project: SFPP Norwalk

QC Level: RTNE

Date Received: 5/22/2018

Comments:

Sample ID	Client Sample ID	Date Collected	Date Due	Matrix	Test No	Test Name	Hld	MS	Sub	Storage
N030447-001A	INF-05-22	5/22/2018 2:05:00 PM	5/30/2018	Wastewater	EPA 8015B	GASOLINE RANGE ORGANICS BY GC/FID	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	VW
			5/30/2018		EPA 8260B	VOLATILE ORGANIC COMPOUNDS BY GC/MS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	VW
N030447-001B			5/30/2018		EPA 3510C	SEPARATORY FUNNEL EXTRACTION: EXTRACTABLE FUELS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Consumed
			5/30/2018		EPA 8015B	TPH EXTRACTABLE BY GC/FID	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Consumed
			5/30/2018		EPA 8015B	Total TPH	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Consumed
N030447-002A	FOLDER	5/30/2018	5/30/2018		Folder	Folder	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LAB
			5/30/2018		Folder	Folder	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LAB



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

April 23, 2018

Vladimir Carino
CH2M Hill, Inc.
P.O. Box 241329
Denver, CO 80224

**Re : KMEP Norwalk Biosparge Startup / 693142
MB187319 / 8C30001**

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received on 03/29/18 16:00 and analyzed in accordance with the attached chain-of-custody.

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

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

Sincerely,

A handwritten signature in black ink, appearing to read 'Allen A.' with a stylized flourish at the end.

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
<u>Fixed Gases - Field</u>					
SVM-1-5	8C30001-01	Vapor	3	03/29/18 07:40	03/29/18 16:00
SVM-1-15	8C30001-02	Vapor	3	03/29/18 07:45	03/29/18 16:00
SVM-15-7	8C30001-03	Vapor	3	03/29/18 09:00	03/29/18 16:00
SVM-15-15	8C30001-04	Vapor	3	03/29/18 09:02	03/29/18 16:00
SVM-15-22	8C30001-05	Vapor	3	03/29/18 09:04	03/29/18 16:00
SVM-6-7	8C30001-06	Vapor	3	03/29/18 09:32	03/29/18 16:00
SVM-6-15	8C30001-07	Vapor	3	03/29/18 09:34	03/29/18 16:00
SVM-7-6	8C30001-08	Vapor	3	03/29/18 10:52	03/29/18 16:00
SVM-7-13	8C30001-09	Vapor	3	03/29/18 10:54	03/29/18 16:00
SVM-7-13 DUP	8C30001-10	Vapor	3	03/29/18 10:54	03/29/18 16:00
SVM-10-15	8C30001-11	Vapor	3	03/29/18 11:30	03/29/18 16:00
SVM-3-5	8C30001-12	Vapor	3	03/29/18 12:02	03/29/18 16:00
SVM-3-15	8C30001-13	Vapor	3	03/29/18 12:05	03/29/18 16:00
SVM-2-5	8C30001-14	Vapor	3	03/29/18 12:40	03/29/18 16:00
SVM-5-5	8C30001-15	Vapor	3	03/29/18 13:20	03/29/18 16:00
SVM-5-15	8C30001-16	Vapor	3	03/29/18 13:23	03/29/18 16:00
SVM-8-5	8C30001-17	Vapor	3	03/29/18 13:50	03/29/18 16:00
SVM-8-15	8C30001-18	Vapor	3	03/29/18 13:53	03/29/18 16:00
SVM-16-7	8C30001-19	Vapor	3	03/29/18 14:33	03/29/18 16:00

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-16-16	8C30001-20	Vapor	3	03/29/18 14:35	03/29/18 16:00
SVM-16-22	8C30001-21	Vapor	3	03/29/18 14:38	03/29/18 16:00
SVM-16-22 DUP	8C30001-22	Vapor	3	03/29/18 14:38	03/29/18 16:00

TO-15 (Mid Level)

SVM-1-5	8C30001-01	Vapor	3	03/29/18 07:40	03/29/18 16:00
SVM-1-15	8C30001-02	Vapor	3	03/29/18 07:45	03/29/18 16:00
SVM-15-7	8C30001-03	Vapor	3	03/29/18 09:00	03/29/18 16:00
SVM-15-15	8C30001-04	Vapor	3	03/29/18 09:02	03/29/18 16:00
SVM-15-22	8C30001-05	Vapor	3	03/29/18 09:04	03/29/18 16:00
SVM-6-7	8C30001-06	Vapor	3	03/29/18 09:32	03/29/18 16:00
SVM-6-15	8C30001-07	Vapor	3	03/29/18 09:34	03/29/18 16:00
SVM-7-6	8C30001-08	Vapor	3	03/29/18 10:52	03/29/18 16:00
SVM-7-13	8C30001-09	Vapor	3	03/29/18 10:54	03/29/18 16:00
SVM-7-13 DUP	8C30001-10	Vapor	3	03/29/18 10:54	03/29/18 16:00
SVM-10-15	8C30001-11	Vapor	3	03/29/18 11:30	03/29/18 16:00
SVM-3-5	8C30001-12	Vapor	3	03/29/18 12:02	03/29/18 16:00
SVM-3-15	8C30001-13	Vapor	3	03/29/18 12:05	03/29/18 16:00
SVM-2-5	8C30001-14	Vapor	3	03/29/18 12:40	03/29/18 16:00
SVM-5-5	8C30001-15	Vapor	3	03/29/18 13:20	03/29/18 16:00
SVM-5-15	8C30001-16	Vapor	3	03/29/18 13:23	03/29/18 16:00

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-8-5	8C30001-17	Vapor	3	03/29/18 13:50	03/29/18 16:00
SVM-8-15	8C30001-18	Vapor	3	03/29/18 13:53	03/29/18 16:00
SVM-16-7	8C30001-19	Vapor	3	03/29/18 14:33	03/29/18 16:00
SVM-16-16	8C30001-20	Vapor	3	03/29/18 14:35	03/29/18 16:00
SVM-16-22	8C30001-21	Vapor	3	03/29/18 14:38	03/29/18 16:00
SVM-16-22 DUP	8C30001-22	Vapor	3	03/29/18 14:38	03/29/18 16:00
Ambient Air	8C30001-23	Vapor	3	03/29/18 14:38	03/29/18 16:00

TO-3

SVM-1-5	8C30001-01	Vapor	3	03/29/18 07:40	03/29/18 16:00
SVM-1-15	8C30001-02	Vapor	3	03/29/18 07:45	03/29/18 16:00
SVM-15-7	8C30001-03	Vapor	3	03/29/18 09:00	03/29/18 16:00
SVM-15-15	8C30001-04	Vapor	3	03/29/18 09:02	03/29/18 16:00
SVM-15-22	8C30001-05	Vapor	3	03/29/18 09:04	03/29/18 16:00
SVM-6-7	8C30001-06	Vapor	3	03/29/18 09:32	03/29/18 16:00
SVM-6-15	8C30001-07	Vapor	3	03/29/18 09:34	03/29/18 16:00
SVM-7-6	8C30001-08	Vapor	3	03/29/18 10:52	03/29/18 16:00
SVM-7-13	8C30001-09	Vapor	3	03/29/18 10:54	03/29/18 16:00
SVM-7-13 DUP	8C30001-10	Vapor	3	03/29/18 10:54	03/29/18 16:00
SVM-10-15	8C30001-11	Vapor	3	03/29/18 11:30	03/29/18 16:00
SVM-3-5	8C30001-12	Vapor	3	03/29/18 12:02	03/29/18 16:00

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-3-15	8C30001-13	Vapor	3	03/29/18 12:05	03/29/18 16:00
SVM-2-5	8C30001-14	Vapor	3	03/29/18 12:40	03/29/18 16:00
SVM-5-5	8C30001-15	Vapor	3	03/29/18 13:20	03/29/18 16:00
SVM-5-15	8C30001-16	Vapor	3	03/29/18 13:23	03/29/18 16:00
SVM-8-5	8C30001-17	Vapor	3	03/29/18 13:50	03/29/18 16:00
SVM-8-15	8C30001-18	Vapor	3	03/29/18 13:53	03/29/18 16:00
SVM-16-7	8C30001-19	Vapor	3	03/29/18 14:33	03/29/18 16:00
SVM-16-16	8C30001-20	Vapor	3	03/29/18 14:35	03/29/18 16:00
SVM-16-22	8C30001-21	Vapor	3	03/29/18 14:38	03/29/18 16:00
SVM-16-22 DUP	8C30001-22	Vapor	3	03/29/18 14:38	03/29/18 16:00
Ambient Air	8C30001-23	Vapor	3	03/29/18 14:38	03/29/18 16:00

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Fixed Gases by TCD								
Oxygen	SVM-1-5	19	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Carbon Dioxide	SVM-1-5	0.10	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-1-15	19	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-15-7	19	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Carbon Dioxide	SVM-15-7	0.11	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-15-15	19	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Carbon Dioxide	SVM-15-15	0.17	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-15-22	18	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Carbon Dioxide	SVM-15-22	0.34	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-6-7	18	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Carbon Dioxide	SVM-6-7	0.94	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-6-15	18	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Carbon Dioxide	SVM-6-15	2.3	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-7-6	17	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Carbon Dioxide	SVM-7-6	0.42	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-7-13	15	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Carbon Dioxide	SVM-7-13	1.9	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-7-13 DUP	16	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Carbon Dioxide	SVM-7-13 DUP	1.9	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-10-15	10	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Carbon Dioxide	SVM-10-15	2.9	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-3-5	19	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Carbon Dioxide	SVM-3-5	0.15	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-3-15	19	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Carbon Dioxide	SVM-3-15	0.15	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-2-5	19	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-5-5	19	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-5-15	19	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-8-5	19	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-8-15	19	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-16-7	19	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Carbon Dioxide	SVM-16-7	0.28	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-16-16	8.7	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Carbon Dioxide	SVM-16-16	7.4	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-16-22	9.0	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Carbon Dioxide	SVM-16-22	7.4	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Oxygen	SVM-16-22 DUP	9.1	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM
Carbon Dioxide	SVM-16-22 DUP	7.5	0.10	% by Volume	1	03/29/18	03/29/18	EPA 3CM

VOCs by EPA TO-3**VOCs by GCMS EPA TO-15 (Mid Level)**

2,2,4-Trimethylpentane	SVM-7-6	1.0	0.10	ug/L	5	03/29/18	03/29/18	TO-15
Chloroform	SVM-3-5	0.16	0.020	ug/L	1	03/29/18	03/29/18	TO-15
Ethanol	SVM-5-15	0.045	0.020	ug/L	1	03/30/18	03/30/18	TO-15
Heptane	SVM-16-22	0.029	0.020	ug/L	1	04/02/18	04/03/18	TO-15
2,2,4-Trimethylpentane	SVM-16-22	0.033	0.020	ug/L	1	04/02/18	04/03/18	TO-15
Heptane	SVM-16-22 DUP	0.023	0.020	ug/L	1	04/02/18	04/03/18	TO-15
2,2,4-Trimethylpentane	SVM-16-22 DUP	0.027	0.020	ug/L	1	04/02/18	04/03/18	TO-15

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18
Units: ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Prepared:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Analyzed:	03/29/18	03/29/18	03/29/18	03/29/18	
AA ID No:	8C30001-01	8C30001-02	8C30001-03	8C30001-04	
Client ID No:	SVM-1-5	SVM-1-15	SVM-15-7	SVM-15-15	
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
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Surrogates

4-Bromofluorobenzene	113%	117%	115%	113%	<u>%REC Limits</u> 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18
Units: ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Prepared:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Analyzed:	03/29/18	03/29/18	03/29/18	03/29/18	
AA ID No:	8C30001-05	8C30001-06	8C30001-07	8C30001-08	
Client ID No:	SVM-15-22	SVM-6-7	SVM-6-15	SVM-7-6	
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
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Surrogates

4-Bromofluorobenzene	111%	116%	110%	110%	%REC Limits 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18
Units: ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Prepared:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Analyzed:	03/29/18	03/29/18	03/29/18	03/29/18	
AA ID No:	8C30001-09	8C30001-10	8C30001-11	8C30001-12	
Client ID No:	SVM-7-13	SVM-7-13 DUP	SVM-10-15	SVM-3-5	
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
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Surrogates

4-Bromofluorobenzene	113%	115%	111%	118%	%REC Limits 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18
Units: ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Prepared:	03/29/18	03/29/18	03/30/18	03/30/18	
Date Analyzed:	03/29/18	03/29/18	03/30/18	03/30/18	
AA ID No:	8C30001-13	8C30001-14	8C30001-15	8C30001-16	
Client ID No:	SVM-3-15	SVM-2-5	SVM-5-5	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
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Surrogates

4-Bromofluorobenzene	117%	117%	117%	119%	%REC Limits 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18
Units: ug/L

Date Sampled:	03/29/2018	03/29/2018	03/29/2018	03/29/2018	
Date Prepared:	04/02/18	04/02/18	04/02/18	04/02/18	
Date Analyzed:	04/02/18	04/02/18	04/02/18	04/02/18	
AA ID No:	8C30001-17	8C30001-18	8C30001-19	8C30001-20	
Client ID No:	SVM-8-5	SVM-8-15	SVM-16-7	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
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Surrogates

4-Bromofluorobenzene	99%	96%	97%	94%	%REC Limits 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18
Units: ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	
Date Prepared:	04/02/18	04/02/18	04/02/18	
Date Analyzed:	04/03/18	04/03/18	04/03/18	
AA ID No:	8C30001-21	8C30001-22	8C30001-23	
Client ID No:	SVM-16-22	SVM-16-22 DUP	Ambient Air	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	MRL

TO-3 (TO-3)

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

4-Bromofluorobenzene	99%	94%	93%	%REC Limits 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187319
Project No:	693142	Date Received:	03/29/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18
Date Prepared:	03/29/18	03/29/18	03/29/18	03/29/18
Date Analyzed:	03/29/18	03/29/18	03/29/18	03/29/18
AA ID No:	8C30001-01	8C30001-02	8C30001-03	8C30001-04
Client ID No:	SVM-1-5	SVM-1-15	SVM-15-7	SVM-15-15
Matrix:	Vapor	Vapor	Vapor	Vapor
Dilution Factor:	1	1	1	1

MRL

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

Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187319
Project No:	693142	Date Received:	03/29/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18
Date Prepared:	03/29/18	03/29/18	03/29/18	03/29/18
Date Analyzed:	03/29/18	03/29/18	03/29/18	03/29/18
AA ID No:	8C30001-01	8C30001-02	8C30001-03	8C30001-04
Client ID No:	SVM-1-5	SVM-1-15	SVM-15-7	SVM-15-15
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.	AA Project No:	MB187319
Project No:	693142	Date Received:	03/29/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18
Date Prepared:	03/29/18	03/29/18	03/29/18	03/29/18
Date Analyzed:	03/29/18	03/29/18	03/29/18	03/29/18
AA ID No:	8C30001-01	8C30001-02	8C30001-03	8C30001-04
Client ID No:	SVM-1-5	SVM-1-15	SVM-15-7	SVM-15-15
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
1,2,3-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

<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	113%	117%	115%	113%	70-130

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187319
Project No:	693142	Date Received:	03/29/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18
Date Prepared:	03/29/18	03/29/18	03/29/18	03/29/18
Date Analyzed:	03/29/18	03/29/18	03/29/18	03/29/18
AA ID No:	8C30001-05	8C30001-06	8C30001-07	8C30001-08
Client ID No:	SVM-15-22	SVM-6-7	SVM-6-15	SVM-7-6
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:	MB187319
Project No:	693142	Date Received:	03/29/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18
Date Prepared:	03/29/18	03/29/18	03/29/18	03/29/18
Date Analyzed:	03/29/18	03/29/18	03/29/18	03/29/18
AA ID No:	8C30001-05	8C30001-06	8C30001-07	8C30001-08
Client ID No:	SVM-15-22	SVM-6-7	SVM-6-15	SVM-7-6
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:	MB187319
Project No:	693142	Date Received:	03/29/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Prepared:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Analyzed:	03/29/18	03/29/18	03/29/18	03/29/18	
AA ID No:	8C30001-05	8C30001-06	8C30001-07	8C30001-08	
Client ID No:	SVM-15-22	SVM-6-7	SVM-6-15	SVM-7-6	
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	1.0	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
1,2,3-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	111%	116%	110%	110%	70-130

Allen Aminian

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187319
Project No:	693142	Date Received:	03/29/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18
Date Prepared:	03/29/18	03/29/18	03/29/18	03/29/18
Date Analyzed:	03/29/18	03/29/18	03/29/18	03/29/18
AA ID No:	8C30001-09	8C30001-10	8C30001-11	8C30001-12
Client ID No:	SVM-7-13	SVM-7-13 DUP	SVM-10-15	SVM-3-5
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	0.16	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:	MB187319
Project No:	693142	Date Received:	03/29/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18
Date Prepared:	03/29/18	03/29/18	03/29/18	03/29/18
Date Analyzed:	03/29/18	03/29/18	03/29/18	03/29/18
AA ID No:	8C30001-09	8C30001-10	8C30001-11	8C30001-12
Client ID No:	SVM-7-13	SVM-7-13 DUP	SVM-10-15	SVM-3-5
Matrix:	Vapor	Vapor	Vapor	Vapor
Dilution Factor:	1	1	1	1
				MRL

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

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

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187319
Project No:	693142	Date Received:	03/29/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18
Date Prepared:	03/29/18	03/29/18	03/29/18	03/29/18
Date Analyzed:	03/29/18	03/29/18	03/29/18	03/29/18
AA ID No:	8C30001-09	8C30001-10	8C30001-11	8C30001-12
Client ID No:	SVM-7-13	SVM-7-13 DUP	SVM-10-15	SVM-3-5
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
1,2,3-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

<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	113%	115%	116%	118%	70-130

Allen Aminian

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187319
Project No:	693142	Date Received:	03/29/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18
Date Prepared:	03/29/18	03/29/18	03/30/18	03/30/18
Date Analyzed:	03/29/18	03/29/18	03/30/18	03/30/18
AA ID No:	8C30001-13	8C30001-14	8C30001-15	8C30001-16
Client ID No:	SVM-3-15	SVM-2-5	SVM-5-5	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.	AA Project No:	MB187319
Project No:	693142	Date Received:	03/29/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18
Date Prepared:	03/29/18	03/29/18	03/30/18	03/30/18
Date Analyzed:	03/29/18	03/29/18	03/30/18	03/30/18
AA ID No:	8C30001-13	8C30001-14	8C30001-15	8C30001-16
Client ID No:	SVM-3-15	SVM-2-5	SVM-5-5	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	0.045	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:	MB187319
Project No:	693142	Date Received:	03/29/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18
Date Prepared:	03/29/18	03/29/18	03/30/18	03/30/18
Date Analyzed:	03/29/18	03/29/18	03/30/18	03/30/18
AA ID No:	8C30001-13	8C30001-14	8C30001-15	8C30001-16
Client ID No:	SVM-3-15	SVM-2-5	SVM-5-5	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
1,2,3-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

4-Bromofluorobenzene	117%	117%	117%	119%	<u>%REC Limits</u> 70-130
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Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187319
Project No:	693142	Date Received:	03/29/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/29/2018	03/29/2018	03/29/2018	03/29/2018	
Date Prepared:	04/02/18	04/02/18	04/02/18	04/02/18	
Date Analyzed:	04/02/18	04/02/18	04/02/18	04/02/18	
AA ID No:	8C30001-17	8C30001-18	8C30001-19	8C30001-20	
Client ID No:	SVM-8-5	SVM-8-15	SVM-16-7	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.	AA Project No:	MB187319
Project No:	693142	Date Received:	03/29/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/29/2018	03/29/2018	03/29/2018	03/29/2018	
Date Prepared:	04/02/18	04/02/18	04/02/18	04/02/18	
Date Analyzed:	04/02/18	04/02/18	04/02/18	04/02/18	
AA ID No:	8C30001-17	8C30001-18	8C30001-19	8C30001-20	
Client ID No:	SVM-8-5	SVM-8-15	SVM-16-7	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.	AA Project No:	MB187319
Project No:	693142	Date Received:	03/29/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/29/2018	03/29/2018	03/29/2018	03/29/2018	
Date Prepared:	04/02/18	04/02/18	04/02/18	04/02/18	
Date Analyzed:	04/02/18	04/02/18	04/02/18	04/02/18	
AA ID No:	8C30001-17	8C30001-18	8C30001-19	8C30001-20	
Client ID No:	SVM-8-5	SVM-8-15	SVM-16-7	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
1,2,3-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	99%	96%	96%	94%	70-130

Allen Aminian

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15 (Mid Level)

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18
Units: ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	
Date Prepared:	04/02/18	04/02/18	04/02/18	
Date Analyzed:	04/03/18	04/03/18	04/03/18	
AA ID No:	8C30001-21	8C30001-22	8C30001-23	
Client ID No:	SVM-16-22	SVM-16-22 DUP	Ambient Air	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	MRL

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

Acetone	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	0.020

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15 (Mid Level)

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18
Units: ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	
Date Prepared:	04/02/18	04/02/18	04/02/18	
Date Analyzed:	04/03/18	04/03/18	04/03/18	
AA ID No:	8C30001-21	8C30001-22	8C30001-23	
Client ID No:	SVM-16-22	SVM-16-22 DUP	Ambient Air	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	MRL

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

1,1-Dichloroethylene	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	0.020
Heptane	0.029	0.023	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	0.020

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187319
Project No:	693142	Date Received:	03/29/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/29/18	03/29/18	03/29/18	
Date Prepared:	04/02/18	04/02/18	04/02/18	
Date Analyzed:	04/03/18	04/03/18	04/03/18	
AA ID No:	8C30001-21	8C30001-22	8C30001-23	
Client ID No:	SVM-16-22	SVM-16-22 DUP	Ambient Air	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	MRL

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

Toluene	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<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
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	0.033	0.027	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	0.020

<u>Surrogates</u>				<u>%REC Limits</u>
4-Bromofluorobenzene	99%	91%	90%	70-130

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18
Units: % by Volume

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Prepared:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Analyzed:	03/29/18	03/29/18	03/29/18	03/29/18	
AA ID No:	8C30001-01	8C30001-02	8C30001-03	8C30001-04	
Client ID No:	SVM-1-5	SVM-1-15	SVM-15-7	SVM-15-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	19	19	19	19	0.10
Carbon Dioxide	0.10	<0.10	0.11	0.17	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18
Units: % by Volume

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Prepared:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Analyzed:	03/29/18	03/29/18	03/29/18	03/29/18	
AA ID No:	8C30001-05	8C30001-06	8C30001-07	8C30001-08	
Client ID No:	SVM-15-22	SVM-6-7	SVM-6-15	SVM-7-6	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	18	18	18	17	0.10
Carbon Dioxide	0.34	0.94	2.3	0.42	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18
Units: % by Volume

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Prepared:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Analyzed:	03/29/18	03/29/18	03/29/18	03/29/18	
AA ID No:	8C30001-09	8C30001-10	8C30001-11	8C30001-12	
Client ID No:	SVM-7-13	SVM-7-13 DUP	SVM-10-15	SVM-3-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	15	16	10	19	0.10
Carbon Dioxide	1.9	1.9	2.9	0.15	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18
Units: % by Volume

Date Sampled:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Prepared:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Analyzed:	03/29/18	03/29/18	03/29/18	03/29/18	
AA ID No:	8C30001-13	8C30001-14	8C30001-15	8C30001-16	
Client ID No:	SVM-3-15	SVM-2-5	SVM-5-5	SVM-5-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	19	19	19	19	0.10
Carbon Dioxide	0.15	<0.10	<0.10	<0.10	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18
Units: % by Volume

Date Sampled:	03/29/2018	03/29/2018	03/29/2018	03/29/2018	
Date Prepared:	03/29/18	03/29/18	03/29/18	03/29/18	
Date Analyzed:	03/29/18	03/29/18	03/29/18	03/29/18	
AA ID No:	8C30001-17	8C30001-18	8C30001-19	8C30001-20	
Client ID No:	SVM-8-5	SVM-8-15	SVM-16-7	SVM-16-16	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	19	19	19	8.7	0.10
Carbon Dioxide	<0.10	<0.10	0.28	7.4	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18
Units: % by Volume

Date Sampled:	03/29/18	03/29/18	
Date Prepared:	03/29/18	03/29/18	
Date Analyzed:	03/29/18	03/29/18	
AA ID No:	8C30001-21	8C30001-22	
Client ID No:	SVM-16-22	SVM-16-22 DUP	
Matrix:	Vapor	Vapor	
Dilution Factor:	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	0.10
Oxygen	9.0	9.1	0.10
Carbon Dioxide	7.4	7.5	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC Limits	RPD	RPD Limit	Notes
VOCs by EPA TO-3 - Quality Control									
<i>Batch B8D0511 - *** DEFAULT PREP ***</i>									
Blank (B8D0511-BLK1)				Prepared & Analyzed: 04/02/18					
Gasoline Range Organics (GRO)	<20	20	ug/L						
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0326</i>		<i>ug/L</i>	<i>0.036</i>	<i>91.2</i>	<i>70-130</i>			
LCS (B8D0511-BS1)				Prepared & Analyzed: 04/02/18					
Gasoline Range Organics (GRO)	0.665	20	ug/L	0.82	81.2	70-130			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0332</i>		<i>ug/L</i>	<i>0.036</i>	<i>92.8</i>	<i>70-130</i>			
LCS Dup (B8D0511-BSD1)				Prepared: 04/02/18 Analyzed: 04/03/18					
Gasoline Range Organics (GRO)	0.611	20	ug/L	0.82	74.7	70-130	8.34	30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0349</i>		<i>ug/L</i>	<i>0.036</i>	<i>97.4</i>	<i>70-130</i>			
<i>Batch B8D1729 - *** DEFAULT PREP ***</i>									
Blank (B8D1729-BLK1)				Prepared & Analyzed: 03/29/18					
Gasoline Range Organics (GRO)	<20	20	ug/L						
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.138</i>		<i>ug/L</i>	<i>0.14</i>	<i>96.3</i>	<i>70-130</i>			
LCS (B8D1729-BS1)				Prepared & Analyzed: 03/29/18					
Gasoline Range Organics (GRO)	0.963	20	ug/L	0.82	118	70-130			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.140</i>		<i>ug/L</i>	<i>0.14</i>	<i>97.5</i>	<i>70-130</i>			
LCS Dup (B8D1729-BSD1)				Prepared & Analyzed: 03/29/18					
Gasoline Range Organics (GRO)	0.939	20	ug/L	0.82	115	70-130	2.53	30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.168</i>		<i>ug/L</i>	<i>0.14</i>	<i>118</i>	<i>70-130</i>			
Duplicate (B8D1729-DUP1)				Source: 8C30001-09 Prepared & Analyzed: 03/29/18					
Gasoline Range Organics (GRO)	<20	20	ug/L	<20				30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.165</i>		<i>ug/L</i>	<i>0.14</i>	<i>115</i>	<i>70-130</i>			
<i>Batch B8D1733 - *** DEFAULT PREP ***</i>									
Blank (B8D1733-BLK1)				Prepared & Analyzed: 03/30/18					
Gasoline Range Organics (GRO)	<20	20	ug/L						
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.149</i>		<i>ug/L</i>	<i>0.14</i>	<i>104</i>	<i>70-130</i>			
LCS (B8D1733-BS1)				Prepared & Analyzed: 03/30/18					
Gasoline Range Organics (GRO)	0.769	20	ug/L	0.82	94.0	70-130			

Allen Aminian

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 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by EPA TO-3 - Quality Control										
<i>Batch B8D1733 - *** DEFAULT PREP ***</i>										
LCS (B8D1733-BS1) Continued										
Prepared & Analyzed: 03/30/18										
<i>Surrogate: 4-Bromofluorobenzene</i>	0.133		ug/L	0.14		93.0	70-130			
LCS Dup (B8D1733-BSD1)										
Prepared & Analyzed: 03/30/18										
Gasoline Range Organics (GRO)	0.807	20	ug/L	0.82		98.7	70-130	4.85	30	
<i>Surrogate: 4-Bromofluorobenzene</i>	0.133		ug/L	0.14		93.0	70-130			
Duplicate (B8D1733-DUP1)										
Source: 8D02010-15 Prepared & Analyzed: 03/30/18										
Gasoline Range Organics (GRO)	<20	20	ug/L						30	
<i>Surrogate: 4-Bromofluorobenzene</i>	0.149		ug/L	0.14		104	70-130			

VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control

*Batch B8D0510 - *** DEFAULT PREP ****

Blank (B8D0510-BLK1)

Prepared & Analyzed: 04/02/18

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							

Allen Aminian

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limits RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control									
<i>Batch B8D0510 - *** DEFAULT PREP ***</i>									
Blank (B8D0510-BLK1) Continued					Prepared & Analyzed: 04/02/18				
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						
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						

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8D0510 - *** DEFAULT PREP ***</i>										
Blank (B8D0510-BLK1) Continued										
Prepared & Analyzed: 04/02/18										
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							
1,2,3-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							
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.132</i>		<i>ug/L</i>	<i>0.14</i>		<i>92.0</i>	<i>70-130</i>			
LCS (B8D0510-BS1)										
Prepared: 04/02/18 Analyzed: 04/03/18										
Acetone	0.0733	0.020	ug/L	0.095		77.1	70-130		30	
Benzene	0.103	0.020	ug/L	0.13		80.8	70-130		30	
Benzyl chloride	0.180	0.020	ug/L	0.21		87.1	70-130		30	
Bromodichloromethane	0.232	0.020	ug/L	0.27		86.7	70-130		30	
Bromoform	0.348	0.020	ug/L	0.41		84.1	70-130		30	

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
Batch B8D0510 - *** DEFAULT PREP ***										
LCS (B8D0510-BS1) Continued										
					Prepared: 04/02/18 Analyzed: 04/03/18					
Bromomethane	0.125	0.020	ug/L	0.16		80.2	70-130		30	
2-Butanone (MEK)	0.0962	0.020	ug/L	0.12		81.5	70-130		30	
Carbon Disulfide	0.100	0.020	ug/L	0.12		80.7	70-130		30	
Carbon Tetrachloride	0.222	0.020	ug/L	0.25		88.1	70-130		30	
Chlorobenzene	0.162	0.020	ug/L	0.18		88.2	70-130		30	
Chloroethane	0.0645	0.020	ug/L	0.11		61.1	70-130		30	***
Chloroform	0.160	0.020	ug/L	0.20		82.0	70-130		30	
Chloromethane	0.0605	0.020	ug/L	0.083		73.3	70-130		30	
Dibromochloromethane	0.316	0.020	ug/L	0.34		92.6	70-130		30	
1,2-Dibromoethane (EDB)	0.316	0.020	ug/L	0.31		103	70-130		30	
1,2-Dichlorobenzene	0.209	0.020	ug/L	0.24		86.7	70-130		30	
1,3-Dichlorobenzene	0.209	0.020	ug/L	0.24		86.8	70-130		30	
1,4-Dichlorobenzene	0.208	0.020	ug/L	0.24		86.3	70-130		30	
Dichlorodifluoromethane (R12)	0.161	0.020	ug/L	0.20		81.3	70-130		30	
1,1-Dichloroethane	0.125	0.020	ug/L	0.16		77.4	70-130		30	
1,2-Dichloroethane (EDC)	0.135	0.020	ug/L	0.16		83.2	70-130		30	
cis-1,2-Dichloroethylene	0.126	0.020	ug/L	0.16		79.6	70-130		30	
1,1-Dichloroethylene	0.124	0.020	ug/L	0.16		78.1	70-130		30	
trans-1,2-Dichloroethylene	0.124	0.020	ug/L	0.16		78.2	70-130		30	
1,2-Dichloropropane	0.156	0.020	ug/L	0.18		84.6	70-130		30	
trans-1,3-Dichloropropylene	0.170	0.020	ug/L	0.18		93.8	70-130		30	
cis-1,3-Dichloropropylene	0.164	0.020	ug/L	0.18		90.2	70-130		30	
Dichlorotetrafluoroethane	0.211	0.020	ug/L	0.28		75.4	70-130		30	
Ethylbenzene	0.139	0.020	ug/L	0.17		79.9	70-130		30	
4-Ethyltoluene	0.161	0.020	ug/L	0.20		81.9	70-130		30	
Hexachlorobutadiene	0.403	0.020	ug/L	0.43		94.5	70-130		30	
2-Hexanone (MBK)	0.147	0.020	ug/L	0.16		90.0	70-130		30	
Isopropanol (IPA)	0.0729	0.20	ug/L	0.098		74.1	70-130		30	
Methylene Chloride	0.0987	0.020	ug/L	0.14		71.0	70-130		30	
4-Methyl-2-pentanone (MIBK)	0.142	0.020	ug/L	0.16		86.8	70-130		30	
Styrene	0.147	0.020	ug/L	0.17		86.2	70-130		30	
1,1,2,2-Tetrachloroethane	0.192	0.020	ug/L	0.27		70.0	70-130		30	

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control

Batch B8D0510 - *** DEFAULT PREP ***

LCS (B8D0510-BS1) Continued

Prepared: 04/02/18 Analyzed: 04/03/18

Tetrachloroethylene (PCE)	0.239	0.020	ug/L	0.27		88.0	70-130		30	
Toluene	0.129	0.020	ug/L	0.15		85.7	70-130		30	
1,2,4-Trichlorobenzene	0.310	0.020	ug/L	0.30		105	70-130		30	
1,1,2-Trichloroethane	0.201	0.020	ug/L	0.22		92.0	70-130		30	
1,1,1-Trichloroethane	0.180	0.020	ug/L	0.22		82.7	70-130		30	
Trichloroethylene (TCE)	0.208	0.020	ug/L	0.21		96.6	70-130		30	
Trichlorofluoromethane (R11)	0.175	0.020	ug/L	0.22		78.0	70-130		30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	0.236	0.020	ug/L	0.31		77.0	70-130		30	
1,3,5-Trimethylbenzene	0.161	0.020	ug/L	0.20		82.1	70-130		30	
1,2,4-Trimethylbenzene	0.162	0.020	ug/L	0.20		82.4	70-130		30	
Vinyl acetate	0.113	0.020	ug/L	0.14		80.3	70-130		30	
Vinyl chloride	0.0722	0.020	ug/L	0.10		70.6	70-130		30	
o-Xylene	0.137	0.020	ug/L	0.17		79.0	70-130		30	
m,p-Xylenes	0.268	0.020	ug/L	0.35		77.2	70-130		30	
1,2,3-Trichloropropane	0.202	0.020	ug/L	0.24		83.7	70-130		30	
sec-Butylbenzene	0.189	0.020	ug/L	0.22		85.9	70-130		30	
Isopropylbenzene	0.167	0.020	ug/L	0.20		85.0	70-130		30	
n-Propylbenzene	0.166	0.020	ug/L	0.20		84.4	70-130		30	
4-Isopropyltoluene	0.194	0.020	ug/L	0.22		88.3	70-130		30	

Surrogate: 4-Bromofluorobenzene 0.141 ug/L 0.14 98.1 70-130

LCS Dup (B8D0510-BSD1)

Prepared: 04/02/18 Analyzed: 04/03/18

Acetone	0.0750	0.020	ug/L	0.095		79.0	70-130	2.40	30	
Benzene	0.103	0.020	ug/L	0.13		80.3	70-130	0.683	30	
Benzyl chloride	0.188	0.020	ug/L	0.21		90.6	70-130	3.99	30	
Bromodichloromethane	0.228	0.020	ug/L	0.27		85.1	70-130	1.95	30	
Bromoform	0.361	0.020	ug/L	0.41		87.4	70-130	3.91	30	
Bromomethane	0.127	0.020	ug/L	0.16		81.9	70-130	2.00	30	
2-Butanone (MEK)	0.0989	0.020	ug/L	0.12		83.8	70-130	2.75	30	
Carbon Disulfide	0.100	0.020	ug/L	0.12		80.5	70-130	0.155	30	
Carbon Tetrachloride	0.224	0.020	ug/L	0.25		89.2	70-130	1.16	30	

Allen Aminian

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
Batch B8D0510 - *** DEFAULT PREP ***										
LCS Dup (B8D0510-BSD1) Continued										
					Prepared: 04/02/18 Analyzed: 04/03/18					
Chlorobenzene	0.165	0.020	ug/L	0.18		89.9	70-130	1.91	30	
Chloroethane	0.0840	0.020	ug/L	0.11		79.6	70-130	26.3	30	
Chloroform	0.162	0.020	ug/L	0.20		83.0	70-130	1.24	30	
Chloromethane	0.0546	0.020	ug/L	0.083		66.1	70-130	10.3	30	***
Dibromochloromethane	0.314	0.020	ug/L	0.34		92.0	70-130	0.596	30	
1,2-Dibromoethane (EDB)	0.314	0.020	ug/L	0.31		102	70-130	0.488	30	
1,2-Dichlorobenzene	0.215	0.020	ug/L	0.24		89.4	70-130	3.07	30	
1,3-Dichlorobenzene	0.217	0.020	ug/L	0.24		90.3	70-130	4.04	30	
1,4-Dichlorobenzene	0.213	0.020	ug/L	0.24		88.6	70-130	2.63	30	
Dichlorodifluoromethane (R12)	0.158	0.020	ug/L	0.20		79.8	70-130	1.80	30	
1,1-Dichloroethane	0.126	0.020	ug/L	0.16		77.9	70-130	0.644	30	
1,2-Dichloroethane (EDC)	0.134	0.020	ug/L	0.16		83.0	70-130	0.241	30	
cis-1,2-Dichloroethylene	0.128	0.020	ug/L	0.16		81.0	70-130	1.71	30	
1,1-Dichloroethylene	0.126	0.020	ug/L	0.16		79.2	70-130	1.43	30	
trans-1,2-Dichloroethylene	0.123	0.020	ug/L	0.16		77.8	70-130	0.545	30	
1,2-Dichloropropane	0.159	0.020	ug/L	0.18		86.1	70-130	1.82	30	
trans-1,3-Dichloropropylene	0.174	0.020	ug/L	0.18		95.6	70-130	1.93	30	
cis-1,3-Dichloropropylene	0.167	0.020	ug/L	0.18		91.7	70-130	1.68	30	
Dichlorotetrafluoroethane	0.210	0.020	ug/L	0.28		75.0	70-130	0.466	30	
Ethylbenzene	0.142	0.020	ug/L	0.17		81.9	70-130	2.44	30	
4-Ethyltoluene	0.165	0.020	ug/L	0.20		84.0	70-130	2.56	30	
Hexachlorobutadiene	0.418	0.020	ug/L	0.43		98.1	70-130	3.71	30	
2-Hexanone (MBK)	0.152	0.020	ug/L	0.16		92.9	70-130	3.17	30	
Isopropanol (IPA)	0.0747	0.20	ug/L	0.098		76.0	70-130	2.50	30	
Methylene Chloride	0.100	0.020	ug/L	0.14		72.0	70-130	1.33	30	
4-Methyl-2-pentanone (MIBK)	0.145	0.020	ug/L	0.16		88.5	70-130	2.00	30	
Styrene	0.150	0.020	ug/L	0.17		88.1	70-130	2.21	30	
1,1,2,2-Tetrachloroethane	0.196	0.020	ug/L	0.27		71.4	70-130	1.98	30	
Tetrachloroethylene (PCE)	0.241	0.020	ug/L	0.27		88.7	70-130	0.793	30	
Toluene	0.131	0.020	ug/L	0.15		86.6	70-130	1.02	30	
1,2,4-Trichlorobenzene	0.328	0.020	ug/L	0.30		110	70-130	5.51	30	
1,1,2-Trichloroethane	0.204	0.020	ug/L	0.22		93.4	70-130	1.51	30	

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control

Batch B8D0510 - *** DEFAULT PREP ***

LCS Dup (B8D0510-BSD1) Continued

Prepared: 04/02/18 Analyzed: 04/03/18

1,1,1-Trichloroethane	0.177	0.020	ug/L	0.22		81.0	70-130	2.08	30	
Trichloroethylene (TCE)	0.205	0.020	ug/L	0.21		95.2	70-130	1.49	30	
Trichlorofluoromethane (R11)	0.180	0.020	ug/L	0.22		80.2	70-130	2.75	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	0.239	0.020	ug/L	0.31		78.0	70-130	1.39	30	
1,3,5-Trimethylbenzene	0.167	0.020	ug/L	0.20		85.1	70-130	3.59	30	
1,2,4-Trimethylbenzene	0.168	0.020	ug/L	0.20		85.2	70-130	3.37	30	
Vinyl acetate	0.115	0.020	ug/L	0.14		81.4	70-130	1.33	30	
Vinyl chloride	0.0690	0.020	ug/L	0.10		67.5	70-130	4.49	30	***
o-Xylene	0.141	0.020	ug/L	0.17		81.4	70-130	2.90	30	
m,p-Xylenes	0.279	0.020	ug/L	0.35		80.3	70-130	3.94	30	
1,2,3-Trichloropropane	0.212	0.020	ug/L	0.24		87.9	70-130	4.87	30	
sec-Butylbenzene	0.192	0.020	ug/L	0.22		87.4	70-130	1.73	30	
Isopropylbenzene	0.172	0.020	ug/L	0.20		87.4	70-130	2.75	30	
n-Propylbenzene	0.169	0.020	ug/L	0.20		85.7	70-130	1.53	30	
4-Isopropyltoluene	0.200	0.020	ug/L	0.22		91.3	70-130	3.31	30	

Surrogate: 4-Bromofluorobenzene 0.143 ug/L 0.14 99.8 70-130

Batch B8D1721 - *** DEFAULT PREP ***

Blank (B8D1721-BLK1)

Prepared & Analyzed: 03/29/18

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							

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limits RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control									
<i>Batch B8D1721 - *** DEFAULT PREP ***</i>									
Blank (B8D1721-BLK1) Continued					Prepared & Analyzed: 03/29/18				
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						
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						

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limit	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8D1721 - *** DEFAULT PREP ***</i>										
Blank (B8D1721-BLK1) Continued										
Prepared & Analyzed: 03/29/18										
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							
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							
1,2,3-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							

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8D1721 - *** DEFAULT PREP ***</i>										
Blank (B8D1721-BLK1) Continued										
Prepared & Analyzed: 03/29/18										
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.138</i>		<i>ug/L</i>	<i>0.14</i>		<i>96.3</i>	<i>70-130</i>			
LCS (B8D1721-BS1)										
Prepared & Analyzed: 03/29/18										
Acetone	0.0369	0.020	ug/L	0.024		155	70-130		30	**
Benzene	0.0320	0.020	ug/L	0.032		100	70-130		30	
Benzyl chloride	0.0693	0.020	ug/L	0.052		134	70-130		30	**
Bromodichloromethane	0.0849	0.020	ug/L	0.067		127	70-130		30	
Bromoform	0.125	0.020	ug/L	0.10		121	70-130		30	
Bromomethane	0.0588	0.020	ug/L	0.039		152	70-130		30	**
2-Butanone (MEK)	0.0412	0.020	ug/L	0.029		140	70-130		30	**
Carbon Disulfide	0.0346	0.020	ug/L	0.031		111	70-130		30	
Carbon Tetrachloride	0.0782	0.020	ug/L	0.063		124	70-130		30	
Chlorobenzene	0.0454	0.020	ug/L	0.046		98.7	70-130		30	
Chloroethane	0.0360	0.020	ug/L	0.026		136	70-130		30	**
Chloroform	0.0648	0.020	ug/L	0.049		133	70-130		30	**
Chloromethane	0.0215	0.020	ug/L	0.021		104	70-130		30	
Dibromochloromethane	0.101	0.020	ug/L	0.085		119	70-130		30	
1,2-Dibromoethane (EDB)	0.0838	0.020	ug/L	0.077		109	70-130		30	
1,2-Dichlorobenzene	0.0739	0.020	ug/L	0.060		123	70-130		30	
1,3-Dichlorobenzene	0.0718	0.020	ug/L	0.060		119	70-130		30	
1,4-Dichlorobenzene	0.0719	0.020	ug/L	0.060		120	70-130		30	
Dichlorodifluoromethane (R12)	0.0671	0.020	ug/L	0.049		136	70-130		30	**
1,1-Dichloroethane	0.0525	0.020	ug/L	0.040		130	70-130		30	
1,2-Dichloroethane (EDC)	0.0611	0.020	ug/L	0.040		151	70-130		30	**
cis-1,2-Dichloroethylene	0.0383	0.020	ug/L	0.040		96.7	70-130		30	
1,1-Dichloroethylene	0.0523	0.020	ug/L	0.040		132	70-130		30	**
trans-1,2-Dichloroethylene	0.0397	0.020	ug/L	0.040		100	70-130		30	
1,2-Dichloropropane	0.0514	0.020	ug/L	0.046		111	70-130		30	
trans-1,3-Dichloropropylene	0.0508	0.020	ug/L	0.045		112	70-130		30	
cis-1,3-Dichloropropylene	0.0462	0.020	ug/L	0.045		102	70-130		30	
Dichlorotetrafluoroethane	0.0945	0.020	ug/L	0.070		135	70-130		30	**
Ethylbenzene	0.0455	0.020	ug/L	0.043		105	70-130		30	

Allen Aminian
 QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
Batch B8D1721 - *** DEFAULT PREP ***										
LCS (B8D1721-BS1) Continued										
Prepared & Analyzed: 03/29/18										
4-Ethyltoluene	0.0566	0.020	ug/L	0.049	115	70-130	30			
Hexachlorobutadiene	0.181	0.020	ug/L	0.11	170	70-130	30			**
2-Hexanone (MBK)	0.0901	0.020	ug/L	0.041	220	70-130	30			**
Isopropanol (IPA)	0.0344	0.20	ug/L	0.025	140	70-130	30			**
Methylene Chloride	0.0388	0.020	ug/L	0.035	112	70-130	30			
4-Methyl-2-pentanone (MIBK)	0.0784	0.020	ug/L	0.041	191	70-130	30			**
Styrene	0.0416	0.020	ug/L	0.043	97.7	70-130	30			
1,1,2,2-Tetrachloroethane	0.0712	0.020	ug/L	0.069	104	70-130	30			
Tetrachloroethylene (PCE)	0.0583	0.020	ug/L	0.068	85.9	70-130	30			
Toluene	0.0369	0.020	ug/L	0.038	97.9	70-130	30			
1,2,4-Trichlorobenzene	0.107	0.020	ug/L	0.074	144	70-130	30			**
1,1,2-Trichloroethane	0.0594	0.020	ug/L	0.055	109	70-130	30			
1,1,1-Trichloroethane	0.0726	0.020	ug/L	0.055	133	70-130	30			**
Trichloroethylene (TCE)	0.0584	0.020	ug/L	0.054	109	70-130	30			
Trichlorofluoromethane (R11)	0.0860	0.020	ug/L	0.056	153	70-130	30			**
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	0.0930	0.020	ug/L	0.077	121	70-130	30			
1,3,5-Trimethylbenzene	0.0568	0.020	ug/L	0.049	116	70-130	30			
1,2,4-Trimethylbenzene	0.0544	0.020	ug/L	0.049	111	70-130	30			
Vinyl acetate	0.0505	0.020	ug/L	0.035	144	70-130	30			**
Vinyl chloride	0.0314	0.020	ug/L	0.026	123	70-130	30			
o-Xylene	0.0499	0.020	ug/L	0.043	115	70-130	30			
m,p-Xylenes	0.0862	0.020	ug/L	0.087	99.3	70-130	30			
1,2,3-Trichloropropane	0.0805	0.020	ug/L	0.060	134	70-130	30			**
sec-Butylbenzene	0.0691	0.020	ug/L	0.055	126	70-130	30			
Isopropylbenzene	0.0590	0.020	ug/L	0.049	120	70-130	30			
n-Propylbenzene	0.0609	0.020	ug/L	0.049	124	70-130	30			
4-Isopropyltoluene	0.0685	0.020	ug/L	0.055	125	70-130	30			
Surrogate: 4-Bromofluorobenzene	0.174		ug/L	0.14	122	70-130				
LCS Dup (B8D1721-BS1)										
Prepared & Analyzed: 03/29/18										
Acetone	0.0299	0.020	ug/L	0.024	126	70-130	21.0	30		

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8D1721 - *** DEFAULT PREP ***</i>										
LCS Dup (B8D1721-BSD1) Continued					Prepared & Analyzed: 03/29/18					
Benzene	0.0346	0.020	ug/L	0.032	108	70-130	7.86	30		
Benzyl chloride	0.0622	0.020	ug/L	0.052	120	70-130	10.7	30		
Bromodichloromethane	0.0788	0.020	ug/L	0.067	118	70-130	7.45	30		
Bromoform	0.115	0.020	ug/L	0.10	111	70-130	8.18	30		
Bromomethane	0.0596	0.020	ug/L	0.039	154	70-130	1.31	30		**
2-Butanone (MEK)	0.0250	0.020	ug/L	0.029	84.9	70-130	48.9	30		AA-C1
Carbon Disulfide	0.0338	0.020	ug/L	0.031	109	70-130	2.28	30		
Carbon Tetrachloride	0.0713	0.020	ug/L	0.063	113	70-130	9.17	30		
Chlorobenzene	0.0451	0.020	ug/L	0.046	97.9	70-130	0.814	30		
Chloroethane	0.0368	0.020	ug/L	0.026	139	70-130	2.25	30		**
Chloroform	0.0606	0.020	ug/L	0.049	124	70-130	6.62	30		
Chloromethane	0.0240	0.020	ug/L	0.021	116	70-130	11.2	30		
Dibromochloromethane	0.0993	0.020	ug/L	0.085	117	70-130	1.78	30		
1,2-Dibromoethane (EDB)	0.0850	0.020	ug/L	0.077	111	70-130	1.37	30		
1,2-Dichlorobenzene	0.0680	0.020	ug/L	0.060	113	70-130	8.31	30		
1,3-Dichlorobenzene	0.0681	0.020	ug/L	0.060	113	70-130	5.33	30		
1,4-Dichlorobenzene	0.0663	0.020	ug/L	0.060	110	70-130	8.18	30		
Dichlorodifluoromethane (R12)	0.0660	0.020	ug/L	0.049	134	70-130	1.63	30		**
1,1-Dichloroethane	0.0499	0.020	ug/L	0.040	123	70-130	5.22	30		
1,2-Dichloroethane (EDC)	0.0601	0.020	ug/L	0.040	149	70-130	1.54	30		**
cis-1,2-Dichloroethylene	0.0396	0.020	ug/L	0.040	99.9	70-130	3.26	30		
1,1-Dichloroethylene	0.0517	0.020	ug/L	0.040	130	70-130	1.07	30		
trans-1,2-Dichloroethylene	0.0415	0.020	ug/L	0.040	105	70-130	4.30	30		
1,2-Dichloropropane	0.0515	0.020	ug/L	0.046	112	70-130	0.269	30		
trans-1,3-Dichloropropylene	0.0521	0.020	ug/L	0.045	115	70-130	2.47	30		
cis-1,3-Dichloropropylene	0.0482	0.020	ug/L	0.045	106	70-130	4.13	30		
Dichlorotetrafluoroethane	0.0931	0.020	ug/L	0.070	133	70-130	1.49	30		**
Ethylbenzene	0.0441	0.020	ug/L	0.043	102	70-130	3.10	30		
4-Ethyltoluene	0.0517	0.020	ug/L	0.049	105	70-130	9.17	30		
Hexachlorobutadiene	0.167	0.020	ug/L	0.11	157	70-130	7.95	30		**
2-Hexanone (MBK)	0.0452	0.020	ug/L	0.041	110	70-130	66.4	30		AA-C1
Isopropanol (IPA)	0.0310	0.20	ug/L	0.025	126	70-130	10.5	30		

Allen Aminian
 QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
Batch B8D1721 - *** DEFAULT PREP ***										
LCS Dup (B8D1721-BSD1) Continued										
Prepared & Analyzed: 03/29/18										
Methylene Chloride	0.0381	0.020	ug/L	0.035		110	70-130	1.99	30	
4-Methyl-2-pentanone (MIBK)	0.0391	0.020	ug/L	0.041		95.4	70-130	66.9	30	AA-C1
Styrene	0.0408	0.020	ug/L	0.043		95.7	70-130	2.07	30	
1,1,2,2-Tetrachloroethane	0.0641	0.020	ug/L	0.069		93.3	70-130	10.6	30	
Tetrachloroethylene (PCE)	0.0584	0.020	ug/L	0.068		86.1	70-130	0.233	30	
Toluene	0.0383	0.020	ug/L	0.038		102	70-130	3.71	30	
1,2,4-Trichlorobenzene	0.0985	0.020	ug/L	0.074		133	70-130	8.44	30	**
1,1,2-Trichloroethane	0.0596	0.020	ug/L	0.055		109	70-130	0.459	30	
1,1,1-Trichloroethane	0.0685	0.020	ug/L	0.055		126	70-130	5.80	30	
Trichloroethylene (TCE)	0.0564	0.020	ug/L	0.054		105	70-130	3.47	30	
Trichlorofluoromethane (R11)	0.0787	0.020	ug/L	0.056		140	70-130	8.80	30	**
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	0.0894	0.020	ug/L	0.077		117	70-130	3.95	30	
1,3,5-Trimethylbenzene	0.0513	0.020	ug/L	0.049		104	70-130	10.3	30	
1,2,4-Trimethylbenzene	0.0498	0.020	ug/L	0.049		101	70-130	8.88	30	
Vinyl acetate	0.0452	0.020	ug/L	0.035		128	70-130	11.1	30	
Vinyl chloride	0.0301	0.020	ug/L	0.026		118	70-130	4.41	30	
o-Xylene	0.0462	0.020	ug/L	0.043		106	70-130	7.77	30	
m,p-Xylenes	0.0839	0.020	ug/L	0.087		96.6	70-130	2.70	30	
1,2,3-Trichloropropane	0.0704	0.020	ug/L	0.060		117	70-130	13.4	30	
sec-Butylbenzene	0.0621	0.020	ug/L	0.055		113	70-130	10.7	30	
Isopropylbenzene	0.0557	0.020	ug/L	0.049		113	70-130	5.83	30	
n-Propylbenzene	0.0569	0.020	ug/L	0.049		116	70-130	6.68	30	
4-Isopropyltoluene	0.0606	0.020	ug/L	0.055		110	70-130	12.2	30	
Surrogate: 4-Bromofluorobenzene	0.167		ug/L	0.14		116	70-130			
Duplicate (B8D1721-DUP1)										
Source: 8C30001-09 Prepared & Analyzed: 03/29/18										
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	

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8D1721 - *** DEFAULT PREP ***</i>										
Duplicate (B8D1721-DUP1) Continued Source: 8C30001-09 Prepared & Analyzed: 03/29/18										
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	
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	

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8D1721 - *** DEFAULT PREP ***</i>										
Duplicate (B8D1721-DUP1) Continued Source: 8C30001-09 Prepared & Analyzed: 03/29/18										
Ethylbenzene	<0.020	0.020	ug/L		<0.020				30	
Ethyl-tert-Butyl Ether (ETBE)	<0.020	0.020	ug/L		<0.020				30	
4-Ethyltoluene	<0.020	0.020	ug/L		<0.020				30	
Heptane	<0.020	0.020	ug/L		<0.020				30	
Hexachlorobutadiene	<0.020	0.020	ug/L		<0.020				30	
n-Hexane	<0.020	0.020	ug/L		<0.020				30	
2-Hexanone (MBK)	<0.020	0.020	ug/L		<0.020				30	
Isopropanol (IPA)	<0.20	0.20	ug/L		<0.20				30	
Methyl-tert-Butyl Ether (MTBE)	<0.020	0.020	ug/L		<0.020				30	
Methylene Chloride	<0.020	0.020	ug/L		<0.020				30	
4-Methyl-2-pentanone (MIBK)	<0.020	0.020	ug/L		<0.020				30	
Naphthalene	<0.020	0.020	ug/L		<0.020				30	
Propylene	<0.020	0.020	ug/L		<0.020				30	
Styrene	<0.020	0.020	ug/L		<0.020				30	
1,1,2,2-Tetrachloroethane	<0.020	0.020	ug/L		<0.020				30	
Tetrachloroethylene (PCE)	<0.020	0.020	ug/L		<0.020				30	
Tetrahydrofuran (THF)	<0.020	0.020	ug/L		<0.020				30	
Toluene	<0.020	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	

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8D1721 - *** DEFAULT PREP ***</i>										
Duplicate (B8D1721-DUP1) Continued Source: 8C30001-09 Prepared & Analyzed: 03/29/18										
m,p-Xylenes	<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	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.165</i>		<i>ug/L</i>	<i>0.14</i>		<i>115</i>	<i>70-130</i>			
<i>Batch B8D1732 - *** DEFAULT PREP ***</i>										
Blank (B8D1732-BLK1) Prepared & Analyzed: 03/30/18										
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							

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limits RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control									
<i>Batch B8D1732 - *** DEFAULT PREP ***</i>									
Blank (B8D1732-BLK1) Continued					Prepared & Analyzed: 03/30/18				
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						
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						

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8D1732 - *** DEFAULT PREP ***</i>										
Blank (B8D1732-BLK1) Continued										
Prepared & Analyzed: 03/30/18										
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							
1,2,3-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							
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.149</i>		<i>ug/L</i>	<i>0.14</i>		<i>104</i>	<i>70-130</i>			
LCS (B8D1732-BS1)										
Prepared & Analyzed: 03/30/18										
Acetone	0.0177	0.020	ug/L	0.024		74.5	70-130		30	
Benzene	0.0309	0.020	ug/L	0.032		96.7	70-130		30	
Benzyl chloride	0.0412	0.020	ug/L	0.052		79.5	70-130		30	
Bromodichloromethane	0.0582	0.020	ug/L	0.067		86.9	70-130		30	
Bromoform	0.0914	0.020	ug/L	0.10		88.4	70-130		30	
Bromomethane	0.0522	0.020	ug/L	0.039		134	70-130		30	**

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8D1732 - *** DEFAULT PREP ***</i>										
LCS (B8D1732-BS1) Continued										
Prepared & Analyzed: 03/30/18										
2-Butanone (MEK)	0.0209	0.020	ug/L	0.029		70.9	70-130		30	
Carbon Disulfide	0.0300	0.020	ug/L	0.031		96.4	70-130		30	
Carbon Tetrachloride	0.0506	0.020	ug/L	0.063		80.5	70-130		30	
Chlorobenzene	0.0383	0.020	ug/L	0.046		83.1	70-130		30	
Chloroethane	0.0316	0.020	ug/L	0.026		120	70-130		30	
Chloroform	0.0459	0.020	ug/L	0.049		94.1	70-130		30	
Chloromethane	0.0186	0.020	ug/L	0.021		90.2	70-130		30	
Dibromochloromethane	0.0823	0.020	ug/L	0.085		96.6	70-130		30	
1,2-Dibromoethane (EDB)	0.0732	0.020	ug/L	0.077		95.3	70-130		30	
1,2-Dichlorobenzene	0.0491	0.020	ug/L	0.060		81.7	70-130		30	
1,3-Dichlorobenzene	0.0504	0.020	ug/L	0.060		83.8	70-130		30	
1,4-Dichlorobenzene	0.0497	0.020	ug/L	0.060		82.7	70-130		30	
Dichlorodifluoromethane (R12)	0.0456	0.020	ug/L	0.049		92.3	70-130		30	
1,1-Dichloroethane	0.0391	0.020	ug/L	0.040		96.6	70-130		30	
1,2-Dichloroethane (EDC)	0.0372	0.020	ug/L	0.040		91.9	70-130		30	
cis-1,2-Dichloroethylene	0.0373	0.020	ug/L	0.040		94.2	70-130		30	
1,1-Dichloroethylene	0.0384	0.020	ug/L	0.040		96.8	70-130		30	
trans-1,2-Dichloroethylene	0.0384	0.020	ug/L	0.040		96.8	70-130		30	
1,2-Dichloropropane	0.0409	0.020	ug/L	0.046		88.5	70-130		30	
trans-1,3-Dichloropropylene	0.0379	0.020	ug/L	0.045		83.6	70-130		30	
cis-1,3-Dichloropropylene	0.0376	0.020	ug/L	0.045		82.8	70-130		30	
Dichlorotetrafluoroethane	0.0645	0.020	ug/L	0.070		92.3	70-130		30	
Ethylbenzene	0.0332	0.020	ug/L	0.043		76.4	70-130		30	
4-Ethyltoluene	0.0380	0.020	ug/L	0.049		77.3	70-130		30	
Hexachlorobutadiene	0.121	0.020	ug/L	0.11		114	70-130		30	
2-Hexanone (MBK)	0.0500	0.020	ug/L	0.041		122	70-130		30	
Isopropanol (IPA)	0.0268	0.20	ug/L	0.025		109	70-130		30	
Methylene Chloride	0.0341	0.020	ug/L	0.035		98.3	70-130		30	
4-Methyl-2-pentanone (MIBK)	0.0477	0.020	ug/L	0.041		116	70-130		30	
Styrene	0.0333	0.020	ug/L	0.043		78.2	70-130		30	
1,1,2,2-Tetrachloroethane	0.0515	0.020	ug/L	0.069		75.0	70-130		30	
Tetrachloroethylene (PCE)	0.0594	0.020	ug/L	0.068		87.5	70-130		30	

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control

Batch B8D1732 - *** DEFAULT PREP ***

LCS (B8D1732-BS1) Continued

Prepared & Analyzed: 03/30/18

Toluene	0.0334	0.020	ug/L	0.038		88.6	70-130		30	
1,2,4-Trichlorobenzene	0.0772	0.020	ug/L	0.074		104	70-130		30	
1,1,2-Trichloroethane	0.0505	0.020	ug/L	0.055		92.5	70-130		30	
1,1,1-Trichloroethane	0.0495	0.020	ug/L	0.055		90.7	70-130		30	
Trichloroethylene (TCE)	0.0495	0.020	ug/L	0.054		92.1	70-130		30	
Trichlorofluoromethane (R11)	0.0547	0.020	ug/L	0.056		97.3	70-130		30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	0.0761	0.020	ug/L	0.077		99.3	70-130		30	
1,3,5-Trimethylbenzene	0.0367	0.020	ug/L	0.049		74.7	70-130		30	
1,2,4-Trimethylbenzene	0.0364	0.020	ug/L	0.049		74.1	70-130		30	
Vinyl acetate	0.0268	0.020	ug/L	0.035		76.2	70-130		30	
Vinyl chloride	0.0256	0.020	ug/L	0.026		100	70-130		30	
o-Xylene	0.0319	0.020	ug/L	0.043		73.5	70-130		30	
m,p-Xylenes	0.0652	0.020	ug/L	0.087		75.1	70-130		30	
1,2,3-Trichloropropane	0.0478	0.020	ug/L	0.060		79.2	70-130		30	
sec-Butylbenzene	0.0439	0.020	ug/L	0.055		80.0	70-130		30	
Isopropylbenzene	0.0400	0.020	ug/L	0.049		81.4	70-130		30	
n-Propylbenzene	0.0408	0.020	ug/L	0.049		83.0	70-130		30	
4-Isopropyltoluene	0.0443	0.020	ug/L	0.055		80.7	70-130		30	

Surrogate: 4-Bromofluorobenzene 0.147 ug/L 0.14 103 70-130

LCS Dup (B8D1732-BSD1)

Prepared & Analyzed: 03/30/18

Acetone	0.0176	0.020	ug/L	0.024		74.1	70-130	0.538	30	
Benzene	0.0313	0.020	ug/L	0.032		97.9	70-130	1.23	30	
Benzyl chloride	0.0413	0.020	ug/L	0.052		79.8	70-130	0.377	30	
Bromodichloromethane	0.0559	0.020	ug/L	0.067		83.4	70-130	4.11	30	
Bromoform	0.0933	0.020	ug/L	0.10		90.3	70-130	2.13	30	
Bromomethane	0.0551	0.020	ug/L	0.039		142	70-130	5.42	30	**
2-Butanone (MEK)	0.0211	0.020	ug/L	0.029		71.4	70-130	0.703	30	
Carbon Disulfide	0.0301	0.020	ug/L	0.031		96.5	70-130	0.104	30	
Carbon Tetrachloride	0.0483	0.020	ug/L	0.063		76.7	70-130	4.83	30	
Chlorobenzene	0.0391	0.020	ug/L	0.046		84.9	70-130	2.14	30	

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
Batch B8D1732 - *** DEFAULT PREP ***										
LCS Dup (B8D1732-BSD1) Continued										
Prepared & Analyzed: 03/30/18										
Chloroethane	0.0316	0.020	ug/L	0.026	120	70-130	0.0836	30		
Chloroform	0.0439	0.020	ug/L	0.049	89.9	70-130	4.57	30		
Chloromethane	0.0183	0.020	ug/L	0.021	88.8	70-130	1.56	30		
Dibromochloromethane	0.0798	0.020	ug/L	0.085	93.7	70-130	3.05	30		
1,2-Dibromoethane (EDB)	0.0723	0.020	ug/L	0.077	94.1	70-130	1.27	30		
1,2-Dichlorobenzene	0.0497	0.020	ug/L	0.060	82.6	70-130	1.10	30		
1,3-Dichlorobenzene	0.0515	0.020	ug/L	0.060	85.7	70-130	2.24	30		
1,4-Dichlorobenzene	0.0507	0.020	ug/L	0.060	84.3	70-130	1.92	30		
Dichlorodifluoromethane (R12)	0.0439	0.020	ug/L	0.049	88.8	70-130	3.87	30		
1,1-Dichloroethane	0.0390	0.020	ug/L	0.040	96.3	70-130	0.311	30		
1,2-Dichloroethane (EDC)	0.0363	0.020	ug/L	0.040	89.8	70-130	2.31	30		
cis-1,2-Dichloroethylene	0.0385	0.020	ug/L	0.040	97.1	70-130	3.03	30		
1,1-Dichloroethylene	0.0374	0.020	ug/L	0.040	94.3	70-130	2.62	30		
trans-1,2-Dichloroethylene	0.0396	0.020	ug/L	0.040	99.9	70-130	3.15	30		
1,2-Dichloropropane	0.0414	0.020	ug/L	0.046	89.5	70-130	1.12	30		
trans-1,3-Dichloropropylene	0.0374	0.020	ug/L	0.045	82.5	70-130	1.32	30		
cis-1,3-Dichloropropylene	0.0380	0.020	ug/L	0.045	83.7	70-130	1.08	30		
Dichlorotetrafluoroethane	0.0621	0.020	ug/L	0.070	88.8	70-130	3.87	30		
Ethylbenzene	0.0333	0.020	ug/L	0.043	76.7	70-130	0.392	30		
4-Ethyltoluene	0.0381	0.020	ug/L	0.049	77.5	70-130	0.258	30		
Hexachlorobutadiene	0.118	0.020	ug/L	0.11	111	70-130	2.32	30		
2-Hexanone (MBK)	0.0389	0.020	ug/L	0.041	94.9	70-130	25.1	30		
Isopropanol (IPA)	0.0243	0.20	ug/L	0.025	98.8	70-130	9.91	30		
Methylene Chloride	0.0346	0.020	ug/L	0.035	99.6	70-130	1.31	30		
4-Methyl-2-pentanone (MIBK)	0.0318	0.020	ug/L	0.041	77.6	70-130	40.1	30		QR-02
Styrene	0.0328	0.020	ug/L	0.043	76.9	70-130	1.68	30		
1,1,2,2-Tetrachloroethane	0.0487	0.020	ug/L	0.069	70.9	70-130	5.62	30		
Tetrachloroethylene (PCE)	0.0565	0.020	ug/L	0.068	83.2	70-130	5.04	30		
Toluene	0.0329	0.020	ug/L	0.038	87.3	70-130	1.48	30		
1,2,4-Trichlorobenzene	0.0771	0.020	ug/L	0.074	104	70-130	0.0962	30		
1,1,2-Trichloroethane	0.0500	0.020	ug/L	0.055	91.6	70-130	0.978	30		
1,1,1-Trichloroethane	0.0479	0.020	ug/L	0.055	87.8	70-130	3.25	30		

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control

Batch B8D1732 - *** DEFAULT PREP ***

LCS Dup (B8D1732-BSD1) Continued

Prepared & Analyzed: 03/30/18

Trichloroethylene (TCE)	0.0486	0.020	ug/L	0.054	90.5	70-130	1.75	30	
Trichlorofluoromethane (R11)	0.0524	0.020	ug/L	0.056	93.3	70-130	4.20	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	0.0765	0.020	ug/L	0.077	99.8	70-130	0.502	30	
1,3,5-Trimethylbenzene	0.0367	0.020	ug/L	0.049	74.7	70-130	0.00	30	
1,2,4-Trimethylbenzene	0.0360	0.020	ug/L	0.049	73.2	70-130	1.22	30	
Vinyl acetate	0.0265	0.020	ug/L	0.035	75.3	70-130	1.19	30	
Vinyl chloride	0.0261	0.020	ug/L	0.026	102	70-130	1.68	30	
o-Xylene	0.0317	0.020	ug/L	0.043	72.9	70-130	0.820	30	
m,p-Xylenes	0.0667	0.020	ug/L	0.087	76.8	70-130	2.30	30	
1,2,3-Trichloropropane	0.0478	0.020	ug/L	0.060	79.2	70-130	0.00	30	
sec-Butylbenzene	0.0440	0.020	ug/L	0.055	80.1	70-130	0.125	30	
Isopropylbenzene	0.0403	0.020	ug/L	0.049	82.0	70-130	0.734	30	
n-Propylbenzene	0.0400	0.020	ug/L	0.049	81.3	70-130	2.07	30	
4-Isopropyltoluene	0.0432	0.020	ug/L	0.055	78.7	70-130	2.51	30	

Surrogate: 4-Bromofluorobenzene 0.144 ug/L 0.14 100 70-130

Duplicate (B8D1732-DUP1)

Source: 8D02010-15 Prepared & Analyzed: 03/30/18

Acetone	<0.40	0.40	ug/L					30	
Allyl chloride	<0.40	0.40	ug/L					30	
tert-Amyl Methyl Ether (TAME)	<0.40	0.40	ug/L					30	
Benzene	<0.40	0.40	ug/L					30	
Benzyl chloride	<0.40	0.40	ug/L					30	
Bromodichloromethane	<0.40	0.40	ug/L					30	
Bromoform	<0.40	0.40	ug/L					30	
Bromomethane	<0.40	0.40	ug/L					30	
1,3-Butadiene	<0.40	0.40	ug/L					30	
2-Butanone (MEK)	<0.40	0.40	ug/L					30	
tert-Butyl alcohol (TBA)	<400	400	ug/L					30	
Carbon Disulfide	<0.40	0.40	ug/L					30	
Carbon Tetrachloride	<0.40	0.40	ug/L					30	
Chlorobenzene	<0.40	0.40	ug/L					30	

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8D1732 - *** DEFAULT PREP ***</i>										
Duplicate (B8D1732-DUP1) Continued Source: 8D02010-15 Prepared & Analyzed: 03/30/18										
Chloroethane	<0.40	0.40	ug/L						30	
Chloroform	<0.40	0.40	ug/L						30	
Chloromethane	<0.40	0.40	ug/L						30	
Cyclohexane	<0.40	0.40	ug/L						30	
Dibromochloromethane	<0.40	0.40	ug/L						30	
1,2-Dibromoethane (EDB)	<0.40	0.40	ug/L						30	
1,2-Dichlorobenzene	<0.40	0.40	ug/L						30	
1,3-Dichlorobenzene	<0.40	0.40	ug/L						30	
1,4-Dichlorobenzene	<0.40	0.40	ug/L						30	
Dichlorodifluoromethane (R12)	<0.40	0.40	ug/L						30	
1,1-Dichloroethane	<0.40	0.40	ug/L						30	
1,2-Dichloroethane (EDC)	<0.40	0.40	ug/L						30	
cis-1,2-Dichloroethylene	<0.40	0.40	ug/L						30	
1,1-Dichloroethylene	<0.40	0.40	ug/L						30	
trans-1,2-Dichloroethylene	<0.40	0.40	ug/L						30	
1,2-Dichloropropane	<0.40	0.40	ug/L						30	
trans-1,3-Dichloropropylene	<0.40	0.40	ug/L						30	
cis-1,3-Dichloropropylene	<0.40	0.40	ug/L						30	
Dichlorotetrafluoroethane	<0.40	0.40	ug/L						30	
Diisopropyl ether (DIPE)	<0.40	0.40	ug/L						30	
1,4-Dioxane	<0.40	0.40	ug/L						30	
Ethanol	<0.40	0.40	ug/L						30	
Ethyl Acetate	<0.40	0.40	ug/L						30	
Ethylbenzene	<0.40	0.40	ug/L						30	
Ethyl-tert-Butyl Ether (ETBE)	<0.40	0.40	ug/L						30	
4-Ethyltoluene	<0.40	0.40	ug/L						30	
Heptane	<0.40	0.40	ug/L						30	
Hexachlorobutadiene	<0.40	0.40	ug/L						30	
n-Hexane	<0.40	0.40	ug/L						30	
2-Hexanone (MBK)	<0.40	0.40	ug/L						30	
Isopropanol (IPA)	<4.0	4.0	ug/L						30	
Methyl-tert-Butyl Ether (MTBE)	<0.40	0.40	ug/L						30	

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8D1732 - *** DEFAULT PREP ***</i>										
Duplicate (B8D1732-DUP1) Continued Source: 8D02010-15 Prepared & Analyzed: 03/30/18										
Methylene Chloride	<0.40	0.40	ug/L						30	
4-Methyl-2-pentanone (MIBK)	<0.40	0.40	ug/L						30	
Naphthalene	<0.40	0.40	ug/L						30	
Propylene	<0.40	0.40	ug/L						30	
Styrene	<0.40	0.40	ug/L						30	
1,1,2,2-Tetrachloroethane	<0.40	0.40	ug/L						30	
Tetrachloroethylene (PCE)	<0.40	0.40	ug/L						30	
Tetrahydrofuran (THF)	<0.40	0.40	ug/L						30	
Toluene	<0.40	0.40	ug/L						30	
1,2,4-Trichlorobenzene	<0.40	0.40	ug/L						30	
1,1,2-Trichloroethane	<0.40	0.40	ug/L						30	
1,1,1-Trichloroethane	<0.40	0.40	ug/L						30	
Trichloroethylene (TCE)	<0.40	0.40	ug/L						30	
Trichlorofluoromethane (R11)	<0.40	0.40	ug/L						30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.40	0.40	ug/L						30	
1,3,5-Trimethylbenzene	<0.40	0.40	ug/L						30	
1,2,4-Trimethylbenzene	<0.40	0.40	ug/L						30	
2,2,4-Trimethylpentane	<0.40	0.40	ug/L						30	
Vinyl acetate	<0.40	0.40	ug/L						30	
Vinyl bromide	<0.40	0.40	ug/L						30	
Vinyl chloride	<0.40	0.40	ug/L						30	
o-Xylene	<0.40	0.40	ug/L						30	
m,p-Xylenes	<0.40	0.40	ug/L						30	
1,2,3-Trichloropropane	<0.40	0.40	ug/L						30	
sec-Butylbenzene	<0.40	0.40	ug/L						30	
Isopropylbenzene	<0.40	0.40	ug/L						30	
n-Propylbenzene	<0.40	0.40	ug/L						30	
4-Isopropyltoluene	<0.40	0.40	ug/L						30	
n-Butylbenzene	<0.40	0.40	ug/L						30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.149</i>		<i>ug/L</i>	<i>0.14</i>		<i>104</i>	<i>70-130</i>			

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
<i>Batch B8D1714 - *** DEFAULT PREP ***</i>										
Blank (B8D1714-BLK1) Prepared & Analyzed: 03/29/18										
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B8D1714-BS1) Prepared & Analyzed: 03/29/18										
Methane	4.59	0.10	% by Volume	4.5		102	75-125			
Oxygen	4.01	0.10	% by Volume	4.0		100	75-125			
Carbon Dioxide	13.2	0.10	% by Volume	15		88.2	75-125			
LCS Dup (B8D1714-BSD1) Prepared & Analyzed: 03/29/18										
Methane	4.66	0.10	% by Volume	4.5		104	75-125	1.47	30	
Oxygen	3.77	0.10	% by Volume	4.0		94.3	75-125	6.09	30	
Carbon Dioxide	13.2	0.10	% by Volume	15		88.0	75-125	0.189	30	
Duplicate (B8D1714-DUP1) Source: 8C30001-09 Prepared & Analyzed: 03/29/18										
Methane	<0.10	0.10	% by Volume		<0.10				30	
Oxygen	15.8	0.10	% by Volume		15.4			2.67	30	
Carbon Dioxide	1.86	0.10	% by Volume		1.86			0.161	30	
Duplicate (B8D1714-DUP2) Source: 8C30001-21 Prepared & Analyzed: 03/29/18										
Methane	<0.10	0.10	% by Volume		<0.10				30	
Oxygen	9.10	0.10	% by Volume		9.03			0.750	30	

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
<i>Batch B8D1714 - *** DEFAULT PREP ***</i>										
Duplicate (B8D1714-DUP2) Continued Source: 8C30001-21 Prepared & Analyzed: 03/29/18										
Carbon Dioxide	7.50	0.10	% by Volume		7.42			1.13	30	

Allen Aminian

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187319
Date Received: 03/29/18
Date Reported: 04/23/18

Special Notes

- [1] = ** : Analyte recovery exceeded the upper control limit.
- [2] = *** : Analyte recovery exceeded the lower control limit.
- [3] = **AA-C1** : Exceeds the RPD limit. Analyte was not detected in the samples.
- [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.

A handwritten signature in black ink, appearing to read 'Allen Aminian'.

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.: 15049

70050947

Page 1 of 2

Client: CH2MHILL Project Name / No.: KINDER MORGAN NORWALK Sampler's Name: WILLIAM SCHMIDT
 Project Manager: _____ Site Address: 15306 NORWALK BLVD Sampler's Signature: [Signature]
 Phone: _____ City: NORWALK P.O. No.: _____
 Fax: _____ State & Zip: CA Quote No.: _____

TAT Turnaround Codes **

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

ANALYSIS REQUESTED (Test Name)

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	Please enter the TAT Turnaround Codes ** below										Special Instructions	
						TO15	783	FMND	GMATCS								
VM-1-5	8C30001-01	3/29/18	0840	V	3	X	X	X									PUS
VM-1-15	-02		0845	V	3	X	X	X									
VM-15-7	-03		0900	V	3	X	X	X									
VM-15-15	-04		0902	V	3	X	X	X									
VM-15-22	-05		0904	V	3	X	X	X									
VM-6-7	-06		0932	V	3	X	X	X									
SVM-6-15	-07		0934	V	3	X	X	X									
VM-7-6	-08		1052	V	3	X	X	X									
VM-7-13	-09		1054	V	2	X	X	X									
VM-7-13 DUP	-10		1054	V	2	X	X	X									
VM-10-15	-11		1130	V	3	X	X	X									
VM-3-5	-12		1202	V	3	X	X	X									
VM-3-15	-13		1205	V	3	X	X	X									
VM-2-5	-14		1240	V	2	X	X	X									
SVM-5-5	-15		1320	V	3	X	X	X									

For Laboratory Use

REVIEWED

Date: 3/30/18 Time: 10:00

TAT 3 Days Sign: [Signature]

A.A. Project No.: MB187319 / 8C30001

Relinquished by <u>[Signature]</u>	Date <u>3/29/18</u>	Time <u>1600</u>	Received by <u>[Signature]</u>
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by

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



AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311

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

A.A. COC No.: 15050

70050948

Page 2 of 2

Client: CH2MHILL Project Name / No.: KINDER MORGAN NORWALK Sampler's Name: William Schmitt
 Project Manager: _____ Site Address: 15306 NORWALK BLVD Sampler's Signature: [Signature]
 Phone: _____ City: NORWALK P.O. No.: _____
 Fax: _____ State & Zip: CA Quote No.: _____

TAT Turnaround Codes **

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

ANALYSIS REQUESTED (Test Name)

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	Please enter the TAT Turnaround Codes ** below										Special Instructions				
						①	②	③	④	⑤	X	1	2	3	4		5	6	7	8
VM-5-15	8030001-16	3/29/18	1323	V	3	X	X	X												
VM-8-5	-17		1350	V	3	X	X	X												
VM-8-15	-18		1353	V	3	X	X	X												
VM-16-7	-19		1433	V	3	X	X	X												
VM-16-16	-20		1435	V	3	X	X	X												
VM-16-22	-21		1438	V	3	X	X	X												
VM-16-22DP	-22		1438	V	3	X	X	X												
Ambient Air	-23																			

<p style="text-align: center;">For Laboratory Use</p> <p style="font-size: 2em; text-align: center;">REVIEWED</p> <p>Date <u>3/30/18</u> Time <u>10:00</u></p> <p>TAT <u>3</u> Days Sign: <u>[Signature]</u></p>	Relinquished by _____	Date <u>3/29/18</u>	Time <u>1600</u>	Received by _____
	Relinquished by _____	Date _____	Time _____	Received by _____
	Relinquished by _____	Date _____	Time _____	Received by _____

A.A. Project No.: MB187319 / 8030001

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



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

April 23, 2018

Vladimir Carino
CH2M Hill, Inc.
P.O. Box 241329
Denver, CO 80224

Re : KMEP Norwalk Biosparge Startup / 693142
MB187320 / 8D02010

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received on 03/30/18 15:00 and analyzed in accordance with the attached chain-of-custody.

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

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

Sincerely,

A handwritten signature in black ink, appearing to read 'Allen A.', is written above the printed name.

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18

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

SVM-9-5	8D02010-02	Vapor	3	03/30/18 07:30	03/30/18 15:00
SVM-9-15	8D02010-03	Vapor	3	03/30/18 07:32	03/30/18 15:00
SVM-12-7	8D02010-04	Vapor	3	03/30/18 08:25	03/30/18 15:00
SVM-12-15	8D02010-05	Vapor	3	03/30/18 08:26	03/30/18 15:00
SVM-12-22	8D02010-06	Vapor	3	03/30/18 08:27	03/30/18 15:00
SVM-11-7	8D02010-07	Vapor	3	03/30/18 09:25	03/30/18 15:00
SVM-11-15	8D02010-08	Vapor	3	03/30/18 09:27	03/30/18 15:00
SVM-11-22	8D02010-09	Vapor	3	03/30/18 09:29	03/30/18 15:00
SVM-13-7	8D02010-10	Vapor	3	03/30/18 10:24	03/30/18 15:00
SVM-13-15.5	8D02010-11	Vapor	3	03/30/18 10:26	03/30/18 15:00
SVM-13-22.5	8D02010-12	Vapor	3	03/30/18 10:28	03/30/18 15:00
SVM-14R-8	8D02010-13	Vapor	3	03/30/18 11:20	03/30/18 15:00
SVM-14R-16	8D02010-14	Vapor	3	03/30/18 11:22	03/30/18 15:00
SVM-14R-23	8D02010-15	Vapor	3	03/30/18 11:24	03/30/18 15:00
SVM-14R-23 DUP	8D02010-16	Vapor	3	03/30/18 11:24	03/30/18 15:00

TO-15 (Mid Level)

Ambient Air	8D02010-01	Vapor	3	03/30/18 07:20	03/30/18 15:00
SVM-9-5	8D02010-02	Vapor	3	03/30/18 07:30	03/30/18 15:00

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-9-15	8D02010-03	Vapor	3	03/30/18 07:32	03/30/18 15:00
SVM-12-7	8D02010-04	Vapor	3	03/30/18 08:25	03/30/18 15:00
SVM-12-15	8D02010-05	Vapor	3	03/30/18 08:26	03/30/18 15:00
SVM-12-22	8D02010-06	Vapor	3	03/30/18 08:27	03/30/18 15:00
SVM-11-7	8D02010-07	Vapor	3	03/30/18 09:25	03/30/18 15:00
SVM-11-15	8D02010-08	Vapor	3	03/30/18 09:27	03/30/18 15:00
SVM-11-22	8D02010-09	Vapor	3	03/30/18 09:29	03/30/18 15:00
SVM-13-7	8D02010-10	Vapor	3	03/30/18 10:24	03/30/18 15:00
SVM-13-15.5	8D02010-11	Vapor	3	03/30/18 10:26	03/30/18 15:00
SVM-13-22.5	8D02010-12	Vapor	3	03/30/18 10:28	03/30/18 15:00
SVM-14R-8	8D02010-13	Vapor	3	03/30/18 11:20	03/30/18 15:00
SVM-14R-16	8D02010-14	Vapor	3	03/30/18 11:22	03/30/18 15:00
SVM-14R-23	8D02010-15	Vapor	3	03/30/18 11:24	03/30/18 15:00
SVM-14R-23 DUP	8D02010-16	Vapor	3	03/30/18 11:24	03/30/18 15:00

TO-3

Ambient Air	8D02010-01	Vapor	3	03/30/18 07:20	03/30/18 15:00
SVM-9-5	8D02010-02	Vapor	3	03/30/18 07:30	03/30/18 15:00
SVM-9-15	8D02010-03	Vapor	3	03/30/18 07:32	03/30/18 15:00
SVM-12-7	8D02010-04	Vapor	3	03/30/18 08:25	03/30/18 15:00
SVM-12-15	8D02010-05	Vapor	3	03/30/18 08:26	03/30/18 15:00

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-12-22	8D02010-06	Vapor	3	03/30/18 08:27	03/30/18 15:00
SVM-11-7	8D02010-07	Vapor	3	03/30/18 09:25	03/30/18 15:00
SVM-11-15	8D02010-08	Vapor	3	03/30/18 09:27	03/30/18 15:00
SVM-11-22	8D02010-09	Vapor	3	03/30/18 09:29	03/30/18 15:00
SVM-13-7	8D02010-10	Vapor	3	03/30/18 10:24	03/30/18 15:00
SVM-13-15.5	8D02010-11	Vapor	3	03/30/18 10:26	03/30/18 15:00
SVM-13-22.5	8D02010-12	Vapor	3	03/30/18 10:28	03/30/18 15:00
SVM-14R-8	8D02010-13	Vapor	3	03/30/18 11:20	03/30/18 15:00
SVM-14R-16	8D02010-14	Vapor	3	03/30/18 11:22	03/30/18 15:00
SVM-14R-23	8D02010-15	Vapor	3	03/30/18 11:24	03/30/18 15:00
SVM-14R-23 DUP	8D02010-16	Vapor	3	03/30/18 11:24	03/30/18 15:00

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Fixed Gases by TCD								
Oxygen	SVM-9-5	18	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Carbon Dioxide	SVM-9-5	0.43	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Oxygen	SVM-9-15	16	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Carbon Dioxide	SVM-9-15	2.5	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Oxygen	SVM-12-7	14	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Carbon Dioxide	SVM-12-7	5.3	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Oxygen	SVM-12-15	7.9	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Carbon Dioxide	SVM-12-15	9.9	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Oxygen	SVM-12-22	5.2	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Carbon Dioxide	SVM-12-22	11	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-11-7	18	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Carbon Dioxide	SVM-11-7	2.8	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Oxygen	SVM-11-15	14	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Carbon Dioxide	SVM-11-15	5.2	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Oxygen	SVM-11-22	8.1	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Carbon Dioxide	SVM-11-22	8.3	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Oxygen	SVM-13-7	19	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Oxygen	SVM-13-15.5	19	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Oxygen	SVM-13-22.5	18	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Carbon Dioxide	SVM-13-22.5	0.88	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Oxygen	SVM-14R-8	18	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Carbon Dioxide	SVM-14R-8	0.34	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Oxygen	SVM-14R-16	19	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Carbon Dioxide	SVM-14R-16	0.32	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Oxygen	SVM-14R-23	19	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Carbon Dioxide	SVM-14R-23	0.34	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Oxygen	SVM-14R-23 DUP	19	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM
Carbon Dioxide	SVM-14R-23 DUP	0.32	0.10	% by Volume	1	03/30/18	03/30/18	EPA 3CM

VOCs by EPA TO-3**VOCs by GCMS EPA TO-15 (Mid Level)**

Methyl-tert-Butyl Ether (MTBE)	SVM-9-15	0.032	0.020	ug/L	1	03/30/18	03/30/18	TO-15
Tetrachloroethylene (PCE)	SVM-12-22	0.028	0.020	ug/L	1	03/30/18	03/30/18	TO-15
Tetrachloroethylene (PCE)	SVM-11-15	0.051	0.020	ug/L	1	03/30/18	03/30/18	TO-15
Chloroform	SVM-11-22	0.021	0.020	ug/L	1	03/30/18	03/30/18	TO-15
Tetrachloroethylene (PCE)	SVM-11-22	0.096	0.020	ug/L	1	03/30/18	03/30/18	TO-15

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18
Units: ug/L

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Prepared:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Analyzed:	03/30/18	03/30/18	03/30/18	03/30/18	
AA ID No:	8D02010-01	8D02010-02	8D02010-03	8D02010-04	
Client ID No:	Ambient Air	SVM-9-5	SVM-9-15	SVM-12-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

TO-3 (TO-3)

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

4-Bromofluorobenzene	116%	117%	117%	104%	<u>%REC Limits</u> 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18
Units: ug/L

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Prepared:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Analyzed:	03/30/18	03/30/18	03/30/18	03/30/18	
AA ID No:	8D02010-05	8D02010-06	8D02010-07	8D02010-08	
Client ID No:	SVM-12-15	SVM-12-22	SVM-11-7	SVM-11-15	
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
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Surrogates

4-Bromofluorobenzene	103%	105%	114%	117%	<u>%REC Limits</u> 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18
Units: ug/L

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Prepared:	03/30/18	04/02/18	04/02/18	04/02/18	
Date Analyzed:	03/30/18	04/02/18	04/02/18	04/02/18	
AA ID No:	8D02010-09	8D02010-10	8D02010-11	8D02010-12	
Client ID No:	SVM-11-22	SVM-13-7	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
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Surrogates

4-Bromofluorobenzene	105%	99%	99%	99%	<u>%REC Limits</u> 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18
Units: ug/L

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Prepared:	04/02/18	04/02/18	03/30/18	03/30/18	
Date Analyzed:	04/02/18	04/02/18	03/30/18	03/30/18	
AA ID No:	8D02010-13	8D02010-14	8D02010-15	8D02010-16	
Client ID No:	SVM-14R-8	SVM-14R-16	SVM-14R-23	SVM-14R-23 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
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Surrogates

4-Bromofluorobenzene	93%	93%	110%	104%	<u>%REC Limits</u> 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187320
Project No:	693142	Date Received:	03/30/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18
Date Prepared:	03/30/18	03/30/18	03/30/18	03/30/18
Date Analyzed:	03/30/18	03/30/18	03/30/18	03/30/18
AA ID No:	8D02010-01	8D02010-02	8D02010-03	8D02010-04
Client ID No:	Ambient Air	SVM-9-5	SVM-9-15	SVM-12-7
Matrix:	Vapor	Vapor	Vapor	Vapor
Dilution Factor:	1	1	1	1

MRL

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

Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187320
Project No:	693142	Date Received:	03/30/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18
Date Prepared:	03/30/18	03/30/18	03/30/18	03/30/18
Date Analyzed:	03/30/18	03/30/18	03/30/18	03/30/18
AA ID No:	8D02010-01	8D02010-02	8D02010-03	8D02010-04
Client ID No:	Ambient Air	SVM-9-5	SVM-9-15	SVM-12-7
Matrix:	Vapor	Vapor	Vapor	Vapor
Dilution Factor:	1	1	1	1

MRL

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

1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	0.032	<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:	MB187320
Project No:	693142	Date Received:	03/30/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18
Date Prepared:	03/30/18	03/30/18	03/30/18	03/30/18
Date Analyzed:	03/30/18	03/30/18	03/30/18	03/30/18
AA ID No:	8D02010-01	8D02010-02	8D02010-03	8D02010-04
Client ID No:	Ambient Air	SVM-9-5	SVM-9-15	SVM-12-7
Matrix:	Vapor	Vapor	Vapor	Vapor
Dilution Factor:	1	1	1	1

MRL

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

Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-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

4-Bromofluorobenzene	116%	117%	116%	104%	<u>%REC Limits</u> 70-130
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Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187320
Project No:	693142	Date Received:	03/30/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Prepared:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Analyzed:	03/30/18	03/30/18	03/30/18	03/30/18	
AA ID No:	8D02010-05	8D02010-06	8D02010-07	8D02010-08	
Client ID No:	SVM-12-15	SVM-12-22	SVM-11-7	SVM-11-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

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

Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187320
Project No:	693142	Date Received:	03/30/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18
Date Prepared:	03/30/18	03/30/18	03/30/18	03/30/18
Date Analyzed:	03/30/18	03/30/18	03/30/18	03/30/18
AA ID No:	8D02010-05	8D02010-06	8D02010-07	8D02010-08
Client ID No:	SVM-12-15	SVM-12-22	SVM-11-7	SVM-11-15
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	0.028	<0.020	0.051	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:	MB187320
Project No:	693142	Date Received:	03/30/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Prepared:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Analyzed:	03/30/18	03/30/18	03/30/18	03/30/18	
AA ID No:	8D02010-05	8D02010-06	8D02010-07	8D02010-08	
Client ID No:	SVM-12-15	SVM-12-22	SVM-11-7	SVM-11-15	
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
1,2,3-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

4-Bromofluorobenzene	103%	105%	114%	117%	%REC Limits 70-130
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Allen Aminian

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187320
Project No:	693142	Date Received:	03/30/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18
Date Prepared:	03/30/18	04/02/18	04/02/18	04/02/18
Date Analyzed:	03/30/18	04/02/18	04/02/18	04/02/18
AA ID No:	8D02010-09	8D02010-10	8D02010-11	8D02010-12
Client ID No:	SVM-11-22	SVM-13-7	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	0.021	<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:	MB187320
Project No:	693142	Date Received:	03/30/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18
Date Prepared:	03/30/18	04/02/18	04/02/18	04/02/18
Date Analyzed:	03/30/18	04/02/18	04/02/18	04/02/18
AA ID No:	8D02010-09	8D02010-10	8D02010-11	8D02010-12
Client ID No:	SVM-11-22	SVM-13-7	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)	0.096	<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:	MB187320
Project No:	693142	Date Received:	03/30/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Prepared:	03/30/18	04/02/18	04/02/18	04/02/18	
Date Analyzed:	03/30/18	04/02/18	04/02/18	04/02/18	
AA ID No:	8D02010-09	8D02010-10	8D02010-11	8D02010-12	
Client ID No:	SVM-11-22	SVM-13-7	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
1,2,3-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

4-Bromofluorobenzene	105%	99%	98%	99%	<u>%REC Limits</u> 70-130
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Allen Aminian

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187320
Project No:	693142	Date Received:	03/30/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Prepared:	04/02/18	04/02/18	03/30/18	03/30/18	
Date Analyzed:	04/02/18	04/02/18	03/30/18	03/30/18	
AA ID No:	8D02010-13	8D02010-14	8D02010-15	8D02010-16	
Client ID No:	SVM-14R-8	SVM-14R-16	SVM-14R-23	SVM-14R-23 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	20	20	MRL

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

Acetone	<0.020	<0.020	<0.40	<0.40	0.020
Allyl chloride	<0.020	<0.020	<0.40	<0.40	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.40	<0.40	0.020
Benzene	<0.020	<0.020	<0.40	<0.40	0.020
Benzyl chloride	<0.020	<0.020	<0.40	<0.40	0.020
Bromodichloromethane	<0.020	<0.020	<0.40	<0.40	0.020
Bromoform	<0.020	<0.020	<0.40	<0.40	0.020
Bromomethane	<0.020	<0.020	<0.40	<0.40	0.020
1,3-Butadiene	<0.020	<0.020	<0.40	<0.40	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.40	<0.40	0.020
tert-Butyl alcohol (TBA)	<20	<20	<400	<400	20
Carbon Disulfide	<0.020	<0.020	<0.40	<0.40	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.40	<0.40	0.020
Chlorobenzene	<0.020	<0.020	<0.40	<0.40	0.020
Chloroethane	<0.020	<0.020	<0.40	<0.40	0.020
Chloroform	<0.020	<0.020	<0.40	<0.40	0.020
Chloromethane	<0.020	<0.020	<0.40	<0.40	0.020
Cyclohexane	<0.020	<0.020	<0.40	<0.40	0.020
Dibromochloromethane	<0.020	<0.020	<0.40	<0.40	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.40	<0.40	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.40	<0.40	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.40	<0.40	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.40	<0.40	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.40	<0.40	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.40	<0.40	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.40	<0.40	0.020

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187320
Project No:	693142	Date Received:	03/30/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Prepared:	04/02/18	04/02/18	03/30/18	03/30/18	
Date Analyzed:	04/02/18	04/02/18	03/30/18	03/30/18	
AA ID No:	8D02010-13	8D02010-14	8D02010-15	8D02010-16	
Client ID No:	SVM-14R-8	SVM-14R-16	SVM-14R-23	SVM-14R-23 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	20	20	MRL

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

cis-1,2-Dichloroethylene	<0.020	<0.020	<0.40	<0.40	0.020
1,1-Dichloroethylene	<0.020	<0.020	<0.40	<0.40	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.40	<0.40	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.40	<0.40	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.40	<0.40	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.40	<0.40	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.40	<0.40	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.40	<0.40	0.020
1,4-Dioxane	<0.020	<0.020	<0.40	<0.40	0.020
Ethanol	<0.020	<0.020	<0.40	<0.40	0.020
Ethyl Acetate	<0.020	<0.020	<0.40	<0.40	0.020
Ethylbenzene	<0.020	<0.020	<0.40	<0.40	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.40	<0.40	0.020
4-Ethyltoluene	<0.020	<0.020	<0.40	<0.40	0.020
Heptane	<0.020	<0.020	<0.40	<0.40	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.40	<0.40	0.020
n-Hexane	<0.020	<0.020	<0.40	<0.40	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.40	<0.40	0.020
Isopropanol (IPA)	<0.20	<0.20	<4.0	<4.0	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.40	<0.40	0.020
Methylene Chloride	<0.020	<0.020	<0.40	<0.40	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.40	<0.40	0.020
Naphthalene	<0.020	<0.020	<0.40	<0.40	0.020
Propylene	<0.020	<0.020	<0.40	<0.40	0.020
Styrene	<0.020	<0.020	<0.40	<0.40	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.40	<0.40	0.020

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187320
Project No:	693142	Date Received:	03/30/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Prepared:	04/02/18	04/02/18	03/30/18	03/30/18	
Date Analyzed:	04/02/18	04/02/18	03/30/18	03/30/18	
AA ID No:	8D02010-13	8D02010-14	8D02010-15	8D02010-16	
Client ID No:	SVM-14R-8	SVM-14R-16	SVM-14R-23	SVM-14R-23 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	20	20	MRL

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

Tetrachloroethylene (PCE)	<0.020	<0.020	<0.40	<0.40	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.40	<0.40	0.020
Toluene	<0.020	<0.020	<0.40	<0.40	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.40	<0.40	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.40	<0.40	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.40	<0.40	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.40	<0.40	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.40	<0.40	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.40	<0.40	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.40	<0.40	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.40	<0.40	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<0.40	<0.40	0.020
Vinyl acetate	<0.020	<0.020	<0.40	<0.40	0.020
Vinyl bromide	<0.020	<0.020	<0.40	<0.40	0.020
Vinyl chloride	<0.020	<0.020	<0.40	<0.40	0.020
o-Xylene	<0.020	<0.020	<0.40	<0.40	0.020
m,p-Xylenes	<0.020	<0.020	<0.40	<0.40	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.40	<0.40	0.020
sec-Butylbenzene	<0.020	<0.020	<0.40	<0.40	0.020
Isopropylbenzene	<0.020	<0.020	<0.40	<0.40	0.020
n-Propylbenzene	<0.020	<0.020	<0.40	<0.40	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.40	<0.40	0.020
n-Butylbenzene	<0.020	<0.020	<0.40	<0.40	0.020

Surrogates

%REC Limits

Allen Aminian

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187320
Project No:	693142	Date Received:	03/30/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	04/23/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Prepared:	04/02/18	04/02/18	03/30/18	03/30/18	
Date Analyzed:	04/02/18	04/02/18	03/30/18	03/30/18	
AA ID No:	8D02010-13	8D02010-14	8D02010-15	8D02010-16	
Client ID No:	SVM-14R-8	SVM-14R-16	SVM-14R-23	SVM-14R-23 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	20	20	MRL

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

4-Bromofluorobenzene	93%	93%	108%	104%	70-130
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Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18
Units: % by Volume

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Prepared:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Analyzed:	03/30/18	03/30/18	03/30/18	03/30/18	
AA ID No:	8D02010-02	8D02010-03	8D02010-04	8D02010-05	
Client ID No:	SVM-9-5	SVM-9-15	SVM-12-7	SVM-12-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	18	16	14	7.9	0.10
Carbon Dioxide	0.43	2.5	5.3	9.9	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18
Units: % by Volume

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Prepared:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Analyzed:	03/30/18	03/30/18	03/30/18	03/30/18	
AA ID No:	8D02010-06	8D02010-07	8D02010-08	8D02010-09	
Client ID No:	SVM-12-22	SVM-11-7	SVM-11-15	SVM-11-22	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	5.2	18	14	8.1	0.10
Carbon Dioxide	11	2.8	5.2	8.3	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18
Units: % by Volume

Date Sampled:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Prepared:	03/30/18	03/30/18	03/30/18	03/30/18	
Date Analyzed:	03/30/18	03/30/18	03/30/18	03/30/18	
AA ID No:	8D02010-10	8D02010-11	8D02010-12	8D02010-13	
Client ID No:	SVM-13-7	SVM-13-15.5	SVM-13-22.5	SVM-14R-8	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	19	19	18	18	0.10
Carbon Dioxide	<0.10	<0.10	0.88	0.34	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18
Units: % by Volume

Date Sampled:	03/30/18	03/30/18	03/30/18	
Date Prepared:	03/30/18	03/30/18	03/30/18	
Date Analyzed:	03/30/18	03/30/18	03/30/18	
AA ID No:	8D02010-14	8D02010-15	8D02010-16	
Client ID No:	SVM-14R-16	SVM-14R-23	SVM-14R-23 DUP	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	<0.10	0.10
Oxygen	19	19	19	0.10
Carbon Dioxide	0.32	0.34	0.32	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
 Project No: 693142
 Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
 Date Received: 03/30/18
 Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limits	RPD	RPD Limit	Notes
VOCs by EPA TO-3 - Quality Control										
<i>Batch B8D0511 - *** DEFAULT PREP ***</i>										
Blank (B8D0511-BLK1)				Prepared & Analyzed: 04/02/18						
Gasoline Range Organics (GRO)	<20	20	ug/L							
Surrogate: 4-Bromofluorobenzene	0.0326		ug/L	0.036	91.2	70-130				
LCS (B8D0511-BS1)				Prepared & Analyzed: 04/02/18						
Gasoline Range Organics (GRO)	0.665	20	ug/L	0.82	81.2	70-130				
Surrogate: 4-Bromofluorobenzene	0.0332		ug/L	0.036	92.8	70-130				
LCS Dup (B8D0511-BSD1)				Prepared: 04/02/18 Analyzed: 04/03/18						
Gasoline Range Organics (GRO)	0.611	20	ug/L	0.82	74.7	70-130	8.34	30		
Surrogate: 4-Bromofluorobenzene	0.0349		ug/L	0.036	97.4	70-130				
<i>Batch B8D1733 - *** DEFAULT PREP ***</i>										
Blank (B8D1733-BLK1)				Prepared & Analyzed: 03/30/18						
Gasoline Range Organics (GRO)	<20	20	ug/L							
Surrogate: 4-Bromofluorobenzene	0.149		ug/L	0.14	104	70-130				
LCS (B8D1733-BS1)				Prepared & Analyzed: 03/30/18						
Gasoline Range Organics (GRO)	0.769	20	ug/L	0.82	94.0	70-130				
Surrogate: 4-Bromofluorobenzene	0.133		ug/L	0.14	93.0	70-130				
LCS Dup (B8D1733-BSD1)				Prepared & Analyzed: 03/30/18						
Gasoline Range Organics (GRO)	0.807	20	ug/L	0.82	98.7	70-130	4.85	30		
Surrogate: 4-Bromofluorobenzene	0.133		ug/L	0.14	93.0	70-130				
Duplicate (B8D1733-DUP1)				Source: 8D02010-15 Prepared & Analyzed: 03/30/18						
Gasoline Range Organics (GRO)	<20	20	ug/L	<20					30	
Surrogate: 4-Bromofluorobenzene	0.149		ug/L	0.14	104	70-130				

VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control

*Batch B8D0510 - *** DEFAULT PREP ****

Blank (B8D0510-BLK1)				Prepared & Analyzed: 04/02/18						
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							

Allen Aminian

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
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AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limits RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control									
<i>Batch B8D0510 - *** DEFAULT PREP ***</i>									
Blank (B8D0510-BLK1) Continued					Prepared & Analyzed: 04/02/18				
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						
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						

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limits RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control									
<i>Batch B8D0510 - *** DEFAULT PREP ***</i>									
Blank (B8D0510-BLK1) Continued					Prepared & Analyzed: 04/02/18				
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						
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						

Allen Aminian
 QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

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Project No: 693142
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Date Received: 03/30/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
Batch B8D0510 - *** DEFAULT PREP ***										
Blank (B8D0510-BLK1) Continued										
Prepared & Analyzed: 04/02/18										
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							
1,2,3-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							
<hr/>										
Surrogate: 4-Bromofluorobenzene	0.132		ug/L	0.14		92.0	70-130			
LCS (B8D0510-BS1)										
Prepared: 04/02/18 Analyzed: 04/03/18										
Acetone	0.0733	0.020	ug/L	0.095		77.1	70-130		30	
Benzene	0.103	0.020	ug/L	0.13		80.8	70-130		30	
Benzyl chloride	0.180	0.020	ug/L	0.21		87.1	70-130		30	
Bromodichloromethane	0.232	0.020	ug/L	0.27		86.7	70-130		30	
Bromoform	0.348	0.020	ug/L	0.41		84.1	70-130		30	
Bromomethane	0.125	0.020	ug/L	0.16		80.2	70-130		30	
2-Butanone (MEK)	0.0962	0.020	ug/L	0.12		81.5	70-130		30	
Carbon Disulfide	0.100	0.020	ug/L	0.12		80.7	70-130		30	
Carbon Tetrachloride	0.222	0.020	ug/L	0.25		88.1	70-130		30	
Chlorobenzene	0.162	0.020	ug/L	0.18		88.2	70-130		30	
Chloroethane	0.0645	0.020	ug/L	0.11		61.1	70-130		30	***
Chloroform	0.160	0.020	ug/L	0.20		82.0	70-130		30	
Chloromethane	0.0605	0.020	ug/L	0.083		73.3	70-130		30	
Dibromochloromethane	0.316	0.020	ug/L	0.34		92.6	70-130		30	
1,2-Dibromoethane (EDB)	0.316	0.020	ug/L	0.31		103	70-130		30	
1,2-Dichlorobenzene	0.209	0.020	ug/L	0.24		86.7	70-130		30	
1,3-Dichlorobenzene	0.209	0.020	ug/L	0.24		86.8	70-130		30	
1,4-Dichlorobenzene	0.208	0.020	ug/L	0.24		86.3	70-130		30	
Dichlorodifluoromethane (R12)	0.161	0.020	ug/L	0.20		81.3	70-130		30	
1,1-Dichloroethane	0.125	0.020	ug/L	0.16		77.4	70-130		30	

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**LABORATORY ANALYSIS RESULTS**

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Date Received: 03/30/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8D0510 - *** DEFAULT PREP ***</i>										
LCS (B8D0510-BS1) Continued										
Prepared: 04/02/18 Analyzed: 04/03/18										
1,2-Dichloroethane (EDC)	0.135	0.020	ug/L	0.16		83.2	70-130		30	
cis-1,2-Dichloroethylene	0.126	0.020	ug/L	0.16		79.6	70-130		30	
1,1-Dichloroethylene	0.124	0.020	ug/L	0.16		78.1	70-130		30	
trans-1,2-Dichloroethylene	0.124	0.020	ug/L	0.16		78.2	70-130		30	
1,2-Dichloropropane	0.156	0.020	ug/L	0.18		84.6	70-130		30	
trans-1,3-Dichloropropylene	0.170	0.020	ug/L	0.18		93.8	70-130		30	
cis-1,3-Dichloropropylene	0.164	0.020	ug/L	0.18		90.2	70-130		30	
Dichlorotetrafluoroethane	0.211	0.020	ug/L	0.28		75.4	70-130		30	
Ethylbenzene	0.139	0.020	ug/L	0.17		79.9	70-130		30	
4-Ethyltoluene	0.161	0.020	ug/L	0.20		81.9	70-130		30	
Hexachlorobutadiene	0.403	0.020	ug/L	0.43		94.5	70-130		30	
2-Hexanone (MBK)	0.147	0.020	ug/L	0.16		90.0	70-130		30	
Isopropanol (IPA)	0.0729	0.20	ug/L	0.098		74.1	70-130		30	
Methylene Chloride	0.0987	0.020	ug/L	0.14		71.0	70-130		30	
4-Methyl-2-pentanone (MIBK)	0.142	0.020	ug/L	0.16		86.8	70-130		30	
Styrene	0.147	0.020	ug/L	0.17		86.2	70-130		30	
1,1,2,2-Tetrachloroethane	0.192	0.020	ug/L	0.27		70.0	70-130		30	
Tetrachloroethylene (PCE)	0.239	0.020	ug/L	0.27		88.0	70-130		30	
Toluene	0.129	0.020	ug/L	0.15		85.7	70-130		30	
1,2,4-Trichlorobenzene	0.310	0.020	ug/L	0.30		105	70-130		30	
1,1,2-Trichloroethane	0.201	0.020	ug/L	0.22		92.0	70-130		30	
1,1,1-Trichloroethane	0.180	0.020	ug/L	0.22		82.7	70-130		30	
Trichloroethylene (TCE)	0.208	0.020	ug/L	0.21		96.6	70-130		30	
Trichlorofluoromethane (R11)	0.175	0.020	ug/L	0.22		78.0	70-130		30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	0.236	0.020	ug/L	0.31		77.0	70-130		30	
1,3,5-Trimethylbenzene	0.161	0.020	ug/L	0.20		82.1	70-130		30	
1,2,4-Trimethylbenzene	0.162	0.020	ug/L	0.20		82.4	70-130		30	
Vinyl acetate	0.113	0.020	ug/L	0.14		80.3	70-130		30	
Vinyl chloride	0.0722	0.020	ug/L	0.10		70.6	70-130		30	
o-Xylene	0.137	0.020	ug/L	0.17		79.0	70-130		30	
m,p-Xylenes	0.268	0.020	ug/L	0.35		77.2	70-130		30	

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LABORATORY ANALYSIS RESULTS

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Date Received: 03/30/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8D0510 - *** DEFAULT PREP ***</i>										
LCS (B8D0510-BS1) Continued					Prepared: 04/02/18 Analyzed: 04/03/18					
1,2,3-Trichloropropane	0.202	0.020	ug/L	0.24		83.7	70-130		30	
sec-Butylbenzene	0.189	0.020	ug/L	0.22		85.9	70-130		30	
Isopropylbenzene	0.167	0.020	ug/L	0.20		85.0	70-130		30	
n-Propylbenzene	0.166	0.020	ug/L	0.20		84.4	70-130		30	
4-Isopropyltoluene	0.194	0.020	ug/L	0.22		88.3	70-130		30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.141</i>		<i>ug/L</i>	<i>0.14</i>		<i>98.1</i>	<i>70-130</i>			
LCS Dup (B8D0510-BSD1)					Prepared: 04/02/18 Analyzed: 04/03/18					
Acetone	0.0750	0.020	ug/L	0.095		79.0	70-130	2.40	30	
Benzene	0.103	0.020	ug/L	0.13		80.3	70-130	0.683	30	
Benzyl chloride	0.188	0.020	ug/L	0.21		90.6	70-130	3.99	30	
Bromodichloromethane	0.228	0.020	ug/L	0.27		85.1	70-130	1.95	30	
Bromoform	0.361	0.020	ug/L	0.41		87.4	70-130	3.91	30	
Bromomethane	0.127	0.020	ug/L	0.16		81.9	70-130	2.00	30	
2-Butanone (MEK)	0.0989	0.020	ug/L	0.12		83.8	70-130	2.75	30	
Carbon Disulfide	0.100	0.020	ug/L	0.12		80.5	70-130	0.155	30	
Carbon Tetrachloride	0.224	0.020	ug/L	0.25		89.2	70-130	1.16	30	
Chlorobenzene	0.165	0.020	ug/L	0.18		89.9	70-130	1.91	30	
Chloroethane	0.0840	0.020	ug/L	0.11		79.6	70-130	26.3	30	
Chloroform	0.162	0.020	ug/L	0.20		83.0	70-130	1.24	30	
Chloromethane	0.0546	0.020	ug/L	0.083		66.1	70-130	10.3	30	***
Dibromochloromethane	0.314	0.020	ug/L	0.34		92.0	70-130	0.596	30	
1,2-Dibromoethane (EDB)	0.314	0.020	ug/L	0.31		102	70-130	0.488	30	
1,2-Dichlorobenzene	0.215	0.020	ug/L	0.24		89.4	70-130	3.07	30	
1,3-Dichlorobenzene	0.217	0.020	ug/L	0.24		90.3	70-130	4.04	30	
1,4-Dichlorobenzene	0.213	0.020	ug/L	0.24		88.6	70-130	2.63	30	
Dichlorodifluoromethane (R12)	0.158	0.020	ug/L	0.20		79.8	70-130	1.80	30	
1,1-Dichloroethane	0.126	0.020	ug/L	0.16		77.9	70-130	0.644	30	
1,2-Dichloroethane (EDC)	0.134	0.020	ug/L	0.16		83.0	70-130	0.241	30	
cis-1,2-Dichloroethylene	0.128	0.020	ug/L	0.16		81.0	70-130	1.71	30	
1,1-Dichloroethylene	0.126	0.020	ug/L	0.16		79.2	70-130	1.43	30	
trans-1,2-Dichloroethylene	0.123	0.020	ug/L	0.16		77.8	70-130	0.545	30	

Allen Aminian
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**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
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Date Received: 03/30/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
Batch B8D0510 - *** DEFAULT PREP ***										
LCS Dup (B8D0510-BSD1) Continued										
					Prepared: 04/02/18 Analyzed: 04/03/18					
1,2-Dichloropropane	0.159	0.020	ug/L	0.18		86.1	70-130	1.82	30	
trans-1,3-Dichloropropylene	0.174	0.020	ug/L	0.18		95.6	70-130	1.93	30	
cis-1,3-Dichloropropylene	0.167	0.020	ug/L	0.18		91.7	70-130	1.68	30	
Dichlorotetrafluoroethane	0.210	0.020	ug/L	0.28		75.0	70-130	0.466	30	
Ethylbenzene	0.142	0.020	ug/L	0.17		81.9	70-130	2.44	30	
4-Ethyltoluene	0.165	0.020	ug/L	0.20		84.0	70-130	2.56	30	
Hexachlorobutadiene	0.418	0.020	ug/L	0.43		98.1	70-130	3.71	30	
2-Hexanone (MBK)	0.152	0.020	ug/L	0.16		92.9	70-130	3.17	30	
Isopropanol (IPA)	0.0747	0.20	ug/L	0.098		76.0	70-130	2.50	30	
Methylene Chloride	0.100	0.020	ug/L	0.14		72.0	70-130	1.33	30	
4-Methyl-2-pentanone (MIBK)	0.145	0.020	ug/L	0.16		88.5	70-130	2.00	30	
Styrene	0.150	0.020	ug/L	0.17		88.1	70-130	2.21	30	
1,1,2,2-Tetrachloroethane	0.196	0.020	ug/L	0.27		71.4	70-130	1.98	30	
Tetrachloroethylene (PCE)	0.241	0.020	ug/L	0.27		88.7	70-130	0.793	30	
Toluene	0.131	0.020	ug/L	0.15		86.6	70-130	1.02	30	
1,2,4-Trichlorobenzene	0.328	0.020	ug/L	0.30		110	70-130	5.51	30	
1,1,2-Trichloroethane	0.204	0.020	ug/L	0.22		93.4	70-130	1.51	30	
1,1,1-Trichloroethane	0.177	0.020	ug/L	0.22		81.0	70-130	2.08	30	
Trichloroethylene (TCE)	0.205	0.020	ug/L	0.21		95.2	70-130	1.49	30	
Trichlorofluoromethane (R11)	0.180	0.020	ug/L	0.22		80.2	70-130	2.75	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	0.239	0.020	ug/L	0.31		78.0	70-130	1.39	30	
1,3,5-Trimethylbenzene	0.167	0.020	ug/L	0.20		85.1	70-130	3.59	30	
1,2,4-Trimethylbenzene	0.168	0.020	ug/L	0.20		85.2	70-130	3.37	30	
Vinyl acetate	0.115	0.020	ug/L	0.14		81.4	70-130	1.33	30	
Vinyl chloride	0.0690	0.020	ug/L	0.10		67.5	70-130	4.49	30	***
o-Xylene	0.141	0.020	ug/L	0.17		81.4	70-130	2.90	30	
m,p-Xylenes	0.279	0.020	ug/L	0.35		80.3	70-130	3.94	30	
1,2,3-Trichloropropane	0.212	0.020	ug/L	0.24		87.9	70-130	4.87	30	
sec-Butylbenzene	0.192	0.020	ug/L	0.22		87.4	70-130	1.73	30	
Isopropylbenzene	0.172	0.020	ug/L	0.20		87.4	70-130	2.75	30	
n-Propylbenzene	0.169	0.020	ug/L	0.20		85.7	70-130	1.53	30	

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8D0510 - *** DEFAULT PREP ***</i>										
LCS Dup (B8D0510-BSD1) Continued										
					Prepared: 04/02/18 Analyzed: 04/03/18					
4-Isopropyltoluene	0.200	0.020	ug/L	0.22	91.3	70-130	3.31	30		
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.143</i>		<i>ug/L</i>	<i>0.14</i>	<i>99.8</i>	<i>70-130</i>				
<i>Batch B8D1732 - *** DEFAULT PREP ***</i>										
Blank (B8D1732-BLK1)										
					Prepared & Analyzed: 03/30/18					
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							

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limits RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control									
<i>Batch B8D1732 - *** DEFAULT PREP ***</i>									
Blank (B8D1732-BLK1) Continued					Prepared & Analyzed: 03/30/18				
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						
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						

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8D1732 - *** DEFAULT PREP ***</i>										
Blank (B8D1732-BLK1) Continued					Prepared & Analyzed: 03/30/18					
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							
1,2,3-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							
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.149</i>		<i>ug/L</i>	<i>0.14</i>		<i>104</i>	<i>70-130</i>			
LCS (B8D1732-BS1)					Prepared & Analyzed: 03/30/18					
Acetone	0.0177	0.020	ug/L	0.024		74.5	70-130		30	
Benzene	0.0309	0.020	ug/L	0.032		96.7	70-130		30	
Benzyl chloride	0.0412	0.020	ug/L	0.052		79.5	70-130		30	
Bromodichloromethane	0.0582	0.020	ug/L	0.067		86.9	70-130		30	
Bromoform	0.0914	0.020	ug/L	0.10		88.4	70-130		30	
Bromomethane	0.0522	0.020	ug/L	0.039		134	70-130		30	**
2-Butanone (MEK)	0.0209	0.020	ug/L	0.029		70.9	70-130		30	
Carbon Disulfide	0.0300	0.020	ug/L	0.031		96.4	70-130		30	
Carbon Tetrachloride	0.0506	0.020	ug/L	0.063		80.5	70-130		30	
Chlorobenzene	0.0383	0.020	ug/L	0.046		83.1	70-130		30	
Chloroethane	0.0316	0.020	ug/L	0.026		120	70-130		30	
Chloroform	0.0459	0.020	ug/L	0.049		94.1	70-130		30	

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8D1732 - *** DEFAULT PREP ***</i>										
LCS (B8D1732-BS1) Continued										
Prepared & Analyzed: 03/30/18										
Chloromethane	0.0186	0.020	ug/L	0.021		90.2	70-130		30	
Dibromochloromethane	0.0823	0.020	ug/L	0.085		96.6	70-130		30	
1,2-Dibromoethane (EDB)	0.0732	0.020	ug/L	0.077		95.3	70-130		30	
1,2-Dichlorobenzene	0.0491	0.020	ug/L	0.060		81.7	70-130		30	
1,3-Dichlorobenzene	0.0504	0.020	ug/L	0.060		83.8	70-130		30	
1,4-Dichlorobenzene	0.0497	0.020	ug/L	0.060		82.7	70-130		30	
Dichlorodifluoromethane (R12)	0.0456	0.020	ug/L	0.049		92.3	70-130		30	
1,1-Dichloroethane	0.0391	0.020	ug/L	0.040		96.6	70-130		30	
1,2-Dichloroethane (EDC)	0.0372	0.020	ug/L	0.040		91.9	70-130		30	
cis-1,2-Dichloroethylene	0.0373	0.020	ug/L	0.040		94.2	70-130		30	
1,1-Dichloroethylene	0.0384	0.020	ug/L	0.040		96.8	70-130		30	
trans-1,2-Dichloroethylene	0.0384	0.020	ug/L	0.040		96.8	70-130		30	
1,2-Dichloropropane	0.0409	0.020	ug/L	0.046		88.5	70-130		30	
trans-1,3-Dichloropropylene	0.0379	0.020	ug/L	0.045		83.6	70-130		30	
cis-1,3-Dichloropropylene	0.0376	0.020	ug/L	0.045		82.8	70-130		30	
Dichlorotetrafluoroethane	0.0645	0.020	ug/L	0.070		92.3	70-130		30	
Ethylbenzene	0.0332	0.020	ug/L	0.043		76.4	70-130		30	
4-Ethyltoluene	0.0380	0.020	ug/L	0.049		77.3	70-130		30	
Hexachlorobutadiene	0.121	0.020	ug/L	0.11		114	70-130		30	
2-Hexanone (MBK)	0.0500	0.020	ug/L	0.041		122	70-130		30	
Isopropanol (IPA)	0.0268	0.20	ug/L	0.025		109	70-130		30	
Methylene Chloride	0.0341	0.020	ug/L	0.035		98.3	70-130		30	
4-Methyl-2-pentanone (MIBK)	0.0477	0.020	ug/L	0.041		116	70-130		30	
Styrene	0.0333	0.020	ug/L	0.043		78.2	70-130		30	
1,1,2,2-Tetrachloroethane	0.0515	0.020	ug/L	0.069		75.0	70-130		30	
Tetrachloroethylene (PCE)	0.0594	0.020	ug/L	0.068		87.5	70-130		30	
Toluene	0.0334	0.020	ug/L	0.038		88.6	70-130		30	
1,2,4-Trichlorobenzene	0.0772	0.020	ug/L	0.074		104	70-130		30	
1,1,2-Trichloroethane	0.0505	0.020	ug/L	0.055		92.5	70-130		30	
1,1,1-Trichloroethane	0.0495	0.020	ug/L	0.055		90.7	70-130		30	
Trichloroethylene (TCE)	0.0495	0.020	ug/L	0.054		92.1	70-130		30	
Trichlorofluoromethane (R11)	0.0547	0.020	ug/L	0.056		97.3	70-130		30	

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
 Project No: 693142
 Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
 Date Received: 03/30/18
 Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
Batch B8D1732 - *** DEFAULT PREP ***										
LCS (B8D1732-BS1) Continued										
Prepared & Analyzed: 03/30/18										
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	0.0761	0.020	ug/L	0.077		99.3	70-130		30	
1,3,5-Trimethylbenzene	0.0367	0.020	ug/L	0.049		74.7	70-130		30	
1,2,4-Trimethylbenzene	0.0364	0.020	ug/L	0.049		74.1	70-130		30	
Vinyl acetate	0.0268	0.020	ug/L	0.035		76.2	70-130		30	
Vinyl chloride	0.0256	0.020	ug/L	0.026		100	70-130		30	
o-Xylene	0.0319	0.020	ug/L	0.043		73.5	70-130		30	
m,p-Xylenes	0.0652	0.020	ug/L	0.087		75.1	70-130		30	
1,2,3-Trichloropropane	0.0478	0.020	ug/L	0.060		79.2	70-130		30	
sec-Butylbenzene	0.0439	0.020	ug/L	0.055		80.0	70-130		30	
Isopropylbenzene	0.0400	0.020	ug/L	0.049		81.4	70-130		30	
n-Propylbenzene	0.0408	0.020	ug/L	0.049		83.0	70-130		30	
4-Isopropyltoluene	0.0443	0.020	ug/L	0.055		80.7	70-130		30	
Surrogate: 4-Bromofluorobenzene	0.147		ug/L	0.14		103	70-130			
LCS Dup (B8D1732-BSD1)										
Prepared & Analyzed: 03/30/18										
Acetone	0.0176	0.020	ug/L	0.024		74.1	70-130	0.538	30	
Benzene	0.0313	0.020	ug/L	0.032		97.9	70-130	1.23	30	
Benzyl chloride	0.0413	0.020	ug/L	0.052		79.8	70-130	0.377	30	
Bromodichloromethane	0.0559	0.020	ug/L	0.067		83.4	70-130	4.11	30	
Bromoform	0.0933	0.020	ug/L	0.10		90.3	70-130	2.13	30	
Bromomethane	0.0551	0.020	ug/L	0.039		142	70-130	5.42	30	**
2-Butanone (MEK)	0.0211	0.020	ug/L	0.029		71.4	70-130	0.703	30	
Carbon Disulfide	0.0301	0.020	ug/L	0.031		96.5	70-130	0.104	30	
Carbon Tetrachloride	0.0483	0.020	ug/L	0.063		76.7	70-130	4.83	30	
Chlorobenzene	0.0391	0.020	ug/L	0.046		84.9	70-130	2.14	30	
Chloroethane	0.0316	0.020	ug/L	0.026		120	70-130	0.0836	30	
Chloroform	0.0439	0.020	ug/L	0.049		89.9	70-130	4.57	30	
Chloromethane	0.0183	0.020	ug/L	0.021		88.8	70-130	1.56	30	
Dibromochloromethane	0.0798	0.020	ug/L	0.085		93.7	70-130	3.05	30	
1,2-Dibromoethane (EDB)	0.0723	0.020	ug/L	0.077		94.1	70-130	1.27	30	
1,2-Dichlorobenzene	0.0497	0.020	ug/L	0.060		82.6	70-130	1.10	30	

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
Batch B8D1732 - *** DEFAULT PREP ***										
LCS Dup (B8D1732-BSD1) Continued										
Prepared & Analyzed: 03/30/18										
1,3-Dichlorobenzene	0.0515	0.020	ug/L	0.060		85.7	70-130	2.24	30	
1,4-Dichlorobenzene	0.0507	0.020	ug/L	0.060		84.3	70-130	1.92	30	
Dichlorodifluoromethane (R12)	0.0439	0.020	ug/L	0.049		88.8	70-130	3.87	30	
1,1-Dichloroethane	0.0390	0.020	ug/L	0.040		96.3	70-130	0.311	30	
1,2-Dichloroethane (EDC)	0.0363	0.020	ug/L	0.040		89.8	70-130	2.31	30	
cis-1,2-Dichloroethylene	0.0385	0.020	ug/L	0.040		97.1	70-130	3.03	30	
1,1-Dichloroethylene	0.0374	0.020	ug/L	0.040		94.3	70-130	2.62	30	
trans-1,2-Dichloroethylene	0.0396	0.020	ug/L	0.040		99.9	70-130	3.15	30	
1,2-Dichloropropane	0.0414	0.020	ug/L	0.046		89.5	70-130	1.12	30	
trans-1,3-Dichloropropylene	0.0374	0.020	ug/L	0.045		82.5	70-130	1.32	30	
cis-1,3-Dichloropropylene	0.0380	0.020	ug/L	0.045		83.7	70-130	1.08	30	
Dichlorotetrafluoroethane	0.0621	0.020	ug/L	0.070		88.8	70-130	3.87	30	
Ethylbenzene	0.0333	0.020	ug/L	0.043		76.7	70-130	0.392	30	
4-Ethyltoluene	0.0381	0.020	ug/L	0.049		77.5	70-130	0.258	30	
Hexachlorobutadiene	0.118	0.020	ug/L	0.11		111	70-130	2.32	30	
2-Hexanone (MBK)	0.0389	0.020	ug/L	0.041		94.9	70-130	25.1	30	
Isopropanol (IPA)	0.0243	0.20	ug/L	0.025		98.8	70-130	9.91	30	
Methylene Chloride	0.0346	0.020	ug/L	0.035		99.6	70-130	1.31	30	
4-Methyl-2-pentanone (MIBK)	0.0318	0.020	ug/L	0.041		77.6	70-130	40.1	30	QR-02
Styrene	0.0328	0.020	ug/L	0.043		76.9	70-130	1.68	30	
1,1,2,2-Tetrachloroethane	0.0487	0.020	ug/L	0.069		70.9	70-130	5.62	30	
Tetrachloroethylene (PCE)	0.0565	0.020	ug/L	0.068		83.2	70-130	5.04	30	
Toluene	0.0329	0.020	ug/L	0.038		87.3	70-130	1.48	30	
1,2,4-Trichlorobenzene	0.0771	0.020	ug/L	0.074		104	70-130	0.0962	30	
1,1,2-Trichloroethane	0.0500	0.020	ug/L	0.055		91.6	70-130	0.978	30	
1,1,1-Trichloroethane	0.0479	0.020	ug/L	0.055		87.8	70-130	3.25	30	
Trichloroethylene (TCE)	0.0486	0.020	ug/L	0.054		90.5	70-130	1.75	30	
Trichlorofluoromethane (R11)	0.0524	0.020	ug/L	0.056		93.3	70-130	4.20	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	0.0765	0.020	ug/L	0.077		99.8	70-130	0.502	30	
1,3,5-Trimethylbenzene	0.0367	0.020	ug/L	0.049		74.7	70-130	0.00	30	
1,2,4-Trimethylbenzene	0.0360	0.020	ug/L	0.049		73.2	70-130	1.22	30	

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control

Batch B8D1732 - *** DEFAULT PREP ***

LCS Dup (B8D1732-BSD1) Continued

Prepared & Analyzed: 03/30/18

Vinyl acetate	0.0265	0.020	ug/L	0.035	75.3	70-130	1.19	30	
Vinyl chloride	0.0261	0.020	ug/L	0.026	102	70-130	1.68	30	
o-Xylene	0.0317	0.020	ug/L	0.043	72.9	70-130	0.820	30	
m,p-Xylenes	0.0667	0.020	ug/L	0.087	76.8	70-130	2.30	30	
1,2,3-Trichloropropane	0.0478	0.020	ug/L	0.060	79.2	70-130	0.00	30	
sec-Butylbenzene	0.0440	0.020	ug/L	0.055	80.1	70-130	0.125	30	
Isopropylbenzene	0.0403	0.020	ug/L	0.049	82.0	70-130	0.734	30	
n-Propylbenzene	0.0400	0.020	ug/L	0.049	81.3	70-130	2.07	30	
4-Isopropyltoluene	0.0432	0.020	ug/L	0.055	78.7	70-130	2.51	30	

Surrogate: 4-Bromofluorobenzene 0.144 ug/L 0.14 100 70-130

Duplicate (B8D1732-DUP1)

Source: 8D02010-15 Prepared & Analyzed: 03/30/18

Acetone	<0.40	0.40	ug/L	<0.40				30	
Allyl chloride	<0.40	0.40	ug/L	<0.40				30	
tert-Amyl Methyl Ether (TAME)	<0.40	0.40	ug/L	<0.40				30	
Benzene	<0.40	0.40	ug/L	<0.40				30	
Benzyl chloride	<0.40	0.40	ug/L	<0.40				30	
Bromodichloromethane	<0.40	0.40	ug/L	<0.40				30	
Bromoform	<0.40	0.40	ug/L	<0.40				30	
Bromomethane	<0.40	0.40	ug/L	<0.40				30	
1,3-Butadiene	<0.40	0.40	ug/L	<0.40				30	
2-Butanone (MEK)	<0.40	0.40	ug/L	<0.40				30	
tert-Butyl alcohol (TBA)	<400	400	ug/L	<400				30	
Carbon Disulfide	<0.40	0.40	ug/L	<0.40				30	
Carbon Tetrachloride	<0.40	0.40	ug/L	<0.40				30	
Chlorobenzene	<0.40	0.40	ug/L	<0.40				30	
Chloroethane	<0.40	0.40	ug/L	<0.40				30	
Chloroform	<0.40	0.40	ug/L	<0.40				30	
Chloromethane	<0.40	0.40	ug/L	<0.40				30	
Cyclohexane	<0.40	0.40	ug/L	<0.40				30	
Dibromochloromethane	<0.40	0.40	ug/L	<0.40				30	
1,2-Dibromoethane (EDB)	<0.40	0.40	ug/L	<0.40				30	

Allen Aminian

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8D1732 - *** DEFAULT PREP ***</i>										
Duplicate (B8D1732-DUP1) Continued Source: 8D02010-15 Prepared & Analyzed: 03/30/18										
1,2-Dichlorobenzene	<0.40	0.40	ug/L		<0.40				30	
1,3-Dichlorobenzene	<0.40	0.40	ug/L		<0.40				30	
1,4-Dichlorobenzene	<0.40	0.40	ug/L		<0.40				30	
Dichlorodifluoromethane (R12)	<0.40	0.40	ug/L		<0.40				30	
1,1-Dichloroethane	<0.40	0.40	ug/L		<0.40				30	
1,2-Dichloroethane (EDC)	<0.40	0.40	ug/L		<0.40				30	
cis-1,2-Dichloroethylene	<0.40	0.40	ug/L		<0.40				30	
1,1-Dichloroethylene	<0.40	0.40	ug/L		<0.40				30	
trans-1,2-Dichloroethylene	<0.40	0.40	ug/L		<0.40				30	
1,2-Dichloropropane	<0.40	0.40	ug/L		<0.40				30	
trans-1,3-Dichloropropylene	<0.40	0.40	ug/L		<0.40				30	
cis-1,3-Dichloropropylene	<0.40	0.40	ug/L		<0.40				30	
Dichlorotetrafluoroethane	<0.40	0.40	ug/L		<0.40				30	
Diisopropyl ether (DIPE)	<0.40	0.40	ug/L		<0.40				30	
1,4-Dioxane	<0.40	0.40	ug/L		<0.40				30	
Ethanol	<0.40	0.40	ug/L		<0.40				30	
Ethyl Acetate	<0.40	0.40	ug/L		<0.40				30	
Ethylbenzene	<0.40	0.40	ug/L		<0.40				30	
Ethyl-tert-Butyl Ether (ETBE)	<0.40	0.40	ug/L		<0.40				30	
4-Ethyltoluene	<0.40	0.40	ug/L		<0.40				30	
Heptane	<0.40	0.40	ug/L		<0.40				30	
Hexachlorobutadiene	<0.40	0.40	ug/L		<0.40				30	
n-Hexane	<0.40	0.40	ug/L		<0.40				30	
2-Hexanone (MBK)	<0.40	0.40	ug/L		<0.40				30	
Isopropanol (IPA)	<4.0	4.0	ug/L		<4.0				30	
Methyl-tert-Butyl Ether (MTBE)	<0.40	0.40	ug/L		<0.40				30	
Methylene Chloride	<0.40	0.40	ug/L		<0.40				30	
4-Methyl-2-pentanone (MIBK)	<0.40	0.40	ug/L		<0.40				30	
Naphthalene	<0.40	0.40	ug/L		<0.40				30	
Propylene	<0.40	0.40	ug/L		<0.40				30	
Styrene	<0.40	0.40	ug/L		<0.40				30	
1,1,2,2-Tetrachloroethane	<0.40	0.40	ug/L		<0.40				30	

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
Batch B8D1732 - *** DEFAULT PREP ***										
Duplicate (B8D1732-DUP1) Continued Source: 8D02010-15 Prepared & Analyzed: 03/30/18										
Tetrachloroethylene (PCE)	<0.40	0.40	ug/L		<0.40				30	
Tetrahydrofuran (THF)	<0.40	0.40	ug/L		<0.40				30	
Toluene	<0.40	0.40	ug/L		<0.40				30	
1,2,4-Trichlorobenzene	<0.40	0.40	ug/L		<0.40				30	
1,1,2-Trichloroethane	<0.40	0.40	ug/L		<0.40				30	
1,1,1-Trichloroethane	<0.40	0.40	ug/L		<0.40				30	
Trichloroethylene (TCE)	<0.40	0.40	ug/L		<0.40				30	
Trichlorofluoromethane (R11)	<0.40	0.40	ug/L		<0.40				30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.40	0.40	ug/L		<0.40				30	
1,3,5-Trimethylbenzene	<0.40	0.40	ug/L		<0.40				30	
1,2,4-Trimethylbenzene	<0.40	0.40	ug/L		<0.40				30	
2,2,4-Trimethylpentane	<0.40	0.40	ug/L		<0.40				30	
Vinyl acetate	<0.40	0.40	ug/L		<0.40				30	
Vinyl bromide	<0.40	0.40	ug/L		<0.40				30	
Vinyl chloride	<0.40	0.40	ug/L		<0.40				30	
o-Xylene	<0.40	0.40	ug/L		<0.40				30	
m,p-Xylenes	<0.40	0.40	ug/L		<0.40				30	
1,2,3-Trichloropropane	<0.40	0.40	ug/L		<0.40				30	
sec-Butylbenzene	<0.40	0.40	ug/L		<0.40				30	
Isopropylbenzene	<0.40	0.40	ug/L		<0.40				30	
n-Propylbenzene	<0.40	0.40	ug/L		<0.40				30	
4-Isopropyltoluene	<0.40	0.40	ug/L		<0.40				30	
n-Butylbenzene	<0.40	0.40	ug/L		<0.40				30	
Surrogate: 4-Bromofluorobenzene	0.149		ug/L	0.14		104	70-130			

Fixed Gases by TCD - Quality Control

Batch B8D1720 - *** DEFAULT PREP ***

Blank (B8D1720-BLK1)

Prepared & Analyzed: 03/30/18

Methane	<0.10	0.10	% by Volume
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Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
<i>Batch B8D1720 - *** DEFAULT PREP ***</i>										
Blank (B8D1720-BLK1) Continued Prepared & Analyzed: 03/30/18										
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B8D1720-BS1) Prepared & Analyzed: 03/30/18										
Methane	4.51	0.10	% by Volume	4.5		100	75-125			
Oxygen	4.17	0.10	% by Volume	4.0		104	75-125			
Carbon Dioxide	12.9	0.10	% by Volume	15		86.0	75-125			
LCS Dup (B8D1720-BSD1) Prepared & Analyzed: 03/30/18										
Methane	4.65	0.10	% by Volume	4.5		103	75-125	3.08	30	
Oxygen	3.94	0.10	% by Volume	4.0		98.6	75-125	5.64	30	
Carbon Dioxide	13.5	0.10	% by Volume	15		89.7	75-125	4.20	30	
Duplicate (B8D1720-DUP1) Source: 8D02010-15 Prepared & Analyzed: 03/30/18										
Methane	<0.10	0.10	% by Volume		<0.10				30	
Oxygen	18.7	0.10	% by Volume		18.7			0.251	30	
Carbon Dioxide	0.320	0.10	% by Volume		0.340			6.06	30	

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187320
Date Received: 03/30/18
Date Reported: 04/23/18

Special Notes

- [1] = ** : Analyte recovery exceeded the upper control limit.
- [2] = *** : Analyte recovery exceeded the lower control limit.
- [3] = **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.

A handwritten signature in black ink, appearing to read 'Allen Aminian'.

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.:

70050949

Page 1 of 2

Client: CH2MHILL Project Name / No.: KINDER MORGAN NORWALK Sampler's Name: William Selfadant
 Project Manager: _____ Site Address: 15306 NORWALK BLVD Sampler's Signature: [Signature]
 Phone: _____ City: NORWALK P.O. No.: _____
 Fax: _____ State & Zip: CA Quote No.: _____

TAT Turnaround Codes **

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

ANALYSIS REQUESTED (Test Name)

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	Please enter the TAT Turnaround Codes ** below										Special Instructions		
						①	②	③	④	⑤	X							
AMBIENT AIR	8D02010-1	3/30/18	0720	V	1	X												
SUM-9-5	-2		0730	V	3	X	X	X										
SUM-9-15	-3		0732	V	3	X	X	X										
SUM-12-7	-4		0825	V	3	X	X	X										
SUM-12-15	-5		0826	V	3	X	X	X										
SUM-12-22	-6		0827	V	3	X	X	X										
SUM-11-7	-7		0925	V	3	X	X	X										
SUM-11-15	-8		0927	V	3	X	X	X										
SUM-11-22	-9		0929	V	3	X	X	X										
SUM-13-7	-10		1024	V	3	X	X	X										
SUM-13-15, 15	-11		1026	V	3	X	X	X										
SUM-13-22, 5	-12		1028	V	3	X	X	X										
SUM-14R-8	-13		1120	V	3	X	X	X										
SUM-14R-16	-14		1122	V	3	X	X	X										
SUM-14R-23	-15		1124	V	3	X	X	X										

T015
T03
F010000

For Laboratory Use REVIEWED Date: <u>4/2/18</u> Time: <u>10:00</u> TAT: <u>5</u> Days Sign: <u>[Signature]</u>	Relinquished by: <u>[Signature]</u>	Date: <u>3/30/18</u>	Time: <u>1245</u>	Received by: <u>[Signature]</u>
	Relinquished by: <u>[Signature]</u>	Date: <u>3/30/18</u>	Time: <u>16:00</u>	Received by: <u>[Signature]</u>
	Relinquished by: _____	Date: _____	Time: _____	Received by: _____

Note: By relinquishing samples to American Analytics, client agrees to pay for the services requested on this chain of custody form and any additional client-requested analyses performed on this project



AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311

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

A.A. COC No.:

70050372
Page 2 of 2

Client: CH2MHILL Project Name / No.: KINDER MORGAN Sampler's Name: William Schmitt
 Project Manager: Site Address: 15306 NORWALK BLVD Sampler's Signature: [Signature]
 Phone: City: NORWALK P.O. No.:
 Fax: State & Zip: CA Quote No.:

TAT Turnaround Codes **

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

ANALYSIS REQUESTED (Test Name)

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	ANALYSIS REQUESTED (Test Name)										Special Instructions			
						Please enter the TAT Turnaround Codes ** below													
<u>SUM-14R-23 DUP</u>	<u>8D02010-16</u>	<u>3/30/18</u>	<u>1124</u>	<u>✓</u>	<u>3</u>	<u>X</u>	<u>X</u>	<u>7</u>											

For Laboratory Use REVIEWED Date <u>4/2/18</u> Time <u>12:00</u> TAT <u>3 Days</u> Sign: <u>[Signature]</u>	Relinquished by <u>[Signature]</u> Date <u>3/30/18</u> Time <u>12:45</u> Received by <u>[Signature]</u>
	Relinquished by <u>[Signature]</u> Date <u>3/30/18</u> Time <u>12:00</u> Received by <u>[Signature]</u>
	Relinquished by _____ Date _____ Time _____ Received by _____

Note: By relinquishing samples to American Analytics, client agrees to pay for the services requested on this chain of custody form and any additional client requested analyses performed on this project.



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

June 18, 2018

Vladimir Carino
CH2M Hill, Inc.
P.O. Box 241329
Denver, CO 80224

**Re : KMEP Norwalk Biosparge Startup / 693142
MB187321 / 8F15012**

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received on 06/08/18 15:00 and analyzed in accordance with the attached chain-of-custody.

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

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

Sincerely,

A handwritten signature in black ink, appearing to read 'Allen A.', is written above the printed name.

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
<u>Fixed Gases - Field</u>					
SVM-1-5	8F15012-01	Vapor	5	06/06/18 07:56	06/08/18 15:00
SVM-1-15	8F15012-02	Vapor	5	06/06/18 07:57	06/08/18 15:00
SVM-2-5	8F15012-03	Vapor	5	06/06/18 08:38	06/08/18 15:00
SVM-15-7	8F15012-04	Vapor	5	06/06/18 09:20	06/08/18 15:00
SVM-15-15	8F15012-05	Vapor	5	06/06/18 09:21	06/08/18 15:00
SVM-15-22	8F15012-06	Vapor	5	06/06/18 09:22	06/08/18 15:00
SVM-6-7	8F15012-07	Vapor	5	06/06/18 10:15	06/08/18 15:00
SVM-6-13	8F15012-08	Vapor	5	06/06/18 10:16	06/08/18 15:00
SVM-7-6	8F15012-09	Vapor	5	06/06/18 10:50	06/08/18 15:00
SVM-7-13	8F15012-10	Vapor	5	06/06/18 10:51	06/08/18 15:00
SVM-7-13 DUP	8F15012-11	Vapor	5	06/06/18 10:51	06/08/18 15:00
SVM-10-15	8F15012-12	Vapor	5	06/06/18 11:42	06/08/18 15:00
SVM-5-5	8F15012-13	Vapor	5	06/07/18 08:00	06/08/18 15:00
SVM-5-15	8F15012-14	Vapor	5	06/07/18 08:01	06/08/18 15:00
SVM-8-5	8F15012-15	Vapor	5	06/07/18 08:35	06/08/18 15:00
SVM-8-15	8F15012-16	Vapor	5	06/07/18 08:36	06/08/18 15:00
SVM-16-7	8F15012-17	Vapor	5	06/07/18 08:58	06/08/18 15:00
SVM-16-16	8F15012-18	Vapor	5	06/07/18 08:59	06/08/18 15:00
SVM-16-22	8F15012-19	Vapor	5	06/07/18 09:00	06/08/18 15:00

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-3-5	8F15012-20	Vapor	5	06/07/18 10:30	06/08/18 15:00
SVM-3-15	8F15012-21	Vapor	5	06/07/18 10:31	06/08/18 15:00
SVM-12-7	8F15012-22	Vapor	5	06/07/18 11:16	06/08/18 15:00
SVM-12-15	8F15012-23	Vapor	5	06/07/18 11:17	06/08/18 15:00
SVM-12-22	8F15012-24	Vapor	5	06/07/18 11:18	06/08/18 15:00
SVM-12-22 DUP	8F15012-25	Vapor	5	06/07/18 11:18	06/08/18 15:00
SVM-11-7	8F15012-26	Vapor	5	06/08/18 07:34	06/08/18 15:00
SVM-11-15	8F15012-27	Vapor	5	06/08/18 07:35	06/08/18 15:00
SVM-11-22	8F15012-28	Vapor	5	06/08/18 07:36	06/08/18 15:00
SVM-13-7	8F15012-29	Vapor	5	06/08/18 08:32	06/08/18 15:00
SVM-13-15.5	8F15012-30	Vapor	5	06/08/18 08:33	06/08/18 15:00
SVM-13-22.5	8F15012-31	Vapor	5	06/08/18 08:34	06/08/18 15:00
SVM-14R-8	8F15012-32	Vapor	5	06/08/18 09:27	06/08/18 15:00
SVM-14R-16	8F15012-33	Vapor	5	06/08/18 09:28	06/08/18 15:00
SVM-14R-23	8F15012-34	Vapor	5	06/08/18 09:29	06/08/18 15:00
SVM-14R-23 DUP	8F15012-35	Vapor	5	06/08/18 09:29	06/08/18 15:00
<u>TO-15 (Mid Level)</u>					
SVM-1-5	8F15012-01	Vapor	5	06/06/18 07:56	06/08/18 15:00
SVM-1-15	8F15012-02	Vapor	5	06/06/18 07:57	06/08/18 15:00
SVM-2-5	8F15012-03	Vapor	5	06/06/18 08:38	06/08/18 15:00

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-15-7	8F15012-04	Vapor	5	06/06/18 09:20	06/08/18 15:00
SVM-15-15	8F15012-05	Vapor	5	06/06/18 09:21	06/08/18 15:00
SVM-15-22	8F15012-06	Vapor	5	06/06/18 09:22	06/08/18 15:00
SVM-6-7	8F15012-07	Vapor	5	06/06/18 10:15	06/08/18 15:00
SVM-6-13	8F15012-08	Vapor	5	06/06/18 10:16	06/08/18 15:00
SVM-7-6	8F15012-09	Vapor	5	06/06/18 10:50	06/08/18 15:00
SVM-7-13	8F15012-10	Vapor	5	06/06/18 10:51	06/08/18 15:00
SVM-7-13 DUP	8F15012-11	Vapor	5	06/06/18 10:51	06/08/18 15:00
SVM-10-15	8F15012-12	Vapor	5	06/06/18 11:42	06/08/18 15:00
SVM-5-5	8F15012-13	Vapor	5	06/07/18 08:00	06/08/18 15:00
SVM-5-15	8F15012-14	Vapor	5	06/07/18 08:01	06/08/18 15:00
SVM-8-5	8F15012-15	Vapor	5	06/07/18 08:35	06/08/18 15:00
SVM-8-15	8F15012-16	Vapor	5	06/07/18 08:36	06/08/18 15:00
SVM-16-7	8F15012-17	Vapor	5	06/07/18 08:58	06/08/18 15:00
SVM-16-16	8F15012-18	Vapor	5	06/07/18 08:59	06/08/18 15:00
SVM-16-22	8F15012-19	Vapor	5	06/07/18 09:00	06/08/18 15:00
SVM-3-5	8F15012-20	Vapor	5	06/07/18 10:30	06/08/18 15:00
SVM-3-15	8F15012-21	Vapor	5	06/07/18 10:31	06/08/18 15:00
SVM-12-7	8F15012-22	Vapor	5	06/07/18 11:16	06/08/18 15:00
SVM-12-15	8F15012-23	Vapor	5	06/07/18 11:17	06/08/18 15:00

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-12-22	8F15012-24	Vapor	5	06/07/18 11:18	06/08/18 15:00
SVM-12-22 DUP	8F15012-25	Vapor	5	06/07/18 11:18	06/08/18 15:00
SVM-11-7	8F15012-26	Vapor	5	06/08/18 07:34	06/08/18 15:00
SVM-11-15	8F15012-27	Vapor	5	06/08/18 07:35	06/08/18 15:00
SVM-11-22	8F15012-28	Vapor	5	06/08/18 07:36	06/08/18 15:00
SVM-13-7	8F15012-29	Vapor	5	06/08/18 08:32	06/08/18 15:00
SVM-13-15.5	8F15012-30	Vapor	5	06/08/18 08:33	06/08/18 15:00
SVM-13-22.5	8F15012-31	Vapor	5	06/08/18 08:34	06/08/18 15:00
SVM-14R-8	8F15012-32	Vapor	5	06/08/18 09:27	06/08/18 15:00
SVM-14R-16	8F15012-33	Vapor	5	06/08/18 09:28	06/08/18 15:00
SVM-14R-23	8F15012-34	Vapor	5	06/08/18 09:29	06/08/18 15:00
SVM-14R-23 DUP	8F15012-35	Vapor	5	06/08/18 09:29	06/08/18 15:00

TO-3

SVM-1-5	8F15012-01	Vapor	5	06/06/18 07:56	06/08/18 15:00
SVM-1-15	8F15012-02	Vapor	5	06/06/18 07:57	06/08/18 15:00
SVM-2-5	8F15012-03	Vapor	5	06/06/18 08:38	06/08/18 15:00
SVM-15-7	8F15012-04	Vapor	5	06/06/18 09:20	06/08/18 15:00
SVM-15-15	8F15012-05	Vapor	5	06/06/18 09:21	06/08/18 15:00
SVM-15-22	8F15012-06	Vapor	5	06/06/18 09:22	06/08/18 15:00
SVM-6-7	8F15012-07	Vapor	5	06/06/18 10:15	06/08/18 15:00

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-6-13	8F15012-08	Vapor	5	06/06/18 10:16	06/08/18 15:00
SVM-7-6	8F15012-09	Vapor	5	06/06/18 10:50	06/08/18 15:00
SVM-7-13	8F15012-10	Vapor	5	06/06/18 10:51	06/08/18 15:00
SVM-7-13 DUP	8F15012-11	Vapor	5	06/06/18 10:51	06/08/18 15:00
SVM-10-15	8F15012-12	Vapor	5	06/06/18 11:42	06/08/18 15:00
SVM-5-5	8F15012-13	Vapor	5	06/07/18 08:00	06/08/18 15:00
SVM-5-15	8F15012-14	Vapor	5	06/07/18 08:01	06/08/18 15:00
SVM-8-5	8F15012-15	Vapor	5	06/07/18 08:35	06/08/18 15:00
SVM-8-15	8F15012-16	Vapor	5	06/07/18 08:36	06/08/18 15:00
SVM-16-7	8F15012-17	Vapor	5	06/07/18 08:58	06/08/18 15:00
SVM-16-16	8F15012-18	Vapor	5	06/07/18 08:59	06/08/18 15:00
SVM-16-22	8F15012-19	Vapor	5	06/07/18 09:00	06/08/18 15:00
SVM-3-5	8F15012-20	Vapor	5	06/07/18 10:30	06/08/18 15:00
SVM-3-15	8F15012-21	Vapor	5	06/07/18 10:31	06/08/18 15:00
SVM-12-7	8F15012-22	Vapor	5	06/07/18 11:16	06/08/18 15:00
SVM-12-15	8F15012-23	Vapor	5	06/07/18 11:17	06/08/18 15:00
SVM-12-22	8F15012-24	Vapor	5	06/07/18 11:18	06/08/18 15:00
SVM-12-22 DUP	8F15012-25	Vapor	5	06/07/18 11:18	06/08/18 15:00
SVM-11-7	8F15012-26	Vapor	5	06/08/18 07:34	06/08/18 15:00
SVM-11-15	8F15012-27	Vapor	5	06/08/18 07:35	06/08/18 15:00

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-11-22	8F15012-28	Vapor	5	06/08/18 07:36	06/08/18 15:00
SVM-13-7	8F15012-29	Vapor	5	06/08/18 08:32	06/08/18 15:00
SVM-13-15.5	8F15012-30	Vapor	5	06/08/18 08:33	06/08/18 15:00
SVM-13-22.5	8F15012-31	Vapor	5	06/08/18 08:34	06/08/18 15:00
SVM-14R-8	8F15012-32	Vapor	5	06/08/18 09:27	06/08/18 15:00
SVM-14R-16	8F15012-33	Vapor	5	06/08/18 09:28	06/08/18 15:00
SVM-14R-23	8F15012-34	Vapor	5	06/08/18 09:29	06/08/18 15:00
SVM-14R-23 DUP	8F15012-35	Vapor	5	06/08/18 09:29	06/08/18 15:00

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Fixed Gases by TCD								
Oxygen	SVM-1-5	19	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Oxygen	SVM-1-15	19	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Oxygen	SVM-2-5	19	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Oxygen	SVM-15-7	19	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Carbon Dioxide	SVM-15-7	0.15	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Oxygen	SVM-15-15	19	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Carbon Dioxide	SVM-15-15	0.19	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Oxygen	SVM-15-22	19	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Oxygen	SVM-6-7	19	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Carbon Dioxide	SVM-6-7	0.35	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-6-13	18	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Carbon Dioxide	SVM-6-13	0.90	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Oxygen	SVM-7-6	18	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Carbon Dioxide	SVM-7-6	0.78	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Oxygen	SVM-7-13	18	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Carbon Dioxide	SVM-7-13	0.91	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Oxygen	SVM-7-13 DUP	18	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Carbon Dioxide	SVM-7-13 DUP	0.92	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Oxygen	SVM-10-15	11	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Carbon Dioxide	SVM-10-15	3.5	0.10	% by Volume	1	06/06/18	06/06/18	EPA 3CM
Oxygen	SVM-5-5	19	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-5-15	19	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Oxygen	SVM-8-5	19	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Carbon Dioxide	SVM-8-5	0.16	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Oxygen	SVM-8-15	19	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Carbon Dioxide	SVM-8-15	0.14	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Oxygen	SVM-16-7	19	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Carbon Dioxide	SVM-16-7	0.36	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Oxygen	SVM-16-16	19	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Carbon Dioxide	SVM-16-16	0.61	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Oxygen	SVM-16-22	10	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Carbon Dioxide	SVM-16-22	6.8	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-3-5	19	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Carbon Dioxide	SVM-3-5	0.20	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Oxygen	SVM-3-15	19	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Carbon Dioxide	SVM-3-15	0.29	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Oxygen	SVM-12-7	18	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Carbon Dioxide	SVM-12-7	3.3	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Oxygen	SVM-12-15	15	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Carbon Dioxide	SVM-12-15	7.5	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Oxygen	SVM-12-22	11	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Carbon Dioxide	SVM-12-22	7.6	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Oxygen	SVM-12-22 DUP	11	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Carbon Dioxide	SVM-12-22 DUP	7.6	0.10	% by Volume	1	06/07/18	06/07/18	EPA 3CM
Oxygen	SVM-11-7	19	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM
Carbon Dioxide	SVM-11-7	0.90	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM
Oxygen	SVM-11-15	18	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM
Carbon Dioxide	SVM-11-15	2.9	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM
Oxygen	SVM-11-22	8.0	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM
Carbon Dioxide	SVM-11-22	9.6	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM
Oxygen	SVM-13-7	19	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM
Oxygen	SVM-13-15.5	19	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM
Methane	SVM-13-22.5	18	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM
Oxygen	SVM-13-22.5	0.88	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-14R-8	18	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM
Carbon Dioxide	SVM-14R-8	0.55	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM
Oxygen	SVM-14R-16	19	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM
Carbon Dioxide	SVM-14R-16	0.50	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM
Oxygen	SVM-14R-23	19	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM
Carbon Dioxide	SVM-14R-23	0.26	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM
Oxygen	SVM-14R-23 DUP	19	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM
Carbon Dioxide	SVM-14R-23 DUP	0.22	0.10	% by Volume	1	06/08/18	06/08/18	EPA 3CM

VOCs by EPA TO-3

Gasoline Range Organics (GRO)	SVM-14R-23	35	20	ug/L	1	06/08/18	06/08/18	TO-3
Gasoline Range Organics (GRO)	SVM-14R-23 DUP	34	20	ug/L	1	06/08/18	06/08/18	TO-3

VOCs by GCMS EPA TO-15 (Mid Level)

Heptane	SVM-16-22	0.024	0.020	ug/L	1	06/07/18	06/07/18	TO-15
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Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Bromodichloromethane	SVM-3-5	0.027	0.020	ug/L	1	06/07/18	06/07/18	TO-15
Chloroform	SVM-3-5	0.056	0.020	ug/L	1	06/07/18	06/07/18	TO-15
Chloroform	SVM-3-15	0.025	0.020	ug/L	1	06/07/18	06/07/18	TO-15
Tetrachloroethylene (PCE)	SVM-12-22	0.028	0.020	ug/L	1	06/07/18	06/07/18	TO-15
Tetrachloroethylene (PCE)	SVM-12-22 DUP	0.028	0.020	ug/L	1	06/07/18	06/07/18	TO-15
Tetrachloroethylene (PCE)	SVM-11-15	0.025	0.020	ug/L	1	06/08/18	06/08/18	TO-15
Tetrachloroethylene (PCE)	SVM-11-22	0.10	0.020	ug/L	1	06/08/18	06/08/18	TO-15
n-Hexane	SVM-14R-8	0.032	0.020	ug/L	1	06/08/18	06/08/18	TO-15
Methylene Chloride	SVM-14R-8	0.024	0.020	ug/L	1	06/08/18	06/08/18	TO-15
Tetrachloroethylene (PCE)	SVM-14R-23	0.37	0.20	ug/L	10	06/08/18	06/08/18	TO-15
Tetrachloroethylene (PCE)	SVM-14R-23 DUP	0.37	0.20	ug/L	10	06/08/18	06/08/18	TO-15

Allen A

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 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: ug/L

Date Sampled:	06/06/18	06/06/18	06/06/18	06/06/18	
Date Prepared:	06/06/18	06/06/18	06/06/18	06/06/18	
Date Analyzed:	06/06/18	06/06/18	06/06/18	06/06/18	
AA ID No:	8F15012-01	8F15012-02	8F15012-03	8F15012-04	
Client ID No:	SVM-1-5	SVM-1-15	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
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Surrogates

4-Bromofluorobenzene	107%	108%	108%	109%	<u>%REC Limits</u> 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: ug/L

Date Sampled:	06/06/18	06/06/18	06/06/18	06/06/18	
Date Prepared:	06/06/18	06/06/18	06/06/18	06/06/18	
Date Analyzed:	06/06/18	06/06/18	06/06/18	06/06/18	
AA ID No:	8F15012-05	8F15012-06	8F15012-07	8F15012-08	
Client ID No:	SVM-15-15	SVM-15-22	SVM-6-7	SVM-6-13	
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
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Surrogates

4-Bromofluorobenzene	111%	107%	108%	106%	<u>%REC Limits</u> 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: ug/L

Date Sampled:	06/06/18	06/06/18	06/06/18	06/06/18	
Date Prepared:	06/06/18	06/06/18	06/06/18	06/06/18	
Date Analyzed:	06/06/18	06/06/18	06/06/18	06/06/18	
AA ID No:	8F15012-09	8F15012-10	8F15012-11	8F15012-12	
Client ID No:	SVM-7-6	SVM-7-13	SVM-7-13 DUP	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
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Surrogates

4-Bromofluorobenzene	107%	107%	106%	108%	<u>%REC Limits</u> 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: ug/L

Date Sampled:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Prepared:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Analyzed:	06/07/18	06/07/18	06/07/18	06/07/18	
AA ID No:	8F15012-13	8F15012-14	8F15012-15	8F15012-16	
Client ID No:	SVM-5-5	SVM-5-15	SVM-8-5	SVM-8-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

TO-3 (TO-3)

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

4-Bromofluorobenzene	112%	114%	115%	114%	%REC Limits 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: ug/L

Date Sampled:	06/07/2018	06/07/2018	06/07/2018	06/07/2018	
Date Prepared:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Analyzed:	06/07/18	06/07/18	06/07/18	06/07/18	
AA ID No:	8F15012-17	8F15012-18	8F15012-19	8F15012-20	
Client ID No:	SVM-16-7	SVM-16-16	SVM-16-22	SVM-3-5	
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
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Surrogates

4-Bromofluorobenzene	117%	111%	112%	113%	%REC Limits 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: ug/L

Date Sampled:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Prepared:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Analyzed:	06/07/18	06/07/18	06/07/18	06/07/18	
AA ID No:	8F15012-21	8F15012-22	8F15012-23	8F15012-24	
Client ID No:	SVM-3-15	SVM-12-7	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
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Surrogates

4-Bromofluorobenzene	104%	108%	110%	109%	%REC Limits 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: ug/L

Date Sampled:	06/07/18	06/08/18	06/08/18	06/08/18	
Date Prepared:	06/07/18	06/08/18	06/08/18	06/08/18	
Date Analyzed:	06/07/18	06/08/18	06/08/18	06/08/18	
AA ID No:	8F15012-25	8F15012-26	8F15012-27	8F15012-28	
Client ID No:	SVM-12-22 DUP	SVM-11-7	SVM-11-15	SVM-11-22	
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
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Surrogates

4-Bromofluorobenzene	110%	102%	104%	102%	%REC Limits 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: ug/L

Date Sampled:	06/08/18	06/08/18	06/08/18	06/08/18	
Date Prepared:	06/08/18	06/08/18	06/08/18	06/08/18	
Date Analyzed:	06/08/18	06/08/18	06/08/18	06/08/18	
AA ID No:	8F15012-29	8F15012-30	8F15012-31	8F15012-32	
Client ID No:	SVM-13-7	SVM-13-15.5	SVM-13-22.5	SVM-14R-8	
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
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Surrogates

4-Bromofluorobenzene	103%	106%	109%	102%	<u>%REC Limits</u> 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: ug/L

Date Sampled:	06/08/18	06/08/18	06/08/18	
Date Prepared:	06/08/18	06/08/18	06/08/18	
Date Analyzed:	06/08/18	06/08/18	06/08/18	
AA ID No:	8F15012-33	8F15012-34	8F15012-35	
Client ID No:	SVM-14R-16	SVM-14R-23	SVM-14R-23	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	MRL

TO-3 (TO-3)

Gasoline Range Organics (GRO)	<20	35	34	20
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Surrogates

4-Bromofluorobenzene	99%	111%	105%	%REC Limits 70-130
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Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/06/18	06/06/18	06/06/18	06/06/18	
Date Prepared:	06/06/18	06/06/18	06/06/18	06/06/18	
Date Analyzed:	06/06/18	06/06/18	06/06/18	06/06/18	
AA ID No:	8F15012-01	8F15012-02	8F15012-03	8F15012-04	
Client ID No:	SVM-1-5	SVM-1-15	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:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/06/18	06/06/18	06/06/18	06/06/18
Date Prepared:	06/06/18	06/06/18	06/06/18	06/06/18
Date Analyzed:	06/06/18	06/06/18	06/06/18	06/06/18
AA ID No:	8F15012-01	8F15012-02	8F15012-03	8F15012-04
Client ID No:	SVM-1-5	SVM-1-15	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.	AA Project No:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/06/18	06/06/18	06/06/18	06/06/18
Date Prepared:	06/06/18	06/06/18	06/06/18	06/06/18
Date Analyzed:	06/06/18	06/06/18	06/06/18	06/06/18
AA ID No:	8F15012-01	8F15012-02	8F15012-03	8F15012-04
Client ID No:	SVM-1-5	SVM-1-15	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
1,2,3-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

4-Bromofluorobenzene	107%	108%	108%	109%	<u>%REC Limits</u> 70-130
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Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/06/18	06/06/18	06/06/18	06/06/18
Date Prepared:	06/06/18	06/06/18	06/06/18	06/06/18
Date Analyzed:	06/06/18	06/06/18	06/06/18	06/06/18
AA ID No:	8F15012-05	8F15012-06	8F15012-07	8F15012-08
Client ID No:	SVM-15-15	SVM-15-22	SVM-6-7	SVM-6-13
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:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/06/18	06/06/18	06/06/18	06/06/18
Date Prepared:	06/06/18	06/06/18	06/06/18	06/06/18
Date Analyzed:	06/06/18	06/06/18	06/06/18	06/06/18
AA ID No:	8F15012-05	8F15012-06	8F15012-07	8F15012-08
Client ID No:	SVM-15-15	SVM-15-22	SVM-6-7	SVM-6-13
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:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/06/18	06/06/18	06/06/18	06/06/18	
Date Prepared:	06/06/18	06/06/18	06/06/18	06/06/18	
Date Analyzed:	06/06/18	06/06/18	06/06/18	06/06/18	
AA ID No:	8F15012-05	8F15012-06	8F15012-07	8F15012-08	
Client ID No:	SVM-15-15	SVM-15-22	SVM-6-7	SVM-6-13	
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
1,2,3-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

<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	111%	107%	108%	106%	70-130

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/06/18	06/06/18	06/06/18	06/06/18
Date Prepared:	06/06/18	06/06/18	06/06/18	06/06/18
Date Analyzed:	06/06/18	06/06/18	06/06/18	06/06/18
AA ID No:	8F15012-09	8F15012-10	8F15012-11	8F15012-12
Client ID No:	SVM-7-6	SVM-7-13	SVM-7-13 DUP	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.	AA Project No:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/06/18	06/06/18	06/06/18	06/06/18
Date Prepared:	06/06/18	06/06/18	06/06/18	06/06/18
Date Analyzed:	06/06/18	06/06/18	06/06/18	06/06/18
AA ID No:	8F15012-09	8F15012-10	8F15012-11	8F15012-12
Client ID No:	SVM-7-6	SVM-7-13	SVM-7-13 DUP	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	<0.020	<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:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/06/18	06/06/18	06/06/18	06/06/18
Date Prepared:	06/06/18	06/06/18	06/06/18	06/06/18
Date Analyzed:	06/06/18	06/06/18	06/06/18	06/06/18
AA ID No:	8F15012-09	8F15012-10	8F15012-11	8F15012-12
Client ID No:	SVM-7-6	SVM-7-13	SVM-7-13 DUP	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	<0.020	<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
1,2,3-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	107%	107%	106%	108%	70-130

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/07/18	06/07/18	06/07/18	06/07/18
Date Prepared:	06/07/18	06/07/18	06/07/18	06/07/18
Date Analyzed:	06/07/18	06/07/18	06/07/18	06/07/18
AA ID No:	8F15012-13	8F15012-14	8F15012-15	8F15012-16
Client ID No:	SVM-5-5	SVM-5-15	SVM-8-5	SVM-8-15
Matrix:	Vapor	Vapor	Vapor	Vapor
Dilution Factor:	1	1	1	1

MRL

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

Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/07/18	06/07/18	06/07/18	06/07/18
Date Prepared:	06/07/18	06/07/18	06/07/18	06/07/18
Date Analyzed:	06/07/18	06/07/18	06/07/18	06/07/18
AA ID No:	8F15012-13	8F15012-14	8F15012-15	8F15012-16
Client ID No:	SVM-5-5	SVM-5-15	SVM-8-5	SVM-8-15
Matrix:	Vapor	Vapor	Vapor	Vapor
Dilution Factor:	1	1	1	1

MRL

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

1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<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:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Prepared:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Analyzed:	06/07/18	06/07/18	06/07/18	06/07/18	
AA ID No:	8F15012-13	8F15012-14	8F15012-15	8F15012-16	
Client ID No:	SVM-5-5	SVM-5-15	SVM-8-5	SVM-8-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

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

Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-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

<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	112%	114%	115%	114%	70-130

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/07/2018	06/07/2018	06/07/2018	06/07/2018	
Date Prepared:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Analyzed:	06/07/18	06/07/18	06/07/18	06/07/18	
AA ID No:	8F15012-17	8F15012-18	8F15012-19	8F15012-20	
Client ID No:	SVM-16-7	SVM-16-16	SVM-16-22	SVM-3-5	
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	0.027	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	0.056	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:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/07/2018	06/07/2018	06/07/2018	06/07/2018	MRL
Date Prepared:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Analyzed:	06/07/18	06/07/18	06/07/18	06/07/18	
AA ID No:	8F15012-17	8F15012-18	8F15012-19	8F15012-20	
Client ID No:	SVM-16-7	SVM-16-16	SVM-16-22	SVM-3-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	

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	0.024	<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:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/07/2018	06/07/2018	06/07/2018	06/07/2018	
Date Prepared:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Analyzed:	06/07/18	06/07/18	06/07/18	06/07/18	
AA ID No:	8F15012-17	8F15012-18	8F15012-19	8F15012-20	
Client ID No:	SVM-16-7	SVM-16-16	SVM-16-22	SVM-3-5	
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
1,2,3-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

<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	117%	111%	112%	113%	70-130

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/07/18	06/07/18	06/07/18	06/07/18
Date Prepared:	06/07/18	06/07/18	06/07/18	06/07/18
Date Analyzed:	06/07/18	06/07/18	06/07/18	06/07/18
AA ID No:	8F15012-21	8F15012-22	8F15012-23	8F15012-24
Client ID No:	SVM-3-15	SVM-12-7	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	0.025	<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:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Prepared:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Analyzed:	06/07/18	06/07/18	06/07/18	06/07/18	
AA ID No:	8F15012-21	8F15012-22	8F15012-23	8F15012-24	
Client ID No:	SVM-3-15	SVM-12-7	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	0.028	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:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Prepared:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Analyzed:	06/07/18	06/07/18	06/07/18	06/07/18	
AA ID No:	8F15012-21	8F15012-22	8F15012-23	8F15012-24	
Client ID No:	SVM-3-15	SVM-12-7	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
1,2,3-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

<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	104%	108%	110%	109%	70-130

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/07/18	06/08/18	06/08/18	06/08/18	
Date Prepared:	06/07/18	06/08/18	06/08/18	06/08/18	
Date Analyzed:	06/07/18	06/08/18	06/08/18	06/08/18	
AA ID No:	8F15012-25	8F15012-26	8F15012-27	8F15012-28	
Client ID No:	SVM-12-22 DUP	SVM-11-7	SVM-11-15	SVM-11-22	
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	<0.020	<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:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/07/18	06/08/18	06/08/18	06/08/18	
Date Prepared:	06/07/18	06/08/18	06/08/18	06/08/18	
Date Analyzed:	06/07/18	06/08/18	06/08/18	06/08/18	
AA ID No:	8F15012-25	8F15012-26	8F15012-27	8F15012-28	
Client ID No:	SVM-12-22 DUP	SVM-11-7	SVM-11-15	SVM-11-22	
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)	0.028	<0.020	0.025	0.10	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:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/07/18	06/08/18	06/08/18	06/08/18	
Date Prepared:	06/07/18	06/08/18	06/08/18	06/08/18	
Date Analyzed:	06/07/18	06/08/18	06/08/18	06/08/18	
AA ID No:	8F15012-25	8F15012-26	8F15012-27	8F15012-28	
Client ID No:	SVM-12-22 DUP	SVM-11-7	SVM-11-15	SVM-11-22	
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
1,2,3-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

4-Bromofluorobenzene	110%	102%	104%	102%	%REC Limits 70-130
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Allen Aminian

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	AA Project No:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/08/18	06/08/18	06/08/18	06/08/18
Date Prepared:	06/08/18	06/08/18	06/08/18	06/08/18
Date Analyzed:	06/08/18	06/08/18	06/08/18	06/08/18
AA ID No:	8F15012-29	8F15012-30	8F15012-31	8F15012-32
Client ID No:	SVM-13-7	SVM-13-15.5	SVM-13-22.5	SVM-14R-8
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:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/08/18	06/08/18	06/08/18	06/08/18
Date Prepared:	06/08/18	06/08/18	06/08/18	06/08/18
Date Analyzed:	06/08/18	06/08/18	06/08/18	06/08/18
AA ID No:	8F15012-29	8F15012-30	8F15012-31	8F15012-32
Client ID No:	SVM-13-7	SVM-13-15.5	SVM-13-22.5	SVM-14R-8
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	0.032	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	0.024	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:	MB187321
Project No:	693142	Date Received:	06/08/18
Project Name:	KMEP Norwalk Biosparge Startup	Date Reported:	06/18/18
Method:	VOCs by GCMS EPA TO-15 (Mid Level)	Units:	ug/L

Date Sampled:	06/08/18	06/08/18	06/08/18	06/08/18
Date Prepared:	06/08/18	06/08/18	06/08/18	06/08/18
Date Analyzed:	06/08/18	06/08/18	06/08/18	06/08/18
AA ID No:	8F15012-29	8F15012-30	8F15012-31	8F15012-32
Client ID No:	SVM-13-7	SVM-13-15.5	SVM-13-22.5	SVM-14R-8
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
1,2,3-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

<u>Surrogates</u>					<u>%REC Limits</u>
4-Bromofluorobenzene	103%	106%	109%	102%	70-130

Allen Aminian

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15 (Mid Level)

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: ug/L

Date Sampled:	06/08/18	06/08/18	06/08/18	
Date Prepared:	06/08/18	06/08/18	06/08/18	
Date Analyzed:	06/08/18	06/08/18	06/08/18	
AA ID No:	8F15012-33	8F15012-34	8F15012-35	
Client ID No:	SVM-14R-16	SVM-14R-23	SVM-14R-23	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	10	10	MRL

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

Acetone	<0.020	<0.20	<0.20	0.020
Allyl chloride	<0.020	<0.20	<0.20	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.20	<0.20	0.020
Benzene	<0.020	<0.20	<0.20	0.020
Benzyl chloride	<0.020	<0.20	<0.20	0.020
Bromodichloromethane	<0.020	<0.20	<0.20	0.020
Bromoform	<0.020	<0.20	<0.20	0.020
Bromomethane	<0.020	<0.20	<0.20	0.020
1,3-Butadiene	<0.020	<0.20	<0.20	0.020
2-Butanone (MEK)	<0.020	<0.20	<0.20	0.020
tert-Butyl alcohol (TBA)	<20	<200	<200	20
Carbon Disulfide	<0.020	<0.20	<0.20	0.020
Carbon Tetrachloride	<0.020	<0.20	<0.20	0.020
Chlorobenzene	<0.020	<0.20	<0.20	0.020
Chloroethane	<0.020	<0.20	<0.20	0.020
Chloroform	<0.020	<0.20	<0.20	0.020
Chloromethane	<0.020	<0.20	<0.20	0.020
Cyclohexane	<0.020	<0.20	<0.20	0.020
Dibromochloromethane	<0.020	<0.20	<0.20	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.20	<0.20	0.020
1,2-Dichlorobenzene	<0.020	<0.20	<0.20	0.020
1,3-Dichlorobenzene	<0.020	<0.20	<0.20	0.020
1,4-Dichlorobenzene	<0.020	<0.20	<0.20	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.20	<0.20	0.020
1,1-Dichloroethane	<0.020	<0.20	<0.20	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.20	<0.20	0.020

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15 (Mid Level)

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: ug/L

Date Sampled:	06/08/18	06/08/18	06/08/18	
Date Prepared:	06/08/18	06/08/18	06/08/18	
Date Analyzed:	06/08/18	06/08/18	06/08/18	
AA ID No:	8F15012-33	8F15012-34	8F15012-35	
Client ID No:	SVM-14R-16	SVM-14R-23	SVM-14R-23	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	10	10	MRL

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

cis-1,2-Dichloroethylene	<0.020	<0.20	<0.20	0.020
1,1-Dichloroethylene	<0.020	<0.20	<0.20	0.020
trans-1,2-Dichloroethylene	<0.020	<0.20	<0.20	0.020
1,2-Dichloropropane	<0.020	<0.20	<0.20	0.020
trans-1,3-Dichloropropylene	<0.020	<0.20	<0.20	0.020
cis-1,3-Dichloropropylene	<0.020	<0.20	<0.20	0.020
Dichlorotetrafluoroethane	<0.020	<0.20	<0.20	0.020
Diisopropyl ether (DIPE)	<0.020	<0.20	<0.20	0.020
1,4-Dioxane	<0.020	<0.20	<0.20	0.020
Ethanol	<0.020	<0.20	<0.20	0.020
Ethyl Acetate	<0.020	<0.20	<0.20	0.020
Ethylbenzene	<0.020	<0.20	<0.20	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.20	<0.20	0.020
4-Ethyltoluene	<0.020	<0.20	<0.20	0.020
Heptane	<0.020	<0.20	<0.20	0.020
Hexachlorobutadiene	<0.020	<0.20	<0.20	0.020
n-Hexane	<0.020	<0.20	<0.20	0.020
2-Hexanone (MBK)	<0.020	<0.20	<0.20	0.020
Isopropanol (IPA)	<0.20	<2.0	<2.0	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.20	<0.20	0.020
Methylene Chloride	<0.020	<0.20	<0.20	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.20	<0.20	0.020
Naphthalene	<0.020	<0.20	<0.20	0.020
Propylene	<0.020	<0.20	<0.20	0.020
Styrene	<0.020	<0.20	<0.20	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.20	<0.20	0.020

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15 (Mid Level)

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: ug/L

Date Sampled:	06/08/18	06/08/18	06/08/18
Date Prepared:	06/08/18	06/08/18	06/08/18
Date Analyzed:	06/08/18	06/08/18	06/08/18
AA ID No:	8F15012-33	8F15012-34	8F15012-35
Client ID No:	SVM-14R-16	SVM-14R-23	SVM-14R-23
Matrix:	Vapor	Vapor	Vapor
Dilution Factor:	1	10	10
			MRL

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

Tetrachloroethylene (PCE)	<0.020	0.37	0.37	0.020
Tetrahydrofuran (THF)	<0.020	<0.20	<0.20	0.020
Toluene	<0.020	<0.20	<0.20	0.020
1,2,4-Trichlorobenzene	<0.020	<0.20	<0.20	0.020
1,1,2-Trichloroethane	<0.020	<0.20	<0.20	0.020
1,1,1-Trichloroethane	<0.020	<0.20	<0.20	0.020
Trichloroethylene (TCE)	<0.020	<0.20	<0.20	0.020
Trichlorofluoromethane (R11)	<0.020	<0.20	<0.20	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.20	<0.20	0.020
1,3,5-Trimethylbenzene	<0.020	<0.20	<0.20	0.020
1,2,4-Trimethylbenzene	<0.020	<0.20	<0.20	0.020
2,2,4-Trimethylpentane	<0.020	<0.20	<0.20	0.020
Vinyl acetate	<0.020	<0.20	<0.20	0.020
Vinyl bromide	<0.020	<0.20	<0.20	0.020
Vinyl chloride	<0.020	<0.20	<0.20	0.020
o-Xylene	<0.020	<0.20	<0.20	0.020
m,p-Xylenes	<0.020	<0.20	<0.20	0.020
1,2,3-Trichloropropane	<0.020	<0.20	<0.20	0.020
sec-Butylbenzene	<0.020	<0.20	<0.20	0.020
Isopropylbenzene	<0.020	<0.20	<0.20	0.020
n-Propylbenzene	<0.020	<0.20	<0.20	0.020
4-Isopropyltoluene	<0.020	<0.20	<0.20	0.020
n-Butylbenzene	<0.020	<0.20	<0.20	0.020

Surrogates

%REC Limits

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.	AA Project No: MB187321
Project No: 693142	Date Received: 06/08/18
Project Name: KMEP Norwalk Biosparge Startup	Date Reported: 06/18/18
Method: VOCs by GCMS EPA TO-15 (Mid Level)	Units: ug/L

Date Sampled:	06/08/18	06/08/18	06/08/18	
Date Prepared:	06/08/18	06/08/18	06/08/18	
Date Analyzed:	06/08/18	06/08/18	06/08/18	
AA ID No:	8F15012-33	8F15012-34	8F15012-35	
Client ID No:	SVM-14R-16	SVM-14R-23	SVM-14R-23	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	10	10	MRL

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

4-Bromofluorobenzene	99%	106%	105%	70-130
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Allen Aminian

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: % by Volume

Date Sampled:	06/06/18	06/06/18	06/06/18	06/06/18
Date Prepared:	06/06/18	06/06/18	06/06/18	06/06/18
Date Analyzed:	06/06/18	06/06/18	06/06/18	06/06/18
AA ID No:	8F15012-01	8F15012-02	8F15012-03	8F15012-04
Client ID No:	SVM-1-5	SVM-1-15	SVM-2-5	SVM-15-7
Matrix:	Vapor	Vapor	Vapor	Vapor
Dilution Factor:	1	1	1	1
				MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	19	19	19	19	0.10
Carbon Dioxide	<0.10	<0.10	<0.10	0.15	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: % by Volume

Date Sampled:	06/06/18	06/06/18	06/06/18	06/06/18	
Date Prepared:	06/06/18	06/06/18	06/06/18	06/06/18	
Date Analyzed:	06/06/18	06/06/18	06/06/18	06/06/18	
AA ID No:	8F15012-05	8F15012-06	8F15012-07	8F15012-08	
Client ID No:	SVM-15-15	SVM-15-22	SVM-6-7	SVM-6-13	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	19	19	19	18	0.10
Carbon Dioxide	0.19	<0.10	0.35	0.90	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: % by Volume

Date Sampled:	06/06/18	06/06/18	06/06/18	06/06/18	
Date Prepared:	06/06/18	06/06/18	06/06/18	06/06/18	
Date Analyzed:	06/06/18	06/06/18	06/06/18	06/06/18	
AA ID No:	8F15012-09	8F15012-10	8F15012-11	8F15012-12	
Client ID No:	SVM-7-6	SVM-7-13	SVM-7-13 DUP	SVM-10-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	18	18	18	11	0.10
Carbon Dioxide	0.78	0.91	0.92	3.5	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: % by Volume

Date Sampled:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Prepared:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Analyzed:	06/07/18	06/07/18	06/07/18	06/07/18	
AA ID No:	8F15012-13	8F15012-14	8F15012-15	8F15012-16	
Client ID No:	SVM-5-5	SVM-5-15	SVM-8-5	SVM-8-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	19	19	19	19	0.10
Carbon Dioxide	<0.10	<0.10	0.16	0.14	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: % by Volume

Date Sampled:	06/07/2018	06/07/2018	06/07/2018	06/07/2018	
Date Prepared:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Analyzed:	06/07/18	06/07/18	06/07/18	06/07/18	
AA ID No:	8F15012-17	8F15012-18	8F15012-19	8F15012-20	
Client ID No:	SVM-16-7	SVM-16-16	SVM-16-22	SVM-3-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	19	19	10	19	0.10
Carbon Dioxide	0.36	0.61	6.8	0.20	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: % by Volume

Date Sampled:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Prepared:	06/07/18	06/07/18	06/07/18	06/07/18	
Date Analyzed:	06/07/18	06/07/18	06/07/18	06/07/18	
AA ID No:	8F15012-21	8F15012-22	8F15012-23	8F15012-24	
Client ID No:	SVM-3-15	SVM-12-7	SVM-12-15	SVM-12-22	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	19	18	15	11	0.10
Carbon Dioxide	0.29	3.3	7.5	7.6	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: % by Volume

Date Sampled:	06/07/18	06/08/18	06/08/18	06/08/18	
Date Prepared:	06/07/18	06/08/18	06/08/18	06/08/18	
Date Analyzed:	06/07/18	06/08/18	06/08/18	06/08/18	
AA ID No:	8F15012-25	8F15012-26	8F15012-27	8F15012-28	
Client ID No:	SVM-12-22 DUP	SVM-11-7	SVM-11-15	SVM-11-22	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	11	19	18	8.0	0.10
Carbon Dioxide	7.6	0.90	2.9	9.6	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: % by Volume

Date Sampled:	06/08/18	06/08/18	06/08/18	06/08/18	
Date Prepared:	06/08/18	06/08/18	06/08/18	06/08/18	
Date Analyzed:	06/08/18	06/08/18	06/08/18	06/08/18	
AA ID No:	8F15012-29	8F15012-30	8F15012-31	8F15012-32	
Client ID No:	SVM-13-7	SVM-13-15.5	SVM-13-22.5	SVM-14R-8	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	18	<0.10	0.10
Oxygen	19	19	0.88	18	0.10
Carbon Dioxide	<0.10	<0.10	<0.10	0.55	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18
Units: % by Volume

Date Sampled:	06/08/18	06/08/18	06/08/18	
Date Prepared:	06/08/18	06/08/18	06/08/18	
Date Analyzed:	06/08/18	06/08/18	06/08/18	
AA ID No:	8F15012-33	8F15012-34	8F15012-35	
Client ID No:	SVM-14R-16	SVM-14R-23	SVM-14R-23	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	MRL

Fixed Gases - Field (EPA 3CM)

Methane	<0.10	<0.10	<0.10	0.10
Oxygen	19	19	19	0.10
Carbon Dioxide	0.50	0.26	0.22	0.10

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC Limits	RPD	RPD Limit	Notes
VOCs by EPA TO-3 - Quality Control									
<i>Batch B8F1516 - *** DEFAULT PREP ***</i>									
Blank (B8F1516-BLK1)				Prepared & Analyzed: 06/06/18					
Gasoline Range Organics (GRO)	<20	20	ug/L						
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.150</i>		<i>ug/L</i>	<i>0.14</i>	<i>105</i>	<i>70-130</i>			
LCS (B8F1516-BS1)				Prepared & Analyzed: 06/06/18					
Gasoline Range Organics (GRO)	0.924	20	ug/L	0.82	113	70-130			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.151</i>		<i>ug/L</i>	<i>0.14</i>	<i>105</i>	<i>70-130</i>			
LCS Dup (B8F1516-BSD1)				Prepared & Analyzed: 06/06/18					
Gasoline Range Organics (GRO)	0.908	20	ug/L	0.82	111	70-130	1.79	30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.148</i>		<i>ug/L</i>	<i>0.14</i>	<i>104</i>	<i>70-130</i>			
Duplicate (B8F1516-DUP1)				Source: 8F15012-10 Prepared & Analyzed: 06/06/18					
Gasoline Range Organics (GRO)	<20	20	ug/L		<20			30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.152</i>		<i>ug/L</i>	<i>0.14</i>	<i>106</i>	<i>70-130</i>			
<i>Batch B8F1517 - *** DEFAULT PREP ***</i>									
Blank (B8F1517-BLK1)				Prepared & Analyzed: 06/07/18					
Gasoline Range Organics (GRO)	<20	20	ug/L						
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.157</i>		<i>ug/L</i>	<i>0.14</i>	<i>110</i>	<i>70-130</i>			
LCS (B8F1517-BS1)				Prepared & Analyzed: 06/07/18					
Gasoline Range Organics (GRO)	0.998	20	ug/L	0.82	122	70-130			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.153</i>		<i>ug/L</i>	<i>0.14</i>	<i>107</i>	<i>70-130</i>			
LCS Dup (B8F1517-BSD1)				Prepared & Analyzed: 06/07/18					
Gasoline Range Organics (GRO)	0.973	20	ug/L	0.82	119	70-130	2.49	30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.157</i>		<i>ug/L</i>	<i>0.14</i>	<i>110</i>	<i>70-130</i>			
Duplicate (B8F1517-DUP1)				Source: 8F15012-24 Prepared & Analyzed: 06/07/18					
Gasoline Range Organics (GRO)	<20	20	ug/L		<20			30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.157</i>		<i>ug/L</i>	<i>0.14</i>	<i>110</i>	<i>70-130</i>			
<i>Batch B8F1518 - *** DEFAULT PREP ***</i>									
Blank (B8F1518-BLK1)				Prepared & Analyzed: 06/08/18					
Gasoline Range Organics (GRO)	<20	20	ug/L						

Allen Aminian

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by EPA TO-3 - Quality Control										
<i>Batch B8F1518 - *** DEFAULT PREP ***</i>										
Blank (B8F1518-BLK1) Continued				Prepared & Analyzed: 06/08/18						
Surrogate: 4-Bromofluorobenzene	0.150		ug/L	0.14		105	70-130			
LCS (B8F1518-BS1)				Prepared & Analyzed: 06/08/18						
Gasoline Range Organics (GRO)	0.769	20	ug/L	0.82		94.0	70-130			
Surrogate: 4-Bromofluorobenzene	0.152		ug/L	0.14		106	70-130			
LCS Dup (B8F1518-BSD1)				Prepared & Analyzed: 06/08/18						
Gasoline Range Organics (GRO)	0.720	20	ug/L	0.82		88.0	70-130	6.59	30	
Surrogate: 4-Bromofluorobenzene	0.153		ug/L	0.14		107	70-130			
Duplicate (B8F1518-DUP1)				Source: 8F15012-34 Prepared & Analyzed: 06/08/18						
Gasoline Range Organics (GRO)	34.4	20	ug/L		34.8			1.18	30	
Surrogate: 4-Bromofluorobenzene	0.151		ug/L	0.14		105	70-130			

VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control

*Batch B8F1513 - *** DEFAULT PREP ****

Blank (B8F1513-BLK1)

Prepared & Analyzed: 06/06/18

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: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limits RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control									
<i>Batch B8F1513 - *** DEFAULT PREP ***</i>									
Blank (B8F1513-BLK1) Continued					Prepared & Analyzed: 06/06/18				
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: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8F1513 - *** DEFAULT PREP ***</i>										
Blank (B8F1513-BLK1) Continued										
Prepared & Analyzed: 06/06/18										
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							
1,2,3-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							
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.150</i>		<i>ug/L</i>	<i>0.14</i>		<i>105</i>	<i>70-130</i>			
LCS (B8F1513-BS1)										
Prepared & Analyzed: 06/06/18										
Acetone	0.0266	0.020	ug/L	0.024		112	70-130		30	
Benzene	0.0338	0.020	ug/L	0.032		106	70-130		30	

Allen Aminian

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
Batch B8F1513 - *** DEFAULT PREP ***										
LCS (B8F1513-BS1) Continued										
Prepared & Analyzed: 06/06/18										
Benzyl chloride	0.0523	0.020	ug/L	0.052		101	70-130		30	
Bromodichloromethane	0.0768	0.020	ug/L	0.067		115	70-130		30	
Bromoform	0.0972	0.020	ug/L	0.10		94.0	70-130		30	
Bromomethane	0.0399	0.020	ug/L	0.039		103	70-130		30	
2-Butanone (MEK)	0.0342	0.020	ug/L	0.029		116	70-130		30	
Carbon Disulfide	0.0333	0.020	ug/L	0.031		107	70-130		30	
Carbon Tetrachloride	0.0680	0.020	ug/L	0.063		108	70-130		30	
Chlorobenzene	0.0458	0.020	ug/L	0.046		99.5	70-130		30	
Chloroethane	0.0282	0.020	ug/L	0.026		107	70-130		30	
Chloroform	0.0577	0.020	ug/L	0.049		118	70-130		30	
Chloromethane	0.0210	0.020	ug/L	0.021		102	70-130		30	
Dibromochloromethane	0.0856	0.020	ug/L	0.085		100	70-130		30	
1,2-Dibromoethane (EDB)	0.0763	0.020	ug/L	0.077		99.3	70-130		30	
1,2-Dichlorobenzene	0.0619	0.020	ug/L	0.060		103	70-130		30	
1,3-Dichlorobenzene	0.0624	0.020	ug/L	0.060		104	70-130		30	
1,4-Dichlorobenzene	0.0623	0.020	ug/L	0.060		104	70-130		30	
Dichlorodifluoromethane (R12)	0.0597	0.020	ug/L	0.049		121	70-130		30	
1,1-Dichloroethane	0.0499	0.020	ug/L	0.040		123	70-130		30	
1,2-Dichloroethane (EDC)	0.0514	0.020	ug/L	0.040		127	70-130		30	
cis-1,2-Dichloroethylene	0.0400	0.020	ug/L	0.040		101	70-130		30	
1,1-Dichloroethylene	0.0527	0.020	ug/L	0.040		133	70-130		30	**
trans-1,2-Dichloroethylene	0.0409	0.020	ug/L	0.040		103	70-130		30	
1,2-Dichloropropane	0.0494	0.020	ug/L	0.046		107	70-130		30	
trans-1,3-Dichloropropylene	0.0489	0.020	ug/L	0.045		108	70-130		30	
cis-1,3-Dichloropropylene	0.0482	0.020	ug/L	0.045		106	70-130		30	
Dichlorotetrafluoroethane	0.106	0.020	ug/L	0.070		151	70-130		30	**
Ethylbenzene	0.0450	0.020	ug/L	0.043		104	70-130		30	
4-Ethyltoluene	0.0547	0.020	ug/L	0.049		111	70-130		30	
Hexachlorobutadiene	0.0999	0.020	ug/L	0.11		93.7	70-130		30	
2-Hexanone (MBK)	0.0351	0.020	ug/L	0.041		85.7	70-130		30	
Isopropanol (IPA)	0.0266	0.20	ug/L	0.025		108	70-130		30	
Methylene Chloride	0.0402	0.020	ug/L	0.035		116	70-130		30	

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control

Batch B8F1513 - *** DEFAULT PREP ***

LCS (B8F1513-BS1) Continued

Prepared & Analyzed: 06/06/18

4-Methyl-2-pentanone (MIBK)	0.0415	0.020	ug/L	0.041		101	70-130		30	
Styrene	0.0426	0.020	ug/L	0.043		100	70-130		30	
1,1,2,2-Tetrachloroethane	0.0803	0.020	ug/L	0.069		117	70-130		30	
Tetrachloroethylene (PCE)	0.0576	0.020	ug/L	0.068		84.9	70-130		30	
Toluene	0.0372	0.020	ug/L	0.038		98.7	70-130		30	
1,2,4-Trichlorobenzene	0.0678	0.020	ug/L	0.074		91.4	70-130		30	
1,1,2-Trichloroethane	0.0541	0.020	ug/L	0.055		99.2	70-130		30	
1,1,1-Trichloroethane	0.0614	0.020	ug/L	0.055		113	70-130		30	
Trichloroethylene (TCE)	0.0584	0.020	ug/L	0.054		109	70-130		30	
Trichlorofluoromethane (R11)	0.0690	0.020	ug/L	0.056		123	70-130		30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	0.0865	0.020	ug/L	0.077		113	70-130		30	
1,3,5-Trimethylbenzene	0.0551	0.020	ug/L	0.049		112	70-130		30	
1,2,4-Trimethylbenzene	0.0556	0.020	ug/L	0.049		113	70-130		30	
Vinyl acetate	0.0449	0.020	ug/L	0.035		128	70-130		30	
Vinyl chloride	0.0282	0.020	ug/L	0.026		110	70-130		30	
o-Xylene	0.0489	0.020	ug/L	0.043		112	70-130		30	
m,p-Xylenes	0.0888	0.020	ug/L	0.087		102	70-130		30	
1,2,3-Trichloropropane	0.0703	0.020	ug/L	0.060		117	70-130		30	
sec-Butylbenzene	0.0619	0.020	ug/L	0.055		113	70-130		30	
Isopropylbenzene	0.0525	0.020	ug/L	0.049		107	70-130		30	
n-Propylbenzene	0.0554	0.020	ug/L	0.049		113	70-130		30	
4-Isopropyltoluene	0.0593	0.020	ug/L	0.055		108	70-130		30	

Surrogate: 4-Bromofluorobenzene 0.156 ug/L

0.14 109 70-130

LCS Dup (B8F1513-BSD1)

Prepared & Analyzed: 06/06/18

Acetone	0.0269	0.020	ug/L	0.024		113	70-130	1.16	30	
Benzene	0.0337	0.020	ug/L	0.032		106	70-130	0.0947	30	
Benzyl chloride	0.0555	0.020	ug/L	0.052		107	70-130	5.86	30	
Bromodichloromethane	0.0730	0.020	ug/L	0.067		109	70-130	5.10	30	
Bromoform	0.100	0.020	ug/L	0.10		97.1	70-130	3.24	30	
Bromomethane	0.0407	0.020	ug/L	0.039		105	70-130	2.02	30	

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
Batch B8F1513 - *** DEFAULT PREP ***										
LCS Dup (B8F1513-BSD1) Continued										
Prepared & Analyzed: 06/06/18										
2-Butanone (MEK)	0.0372	0.020	ug/L	0.029	126	70-130	8.26	30		
Carbon Disulfide	0.0334	0.020	ug/L	0.031	107	70-130	0.374	30		
Carbon Tetrachloride	0.0668	0.020	ug/L	0.063	106	70-130	1.77	30		
Chlorobenzene	0.0472	0.020	ug/L	0.046	103	70-130	3.07	30		
Chloroethane	0.0283	0.020	ug/L	0.026	107	70-130	0.187	30		
Chloroform	0.0553	0.020	ug/L	0.049	113	70-130	4.23	30		
Chloromethane	0.0203	0.020	ug/L	0.021	98.3	70-130	3.60	30		
Dibromochloromethane	0.0845	0.020	ug/L	0.085	99.2	70-130	1.30	30		
1,2-Dibromoethane (EDB)	0.0801	0.020	ug/L	0.077	104	70-130	4.82	30		
1,2-Dichlorobenzene	0.0638	0.020	ug/L	0.060	106	70-130	3.06	30		
1,3-Dichlorobenzene	0.0629	0.020	ug/L	0.060	105	70-130	0.863	30		
1,4-Dichlorobenzene	0.0631	0.020	ug/L	0.060	105	70-130	1.25	30		
Dichlorodifluoromethane (R12)	0.0549	0.020	ug/L	0.049	111	70-130	8.37	30		
1,1-Dichloroethane	0.0491	0.020	ug/L	0.040	121	70-130	1.72	30		
1,2-Dichloroethane (EDC)	0.0498	0.020	ug/L	0.040	123	70-130	3.28	30		
cis-1,2-Dichloroethylene	0.0406	0.020	ug/L	0.040	102	70-130	1.38	30		
1,1-Dichloroethylene	0.0508	0.020	ug/L	0.040	128	70-130	3.60	30		
trans-1,2-Dichloroethylene	0.0423	0.020	ug/L	0.040	107	70-130	3.24	30		
1,2-Dichloropropane	0.0520	0.020	ug/L	0.046	113	70-130	5.19	30		
trans-1,3-Dichloropropylene	0.0504	0.020	ug/L	0.045	111	70-130	3.02	30		
cis-1,3-Dichloropropylene	0.0489	0.020	ug/L	0.045	108	70-130	1.40	30		
Dichlorotetrafluoroethane	0.0883	0.020	ug/L	0.070	126	70-130	17.8	30		
Ethylbenzene	0.0485	0.020	ug/L	0.043	112	70-130	7.34	30		
4-Ethyltoluene	0.0578	0.020	ug/L	0.049	118	70-130	5.42	30		
Hexachlorobutadiene	0.103	0.020	ug/L	0.11	96.6	70-130	3.05	30		
2-Hexanone (MBK)	0.0438	0.020	ug/L	0.041	107	70-130	22.1	30		
Isopropanol (IPA)	0.0296	0.20	ug/L	0.025	120	70-130	10.4	30		
Methylene Chloride	0.0405	0.020	ug/L	0.035	117	70-130	0.861	30		
4-Methyl-2-pentanone (MIBK)	0.0541	0.020	ug/L	0.041	132	70-130	26.4	30		**
Styrene	0.0452	0.020	ug/L	0.043	106	70-130	5.83	30		
1,1,2,2-Tetrachloroethane	0.0813	0.020	ug/L	0.069	118	70-130	1.19	30		
Tetrachloroethylene (PCE)	0.0584	0.020	ug/L	0.068	86.1	70-130	1.40	30		

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control

Batch B8F1513 - *** DEFAULT PREP ***

LCS Dup (B8F1513-BSD1) Continued

Prepared & Analyzed: 06/06/18

Toluene	0.0386	0.020	ug/L	0.038		102	70-130	3.78	30	
1,2,4-Trichlorobenzene	0.0716	0.020	ug/L	0.074		96.5	70-130	5.43	30	
1,1,2-Trichloroethane	0.0566	0.020	ug/L	0.055		104	70-130	4.53	30	
1,1,1-Trichloroethane	0.0590	0.020	ug/L	0.055		108	70-130	3.99	30	
Trichloroethylene (TCE)	0.0558	0.020	ug/L	0.054		104	70-130	4.52	30	
Trichlorofluoromethane (R11)	0.0644	0.020	ug/L	0.056		115	70-130	6.82	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	0.0860	0.020	ug/L	0.077		112	70-130	0.622	30	
1,3,5-Trimethylbenzene	0.0589	0.020	ug/L	0.049		120	70-130	6.81	30	
1,2,4-Trimethylbenzene	0.0588	0.020	ug/L	0.049		120	70-130	5.67	30	
Vinyl acetate	0.0473	0.020	ug/L	0.035		134	70-130	5.04	30	**
Vinyl chloride	0.0281	0.020	ug/L	0.026		110	70-130	0.544	30	
o-Xylene	0.0507	0.020	ug/L	0.043		117	70-130	3.66	30	
m,p-Xylenes	0.0938	0.020	ug/L	0.087		108	70-130	5.52	30	
1,2,3-Trichloropropane	0.0734	0.020	ug/L	0.060		122	70-130	4.36	30	
sec-Butylbenzene	0.0651	0.020	ug/L	0.055		118	70-130	4.93	30	
Isopropylbenzene	0.0557	0.020	ug/L	0.049		113	70-130	6.00	30	
n-Propylbenzene	0.0584	0.020	ug/L	0.049		119	70-130	5.19	30	
4-Isopropyltoluene	0.0636	0.020	ug/L	0.055		116	70-130	6.96	30	

Surrogate: 4-Bromofluorobenzene 0.151 ug/L 0.14 106 70-130

Duplicate (B8F1513-DUP1) Source: 8F15012-10 Prepared & Analyzed: 06/06/18

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	

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control									
<i>Batch B8F1513 - *** DEFAULT PREP ***</i>									
Duplicate (B8F1513-DUP1) Continued Source: 8F15012-10 Prepared & Analyzed: 06/06/18									
tert-Butyl alcohol (TBA)	<0.20	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	
Hexachlorobutadiene	<0.020	0.020	ug/L		<0.020			30	

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8F1513 - *** DEFAULT PREP ***</i>										
Duplicate (B8F1513-DUP1) Continued Source: 8F15012-10 Prepared & Analyzed: 06/06/18										
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	
1,2,3-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	

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8F1513 - *** DEFAULT PREP ***</i>										
Duplicate (B8F1513-DUP1) Continued Source: 8F15012-10 Prepared & Analyzed: 06/06/18										
4-Isopropyltoluene	<0.020	0.020	ug/L		<0.020				30	
n-Butylbenzene	<0.020	0.020	ug/L		<0.020				30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.152</i>		<i>ug/L</i>	<i>0.14</i>		<i>106</i>	<i>70-130</i>			
<i>Batch B8F1514 - *** DEFAULT PREP ***</i>										
Blank (B8F1514-BLK1) Prepared & Analyzed: 06/07/18										
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							

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limits RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control									
<i>Batch B8F1514 - *** DEFAULT PREP ***</i>									
Blank (B8F1514-BLK1) Continued					Prepared & Analyzed: 06/07/18				
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						
1,1,2-Trichloroethane	<0.020	0.020	ug/L						
1,1,1-Trichloroethane	<0.020	0.020	ug/L						

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8F1514 - *** DEFAULT PREP ***</i>										
Blank (B8F1514-BLK1) Continued										
Prepared & Analyzed: 06/07/18										
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							
1,2,3-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							
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.157</i>		<i>ug/L</i>	<i>0.14</i>		<i>110</i>	<i>70-130</i>			
LCS (B8F1514-BS1)										
Prepared & Analyzed: 06/07/18										
Acetone	0.0288	0.020	ug/L	0.024		121	70-130		30	
Benzene	0.0322	0.020	ug/L	0.032		101	70-130		30	
Benzyl chloride	0.0536	0.020	ug/L	0.052		104	70-130		30	
Bromodichloromethane	0.0732	0.020	ug/L	0.067		109	70-130		30	
Bromoform	0.0976	0.020	ug/L	0.10		94.4	70-130		30	
Bromomethane	0.0401	0.020	ug/L	0.039		103	70-130		30	
2-Butanone (MEK)	0.0315	0.020	ug/L	0.029		107	70-130		30	
Carbon Disulfide	0.0328	0.020	ug/L	0.031		105	70-130		30	
Carbon Tetrachloride	0.0670	0.020	ug/L	0.063		106	70-130		30	
Chlorobenzene	0.0469	0.020	ug/L	0.046		102	70-130		30	
Chloroethane	0.0282	0.020	ug/L	0.026		107	70-130		30	

Allen Aminian

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
Batch B8F1514 - *** DEFAULT PREP ***										
LCS (B8F1514-BS1) Continued										
Prepared & Analyzed: 06/07/18										
Chloroform	0.0554	0.020	ug/L	0.049		114	70-130		30	
Chloromethane	0.0197	0.020	ug/L	0.021		95.3	70-130		30	
Dibromochloromethane	0.0810	0.020	ug/L	0.085		95.1	70-130		30	
1,2-Dibromoethane (EDB)	0.0749	0.020	ug/L	0.077		97.5	70-130		30	
1,2-Dichlorobenzene	0.0595	0.020	ug/L	0.060		98.9	70-130		30	
1,3-Dichlorobenzene	0.0595	0.020	ug/L	0.060		98.9	70-130		30	
1,4-Dichlorobenzene	0.0596	0.020	ug/L	0.060		99.2	70-130		30	
Dichlorodifluoromethane (R12)	0.0516	0.020	ug/L	0.049		104	70-130		30	
1,1-Dichloroethane	0.0478	0.020	ug/L	0.040		118	70-130		30	
1,2-Dichloroethane (EDC)	0.0482	0.020	ug/L	0.040		119	70-130		30	
cis-1,2-Dichloroethylene	0.0386	0.020	ug/L	0.040		97.3	70-130		30	
1,1-Dichloroethylene	0.0517	0.020	ug/L	0.040		130	70-130		30	**
trans-1,2-Dichloroethylene	0.0398	0.020	ug/L	0.040		100	70-130		30	
1,2-Dichloropropane	0.0471	0.020	ug/L	0.046		102	70-130		30	
trans-1,3-Dichloropropylene	0.0461	0.020	ug/L	0.045		102	70-130		30	
cis-1,3-Dichloropropylene	0.0452	0.020	ug/L	0.045		99.6	70-130		30	
Dichlorotetrafluoroethane	0.0710	0.020	ug/L	0.070		102	70-130		30	
Ethylbenzene	0.0466	0.020	ug/L	0.043		107	70-130		30	
4-Ethyltoluene	0.0553	0.020	ug/L	0.049		112	70-130		30	
Hexachlorobutadiene	0.109	0.020	ug/L	0.11		102	70-130		30	
2-Hexanone (MBK)	0.0648	0.020	ug/L	0.041		158	70-130		30	**
Isopropanol (IPA)	0.0355	0.20	ug/L	0.025		145	70-130		30	**
Methylene Chloride	0.0386	0.020	ug/L	0.035		111	70-130		30	
4-Methyl-2-pentanone (MIBK)	0.0707	0.020	ug/L	0.041		173	70-130		30	**
Styrene	0.0426	0.020	ug/L	0.043		100	70-130		30	
1,1,2,2-Tetrachloroethane	0.0802	0.020	ug/L	0.069		117	70-130		30	
Tetrachloroethylene (PCE)	0.0563	0.020	ug/L	0.068		83.0	70-130		30	
Toluene	0.0358	0.020	ug/L	0.038		95.0	70-130		30	
1,2,4-Trichlorobenzene	0.0758	0.020	ug/L	0.074		102	70-130		30	
1,1,2-Trichloroethane	0.0518	0.020	ug/L	0.055		94.9	70-130		30	
1,1,1-Trichloroethane	0.0588	0.020	ug/L	0.055		108	70-130		30	
Trichloroethylene (TCE)	0.0565	0.020	ug/L	0.054		105	70-130		30	

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8F1514 - *** DEFAULT PREP ***</i>										
LCS (B8F1514-BS1) Continued					Prepared & Analyzed: 06/07/18					
Trichlorofluoromethane (R11)	0.0682	0.020	ug/L	0.056		121	70-130		30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	0.0830	0.020	ug/L	0.077		108	70-130		30	
1,3,5-Trimethylbenzene	0.0565	0.020	ug/L	0.049		115	70-130		30	
1,2,4-Trimethylbenzene	0.0569	0.020	ug/L	0.049		116	70-130		30	
Vinyl acetate	0.0427	0.020	ug/L	0.035		121	70-130		30	
Vinyl chloride	0.0273	0.020	ug/L	0.026		107	70-130		30	
o-Xylene	0.0497	0.020	ug/L	0.043		114	70-130		30	
m,p-Xylenes	0.0895	0.020	ug/L	0.087		103	70-130		30	
1,2,3-Trichloropropane	0.0713	0.020	ug/L	0.060		118	70-130		30	
sec-Butylbenzene	0.0618	0.020	ug/L	0.055		112	70-130		30	
Isopropylbenzene	0.0531	0.020	ug/L	0.049		108	70-130		30	
n-Propylbenzene	0.0557	0.020	ug/L	0.049		113	70-130		30	
4-Isopropyltoluene	0.0603	0.020	ug/L	0.055		110	70-130		30	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.159</i>		<i>ug/L</i>	<i>0.14</i>		<i>111</i>	<i>70-130</i>			
LCS Dup (B8F1514-BSD1)					Prepared & Analyzed: 06/07/18					
Acetone	0.0256	0.020	ug/L	0.024		108	70-130	11.8	30	
Benzene	0.0314	0.020	ug/L	0.032		98.4	70-130	2.31	30	
Benzyl chloride	0.0543	0.020	ug/L	0.052		105	70-130	1.25	30	
Bromodichloromethane	0.0697	0.020	ug/L	0.067		104	70-130	4.88	30	
Bromoform	0.101	0.020	ug/L	0.10		98.1	70-130	3.84	30	
Bromomethane	0.0385	0.020	ug/L	0.039		99.2	70-130	3.95	30	
2-Butanone (MEK)	0.0339	0.020	ug/L	0.029		115	70-130	7.57	30	
Carbon Disulfide	0.0322	0.020	ug/L	0.031		103	70-130	2.01	30	
Carbon Tetrachloride	0.0639	0.020	ug/L	0.063		102	70-130	4.71	30	
Chlorobenzene	0.0482	0.020	ug/L	0.046		105	70-130	2.62	30	
Chloroethane	0.0275	0.020	ug/L	0.026		104	70-130	2.56	30	
Chloroform	0.0520	0.020	ug/L	0.049		106	70-130	6.46	30	
Chloromethane	0.0183	0.020	ug/L	0.021		88.7	70-130	7.17	30	
Dibromochloromethane	0.0802	0.020	ug/L	0.085		94.2	70-130	0.951	30	
1,2-Dibromoethane (EDB)	0.0771	0.020	ug/L	0.077		100	70-130	2.93	30	

Allen Aminian

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
 Project No: 693142
 Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
 Date Received: 06/08/18
 Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control

Batch B8F1514 - *** DEFAULT PREP ***

LCS Dup (B8F1514-BSD1) Continued

Prepared & Analyzed: 06/07/18

1,2-Dichlorobenzene	0.0611	0.020	ug/L	0.060		102	70-130	2.69	30	
1,3-Dichlorobenzene	0.0604	0.020	ug/L	0.060		100	70-130	1.60	30	
1,4-Dichlorobenzene	0.0608	0.020	ug/L	0.060		101	70-130	2.00	30	
Dichlorodifluoromethane (R12)	0.0508	0.020	ug/L	0.049		103	70-130	1.64	30	
1,1-Dichloroethane	0.0454	0.020	ug/L	0.040		112	70-130	5.21	30	
1,2-Dichloroethane (EDC)	0.0464	0.020	ug/L	0.040		115	70-130	3.85	30	
cis-1,2-Dichloroethylene	0.0383	0.020	ug/L	0.040		96.7	70-130	0.619	30	
1,1-Dichloroethylene	0.0488	0.020	ug/L	0.040		123	70-130	5.76	30	
trans-1,2-Dichloroethylene	0.0402	0.020	ug/L	0.040		101	70-130	0.793	30	
1,2-Dichloropropane	0.0475	0.020	ug/L	0.046		103	70-130	0.684	30	
trans-1,3-Dichloropropylene	0.0476	0.020	ug/L	0.045		105	70-130	3.29	30	
cis-1,3-Dichloropropylene	0.0459	0.020	ug/L	0.045		101	70-130	1.59	30	
Dichlorotetrafluoroethane	0.0793	0.020	ug/L	0.070		113	70-130	11.1	30	
Ethylbenzene	0.0493	0.020	ug/L	0.043		114	70-130	5.70	30	
4-Ethyltoluene	0.0574	0.020	ug/L	0.049		117	70-130	3.75	30	
Hexachlorobutadiene	0.103	0.020	ug/L	0.11		96.7	70-130	5.33	30	
2-Hexanone (MBK)	0.0369	0.020	ug/L	0.041		90.0	70-130	55.0	30	QR-01
Isopropanol (IPA)	0.0301	0.20	ug/L	0.025		122	70-130	16.6	30	
Methylene Chloride	0.0379	0.020	ug/L	0.035		109	70-130	2.00	30	
4-Methyl-2-pentanone (MIBK)	0.0460	0.020	ug/L	0.041		112	70-130	42.4	30	QR-01
Styrene	0.0452	0.020	ug/L	0.043		106	70-130	6.01	30	
1,1,2,2-Tetrachloroethane	0.0811	0.020	ug/L	0.069		118	70-130	1.19	30	
Tetrachloroethylene (PCE)	0.0565	0.020	ug/L	0.068		83.2	70-130	0.241	30	
Toluene	0.0377	0.020	ug/L	0.038		100	70-130	5.23	30	
1,2,4-Trichlorobenzene	0.0718	0.020	ug/L	0.074		96.8	70-130	5.33	30	
1,1,2-Trichloroethane	0.0534	0.020	ug/L	0.055		97.8	70-130	3.01	30	
1,1,1-Trichloroethane	0.0551	0.020	ug/L	0.055		101	70-130	6.51	30	
Trichloroethylene (TCE)	0.0535	0.020	ug/L	0.054		99.5	70-130	5.47	30	
Trichlorofluoromethane (R11)	0.0625	0.020	ug/L	0.056		111	70-130	8.77	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	0.0799	0.020	ug/L	0.077		104	70-130	3.76	30	
1,3,5-Trimethylbenzene	0.0585	0.020	ug/L	0.049		119	70-130	3.50	30	

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control

Batch B8F1514 - *** DEFAULT PREP ***

LCS Dup (B8F1514-BSD1) Continued

Prepared & Analyzed: 06/07/18

1,2,4-Trimethylbenzene	0.0590	0.020	ug/L	0.049		120	70-130	3.56	30	
Vinyl acetate	0.0434	0.020	ug/L	0.035		123	70-130	1.72	30	
Vinyl chloride	0.0262	0.020	ug/L	0.026		102	70-130	4.11	30	
o-Xylene	0.0515	0.020	ug/L	0.043		119	70-130	3.61	30	
m,p-Xylenes	0.0944	0.020	ug/L	0.087		109	70-130	5.33	30	
1,2,3-Trichloropropane	0.0718	0.020	ug/L	0.060		119	70-130	0.674	30	
sec-Butylbenzene	0.0641	0.020	ug/L	0.055		117	70-130	3.66	30	
Isopropylbenzene	0.0559	0.020	ug/L	0.049		114	70-130	5.14	30	
n-Propylbenzene	0.0586	0.020	ug/L	0.049		119	70-130	4.90	30	
4-Isopropyltoluene	0.0613	0.020	ug/L	0.055		112	70-130	1.72	30	

Surrogate: 4-Bromofluorobenzene 0.154 ug/L 0.14 107 70-130

Duplicate (B8F1514-DUP1)

Source: 8F15012-24 Prepared & Analyzed: 06/07/18

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	

Allen Aminian

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control									
Batch B8F1514 - *** DEFAULT PREP ***									
Duplicate (B8F1514-DUP1) Continued Source: 8F15012-24 Prepared & Analyzed: 06/07/18									
1,2-Dibromoethane (EDB)	<0.020	0.020	ug/L		<0.020			30	
1,2-Dichlorobenzene	<0.020	0.020	ug/L		<0.020			30	
1,3-Dichlorobenzene	<0.020	0.020	ug/L		<0.020			30	
1,4-Dichlorobenzene	<0.020	0.020	ug/L		<0.020			30	
Dichlorodifluoromethane (R12)	<0.020	0.020	ug/L		<0.020			30	
1,1-Dichloroethane	<0.020	0.020	ug/L		<0.020			30	
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L		<0.020			30	
cis-1,2-Dichloroethylene	<0.020	0.020	ug/L		<0.020			30	
1,1-Dichloroethylene	<0.020	0.020	ug/L		<0.020			30	
trans-1,2-Dichloroethylene	<0.020	0.020	ug/L		<0.020			30	
1,2-Dichloropropane	<0.020	0.020	ug/L		<0.020			30	
trans-1,3-Dichloropropylene	<0.020	0.020	ug/L		<0.020			30	
cis-1,3-Dichloropropylene	<0.020	0.020	ug/L		<0.020			30	
Dichlorotetrafluoroethane	<0.020	0.020	ug/L		<0.020			30	
Diisopropyl ether (DIPE)	<0.020	0.020	ug/L		<0.020			30	
1,4-Dioxane	<0.020	0.020	ug/L		<0.020			30	
Ethanol	<0.020	0.020	ug/L		<0.020			30	
Ethyl Acetate	<0.020	0.020	ug/L		<0.020			30	
Ethylbenzene	<0.020	0.020	ug/L		<0.020			30	
Ethyl-tert-Butyl Ether (ETBE)	<0.020	0.020	ug/L		<0.020			30	
4-Ethyltoluene	<0.020	0.020	ug/L		<0.020			30	
Heptane	<0.020	0.020	ug/L		<0.020			30	
Hexachlorobutadiene	<0.020	0.020	ug/L		<0.020			30	
n-Hexane	<0.020	0.020	ug/L		<0.020			30	
2-Hexanone (MBK)	<0.020	0.020	ug/L		<0.020			30	
Isopropanol (IPA)	<0.20	0.20	ug/L		<0.20			30	
Methyl-tert-Butyl Ether (MTBE)	<0.020	0.020	ug/L		<0.020			30	
Methylene Chloride	<0.020	0.020	ug/L		<0.020			30	
4-Methyl-2-pentanone (MIBK)	<0.020	0.020	ug/L		<0.020			30	
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	

Allen Aminian
 QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control

Batch B8F1514 - *** DEFAULT PREP ***

Duplicate (B8F1514-DUP1) Continued Source: 8F15012-24 Prepared & Analyzed: 06/07/18

1,1,2,2-Tetrachloroethane	<0.020	0.020	ug/L		<0.020				30	
Tetrachloroethylene (PCE)	0.0275	0.020	ug/L		0.0275			0.00	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	
1,2,3-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 0.157 ug/L 0.14 110 70-130

Batch B8F1515 - *** DEFAULT PREP ***

Blank (B8F1515-BLK1)

Prepared & Analyzed: 06/08/18

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							

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limits RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control									
<i>Batch B8F1515 - *** DEFAULT PREP ***</i>									
Blank (B8F1515-BLK1) Continued					Prepared & Analyzed: 06/08/18				
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						
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						

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limits RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control									
<i>Batch B8F1515 - *** DEFAULT PREP ***</i>									
Blank (B8F1515-BLK1) Continued					Prepared & Analyzed: 06/08/18				
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						
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						

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8F1515 - *** DEFAULT PREP ***</i>										
Blank (B8F1515-BLK1) Continued										
Prepared & Analyzed: 06/08/18										
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							
1,2,3-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							
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.150</i>		<i>ug/L</i>	<i>0.14</i>		<i>105</i>	<i>70-130</i>			
LCS (B8F1515-BS1)										
Prepared & Analyzed: 06/08/18										
Acetone	0.0254	0.020	ug/L	0.024		107	70-130		30	
Benzene	0.0326	0.020	ug/L	0.032		102	70-130		30	
Benzyl chloride	0.0521	0.020	ug/L	0.052		101	70-130		30	
Bromodichloromethane	0.0714	0.020	ug/L	0.067		107	70-130		30	
Bromoform	0.0952	0.020	ug/L	0.10		92.1	70-130		30	
Bromomethane	0.0388	0.020	ug/L	0.039		100	70-130		30	
2-Butanone (MEK)	0.0335	0.020	ug/L	0.029		114	70-130		30	
Carbon Disulfide	0.0320	0.020	ug/L	0.031		103	70-130		30	
Carbon Tetrachloride	0.0655	0.020	ug/L	0.063		104	70-130		30	
Chlorobenzene	0.0468	0.020	ug/L	0.046		102	70-130		30	
Chloroethane	0.0271	0.020	ug/L	0.026		103	70-130		30	
Chloroform	0.0522	0.020	ug/L	0.049		107	70-130		30	
Chloromethane	0.0192	0.020	ug/L	0.021		93.1	70-130		30	
Dibromochloromethane	0.0819	0.020	ug/L	0.085		96.1	70-130		30	
1,2-Dibromoethane (EDB)	0.0777	0.020	ug/L	0.077		101	70-130		30	
1,2-Dichlorobenzene	0.0600	0.020	ug/L	0.060		99.8	70-130		30	
1,3-Dichlorobenzene	0.0597	0.020	ug/L	0.060		99.3	70-130		30	
1,4-Dichlorobenzene	0.0598	0.020	ug/L	0.060		99.5	70-130		30	
Dichlorodifluoromethane (R12)	0.0522	0.020	ug/L	0.049		106	70-130		30	
1,1-Dichloroethane	0.0463	0.020	ug/L	0.040		114	70-130		30	

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8F1515 - *** DEFAULT PREP ***</i>										
LCS (B8F1515-BS1) Continued						Prepared & Analyzed: 06/08/18				
1,2-Dichloroethane (EDC)	0.0469	0.020	ug/L	0.040		116	70-130		30	
cis-1,2-Dichloroethylene	0.0376	0.020	ug/L	0.040		94.8	70-130		30	
1,1-Dichloroethylene	0.0499	0.020	ug/L	0.040		126	70-130		30	
trans-1,2-Dichloroethylene	0.0393	0.020	ug/L	0.040		99.2	70-130		30	
1,2-Dichloropropane	0.0484	0.020	ug/L	0.046		105	70-130		30	
trans-1,3-Dichloropropylene	0.0465	0.020	ug/L	0.045		102	70-130		30	
cis-1,3-Dichloropropylene	0.0456	0.020	ug/L	0.045		100	70-130		30	
Dichlorotetrafluoroethane	0.0856	0.020	ug/L	0.070		122	70-130		30	
Ethylbenzene	0.0471	0.020	ug/L	0.043		108	70-130		30	
4-Ethyltoluene	0.0545	0.020	ug/L	0.049		111	70-130		30	
Hexachlorobutadiene	0.0961	0.020	ug/L	0.11		90.1	70-130		30	
2-Hexanone (MBK)	0.0659	0.020	ug/L	0.041		161	70-130		30	**
Isopropanol (IPA)	0.0315	0.20	ug/L	0.025		128	70-130		30	
Methylene Chloride	0.0376	0.020	ug/L	0.035		108	70-130		30	
4-Methyl-2-pentanone (MIBK)	0.0745	0.020	ug/L	0.041		182	70-130		30	**
Styrene	0.0437	0.020	ug/L	0.043		102	70-130		30	
1,1,2,2-Tetrachloroethane	0.0777	0.020	ug/L	0.069		113	70-130		30	
Tetrachloroethylene (PCE)	0.0558	0.020	ug/L	0.068		82.3	70-130		30	
Toluene	0.0364	0.020	ug/L	0.038		96.7	70-130		30	
1,2,4-Trichlorobenzene	0.0675	0.020	ug/L	0.074		91.0	70-130		30	
1,1,2-Trichloroethane	0.0530	0.020	ug/L	0.055		97.2	70-130		30	
1,1,1-Trichloroethane	0.0544	0.020	ug/L	0.055		99.7	70-130		30	
Trichloroethylene (TCE)	0.0563	0.020	ug/L	0.054		105	70-130		30	
Trichlorofluoromethane (R11)	0.0614	0.020	ug/L	0.056		109	70-130		30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	0.0805	0.020	ug/L	0.077		105	70-130		30	
1,3,5-Trimethylbenzene	0.0560	0.020	ug/L	0.049		114	70-130		30	
1,2,4-Trimethylbenzene	0.0561	0.020	ug/L	0.049		114	70-130		30	
Vinyl acetate	0.0430	0.020	ug/L	0.035		122	70-130		30	
Vinyl chloride	0.0269	0.020	ug/L	0.026		105	70-130		30	
o-Xylene	0.0495	0.020	ug/L	0.043		114	70-130		30	
m,p-Xylenes	0.0891	0.020	ug/L	0.087		103	70-130		30	

Allen Aminian
 QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8F1515 - *** DEFAULT PREP ***</i>										
LCS (B8F1515-BS1) Continued					Prepared & Analyzed: 06/08/18					
1,2,3-Trichloropropane	0.0702	0.020	ug/L	0.060	116	70-130		30		
sec-Butylbenzene	0.0624	0.020	ug/L	0.055	114	70-130		30		
Isopropylbenzene	0.0535	0.020	ug/L	0.049	109	70-130		30		
n-Propylbenzene	0.0561	0.020	ug/L	0.049	114	70-130		30		
4-Isopropyltoluene	0.0598	0.020	ug/L	0.055	109	70-130		30		
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.152</i>		<i>ug/L</i>	<i>0.14</i>	<i>106</i>	<i>70-130</i>				
LCS Dup (B8F1515-BSD1)					Prepared & Analyzed: 06/08/18					
Acetone	0.0253	0.020	ug/L	0.024	106	70-130	0.469	30		
Benzene	0.0320	0.020	ug/L	0.032	100	70-130	1.88	30		
Benzyl chloride	0.0545	0.020	ug/L	0.052	105	70-130	4.57	30		
Bromodichloromethane	0.0710	0.020	ug/L	0.067	106	70-130	0.659	30		
Bromoform	0.0981	0.020	ug/L	0.10	94.9	70-130	2.99	30		
Bromomethane	0.0383	0.020	ug/L	0.039	98.7	70-130	1.31	30		
2-Butanone (MEK)	0.0343	0.020	ug/L	0.029	116	70-130	2.26	30		
Carbon Disulfide	0.0315	0.020	ug/L	0.031	101	70-130	1.57	30		
Carbon Tetrachloride	0.0636	0.020	ug/L	0.063	101	70-130	2.92	30		
Chlorobenzene	0.0486	0.020	ug/L	0.046	106	70-130	3.77	30		
Chloroethane	0.0265	0.020	ug/L	0.026	101	70-130	1.97	30		
Chloroform	0.0511	0.020	ug/L	0.049	105	70-130	2.17	30		
Chloromethane	0.0179	0.020	ug/L	0.021	86.6	70-130	7.23	30		
Dibromochloromethane	0.0835	0.020	ug/L	0.085	98.0	70-130	1.96	30		
1,2-Dibromoethane (EDB)	0.0795	0.020	ug/L	0.077	104	70-130	2.35	30		
1,2-Dichlorobenzene	0.0616	0.020	ug/L	0.060	102	70-130	2.57	30		
1,3-Dichlorobenzene	0.0610	0.020	ug/L	0.060	102	70-130	2.19	30		
1,4-Dichlorobenzene	0.0614	0.020	ug/L	0.060	102	70-130	2.58	30		
Dichlorodifluoromethane (R12)	0.0505	0.020	ug/L	0.049	102	70-130	3.28	30		
1,1-Dichloroethane	0.0440	0.020	ug/L	0.040	109	70-130	5.11	30		
1,2-Dichloroethane (EDC)	0.0449	0.020	ug/L	0.040	111	70-130	4.32	30		
cis-1,2-Dichloroethylene	0.0372	0.020	ug/L	0.040	93.9	70-130	0.954	30		
1,1-Dichloroethylene	0.0470	0.020	ug/L	0.040	119	70-130	5.97	30		
trans-1,2-Dichloroethylene	0.0383	0.020	ug/L	0.040	96.7	70-130	2.55	30		

Allen Aminian
QA/QC Manager

**LABORATORY ANALYSIS RESULTS**

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8F1515 - *** DEFAULT PREP ***</i>										
LCS Dup (B8F1515-BSD1) Continued					Prepared & Analyzed: 06/08/18					
1,2-Dichloropropane	0.0501	0.020	ug/L	0.046		108	70-130	3.47	30	
trans-1,3-Dichloropropylene	0.0481	0.020	ug/L	0.045		106	70-130	3.36	30	
cis-1,3-Dichloropropylene	0.0469	0.020	ug/L	0.045		103	70-130	2.84	30	
Dichlorotetrafluoroethane	0.0805	0.020	ug/L	0.070		115	70-130	6.23	30	
Ethylbenzene	0.0491	0.020	ug/L	0.043		113	70-130	4.24	30	
4-Ethyltoluene	0.0566	0.020	ug/L	0.049		115	70-130	3.89	30	
Hexachlorobutadiene	0.100	0.020	ug/L	0.11		94.0	70-130	4.24	30	
2-Hexanone (MBK)	0.0430	0.020	ug/L	0.041		105	70-130	42.1	30	QR-01
Isopropanol (IPA)	0.0279	0.20	ug/L	0.025		113	70-130	12.1	30	
Methylene Chloride	0.0373	0.020	ug/L	0.035		107	70-130	0.742	30	
4-Methyl-2-pentanone (MIBK)	0.0509	0.020	ug/L	0.041		124	70-130	37.6	30	QR-02
Styrene	0.0461	0.020	ug/L	0.043		108	70-130	5.41	30	
1,1,2,2-Tetrachloroethane	0.0803	0.020	ug/L	0.069		117	70-130	3.22	30	
Tetrachloroethylene (PCE)	0.0581	0.020	ug/L	0.068		85.6	70-130	3.93	30	
Toluene	0.0388	0.020	ug/L	0.038		103	70-130	6.21	30	
1,2,4-Trichlorobenzene	0.0709	0.020	ug/L	0.074		95.6	70-130	4.93	30	
1,1,2-Trichloroethane	0.0548	0.020	ug/L	0.055		100	70-130	3.24	30	
1,1,1-Trichloroethane	0.0527	0.020	ug/L	0.055		96.6	70-130	3.16	30	
Trichloroethylene (TCE)	0.0557	0.020	ug/L	0.054		104	70-130	1.15	30	
Trichlorofluoromethane (R11)	0.0582	0.020	ug/L	0.056		104	70-130	5.45	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	0.0790	0.020	ug/L	0.077		103	70-130	1.83	30	
1,3,5-Trimethylbenzene	0.0585	0.020	ug/L	0.049		119	70-130	4.38	30	
1,2,4-Trimethylbenzene	0.0584	0.020	ug/L	0.049		119	70-130	3.95	30	
Vinyl acetate	0.0436	0.020	ug/L	0.035		124	70-130	1.22	30	
Vinyl chloride	0.0255	0.020	ug/L	0.026		99.7	70-130	5.27	30	
o-Xylene	0.0509	0.020	ug/L	0.043		117	70-130	2.94	30	
m,p-Xylenes	0.0942	0.020	ug/L	0.087		108	70-130	5.54	30	
1,2,3-Trichloropropane	0.0713	0.020	ug/L	0.060		118	70-130	1.53	30	
sec-Butylbenzene	0.0646	0.020	ug/L	0.055		118	70-130	3.46	30	
Isopropylbenzene	0.0567	0.020	ug/L	0.049		115	70-130	5.80	30	
n-Propylbenzene	0.0595	0.020	ug/L	0.049		121	70-130	5.78	30	

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control										
<i>Batch B8F1515 - *** DEFAULT PREP ***</i>										
LCS Dup (B8F1515-BSD1) Continued					Prepared & Analyzed: 06/08/18					
4-Isopropyltoluene	0.0616	0.020	ug/L	0.055	112	70-130	2.89	30		
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.153</i>		<i>ug/L</i>	<i>0.14</i>	<i>107</i>	<i>70-130</i>				
Duplicate (B8F1515-DUP1)					Source: 8F15012-34 Prepared & Analyzed: 06/08/18					
Acetone	<0.20	0.20	ug/L	<0.20				30		
Allyl chloride	<0.20	0.20	ug/L	<0.20				30		
tert-Amyl Methyl Ether (TAME)	<0.20	0.20	ug/L	<0.20				30		
Benzene	<0.20	0.20	ug/L	<0.20				30		
Benzyl chloride	<0.20	0.20	ug/L	<0.20				30		
Bromodichloromethane	<0.20	0.20	ug/L	<0.20				30		
Bromoform	<0.20	0.20	ug/L	<0.20				30		
Bromomethane	<0.20	0.20	ug/L	<0.20				30		
1,3-Butadiene	<0.20	0.20	ug/L	<0.20				30		
2-Butanone (MEK)	<0.20	0.20	ug/L	<0.20				30		
tert-Butyl alcohol (TBA)	<200	200	ug/L	<200				30		
Carbon Disulfide	<0.20	0.20	ug/L	<0.20				30		
Carbon Tetrachloride	<0.20	0.20	ug/L	<0.20				30		
Chlorobenzene	<0.20	0.20	ug/L	<0.20				30		
Chloroethane	<0.20	0.20	ug/L	<0.20				30		
Chloroform	<0.20	0.20	ug/L	<0.20				30		
Chloromethane	<0.20	0.20	ug/L	<0.20				30		
Cyclohexane	<0.20	0.20	ug/L	<0.20				30		
Dibromochloromethane	<0.20	0.20	ug/L	<0.20				30		
1,2-Dibromoethane (EDB)	<0.20	0.20	ug/L	<0.20				30		
1,2-Dichlorobenzene	<0.20	0.20	ug/L	<0.20				30		
1,3-Dichlorobenzene	<0.20	0.20	ug/L	<0.20				30		
1,4-Dichlorobenzene	<0.20	0.20	ug/L	<0.20				30		
Dichlorodifluoromethane (R12)	<0.20	0.20	ug/L	<0.20				30		
1,1-Dichloroethane	<0.20	0.20	ug/L	<0.20				30		
1,2-Dichloroethane (EDC)	<0.20	0.20	ug/L	<0.20				30		
cis-1,2-Dichloroethylene	<0.20	0.20	ug/L	<0.20				30		
1,1-Dichloroethylene	<0.20	0.20	ug/L	<0.20				30		

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control									
<i>Batch B8F1515 - *** DEFAULT PREP ***</i>									
Duplicate (B8F1515-DUP1) Continued Source: 8F15012-34 Prepared & Analyzed: 06/08/18									
trans-1,2-Dichloroethylene	<0.20	0.20	ug/L		<0.20			30	
1,2-Dichloropropane	<0.20	0.20	ug/L		<0.20			30	
trans-1,3-Dichloropropylene	<0.20	0.20	ug/L		<0.20			30	
cis-1,3-Dichloropropylene	<0.20	0.20	ug/L		<0.20			30	
Dichlorotetrafluoroethane	<0.20	0.20	ug/L		<0.20			30	
Diisopropyl ether (DIPE)	<0.20	0.20	ug/L		<0.20			30	
1,4-Dioxane	<0.20	0.20	ug/L		<0.20			30	
Ethanol	<0.20	0.20	ug/L		0.100			30	
Ethyl Acetate	<0.20	0.20	ug/L		<0.20			30	
Ethylbenzene	<0.20	0.20	ug/L		<0.20			30	
Ethyl-tert-Butyl Ether (ETBE)	<0.20	0.20	ug/L		<0.20			30	
4-Ethyltoluene	<0.20	0.20	ug/L		<0.20			30	
Heptane	<0.20	0.20	ug/L		<0.20			30	
Hexachlorobutadiene	<0.20	0.20	ug/L		<0.20			30	
n-Hexane	<0.20	0.20	ug/L		<0.20			30	
2-Hexanone (MBK)	<0.20	0.20	ug/L		<0.20			30	
Isopropanol (IPA)	<2.0	2.0	ug/L		<2.0			30	
Methyl-tert-Butyl Ether (MTBE)	<0.20	0.20	ug/L		<0.20			30	
Methylene Chloride	<0.20	0.20	ug/L		<0.20			30	
4-Methyl-2-pentanone (MIBK)	<0.20	0.20	ug/L		<0.20			30	
Naphthalene	<0.20	0.20	ug/L		<0.20			30	
Propylene	<0.20	0.20	ug/L		<0.20			30	
Styrene	<0.20	0.20	ug/L		<0.20			30	
1,1,2,2-Tetrachloroethane	<0.20	0.20	ug/L		<0.20			30	
Tetrachloroethylene (PCE)	0.366	0.20	ug/L		0.375		2.38	30	
Tetrahydrofuran (THF)	<0.20	0.20	ug/L		<0.20			30	
Toluene	<0.20	0.20	ug/L		<0.20			30	
1,2,4-Trichlorobenzene	<0.20	0.20	ug/L		<0.20			30	
1,1,2-Trichloroethane	<0.20	0.20	ug/L		<0.20			30	
1,1,1-Trichloroethane	<0.20	0.20	ug/L		<0.20			30	
Trichloroethylene (TCE)	<0.20	0.20	ug/L		<0.20			30	
Trichlorofluoromethane (R11)	<0.20	0.20	ug/L		<0.20			30	

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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VOCs by GCMS EPA TO-15 (Mid Level) - Quality Control

*Batch B8F1515 - *** DEFAULT PREP ****

Duplicate (B8F1515-DUP1) Continued **Source: 8F15012-34** Prepared & Analyzed: 06/08/18

1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.20	0.20	ug/L		<0.20				30	
1,3,5-Trimethylbenzene	<0.20	0.20	ug/L		<0.20				30	
1,2,4-Trimethylbenzene	<0.20	0.20	ug/L		<0.20				30	
2,2,4-Trimethylpentane	<0.20	0.20	ug/L		<0.20				30	
Vinyl acetate	<0.20	0.20	ug/L		<0.20				30	
Vinyl bromide	<0.20	0.20	ug/L		<0.20				30	
Vinyl chloride	<0.20	0.20	ug/L		<0.20				30	
o-Xylene	<0.20	0.20	ug/L		<0.20				30	
m,p-Xylenes	<0.20	0.20	ug/L		<0.20				30	
1,2,3-Trichloropropane	<0.20	0.20	ug/L		<0.20				30	
sec-Butylbenzene	<0.20	0.20	ug/L		<0.20				30	
Isopropylbenzene	<0.20	0.20	ug/L		<0.20				30	
n-Propylbenzene	<0.20	0.20	ug/L		<0.20				30	
4-Isopropyltoluene	<0.20	0.20	ug/L		<0.20				30	
n-Butylbenzene	<0.20	0.20	ug/L		<0.20				30	

Surrogate: 4-Bromofluorobenzene 0.151 ug/L 0.14 105 70-130

Fixed Gases by TCD - Quality Control

*Batch B8F1519 - *** DEFAULT PREP ****

Blank (B8F1519-BLK1)

Prepared & Analyzed: 06/06/18

Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							

LCS (B8F1519-BS1)

Prepared & Analyzed: 06/06/18

Methane	4.46	0.10	% by Volume	4.5	99.1	75-125				
Oxygen	4.28	0.10	% by Volume	4.0	107	75-125				

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
<i>Batch B8F1519 - *** DEFAULT PREP ***</i>										
LCS (B8F1519-BS1) Continued					Prepared & Analyzed: 06/06/18					
Carbon Dioxide	13.4	0.10	% by Volume	15		89.3	75-125			
LCS Dup (B8F1519-BSD1)					Prepared & Analyzed: 06/06/18					
Methane	4.37	0.10	% by Volume	4.5		97.2	75-125	1.95	30	
Oxygen	4.33	0.10	% by Volume	4.0		108	75-125	0.999	30	
Carbon Dioxide	13.4	0.10	% by Volume	15		89.3	75-125	0.0299	30	
Duplicate (B8F1519-DUP1)					Source: 8F15012-10 Prepared & Analyzed: 06/06/18					
Methane	<0.10	0.10	% by Volume		<0.10				30	
Oxygen	18.2	0.10	% by Volume		18.1			0.330	30	
Carbon Dioxide	0.920	0.10	% by Volume		0.907			1.42	30	
<i>Batch B8F1520 - *** DEFAULT PREP ***</i>										
Blank (B8F1520-BLK1)					Prepared & Analyzed: 06/07/18					
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B8F1520-BS1)					Prepared & Analyzed: 06/07/18					
Methane	4.44	0.10	% by Volume	4.5		98.6	75-125			
Oxygen	4.37	0.10	% by Volume	4.0		109	75-125			
Carbon Dioxide	13.5	0.10	% by Volume	15		89.9	75-125			
LCS Dup (B8F1520-BSD1)					Prepared & Analyzed: 06/07/18					

Allen Aminian
QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
<i>Batch B8F1520 - *** DEFAULT PREP ***</i>										
Methane	4.65	0.10	% by Volume	4.5		103	75-125	4.73	30	
Oxygen	4.09	0.10	% by Volume	4.0		102	75-125	6.57	30	
Carbon Dioxide	13.8	0.10	% by Volume	15		91.9	75-125	2.20	30	
Duplicate (B8F1520-DUP1) Source: 8F15012-24 Prepared & Analyzed: 06/07/18										
Methane	<0.10	0.10	% by Volume		<0.10				30	
Oxygen	11.0	0.10	% by Volume		11.2			1.98	30	
Carbon Dioxide	7.57	0.10	% by Volume		7.58			0.132	30	
<i>Batch B8F1521 - *** DEFAULT PREP ***</i>										
Blank (B8F1521-BLK1) Prepared & Analyzed: 06/08/18										
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B8F1521-BS1) Prepared & Analyzed: 06/08/18										
Methane	4.36	0.10	% by Volume	4.5		97.0	75-125			
Oxygen	4.48	0.10	% by Volume	4.0		112	75-125			
Carbon Dioxide	13.2	0.10	% by Volume	15		88.2	75-125			
LCS Dup (B8F1521-BSD1) Prepared & Analyzed: 06/08/18										
Methane	4.49	0.10	% by Volume	4.5		99.7	75-125	2.78	30	
Oxygen	4.58	0.10	% by Volume	4.0		114	75-125	2.12	30	

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
<i>Batch B8F1521 - *** DEFAULT PREP ***</i>										
LCS Dup (B8F1521-BSD1) Continued					Prepared & Analyzed: 06/08/18					
Carbon Dioxide	13.3	0.10	% by Volume	15		88.7	75-125	0.512	30	
Duplicate (B8F1521-DUP1)					Source: 8F15012-34 Prepared & Analyzed: 06/08/18					
Methane	<0.10	0.10	% by Volume		<0.10				30	
Oxygen	18.8	0.10	% by Volume		18.9			0.424	30	
Carbon Dioxide	0.223	0.10	% by Volume		0.256			13.8	30	

Allen Aminian
 QA/QC Manager



LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 693142
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187321
Date Received: 06/08/18
Date Reported: 06/18/18

Special Notes

- [1] = ** : Analyte recovery exceeded the upper control limit.
- [2] = **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.
- [3] = **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.

A handwritten signature in black ink, appearing to read 'Allen Aminian'.

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.: 15796

70051291
Page 1 of 1

Client: JACOBS Project Name / No.: KINDAL MORGAN NORWALK Sampler's Name: William Spillman
 Project Manager: _____ Site Address: _____ Sampler's Signature: [Signature]
 Phone: _____ City: _____ P.O. No.: _____
 Fax: _____ State & Zip: _____ Quote No.: _____

TAT Turnaround Codes **

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

ANALYSIS REQUESTED (Test Name)

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	Please enter the TAT Turnaround Codes ** below										Special Instructions		
						①	②	③	④	⑤	X							
SVM-1-5	8FIS012-1	6-6-18	0756	V	3	X	X	X										
SVM-1-15	-2		0857	V	3	X	X	X										P03
SVM-2-5	-3		0858	V	3	X	X	X										
SVM-15-7	-4		0920	V	3	X	X	X										
SVM-15-15	-5		0921	V	3	X	X	X										
SVM-15-22	-6		0922	V	3	X	X	X										
SVM-6-7	-7		1015	V	3	X	X	X										
SVM-6-13	-8		1016	V	3	X	X	X										
SVM-7-6	-9		1050	V	3	X	X	X										
SVM-7-13	-10		1051	V	3	X	X	X										
SVM-7-13 DUP	-11		1051	V	3	X	X	X										
SVM-10-15	-12		1142	V	3	X	X	X										

REVIEWED For Laboratory Use Date <u>6/11/18</u> Time <u>10:00</u> TAT <u>5</u> Days Sign: <u>[Signature]</u>	Relinquished by <u>[Signature]</u> Date <u>6-6-18</u> Time <u>13:00</u> Received by <u>[Signature]</u>
	Relinquished by <u>[Signature]</u> Date <u>6/8/18</u> Time <u>15:00</u> Received by <u>[Signature]</u>
	Relinquished by _____ Date _____ Time _____ Received by _____

A.A. Project No.: MB/87524/8FIS012

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



AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311

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

A.A. COC No.: 15797

70051294

Page 1 of 1

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

TAT Turnaround Codes **

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

ANALYSIS REQUESTED (Test Name)

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	Please enter the TAT Turnaround Codes ** below										Special Instructions		
						TOIS	TOIS	FIXED GND										
SUM-5-5	8F15012-13	6-7-18	0800	V	3	X	X	X										
SUM-5-15	-14		0801	V	3	X	X	X										
SUM-8-5	-15		0835	V	3	X	X	X										
SUM-8-15	-16		0836	V	3	X	X	X										
SUM-16-7	-17		0858	V	3	X	X	X										
SUM-16-16	-18		0859	V	3	X	X	X										
SUM-16-22	-19		0900	V	3	X	X	X										
SUM-3-5	-20		1030	V	3	X	X	X										
SUM-3-15	-21		1031	V	3	X	X	X										
SUM-12-7	-22		1116	V	3	X	X	X										
SUM-12-15	-23		1117	V	3	X	X	X										
SUM-12-22	-24		1118	V	3	X	X	X										
SUM-12-22-04	-25		1118	V	2	X	X	X										

RECEIVED For Laboratory Use Date <u>6/11/18</u> Time <u>10:00</u> TAT <u>5</u> Days Sign <u>[Signature]</u>	Relinquished by <u>[Signature]</u>	Date <u>6-7-18</u>	Time <u>1145</u>	Received by <u>[Signature]</u>
	Relinquished by <u>[Signature]</u>	Date <u>6/16/18</u>	Time <u>15:30</u>	Received by <u>[Signature]</u>
	Relinquished by	Date	Time	Received by

A.A. Project No.: MB187324/8F15012

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



AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

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

A.A. COC No.: 15798

70051295

Page 1 of 1

Client: JACOBS Project Name / No.: KINDER MORGAN NORWALK Sampler's Name: WILLIAM SCHWABER
 Project Manager: _____ Site Address: 15706 NORWALK RD Sampler's Signature: [Signature]
 Phone: _____ City: NORWALK P.O. No.: _____
 Fax: _____ State & Zip: CA Quote No.: _____

TAT Turnaround Codes **

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

ANALYSIS REQUESTED (Test Name)

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	Please enter the TAT Turnaround Codes ** below										Special Instructions			
						1	2	3	4	5	X								
SUM-11-7	8F15012-26	6-8-18	0734	V	3	X	X	X											
SUM-11-15	-27	↓	0735	V	3	X	X	X											
SUM-11-22	-28		0736	V	3	X	X	X											
SUM-13-7	-29		0832	V	3	X	X	X											
SUM-13-15.S	-30		0833	V	3	X	X	X											
SUM-13-22.S	-31		0834	V	3	X	X	X											
SUM-14R-8	-32		0927	V	3	X	X	X											
SUM-14R-16	-33		0928	V	3	X	X	X											
SUM-14R-23	-34		0929	V	3	X	X	X											
SUM-14R-23 DUP	-35		0929	V	3	X	X	X											

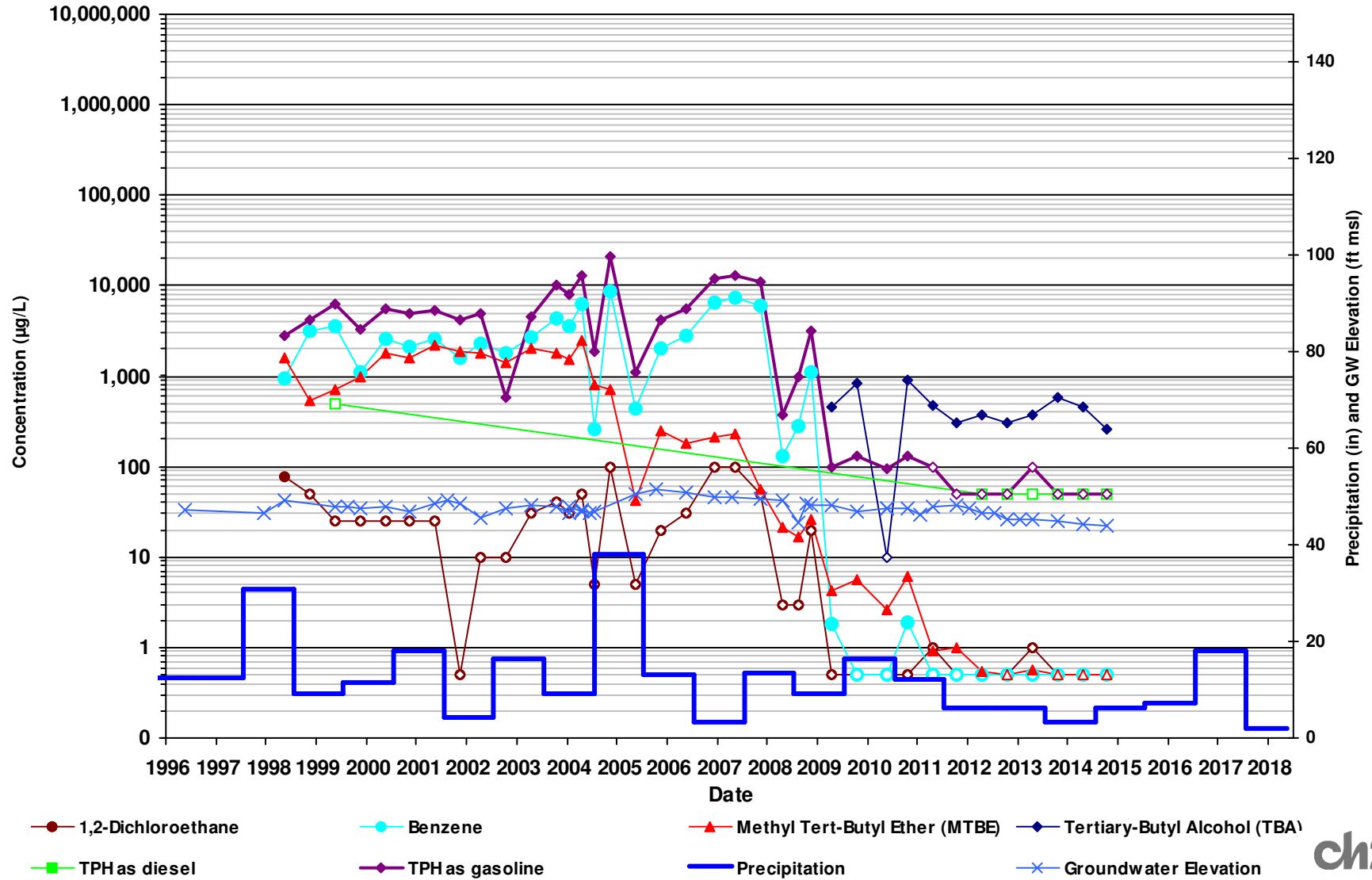
RELEASED For Laboratory Use Date <u>6/11/18</u> Time <u>10:00</u> TAT <u>5</u> Days Sign: <u>[Signature]</u>	Relinquished by <u>[Signature]</u>	Date <u>6-8-18</u>	Time <u>11:15</u>	Received by <u>[Signature]</u>
	Relinquished by <u>[Signature]</u>	Date <u>6/8/18</u>	Time <u>15:00</u>	Received by <u>[Signature]</u>
	Relinquished by _____	Date _____	Time _____	Received by _____

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

Appendix B
Time Series Charts for Select
South-Central Area Wells

South-Central Area
GMW-27, GMW-O-3, GMW-O-5,
GMW-O-9, GMW-O-10, GMW-O-14,
GWR-1R, HL-2, MW-SF-1

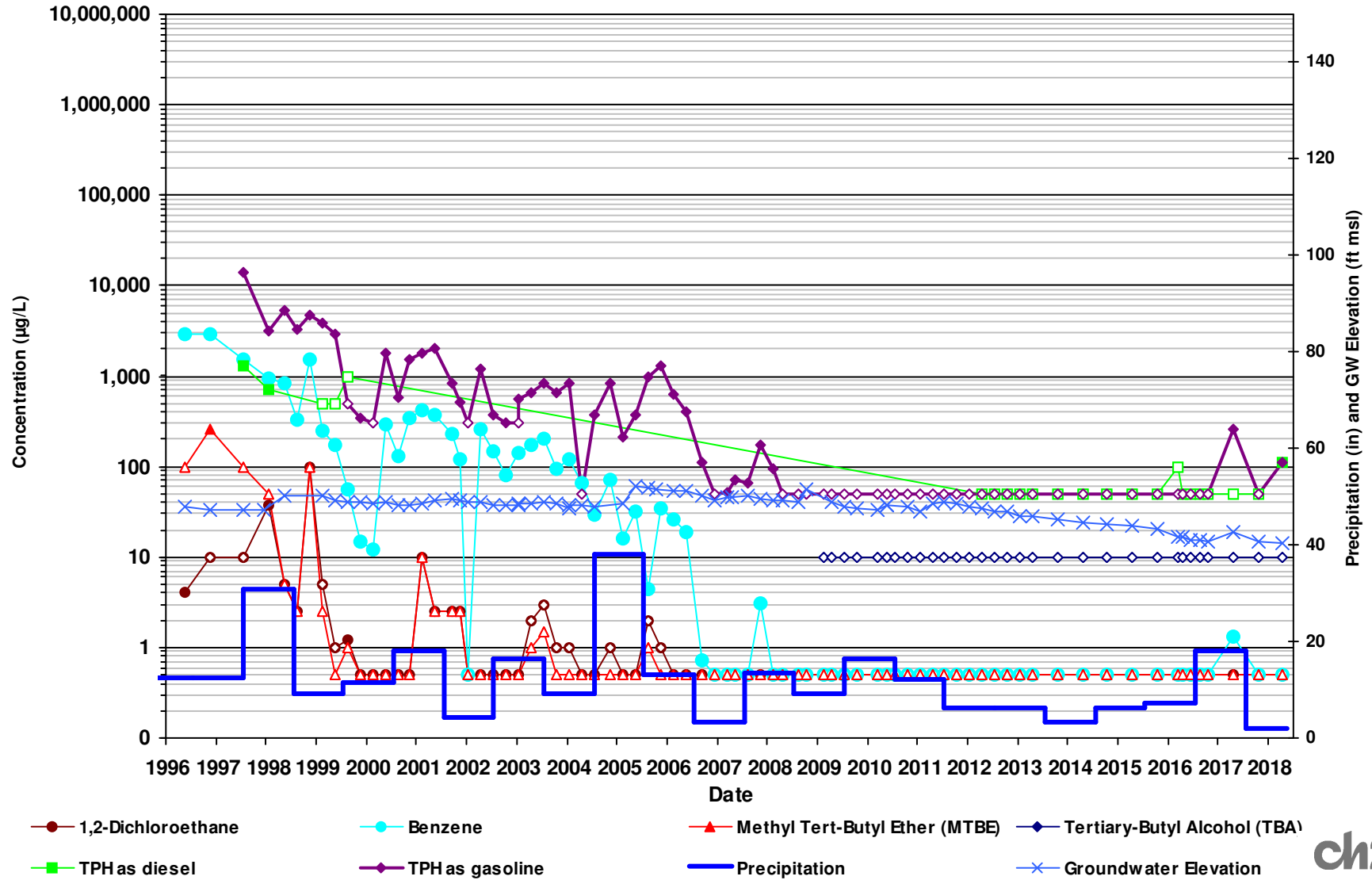
GMW-27



Non detect results (ND) are plotted with an open symbol using the laboratory reporting limit.

Precipitation data reported as annual rainfall which is calculated from Long Beach CIMIS #174 weather station. source: <https://cimis.water.ca.gov/>

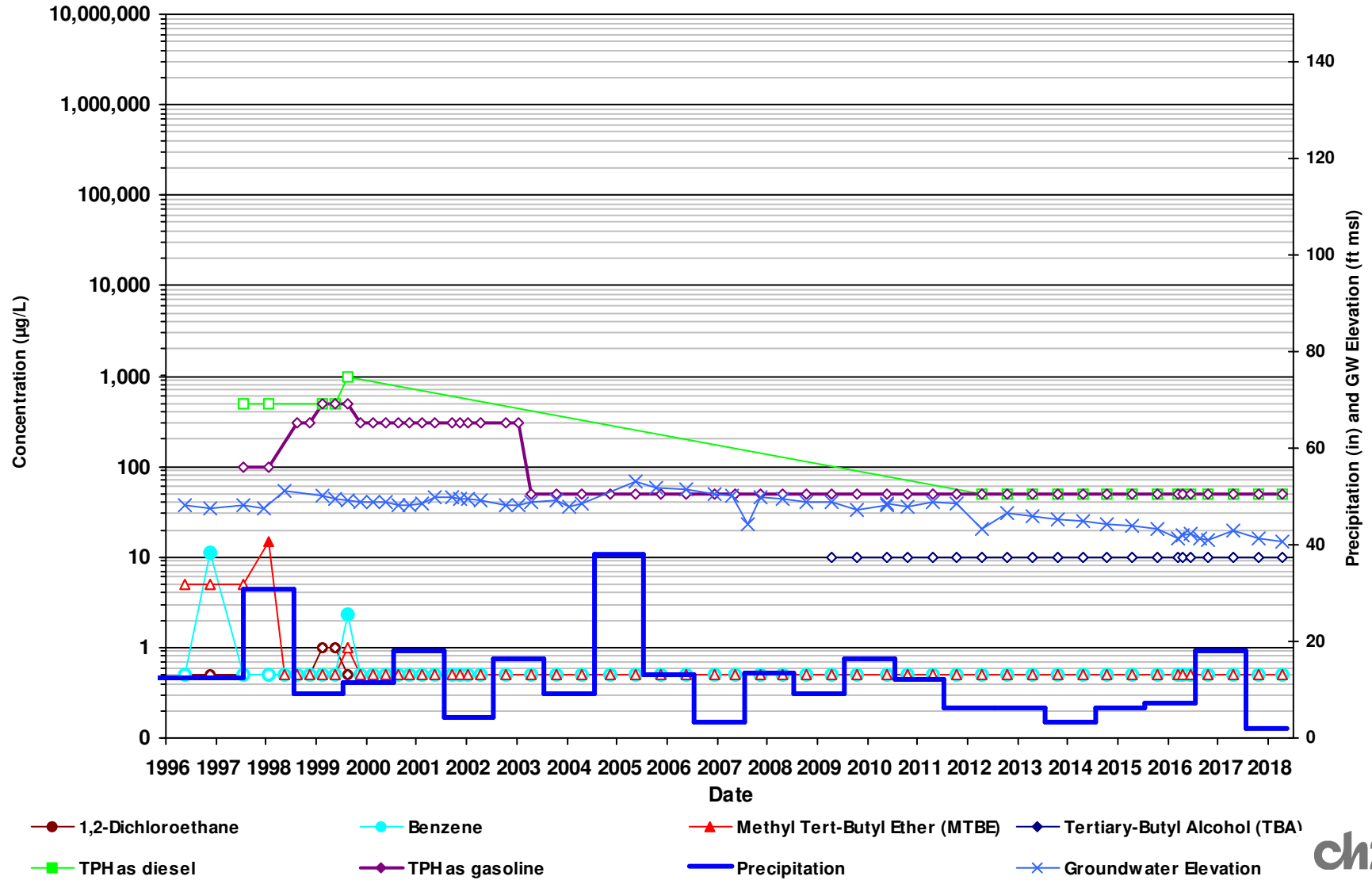
GMW-O-3



Non detect results (ND) are plotted with an open symbol using the laboratory reporting limit.

Precipitation data reported as annual rainfall which is calculated from Long Beach CIMIS #174 weather station. source: <https://cimis.water.ca.gov/>

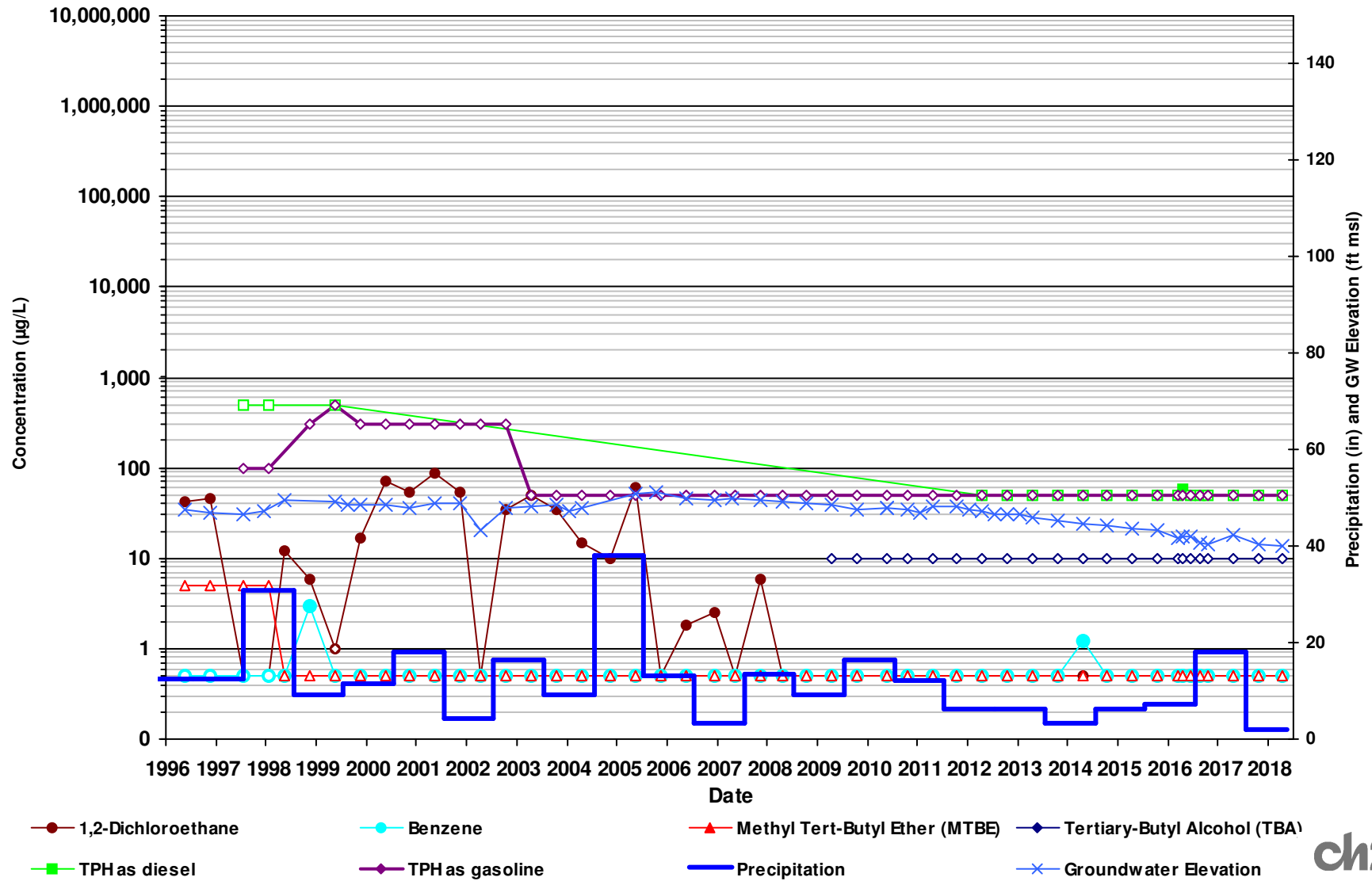
GMW-O-5



Non detect results (ND) are plotted with an open symbol using the laboratory reporting limit.

Precipitation data reported as annual rainfall which is calculated from Long Beach CIMIS #174 weather station. source: <https://cimis.water.ca.gov/>

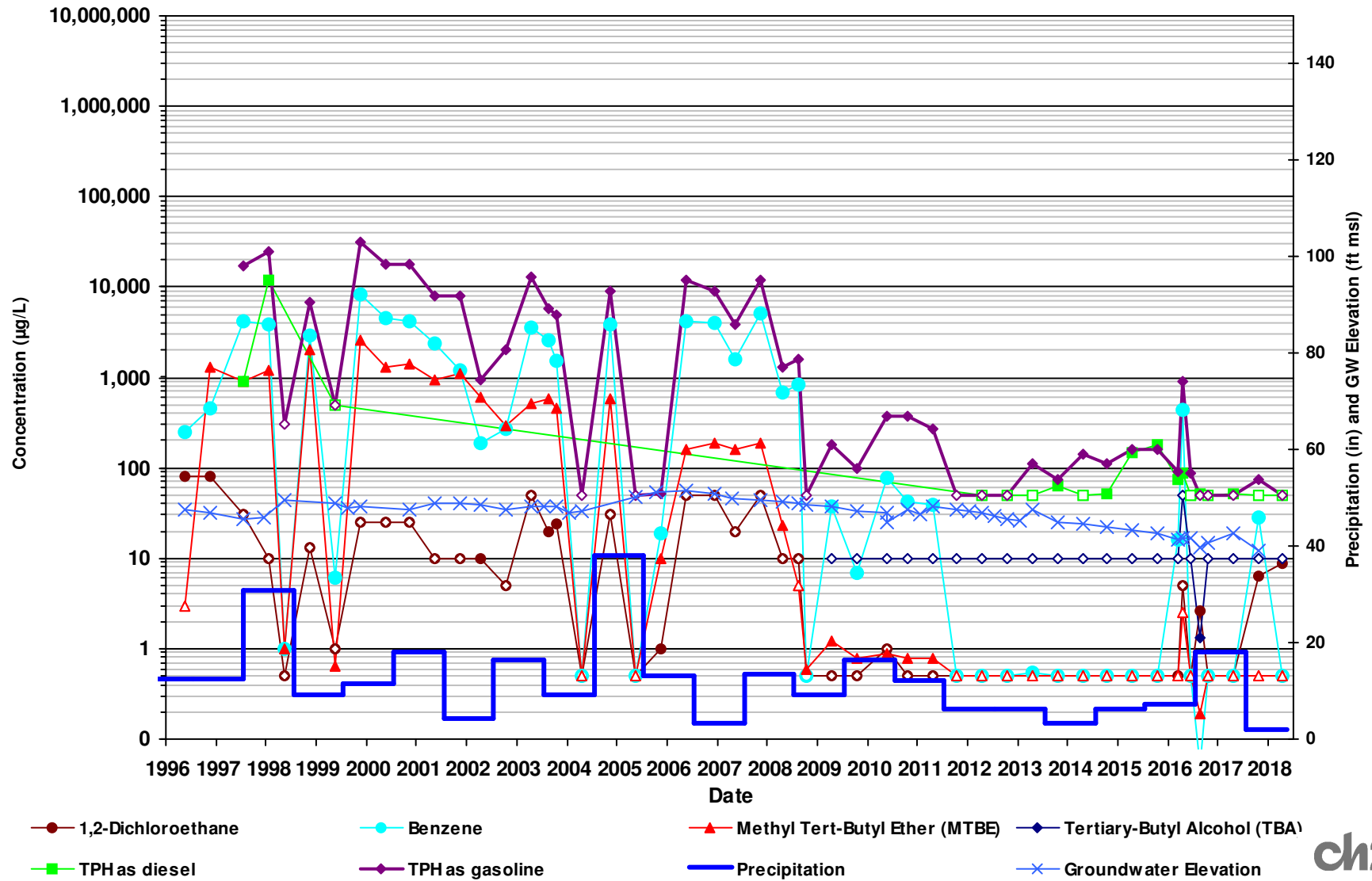
GMW-O-9



Non detect results (ND) are plotted with an open symbol using the laboratory reporting limit.

Precipitation data reported as annual rainfall which is calculated from Long Beach CIMIS #174 weather station. source: <https://cimis.water.ca.gov/>

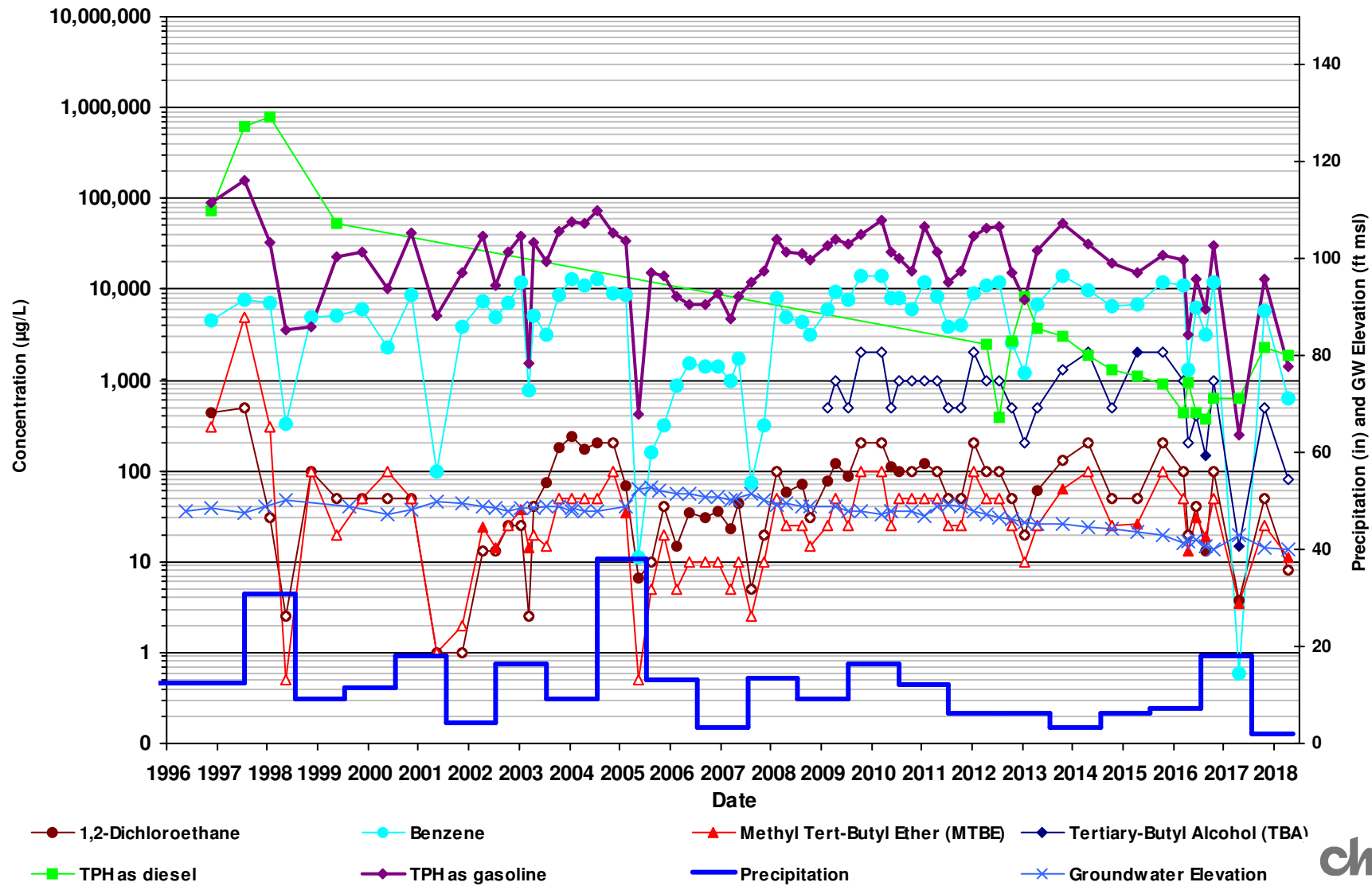
GMW-O-10



Non detect results (ND) are plotted with an open symbol using the laboratory reporting limit.

Precipitation data reported as annual rainfall which is calculated from Long Beach CIMIS #174 weather station. source: <https://cimis.water.ca.gov/>

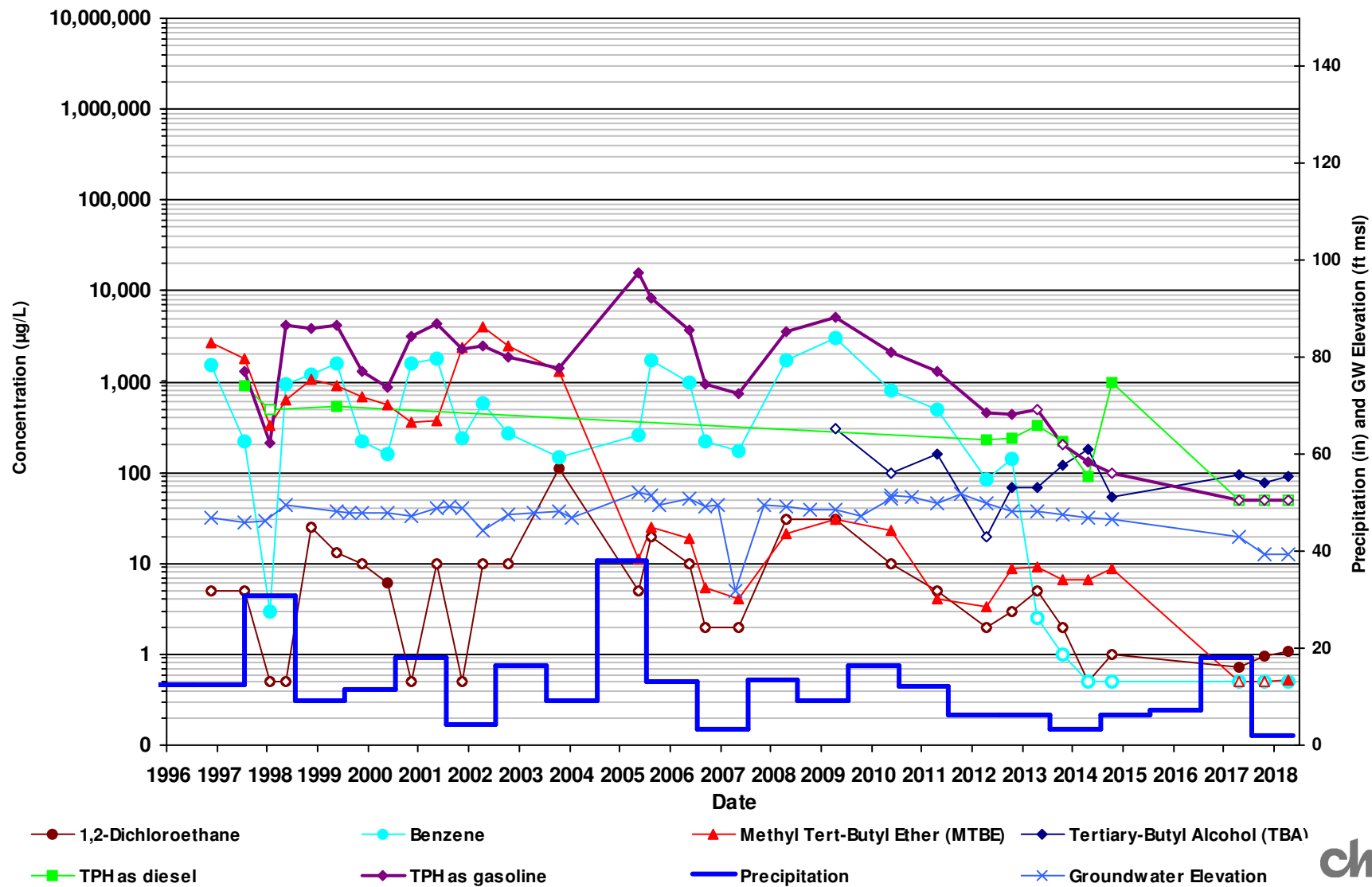
GMW-O-14



Non detect results (ND) are plotted with an open symbol using the laboratory reporting limit.

Precipitation data reported as annual rainfall which is calculated from Long Beach CIMIS #174 weather station. source: <https://cimis.water.ca.gov/>

GWR-1R



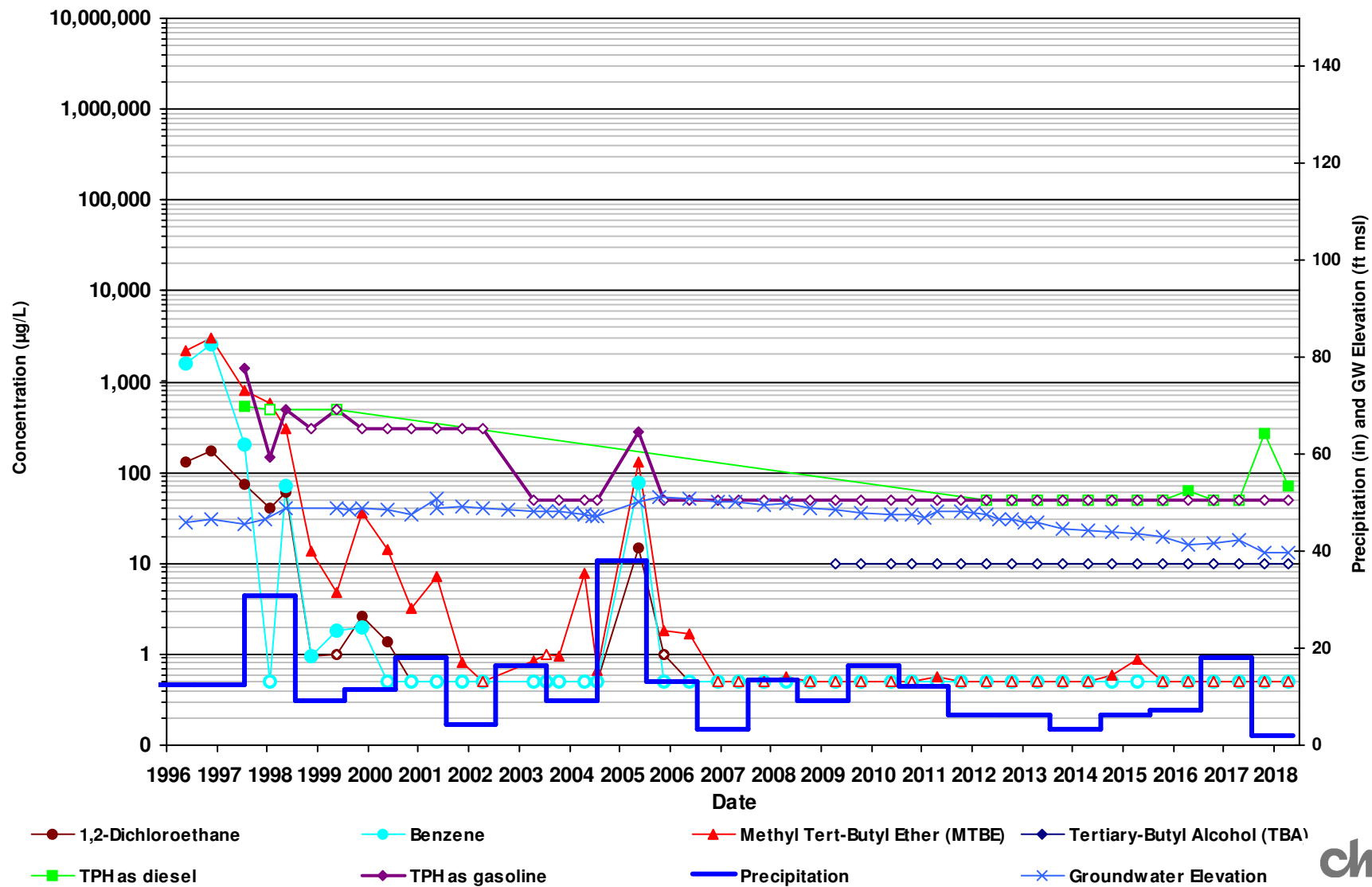
Well formerly known as GWR-1.

Non detect results (ND) are plotted with an open symbol using the laboratory reporting limit.

Precipitation data reported as annual rainfall which is calculated from Long Beach CIMIS #174 weather station.

source: <https://cimis.water.ca.gov/>

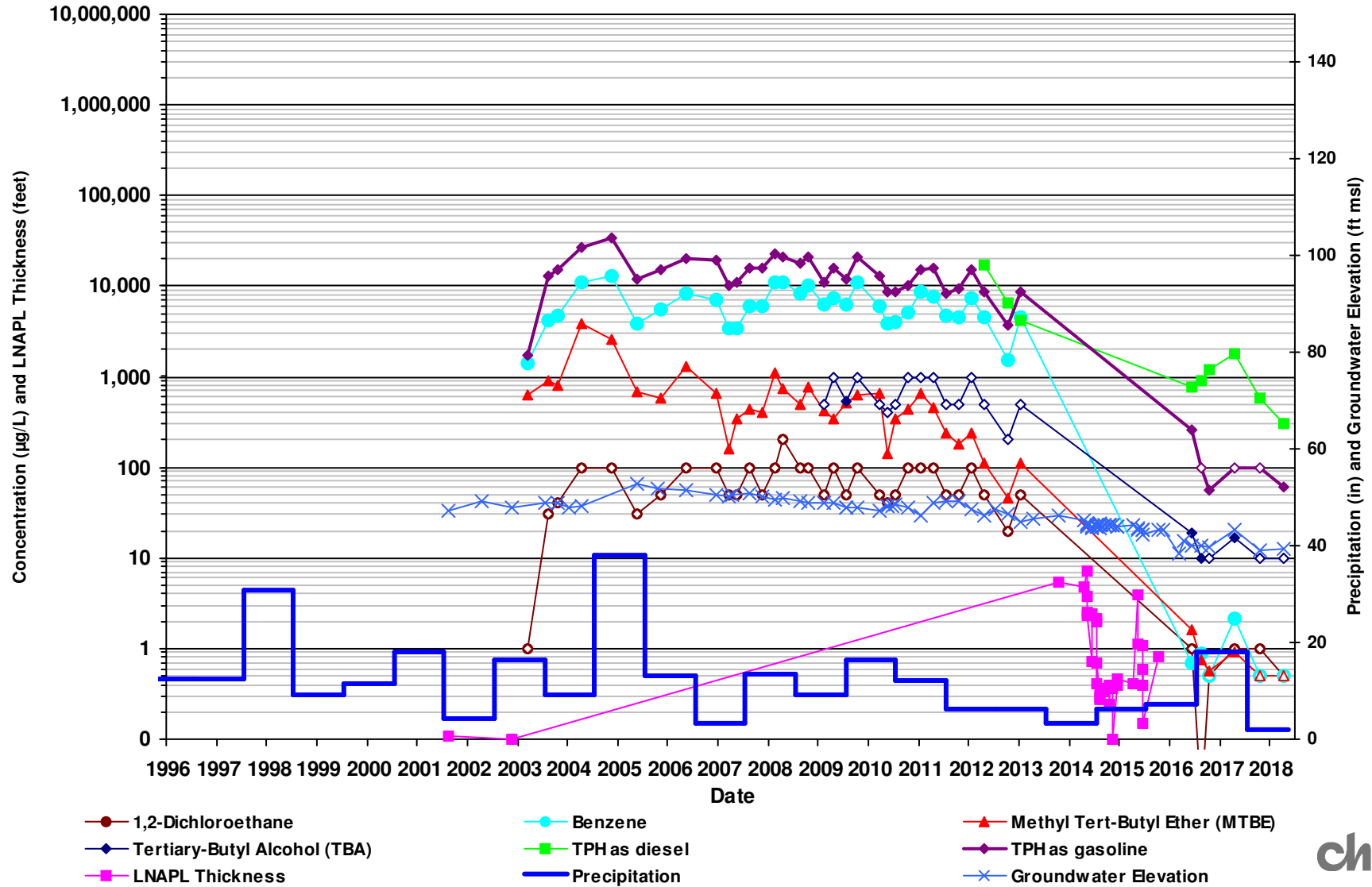
HL-2



Non detect results (ND) are plotted with an open symbol using the laboratory reporting limit.

Precipitation data reported as annual rainfall which is calculated from Long Beach CIMIS #174 weather station. source: <https://cimis.water.ca.gov/>

MW-SF-1



Non detect results (ND) are plotted with an open symbol using the laboratory reporting limit.

Precipitation data reported as annual rainfall which is calculated from Long Beach CIMIS #174 weather station. source:<https://cimis.water.ca.gov/>