2600 Michelson Drive, Suite 500
Irvine, California 92612
United States
T +1.949.224.7500
F +1.949.224.7501
www.jacobs.com

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

April 15, 2019

Subject: **Results of Additional Soil and Soil Vapor Sampling and Human Health Risk Assessment to Support Shallow Soil Closure for the 36-Acre Parcel, Defense Fuel Support Point, Norwalk, California – Revision 1**

Dear Mr. Cho,

This letter report has been prepared by CH2M HILL Engineers, Inc. (CH2M), now part of Jacobs Engineering Group Inc. (Jacobs), on behalf of SFPP, L.P. (SFPP), an operating partnership of Kinder Morgan, Inc. (Kinder Morgan), to provide results from the collection and analysis of additional shallow soil and soil vapor samples and human health risk assessment (HHRA) at five locations in the southwestern and south-central areas of the 36-acre parcel of the Defense Fuel Support Point (DFSP) Norwalk facility at 15306 Norwalk Boulevard, Norwalk, California (Figure 1). The work was performed in accordance with the *Addendum to Soil Gas Work Plan* (SGI, 2017).

The 36-acre parcel is located within the DFSP Norwalk facility, which formerly contained petroleum storage operations managed by the Defense Logistics Agency – Energy (DLA Energy), and is currently being investigated and remediated by DLA Energy. Historically, Kinder Morgan's investigations and remediation activities have been performed along the southern and eastern boundaries of the 36-acre parcel, where its active pipelines are located.

Following excavation, soil treatment, and backfilling activities in the 36-acre parcel, DLA Energy conducted a soil gas survey. The soil gas survey was performed as a condition of approval by the Los Angeles Regional Water Quality Control Board (RWQCB) to demonstrate that remedial activities in the 36-acre parcel would not present a vapor intrusion (VI) risk. As a companion study to DLA Energy's soil gas survey, Kinder Morgan installed and sampled five additional soil vapor probes along the southern boundary of the 36-acre parcel and performed a round of sampling in September 2017 to confirm that shallow soil gas concentrations of hydrocarbons would not pose a human health risk through VI.

The soil vapor sampling results and HHRA for the southernmost portion of the western 36-acre parcel were submitted to the RWQCB on January 26, 2018, in the letter report titled *Results of Additional Soil and Soil Vapor Sampling and Human Health Risk Assessment to Support Shallow Closure for the 36-acre Parcel* (CH2M-Jacobs, 2018). On January 22, 2019, Kinder Morgan received comments from the RWQCB (RWQCB, 2019), which were based on a memorandum prepared by the California Office of Environmental Health Hazard Assessment (OEHHA) on October 31, 2018 (OEHHA, 2018). The response to these comments has been incorporated into this revised report. A summary of OEHHA comments and response to comments is provided in Attachment A of this report.

Background

DLA Energy operates remediation systems to address the following areas at the site: the north-central tank farm area, the truck fill stand (or truck rack area), the northwestern boundary area, and the northeastern area, a portion of which extends into the northern part of Holifield Park. Kinder Morgan has equipment at the DFSP facility, as well as easements for its pipelines along the southern and eastern boundaries of the facility, and is performing remediation within these areas (CH2M, 2013). As a part of ongoing site restoration activities, DLA Energy excavated approximately 95,000 tons of petroleum-contaminated soil that was treated onsite using biological methods and then used as backfill material once cleanup goals were achieved. As a condition of approval for the proposed onsite treatment and backfilling of treated soil, RWQCB requested that a soil gas survey be conducted after backfilling to confirm that shallow soil gas concentrations of hydrocarbons would not pose a human health risk through VI.

In February 2016, The Source Group, Inc. (SGI) submitted the *Updated Work Plan for Post-Excavation Soil Gas Sampling* (SGI, 2016) for the DFSP Norwalk facility. The February 2016 work plan included soil gas sampling locations throughout the DLA Energy areas of previous petroleum storage operations and the areas of shallow soil treatment, excavation, and backfilling, but did not include the southwestern corner of the 36-acre parcel. To fill that data gap, it was agreed that SGI would prepare an addendum to the *Updated Work Plan for Post-Excavation Soil Gas Sampling* (SGI, 2016) to select additional sampling locations in the southwest corner of the site.

The *Addendum to Soil Gas Work Pla*n (SGI, 2017) proposed the collection of discrete-depth soil samples and discrete-depth soil vapor samples at five locations within the southwestern and south-central areas of the 36-acre parcel. Soil and soil vapor samples would be collected at 5 and 10 feet below ground surface (bgs) and analyzed for total petroleum hydrocarbons (TPH) and volatile organic compounds (VOCs). The data collected from the investigation would be used to support the HHRA and soil closure request for the upper 10 feet of soil in the 36-acre parcel. The *Addendum to Soil Gas Work Pla*n (SGI, 2017) was approved by OEHHA in a letter to the RWQCB dated July 13, 2017 (OEHHA, 2017). CH2M installed and sampled the five new soil vapor probes in August 2017, on behalf of SFPP, since that area was near its pipelines. The approach and results of the investigation are discussed in the following sections.

Approach

Pre-field Activities

CH2M performed the following field preparation activities prior to commencing soil and soil vapor sampling:

- Updated the existing site-specific health and safety plan to incorporate the planned fieldwork.
- Marked the proposed boring locations.
- As required by Dig Alert, the borings were called-in and marked-out in white paint at least 2 business days prior to boring advancement. Dig Alert Ticket No. A72090413-00A was issued on July 28, 2017.
- Performed an underground utility check using a private utility-locating subcontractor (Spectrum Geophysics).
- Coordinated with Kinder Morgan staff regarding potential conflicts with SFPP's pipelines.

Field Activities

In May 2017, SGI, on behalf of DLA Energy, installed 213 temporary soil gas probes at 71 locations at intervals of 5, 10, and 15 feet bgs in the western portion of the 36-acre parcel. Installation and sampling of the soil gas probes were performed in accordance with California Department of Toxic Substances Control (DTSC) guidance (DTSC, 2011a, 2015). Soil vapor samples were analyzed for VOCs and fixed gases. Soil gas samples were collected from discrete-depth intervals of 5, 10, and 15 feet bgs at seven southwestern

soil gas probes, and analyzed for VOCs and TPH. The analytical results and HHRA for these samples were provided in a separate report submitted by SGI (SGI, 2018).

To supplement DLA Energy's efforts, CH2M retained Gregg Drilling and Testing of Huntington Beach, California, on August 3, 2017, to advance borings using hand auger methods in order to facilitate the collection of discrete-depth soil samples and the installation of nested soil vapor probes. The locations (SVP-105, SVP-106, SVP-107, SVP-108, and SVP-109) are shown on Figure 2. Each location was hand-augered up to 5 feet bgs to clear for subsurface utilities. Hand augering continued at each location to a maximum depth of 10 feet bgs. Discrete soil samples were collected at 5 and 10 feet bgs and submitted for laboratory analysis on August 3, 2017. Nested soil vapor probes were then installed at depths of 5 and 10 feet bgs at all five locations. Soil vapor samples were collected on September 7, 2017, after the biosparge and soil vapor extraction (SVE) systems had been deactivated for several days so that soil vapor concentrations were representative of static subsurface conditions. To supplement this report revision, soil vapor samples were re-collected in February 2019 with the biosparge and SVE systems off, as discussed below.

Soil Sampling and Analysis

Hand auger methods were used to collect soil samples for the following:

- Lithologic characterization
- Field photoionization detector (PID) headspace screening to determine the presence of VOCs
- Laboratory analysis

Lithology was described by visual observation, following ASTM International Method D2488 procedures, which are based on the Unified Soil Classification System for guidance. Color, moisture content, grain size, PID readings, and other pertinent soil characteristics were recorded on the boring logs. Copies of the boring logs are provided in Attachment B.

Discrete-depth soil samples also were collected at each boring location for field screening using a PID and for laboratory analysis as follows:

- Soil samples were collected at 5 and 10 feet bgs at SVP-105, SVP-106, SVP-107, SVP-108, and SVP-109. Sub-core samples were immediately collected using an Encore T-handle and six 5-gram Encore sample containers per depth sampled. The remaining soil was transferred to sample jars provided by the laboratory.
- For quality assurance and quality control purposes, one field duplicate soil sample was collected at the 5-foot depth at SVP-108. In addition, one equipment blank (water sample) and one trip blank (water sample) were collected at the end of the day.
- Samples were placed in an ice-chilled cooler and submitted under standard chain-of-custody protocol to TestAmerica in Irvine, California. TestAmerica is certified under the California Environmental Laboratory Accreditation Program.

Soil samples, including the field duplicate and equipment blank, were analyzed for the following:

- TPH quantified as gasoline (TPH-g) and diesel-range organics, reported as diesel (TPH-d) and oil (TPH-o), using U.S. Environmental Protection Agency (EPA) Method 8015B.
- VOCs and fuel oxygenates using EPA Method 8260B.

Soil Vapor Probe Installation

Each vapor probe was constructed with new 1/4-inch-outside-diameter Teflon tubing with a nominal 6-inch-long stainless-steel screen. A 1-foot-thick filter pack consisting of No. 3 sand was placed around each screen. A 1-foot-thick dry granular bentonite seal was placed on top of each filter sand pack. The boring was then backfilled to the ground surface in 6-inch-thick lifts, with granular bentonite hydrated in place. A sampling valve was fitted to the end of the tubing. Each soil vapor monitoring point was

completed at the surface with a flush-mounted, traffic-rated well box. Construction details for each soil vapor probe are summarized in Table 1. Figure 3 presents a diagram of a typical nested probe.

Soil Vapor Probe Sampling and Analysis

Soil vapor samples were collected by American Analytics of Chatsworth, California, and analyzed onsite using its mobile laboratory, under the direction of CH2M. To allow the vadose zone to reach equilibrium prior to sample collection, Kinder Morgan's biosparge system and the southeastern SVE wells were shut down on September 1, 2017. Sampling was conducted on September 7, 2017. The biosparge system and SVE wells were turned on after sampling on September 7, 2017. The analytical results were evaluated by comparison with soil gas screening levels based on the most current DTSC guidance. The soil gas screening levels were calculated from indoor air screening levels published in *Human Health Risk Assessment (HHRA) Note 3* (DTSC, 2017) using the default attenuation factors presented in the VI guidance (DTSC, 2011a).

The soil vapor probes at each monitoring location were purged and sampled in accordance with the recommended guidelines in the *Advisory for Active Soil Gas Investigations* (the Advisory) (DTSC, 2015). 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.

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

In accordance with the guidelines presented in the Advisory (DTSC, 2015), one duplicate soil vapor sample was collected at SVP-108 at a depth of 10 feet. The duplicate sample was collected and analyzed in the same manner as the native samples.

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

Analytical Results

Soil Vapor Screening Level Update

At the request of the RWQCB and OEHHA, soil vapor data were compared with proposed soil vapor screening levels under "unified" VI guidance being developed by DTSC and the San Francisco RWQCB (DTSC, 2018; SFRWQCB, 2018). The unified guide would update the current DTSC VI guidance (DTSC, 2011a). Currently, soil vapor screening levels are derived from residential and commercial indoor air screening levels using an attenuation factor of 0.001 (DTSC, 2011a). In the proposed unified guidance, soil vapor screening levels would be derived using an attenuation factor of 0.03 or a 30-fold reduction in the screening level values. Soil vapor samples collected in February 2019 were analyzed with reporting limits that achieved the proposed soil vapor screening levels. All soil vapor sampling results (September 2017 and February 2019) were compared to both the current and proposed soil vapor screening levels, as discussed below. In addition to these two sampling events, soil vapor data were collected in March 2019 from the south-central offsite portion of the Site. These soil vapor samples were analyzed with reporting limits which could achieve the proposed soil vapor screening levels. The soil vapor samples collected in March 2019 will be reported in the forthcoming First Quarter 2019

Remediation Progress Report and in the 2019 Annual Soil Vapor Monitoring Report, but were provided in this report to supplement the HHRA presented below.

Soil Results

The soil analytical results are presented in this section. A copy of the laboratory analytical report is provided in Attachment C.

TPH and VOCs

Table 2 presents a summary of results for TPH and VOCs in soil for samples collected at SVP-105, SVP-106, SVP-107, SVP-108, and SVP-109. DLA Energy's soil cleanup goals for 0.5-, 5-, and 10-foot depths are provided in Table 2 for comparison purposes. Parsons (DLA Energy's consultant) calculated soil cleanup goals for protection of groundwater at the site according to the methods provided in the RWQCB Interim Site Assessment and Cleanup Guidebook (Guidebook) (RWQCB, 1996). These goals were approved by the RWQCB in its letter to DLA Energy, dated July 12, 2012 (RWQCB, 2012). The RWQCB also approved DLA Energy's modification of soil cleanup goals for TPH in its letter to DLA Energy, dated July 16, 2015 (RWQCB, 2015). In its letter to the RWQCB, dated January 14, 2013, Kinder Morgan provided conditional concurrence with some shallow soil cleanup goals (0.5 foot to 10 feet) that are relevant to Kinder Morgan's former releases (CH2M, 2013).

TPH-g (C4-C12) was detected in a single sample (SVP-108 at a depth of 10 feet) at a concentration of 11 milligrams per kilogram (mg/kg). TPH-d (reported as C8-C18 and C13-C22 in each sample) was detected in multiple samples at concentrations ranging from less than 5 mg/kg to 370 mg/kg. TPH-d (C8-C18) was detected in a method blank at a concentration of 4.13 J mg/kg (J = estimated concentration), slightly lower than the reporting limit of 5 mg/kg. TPH-d (C8-C18) concentrations that were less than 5-fold above the concentration detected in a method blank were qualified as "U" or not detected. Concentrations of TPH-d (reported as C8-C18 and C13-C22) were slightly higher than the DLA Energy soil cleanup goal for the 10-foot interval in sample SVP-108. Low concentrations of TPH quantified as motor oil, or TPH-o (C23-C40), reported in most of the samples were less than 5-fold above the concentrations detected in method blanks, and were qualified as not detected. TPH-o was detected in sample SVP-107 at 1,800 mg/kg (at a depth of 5 feet) and 290 mg/kg (at a depth of 10 feet). Methylene chloride was reported at 5.2 J mg/kg in a single sample (SVP-106, at a depth of 10 feet). Naphthalene was reported at 0.46 mg/kg in a single sample (SVP-108, at a depth of 10 feet). This naphthalene result was slightly higher than the DLA Energy soil cleanup goal for the 10-foot interval. All other analytes were reported as not detected in all soil samples.

Soil Vapor Results

Table 3 presents a summary of mobile laboratory analytical results for soil vapor samples collected in September 2017 from SVP-105, SVP-106, SVP-107, SVP-108, and SVP-109. Table 4 presents a summary of the mobile laboratory analytical results for samples collected in February 2019. All soil vapor sampling results (September 2017 and February 2019) were compared to both the current and proposed soil vapor screening levels as described above, and as shown in Tables 3 and 4. Copies of the laboratory analytical reports are presented in Attachment D. Analytical results from the March 2019 sampling event are presented in Attachment E.

September 2017 Results

The laboratory reporting limits used were below screening levels under the current residential and commercial scenarios. VOCs were not detected in the soil vapor samples, with the following exceptions:

- SVP-108: TPH-g (7,400 micrograms per liter [µg/L]) was detected at a depth of 10 feet.
- SVP-109: tetrachloroethene (PCE) was detected at concentrations of 0.056 µg/L and 0.12 µg/L at depths of 5 feet and 10 feet, respectively.

The fixed gas data from the SVP-108 probe showed high concentrations of oxygen (greater than 4 percent) throughout the soil profile along with low concentrations of methane and carbon dioxide.

The field duplicate showed acceptable agreement with the native sample results, and analytes were not detected in the ambient samples.

February 2019 Results

The laboratory reporting limits used were below the proposed screening levels. VOCs were not detected in the soil vapor samples with the following exceptions:

- SVP-107: benzene (0.0033 µg/L) and acetone (0.035 µg/L) were detected at a depth of 10 feet.
- SVP-108: cyclohexane (1.7 µg/L) and TPH-g (620 µg/L) were detected at a depth of 10 feet, and were not detected at the 5-foot interval.
- SVP-109: acetone (0.021 µg/L) was detected at a depth of 5 feet, and PCE was detected at depths of 5 and 10 feet with concentrations of 0.023 µg/L and 0.036 µg/L, respectively.

The fixed gas data from all probes showed high concentrations of oxygen (greater than 4 percent) throughout the soil profile along with low concentrations of methane and carbon dioxide.

March 2019 Results

The March 2019 results were sampled from soil vapor monitoring probes SVM-1 through SVM-8, SVM-10, SVM-15 and SVM-16 located offsite to the south. Soil vapor sampling from these probes was performed with the biosparge and SVE systems operating. VOCs were not detected in the soil vapor samples with the following exceptions:

- SVM-3: chloroform (0.021 µg/L) was detected at a depth of 5 feet.
- SVM-5: acetone (0.027 µg/L) was detected at a depth of 15 feet.
- SVM-15: benzene (0.0089 µg/L), m,p-xylene (0.029 µg/L), toluene (0,044 µg/L) and ethanol (0.16 µg/L) were detected at a depth of 7 feet.
- SVM-16: acetone (0.021 µg/L) and carbon disulfide (0.02 µg/L) were detected at a depth of 7 feet.

With a single exception (SVM-16), the fixed gas data from all probes showed high concentrations of oxygen (greater than 4 percent) throughout the soil profile along with low concentrations of methane and carbon dioxide. At the deepest sampling location in SVM-16 (22 feet), oxygen was detected at 3.6 percent along with 11 percent carbon dioxide.

Human Health Risk Assessment

This section provides the HHRA results for the five new sample locations installed by Kinder Morgan within the 36-acre parcel.

Soil

All concentrations of TPH-g and TPH-d detected in soil were below the respective DLA Energy soil cleanup goals, except for TPH-d (C8-C18 and C13-C-22) and naphthalene at the 10-foot interval in SVP-108, as indicated in Table 2. Parsons (DLA Energy's previous consultant) calculated site-specific cleanup goals to be protective of leaching to groundwater. The attenuation factors from soil to groundwater are depth-specific; therefore, soil cleanup levels were established for different depths below ground surface. Soil cleanup levels were never calculated for protection of human health from direct contact with soil (for example, soil ingestion, dust/vapor inhalation, and dermal contact). The remediation objectives for protection of human health are achieved by providing a minimum buffer of 10 feet (via excavation) between land-surface commercial operations and any potentially remaining impacts below

ground surface (Parsons, 2013). The TPH-d and naphthalene results at the 10-foot interval in SVP-108 were also compared to EPA Regional Screening Levels (RSLs) to evaluate potential human health risks from direct contact with soil (EPA, 2017). The shallow soil data for COPCs (including petroleum hydrocarbons) collected as part of the 36-acre investigation were below soil cleanup goals for groundwater protection, except for TPH-d and naphthalene in sample SVP-108 at a depth of 10 feet bgs. However, these concentrations in soil fall below RSLs for protection of workers from direct contact with soil.[1] Therefore, these constituents in shallow soil do not appear to pose a human health risk.

Soil Vapor

As described in the conceptual site model (CSM) (CH2M, 2013), light nonaqueous phase liquids (LNAPL) are found in deeper soil (generally greater than 15 feet bgs), and LNAPL and dissolved phase hydrocarbons occur in shallow groundwater in the south-central and southeastern areas of the Norwalk site. The CSM (CH2M, 2013) identified horizontal biosparging with SVE as the alternate interim remedy for the south-central and southeastern areas of the site. The purpose of the biosparge system is to enhance mass removal of hydrocarbon constituents in deeper soil and groundwater. SVE operations will continue for mass removal and to control potential off-gassing of VOCs.

The results from previous investigations and this current investigation indicate that aerobic biodegradation in the vadose zone appears to limit the potential occurrence of VI of petroleum hydrocarbon constituents, otherwise known as petroleum vapor intrusion (PVI), as described in the EPA PVI guidance (EPA, 2015). There appears to be the recommended necessary vertical separation between petroleum hydrocarbon constituents in soil or groundwater such that potential PVI impacts do not require further evaluation. The PVI guidance recommends a minimum vertical separation of 6 feet of a clean (i.e. low or non-detected organic compound content), well-oxygenated vadose zone between vapor sources and the ground surface, or 15 feet for LNAPL sources as necessary to prevent PVI impacts in overlying buildings. The TPH-g in soil vapor from this investigation indicates that the vertical distances between petroleum hydrocarbons detected in soil vapor and the ground surface are larger than EPA's recommended minimum values.

The concentration of TPH-g detected in soil vapor in SVP-108 at 10 feet bgs (7,400 µg/L) was higher than the screening levels for residential (630 µg/L) or commercial (2,600 µg/L) land use. However, the TPH-g concentration detected at 5 feet bgs was less than 20 µg/L, well below these screening levels. The screening levels in soil vapor were calculated using an attenuation factor provided in DTSC's VI guidance (DTSC, 2011a). That attenuation factor was calculated with the Johnson and Ettinger model (see Appendix B in DTSC, 2011a). It is generally recognized that the Johnson and Ettinger model is not considered appropriate for petroleum hydrocarbon constituents because it does not include biodegradation in soil (EPA, 2015; ITRC, 2014). By not considering biodegradation in soil, the Johnson and Ettinger model produces overly conservative attenuation factors for petroleum hydrocarbons, and correspondingly provides overly conservative screening levels in soil vapor.

Multiple lines of evidence suggest that the detected TPH-g concentration at 10 feet bgs in SVP-108 would not pose a potential PVI risk under any future land-use scenario. These lines of evidence include:

- Decreasing TPH-g concentrations closer to the ground surface
- Very low or nondetected concentrations of VOCs in soil vapor
- The mixture of fixed gases in soil vapor (high oxygen in the presence of low methane)

These lines of evidence indicate the presence of an aerobic vadose zone supporting petroleum hydrocarbon biodegradation. In addition, soil vapor sampling was performed under "natural" subsurface conditions, with biosparging and SVE systems turned off. Future operations of these systems, particularly

[1] The RSLs for protection of workers from direct contact with soil are: naphthalene – 17 mg/kg based on a 1 x 10^{-6} lifetime cancer risk; TPH-d – 440 mg/kg based on a non-cancer hazard quotient (HQ) of 1. The concentrations in soil in SVP-108 at 10 feet bgs are below these risk-based values.

the biosparge system, are expected to further reduce the already low petroleum hydrocarbon concentrations detected in this area of the 36-acre parcel.

The conditions in soil observed during these sampling events that preclude the occurrence of PVI are consistent with the results observed from soil vapor monitoring, as presented in previous reports (CH2M, 2012, 2013, 2017). For example, vertical migration through the vadose zone from groundwater was minimal in the south-central and southeastern offsite areas. Analysis of soil vapor samples collected in 2012 from the offsite south-central areas did not indicate VOCs were volatilizing from impacted groundwater. Analysis of crawl-space air collected in 2006 from structures offsite did not detect VOC concentrations above ambient air background. Soil vapor sampling also performed in 2006 detected very low VOC concentrations in soil vapor (Geomatrix, 2006). The multiple lines of evidence consist of studies conducted over several years showing the following conditions in shallow soil, which, according to regulatory guidance, preclude the occurrence of PVI:

- Elevated oxygen in soil vapor (greater than 4 percent) combined with low concentrations of carbon dioxide and methane
- Low concentrations of TPH detected (or nondetects) in bulk soil samples
- Vertical profile of VOCs in soil vapor decreases from deep to shallow soil (see TPH-g results for SVP-109)

Quarterly monitoring of the soil vapor probes in the South-Central area confirms that conditions in soil continue to preclude the occurrence of PVI. During the March 2019 sampling event, very low concentrations of VOCs were detected in shallow soil vapor along with high concentrations of oxygen, both of which are lines of evidence indicating that significant biodegradation is occurring underneath a clean (i.e. low or non-detected organic compound concentrations), well-oxygenated layer in the shallow vadose zone. At the deepest sampling interval in SVM-16 (22 feet), lower oxygen concentrations were detected along with higher carbon dioxide concentrations suggesting that active biodegradation of petroleum hydrocarbons is occurring. However, high concentrations of oxygen and low concentrations of carbon dioxide were found in the shallower depths in soil at this sampling location. The VOC concentrations detected during the March 2019 sampling event were very low and did not exceed the current screening levels. Concentrations of benzene detected in SVM-15 at a depth of 5 feet were higher than the proposed screening level based on a residential land use.

Other than TPH-g and PCE, VOCs were not detected in soil vapor during the September 2017 and February 2019 sampling events. Based on the above discussion, for TPH-g, there is no potentially complete exposure pathway to indoor air under future land use conditions. PCE concentrations detected at depths of 5 and 10 feet in SVP-109 were lower than screening levels based on current regulatory guidance (DTSC, 2011a), and did not represent a human health risk. However, PCE concentrations in soil vapor exceed screening levels calculated with a soil vapor attenuation factor (0.03) being proposed by the State of California. Based on these proposed screening levels, PCE concentrations in soil vapor correspond to a lifetime cancer risk in indoor air lower than 1×10^{-5}, and fall within the target risk range that generally does not warrant remedial action (EPA, 1991), but may warrant further evaluation (DTSC, 2011b). Using the highest PCE concentration in soil vapor (0.12 µg/L at a depth of 10 feet in SVP-109), the lifetime cancer risk under a residential scenario is 8×10^{-6}, and under a commercial scenario is 2×10^{-6}. However, based on current regulatory guidance (DTSC, 2011a), lifetime cancer risks from PCE based on the highest concentration detected are 3×10^{-7} under residential use and 6×10^{-8} under commercial use, and would not warrant further evaluation under DTSC's mitigation guidelines (DTSC, 2011b).

Conclusions

The shallow soil data for COPCs (including petroleum hydrocarbons) collected as part of the 36-acre investigation were below soil cleanup goals for groundwater protection, except for TPH-d and naphthalene in sample SVP-108 at a depth of 10 feet. However, these concentrations in soil fall below risk-based screening levels for protection of workers from direct contact with soil.

The shallow soil vapor data for COPCs (including TPH-g and PCE) collected as part of the 36-acre investigation suggest that the potential for VI is insignificant based on the following lines of evidence:

- The lack of significant hydrocarbon concentrations in soil vapor is consistent with the presence of an aerobic vadose zone that promotes natural biodegradation of petroleum hydrocarbons
- High concentrations of oxygen in the vadose zone combined with low concentrations of carbon dioxide and methane also indicate conditions that promote petroleum hydrocarbon biodegradation
- The above-listed findings regarding petroleum hydrocarbons were observed in the three sampling events evaluated in this HHRA
- PCE detected in soil vapor would not be amenable to aerobic biodegradation in the same manner as petroleum hydrocarbons; however, lifetime cancer risks associated with PCE at a single sampling location (SVP-109) fall below target cancer risk levels requiring further evaluation or action; therefore, health risks from exposure through VI (under future land use conditions) in soil vapor are insignificant.

Based on the HHRA presented in this report, there is no human health risk for VI in the upper 10 feet of soil in the southern portion of the 36-acre parcel. Under current California regulatory guidelines for VI assessments, no further evaluation is recommended.

References

California Department of Toxic Substances Control (DTSC). 2011a. *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

California Department of Toxic Substances Control (DTSC). 2011b. *Vapor Intrusion Mitigation Advisory*. October.

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

California Department of Toxic Substances Control (DTSC). 2017. *Human Health Risk Assessment (HHRA) Note Number 3: DTSC Recommended Methodology for Use of U.S. EPA Regional Screening Levels (RSLs) in the Human Health Risk Assessment Process at Hazardous Waste Sites and Permitted Facilities.* http://www.dtsc.ca.gov/AssessingRisk/upload/HHRA_Note_3_August-2017.pdf

California Department of Toxic Substances Control (DTSC). 2018. *E Pluribus Unum: A Cal/EPA Unified Approach to Evaluating and Managing Vapor Intrusion.* Presented at the 28th Annual International Conference on Soil, Water, Energy, and Air, March 19, 2018, San Diego, California.

California Office of Environmental Health Hazard Assessment (OEHHA). 2017. *Memorandum: Addendum to Soil Gas Work Plan – Defense Fuel Support Norwalk, 15306 Norwalk Boulevard, Norwalk, CA.* July 13.

California Office of Environmental Health Hazard Assessment (OEHHA). 2018. *Results of Additional Soil and Soil Vapor Sampling and Human Health Risk Assessment to Support Shallow Soil Closure for the 36-Acre Parcel. Norwalk Tank Farm, 15306 Norwalk Boulevard, Norwalk, CA 90650*. October 31.

California Regional Water Quality Control Board, Los Angeles Region (RWQCB). 1996. *Interim Site Assessment & Cleanup Guidebook.* California Regional Water Quality Control Board, Los Angeles and Ventura Counties, Region 4. May.

California Regional Water Quality Control Board, Los Angeles Region (RWQCB). 2012. Letter to Mr. Mathew Young. *Review of Proposed Soil Cleanup Goals, Defense Fuel Support Point Norwalk, 15306 Norwalk Boulevard, Norwalk, California (SCP No. 0286A, Site No. 16683).* July 12.

California Regional Water Quality Control Board, Los Angeles Region (RWQCB). 2015. Letter to Mr. Nicholas Carros. *Approval of Modification to the Soil Cleanup Goals, Defense Fuel Support Point Norwalk, 15306 Norwalk Boulevard, Norwalk, California (SCP No. 0286A, Site No. 16683).*

California Regional Water Quality Control Board, Los Angeles Region (RWQCB). 2019. Letter to Mr. Steve Defibaugh. *Requirement for Revised Human Health Risk Assessment for No Further Action Determination for Shallow Soil at the Western 36-Acre Parcel. Defense Fuel Support Point Norwalk, 15306 Norwalk Boulevard, Norwalk, California (SCP No. 0286A/B, Site ID No. 16638 and 204DM00)*. January 22.

California Regional Water Quality Control Board, San Francisco Region (SFRWQCB). 2018. *Supplemental Vapor Intrusion Guidance – Cal-EPA.* Presented at the 28th Annual International Conference on Soil, Water, Energy, and Air, March 19, 2018, San Diego, California.

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

CH2M HILL (CH2M). 2013. *Conceptual Site Model and Proposal, Alternate Interim Remedy for Soil, Groundwater, and LNAPL, Defense Fuel Support Point Norwalk, California*. September 3.

CH2M HILL (CH2M). 2017. *Results of Additional Soil and Soil Vapor Sampling and Revised Human Health Risk Assessment to Support Shallow Soil Closure for the Eastern 15-Acre Parcel, Defense Fuel Support Point, Norwalk, California*. March 16.

CH2M HILL-Jacobs Engineering Group Inc. (CH2M-Jacobs). 2018. *Results of Additional Soil and Soil Vapor Sampling and Human Health Risk Assessment to Support Shallow Closure for the 36-acre Parcel*. January 26.

Geomatrix Consultants, Inc. (Geomatrix). 2006. *Vapor Intrusion Sampling and Human Health Risk Assessment, DFSP Norwalk Facility, Norwalk, California.* December 15.

Interstate Technology & Regulatory Council (ITRC). 2014. *Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management*. October.

Parsons. 2013. *Conceptual Site Model and Remedial Action Evaluation for Soil, Groundwater, and LNAPL, Defense Fuel Support Point Norwalk, 15306 Norwalk Boulevard, Norwalk, California*. Prepared for the Defense Logistics Agency Energy, Ft. Belvoir, VA. September.

The Source Group, Inc. (SGI). 2016. *Updated Work Plan for Post-Excavation Soil Gas Sampling, Defense Fuel Support Point Norwalk, 15306 Norwalk Boulevard, Norwalk, California*.

The Source Group, Inc. (SGI). 2017. *Addendum to Soil Gas Work Plan, Defense Fuel Support Point Norwalk, 15306 Norwalk Boulevard, Norwalk, California*. May.

The Source Group, Inc. (SGI). 2018. *Shallow Soil Closure Report Western Portion, Defense Fuel Support Point Norwalk, 15306 Norwalk Boulevard, Norwalk, California*. January.

U.S. Environmental Protection Agency (EPA). 1991. *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions*. OSWER Directive 9355.0-30.

U.S. Environmental Protection Agency (EPA). 2015. *Technical Guide for Addressing Petroleum Vapor Intrusion at Leaking Underground Storage Tank Sites.* EPA 510-R-15-001. https://www.epa.gov/sites/production/files/2015-09/documents/pvi-guide-final.pdf

U.S. Environmental Protection Agency (EPA). 2017. Regional Screening Levels (RSLs). November. https://www.epa.gov/risk/regional-screening-levels-rsls.

If you have any questions regarding this letter report, please contact Mr. Eric Davis of Jacobs at (213) 228-8262 or Mr. Steve Defibaugh of Kinder Morgan at (714) 560-4802.

Regards,

Eric Davis, P.G.
Project Manager

John Lowe, CIH
Vapor Intrusion Consultant

Copies to: Steve Defibaugh, Kinder Morgan, Inc.
Minxia Dong, Norwalk Public Library
Norwalk Tank Farm Restoration Advisory Board

Attachments:

Table 1 – Soil Vapor Monitoring Probe Completion Details
Table 2 – Summary of Soil TPH and VOC Results
Table 3 – Mobile Laboratory Soil Vapor Analytical Results - September 2017
Table 4 – Field Measurements and Mobile Laboratory Soil Vapor Analytical Results - February 2019

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

Attachment A – Response to Comments
Attachment B – Soil Boring Logs
Attachment C – Soil Laboratory Analytical Report
Attachment D – September 2017 and February 2019 Soil Vapor Laboratory Analytical Reports
Attachment E – March 2019 Soil Vapor Analytical Results

Tables

Table 1. Soil Vapor Monitoring Probe Completion Details

36-acre Parcel, Defense Fuel Support Point, Norwalk, California

Probe	Zone	Installation Method	Borehole Diameter (inches)	Boring Total Depth (feet bgs)	Screen Interval (feet bgs)		Filter Park Top (feet bgs)	Filter Pack Bottom (feet bgs)	Dry Bentonite Top (feet bgs)	Dry Bentonite Bottom (feet bgs)	Hydrated Bentonite Top (feet bgs)	Hydrated Bentonite Bottom (feet bgs)
					From	To						
SVP-105	Shallow	Hand Auger	3.5	--	4.8	5.3	4.5	5.5	3.5	4.5	0.5	3.5
SVP-105	Deep	Hand Auger	3.5	10.5	9.5	10.0	9.0	10.5	8.0	9.0	5.5	8.0
SVP-106	Shallow	Hand Auger	3.5	--	4.8	5.3	4.5	5.5	3.5	4.5	0.5	3.5
SVP-106	Deep	Hand Auger	3.5	10.5	9.5	10.0	9.0	10.5	8.0	9.0	5.5	8.0
SVP-107	Shallow	Hand Auger	3.5	--	4.8	5.3	4.5	5.5	3.5	4.5	0.5	3.5
SVP-107	Deep	Hand Auger	3.5	10.5	9.5	10.0	9.0	10.5	8.0	9.0	5.5	8.0
SVP-108	Shallow	Hand Auger	3.5	--	4.8	5.3	4.5	5.5	3.5	4.5	0.5	3.5
SVP-108	Deep	Hand Auger	3.5	10.5	9.5	10.0	9.0	10.5	8.0	9.0	5.5	8.0
SVP-109	Shallow	Hand Auger	3.5	--	4.8	5.3	4.5	5.5	3.5	4.5	0.5	3.5
SVP-109	Deep	Hand Auger	3.5	10.5	9.5	10.0	9.0	10.5	8.0	9.0	5.5	8.0

Notes:

Filter pack consists of Number 3 Monterey fine sand.

Bentonite is granular bentonite.

--- = does not apply

bgs = below ground surface

Table 2. Summary of Soil TPH and VOC Results

36-acre Parcel, Defense Fuel Support Point, Norwalk, California

General Area	Sample Location	Sample Date	Sample ID	Sample Depth Interval (feet bgs)	TPH-g (mg/kg)	TPH-d (C8-C18) (mg/kg)	TPH-d (C13-C22) (mg/kg)	TPH-o (mg/kg)	Benzene (µg/kg)	Toluene (µg/kg)	Ethyl-benzene (µg/kg)	Total Xylenes (µg/kg)	MTBE (µg/kg)	TBA (µg/kg)	DIPE (µg/kg)
36-acre Parcel	SVP-105	8/3/2017	5-5.5	SVP-105-5-080317	<0.15	<2.5	<2.5	<7.3	<1.0	<1.0	<1.0	<2.0	<1.0	<10	<1.0
		8/3/2017	10-10.5	SVP-105-10-080317	<0.15	<2.9	<2.5	<2.5	<1.0	<1.0	<1.0	<2.0	<1.0	<10	<1.0
	SVP-106	8/3/2017	5-5.5	SVP-106-5-080317	<0.15	<2.7	<2.4	<3.4	<1.0	<1.0	<1.0	<2.0	<1.0	<10	<1.0
		8/3/2017	10-10.5	SVP-106-10-080317	<0.15	<3.6	<2.4	<2.4	<0.99	<0.99	<0.99	<2.0	<0.99	<9.9	<0.99
	SVP-107	8/3/2017	5-5.5	SVP-107-5-080317	<0.15	**95**	**370**	**1,800**	<1.0	<1.0	<1.0	<2.0	<1.0	<10	<1.0
		8/3/2017	10-10.5	SVP-107-10-080317	<0.15	**38**	**85**	**290**	<1.0	<1.0	<1.0	<2.0	<1.0	<10	<1.0
	SVP-108	8/3/2017	5-5.5	SVP-108-5-080317	<0.15	<2.6	<2.5	<4.3	<1.0	<1.0	<1.0	<2.0	<1.0	<10	<1.0
		8/3/2017	10-10.5	SVP-108-10-080317	**11**	**240**	**120**	<14	<50	<50	<50	<100	<100	<2,500	<100
	SVP-109	8/3/2017	5-5.5	SVP-109-5-080317	<0.15	<2.5	<2.5	<2.5	<1.0	<1.0	<1.0	<2.0	<1.0	<10	<1.0
		8/3/2017	10-10.5	SVP-109-10-080317	<0.15	<7.1	**3.6 J**	<3.1	<1.0	<1.0	<1.0	<2.0	<1.0	<10	<1.0
		DLA Energy Soil Cleanup Goals		**0.5 Feet**	**500**	**1,000**	**1,000**	**10,000**	**15**	**614**	**2,070**	**5,550**	**0.907**	**1.0**	**449**
				5 Feet	**500**	**1,000**	**1,000**	**10,000**	**13**	**440**	**1,440**	**3,770**	**0.910**	**1.2**	**424**
				10 Feet	**100**	**100**	**100**	**1,000**	**12**	**391**	**1,190**	**3,090**	**0.843**	**1.3**	**364**

Notes:

The total xylenes result is the sum of m,p-xylenes and o-xylenes when detected.

13 **Bold font** represents data detected above the laboratory minimum detection limit.

Shading indicates data that exceeds at least one soil cleanup goal.

<1.4 = not detected at or above the laboratory minimum detection limit shown.

J qualifier indicates that the result was detected above the laboratory minimum detection limit, but below the laboratory reporting limit.

µg/kg = microgram(s) per kilogram

bgs = below ground surface

DIPE = di-isopropyl ether

ETBE = ethyl tertiary butyl ether

mg/kg = milligram(s) per kilogram

MTBE = methyl tertiary butyl ether

TAME = tertiary amyl methyl ether

TBA = tertiary butyl alcohol

TPH = total petroleum hydrocarbons

TPH-d = total extractable petroleum hydrocarbons-diesel, quantified as C8-C18 and as C13-C22 carbon ranges. Reported by the laboratory as "diesel range organics" (DRO).

TPH-g = total purgeable petroleum hydrocarbons-gasoline, quantified as C4-C12 carbon range.

TPH-o = total extractable petroleum hydrocarbons-oil quantified as C23-C40 carbon range. Reported by the laboratory as DRO.

VOC = volatile organic compound

Table 2. Summary of Soil TPH and VOC Results

36-acre Parcel, Defense Fuel Support Point, Norwalk, California

General Area	Sample Location	Sample Date	Sample ID	Sample Depth Interval (feet bgs)	1,1,1,2-Tetrachloroethane (µg/kg)	1,1,2-Trichloroethane (µg/kg)	1,2,3-Trichlorobenzene (µg/kg)	1,2,3-Trichloropropane (µg/kg)	1,2,4-Trimethylbenzene (µg/kg)	1,2-Dibromo-3-Chloropropane (DBCP) (µg/kg)	1,2-Dibromoethane (EDB) (µg/kg)	1,2-Dichloroethane (µg/kg)	1,3,5-Trimethylbenzene (µg/kg)
36-acre Parcel	SVP-105	8/3/2017	5-5.5	SVP-105-5-080317	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
		8/3/2017	10-10.5	SVP-105-10-080317	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	SVP-106	8/3/2017	5-5.5	SVP-106-5-080317	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
		8/3/2017	10-10.5	SVP-106-10-080317	<0.99	<0.99	<0.99	<0.99	<0.99	<2.0	<0.99	<0.99	<0.99
	SVP-107	8/3/2017	5-5.5	SVP-107-5-080317	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
		8/3/2017	10-10.5	SVP-107-10-080317	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
	SVP-108	8/3/2017	5-5.5	SVP-108-5-080317	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
		8/3/2017	10-10.5	SVP-108-10-080317	<100	<50	<100	<100	<50	<100	<50	<50	<50
	SVP-109	8/3/2017	5-5.5	SVP-109-5-080317	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
		8/3/2017	10-10.5	SVP-109-10-080317	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
		DLA Energy Soil Cleanup Goals		**0.5 Feet**	**2.3**	**3.2**	**74**	**0.000874**	**2,100**	**0.250**	**0.00305**	**0.1060**	**2,060**
				5 Feet	**2.0**	**2.9**	**63.4**	**0.000766**	**1,800**	**0.219**	**0.00278**	**0.1040**	**1,770**
				10 Feet	**1.5**	**2.3**	**46.7**	**0.000587**	**1,340**	**0.168**	**0.00227**	**0.0937**	**1,310**

Notes:

The total xylenes result is the sum of m,p-xylenes and o-xylenes when detected.

13 **Bold font** represents data detected above the laboratory minimum detection limit.

Shading indicates data that exceeds at least one soil cleanup goal.

<1.4 = not detected at or above the laboratory minimum detection limit shown.

J qualifier indicates that the result was detected above the laboratory minimum detection limit, but below the laboratory reporting limit.

µg/kg = microgram(s) per kilogram

bgs = below ground surface

DIPE = di-isopropyl ether

ETBE = ethyl tertiary butyl ether

mg/kg = milligram(s) per kilogram

MTBE = methyl tertiary butyl ether

TAME = tertiary amyl methyl ether

TBA = tertiary butyl alcohol

TPH = total petroleum hydrocarbons

TPH-d = total extractable petroleum hydrocarbons-diesel, quantified as C8-C18 and as C13-C22 carbon ranges. Reported by the laboratory as "diesel range organics" (DRO).

TPH-g = total purgeable petroleum hydrocarbons-gasoline, quantified as C4-C12 carbon range.

TPH-o = total extractable petroleum hydrocarbons-oil quantified as C23-C40 carbon range. Reported by the laboratory as DRO.

VOC = volatile organic compound

Table 2. Summary of Soil TPH and VOC Results

36-acre Parcel, Defense Fuel Support Point, Norwalk, California

General Area	Sample Location	Sample Date	Sample ID	Sample Depth Interval (feet bgs)	2-Chlorotoluene (µg/kg)	4-Chlorotoluene (µg/kg)	Bromomethane (µg/kg)	Chlorobenzene (µg/kg)	Chloroethane (µg/kg)	Chloroform (µg/kg)	Dichloro-difluoromethane (µg/kg)	Dichloromethane (µg/kg)	Isopropylbenzene (µg/kg)	Naphthalene (µg/kg)
36-acre Parcel	SVP-105	8/3/2017	5-5.5	SVP-105-5-080317	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<2.0	<5.0	<1.0	<2.0
		8/3/2017	10-10.5	SVP-105-10-080317	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<2.0	<5.0	<1.0	<2.0
	SVP-106	8/3/2017	5-5.5	SVP-106-5-080317	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<2.0	<5.0	<1.0	<2.0
		8/3/2017	10-10.5	SVP-106-10-080317	<0.99	<0.99	<0.99	<0.99	<2.0	<0.99	<2.0	<5.0	<0.99	<2.0
	SVP-107	8/3/2017	5-5.5	SVP-107-5-080317	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<2.0	<5.0	<1.0	<2.0
		8/3/2017	10-10.5	SVP-107-10-080317	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<2.0	<5.0	<1.0	<2.0
	SVP-108	8/3/2017	5-5.5	SVP-108-5-080317	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<2.0	<5.0	<1.0	<2.0
		8/3/2017	10-10.5	SVP-108-10-080317	<100	<50	<100	<50	<100	<50	<100	<500	<50	**460**
	SVP-109	8/3/2017	5-5.5	SVP-109-5-080317	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<2.0	<5.0	<1.0	<2.0
		8/3/2017	10-10.5	SVP-109-10-080317	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<2.0	<5.0	<1.0	<2.0
		DLA Energy Soil Cleanup Goals		**0.5 Feet**	**558**	**547**	**1.5**	**119**	**2,230**	**0.0738**	**984**	**0.778**	**5,560**	**270**
				5 Feet	**481**	**472**	**1.4**	**104**	**2,470**	**0.0682**	**868**	**0.799**	**4,780**	**231**
				10 Feet	**358**	**351**	**1.3**	**79**	**2,550**	**0.0567**	**672**	**0.761**	**3,530**	**170**

Notes:

The total xylenes result is the sum of m,p-xylenes and o-xylenes when detected.

13 **Bold font** represents data detected above the laboratory minimum detection limit.

Shading indicates data that exceeds at least one soil cleanup goal.

<1.4 = not detected at or above the laboratory minimum detection limit shown.

J qualifier indicates that the result was detected above the laboratory minimum detection limit, but below the laboratory reporting limit.

µg/kg = microgram(s) per kilogram

bgs = below ground surface

DIPE = di-isopropyl ether

ETBE = ethyl tertiary butyl ether

mg/kg = milligram(s) per kilogram

MTBE = methyl tertiary butyl ether

TAME = tertiary amyl methyl ether

TBA = tertiary butyl alcohol

TPH = total petroleum hydrocarbons

TPH-d = total extractable petroleum hydrocarbons-diesel, quantified as C8-C18 and as C13-C22 carbon ranges. Reported by the laboratory as "diesel range organics" (DRO).

TPH-g = total purgeable petroleum hydrocarbons-gasoline, quantified as C4-C12 carbon range.

TPH-o = total extractable petroleum hydrocarbons-oil quantified as C23-C40 carbon range. Reported by the laboratory as DRO.

VOC = volatile organic compound

Table 2. Summary of Soil TPH and VOC Results

36-acre Parcel, Defense Fuel Support Point, Norwalk, California

General Area	Sample Location	Sample Date	Sample ID	Sample Depth Interval (feet bgs)	n-Butylbenzene (µg/kg)	n-Propylbenzene (µg/kg)	p-Isopropyltoluene (µg/kg)	sec-Butylbenzene (µg/kg)	Styrene (µg/kg)	tert-Butylbenzene (µg/kg)	Trichloroethene (µg/kg)
36-acre Parcel	SVP-105	8/3/2017	5-5.5	SVP-105-5-080317	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
		8/3/2017	10-10.5	SVP-105-10-080317	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	SVP-106	8/3/2017	5-5.5	SVP-106-5-080317	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
		8/3/2017	10-10.5	SVP-106-10-080317	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99
	SVP-107	8/3/2017	5-5.5	SVP-107-5-080317	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
		8/3/2017	10-10.5	SVP-107-10-080317	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	SVP-108	8/3/2017	5-5.5	SVP-108-5-080317	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
		8/3/2017	10-10.5	SVP-108-10-080317	<100	<50	<50	<50	<50	<100	<50
	SVP-109	8/3/2017	5-5.5	SVP-109-5-080317	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
		8/3/2017	10-10.5	SVP-109-10-080317	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
		DLA Energy Soil Cleanup Goals		**0.5 Feet**	**3,970**	**2,180**	**2,820**	**2,590**	**463**	**2,070**	**7.0**
				5 Feet	**3,400**	**1,870**	**2,420**	**2,220**	**399**	**1,780**	**6.1**
				10 Feet	**2,500**	**1,390**	**1,790**	**1,640**	**296**	**1,320**	**4.7**

Notes:

The total xylenes result is the sum of m,p-xylenes and o-xylenes when detected.

13 **Bold font** represents data detected above the laboratory minimum detection limit.

Shading indicates data that exceeds at least one soil cleanup goal.

<1.4 = not detected at or above the laboratory minimum detection limit shown.

J qualifier indicates that the result was detected above the laboratory minimum detection limit, but below the laboratory reporting limit.

µg/kg = microgram(s) per kilogram

bgs = below ground surface

DIPE = di-isopropyl ether

ETBE = ethyl tertiary butyl ether

mg/kg = milligram(s) per kilogram

MTBE = methyl tertiary butyl ether

TAME = tertiary amyl methyl ether

TBA = tertiary butyl alcohol

TPH = total petroleum hydrocarbons

TPH-d = total extractable petroleum hydrocarbons-diesel, quantified as C8-C18 and as C13-C22 carbon ranges. Reported by the laboratory as "diesel range organics" (DRO).

TPH-g = total purgeable petroleum hydrocarbons-gasoline, quantified as C4-C12 carbon range.

TPH-o = total extractable petroleum hydrocarbons-oil quantified as C23-C40 carbon range. Reported by the laboratory as DRO.

VOC = volatile organic compound

Table 3. Mobile Laboratory Soil Vapor Analytical Results - September 2017

36-acre Parcel, Defense Fuel Support Point, Norwalk, California

Analyte Type	Analyte	Unit	Current Residential Soil Gas Screening Level [a, b, c]	Current Commercial Soil Gas Screening Level [a, b, c]	Proposed Residential Soil Gas Screening Level	Proposed Commercial Soil Gas Screening Level	SVP-105-5 9/7/2017 SVP-105 5-5_5	SVP-105-10 9/7/2017 SVP-105 10-10_5	SVP-106-5 9/7/2017 SVP-106 5-5.5	SVP-106-10 9/7/2017 SVP-106 10-10.5	SVP-107-5 9/7/2017 SVP-107 5-5.5	SVP-107-10 9/7/2017 SVP-107 10-10.5	SVP-108-5 9/7/2017 SVP-108 5-5.5	SVP-108-10 9/7/2017 SVP-108 10-10.5
COPCs[d]	1,2,4-Trimethylbenzene	µg/L	63	262	2	9	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40
	1,2-Dichloroethane	µg/L	0.11	0.47	0.004	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40
	1,3,5-Trimethylbenzene	µg/L	63	262	2.1	8.7	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40
	2-Propanol (leak test compound)	µg/L	---	---			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<400
	Benzene	µg/L	0.097	0.42	0.003	0.014	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40
	Ethylbenzene	µg/L	1.1	4.9	0.037	0.16	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40
	Isopropylbenzene	µg/L	---	---			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40
	m,p-Xylenes	µg/L	100	440	3.3	14.7	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40
	Methyl tert-butyl ether (MTBE)	µg/L	11	47	0.37	1.6	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40
	Naphthalene	µg/L	0.083	0.36	0.003	0.0	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40
	n-Butylbenzene	µg/L	---	---			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40
	n-Propylbenzene	µg/L	1000	4400	33.3	146.7	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40
	o-Xylene	µg/L	100	440	3.3	14.7	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40
	sec-Butylbenzene	µg/L	---	---			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40
	tert-Butanol (TBA)	µg/L	---	---			<20	<20	<20	<20	<20	<20	<20	<40000
	Toluene	µg/L	310	1300	10.3	43.3	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40
Other Detected Compounds	Tetrachloroethylene (PCE)	µg/L	0.48	2.1	0.016	0.067	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<40
	TPH-g (C4-C12)	µg/L	630	2600	21	87	<20	<20	<20	<20	<20	<20	<20	**7400**
Fixed Gases	Methane	% v/v	---	---			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Oxygen	% v/v	---	---			**16**	**15**	**16**	**16**	**15**	**17**	**17**	**16**
	Carbon Dioxide	% v/v	---	---			**1.1**	**1.6**	**0.88**	**1.5**	**1.1**	**0.27**	**0.35**	**1.9**

Notes:

[a] Source for the Indoor Air Screening Levels: DTSC, 2017. *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.* http://www.dtsc.ca.gov/AssessingRisk/upload/HHRA_Note_3_August-2017.pdf

[b] 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

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

[d] Chemicals of potential concern identified from the 2006 soil gas investigation and HHRA (Geomatrix, 2006. *Vapor Intrusion Sampling and Human Health* Risk Assessment, DFSP Norwalk Facility, Norwalk, California. December 15.)

--- = not available
% v/v = percent volume by volume
<0.02 = not detected at the laboratory minimum reporting limit
µg/L = micrograms per liter
COPC = chemical of potential concern
DTSC = California Department of Toxic Substances Control
DUP = field duplicate
EPA = U.S. Environmental Protection Agency
TPH-g = total petroleum hydrocarbons quantified as gasoline

Table 3. Mobile Laboratory Soil Vapor Analytical Results - September 2017

36-acre Parcel, Defense Fuel Support Point, Norwalk, California

Analyte Type	Analyte	Unit	Current Residential Soil Gas Screening Level [a, b, c]	Current Commercial Soil Gas Screening Level [a, b, c]	Proposed Residential Soil Gas Screening Level	Proposed Commercial Soil Gas Screening Level	SVP-108-10 DUP 9/7/2017 SVP-108 10-10.5	SVP-109-5 9/7/2017 SVP-109 5-5.5	SVP-109-10 9/7/2017 SVP-109 10-10.5	Ambient Air 9/7/2017
COPCs[d]	1,2,4-Trimethylbenzene	µg/L	63	262	2	9	<40	<0.02	<0.02	<0.02
	1,2-Dichloroethane	µg/L	0.11	0.47	0.004	0.02	<40	<0.02	<0.02	<0.02
	1,3,5-Trimethylbenzene	µg/L	63	262	2.1	8.7	<40	<0.02	<0.02	<0.02
	2-Propanol (leak test compound)	µg/L	---	---			<400	<0.2	<0.2	<0.2
	Benzene	µg/L	0.097	0.42	0.003	0.014	<40	<0.02	<0.02	<0.02
	Ethylbenzene	µg/L	1.1	4.9	0.037	0.16	<40	<0.02	<0.02	<0.02
	Isopropylbenzene	µg/L	---	---			<40	<0.02	<0.02	<0.02
	m,p-Xylenes	µg/L	100	440	3.3	14.7	<40	<0.02	<0.02	<0.02
	Methyl tert-butyl ether (MTBE)	µg/L	11	47	0.37	1.6	<40	<0.02	<0.02	<0.02
	Naphthalene	µg/L	0.083	0.36	0.003	0.0	<40	<0.02	<0.02	<0.02
	n-Butylbenzene	µg/L	---	---			<40	<0.02	<0.02	<0.02
	n-Propylbenzene	µg/L	1000	4400	33.3	146.7	<40	<0.02	<0.02	<0.02
	o-Xylene	µg/L	100	440	3.3	14.7	<40	<0.02	<0.02	<0.02
	sec-Butylbenzene	µg/L	---	---			<40	<0.02	<0.02	<0.02
	tert-Butanol (TBA)	µg/L	---	---			<40000	<20	<20	<20
	Toluene	µg/L	310	1300	10.3	43.3	<40	<0.02	<0.02	<0.02
Other Detected Compounds	Tetrachloroethylene (PCE)	µg/L	0.48	2.1	0.016	0.067	<40	**0.056**	**0.12**	<0.02
	TPH-g (C4-C12)	µg/L	630	2600	21	87	**7600**	<20	<20	<20
Fixed Gases	Methane	% v/v	---	---			<0.1	<0.1	<0.1	---
	Oxygen	% v/v	---	---			**16**	**15**	**15**	**---**
	Carbon Dioxide	% v/v	---	---			**1.9**	**3.2**	**3**	**---**

Notes:

[a] Source for the Indoor Air Screening Levels: DTSC, 2017. *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.* http://www.dtsc.ca.gov/AssessingRisk/upload/HHRA_Note_3_August-2017.pdf

[b] 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

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

[d] Chemicals of potential concern identified from the 2006 soil gas investigation and HHRA (Geomatrix, 2006. *Vapor Intrusion Sampling and Human Health* Risk Assessment, DFSP Norwalk Facility, Norwalk, California. December 15.)

--- = not available
% v/v = percent volume by volume
<0.02 = not detected at the laboratory minimum reporting limit
µg/L = micrograms per liter
COPC = chemical of potential concern
DTSC = California Department of Toxic Substances Control
DUP = field duplicate
EPA = U.S. Environmental Protection Agency
TPH-g = total petroleum hydrocarbons quantified as gasoline

Table 4. Field Measurements and Mobile Laboratory Soil Vapor Analytical Results - February 2019

SFPP Norwalk Pump Station, Norwalk, California

Analyte Type	Analyte	Unit	Current Residential Soil Gas Screening Level [a, b]	Current Commercial Soil Gas Screening Level [a, b]	Proposed Residential Soil Gas Screening Level	Proposed Commercial Soil Gas Screening Level	SVP-105-5 2/20/2019 SVP-105 5-5.5	SVP-105-10 2/20/2019 SVP-105 10-10.5	SVP-105-10DUP 2/20/2019 SVP-105 10-10.5	SVP-106-5 2/20/2019 SVP-106 5-5.5	SVP-106-10 2/20/2019 SVP-106 10-10.5	SVP-107-5 2/20/2019 SVP-107 5-5.5	SVP-107-10 2/20/2019 SVP-107 10-10.5	SVP-108-5 2/20/2019 SVP-108 5-5.5
Field Measurements	Pressure	inches H_2O	---	---			---	---	---	---	---	---	---	---
	PID	ppmv	---	---			---	---	---	---	---	---	---	---
COPCs [c]	1,2,4-Trimethylbenzene	µg/L	63	262	2.1	8.7	<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	0.004	0.016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
	1,3,5-Trimethylbenzene	µg/L	63	262	2.1	8.7	<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
	Benzene	µg/L	0.097	0.42	0.003	0.014	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	**0.0033**	<0.003
	Ethylbenzene	µg/L	1.1	4.9	0.037	0.16	<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
	m,p-Xylenes	µg/L	100	440	3.3	14.7	<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	0.37	1.6	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Naphthalene	µg/L	0.083	0.36	0.003	0.012	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
	n-Butylbenzene	µg/L	---	---			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Propylbenzene	µg/L	1000	4400	33	147	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	o-Xylene	µg/L	100	440	3.3	14.7	<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
	tert-Butanol (TBA)	µg/L	---	---			<20	<20	<20	<20	<20	<20	<20	<20
	Toluene	µg/L	5200	22400	173	747	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Other Detected Compounds	Acetone	µg/L	32000	140000	1067	4667	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.035**	<0.02
	Cyclohexane	µg/L	6300	26000	210	867	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Tetrachloroethylene (PCE)	µg/L	0.46	2.0	0.015	0.067	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	TPH-g (C4-C12)	µg/L	630	2600	21	87	<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
	Oxygen	% v/v	---	---			**16**	**16**	**16**	**17**	**17**	**17**	**18**	**14**
	Carbon Dioxide	% v/v	---	---			**1.1**	**1.3**	**1.3**	**0.98**	**1.2**	**0.54**	**0.19**	**2.6**

Notes:

[a] Source for the Indoor Air Screening Levels: DTSC, 2017. *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.* http://www.dtsc.ca.gov/AssessingRisk/upload/HHRA_Note_3_August-2017.pdf

[b] 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

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

[d] Chemicals of potential concern identified from the 2006 soil gas investigation and HHRA (Geomatrix, 2006. *Vapor Intrusion Sampling and Human Health* Risk Assessment, DFSP Norwalk Facility, Norwalk, California. December 15.)

--- = not available
% v/v = percent volume by volume
<0.02 = not detected at the laboratory minimum reporting limit
µg/L = micrograms per liter
COPC = chemical of potential concern
DTSC = California Department of Toxic Substances Control
DUP = field duplicate
EPA = U.S. Environmental Protection Agency
TPH-g = total petroleum hydrocarbons quantified as gasoline

Table 4. Field Measurements and Mobile Laboratory Soil Vapor Analytical Results - February 2019

SFPP Norwalk Pump Station, Norwalk, California

Analyte Type	Analyte	Unit	Current Residential Soil Gas Screening Level [a, b]	Current Commercial Soil Gas Screening Level [a, b]	Proposed Residential Soil Gas Screening Level	Proposed Commercial Soil Gas Screening Level	SVP-108-10 2/20/2019 SVP-108 10-10.5	SVP-109-5 2/20/2019 SVP-109 5-5.5	SVP-109-10 2/20/2019 SVP-109 10-10.5	Ambient Air 2/20/2019
Field Measurements	Pressure	inches H_2O	---	---			---	---	---	---
	PID	ppmv	---	---			---	---	---	---
COPCs[c]	1,2,4-Trimethylbenzene	µg/L	63	262	2.1	8.7	<16	<0.02	<0.02	<0.02
	1,2-Dichloroethane	µg/L	0.11	0.47	0.004	0.016	<3.2	<0.004	<0.004	<0.004
	1,3,5-Trimethylbenzene	µg/L	63	262	2.1	8.7	<16	<0.02	<0.02	<0.02
	2-Propanol (leak test compound)	µg/L	---	---			<160	<0.2	<0.2	<0.2
	Benzene	µg/L	0.097	0.42	0.003	0.014	<2.4	<0.003	<0.003	<0.003
	Ethylbenzene	µg/L	1.1	4.9	0.037	0.16	<16	<0.02	<0.02	<0.02
	Isopropylbenzene	µg/L	---	---			<16	<0.02	<0.02	<0.02
	m,p-Xylenes	µg/L	100	440	3.3	14.7	<16	<0.02	<0.02	<0.02
	Methyl tert-butyl ether (MTBE)	µg/L	11	47	0.37	1.6	<16	<0.02	<0.02	<0.02
	Naphthalene	µg/L	0.083	0.36	0.003	0.012	<2.4	<0.003	<0.003	<0.003
	n-Butylbenzene	µg/L	---	---			<16	<0.02	<0.02	<0.02
	n-Propylbenzene	µg/L	1000	4400	33	147	<16	<0.02	<0.02	<0.02
	o-Xylene	µg/L	100	440	3.3	14.7	<16	<0.02	<0.02	<0.02
	sec-Butylbenzene	µg/L	---	---			<16	<0.02	<0.02	<0.02
	tert-Butanol (TBA)	µg/L	---	---			<16000	<20	<20	<20
	Toluene	µg/L	5200	22400	173	747	<16	<0.02	<0.02	<0.02
Other Detected Compounds	Acetone	µg/L	32000	140000	1067	4667	<16	**0.021**	<0.02	<0.02
	Cyclohexane	µg/L	6300	26000	210	867	**1.7**	<0.02	<0.02	<0.02
	Tetrachloroethylene (PCE)	µg/L	0.46	2.0	0.015	0.067	<8	**0.023**	**0.036**	<0.01
	TPH-g (C4-C12)	µg/L	630	2600	21	87	**620**	<20	<20	<20
Fixed Gases	Methane	% v/v	---	---			<0.1	<0.1	<0.1	**---**
	Oxygen	% v/v	---	---			**1.2**	**17**	**17**	**---**
	Carbon Dioxide	% v/v	---	---			**14**	**1.4**	**1.6**	**---**

Notes:

[a] Source for the Indoor Air Screening Levels: DTSC, 2017. *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.* http://www.dtsc.ca.gov/AssessingRisk/upload/HHRA_Note_3_August-2017.pdf

[b] 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

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

[d] Chemicals of potential concern identified from the 2006 soil gas investigation and HHRA (Geomatrix, 2006. *Vapor Intrusion Sampling and Human Health* Risk Assessment, DFSP Norwalk Facility, Norwalk, California. December 15.)

--- = not available
% v/v = percent volume by volume
<0.02 = not detected at the laboratory minimum reporting limit
µg/L = micrograms per liter
COPC = chemical of potential concern
DTSC = California Department of Toxic Substances Control
DUP = field duplicate
EPA = U.S. Environmental Protection Agency
TPH-g = total petroleum hydrocarbons quantified as gasoline

Figures

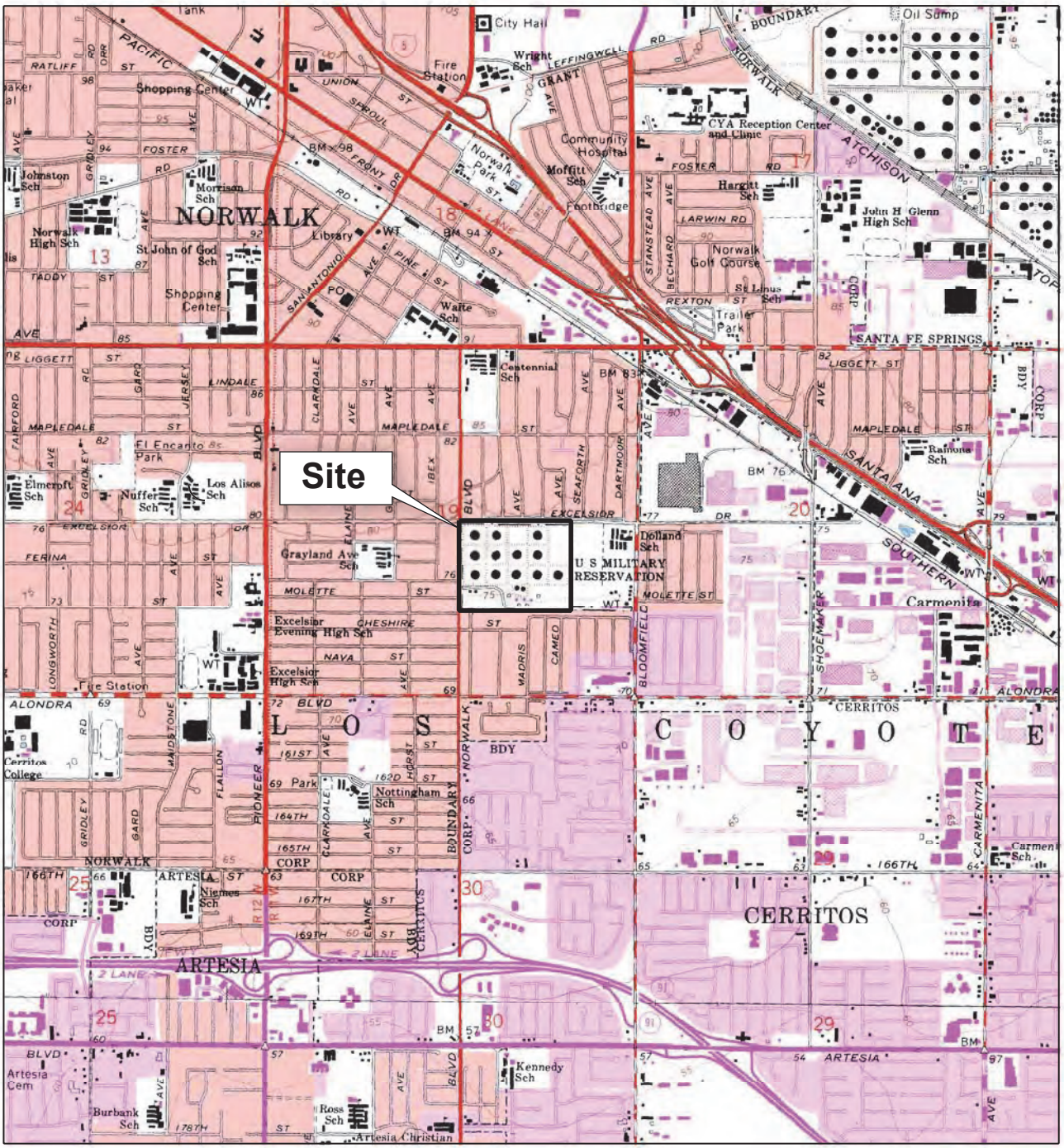
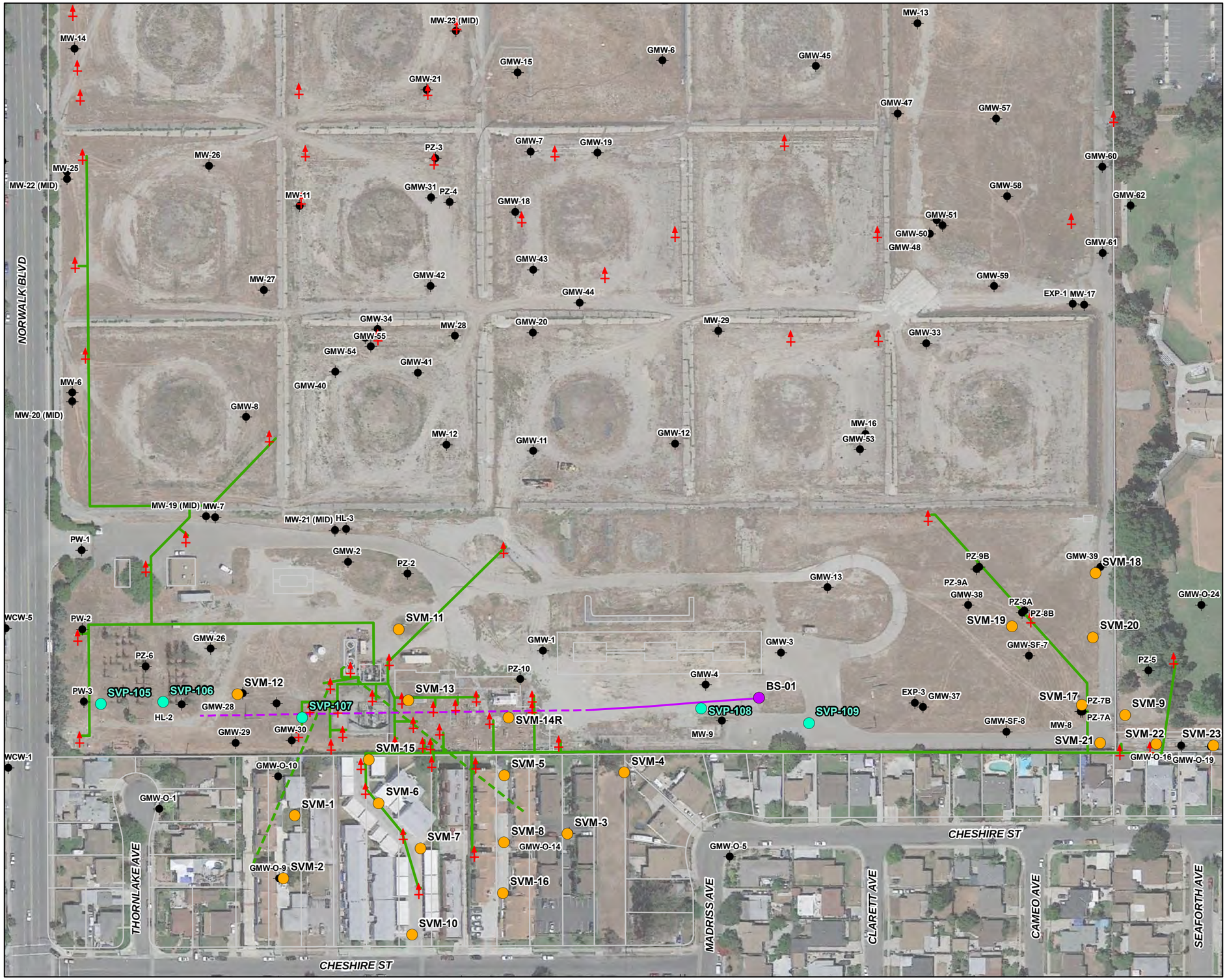


Figure 1. Site Location Map
SFPP Norwalk Pump Station
Norwalk, California

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.

EN1014151027SCO gure1.pdf 10/15

JACOBS®



Legend

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

Imagery Source:
Google Earth April 17, 2013.

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

N

0 75 150 300
Feet

1 inch = 150 feet

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

R:\ENBG\00_PROJ\K\KINDERMORGAN\NORWALK\MAPFILES\2017\FIGURE2_SOIL_VAPOR_MONITORING_PROBES.MXD AESPEJO 9/12/2017 2:42:22 PM

JACOBS

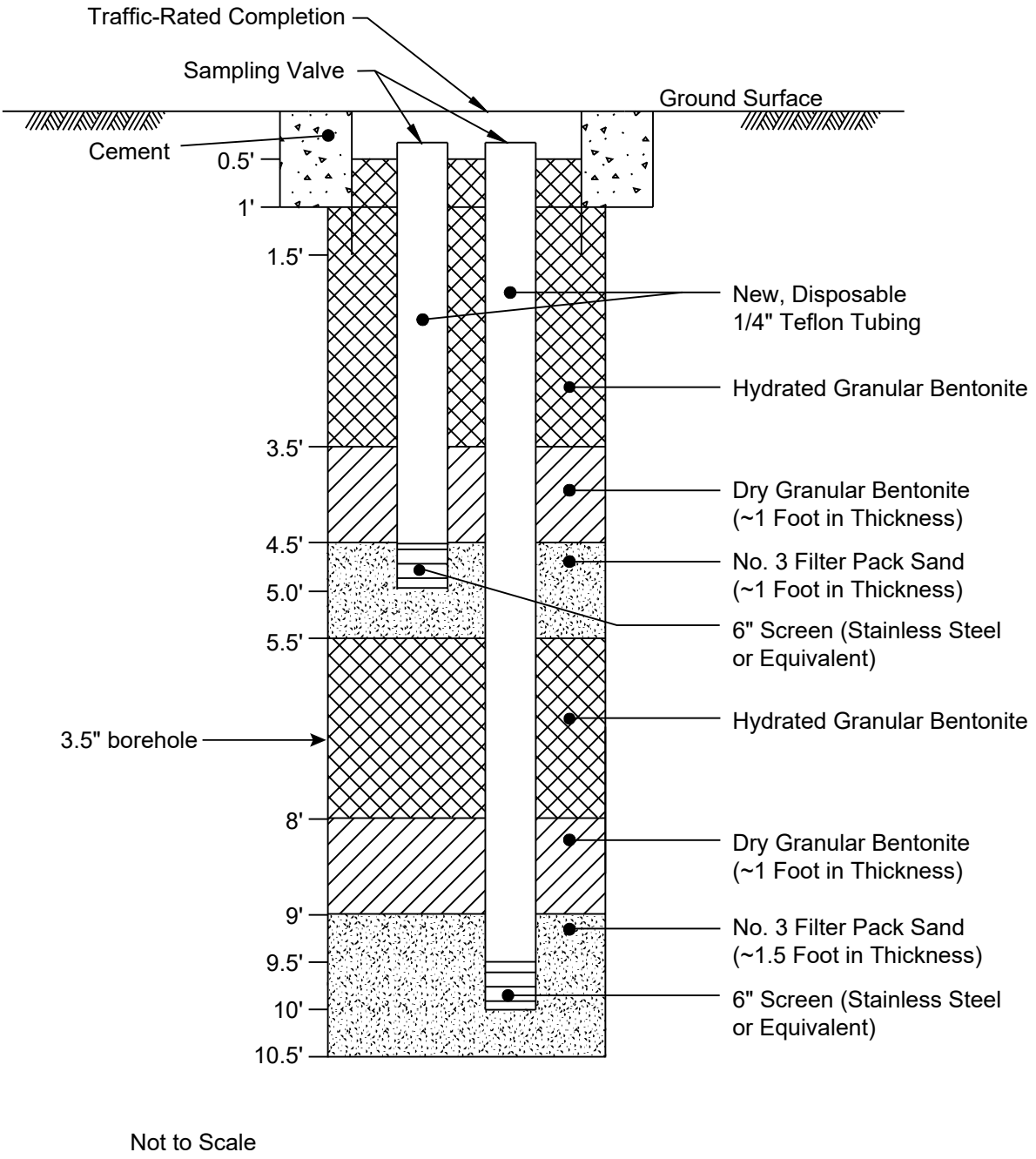


Figure 3. Soil Vapor Monitoring Probe Completion Diagram
SFPP Norwalk Pump Station
Norwalk, California

JACOBS

Attachment A
Response to Comments

Attachment A. Response to Comments Presented by the Los Angeles Regional Water Quality Control Board (LARWQCB) on behalf of the California Office of Health Hazard Assessment (OEHHA) on the Report: *Results of Additional Soil and Soil Vapor Sampling and Human Health Risk Assessment to Support Shallow Soil Closure for the 36-Acre Parcel, Defense Fuel Support Point, Norwalk, California*

Number	LARWQCB Comment	Response
1.	A revised Human Health Risk Assessment (HHRA) for the western 36-acre parcel is warranted to address the above comments. Submit the revised HHRA for the western 36-acre parcel to the Regional Board by April 15, 2019.	A revised HHRA is provided in the attached report.
Number	**OEHHA Comments**	**Response**
1.	OEHHA does not recommend screening out potential COPCs by one-at-a-time comparisons with screening levels, ignoring additivity.	Additive effects were evaluated for the detected volatile organic compounds (VOCs) and do not change identification of contaminants of potential concern (COPCs) that warranted further evaluation in the human health risk assessment (HHRA) (total petroleum hydrocarbons quantified as gasoline [TPH-g] and tetrachloroethene [PCE]). For the non-carcinogenic substances (TPH-g, acetone, and cyclohexane), a review of the reference concentrations (RfCs) reveals no common target organs or critical effects. For TPH-g, where hexane is used as a surrogate, the critical effect is peripheral neuropathy; for acetone, the critical effect is central nervous system effects; for cyclohexane, the critical effect is developmental toxicity. Therefore, there is no basis for adding hazard quotients (HQs) for these COPCs. PCE and benzene are carcinogenic, and these risks can be added. However, the cancer risk from the single detected benzene concentration is very small: under current California Department of Toxic Substances Control (DTSC) vapor intrusion (VI) guidelines, that cancer risk falls below 1×10^{-6}. Using the proposed attenuation factor of 0.03, the risk from benzene in soil vapor is 1.1×10^{-6}, a risk that would not affect the conclusions of the HHRA. Based on these results, the appropriate COPCs (TPH-g and PCE) have been evaluated in the HHRA.
2.	For screening sites for vapor intrusion, USEPA has more recently recommended an empirically derived attenuation factor of 0.03 for subslab and soil vapor data and 0.001 for groundwater data to estimate indoor air concentrations of COPCs (USEPA, 2015) regardless of depth. In addition, USEPA no longer recommends the use of the J&E model to generate a single outcome for the prediction of risk estimates. CalEPA is developing guidance similar to USEPA's approach.	The HHRA was updated to incorporate the proposed attenuation factor (AF) for soil vapor. Soil vapor screening levels based on current regulatory guidance (DTSC, 2011[a]) and the proposed AF were both used to evaluate soil vapor sampling data presented in this report. The second soil vapor sampling event in February 2019 (and March 2019 data) was performed using analytical reporting limits that achieved the screening levels based on the proposed AF. The Johnson & Ettinger model was not used in this evaluation.
3.	OEHHA did several point checks on the calculations presented by CH2M and found them to be accurate with the data presented. However, OEHHA updated the calculations with AF of 0.03 to determine the corresponding soil gas screening levels. Detections of COPCs (PCE and TPH-g) at SVP-108 and SVP-109 are above these updated screening levels.	See the response to Comment 2, above. The soil vapor data were re-evaluated using screening levels based on the proposed AF. In the HHRA, TPH-g was evaluating using the petroleum vapor intrusion (PVI) framework, where multiple lines of evidence collected across multiple studies at this site conclude that VI pathways from petroleum constituents are incomplete under either current or future land uses. The assessment of human health risks from PCE detected in soil vapor was performed using the AF from current DTSC VI guidance (DTSC, 2011[a]) and the proposed AF.
4.	For Table 3, OEHHA suggests specifying the methodology used for soil vapor screening levels (either Note 3 from DTSC, 2017), attenuation factors from DTSC, 2011, or TPH aliphatic low-screening levels.	The source for the screening levels is specified in the notes to Table 3 and below.

[a] California Department of Toxic Substances Control (DTSC). 2011. *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance)*. October. http://www.dtsc.ca.gov/AssessingRisk/upload/Final_VIG_Oct_2011.pdf

Attachment B
Soil Boring Logs

CH2MHILL

PROJECT NUMBER

BORING NUMBER SVP-105

SHEET 1 OF 1

SOIL BORING LOG

PROJECT: 36-Acre Investigation LOCATION: KM Norwalk DATE: 8/3/17

WEATHER: Sunny 80's DRILLING CONTRACTOR: Gregg

DRILLING METHOD AND EQUIPMENT USED: Hand auger

WATER LEVELS START: N/A END: N/A LOGGER: A. Bamhart

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone / Above Hole
0						
1			SM		Silty sand 10YR 4/3 brown 70% fine sand, 30% fines, moist	0.0
2						0.0
3						0.0
4					As above but 10YR 5/2 grayish brown	0.0 soil sample SVP-105 taken from 4-5'
5						0.0
6						0.0
7			SM		As above but 10YR 6/2 light grayish brown, 80% fine sand, 20% fines	0.0
8						0.0
9						0.0 soil sample SVP-105-10 taken from 9-10'
10					TD: 10' bgs	

Sampler Signature: [signature] Date: 8/3/17

CH2MHILL

PROJECT NUMBER

BORING NUMBER SVP-106

SHEET 1 OF 1

SOIL BORING LOG

PROJECT: 36-Acre Investigation LOCATION: KM Norwalk DATE: 8/3/17

WEATHER: Sunny 86°S DRILLING CONTRACTOR: Gregg

DRILLING METHOD AND EQUIPMENT USED: hand auger

WATER LEVELS START: N/A END: N/A LOGGER: K. Barnhart

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone / Above Hole
0						
1			SM		silty sand (SM) 10YR 4/3 brown, 60% fine sand, 40% fines, moist	0.0
2						0.0
3						0.0
4					As above but 10YR 5/2	0.0 soil sample SVP-106-5 taken from 4-5'
5					grayish brown, 70% fine sand 30% fines	0.0
6			SM			0.0
7						0.0
8					As above but 10YR 5/3 brown,	0.0
9						0.0 soil sample SVP-106-10 taken from 9-10'
10						

Sampler Signature: [signature] Date: 8/3/17

CH2MHILL

PROJECT NUMBER

BORING NUMBER SVP-107

SHEET 1 OF 1

SOIL BORING LOG

PROJECT: 36 Acre Investigation LOCATION: KM Norwalk DATE: 8/3/17

WEATHER: Sunny 80s DRILLING CONTRACTOR: Gregg

DRILLING METHOD AND EQUIPMENT USED: Hand auger

WATER LEVELS START: N/A END: N/A LOGGER: A. Bamlet

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone / Above Hole
0						
1					Silty sand (SM) 10YR 5/3 brown, 70% fine sand, 30% fines, moist	0.0
2						0.0
3			SM		As above but 10YR 6/2, dark grayish brown,	0.0
4						0.0 Soil sample SVP-107-5 taken from 4-5'
5						0.0
6						0.0
7			SM		As above but 10YR 5/2 grayish brown, 60% fine sand, 40% fines	0.0
8						0.0
9						0.0
10						0.0 Soil sample SVP-107-10 taken from 9-10'
					TD = 10' bgs	

Sampler Signature: [signature] Date: _____

CH2MHILL

PROJECT NUMBER

BORING NUMBER SVP-108

SHEET 1 OF 1

SOIL BORING LOG

PROJECT: 36-Acre Investigation LOCATION: KM Norwalk DATE: 8/3/17

WEATHER: Sunny 90's DRILLING CONTRACTOR: Gregg

DRILLING METHOD AND EQUIPMENT USED: hand auger LOGGER: A. Barnhart

WATER LEVELS N/A START: N/A END: N/A

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone / Above Hole
0						
1			SM		Silty sand (SM), light brownish-gray, 10YR6/2, 60% fine sand, 35% fines, 5% fine gravel, moist	0.0
2						0.0
3					Silty sand (SM) as above but brown 10YR4/3, moist	0.0
4						0.0 Soil sample SVP-108-5 taken from 4'-5'
5			SP-SM		~~Poorly graded~~ sand with silt, 80% fine sand, 20% silt, 10YR4/3 brown, moist	0.0
6						0.0
7						0.0
8						3.1
9			SM		Silty sand (SM) dark grayish brown 10YR4/2, 60% fine sand, 40% fines, moist	27.5 ppm
10					TD: 10' bgs	54.1 ppm Soil sample SVP-108-10 taken from 9-10'

Sampler Signature: [signature] Date: 8/3/17

CH2MHILL

PROJECT NUMBER

BORING NUMBER SVP-109

SHEET 1 OF 1

SOIL BORING LOG

PROJECT: 36-Acre Investigation LOCATION: Km Norwalk, DATE: 8/3/17

WEATHER: Sunny 80's DRILLING CONTRACTOR: Gregg

DRILLING METHOD AND EQUIPMENT USED: Handauger, concrete corer

WATER LEVELS START: N/A END: N/A LOGGER: A. Barchet

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone / Above Hole
0					10YR 3/2, dark grayish brown silty sand with gravel (SM), 65% fine sand, 20% gravel, 10% fines, moist, possible fill	Concrete core to 5" hand auger to 10'
1			SM			0.0
2						0.0
3					Silty sand (SM), 10YR 4/3 brown, moist, 60% fine sand, 40% fines trace gravel	0.0
4						0.0
5						0.0 soil sample SVP-109-5 taken from 4'-5'
6			SP-SM		Poorly graded sand with silt (SP-SM), 90% fine sand, 10% silt, 10YR 5/2 grayish brown, moist	0.0
7						0.0
8						0.0
9			SM		Silty sand (SM), 10YR 4/3 brown 90% fine sand, 30% fines, moist	0.0 soil sample SVP-109-10 taken from 9-10'
10					Total Depth - 10 ft bgs	

Sampler Signature: [signature] Date: 8/3/17

Attachment C
Soil Laboratory Analytical Report

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Irvine
17461 Derian Ave
Suite 100
Irvine, CA 92614-5817
Tel: (949)261-1022

TestAmerica Job ID: 440-189560-1
Client Project/Site: Kinder Morgan- Norwalk Site

For:
CH2M Hill, Inc.
6 Hutton Centre Drive, Suite 700
Santa Ana, California 92707

Attn: Eric Davis

Authorized for release by:
8/15/2017 11:55:17 AM

Camille Murray, Project Manager I
(949)261-1022
camille.murray@testamericainc.com

Table of Contents

Sample Summary

Client: CH2M Hill, Inc.
Project/Site: Kinder Morgan- Norwalk Site

TestAmerica Job ID: 440-189560-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-189560-1	SVP-108-5	Solid	08/03/17 08:30	08/03/17 17:40
440-189560-2	SVP-108-10	Solid	08/03/17 08:45	08/03/17 17:40
440-189560-3	SVP-109-5	Solid	08/03/17 11:10	08/03/17 17:40
440-189560-4	SVP-109-10	Solid	08/03/17 11:30	08/03/17 17:40
440-189560-5	SVP-107-5	Solid	08/03/17 13:30	08/03/17 17:40
440-189560-6	SVP-107-10	Solid	08/03/17 13:40	08/03/17 17:40
440-189560-7	SVP-106-5	Solid	08/03/17 13:45	08/03/17 17:40
440-189560-8	SVP-106-10	Solid	08/03/17 14:18	08/03/17 17:40
440-189560-9	SVP-105-5	Solid	08/03/17 15:00	08/03/17 17:40
440-189560-10	SVP-105-10	Solid	08/03/17 15:12	08/03/17 17:40

Case Narrative

Client: CH2M Hill, Inc.
Project/Site: Kinder Morgan- Norwalk Site

TestAmerica Job ID: 440-189560-1

Job ID: 440-189560-1

Laboratory: TestAmerica Irvine

Narrative

Job Narrative
440-189560-1

Comments
No additional comments.

Receipt
The samples were received on 8/3/2017 5:40 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.6º C.

GC/MS VOA
Method(s) 8260B: Surrogate 4-Bromofluorobenzene recovery for the following sample was outside the upper control limits: SVP-107-5 (440-189560-5). Re-extraction and/or re-analysis was performed with concurring results. The original analysis has been reported.

Method(s) 8260B: Internal standard (ISTD) 1,4-Dichlorobenzene-d4 response for the following sample was outside the lower control limits: SVP-107-5 (440-189560-5). The sample was re-extracted and/or re-analyzed with concurring results, and the original set of data has been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
Method(s) 8015B: The method blank for preparation batch 440-421498 and analytical batch 440-421631 contained C8-C18 DRO and C23-C40 above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction or re-analysis of samples was not performed.

Method(s) 8015B: The method blank for preparation batch 440-421740 and analytical batch 440-421818 contained C23-C40 above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method(s) 3546: Due to the matrix, the following samples could not be concentrated to the final method required volume: SVP-107-5 (440-189560-5) and SVP-107-10 (440-189560-6). The reporting limits (RLs) are elevated proportionately.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Client: CH2M Hill, Inc.
Project/Site: Kinder Morgan- Norwalk Site

TestAmerica Job ID: 440-189560-1

Client Sample ID: SVP-108-5
Date Collected: 08/03/17 08:30
Date Received: 08/03/17 17:40

Lab Sample ID: 440-189560-1
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
1,1,1-Trichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
1,1,2,2-Tetrachloroethane	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
1,1,2-Trichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
1,1-Dichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
1,1-Dichloroethene	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
1,1-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
1,2,3-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
1,2,3-Trichloropropane	ND		10	1.0	ug/Kg			08/05/17 13:49	1
1,2,4-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
1,2,4-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
1,2-Dibromo-3-Chloropropane	ND		5.0	2.0	ug/Kg			08/05/17 13:49	1
1,2-Dibromoethane (EDB)	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
1,2-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
1,2-Dichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
1,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
1,3,5-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
1,3-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
1,3-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
1,4-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
2,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
2-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
4-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
Benzene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
Bromobenzene	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
Bromochloromethane	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
Bromodichloromethane	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
Bromoform	ND		5.0	2.0	ug/Kg			08/05/17 13:49	1
Bromomethane	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
Carbon tetrachloride	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
Chlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
Chloroethane	ND		5.0	2.0	ug/Kg			08/05/17 13:49	1
Chloroform	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
Chloromethane	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
cis-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
cis-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
Dibromochloromethane	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
Dibromomethane	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
Dichlorodifluoromethane	ND		5.0	2.0	ug/Kg			08/05/17 13:49	1
Ethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
Hexachlorobutadiene	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
Isopropylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
m,p-Xylene	ND		4.0	2.0	ug/Kg			08/05/17 13:49	1
Methylene Chloride	ND		20	5.0	ug/Kg			08/05/17 13:49	1
Methyl-t-Butyl Ether (MTBE)	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
Naphthalene	ND		5.0	2.0	ug/Kg			08/05/17 13:49	1
n-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
N-Propylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
o-Xylene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1

Client Sample ID: SVP-108-5

Date Collected: 08/03/17 08:30
Date Received: 08/03/17 17:40

Lab Sample ID: 440-189560-1
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
sec-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
Styrene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
Tert-amyl-methyl ether (TAME)	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
tert-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
Tetrachloroethene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
Toluene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
trans-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
trans-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
Trichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1
Trichlorofluoromethane	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
Vinyl chloride	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
Xylenes, Total	ND		4.0	2.0	ug/Kg			08/05/17 13:49	1
Isopropyl Ether (DIPE)	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
Ethyl-t-butyl ether (ETBE)	ND		5.0	1.0	ug/Kg			08/05/17 13:49	1
tert-Butyl alcohol (TBA)	ND		100	10	ug/Kg			08/05/17 13:49	1
p-Isopropyltoluene	ND		2.0	1.0	ug/Kg			08/05/17 13:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*90*		*79 - 123*		*08/05/17 13:49*	*1*
4-Bromofluorobenzene (Surr)	*96*		*79 - 120*		*08/05/17 13:49*	*1*
Dibromofluoromethane (Surr)	*94*		*60 - 120*		*08/05/17 13:49*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C4-C12)	ND		400	150	ug/Kg			08/10/17 12:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*112*		*65 - 140*		*08/10/17 12:08*	*1*

Method: 8015B - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C13-C22	ND		5.0	2.5	mg/Kg		08/05/17 07:26	08/07/17 15:01	1
C23-C40	**4.3**	**J B**	5.0	2.5	mg/Kg		08/05/17 07:26	08/07/17 15:01	1
C8 - C18	**2.6**	**J B**	5.0	2.5	mg/Kg		08/05/17 07:26	08/07/17 15:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Octacosane	*74*		*40 - 140*	*08/05/17 07:26*	*08/07/17 15:01*	*1*

Client Sample ID: SVP-108-10

Date Collected: 08/03/17 08:45
Date Received: 08/03/17 17:40

Lab Sample ID: 440-189560-2
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,1,1-Trichloroethane	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,1,2,2-Tetrachloroethane	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,1,2-Trichloroethane	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,1-Dichloroethane	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,1-Dichloroethene	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,1-Dichloropropene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100

Client: CH2M Hill, Inc.
Project/Site: Kinder Morgan- Norwalk Site

TestAmerica Job ID: 440-189560-1

Client Sample ID: SVP-108-10
Date Collected: 08/03/17 08:45
Date Received: 08/03/17 17:40

Lab Sample ID: 440-189560-2
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3-Trichlorobenzene	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,2,3-Trichloropropane	ND		500	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,2,4-Trichlorobenzene	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,2,4-Trimethylbenzene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,2-Dibromo-3-Chloropropane	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,2-Dibromoethane (EDB)	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,2-Dichlorobenzene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,2-Dichloroethane	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,2-Dichloropropane	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,3,5-Trimethylbenzene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,3-Dichlorobenzene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,3-Dichloropropane	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
1,4-Dichlorobenzene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
2,2-Dichloropropane	ND		200	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
2-Chlorotoluene	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
4-Chlorotoluene	ND		250	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Benzene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Bromobenzene	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Bromochloromethane	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Bromodichloromethane	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Bromoform	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Bromomethane	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Carbon tetrachloride	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Chlorobenzene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Chloroethane	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Chloroform	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Chloromethane	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
cis-1,2-Dichloroethene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
cis-1,3-Dichloropropene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Dibromochloromethane	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Dibromomethane	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Dichlorodifluoromethane	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Ethylbenzene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Hexachlorobutadiene	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Isopropylbenzene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
m,p-Xylene	ND		200	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Methylene Chloride	ND		1000	500	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Methyl-t-Butyl Ether (MTBE)	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Naphthalene	**460**		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
n-Butylbenzene	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
N-Propylbenzene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
o-Xylene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
sec-Butylbenzene	ND		250	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Styrene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Tert-amyl-methyl ether (TAME)	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
tert-Butylbenzene	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Tetrachloroethene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Toluene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
trans-1,2-Dichloroethene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100

Client Sample ID: SVP-108-10

Date Collected: 08/03/17 08:45
Date Received: 08/03/17 17:40

Lab Sample ID: 440-189560-2
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,3-Dichloropropene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Trichloroethene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Trichlorofluoromethane	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Vinyl chloride	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Xylenes, Total	ND		200	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Isopropyl Ether (DIPE)	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
Ethyl-t-butyl ether (ETBE)	ND		250	100	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
tert-Butyl alcohol (TBA)	ND		5000	2500	ug/Kg		08/07/17 08:15	08/07/17 13:26	100
p-Isopropyltoluene	ND		100	50	ug/Kg		08/07/17 08:15	08/07/17 13:26	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*89*		*60 - 140*	*08/07/17 08:15*	*08/07/17 13:26*	*100*
4-Bromofluorobenzene (Surr)	*96*		*65 - 140*	*08/07/17 08:15*	*08/07/17 13:26*	*100*
Dibromofluoromethane (Surr)	*88*		*55 - 140*	*08/07/17 08:15*	*08/07/17 13:26*	*100*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C4-C12)	**11000**		1800	660	ug/Kg			08/10/17 12:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*108*		*65 - 140*		*08/10/17 12:34*	*1*

Method: 8015B - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C13-C22	**120**		4.9	2.5	mg/Kg		08/05/17 07:26	08/07/17 17:25	1
C23-C40	**14**	**B**	4.9	2.5	mg/Kg		08/05/17 07:26	08/07/17 17:25	1
C8 - C18	**240**	**B**	4.9	2.5	mg/Kg		08/05/17 07:26	08/07/17 17:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Octacosane	*84*		*40 - 140*	*08/05/17 07:26*	*08/07/17 17:25*	*1*

Client Sample ID: SVP-109-5

Date Collected: 08/03/17 11:10
Date Received: 08/03/17 17:40

Lab Sample ID: 440-189560-3
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
1,1,1-Trichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
1,1,2,2-Tetrachloroethane	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
1,1,2-Trichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
1,1-Dichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
1,1-Dichloroethene	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
1,1-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
1,2,3-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
1,2,3-Trichloropropane	ND		10	1.0	ug/Kg			08/05/17 09:59	1
1,2,4-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
1,2,4-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
1,2-Dibromo-3-Chloropropane	ND		5.0	2.0	ug/Kg			08/05/17 09:59	1
1,2-Dibromoethane (EDB)	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
1,2-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1

Client: CH2M Hill, Inc.
Project/Site: Kinder Morgan- Norwalk Site

TestAmerica Job ID: 440-189560-1

Client Sample ID: SVP-109-5
Date Collected: 08/03/17 11:10
Date Received: 08/03/17 17:40

Lab Sample ID: 440-189560-3
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
1,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
1,3,5-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
1,3-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
1,3-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
1,4-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
2,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
2-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
4-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
Benzene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
Bromobenzene	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
Bromochloromethane	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
Bromodichloromethane	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
Bromoform	ND		5.0	2.0	ug/Kg			08/05/17 09:59	1
Bromomethane	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
Carbon tetrachloride	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
Chlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
Chloroethane	ND		5.0	2.0	ug/Kg			08/05/17 09:59	1
Chloroform	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
Chloromethane	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
cis-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
cis-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
Dibromochloromethane	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
Dibromomethane	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
Dichlorodifluoromethane	ND		5.0	2.0	ug/Kg			08/05/17 09:59	1
Ethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
Hexachlorobutadiene	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
Isopropylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
m,p-Xylene	ND		4.0	2.0	ug/Kg			08/05/17 09:59	1
Methylene Chloride	ND		20	5.0	ug/Kg			08/05/17 09:59	1
Methyl-t-Butyl Ether (MTBE)	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
Naphthalene	ND		5.0	2.0	ug/Kg			08/05/17 09:59	1
n-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
N-Propylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
o-Xylene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
sec-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
Styrene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
Tert-amyl-methyl ether (TAME)	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
tert-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
Tetrachloroethene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
Toluene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
trans-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
trans-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
Trichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1
Trichlorofluoromethane	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
Vinyl chloride	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
Xylenes, Total	ND		4.0	2.0	ug/Kg			08/05/17 09:59	1
Isopropyl Ether (DIPE)	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1
Ethyl-t-butyl ether (ETBE)	ND		5.0	1.0	ug/Kg			08/05/17 09:59	1

Client Sample ID: SVP-109-5

Lab Sample ID: 440-189560-3

Date Collected: 08/03/17 11:10

Matrix: Solid

Date Received: 08/03/17 17:40

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butyl alcohol (TBA)	ND		100	10	ug/Kg			08/05/17 09:59	1
p-Isopropyltoluene	ND		2.0	1.0	ug/Kg			08/05/17 09:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*79 - 123*		*08/05/17 09:59*	*1*
4-Bromofluorobenzene (Surr)	*97*		*79 - 120*		*08/05/17 09:59*	*1*
Dibromofluoromethane (Surr)	*103*		*60 - 120*		*08/05/17 09:59*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C4-C12)	ND		390	150	ug/Kg			08/10/17 13:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*111*		*65 - 140*		*08/10/17 13:01*	*1*

Method: 8015B - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C13-C22	ND		5.0	2.5	mg/Kg		08/05/17 07:26	08/07/17 15:22	1
C23-C40	**2.5**	**J B**	5.0	2.5	mg/Kg		08/05/17 07:26	08/07/17 15:22	1
C8 - C18	**2.5**	**J B**	5.0	2.5	mg/Kg		08/05/17 07:26	08/07/17 15:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Octacosane	*53*		*40 - 140*	*08/05/17 07:26*	*08/07/17 15:22*	*1*

Client Sample ID: SVP-109-10

Lab Sample ID: 440-189560-4

Date Collected: 08/03/17 11:30

Matrix: Solid

Date Received: 08/03/17 17:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
1,1,1-Trichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
1,1,2,2-Tetrachloroethane	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
1,1,2-Trichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
1,1-Dichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
1,1-Dichloroethene	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
1,1-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
1,2,3-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
1,2,3-Trichloropropane	ND		10	1.0	ug/Kg			08/05/17 14:18	1
1,2,4-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
1,2,4-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
1,2-Dibromo-3-Chloropropane	ND		5.0	2.0	ug/Kg			08/05/17 14:18	1
1,2-Dibromoethane (EDB)	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
1,2-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
1,2-Dichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
1,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
1,3,5-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
1,3-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
1,3-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
1,4-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
2,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1

Client: CH2M Hill, Inc.
Project/Site: Kinder Morgan- Norwalk Site

TestAmerica Job ID: 440-189560-1

Client Sample ID: SVP-109-10
Date Collected: 08/03/17 11:30
Date Received: 08/03/17 17:40

Lab Sample ID: 440-189560-4
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
4-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
Benzene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
Bromobenzene	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
Bromochloromethane	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
Bromodichloromethane	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
Bromoform	ND		5.0	2.0	ug/Kg			08/05/17 14:18	1
Bromomethane	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
Carbon tetrachloride	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
Chlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
Chloroethane	ND		5.0	2.0	ug/Kg			08/05/17 14:18	1
Chloroform	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
Chloromethane	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
cis-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
cis-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
Dibromochloromethane	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
Dibromomethane	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
Dichlorodifluoromethane	ND		5.0	2.0	ug/Kg			08/05/17 14:18	1
Ethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
Hexachlorobutadiene	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
Isopropylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
m,p-Xylene	ND		4.0	2.0	ug/Kg			08/05/17 14:18	1
Methylene Chloride	ND		20	5.0	ug/Kg			08/05/17 14:18	1
Methyl-t-Butyl Ether (MTBE)	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
Naphthalene	ND		5.0	2.0	ug/Kg			08/05/17 14:18	1
n-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
N-Propylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
o-Xylene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
sec-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
Styrene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
Tert-amyl-methyl ether (TAME)	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
tert-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
Tetrachloroethene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
Toluene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
trans-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
trans-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
Trichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1
Trichlorofluoromethane	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
Vinyl chloride	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
Xylenes, Total	ND		4.0	2.0	ug/Kg			08/05/17 14:18	1
Isopropyl Ether (DIPE)	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
Ethyl-t-butyl ether (ETBE)	ND		5.0	1.0	ug/Kg			08/05/17 14:18	1
tert-Butyl alcohol (TBA)	ND		100	10	ug/Kg			08/05/17 14:18	1
p-Isopropyltoluene	ND		2.0	1.0	ug/Kg			08/05/17 14:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*89*		*79 - 123*		*08/05/17 14:18*	*1*
4-Bromofluorobenzene (Surr)	*94*		*79 - 120*		*08/05/17 14:18*	*1*
Dibromofluoromethane (Surr)	*93*		*60 - 120*		*08/05/17 14:18*	*1*

Client: CH2M Hill, Inc.
Project/Site: Kinder Morgan- Norwalk Site

TestAmerica Job ID: 440-189560-1

Client Sample ID: SVP-109-10

Lab Sample ID: 440-189560-4

Date Collected: 08/03/17 11:30

Matrix: Solid

Date Received: 08/03/17 17:40

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C4-C12)	ND		400	150	ug/Kg			08/10/17 14:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*110*		*65 - 140*		*08/10/17 14:48*	*1*

Method: 8015B - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C13-C22	3.6	J	4.9	2.4	mg/Kg		08/05/17 07:26	08/07/17 15:42	1
C23-C40	3.1	J B	4.9	2.4	mg/Kg		08/05/17 07:26	08/07/17 15:42	1
C8 - C18	7.1	B	4.9	2.4	mg/Kg		08/05/17 07:26	08/07/17 15:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Octacosane	*70*		*40 - 140*	*08/05/17 07:26*	*08/07/17 15:42*	*1*

Client Sample ID: SVP-107-5

Lab Sample ID: 440-189560-5

Date Collected: 08/03/17 13:30

Matrix: Solid

Date Received: 08/03/17 17:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		5.0	1.0	ug/Kg			08/07/17 13:37	1
1,1,1-Trichloroethane	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
1,1,2,2-Tetrachloroethane	ND	*	2.0	1.0	ug/Kg			08/07/17 13:37	1
1,1,2-Trichloroethane	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
1,1-Dichloroethane	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
1,1-Dichloroethene	ND		5.0	1.0	ug/Kg			08/07/17 13:37	1
1,1-Dichloropropene	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
1,2,3-Trichlorobenzene	ND	*	5.0	1.0	ug/Kg			08/07/17 13:37	1
1,2,3-Trichloropropane	ND	*	10	1.0	ug/Kg			08/07/17 13:37	1
1,2,4-Trichlorobenzene	ND	*	5.0	1.0	ug/Kg			08/07/17 13:37	1
1,2,4-Trimethylbenzene	ND	*	2.0	1.0	ug/Kg			08/07/17 13:37	1
1,2-Dibromo-3-Chloropropane	ND	*	5.0	2.0	ug/Kg			08/07/17 13:37	1
1,2-Dibromoethane (EDB)	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
1,2-Dichlorobenzene	ND	*	2.0	1.0	ug/Kg			08/07/17 13:37	1
1,2-Dichloroethane	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
1,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
1,3,5-Trimethylbenzene	ND	*	2.0	1.0	ug/Kg			08/07/17 13:37	1
1,3-Dichlorobenzene	ND	*	2.0	1.0	ug/Kg			08/07/17 13:37	1
1,3-Dichloropropane	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
1,4-Dichlorobenzene	ND	*	2.0	1.0	ug/Kg			08/07/17 13:37	1
2,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
2-Chlorotoluene	ND	*	5.0	1.0	ug/Kg			08/07/17 13:37	1
4-Chlorotoluene	ND	*	5.0	1.0	ug/Kg			08/07/17 13:37	1
Benzene	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
Bromobenzene	ND	*	5.0	1.0	ug/Kg			08/07/17 13:37	1
Bromochloromethane	ND		5.0	1.0	ug/Kg			08/07/17 13:37	1
Bromodichloromethane	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
Bromoform	ND		5.0	2.0	ug/Kg			08/07/17 13:37	1
Bromomethane	ND		5.0	1.0	ug/Kg			08/07/17 13:37	1
Carbon tetrachloride	ND		5.0	1.0	ug/Kg			08/07/17 13:37	1

Client: CH2M Hill, Inc.
Project/Site: Kinder Morgan- Norwalk Site

TestAmerica Job ID: 440-189560-1

Client Sample ID: SVP-107-5
Date Collected: 08/03/17 13:30
Date Received: 08/03/17 17:40

Lab Sample ID: 440-189560-5
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorobenzene	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
Chloroethane	ND		5.0	2.0	ug/Kg			08/07/17 13:37	1
Chloroform	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
Chloromethane	ND		5.0	1.0	ug/Kg			08/07/17 13:37	1
cis-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
cis-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
Dibromochloromethane	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
Dibromomethane	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
Dichlorodifluoromethane	ND		5.0	2.0	ug/Kg			08/07/17 13:37	1
Ethylbenzene	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
Hexachlorobutadiene	ND	*	5.0	1.0	ug/Kg			08/07/17 13:37	1
Isopropylbenzene	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
m,p-Xylene	ND		4.0	2.0	ug/Kg			08/07/17 13:37	1
Methylene Chloride	ND		20	5.0	ug/Kg			08/07/17 13:37	1
Methyl-t-Butyl Ether (MTBE)	ND		5.0	1.0	ug/Kg			08/07/17 13:37	1
Naphthalene	ND	*	5.0	2.0	ug/Kg			08/07/17 13:37	1
n-Butylbenzene	ND	*	5.0	1.0	ug/Kg			08/07/17 13:37	1
N-Propylbenzene	ND	*	2.0	1.0	ug/Kg			08/07/17 13:37	1
o-Xylene	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
sec-Butylbenzene	ND	*	5.0	1.0	ug/Kg			08/07/17 13:37	1
Styrene	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
Tert-amyl-methyl ether (TAME)	ND		5.0	1.0	ug/Kg			08/07/17 13:37	1
tert-Butylbenzene	ND	*	5.0	1.0	ug/Kg			08/07/17 13:37	1
Tetrachloroethene	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
Toluene	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
trans-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
trans-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
Trichloroethene	ND		2.0	1.0	ug/Kg			08/07/17 13:37	1
Trichlorofluoromethane	ND		5.0	1.0	ug/Kg			08/07/17 13:37	1
Vinyl chloride	ND		5.0	1.0	ug/Kg			08/07/17 13:37	1
Xylenes, Total	ND		4.0	2.0	ug/Kg			08/07/17 13:37	1
Isopropyl Ether (DIPE)	ND		5.0	1.0	ug/Kg			08/07/17 13:37	1
Ethyl-t-butyl ether (ETBE)	ND		5.0	1.0	ug/Kg			08/07/17 13:37	1
tert-Butyl alcohol (TBA)	ND		100	10	ug/Kg			08/07/17 13:37	1
p-Isopropyltoluene	ND	*	2.0	1.0	ug/Kg			08/07/17 13:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*102*		*79 - 123*		*08/07/17 13:37*	*1*
4-Bromofluorobenzene (Surr)	*131*	*X *	*79 - 120*		*08/07/17 13:37*	*1*
Dibromofluoromethane (Surr)	*98*		*60 - 120*		*08/07/17 13:37*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C4-C12)	ND		390	150	ug/Kg			08/10/17 15:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*81*		*65 - 140*		*08/10/17 15:15*	*1*

Client Sample ID: SVP-107-5

Lab Sample ID: 440-189560-5

Date Collected: 08/03/17 13:30

Matrix: Solid

Date Received: 08/03/17 17:40

Method: 8015B - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C13-C22	370		49	25	mg/Kg		08/05/17 07:26	08/08/17 16:15	5
C23-C40	1800	B	49	25	mg/Kg		08/05/17 07:26	08/08/17 16:15	5
C8 - C18	95	B	49	25	mg/Kg		08/05/17 07:26	08/08/17 16:15	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Octacosane	*74*		*40 - 140*	*08/05/17 07:26*	*08/08/17 16:15*	*5*

Client Sample ID: SVP-107-10

Lab Sample ID: 440-189560-6

Date Collected: 08/03/17 13:40

Matrix: Solid

Date Received: 08/03/17 17:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
1,1,1-Trichloroethane	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
1,1,2,2-Tetrachloroethane	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
1,1,2-Trichloroethane	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
1,1-Dichloroethane	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
1,1-Dichloroethene	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
1,1-Dichloropropene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
1,2,3-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
1,2,3-Trichloropropane	ND		10	1.0	ug/Kg			08/07/17 14:06	1
1,2,4-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
1,2,4-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
1,2-Dibromo-3-Chloropropane	ND		5.0	2.0	ug/Kg			08/07/17 14:06	1
1,2-Dibromoethane (EDB)	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
1,2-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
1,2-Dichloroethane	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
1,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
1,3,5-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
1,3-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
1,3-Dichloropropane	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
1,4-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
2,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
2-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
4-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
Benzene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
Bromobenzene	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
Bromochloromethane	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
Bromodichloromethane	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
Bromoform	ND		5.0	2.0	ug/Kg			08/07/17 14:06	1
Bromomethane	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
Carbon tetrachloride	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
Chlorobenzene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
Chloroethane	ND		5.0	2.0	ug/Kg			08/07/17 14:06	1
Chloroform	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
Chloromethane	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
cis-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
cis-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
Dibromochloromethane	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1

Client Sample ID: SVP-107-10
Date Collected: 08/03/17 13:40
Date Received: 08/03/17 17:40

Lab Sample ID: 440-189560-6
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibromomethane	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
Dichlorodifluoromethane	ND		5.0	2.0	ug/Kg			08/07/17 14:06	1
Ethylbenzene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
Hexachlorobutadiene	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
Isopropylbenzene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
m,p-Xylene	ND		4.0	2.0	ug/Kg			08/07/17 14:06	1
Methylene Chloride	ND		20	5.0	ug/Kg			08/07/17 14:06	1
Methyl-t-Butyl Ether (MTBE)	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
Naphthalene	ND		5.0	2.0	ug/Kg			08/07/17 14:06	1
n-Butylbenzene	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
N-Propylbenzene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
o-Xylene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
sec-Butylbenzene	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
Styrene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
Tert-amyl-methyl ether (TAME)	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
tert-Butylbenzene	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
Tetrachloroethene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
Toluene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
trans-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
trans-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
Trichloroethene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1
Trichlorofluoromethane	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
Vinyl chloride	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
Xylenes, Total	ND		4.0	2.0	ug/Kg			08/07/17 14:06	1
Isopropyl Ether (DIPE)	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
Ethyl-t-butyl ether (ETBE)	ND		5.0	1.0	ug/Kg			08/07/17 14:06	1
tert-Butyl alcohol (TBA)	ND		100	10	ug/Kg			08/07/17 14:06	1
p-Isopropyltoluene	ND		2.0	1.0	ug/Kg			08/07/17 14:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*95*		*79 - 123*		*08/07/17 14:06*	*1*
4-Bromofluorobenzene (Surr)	*110*		*79 - 120*		*08/07/17 14:06*	*1*
Dibromofluoromethane (Surr)	*96*		*60 - 120*		*08/07/17 14:06*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C4-C12)	ND		400	150	ug/Kg			08/10/17 15:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*87*		*65 - 140*		*08/10/17 15:42*	*1*

Method: 8015B - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C13-C22	**85**		9.8	4.9	mg/Kg		08/05/17 07:26	08/07/17 18:27	1
C23-C40	**290**	**B**	9.8	4.9	mg/Kg		08/05/17 07:26	08/07/17 18:27	1
C8 - C18	**38**	**B**	9.8	4.9	mg/Kg		08/05/17 07:26	08/07/17 18:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Octacosane	*80*		*40 - 140*	*08/05/17 07:26*	*08/07/17 18:27*	*1*

Client: CH2M Hill, Inc.
Project/Site: Kinder Morgan- Norwalk Site

TestAmerica Job ID: 440-189560-1

Client Sample ID: SVP-106-5
Date Collected: 08/03/17 13:45
Date Received: 08/03/17 17:40

Lab Sample ID: 440-189560-7
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
1,1,1-Trichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
1,1,2,2-Tetrachloroethane	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
1,1,2-Trichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
1,1-Dichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
1,1-Dichloroethene	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
1,1-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
1,2,3-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
1,2,3-Trichloropropane	ND		10	1.0	ug/Kg			08/05/17 15:44	1
1,2,4-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
1,2,4-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
1,2-Dibromo-3-Chloropropane	ND		5.0	2.0	ug/Kg			08/05/17 15:44	1
1,2-Dibromoethane (EDB)	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
1,2-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
1,2-Dichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
1,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
1,3,5-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
1,3-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
1,3-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
1,4-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
2,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
2-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
4-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
Benzene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
Bromobenzene	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
Bromochloromethane	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
Bromodichloromethane	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
Bromoform	ND		5.0	2.0	ug/Kg			08/05/17 15:44	1
Bromomethane	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
Carbon tetrachloride	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
Chlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
Chloroethane	ND		5.0	2.0	ug/Kg			08/05/17 15:44	1
Chloroform	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
Chloromethane	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
cis-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
cis-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
Dibromochloromethane	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
Dibromomethane	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
Dichlorodifluoromethane	ND		5.0	2.0	ug/Kg			08/05/17 15:44	1
Ethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
Hexachlorobutadiene	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
Isopropylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
m,p-Xylene	ND		4.0	2.0	ug/Kg			08/05/17 15:44	1
Methylene Chloride	ND		20	5.0	ug/Kg			08/05/17 15:44	1
Methyl-t-Butyl Ether (MTBE)	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
Naphthalene	ND		5.0	2.0	ug/Kg			08/05/17 15:44	1
n-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
N-Propylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
o-Xylene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1

Client Sample ID: SVP-106-5

Lab Sample ID: 440-189560-7

Date Collected: 08/03/17 13:45

Matrix: Solid

Date Received: 08/03/17 17:40

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
sec-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
Styrene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
Tert-amyl-methyl ether (TAME)	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
tert-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
Tetrachloroethene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
Toluene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
trans-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
trans-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
Trichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1
Trichlorofluoromethane	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
Vinyl chloride	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
Xylenes, Total	ND		4.0	2.0	ug/Kg			08/05/17 15:44	1
Isopropyl Ether (DIPE)	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
Ethyl-t-butyl ether (ETBE)	ND		5.0	1.0	ug/Kg			08/05/17 15:44	1
tert-Butyl alcohol (TBA)	ND		100	10	ug/Kg			08/05/17 15:44	1
p-Isopropyltoluene	ND		2.0	1.0	ug/Kg			08/05/17 15:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*90*		*79 - 123*		*08/05/17 15:44*	*1*
4-Bromofluorobenzene (Surr)	*97*		*79 - 120*		*08/05/17 15:44*	*1*
Dibromofluoromethane (Surr)	*91*		*60 - 120*		*08/05/17 15:44*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C4-C12)	ND		400	150	ug/Kg			08/10/17 16:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*65 - 140*		*08/10/17 16:09*	*1*

Method: 8015B - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C13-C22	ND		4.9	2.4	mg/Kg		08/05/17 07:26	08/07/17 16:03	1
C23-C40	**3.4**	**J B**	4.9	2.4	mg/Kg		08/05/17 07:26	08/07/17 16:03	1
C8 - C18	**2.7**	**J B**	4.9	2.4	mg/Kg		08/05/17 07:26	08/07/17 16:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Octacosane	*74*		*40 - 140*	*08/05/17 07:26*	*08/07/17 16:03*	*1*

Client Sample ID: SVP-106-10

Lab Sample ID: 440-189560-8

Date Collected: 08/03/17 14:18

Matrix: Solid

Date Received: 08/03/17 17:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
1,1,1-Trichloroethane	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
1,1,2,2-Tetrachloroethane	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
1,1,2-Trichloroethane	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
1,1-Dichloroethane	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
1,1-Dichloroethene	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
1,1-Dichloropropene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1

Client: CH2M Hill, Inc.
Project/Site: Kinder Morgan- Norwalk Site

TestAmerica Job ID: 440-189560-1

Client Sample ID: SVP-106-10
Date Collected: 08/03/17 14:18
Date Received: 08/03/17 17:40

Lab Sample ID: 440-189560-8
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3-Trichlorobenzene	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
1,2,3-Trichloropropane	ND		9.9	0.99	ug/Kg			08/05/17 16:12	1
1,2,4-Trichlorobenzene	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
1,2,4-Trimethylbenzene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
1,2-Dibromo-3-Chloropropane	ND		5.0	2.0	ug/Kg			08/05/17 16:12	1
1,2-Dibromoethane (EDB)	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
1,2-Dichlorobenzene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
1,2-Dichloroethane	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
1,2-Dichloropropane	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
1,3,5-Trimethylbenzene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
1,3-Dichlorobenzene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
1,3-Dichloropropane	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
1,4-Dichlorobenzene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
2,2-Dichloropropane	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
2-Chlorotoluene	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
4-Chlorotoluene	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
Benzene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
Bromobenzene	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
Bromochloromethane	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
Bromodichloromethane	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
Bromoform	ND		5.0	2.0	ug/Kg			08/05/17 16:12	1
Bromomethane	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
Carbon tetrachloride	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
Chlorobenzene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
Chloroethane	ND		5.0	2.0	ug/Kg			08/05/17 16:12	1
Chloroform	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
Chloromethane	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
cis-1,2-Dichloroethene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
cis-1,3-Dichloropropene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
Dibromochloromethane	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
Dibromomethane	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
Dichlorodifluoromethane	ND		5.0	2.0	ug/Kg			08/05/17 16:12	1
Ethylbenzene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
Hexachlorobutadiene	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
Isopropylbenzene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
m,p-Xylene	ND		4.0	2.0	ug/Kg			08/05/17 16:12	1
Methylene Chloride	ND		20	5.0	ug/Kg			08/05/17 16:12	1
Methyl-t-Butyl Ether (MTBE)	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
Naphthalene	ND		5.0	2.0	ug/Kg			08/05/17 16:12	1
n-Butylbenzene	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
N-Propylbenzene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
o-Xylene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
sec-Butylbenzene	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
Styrene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
Tert-amyl-methyl ether (TAME)	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
tert-Butylbenzene	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
Tetrachloroethene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
Toluene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
trans-1,2-Dichloroethene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1

Client Sample ID: SVP-106-10

Lab Sample ID: 440-189560-8

Date Collected: 08/03/17 14:18

Matrix: Solid

Date Received: 08/03/17 17:40

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,3-Dichloropropene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
Trichloroethene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1
Trichlorofluoromethane	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
Vinyl chloride	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
Xylenes, Total	ND		4.0	2.0	ug/Kg			08/05/17 16:12	1
Isopropyl Ether (DIPE)	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
Ethyl-t-butyl ether (ETBE)	ND		5.0	0.99	ug/Kg			08/05/17 16:12	1
tert-Butyl alcohol (TBA)	ND		99	9.9	ug/Kg			08/05/17 16:12	1
p-Isopropyltoluene	ND		2.0	0.99	ug/Kg			08/05/17 16:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*90*		*79 - 123*		*08/05/17 16:12*	*1*
4-Bromofluorobenzene (Surr)	*98*		*79 - 120*		*08/05/17 16:12*	*1*
Dibromofluoromethane (Surr)	*91*		*60 - 120*		*08/05/17 16:12*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C4-C12)	ND		390	150	ug/Kg			08/10/17 18:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*100*		*65 - 140*		*08/10/17 18:11*	*1*

Method: 8015B - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C13-C22	ND		4.9	2.4	mg/Kg		08/05/17 07:26	08/07/17 16:44	1
C23-C40	ND		4.9	2.4	mg/Kg		08/05/17 07:26	08/07/17 16:44	1
C8 - C18	**3.6**	**J B**	4.9	2.4	mg/Kg		08/05/17 07:26	08/07/17 16:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Octacosane	*77*		*40 - 140*	*08/05/17 07:26*	*08/07/17 16:44*	*1*

Client Sample ID: SVP-105-5

Lab Sample ID: 440-189560-9

Date Collected: 08/03/17 15:00

Matrix: Solid

Date Received: 08/03/17 17:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
1,1,1-Trichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
1,1,2,2-Tetrachloroethane	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
1,1,2-Trichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
1,1-Dichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
1,1-Dichloroethene	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
1,1-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
1,2,3-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
1,2,3-Trichloropropane	ND		10	1.0	ug/Kg			08/05/17 16:41	1
1,2,4-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
1,2,4-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
1,2-Dibromo-3-Chloropropane	ND		5.0	2.0	ug/Kg			08/05/17 16:41	1
1,2-Dibromoethane (EDB)	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
1,2-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1

Client: CH2M Hill, Inc.
Project/Site: Kinder Morgan- Norwalk Site

TestAmerica Job ID: 440-189560-1

Client Sample ID: SVP-105-5
Date Collected: 08/03/17 15:00
Date Received: 08/03/17 17:40

Lab Sample ID: 440-189560-9
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
1,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
1,3,5-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
1,3-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
1,3-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
1,4-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
2,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
2-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
4-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
Benzene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
Bromobenzene	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
Bromochloromethane	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
Bromodichloromethane	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
Bromoform	ND		5.0	2.0	ug/Kg			08/05/17 16:41	1
Bromomethane	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
Carbon tetrachloride	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
Chlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
Chloroethane	ND		5.0	2.0	ug/Kg			08/05/17 16:41	1
Chloroform	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
Chloromethane	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
cis-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
cis-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
Dibromochloromethane	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
Dibromomethane	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
Dichlorodifluoromethane	ND		5.0	2.0	ug/Kg			08/05/17 16:41	1
Ethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
Hexachlorobutadiene	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
Isopropylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
m,p-Xylene	ND		4.0	2.0	ug/Kg			08/05/17 16:41	1
Methylene Chloride	**5.2**	**J**	20	5.0	ug/Kg			08/05/17 16:41	1
Methyl-t-Butyl Ether (MTBE)	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
Naphthalene	ND		5.0	2.0	ug/Kg			08/05/17 16:41	1
n-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
N-Propylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
o-Xylene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
sec-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
Styrene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
Tert-amyl-methyl ether (TAME)	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
tert-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
Tetrachloroethene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
Toluene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
trans-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
trans-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
Trichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1
Trichlorofluoromethane	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
Vinyl chloride	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
Xylenes, Total	ND		4.0	2.0	ug/Kg			08/05/17 16:41	1
Isopropyl Ether (DIPE)	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1
Ethyl-t-butyl ether (ETBE)	ND		5.0	1.0	ug/Kg			08/05/17 16:41	1

Client Sample ID: SVP-105-5

Lab Sample ID: 440-189560-9

Date Collected: 08/03/17 15:00

Matrix: Solid

Date Received: 08/03/17 17:40

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
tert-Butyl alcohol (TBA)	ND		100	10	ug/Kg			08/05/17 16:41	1
p-Isopropyltoluene	ND		2.0	1.0	ug/Kg			08/05/17 16:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*93*		*79 - 123*		*08/05/17 16:41*	*1*
4-Bromofluorobenzene (Surr)	*99*		*79 - 120*		*08/05/17 16:41*	*1*
Dibromofluoromethane (Surr)	*99*		*60 - 120*		*08/05/17 16:41*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C4-C12)	ND		390	150	ug/Kg			08/11/17 12:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*65 - 140*		*08/11/17 12:08*	*1*

Method: 8015B - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C13-C22	ND		4.9	2.5	mg/Kg		08/07/17 16:21	08/08/17 09:48	1
C23-C40	**7.3**	**B**	4.9	2.5	mg/Kg		08/07/17 16:21	08/08/17 09:48	1
C8 - C18	ND		4.9	2.5	mg/Kg		08/07/17 16:21	08/08/17 09:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Octacosane	*64*		*40 - 140*	*08/07/17 16:21*	*08/08/17 09:48*	*1*

Client Sample ID: SVP-105-10

Lab Sample ID: 440-189560-10

Date Collected: 08/03/17 15:12

Matrix: Solid

Date Received: 08/03/17 17:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
1,1,1-Trichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
1,1,2,2-Tetrachloroethane	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
1,1,2-Trichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
1,1-Dichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
1,1-Dichloroethene	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
1,1-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
1,2,3-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
1,2,3-Trichloropropane	ND		10	1.0	ug/Kg			08/05/17 17:10	1
1,2,4-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
1,2,4-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
1,2-Dibromo-3-Chloropropane	ND		5.0	2.0	ug/Kg			08/05/17 17:10	1
1,2-Dibromoethane (EDB)	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
1,2-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
1,2-Dichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
1,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
1,3,5-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
1,3-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
1,3-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
1,4-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
2,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1

Client Sample ID: SVP-105-10
Date Collected: 08/03/17 15:12
Date Received: 08/03/17 17:40

Lab Sample ID: 440-189560-10
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
4-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
Benzene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
Bromobenzene	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
Bromochloromethane	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
Bromodichloromethane	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
Bromoform	ND		5.0	2.0	ug/Kg			08/05/17 17:10	1
Bromomethane	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
Carbon tetrachloride	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
Chlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
Chloroethane	ND		5.0	2.0	ug/Kg			08/05/17 17:10	1
Chloroform	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
Chloromethane	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
cis-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
cis-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
Dibromochloromethane	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
Dibromomethane	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
Dichlorodifluoromethane	ND		5.0	2.0	ug/Kg			08/05/17 17:10	1
Ethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
Hexachlorobutadiene	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
Isopropylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
m,p-Xylene	ND		4.0	2.0	ug/Kg			08/05/17 17:10	1
Methylene Chloride	ND		20	5.0	ug/Kg			08/05/17 17:10	1
Methyl-t-Butyl Ether (MTBE)	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
Naphthalene	ND		5.0	2.0	ug/Kg			08/05/17 17:10	1
n-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
N-Propylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
o-Xylene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
sec-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
Styrene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
Tert-amyl-methyl ether (TAME)	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
tert-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
Tetrachloroethene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
Toluene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
trans-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
trans-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
Trichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1
Trichlorofluoromethane	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
Vinyl chloride	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
Xylenes, Total	ND		4.0	2.0	ug/Kg			08/05/17 17:10	1
Isopropyl Ether (DIPE)	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
Ethyl-t-butyl ether (ETBE)	ND		5.0	1.0	ug/Kg			08/05/17 17:10	1
tert-Butyl alcohol (TBA)	ND		100	10	ug/Kg			08/05/17 17:10	1
p-Isopropyltoluene	ND		2.0	1.0	ug/Kg			08/05/17 17:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*90*		*79 - 123*		*08/05/17 17:10*	*1*
4-Bromofluorobenzene (Surr)	*96*		*79 - 120*		*08/05/17 17:10*	*1*
Dibromofluoromethane (Surr)	*84*		*60 - 120*		*08/05/17 17:10*	*1*

Client: CH2M Hill, Inc.
Project/Site: Kinder Morgan- Norwalk Site

TestAmerica Job ID: 440-189560-1

Client Sample ID: SVP-105-10
Date Collected: 08/03/17 15:12
Date Received: 08/03/17 17:40

Lab Sample ID: 440-189560-10
Matrix: Solid

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C4-C12)	ND		400	150	ug/Kg			08/10/17 19:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*65 - 140*		*08/10/17 19:04*	*1*

Method: 8015B - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C13-C22	ND		5.0	2.5	mg/Kg		08/05/17 07:26	08/07/17 17:04	1
C23-C40	ND		5.0	2.5	mg/Kg		08/05/17 07:26	08/07/17 17:04	1
C8 - C18	**2.9**	**J B**	5.0	2.5	mg/Kg		08/05/17 07:26	08/07/17 17:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Octacosane	*72*		*40 - 140*	*08/05/17 07:26*	*08/07/17 17:04*	*1*

Method Summary

Client: CH2M Hill, Inc.
Project/Site: Kinder Morgan- Norwalk Site

TestAmerica Job ID: 440-189560-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL IRV
8015B	Gasoline Range Organics - (GC)	SW846	TAL IRV
8015B	Diesel Range Organics (DRO) (GC)	SW846	TAL IRV

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Client Sample ID: SVP-108-5

Lab Sample ID: 440-189560-1

Date Collected: 08/03/17 08:30

Matrix: Solid

Date Received: 08/03/17 17:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	4.97 g	10 mL	421490	08/05/17 13:49	MF	TAL IRV
Total/NA	Analysis	8015B		1	5.01 g	10 mL	422392	08/10/17 12:08	IM	TAL IRV
Total/NA	Prep	3546			15.03 g	1 mL	421498	08/05/17 07:26	VA	TAL IRV
Total/NA	Analysis	8015B		1			421631	08/07/17 15:01	AMH	TAL IRV

Client Sample ID: SVP-108-10

Lab Sample ID: 440-189560-2

Date Collected: 08/03/17 08:45

Matrix: Solid

Date Received: 08/03/17 17:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5030B			10.05 g	10 mL	421620	08/07/17 08:15	HR	TAL IRV
Total/NA	Analysis	8260B		100	10 mL	10 mL	421601	08/07/17 13:26	RM	TAL IRV
Total/NA	Analysis	8015B		1	1.14 g	10 mL	422392	08/10/17 12:34	IM	TAL IRV
Total/NA	Prep	3546			15.18 g	1 mL	421498	08/05/17 07:26	VA	TAL IRV
Total/NA	Analysis	8015B		1			421631	08/07/17 17:25	AMH	TAL IRV

Client Sample ID: SVP-109-5

Lab Sample ID: 440-189560-3

Date Collected: 08/03/17 11:10

Matrix: Solid

Date Received: 08/03/17 17:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5.02 g	10 mL	421490	08/05/17 09:59	MF	TAL IRV
Total/NA	Analysis	8015B		1	5.07 g	10 mL	422392	08/10/17 13:01	IM	TAL IRV
Total/NA	Prep	3546			15.00 g	1 mL	421498	08/05/17 07:26	VA	TAL IRV
Total/NA	Analysis	8015B		1			421631	08/07/17 15:22	AMH	TAL IRV

Client Sample ID: SVP-109-10

Lab Sample ID: 440-189560-4

Date Collected: 08/03/17 11:30

Matrix: Solid

Date Received: 08/03/17 17:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	4.99 g	10 mL	421490	08/05/17 14:18	MF	TAL IRV
Total/NA	Analysis	8015B		1	5.05 g	10 mL	422392	08/10/17 14:48	IM	TAL IRV
Total/NA	Prep	3546			15.33 g	1 mL	421498	08/05/17 07:26	VA	TAL IRV
Total/NA	Analysis	8015B		1			421631	08/07/17 15:42	AMH	TAL IRV

Client Sample ID: SVP-107-5

Lab Sample ID: 440-189560-5

Date Collected: 08/03/17 13:30

Matrix: Solid

Date Received: 08/03/17 17:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5.02 g	10 mL	421599	08/07/17 13:37	RM	TAL IRV

Lab Chronicle

Client: CH2M Hill, Inc.
Project/Site: Kinder Morgan- Norwalk Site

TestAmerica Job ID: 440-189560-1

Client Sample ID: SVP-107-5

Lab Sample ID: 440-189560-5

Date Collected: 08/03/17 13:30
Matrix: Solid
Date Received: 08/03/17 17:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8015B		1	5.07 g	10 mL	422392	08/10/17 15:15	IM	TAL IRV
Total/NA	Prep	3546			15.18 g	2 mL	421498	08/05/17 07:26	VA	TAL IRV
Total/NA	Analysis	8015B		5			421931	08/08/17 16:15	AMH	TAL IRV

Client Sample ID: SVP-107-10

Lab Sample ID: 440-189560-6

Date Collected: 08/03/17 13:40
Matrix: Solid
Date Received: 08/03/17 17:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5.02 g	10 mL	421599	08/07/17 14:06	RM	TAL IRV
Total/NA	Analysis	8015B		1	5.06 g	10 mL	422392	08/10/17 15:42	IM	TAL IRV
Total/NA	Prep	3546			15.29 g	2 mL	421498	08/05/17 07:26	VA	TAL IRV
Total/NA	Analysis	8015B		1			421631	08/07/17 18:27	AMH	TAL IRV

Client Sample ID: SVP-106-5

Lab Sample ID: 440-189560-7

Date Collected: 08/03/17 13:45
Matrix: Solid
Date Received: 08/03/17 17:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5.01 g	10 mL	421490	08/05/17 15:44	MF	TAL IRV
Total/NA	Analysis	8015B		1	5.02 g	10 mL	422392	08/10/17 16:09	IM	TAL IRV
Total/NA	Prep	3546			15.32 g	1 mL	421498	08/05/17 07:26	VA	TAL IRV
Total/NA	Analysis	8015B		1			421631	08/07/17 16:03	AMH	TAL IRV

Client Sample ID: SVP-106-10

Lab Sample ID: 440-189560-8

Date Collected: 08/03/17 14:18
Matrix: Solid
Date Received: 08/03/17 17:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5.03 g	10 mL	421490	08/05/17 16:12	MF	TAL IRV
Total/NA	Analysis	8015B		1	5.08 g	10 mL	422392	08/10/17 18:11	IM	TAL IRV
Total/NA	Prep	3546			15.43 g	1 mL	421498	08/05/17 07:26	VA	TAL IRV
Total/NA	Analysis	8015B		1			421631	08/07/17 16:44	AMH	TAL IRV

Client Sample ID: SVP-105-5

Lab Sample ID: 440-189560-9

Date Collected: 08/03/17 15:00
Matrix: Solid
Date Received: 08/03/17 17:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	4.98 g	10 mL	421490	08/05/17 16:41	MF	TAL IRV
Total/NA	Analysis	8015B		1	5.09 g	10 mL	422690	08/11/17 12:08	EI	TAL IRV
Total/NA	Prep	3546			15.16 g	1 mL	421740	08/07/17 16:21	SMF	TAL IRV

Lab Chronicle

Client: CH2M Hill, Inc.
Project/Site: Kinder Morgan- Norwalk Site

TestAmerica Job ID: 440-189560-1

Client Sample ID: SVP-105-5

Lab Sample ID: 440-189560-9

Date Collected: 08/03/17 15:00

Matrix: Solid

Date Received: 08/03/17 17:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8015B		1			421818	08/08/17 09:48	LMB	TAL IRV

Client Sample ID: SVP-105-10

Lab Sample ID: 440-189560-10

Date Collected: 08/03/17 15:12

Matrix: Solid

Date Received: 08/03/17 17:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	4.98 g	10 mL	421490	08/05/17 17:10	MF	TAL IRV
Total/NA	Analysis	8015B		1	5.05 g	10 mL	422392	08/10/17 19:04	IM	TAL IRV
Total/NA	Prep	3546			15.05 g	1 mL	421498	08/05/17 07:26	VA	TAL IRV
Total/NA	Analysis	8015B		1			421631	08/07/17 17:04	AMH	TAL IRV

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 440-421490/4
Matrix: Solid
Analysis Batch: 421490

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
1,1,1-Trichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
1,1,2,2-Tetrachloroethane	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
1,1,2-Trichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
1,1-Dichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
1,1-Dichloroethene	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
1,1-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
1,2,3-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
1,2,3-Trichloropropane	ND		10	1.0	ug/Kg			08/05/17 08:32	1
1,2,4-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
1,2,4-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
1,2-Dibromo-3-Chloropropane	ND		5.0	2.0	ug/Kg			08/05/17 08:32	1
1,2-Dibromoethane (EDB)	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
1,2-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
1,2-Dichloroethane	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
1,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
1,3,5-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
1,3-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
1,3-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
1,4-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
2,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
2-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
4-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
Benzene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
Bromobenzene	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
Bromochloromethane	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
Bromodichloromethane	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
Bromoform	ND		5.0	2.0	ug/Kg			08/05/17 08:32	1
Bromomethane	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
Carbon tetrachloride	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
Chlorobenzene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
Chloroethane	ND		5.0	2.0	ug/Kg			08/05/17 08:32	1
Chloroform	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
Chloromethane	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
cis-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
cis-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
Dibromochloromethane	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
Dibromomethane	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
Dichlorodifluoromethane	ND		5.0	2.0	ug/Kg			08/05/17 08:32	1
Ethylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
Hexachlorobutadiene	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
Isopropylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
m,p-Xylene	ND		4.0	2.0	ug/Kg			08/05/17 08:32	1
Methylene Chloride	ND		20	5.0	ug/Kg			08/05/17 08:32	1
Methyl-t-Butyl Ether (MTBE)	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
Naphthalene	ND		5.0	2.0	ug/Kg			08/05/17 08:32	1
n-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
N-Propylbenzene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 440-421490/4
Matrix: Solid
Analysis Batch: 421490

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
o-Xylene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
sec-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
Styrene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
Tert-amyl-methyl ether (TAME)	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
tert-Butylbenzene	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
Tetrachloroethene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
Toluene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
trans-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
trans-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
Trichloroethene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1
Trichlorofluoromethane	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
Vinyl chloride	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
Xylenes, Total	ND		4.0	2.0	ug/Kg			08/05/17 08:32	1
Isopropyl Ether (DIPE)	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
Ethyl-t-butyl ether (ETBE)	ND		5.0	1.0	ug/Kg			08/05/17 08:32	1
tert-Butyl alcohol (TBA)	ND		100	10	ug/Kg			08/05/17 08:32	1
p-Isopropyltoluene	ND		2.0	1.0	ug/Kg			08/05/17 08:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*90*		*79 - 123*		*08/05/17 08:32*	*1*
4-Bromofluorobenzene (Surr)	*91*		*79 - 120*		*08/05/17 08:32*	*1*
Dibromofluoromethane (Surr)	*94*		*60 - 120*		*08/05/17 08:32*	*1*

Lab Sample ID: LCS 440-421490/5
Matrix: Solid
Analysis Batch: 421490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1,2-Tetrachloroethane	50.0	55.9		ug/Kg		112	70 - 130
1,1,1-Trichloroethane	50.0	51.1		ug/Kg		102	65 - 135
1,1,2,2-Tetrachloroethane	50.0	52.1		ug/Kg		104	55 - 140
1,1,2-Trichloroethane	50.0	53.6		ug/Kg		107	65 - 135
1,1-Dichloroethane	50.0	54.0		ug/Kg		108	70 - 130
1,1-Dichloroethene	50.0	52.8		ug/Kg		106	70 - 125
1,1-Dichloropropene	50.0	53.5		ug/Kg		107	70 - 130
1,2,3-Trichlorobenzene	50.0	56.1		ug/Kg		112	60 - 130
1,2,3-Trichloropropane	50.0	51.6		ug/Kg		103	60 - 135
1,2,4-Trichlorobenzene	50.0	54.2		ug/Kg		108	70 - 135
1,2,4-Trimethylbenzene	50.0	52.1		ug/Kg		104	70 - 125
1,2-Dibromo-3-Chloropropane	50.0	44.4		ug/Kg		89	50 - 135
1,2-Dibromoethane (EDB)	50.0	52.4		ug/Kg		105	70 - 130
1,2-Dichlorobenzene	50.0	52.6		ug/Kg		105	75 - 120
1,2-Dichloroethane	50.0	48.3		ug/Kg		97	60 - 140
1,2-Dichloropropane	50.0	56.9		ug/Kg		114	70 - 130
1,3,5-Trimethylbenzene	50.0	51.7		ug/Kg		103	70 - 125
1,3-Dichlorobenzene	50.0	51.6		ug/Kg		103	75 - 125
1,3-Dichloropropane	50.0	50.2		ug/Kg		100	70 - 125
1,4-Dichlorobenzene	50.0	52.6		ug/Kg		105	75 - 120

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 440-421490/5
Matrix: Solid
Analysis Batch: 421490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,2-Dichloropropane	50.0	51.6		ug/Kg		103	60 - 145
2-Chlorotoluene	50.0	50.4		ug/Kg		101	70 - 125
4-Chlorotoluene	50.0	50.8		ug/Kg		102	75 - 125
Benzene	50.0	55.1		ug/Kg		110	65 - 120
Bromobenzene	50.0	52.9		ug/Kg		106	75 - 120
Bromochloromethane	50.0	54.0		ug/Kg		108	70 - 135
Bromodichloromethane	50.0	53.0		ug/Kg		106	70 - 135
Bromoform	50.0	51.4		ug/Kg		103	55 - 135
Bromomethane	50.0	42.6		ug/Kg		85	60 - 145
Carbon tetrachloride	50.0	52.0		ug/Kg		104	65 - 140
Chlorobenzene	50.0	51.8		ug/Kg		104	75 - 120
Chloroethane	50.0	45.8		ug/Kg		92	60 - 140
Chloroform	50.0	50.3		ug/Kg		101	70 - 130
Chloromethane	50.0	47.0		ug/Kg		94	45 - 145
cis-1,2-Dichloroethene	50.0	56.2		ug/Kg		112	70 - 125
cis-1,3-Dichloropropene	50.0	53.0		ug/Kg		106	75 - 125
Dibromochloromethane	50.0	55.1		ug/Kg		110	65 - 140
Dibromomethane	50.0	50.6		ug/Kg		101	70 - 130
Dichlorodifluoromethane	50.0	42.9		ug/Kg		86	35 - 160
Ethylbenzene	50.0	50.6		ug/Kg		101	70 - 125
Hexachlorobutadiene	50.0	49.2		ug/Kg		98	60 - 135
Isopropylbenzene	50.0	51.6		ug/Kg		103	75 - 130
m,p-Xylene	50.0	53.0		ug/Kg		106	70 - 125
Methylene Chloride	50.0	45.9		ug/Kg		92	55 - 135
Methyl-t-Butyl Ether (MTBE)	50.0	53.1		ug/Kg		106	60 - 140
Naphthalene	50.0	50.8		ug/Kg		102	55 - 135
n-Butylbenzene	50.0	50.2		ug/Kg		100	70 - 130
N-Propylbenzene	50.0	50.7		ug/Kg		101	70 - 130
o-Xylene	50.0	53.1		ug/Kg		106	70 - 125
sec-Butylbenzene	50.0	51.9		ug/Kg		104	70 - 125
Styrene	50.0	52.8		ug/Kg		106	75 - 130
Tert-amyl-methyl ether (TAME)	50.0	53.3		ug/Kg		107	60 - 145
tert-Butylbenzene	50.0	51.9		ug/Kg		104	70 - 125
Tetrachloroethene	50.0	51.8		ug/Kg		104	70 - 125
Toluene	50.0	51.6		ug/Kg		103	70 - 125
trans-1,2-Dichloroethene	50.0	56.5		ug/Kg		113	70 - 125
trans-1,3-Dichloropropene	50.0	51.8		ug/Kg		104	70 - 135
Trichloroethene	50.0	54.0		ug/Kg		108	70 - 125
Trichlorofluoromethane	50.0	48.1		ug/Kg		96	60 - 145
Vinyl chloride	50.0	45.5		ug/Kg		91	55 - 135
Isopropyl Ether (DIPE)	50.0	60.1		ug/Kg		120	60 - 140
Ethyl-t-butyl ether (ETBE)	50.0	56.9		ug/Kg		114	60 - 140
tert-Butyl alcohol (TBA)	500	576		ug/Kg		115	70 - 135
p-Isopropyltoluene	50.0	54.8		ug/Kg		110	75 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*87*		*79 - 123*
4-Bromofluorobenzene (Surr)	*91*		*79 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 440-421490/5
Matrix: Solid
Analysis Batch: 421490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Dibromofluoromethane (Surr)	*92*		*60 - 120*

Lab Sample ID: 440-189560-3 MS
Matrix: Solid
Analysis Batch: 421490

Client Sample ID: SVP-109-5
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1,2-Tetrachloroethane	ND		50.1	60.9		ug/Kg		121	65 - 145
1,1,1-Trichloroethane	ND		50.1	54.7		ug/Kg		109	65 - 145
1,1,2,2-Tetrachloroethane	ND		50.1	56.3		ug/Kg		112	40 - 160
1,1,2-Trichloroethane	ND		50.1	61.5		ug/Kg		123	65 - 140
1,1-Dichloroethane	ND		50.1	58.8		ug/Kg		117	65 - 135
1,1-Dichloroethene	ND		50.1	56.7		ug/Kg		113	65 - 135
1,1-Dichloropropene	ND		50.1	58.0		ug/Kg		116	65 - 135
1,2,3-Trichlorobenzene	ND		50.1	58.6		ug/Kg		117	45 - 145
1,2,3-Trichloropropane	ND		50.1	57.7		ug/Kg		115	50 - 150
1,2,4-Trichlorobenzene	ND		50.1	57.0		ug/Kg		114	50 - 140
1,2,4-Trimethylbenzene	ND		50.1	54.2		ug/Kg		108	65 - 140
1,2-Dibromo-3-Chloropropane	ND		50.1	54.0		ug/Kg		108	40 - 150
1,2-Dibromoethane (EDB)	ND		50.1	58.3		ug/Kg		116	65 - 140
1,2-Dichlorobenzene	ND		50.1	56.8		ug/Kg		113	70 - 130
1,2-Dichloroethane	ND		50.1	54.0		ug/Kg		108	60 - 150
1,2-Dichloropropane	ND		50.1	62.0		ug/Kg		124	65 - 130
1,3,5-Trimethylbenzene	ND		50.1	54.4		ug/Kg		109	65 - 135
1,3-Dichlorobenzene	ND		50.1	54.5		ug/Kg		109	70 - 130
1,3-Dichloropropane	ND		50.1	54.9		ug/Kg		110	65 - 140
1,4-Dichlorobenzene	ND		50.1	55.8		ug/Kg		111	70 - 130
2,2-Dichloropropane	ND		50.1	55.4		ug/Kg		111	65 - 150
2-Chlorotoluene	ND		50.1	53.9		ug/Kg		108	60 - 135
4-Chlorotoluene	ND		50.1	53.4		ug/Kg		107	65 - 135
Benzene	ND		50.1	59.0		ug/Kg		118	65 - 130
Bromobenzene	ND		50.1	57.4		ug/Kg		115	65 - 140
Bromochloromethane	ND		50.1	60.7		ug/Kg		121	65 - 145
Bromodichloromethane	ND		50.1	58.3		ug/Kg		116	65 - 145
Bromoform	ND		50.1	57.5		ug/Kg		115	50 - 145
Bromomethane	ND		50.1	45.4		ug/Kg		91	60 - 155
Carbon tetrachloride	ND		50.1	55.6		ug/Kg		111	60 - 145
Chlorobenzene	ND		50.1	53.8		ug/Kg		107	70 - 130
Chloroethane	ND		50.1	50.1		ug/Kg		100	60 - 150
Chloroform	ND		50.1	55.2		ug/Kg		110	65 - 135
Chloromethane	ND		50.1	49.3		ug/Kg		98	40 - 145
cis-1,2-Dichloroethene	ND		50.1	61.1		ug/Kg		122	65 - 135
cis-1,3-Dichloropropene	ND		50.1	56.4		ug/Kg		113	70 - 135
Dibromochloromethane	ND		50.1	60.3		ug/Kg		120	60 - 145
Dibromomethane	ND		50.1	58.1		ug/Kg		116	65 - 140
Dichlorodifluoromethane	ND		50.1	46.3		ug/Kg		92	30 - 160
Ethylbenzene	ND		50.1	52.1		ug/Kg		104	70 - 135
Hexachlorobutadiene	ND		50.1	47.7		ug/Kg		95	50 - 145

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-189560-3 MS
Matrix: Solid
Analysis Batch: 421490

Client Sample ID: SVP-109-5
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Isopropylbenzene	ND		50.1	53.5		ug/Kg		107	70 - 145
m,p-Xylene	ND		50.1	53.9		ug/Kg		108	70 - 130
Methylene Chloride	ND		50.1	52.3		ug/Kg		104	55 - 145
Methyl-t-Butyl Ether (MTBE)	ND		50.1	60.8		ug/Kg		121	55 - 155
Naphthalene	ND		50.1	58.4		ug/Kg		117	40 - 150
n-Butylbenzene	ND		50.1	51.6		ug/Kg		103	55 - 145
N-Propylbenzene	ND		50.1	52.7		ug/Kg		105	65 - 140
o-Xylene	ND		50.1	54.7		ug/Kg		109	65 - 130
sec-Butylbenzene	ND		50.1	52.8		ug/Kg		105	60 - 135
Styrene	ND		50.1	55.1		ug/Kg		110	70 - 140
Tert-amyl-methyl ether (TAME)	ND		50.1	58.7		ug/Kg		117	60 - 150
tert-Butylbenzene	ND		50.1	53.8		ug/Kg		107	60 - 140
Tetrachloroethene	ND		50.1	52.1		ug/Kg		104	65 - 135
Toluene	ND		50.1	53.5		ug/Kg		107	70 - 130
trans-1,2-Dichloroethene	ND		50.1	59.7		ug/Kg		119	70 - 135
trans-1,3-Dichloropropene	ND		50.1	55.6		ug/Kg		111	60 - 145
Trichloroethene	ND		50.1	60.1		ug/Kg		120	65 - 140
Trichlorofluoromethane	ND		50.1	51.3		ug/Kg		102	55 - 155
Vinyl chloride	ND		50.1	48.7		ug/Kg		97	55 - 140
Isopropyl Ether (DIPE)	ND		50.1	68.1		ug/Kg		136	60 - 150
Ethyl-t-butyl ether (ETBE)	ND		50.1	63.1		ug/Kg		126	60 - 145
tert-Butyl alcohol (TBA)	ND		501	610		ug/Kg		122	65 - 145
p-Isopropyltoluene	ND		50.1	55.9		ug/Kg		111	60 - 140

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Toluene-d8 (Surr)	*97*		*79 - 123*
4-Bromofluorobenzene (Surr)	*96*		*79 - 120*
Dibromofluoromethane (Surr)	*99*		*60 - 120*

Lab Sample ID: 440-189560-3 MSD
Matrix: Solid
Analysis Batch: 421490

Client Sample ID: SVP-109-5
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1,2-Tetrachloroethane	ND		49.7	59.6		ug/Kg		120	65 - 145	2	20
1,1,1-Trichloroethane	ND		49.7	51.5		ug/Kg		104	65 - 145	6	20
1,1,2,2-Tetrachloroethane	ND		49.7	53.6		ug/Kg		108	40 - 160	5	30
1,1,2-Trichloroethane	ND		49.7	59.8		ug/Kg		120	65 - 140	3	30
1,1-Dichloroethane	ND		49.7	56.3		ug/Kg		113	65 - 135	4	25
1,1-Dichloroethene	ND		49.7	52.2		ug/Kg		105	65 - 135	8	25
1,1-Dichloropropene	ND		49.7	54.8		ug/Kg		110	65 - 135	6	20
1,2,3-Trichlorobenzene	ND		49.7	59.3		ug/Kg		119	45 - 145	1	30
1,2,3-Trichloropropane	ND		49.7	62.2		ug/Kg		125	50 - 150	8	30
1,2,4-Trichlorobenzene	ND		49.7	55.4		ug/Kg		111	50 - 140	3	30
1,2,4-Trimethylbenzene	ND		49.7	54.7		ug/Kg		110	65 - 140	1	25
1,2-Dibromo-3-Chloropropane	ND		49.7	56.3		ug/Kg		113	40 - 150	4	30
1,2-Dibromoethane (EDB)	ND		49.7	59.5		ug/Kg		120	65 - 140	2	25
1,2-Dichlorobenzene	ND		49.7	57.3		ug/Kg		115	70 - 130	1	25

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-189560-3 MSD
Matrix: Solid
Analysis Batch: 421490

Client Sample ID: SVP-109-5
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dichloroethane	ND		49.7	53.0		ug/Kg		107	60 - 150	2	25
1,2-Dichloropropane	ND		49.7	60.9		ug/Kg		123	65 - 130	2	20
1,3,5-Trimethylbenzene	ND		49.7	54.5		ug/Kg		110	65 - 135	0	25
1,3-Dichlorobenzene	ND		49.7	54.4		ug/Kg		109	70 - 130	0	25
1,3-Dichloropropane	ND		49.7	55.1		ug/Kg		111	65 - 140	0	25
1,4-Dichlorobenzene	ND		49.7	55.4		ug/Kg		111	70 - 130	1	25
2,2-Dichloropropane	ND		49.7	53.3		ug/Kg		107	65 - 150	4	25
2-Chlorotoluene	ND		49.7	53.2		ug/Kg		107	60 - 135	1	25
4-Chlorotoluene	ND		49.7	53.2		ug/Kg		107	65 - 135	0	25
Benzene	ND		49.7	57.0		ug/Kg		115	65 - 130	3	20
Bromobenzene	ND		49.7	56.4		ug/Kg		114	65 - 140	2	25
Bromochloromethane	ND		49.7	58.8		ug/Kg		118	65 - 145	3	25
Bromodichloromethane	ND		49.7	57.4		ug/Kg		115	65 - 145	2	20
Bromoform	ND		49.7	59.5		ug/Kg		120	50 - 145	3	30
Bromomethane	ND		49.7	43.5		ug/Kg		88	60 - 155	4	25
Carbon tetrachloride	ND		49.7	52.3		ug/Kg		105	60 - 145	6	25
Chlorobenzene	ND		49.7	53.0		ug/Kg		107	70 - 130	1	25
Chloroethane	ND		49.7	49.6		ug/Kg		100	60 - 150	1	25
Chloroform	ND		49.7	53.8		ug/Kg		108	65 - 135	3	20
Chloromethane	ND		49.7	47.3		ug/Kg		95	40 - 145	4	25
cis-1,2-Dichloroethene	ND		49.7	57.5		ug/Kg		116	65 - 135	6	25
cis-1,3-Dichloropropene	ND		49.7	57.1		ug/Kg		115	70 - 135	1	25
Dibromochloromethane	ND		49.7	60.3		ug/Kg		121	60 - 145	0	25
Dibromomethane	ND		49.7	56.0		ug/Kg		113	65 - 140	4	25
Dichlorodifluoromethane	ND		49.7	45.0		ug/Kg		91	30 - 160	3	35
Ethylbenzene	ND		49.7	51.5		ug/Kg		104	70 - 135	1	25
Hexachlorobutadiene	ND		49.7	46.0		ug/Kg		93	50 - 145	4	35
Isopropylbenzene	ND		49.7	52.6		ug/Kg		106	70 - 145	2	25
m,p-Xylene	ND		49.7	54.2		ug/Kg		109	70 - 130	1	25
Methylene Chloride	ND		49.7	49.6		ug/Kg		100	55 - 145	5	25
Methyl-t-Butyl Ether (MTBE)	ND		49.7	59.3		ug/Kg		119	55 - 155	2	35
Naphthalene	ND		49.7	60.0		ug/Kg		121	40 - 150	3	40
n-Butylbenzene	ND		49.7	51.7		ug/Kg		104	55 - 145	0	30
N-Propylbenzene	ND		49.7	52.1		ug/Kg		105	65 - 140	1	25
o-Xylene	ND		49.7	54.1		ug/Kg		109	65 - 130	1	25
sec-Butylbenzene	ND		49.7	53.0		ug/Kg		107	60 - 135	0	25
Styrene	ND		49.7	54.8		ug/Kg		110	70 - 140	1	25
Tert-amyl-methyl ether (TAME)	ND		49.7	58.3		ug/Kg		117	60 - 150	1	25
tert-Butylbenzene	ND		49.7	54.5		ug/Kg		110	60 - 140	1	25
Tetrachloroethene	ND		49.7	52.8		ug/Kg		106	65 - 135	1	25
Toluene	ND		49.7	52.9		ug/Kg		106	70 - 130	1	20
trans-1,2-Dichloroethene	ND		49.7	58.2		ug/Kg		117	70 - 135	3	25
trans-1,3-Dichloropropene	ND		49.7	57.0		ug/Kg		115	60 - 145	3	25
Trichloroethene	ND		49.7	60.7		ug/Kg		122	65 - 140	1	25
Trichlorofluoromethane	ND		49.7	49.2		ug/Kg		99	55 - 155	4	25
Vinyl chloride	ND		49.7	46.9		ug/Kg		94	55 - 140	4	30
Isopropyl Ether (DIPE)	ND		49.7	63.7		ug/Kg		128	60 - 150	7	25
Ethyl-t-butyl ether (ETBE)	ND		49.7	62.8		ug/Kg		126	60 - 145	0	30

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-189560-3 MSD
Matrix: Solid
Analysis Batch: 421490

Client Sample ID: SVP-109-5
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
tert-Butyl alcohol (TBA)	ND		497	600		ug/Kg		121	65 - 145	2	30
p-Isopropyltoluene	ND		49.7	56.5		ug/Kg		114	60 - 140	1	25

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*99*		*79 - 123*
4-Bromofluorobenzene (Surr)	*99*		*79 - 120*
Dibromofluoromethane (Surr)	*99*		*60 - 120*

Lab Sample ID: MB 440-421599/4
Matrix: Solid
Analysis Batch: 421599

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
1,1,1-Trichloroethane	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
1,1,2,2-Tetrachloroethane	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
1,1,2-Trichloroethane	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
1,1-Dichloroethane	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
1,1-Dichloroethene	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
1,1-Dichloropropene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
1,2,3-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
1,2,3-Trichloropropane	ND		10	1.0	ug/Kg			08/07/17 08:07	1
1,2,4-Trichlorobenzene	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
1,2,4-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
1,2-Dibromo-3-Chloropropane	ND		5.0	2.0	ug/Kg			08/07/17 08:07	1
1,2-Dibromoethane (EDB)	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
1,2-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
1,2-Dichloroethane	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
1,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
1,3,5-Trimethylbenzene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
1,3-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
1,3-Dichloropropane	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
1,4-Dichlorobenzene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
2,2-Dichloropropane	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
2-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
4-Chlorotoluene	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
Benzene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
Bromobenzene	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
Bromochloromethane	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
Bromodichloromethane	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
Bromoform	ND		5.0	2.0	ug/Kg			08/07/17 08:07	1
Bromomethane	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
Carbon tetrachloride	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
Chlorobenzene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
Chloroethane	ND		5.0	2.0	ug/Kg			08/07/17 08:07	1
Chloroform	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
Chloromethane	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
cis-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 440-421599/4
Matrix: Solid
Analysis Batch: 421599

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
Dibromochloromethane	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
Dibromomethane	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
Dichlorodifluoromethane	ND		5.0	2.0	ug/Kg			08/07/17 08:07	1
Ethylbenzene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
Hexachlorobutadiene	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
Isopropylbenzene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
m,p-Xylene	ND		4.0	2.0	ug/Kg			08/07/17 08:07	1
Methylene Chloride	ND		20	5.0	ug/Kg			08/07/17 08:07	1
Methyl-t-Butyl Ether (MTBE)	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
Naphthalene	ND		5.0	2.0	ug/Kg			08/07/17 08:07	1
n-Butylbenzene	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
N-Propylbenzene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
o-Xylene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
sec-Butylbenzene	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
Styrene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
Tert-amyl-methyl ether (TAME)	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
tert-Butylbenzene	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
Tetrachloroethene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
Toluene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
trans-1,2-Dichloroethene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
trans-1,3-Dichloropropene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
Trichloroethene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1
Trichlorofluoromethane	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
Vinyl chloride	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
Xylenes, Total	ND		4.0	2.0	ug/Kg			08/07/17 08:07	1
Isopropyl Ether (DIPE)	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
Ethyl-t-butyl ether (ETBE)	ND		5.0	1.0	ug/Kg			08/07/17 08:07	1
tert-Butyl alcohol (TBA)	ND		100	10	ug/Kg			08/07/17 08:07	1
p-Isopropyltoluene	ND		2.0	1.0	ug/Kg			08/07/17 08:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*91*		*79 - 123*		*08/07/17 08:07*	*1*
4-Bromofluorobenzene (Surr)	*93*		*79 - 120*		*08/07/17 08:07*	*1*
Dibromofluoromethane (Surr)	*96*		*60 - 120*		*08/07/17 08:07*	*1*

Lab Sample ID: LCS 440-421599/5
Matrix: Solid
Analysis Batch: 421599

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1,2-Tetrachloroethane	50.0	57.1		ug/Kg		114	70 - 130
1,1,1-Trichloroethane	50.0	48.6		ug/Kg		97	65 - 135
1,1,2,2-Tetrachloroethane	50.0	53.4		ug/Kg		107	55 - 140
1,1,2-Trichloroethane	50.0	52.8		ug/Kg		106	65 - 135
1,1-Dichloroethane	50.0	50.2		ug/Kg		100	70 - 130
1,1-Dichloroethene	50.0	43.9		ug/Kg		88	70 - 125
1,1-Dichloropropene	50.0	50.0		ug/Kg		100	70 - 130

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 440-421599/5
Matrix: Solid
Analysis Batch: 421599

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3-Trichlorobenzene	50.0	59.8		ug/Kg		120	60 - 130
1,2,3-Trichloropropane	50.0	52.2		ug/Kg		104	60 - 135
1,2,4-Trichlorobenzene	50.0	56.6		ug/Kg		113	70 - 135
1,2,4-Trimethylbenzene	50.0	52.7		ug/Kg		105	70 - 125
1,2-Dibromo-3-Chloropropane	50.0	45.3		ug/Kg		91	50 - 135
1,2-Dibromoethane (EDB)	50.0	52.0		ug/Kg		104	70 - 130
1,2-Dichlorobenzene	50.0	55.1		ug/Kg		110	75 - 120
1,2-Dichloroethane	50.0	49.1		ug/Kg		98	60 - 140
1,2-Dichloropropane	50.0	58.0		ug/Kg		116	70 - 130
1,3,5-Trimethylbenzene	50.0	53.5		ug/Kg		107	70 - 125
1,3-Dichlorobenzene	50.0	53.2		ug/Kg		106	75 - 125
1,3-Dichloropropane	50.0	49.0		ug/Kg		98	70 - 125
1,4-Dichlorobenzene	50.0	54.1		ug/Kg		108	75 - 120
2,2-Dichloropropane	50.0	50.8		ug/Kg		102	60 - 145
2-Chlorotoluene	50.0	52.6		ug/Kg		105	70 - 125
4-Chlorotoluene	50.0	51.9		ug/Kg		104	75 - 125
Benzene	50.0	52.5		ug/Kg		105	65 - 120
Bromobenzene	50.0	54.8		ug/Kg		110	75 - 120
Bromochloromethane	50.0	48.7		ug/Kg		97	70 - 135
Bromodichloromethane	50.0	53.4		ug/Kg		107	70 - 135
Bromoform	50.0	51.5		ug/Kg		103	55 - 135
Bromomethane	50.0	42.3		ug/Kg		85	60 - 145
Carbon tetrachloride	50.0	50.0		ug/Kg		100	65 - 140
Chlorobenzene	50.0	51.8		ug/Kg		104	75 - 120
Chloroethane	50.0	45.7		ug/Kg		91	60 - 140
Chloroform	50.0	49.4		ug/Kg		99	70 - 130
Chloromethane	50.0	48.0		ug/Kg		96	45 - 145
cis-1,2-Dichloroethene	50.0	50.4		ug/Kg		101	70 - 125
cis-1,3-Dichloropropene	50.0	53.3		ug/Kg		107	75 - 125
Dibromochloromethane	50.0	55.3		ug/Kg		111	65 - 140
Dibromomethane	50.0	50.5		ug/Kg		101	70 - 130
Dichlorodifluoromethane	50.0	41.4		ug/Kg		83	35 - 160
Ethylbenzene	50.0	49.7		ug/Kg		99	70 - 125
Hexachlorobutadiene	50.0	51.2		ug/Kg		102	60 - 135
Isopropylbenzene	50.0	51.0		ug/Kg		102	75 - 130
m,p-Xylene	50.0	52.5		ug/Kg		105	70 - 125
Methylene Chloride	50.0	41.0		ug/Kg		82	55 - 135
Methyl-t-Butyl Ether (MTBE)	50.0	47.7		ug/Kg		95	60 - 140
Naphthalene	50.0	53.5		ug/Kg		107	55 - 135
n-Butylbenzene	50.0	50.1		ug/Kg		100	70 - 130
N-Propylbenzene	50.0	51.0		ug/Kg		102	70 - 130
o-Xylene	50.0	53.0		ug/Kg		106	70 - 125
sec-Butylbenzene	50.0	51.5		ug/Kg		103	70 - 125
Styrene	50.0	52.2		ug/Kg		104	75 - 130
Tert-amyl-methyl ether (TAME)	50.0	52.8		ug/Kg		106	60 - 145
tert-Butylbenzene	50.0	51.6		ug/Kg		103	70 - 125
Tetrachloroethene	50.0	50.2		ug/Kg		100	70 - 125
Toluene	50.0	51.1		ug/Kg		102	70 - 125

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 440-421599/5
Matrix: Solid
Analysis Batch: 421599

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
trans-1,2-Dichloroethene	50.0	48.0		ug/Kg		96	70 - 125
trans-1,3-Dichloropropene	50.0	51.5		ug/Kg		103	70 - 135
Trichloroethene	50.0	52.3		ug/Kg		105	70 - 125
Trichlorofluoromethane	50.0	43.9		ug/Kg		88	60 - 145
Vinyl chloride	50.0	44.7		ug/Kg		89	55 - 135
Isopropyl Ether (DIPE)	50.0	60.1		ug/Kg		120	60 - 140
Ethyl-t-butyl ether (ETBE)	50.0	55.3		ug/Kg		111	60 - 140
tert-Butyl alcohol (TBA)	500	622		ug/Kg		124	70 - 135
p-Isopropyltoluene	50.0	54.5		ug/Kg		109	75 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*86*		*79 - 123*
4-Bromofluorobenzene (Surr)	*94*		*79 - 120*
Dibromofluoromethane (Surr)	*87*		*60 - 120*

Lab Sample ID: 440-189624-A-1 MS
Matrix: Solid
Analysis Batch: 421599

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1,2-Tetrachloroethane	ND		50.0	60.1		ug/Kg		120	65 - 145
1,1,1-Trichloroethane	ND		50.0	53.3		ug/Kg		107	65 - 145
1,1,2,2-Tetrachloroethane	ND		50.0	52.1		ug/Kg		104	40 - 160
1,1,2-Trichloroethane	ND		50.0	54.3		ug/Kg		109	65 - 140
1,1-Dichloroethane	ND		50.0	51.5		ug/Kg		103	65 - 135
1,1-Dichloroethene	ND		50.0	46.5		ug/Kg		93	65 - 135
1,1-Dichloropropene	ND		50.0	55.7		ug/Kg		111	65 - 135
1,2,3-Trichlorobenzene	ND		50.0	54.9		ug/Kg		110	45 - 145
1,2,3-Trichloropropane	ND		50.0	52.6		ug/Kg		105	50 - 150
1,2,4-Trichlorobenzene	ND		50.0	53.7		ug/Kg		107	50 - 140
1,2,4-Trimethylbenzene	ND		50.0	54.4		ug/Kg		109	65 - 140
1,2-Dibromo-3-Chloropropane	ND		50.0	44.7		ug/Kg		89	40 - 150
1,2-Dibromoethane (EDB)	ND		50.0	53.8		ug/Kg		108	65 - 140
1,2-Dichlorobenzene	ND		50.0	54.7		ug/Kg		109	70 - 130
1,2-Dichloroethane	ND		50.0	49.1		ug/Kg		98	60 - 150
1,2-Dichloropropane	ND		50.0	58.1		ug/Kg		116	65 - 130
1,3,5-Trimethylbenzene	ND		50.0	54.9		ug/Kg		110	65 - 135
1,3-Dichlorobenzene	ND		50.0	53.1		ug/Kg		106	70 - 130
1,3-Dichloropropane	ND		50.0	50.8		ug/Kg		102	65 - 140
1,4-Dichlorobenzene	ND		50.0	54.8		ug/Kg		110	70 - 130
2,2-Dichloropropane	ND		50.0	54.8		ug/Kg		110	65 - 150
2-Chlorotoluene	ND		50.0	53.3		ug/Kg		107	60 - 135
4-Chlorotoluene	ND		50.0	53.3		ug/Kg		107	65 - 135
Benzene	ND		50.0	56.5		ug/Kg		113	65 - 130
Bromobenzene	ND		50.0	56.5		ug/Kg		113	65 - 140
Bromochloromethane	ND		50.0	54.9		ug/Kg		110	65 - 145
Bromodichloromethane	ND		50.0	54.8		ug/Kg		110	65 - 145
Bromoform	ND		50.0	51.6		ug/Kg		103	50 - 145

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-189624-A-1 MS
Matrix: Solid
Analysis Batch: 421599

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Bromomethane	ND		50.0	42.4		ug/Kg		85	60 - 155
Carbon tetrachloride	ND		50.0	54.1		ug/Kg		108	60 - 145
Chlorobenzene	ND		50.0	53.7		ug/Kg		107	70 - 130
Chloroethane	ND		50.0	47.7		ug/Kg		95	60 - 150
Chloroform	ND		50.0	53.0		ug/Kg		106	65 - 135
Chloromethane	ND		50.0	50.3		ug/Kg		101	40 - 145
cis-1,2-Dichloroethene	ND		50.0	57.0		ug/Kg		114	65 - 135
cis-1,3-Dichloropropene	ND		50.0	53.8		ug/Kg		108	70 - 135
Dibromochloromethane	ND		50.0	56.0		ug/Kg		112	60 - 145
Dibromomethane	ND		50.0	50.6		ug/Kg		101	65 - 140
Dichlorodifluoromethane	ND		50.0	46.8		ug/Kg		94	30 - 160
Ethylbenzene	ND		50.0	52.3		ug/Kg		105	70 - 135
Hexachlorobutadiene	ND		50.0	43.6		ug/Kg		87	50 - 145
Isopropylbenzene	ND		50.0	52.7		ug/Kg		105	70 - 145
m,p-Xylene	ND		50.0	55.0		ug/Kg		110	70 - 130
Methylene Chloride	ND		50.0	42.2		ug/Kg		84	55 - 145
Methyl-t-Butyl Ether (MTBE)	ND		50.0	47.6		ug/Kg		95	55 - 155
Naphthalene	ND		50.0	50.3		ug/Kg		101	40 - 150
n-Butylbenzene	ND		50.0	51.2		ug/Kg		102	55 - 145
N-Propylbenzene	ND		50.0	53.5		ug/Kg		107	65 - 140
o-Xylene	ND		50.0	54.6		ug/Kg		109	65 - 130
sec-Butylbenzene	ND		50.0	52.9		ug/Kg		106	60 - 135
Styrene	ND		50.0	54.0		ug/Kg		108	70 - 140
Tert-amyl-methyl ether (TAME)	ND		50.0	51.9		ug/Kg		104	60 - 150
tert-Butylbenzene	ND		50.0	54.3		ug/Kg		109	60 - 140
Tetrachloroethene	ND		50.0	53.3		ug/Kg		107	65 - 135
Toluene	ND		50.0	53.4		ug/Kg		107	70 - 130
trans-1,2-Dichloroethene	ND		50.0	50.2		ug/Kg		100	70 - 135
trans-1,3-Dichloropropene	ND		50.0	51.3		ug/Kg		103	60 - 145
Trichloroethene	ND		50.0	58.2		ug/Kg		116	65 - 140
Trichlorofluoromethane	ND		50.0	46.6		ug/Kg		93	55 - 155
Vinyl chloride	ND		50.0	48.6		ug/Kg		97	55 - 140
Isopropyl Ether (DIPE)	ND		50.0	62.3		ug/Kg		125	60 - 150
Ethyl-t-butyl ether (ETBE)	ND		50.0	57.2		ug/Kg		114	60 - 145
tert-Butyl alcohol (TBA)	ND		500	589		ug/Kg		118	65 - 145
p-Isopropyltoluene	ND		50.0	55.5		ug/Kg		111	60 - 140

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Toluene-d8 (Surr)	*86*		*79 - 123*
4-Bromofluorobenzene (Surr)	*94*		*79 - 120*
Dibromofluoromethane (Surr)	*92*		*60 - 120*

Lab Sample ID: 440-189624-A-1 MSD
Matrix: Solid
Analysis Batch: 421599

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1,2-Tetrachloroethane	ND		49.6	58.1		ug/Kg		117	65 - 145	3	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-189624-A-1 MSD
Matrix: Solid
Analysis Batch: 421599

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	ND		49.6	48.5		ug/Kg		98	65 - 145	10	20
1,1,2,2-Tetrachloroethane	ND		49.6	53.6		ug/Kg		108	40 - 160	3	30
1,1,2-Trichloroethane	ND		49.6	58.8		ug/Kg		118	65 - 140	8	30
1,1-Dichloroethane	ND		49.6	53.1		ug/Kg		107	65 - 135	3	25
1,1-Dichloroethene	ND		49.6	48.3		ug/Kg		97	65 - 135	4	25
1,1-Dichloropropene	ND		49.6	50.2		ug/Kg		101	65 - 135	11	20
1,2,3-Trichlorobenzene	ND		49.6	56.5		ug/Kg		114	45 - 145	3	30
1,2,3-Trichloropropane	ND		49.6	54.7		ug/Kg		110	50 - 150	4	30
1,2,4-Trichlorobenzene	ND		49.6	53.6		ug/Kg		108	50 - 140	0	30
1,2,4-Trimethylbenzene	ND		49.6	51.4		ug/Kg		104	65 - 140	6	25
1,2-Dibromo-3-Chloropropane	ND		49.6	51.2		ug/Kg		103	40 - 150	13	30
1,2-Dibromoethane (EDB)	ND		49.6	56.9		ug/Kg		115	65 - 140	6	25
1,2-Dichlorobenzene	ND		49.6	54.9		ug/Kg		111	70 - 130	0	25
1,2-Dichloroethane	ND		49.6	51.3		ug/Kg		103	60 - 150	4	25
1,2-Dichloropropane	ND		49.6	57.1		ug/Kg		115	65 - 130	2	20
1,3,5-Trimethylbenzene	ND		49.6	52.0		ug/Kg		105	65 - 135	5	25
1,3-Dichlorobenzene	ND		49.6	53.0		ug/Kg		107	70 - 130	0	25
1,3-Dichloropropane	ND		49.6	53.1		ug/Kg		107	65 - 140	4	25
1,4-Dichlorobenzene	ND		49.6	54.4		ug/Kg		110	70 - 130	1	25
2,2-Dichloropropane	ND		49.6	48.6		ug/Kg		98	65 - 150	12	25
2-Chlorotoluene	ND		49.6	52.2		ug/Kg		105	60 - 135	2	25
4-Chlorotoluene	ND		49.6	51.8		ug/Kg		104	65 - 135	3	25
Benzene	ND		49.6	53.9		ug/Kg		109	65 - 130	5	20
Bromobenzene	ND		49.6	54.8		ug/Kg		111	65 - 140	3	25
Bromochloromethane	ND		49.6	56.0		ug/Kg		113	65 - 145	2	25
Bromodichloromethane	ND		49.6	55.0		ug/Kg		111	65 - 145	0	20
Bromoform	ND		49.6	54.3		ug/Kg		110	50 - 145	5	30
Bromomethane	ND		49.6	42.3		ug/Kg		85	60 - 155	0	25
Carbon tetrachloride	ND		49.6	49.4		ug/Kg		100	60 - 145	9	25
Chlorobenzene	ND		49.6	51.9		ug/Kg		105	70 - 130	3	25
Chloroethane	ND		49.6	45.9		ug/Kg		92	60 - 150	4	25
Chloroform	ND		49.6	51.2		ug/Kg		103	65 - 135	4	20
Chloromethane	ND		49.6	47.0		ug/Kg		95	40 - 145	7	25
cis-1,2-Dichloroethene	ND		49.6	54.0		ug/Kg		109	65 - 135	5	25
cis-1,3-Dichloropropene	ND		49.6	55.0		ug/Kg		111	70 - 135	2	25
Dibromochloromethane	ND		49.6	57.8		ug/Kg		116	60 - 145	3	25
Dibromomethane	ND		49.6	53.0		ug/Kg		107	65 - 140	5	25
Dichlorodifluoromethane	ND		49.6	41.2		ug/Kg		83	30 - 160	13	35
Ethylbenzene	ND		49.6	48.9		ug/Kg		99	70 - 135	7	25
Hexachlorobutadiene	ND		49.6	39.6		ug/Kg		80	50 - 145	10	35
Isopropylbenzene	ND		49.6	49.3		ug/Kg		99	70 - 145	7	25
m,p-Xylene	ND		49.6	51.9		ug/Kg		105	70 - 130	6	25
Methylene Chloride	ND		49.6	46.6		ug/Kg		94	55 - 145	10	25
Methyl-t-Butyl Ether (MTBE)	ND		49.6	55.5		ug/Kg		112	55 - 155	15	35
Naphthalene	ND		49.6	53.0		ug/Kg		107	40 - 150	5	40
n-Butylbenzene	ND		49.6	47.6		ug/Kg		96	55 - 145	7	30
N-Propylbenzene	ND		49.6	49.9		ug/Kg		101	65 - 140	7	25
o-Xylene	ND		49.6	51.6		ug/Kg		104	65 - 130	6	25

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-189624-A-1 MSD
Matrix: Solid
Analysis Batch: 421599

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
sec-Butylbenzene	ND		49.6	49.2		ug/Kg		99	60 - 135	7	25
Styrene	ND		49.6	53.2		ug/Kg		107	70 - 140	1	25
Tert-amyl-methyl ether (TAME)	ND		49.6	55.7		ug/Kg		112	60 - 150	7	25
tert-Butylbenzene	ND		49.6	51.1		ug/Kg		103	60 - 140	6	25
Tetrachloroethene	ND		49.6	49.0		ug/Kg		99	65 - 135	8	25
Toluene	ND		49.6	51.0		ug/Kg		103	70 - 130	5	20
trans-1,2-Dichloroethene	ND		49.6	53.8		ug/Kg		108	70 - 135	7	25
trans-1,3-Dichloropropene	ND		49.6	55.4		ug/Kg		112	60 - 145	8	25
Trichloroethene	ND		49.6	52.8		ug/Kg		106	65 - 140	10	25
Trichlorofluoromethane	ND		49.6	45.0		ug/Kg		91	55 - 155	4	25
Vinyl chloride	ND		49.6	44.0		ug/Kg		89	55 - 140	10	30
Isopropyl Ether (DIPE)	ND		49.6	61.0		ug/Kg		123	60 - 150	2	25
Ethyl-t-butyl ether (ETBE)	ND		49.6	58.6		ug/Kg		118	60 - 145	2	30
tert-Butyl alcohol (TBA)	ND		496	603		ug/Kg		122	65 - 145	2	30
p-Isopropyltoluene	ND		49.6	52.0		ug/Kg		105	60 - 140	7	25

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*86*		*79 - 123*
4-Bromofluorobenzene (Surr)	*91*		*79 - 120*
Dibromofluoromethane (Surr)	*92*		*60 - 120*

Lab Sample ID: MB 440-421601/3
Matrix: Solid
Analysis Batch: 421601

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		250	100	ug/Kg			08/07/17 08:01	100
1,1,1-Trichloroethane	ND		100	50	ug/Kg			08/07/17 08:01	100
1,1,2,2-Tetrachloroethane	ND		100	50	ug/Kg			08/07/17 08:01	100
1,1,2-Trichloroethane	ND		100	50	ug/Kg			08/07/17 08:01	100
1,1-Dichloroethane	ND		100	50	ug/Kg			08/07/17 08:01	100
1,1-Dichloroethene	ND		250	100	ug/Kg			08/07/17 08:01	100
1,1-Dichloropropene	ND		100	50	ug/Kg			08/07/17 08:01	100
1,2,3-Trichlorobenzene	ND		250	100	ug/Kg			08/07/17 08:01	100
1,2,3-Trichloropropane	ND		500	100	ug/Kg			08/07/17 08:01	100
1,2,4-Trichlorobenzene	ND		250	100	ug/Kg			08/07/17 08:01	100
1,2,4-Trimethylbenzene	ND		100	50	ug/Kg			08/07/17 08:01	100
1,2-Dibromo-3-Chloropropane	ND		250	100	ug/Kg			08/07/17 08:01	100
1,2-Dibromoethane (EDB)	ND		100	50	ug/Kg			08/07/17 08:01	100
1,2-Dichlorobenzene	ND		100	50	ug/Kg			08/07/17 08:01	100
1,2-Dichloroethane	ND		100	50	ug/Kg			08/07/17 08:01	100
1,2-Dichloropropane	ND		100	50	ug/Kg			08/07/17 08:01	100
1,3,5-Trimethylbenzene	ND		100	50	ug/Kg			08/07/17 08:01	100
1,3-Dichlorobenzene	ND		100	50	ug/Kg			08/07/17 08:01	100
1,3-Dichloropropane	ND		100	50	ug/Kg			08/07/17 08:01	100
1,4-Dichlorobenzene	ND		100	50	ug/Kg			08/07/17 08:01	100
2,2-Dichloropropane	ND		200	100	ug/Kg			08/07/17 08:01	100
2-Chlorotoluene	ND		250	100	ug/Kg			08/07/17 08:01	100

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 440-421601/3
Matrix: Solid
Analysis Batch: 421601

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Chlorotoluene	ND		250	50	ug/Kg			08/07/17 08:01	100
Benzene	ND		100	50	ug/Kg			08/07/17 08:01	100
Bromobenzene	ND		250	100	ug/Kg			08/07/17 08:01	100
Bromochloromethane	ND		250	100	ug/Kg			08/07/17 08:01	100
Bromodichloromethane	ND		100	50	ug/Kg			08/07/17 08:01	100
Bromoform	ND		250	100	ug/Kg			08/07/17 08:01	100
Bromomethane	ND		250	100	ug/Kg			08/07/17 08:01	100
Carbon tetrachloride	ND		250	100	ug/Kg			08/07/17 08:01	100
Chlorobenzene	ND		100	50	ug/Kg			08/07/17 08:01	100
Chloroethane	ND		250	100	ug/Kg			08/07/17 08:01	100
Chloroform	ND		100	50	ug/Kg			08/07/17 08:01	100
Chloromethane	ND		250	100	ug/Kg			08/07/17 08:01	100
cis-1,2-Dichloroethene	ND		100	50	ug/Kg			08/07/17 08:01	100
cis-1,3-Dichloropropene	ND		100	50	ug/Kg			08/07/17 08:01	100
Dibromochloromethane	ND		100	50	ug/Kg			08/07/17 08:01	100
Dibromomethane	ND		100	50	ug/Kg			08/07/17 08:01	100
Dichlorodifluoromethane	ND		250	100	ug/Kg			08/07/17 08:01	100
Ethylbenzene	ND		100	50	ug/Kg			08/07/17 08:01	100
Hexachlorobutadiene	ND		250	100	ug/Kg			08/07/17 08:01	100
Isopropylbenzene	ND		100	50	ug/Kg			08/07/17 08:01	100
m,p-Xylene	ND		200	100	ug/Kg			08/07/17 08:01	100
Methylene Chloride	ND		1000	500	ug/Kg			08/07/17 08:01	100
Methyl-t-Butyl Ether (MTBE)	ND		250	100	ug/Kg			08/07/17 08:01	100
Naphthalene	ND		250	100	ug/Kg			08/07/17 08:01	100
n-Butylbenzene	ND		250	100	ug/Kg			08/07/17 08:01	100
N-Propylbenzene	ND		100	50	ug/Kg			08/07/17 08:01	100
o-Xylene	ND		100	50	ug/Kg			08/07/17 08:01	100
sec-Butylbenzene	ND		250	50	ug/Kg			08/07/17 08:01	100
Styrene	ND		100	50	ug/Kg			08/07/17 08:01	100
Tert-amyl-methyl ether (TAME)	ND		250	100	ug/Kg			08/07/17 08:01	100
tert-Butylbenzene	ND		250	100	ug/Kg			08/07/17 08:01	100
Tetrachloroethene	ND		100	50	ug/Kg			08/07/17 08:01	100
Toluene	ND		100	50	ug/Kg			08/07/17 08:01	100
trans-1,2-Dichloroethene	ND		100	50	ug/Kg			08/07/17 08:01	100
trans-1,3-Dichloropropene	ND		100	50	ug/Kg			08/07/17 08:01	100
Trichloroethene	ND		100	50	ug/Kg			08/07/17 08:01	100
Trichlorofluoromethane	ND		250	100	ug/Kg			08/07/17 08:01	100
Vinyl chloride	ND		250	100	ug/Kg			08/07/17 08:01	100
Xylenes, Total	ND		200	100	ug/Kg			08/07/17 08:01	100
Isopropyl Ether (DIPE)	ND		250	100	ug/Kg			08/07/17 08:01	100
Ethyl-t-butyl ether (ETBE)	ND		250	100	ug/Kg			08/07/17 08:01	100
tert-Butyl alcohol (TBA)	ND		5000	2500	ug/Kg			08/07/17 08:01	100
p-Isopropyltoluene	ND		100	50	ug/Kg			08/07/17 08:01	100

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*108*		*60 - 140*		*08/07/17 08:01*	*100*
4-Bromofluorobenzene (Surr)	*100*		*65 - 140*		*08/07/17 08:01*	*100*
Dibromofluoromethane (Surr)	*98*		*55 - 140*		*08/07/17 08:01*	*100*

Lab Sample ID: LCS 440-421601/4
Matrix: Solid
Analysis Batch: 421601

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1,2-Tetrachloroethane	2500	2780		ug/Kg		111	70 - 140
1,1,1-Trichloroethane	2500	2650		ug/Kg		106	65 - 140
1,1,2,2-Tetrachloroethane	2500	2560		ug/Kg		102	55 - 135
1,1,2-Trichloroethane	2500	2800		ug/Kg		112	65 - 130
1,1-Dichloroethane	2500	2630		ug/Kg		105	65 - 130
1,1-Dichloroethene	2500	2770		ug/Kg		111	75 - 140
1,1-Dichloropropene	2500	2740		ug/Kg		110	70 - 130
1,2,3-Trichlorobenzene	2500	2980		ug/Kg		119	60 - 135
1,2,3-Trichloropropane	2500	2650		ug/Kg		106	55 - 130
1,2,4-Trichlorobenzene	2500	2870		ug/Kg		115	65 - 135
1,2,4-Trimethylbenzene	2500	2670		ug/Kg		107	70 - 125
1,2-Dibromo-3-Chloropropane	2500	2600		ug/Kg		104	45 - 135
1,2-Dibromoethane (EDB)	2500	2770		ug/Kg		111	70 - 130
1,2-Dichlorobenzene	2500	2670		ug/Kg		107	70 - 120
1,2-Dichloroethane	2500	2610		ug/Kg		104	60 - 145
1,2-Dichloropropane	2500	2640		ug/Kg		105	75 - 125
1,3,5-Trimethylbenzene	2500	2660		ug/Kg		107	70 - 125
1,3-Dichlorobenzene	2500	2570		ug/Kg		103	70 - 125
1,3-Dichloropropane	2500	2690		ug/Kg		108	65 - 130
1,4-Dichlorobenzene	2500	2580		ug/Kg		103	70 - 125
2,2-Dichloropropane	2500	2770		ug/Kg		111	60 - 145
2-Chlorotoluene	2500	2610		ug/Kg		104	70 - 125
4-Chlorotoluene	2500	2700		ug/Kg		108	70 - 125
Benzene	2500	2700		ug/Kg		108	65 - 120
Bromobenzene	2500	2690		ug/Kg		107	70 - 120
Bromochloromethane	2500	2730		ug/Kg		109	65 - 125
Bromodichloromethane	2500	2840		ug/Kg		114	65 - 135
Bromoform	2500	2920		ug/Kg		117	50 - 130
Bromomethane	2500	2460		ug/Kg		98	30 - 140
Carbon tetrachloride	2500	2620		ug/Kg		105	65 - 145
Chlorobenzene	2500	2560		ug/Kg		102	70 - 125
Chloroethane	2500	2550		ug/Kg		102	40 - 140
Chloroform	2500	2600		ug/Kg		104	75 - 130
Chloromethane	2500	2330		ug/Kg		93	30 - 140
cis-1,2-Dichloroethene	2500	2720		ug/Kg		109	65 - 130
cis-1,3-Dichloropropene	2500	2920		ug/Kg		117	70 - 130
Dibromochloromethane	2500	2790		ug/Kg		112	65 - 140
Dibromomethane	2500	2580		ug/Kg		103	65 - 130
Dichlorodifluoromethane	2500	2160		ug/Kg		86	10 - 155
Ethylbenzene	2500	2660		ug/Kg		106	80 - 120
Hexachlorobutadiene	2500	2790		ug/Kg		112	60 - 135
Isopropylbenzene	2500	2720		ug/Kg		109	70 - 125
m,p-Xylene	2500	2710		ug/Kg		108	70 - 125
Methylene Chloride	2500	2660		ug/Kg		106	60 - 140
Methyl-t-Butyl Ether (MTBE)	2500	2780		ug/Kg		111	55 - 145
Naphthalene	2500	2810		ug/Kg		113	50 - 140
n-Butylbenzene	2500	2670		ug/Kg		107	70 - 130
N-Propylbenzene	2500	2610		ug/Kg		104	70 - 130
o-Xylene	2500	2730		ug/Kg		109	70 - 125
sec-Butylbenzene	2500	2580		ug/Kg		103	70 - 125

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 440-421601/4
Matrix: Solid
Analysis Batch: 421601

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Styrene	2500	2810		ug/Kg		112	70 - 135
Tert-amyl-methyl ether (TAME)	2500	2710		ug/Kg		108	60 - 145
tert-Butylbenzene	2500	2630		ug/Kg		105	70 - 125
Tetrachloroethene	2500	2610		ug/Kg		104	65 - 125
Toluene	2500	2780		ug/Kg		111	80 - 120
trans-1,2-Dichloroethene	2500	2600		ug/Kg		104	65 - 130
trans-1,3-Dichloropropene	2500	2810		ug/Kg		112	65 - 135
Trichloroethene	2500	2710		ug/Kg		108	70 - 130
Trichlorofluoromethane	2500	2650		ug/Kg		106	50 - 145
Vinyl chloride	2500	970		ug/Kg		39	10 - 120
Isopropyl Ether (DIPE)	2500	2590		ug/Kg		104	60 - 140
Ethyl-t-butyl ether (ETBE)	2500	2570		ug/Kg		103	60 - 140
tert-Butyl alcohol (TBA)	25000	25500		ug/Kg		102	65 - 140
p-Isopropyltoluene	2500	2630		ug/Kg		105	70 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*103*		*60 - 140*
4-Bromofluorobenzene (Surr)	*96*		*65 - 140*
Dibromofluoromethane (Surr)	*102*		*55 - 140*

Lab Sample ID: LCSD 440-421601/5
Matrix: Solid
Analysis Batch: 421601

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1,2-Tetrachloroethane	2500	2800		ug/Kg		112	70 - 140	1	20
1,1,1-Trichloroethane	2500	2500		ug/Kg		100	65 - 140	6	20
1,1,2,2-Tetrachloroethane	2500	2630		ug/Kg		105	55 - 135	3	25
1,1,2-Trichloroethane	2500	2700		ug/Kg		108	65 - 130	4	20
1,1-Dichloroethane	2500	2620		ug/Kg		105	65 - 130	0	20
1,1-Dichloroethene	2500	2560		ug/Kg		103	75 - 140	8	20
1,1-Dichloropropene	2500	2770		ug/Kg		111	70 - 130	1	20
1,2,3-Trichlorobenzene	2500	3080		ug/Kg		123	60 - 135	4	20
1,2,3-Trichloropropane	2500	2810		ug/Kg		112	55 - 130	6	25
1,2,4-Trichlorobenzene	2500	2910		ug/Kg		116	65 - 135	1	20
1,2,4-Trimethylbenzene	2500	2650		ug/Kg		106	70 - 125	1	20
1,2-Dibromo-3-Chloropropane	2500	2850		ug/Kg		114	45 - 135	9	25
1,2-Dibromoethane (EDB)	2500	2760		ug/Kg		110	70 - 130	0	20
1,2-Dichlorobenzene	2500	2710		ug/Kg		108	70 - 120	2	20
1,2-Dichloroethane	2500	2530		ug/Kg		101	60 - 145	3	20
1,2-Dichloropropane	2500	2610		ug/Kg		105	75 - 125	1	20
1,3,5-Trimethylbenzene	2500	2640		ug/Kg		106	70 - 125	1	20
1,3-Dichlorobenzene	2500	2580		ug/Kg		103	70 - 125	0	20
1,3-Dichloropropane	2500	2680		ug/Kg		107	65 - 130	1	20
1,4-Dichlorobenzene	2500	2610		ug/Kg		104	70 - 125	1	20
2,2-Dichloropropane	2500	2570		ug/Kg		103	60 - 145	8	25
2-Chlorotoluene	2500	2600		ug/Kg		104	70 - 125	1	20
4-Chlorotoluene	2500	2670		ug/Kg		107	70 - 125	1	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 440-421601/5
Matrix: Solid
Analysis Batch: 421601

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	2500	2660		ug/Kg		107	65 - 120	1	20
Bromobenzene	2500	2660		ug/Kg		106	70 - 120	1	20
Bromochloromethane	2500	2710		ug/Kg		108	65 - 125	1	20
Bromodichloromethane	2500	2790		ug/Kg		112	65 - 135	2	20
Bromoform	2500	2890		ug/Kg		115	50 - 130	1	25
Bromomethane	2500	2240		ug/Kg		90	30 - 140	9	30
Carbon tetrachloride	2500	2550		ug/Kg		102	65 - 145	3	20
Chlorobenzene	2500	2620		ug/Kg		105	70 - 125	2	20
Chloroethane	2500	2340		ug/Kg		94	40 - 140	8	25
Chloroform	2500	2510		ug/Kg		100	75 - 130	4	20
Chloromethane	2500	2150		ug/Kg		86	30 - 140	8	25
cis-1,2-Dichloroethene	2500	2590		ug/Kg		104	65 - 130	5	20
cis-1,3-Dichloropropene	2500	2900		ug/Kg		116	70 - 130	1	20
Dibromochloromethane	2500	2770		ug/Kg		111	65 - 140	1	20
Dibromomethane	2500	2580		ug/Kg		103	65 - 130	0	20
Dichlorodifluoromethane	2500	2060		ug/Kg		83	10 - 155	4	30
Ethylbenzene	2500	2680		ug/Kg		107	80 - 120	1	20
Hexachlorobutadiene	2500	2810		ug/Kg		113	60 - 135	1	20
Isopropylbenzene	2500	2680		ug/Kg		107	70 - 125	1	20
m,p-Xylene	2500	2680		ug/Kg		107	70 - 125	1	20
Methylene Chloride	2500	2710		ug/Kg		108	60 - 140	2	20
Methyl-t-Butyl Ether (MTBE)	2500	2800		ug/Kg		112	55 - 145	1	25
Naphthalene	2500	2930		ug/Kg		117	50 - 140	4	25
n-Butylbenzene	2500	2630		ug/Kg		105	70 - 130	2	20
N-Propylbenzene	2500	2630		ug/Kg		105	70 - 130	1	20
o-Xylene	2500	2640		ug/Kg		106	70 - 125	3	20
sec-Butylbenzene	2500	2550		ug/Kg		102	70 - 125	1	20
Styrene	2500	2780		ug/Kg		111	70 - 135	1	20
Tert-amyl-methyl ether (TAME)	2500	2570		ug/Kg		103	60 - 145	5	25
tert-Butylbenzene	2500	2580		ug/Kg		103	70 - 125	2	20
Tetrachloroethene	2500	2570		ug/Kg		103	65 - 125	1	20
Toluene	2500	2750		ug/Kg		110	80 - 120	1	20
trans-1,2-Dichloroethene	2500	2570		ug/Kg		103	65 - 130	1	20
trans-1,3-Dichloropropene	2500	2820		ug/Kg		113	65 - 135	0	20
Trichloroethene	2500	2600		ug/Kg		104	70 - 130	4	20
Trichlorofluoromethane	2500	2570		ug/Kg		103	50 - 145	3	25
Vinyl chloride	2500	898		ug/Kg		36	10 - 120	8	30
Isopropyl Ether (DIPE)	2500	2590		ug/Kg		104	60 - 140	0	20
Ethyl-t-butyl ether (ETBE)	2500	2520		ug/Kg		101	60 - 140	2	20
tert-Butyl alcohol (TBA)	25000	23200		ug/Kg		93	65 - 140	9	20
p-Isopropyltoluene	2500	2700		ug/Kg		108	70 - 125	3	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*104*		*60 - 140*
4-Bromofluorobenzene (Surr)	*99*		*65 - 140*
Dibromofluoromethane (Surr)	*95*		*55 - 140*

Method: 8015B - Gasoline Range Organics - (GC)

Lab Sample ID: MB 440-422392/5
Matrix: Solid
Analysis Batch: 422392

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C4-C12)	ND		400	150	ug/Kg			08/10/17 10:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*65 - 140*		*08/10/17 10:57*	*1*

Lab Sample ID: LCS 440-422392/3
Matrix: Solid
Analysis Batch: 422392

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)			1600	1510		ug/Kg		95	70 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*114*		*65 - 140*

Lab Sample ID: LCSD 440-422392/4
Matrix: Solid
Analysis Batch: 422392

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (C4-C12)			1600	1320		ug/Kg		82	70 - 135	14	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*109*		*65 - 140*

Lab Sample ID: 440-189560-1 MS
Matrix: Solid
Analysis Batch: 422392

Client Sample ID: SVP-108-5
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)	ND		1580	1480		ug/Kg		93	60 - 140		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*113*		*65 - 140*

Lab Sample ID: 440-189560-1 MSD
Matrix: Solid
Analysis Batch: 422392

Client Sample ID: SVP-108-5
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (C4-C12)	ND		1590	1480		ug/Kg		93	60 - 140	0	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*110*		*65 - 140*

Method: 8015B - Gasoline Range Organics - (GC) (Continued)

Lab Sample ID: MB 440-422690/5
Matrix: Solid
Analysis Batch: 422690

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C4-C12)	ND		400	150	ug/Kg			08/11/17 10:20	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*108*		*65 - 140*		*08/11/17 10:20*	*1*

Lab Sample ID: LCS 440-422690/3
Matrix: Solid
Analysis Batch: 422690

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)			1600	1500		ug/Kg		94	70 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*99*		*65 - 140*

Lab Sample ID: LCSD 440-422690/4
Matrix: Solid
Analysis Batch: 422690

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (C4-C12)			1600	1570		ug/Kg		98	70 - 135	5	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*106*		*65 - 140*

Lab Sample ID: 440-189560-9 MS
Matrix: Solid
Analysis Batch: 422690

Client Sample ID: SVP-105-5
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)	ND		1590	1370		ug/Kg		86	60 - 140		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*103*		*65 - 140*

Lab Sample ID: 440-189560-9 MSD
Matrix: Solid
Analysis Batch: 422690

Client Sample ID: SVP-105-5
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (C4-C12)	ND		1580	1320		ug/Kg		83	60 - 140	4	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*106*		*65 - 140*

Method: 8015B - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 440-421498/1-A
Matrix: Solid
Analysis Batch: 421631

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 421498

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C13-C22	ND		5.0	2.5	mg/Kg		08/05/17 07:26	08/07/17 10:46	1
C23-C40	3.44	J	5.0	2.5	mg/Kg		08/05/17 07:26	08/07/17 10:46	1
C8 - C18	4.13	J	5.0	2.5	mg/Kg		08/05/17 07:26	08/07/17 10:46	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Octacosane	*86*		*40 - 140*	*08/05/17 07:26*	*08/07/17 10:46*	*1*

Lab Sample ID: LCS 440-421498/2-A
Matrix: Solid
Analysis Batch: 421631

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 421498

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
C10-C28	66.7	57.4		mg/Kg		86	45 - 115

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
n-Octacosane	*86*		*40 - 140*

Lab Sample ID: 440-189560-1 MS
Matrix: Solid
Analysis Batch: 421631

Client Sample ID: SVP-108-5
Prep Type: Total/NA
Prep Batch: 421498

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
C10-C28	ND		66.4	42.8		mg/Kg		64	40 - 120

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
n-Octacosane	*65*		*40 - 140*

Lab Sample ID: 440-189560-1 MSD
Matrix: Solid
Analysis Batch: 421631

Client Sample ID: SVP-108-5
Prep Type: Total/NA
Prep Batch: 421498

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
C10-C28	ND		66.4	47.5		mg/Kg		72	40 - 120	10	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
n-Octacosane	*71*		*40 - 140*

Lab Sample ID: MB 440-421740/1-A
Matrix: Solid
Analysis Batch: 421818

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 421740

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C13-C22	ND		5.0	2.5	mg/Kg		08/07/17 13:40	08/08/17 01:24	1
C23-C40	2.98	J	5.0	2.5	mg/Kg		08/07/17 13:40	08/08/17 01:24	1
C8 - C18	ND		5.0	2.5	mg/Kg		08/07/17 13:40	08/08/17 01:24	1

Method: 8015B - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: MB 440-421740/1-A
Matrix: Solid
Analysis Batch: 421818

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 421740

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
n-Octacosane	90		40 - 140	08/07/17 13:40	08/08/17 01:24	1

Lab Sample ID: LCS 440-421740/2-A
Matrix: Solid
Analysis Batch: 421818

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 421740

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
C10-C28			66.5	52.8		mg/Kg		79	45 - 115		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
n-Octacosane	82		40 - 140

Lab Sample ID: 440-189667-G-1-C MSD
Matrix: Solid
Analysis Batch: 421819

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 421740

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
C10-C28	6.1	B	66.5	44.0		mg/Kg		57	40 - 120	7	30

Surrogate	MSD %Recovery	MSD Qualifier	Limits
n-Octacosane	72		40 - 140

Lab Sample ID: 440-189667-G-1-E MS
Matrix: Solid
Analysis Batch: 421819

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 421740

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
C10-C28	6.1	B	66.4	46.9		mg/Kg		61	40 - 120		

Surrogate	MS %Recovery	MS Qualifier	Limits
n-Octacosane	74		40 - 140

GC/MS VOA

Analysis Batch: 421490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189560-1	SVP-108-5	Total/NA	Solid	8260B	
440-189560-3	SVP-109-5	Total/NA	Solid	8260B	
440-189560-4	SVP-109-10	Total/NA	Solid	8260B	
440-189560-7	SVP-106-5	Total/NA	Solid	8260B	
440-189560-8	SVP-106-10	Total/NA	Solid	8260B	
440-189560-9	SVP-105-5	Total/NA	Solid	8260B	
440-189560-10	SVP-105-10	Total/NA	Solid	8260B	
MB 440-421490/4	Method Blank	Total/NA	Solid	8260B	
LCS 440-421490/5	Lab Control Sample	Total/NA	Solid	8260B	
440-189560-3 MS	SVP-109-5	Total/NA	Solid	8260B	
440-189560-3 MSD	SVP-109-5	Total/NA	Solid	8260B	

Analysis Batch: 421599

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189560-5	SVP-107-5	Total/NA	Solid	8260B	
440-189560-6	SVP-107-10	Total/NA	Solid	8260B	
MB 440-421599/4	Method Blank	Total/NA	Solid	8260B	
LCS 440-421599/5	Lab Control Sample	Total/NA	Solid	8260B	
440-189624-A-1 MS	Matrix Spike	Total/NA	Solid	8260B	
440-189624-A-1 MSD	Matrix Spike Duplicate	Total/NA	Solid	8260B	

Analysis Batch: 421601

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189560-2	SVP-108-10	Total/NA	Solid	8260B	421620
MB 440-421601/3	Method Blank	Total/NA	Solid	8260B	
LCS 440-421601/4	Lab Control Sample	Total/NA	Solid	8260B	
LCSD 440-421601/5	Lab Control Sample Dup	Total/NA	Solid	8260B	

Prep Batch: 421620

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189560-2	SVP-108-10	Total/NA	Solid	5030B	

GC VOA

Analysis Batch: 422392

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189560-1	SVP-108-5	Total/NA	Solid	8015B	
440-189560-2	SVP-108-10	Total/NA	Solid	8015B	
440-189560-3	SVP-109-5	Total/NA	Solid	8015B	
440-189560-4	SVP-109-10	Total/NA	Solid	8015B	
440-189560-5	SVP-107-5	Total/NA	Solid	8015B	
440-189560-6	SVP-107-10	Total/NA	Solid	8015B	
440-189560-7	SVP-106-5	Total/NA	Solid	8015B	
440-189560-8	SVP-106-10	Total/NA	Solid	8015B	
440-189560-10	SVP-105-10	Total/NA	Solid	8015B	
MB 440-422392/5	Method Blank	Total/NA	Solid	8015B	
LCS 440-422392/3	Lab Control Sample	Total/NA	Solid	8015B	
LCSD 440-422392/4	Lab Control Sample Dup	Total/NA	Solid	8015B	
440-189560-1 MS	SVP-108-5	Total/NA	Solid	8015B	
440-189560-1 MSD	SVP-108-5	Total/NA	Solid	8015B	

GC VOA (Continued)

Analysis Batch: 422690

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189560-9	SVP-105-5	Total/NA	Solid	8015B	
MB 440-422690/5	Method Blank	Total/NA	Solid	8015B	
LCS 440-422690/3	Lab Control Sample	Total/NA	Solid	8015B	
LCSD 440-422690/4	Lab Control Sample Dup	Total/NA	Solid	8015B	
440-189560-9 MS	SVP-105-5	Total/NA	Solid	8015B	
440-189560-9 MSD	SVP-105-5	Total/NA	Solid	8015B	

GC Semi VOA

Prep Batch: 421498

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189560-1	SVP-108-5	Total/NA	Solid	3546	
440-189560-2	SVP-108-10	Total/NA	Solid	3546	
440-189560-3	SVP-109-5	Total/NA	Solid	3546	
440-189560-4	SVP-109-10	Total/NA	Solid	3546	
440-189560-5	SVP-107-5	Total/NA	Solid	3546	
440-189560-6	SVP-107-10	Total/NA	Solid	3546	
440-189560-7	SVP-106-5	Total/NA	Solid	3546	
440-189560-8	SVP-106-10	Total/NA	Solid	3546	
440-189560-10	SVP-105-10	Total/NA	Solid	3546	
MB 440-421498/1-A	Method Blank	Total/NA	Solid	3546	
LCS 440-421498/2-A	Lab Control Sample	Total/NA	Solid	3546	
440-189560-1 MS	SVP-108-5	Total/NA	Solid	3546	
440-189560-1 MSD	SVP-108-5	Total/NA	Solid	3546	

Analysis Batch: 421631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189560-1	SVP-108-5	Total/NA	Solid	8015B	421498
440-189560-2	SVP-108-10	Total/NA	Solid	8015B	421498
440-189560-3	SVP-109-5	Total/NA	Solid	8015B	421498
440-189560-4	SVP-109-10	Total/NA	Solid	8015B	421498
440-189560-6	SVP-107-10	Total/NA	Solid	8015B	421498
440-189560-7	SVP-106-5	Total/NA	Solid	8015B	421498
440-189560-8	SVP-106-10	Total/NA	Solid	8015B	421498
440-189560-10	SVP-105-10	Total/NA	Solid	8015B	421498
MB 440-421498/1-A	Method Blank	Total/NA	Solid	8015B	421498
LCS 440-421498/2-A	Lab Control Sample	Total/NA	Solid	8015B	421498
440-189560-1 MS	SVP-108-5	Total/NA	Solid	8015B	421498
440-189560-1 MSD	SVP-108-5	Total/NA	Solid	8015B	421498

Prep Batch: 421740

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189560-9	SVP-105-5	Total/NA	Solid	3546	
MB 440-421740/1-A	Method Blank	Total/NA	Solid	3546	
LCS 440-421740/2-A	Lab Control Sample	Total/NA	Solid	3546	
440-189667-G-1-C MSD	Matrix Spike Duplicate	Total/NA	Solid	3546	
440-189667-G-1-E MS	Matrix Spike	Total/NA	Solid	3546	

GC Semi VOA (Continued)

Analysis Batch: 421818

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189560-9	SVP-105-5	Total/NA	Solid	8015B	421740
MB 440-421740/1-A	Method Blank	Total/NA	Solid	8015B	421740
LCS 440-421740/2-A	Lab Control Sample	Total/NA	Solid	8015B	421740

Analysis Batch: 421819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189667-G-1-C MSD	Matrix Spike Duplicate	Total/NA	Solid	8015B	421740
440-189667-G-1-E MS	Matrix Spike	Total/NA	Solid	8015B	421740

Analysis Batch: 421931

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189560-5	SVP-107-5	Total/NA	Solid	8015B	421498

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	ISTD response or retention time outside acceptable limits
X	Surrogate is outside control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC Semi VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Accreditation/Certification Summary

Client: CH2M Hill, Inc.
Project/Site: Kinder Morgan- Norwalk Site

TestAmerica Job ID: 440-189560-1

Laboratory: TestAmerica Irvine

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	CA01531	06-30-18 *
Arizona	State Program	9	AZ0671	10-14-17
California	LA Cty Sanitation Districts	9	10256	06-30-18
California	State Program	9	CA ELAP 2706	06-30-18
Guam	State Program	9	Cert. No. 17-003R	01-23-18
Hawaii	State Program	9	N/A	01-29-18
Kansas	NELAP Secondary AB	7	E-10420	07-31-17 *
Nevada	State Program	9	CA015312017-1	07-31-18 *
New Mexico	State Program	6	N/A	01-29-18 *
Northern Mariana Islands	State Program	9	MP0002	01-29-17 *
Oregon	NELAP	10	4028	01-29-18
USDA	Federal		P330-15-00184	07-08-18
Washington	State Program	10	C900	09-03-17 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Test America - Irvine
17461 Derian Avenue Suite 100
Irvine, CA 92614
Tel 949 261 1022 Fax 949 260 3299
Camille Murray

CHAIN OF CUSTODY RECORD

DATE:

PAGE: 1 OF 2 AKB

LABORATORY CLIENT: **Kinder Morgan Energy Partners, attn: Steve Defilbaugh**
ADDRESS: **1100 Town and Country Road**
CITY: **Orange, CA 92868**
TEL: **714-560-4802** E-Mail: steve.defilbaugh@kindermorgan.com

CLIENT PROJECT NAME / NUMBER: **Kinder Morgan - Norwalk**
PROJECT CONTACT: **Eric Davis**
SAMPLER(S): (SIGNATURE)
P.O. NO.:
QUOTE NO.:
LAB USE ONLY

TURNAROUND TIME
☐ SAME DAY ☐ 24 HR ☐ 48HR ☐ 72 HR ☐ 5 DAYS ■ Standard

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ RWQCB REPORTING ☐ ARCHIVE SAMPLES UNTIL ___/___/___

SPECIAL INSTRUCTIONS
Report to Eric Davis/CH2M HILL, Eric.Davis@ch2m.com, cc: KMEP
Direct Bill KMEP - Steve Defilbaugh
"J" flags required/Use lowest possible detection limit - all methods.

REQUESTED ANALYSIS

LAB USE ONLY	SAMPLE ID	LOCATION/ DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MAT-RIX	NO. OF CONT.	Total Cam 17 Metals	VOCs	SVOCs	TPH-Gas	TPH-Diesel	TPH-Jet	Flash point	Comments
	SVP-108-5	SVP-108 4'-5'	8/3/17	0830	Soil	3		X		X	X	X		
	SVP-108-10	SVP-108 9'-10'	8/3/17	0845	Soil	1		X		X	X	X		Invoice to Steve Defilbaugh, KinderMorgan
	SVP-109-5	SVP-109 4'-5'	8/3/17	11:10	Soil	1		X		X	X	X		Energy Partners, Orange, CA
	SVP-109-10	SVP-109 9'-10'	8/3/17	11:30	Soil	1		X		X	X	X		
	SVP-107-5	SVP-107 4'-5'	8/3/17	13:30	Soil	1		X		X	X	X		
	SVP-107-10	SVP-107 9-10'	8/3/17	13:40	Soil	1		X		X	X	X		

440-189560 Chain of Custody

Relinquished by: (Signature)	Received by: (Signature)	Date: 8/3/17	Time: 1740
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature) TA-I	Date: 8/3/17	Time: 1740

IR85 4.3/4.6°C

8/3/17

Revised: 5/22/2017

8/15/2017

Test America - Irvine
17461 Derian Avenue Suite 100
Irvine, CA 92614
Tel 949 261 1022 Fax 949 260 3299
Camille Murray

CHAIN OF CUSTODY RECORD

DATE: 2 + AKB
PAGE: 1 + AKB OF 2 + AKB

LABORATORY CLIENT: **Kinder Morgan Energy Partners, attn: Steve Defilbaugh**
ADDRESS: **1100 Town and Country Road**
CITY: **Orange, CA 92868**
TEL: **714-560-4802** E-Mail: steve.defilbaugh@kindermorgan.com

CLIENT PROJECT NAME / NUMBER: **Kinder Morgan - Norwalk**
PROJECT CONTACT: **Eric Davis**
SAMPLER(S): (SIGNATURE)
P.O. NO.:
QUOTE NO.:
LAB USE ONLY

TURNAROUND TIME
☐ SAME DAY ☐ 24 HR ☐ 48HR ☐ 72 HR ☐ 5 DAYS ■ Standard

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ RWQCB REPORTING ☐ ARCHIVE SAMPLES UNTIL ___/___/___

SPECIAL INSTRUCTIONS
Report to Eric Davis/CH2M HILL, Eric.Davis@ch2m.com, cc: KMEP
Direct Bill KMEP - Steve Defilbaugh
"J" flags required/Use lowest possible detection limit - all methods.

REQUESTED ANALYSIS

LAB USE ONLY	SAMPLE ID	LOCATION/ DESCRIPTION	SAMPLING DATE	SAMPLING TIME	MAT-RIX	NO. OF CONT.	Total Cam 17 Metals	VOCs	SVOCs	TPH-Gas	TPH-Diesel	TPH-Jet	Flash point						Comments
	SVP-106-5	SVP-106 4-5'	8/3/17	13:45	Soil	1		X		X	X	X							
	SVP-106-10	SVP-106 9-10'	8/3/17	14:15	Soil	1		X		X	X	X							Invoice to Steve Defilbaugh, KinderMorgan
	SVP-105-5	SVP-105 4'-5'	8/3/17	15:00	Soil	1		+		X	X	X							Energy Partners, Orange, CA
	SVP-105-10	SVP-105 9'-10'	8/3/17	15:12	Soil	1		+		+	X	X							

8/3/17

Relinquished by: (Signature)	Received by: (Signature)	Date: 8/3/17	Time: 17:40
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature) TA - I	Date: 8/3/17	Time: 1740

Revised: 5/22/2017

Login Sample Receipt Checklist

Client: CH2M Hill, Inc.

Job Number: 440-189560-1

Login Number: 189560

List Source: TestAmerica Irvine

List Number: 1

Creator: Escalante, Maria I

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.		
The cooler's custody seal, if present, is intact.		
Sample custody seals, if present, are intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the containers received and the COC.		
Samples are received within Holding Time (excluding tests with immediate HTs)		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified.		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Residual Chlorine Checked.		

Attachment D
Soil Vapor Laboratory Analytical Report

AMERICAN ANALYTICS

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

September 12, 2017

Vladimir Carino

CH2M Hill, Inc.

P.O. Box 241329

Denver, CO 80224

Re : KMEP Norwalk Biosparge Startup / [none]

MB187317 / 7I11014

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received on 09/08/17 10:00 and analyzed in accordance with the attached chain-of-custody.

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

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

Sincerely,

Allen Aminian

QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
Fixed Gases - Field					
SVP-109-5	7I11014-01	Vapor	5	09/07/17 07:56	09/08/17 10:00
SVP-109-10	7I11014-02	Vapor	5	09/07/17 07:58	09/08/17 10:00
SVP-108-5	7I11014-03	Vapor	5	09/07/17 09:10	09/08/17 10:00
SVP-108-10	7I11014-04	Vapor	5	09/07/17 09:30	09/08/17 10:00
SVP-108-10 DUP	7I11014-05	Vapor	5	09/07/17 09:30	09/08/17 10:00
SVP-107-5	7I11014-06	Vapor	5	09/07/17 10:10	09/08/17 10:00
SVP-107-10	7I11014-07	Vapor	5	09/07/17 10:13	09/08/17 10:00
SVP-106-5	7I11014-09	Vapor	5	09/07/17 10:47	09/08/17 10:00
SVP-106-10	7I11014-10	Vapor	5	09/07/17 10:49	09/08/17 10:00
SVP-105-5	7I11014-11	Vapor	5	09/07/17 11:25	09/08/17 10:00
SVP-105-10	7I11014-12	Vapor	5	09/07/17 11:27	09/08/17 10:00
TO-15 (Mid Level)					
SVP-109-5	7I11014-01	Vapor	5	09/07/17 07:56	09/08/17 10:00
SVP-109-10	7I11014-02	Vapor	5	09/07/17 07:58	09/08/17 10:00
SVP-108-5	7I11014-03	Vapor	5	09/07/17 09:10	09/08/17 10:00
SVP-108-10	7I11014-04	Vapor	5	09/07/17 09:30	09/08/17 10:00
SVP-108-10 DUP	7I11014-05	Vapor	5	09/07/17 09:30	09/08/17 10:00
SVP-107-5	7I11014-06	Vapor	5	09/07/17 10:10	09/08/17 10:00

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVP-107-10	7I11014-07	Vapor	5	09/07/17 10:13	09/08/17 10:00
Ambient Air	7I11014-08	Vapor	5	09/07/17 10:20	09/08/17 10:00
SVP-106-5	7I11014-09	Vapor	5	09/07/17 10:47	09/08/17 10:00
SVP-106-10	7I11014-10	Vapor	5	09/07/17 10:49	09/08/17 10:00
SVP-105-5	7I11014-11	Vapor	5	09/07/17 11:25	09/08/17 10:00
SVP-105-10	7I11014-12	Vapor	5	09/07/17 11:27	09/08/17 10:00
TO-3					
SVP-109-5	7I11014-01	Vapor	5	09/07/17 07:56	09/08/17 10:00
SVP-109-10	7I11014-02	Vapor	5	09/07/17 07:58	09/08/17 10:00
SVP-108-5	7I11014-03	Vapor	5	09/07/17 09:10	09/08/17 10:00
SVP-108-10	7I11014-04	Vapor	5	09/07/17 09:30	09/08/17 10:00
SVP-108-10 DUP	7I11014-05	Vapor	5	09/07/17 09:30	09/08/17 10:00
SVP-107-5	7I11014-06	Vapor	5	09/07/17 10:10	09/08/17 10:00
SVP-107-10	7I11014-07	Vapor	5	09/07/17 10:13	09/08/17 10:00
Ambient Air	7I11014-08	Vapor	5	09/07/17 10:20	09/08/17 10:00
SVP-106-5	7I11014-09	Vapor	5	09/07/17 10:47	09/08/17 10:00
SVP-106-10	7I11014-10	Vapor	5	09/07/17 10:49	09/08/17 10:00
SVP-105-5	7I11014-11	Vapor	5	09/07/17 11:25	09/08/17 10:00
SVP-105-10	7I11014-12	Vapor	5	09/07/17 11:27	09/08/17 10:00

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
		Fixed Gases by TCD						
Oxygen	SVP-109-5	**15**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Carbon Dioxide	SVP-109-5	**3.2**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Oxygen	SVP-109-10	**15**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Carbon Dioxide	SVP-109-10	**3.0**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Oxygen	SVP-108-5	**17**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Carbon Dioxide	SVP-108-5	**0.35**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Oxygen	SVP-108-10	**16**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Carbon Dioxide	SVP-108-10	**1.9**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Oxygen	SVP-108-10 DUP	**16**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Carbon Dioxide	SVP-108-10 DUP	**1.9**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVP-107-5	**15**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Carbon Dioxide	SVP-107-5	**1.1**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Oxygen	SVP-107-10	**17**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Carbon Dioxide	SVP-107-10	**0.27**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Oxygen	SVP-106-5	**16**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Carbon Dioxide	SVP-106-5	**0.88**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Oxygen	SVP-106-10	**16**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Carbon Dioxide	SVP-106-10	**1.5**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Oxygen	SVP-105-5	**16**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Carbon Dioxide	SVP-105-5	**1.1**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
Oxygen	SVP-105-10	**15**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Carbon Dioxide	SVP-105-10	**1.6**	0.10	% by Volume	1	09/07/17	09/07/17	EPA 3CM
		VOCs by EPA TO-3						
Gasoline Range Organics (GRO)	SVP-108-10	**7400**	1600	ug/L	80	09/07/17	09/07/17	TO-3
Gasoline Range Organics (GRO)	SVP-108-10 DUP	**7600**	1600	ug/L	80	09/07/17	09/07/17	TO-3
		VOCs by GCMS EPA TO-15						
Tetrachloroethylene (PCE)	SVP-109-5	**0.056**	0.020	ug/L	1	09/07/17	09/07/17	TO-15
Tetrachloroethylene (PCE)	SVP-109-10	**0.12**	0.020	ug/L	1	09/07/17	09/07/17	TO-15

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17
Units: ug/L

Date Sampled:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Prepared:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Analyzed:	09/07/17	09/07/17	09/07/17	09/07/17	
AA ID No:	7I11014-01	7I11014-02	7I11014-03	7I11014-04	
Client ID No:	SVP-109-5	SVP-109-10	SVP-108-5	SVP-108-10	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	80	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	**7400**	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	103%	101%	103%	108%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17
Units: ug/L

Date Sampled:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Prepared:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Analyzed:	09/07/17	09/07/17	09/07/17	09/07/17	
AA ID No:	7I11014-05	7I11014-06	7I11014-07	7I11014-08	
Client ID No:	SVP-108-10 DUP	SVP-107-5	SVP-107-10	Ambient Air	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	80	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	**7600**	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	104%	101%	99%	119%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187317
Project No:	[none]	**Date Received:**	09/08/17
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	09/12/17
Method:	VOCs by EPA TO-3	**Units:**	ug/L

Date Sampled:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Prepared:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Analyzed:	09/07/17	09/07/17	09/07/17	09/07/17	
AA ID No:	7I11014-09	7I11014-10	7I11014-11	7I11014-12	
Client ID No:	SVP-106-5	SVP-106-10	SVP-105-5	SVP-105-10	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	102%	107%	103%	91%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17
Units: ug/L

Date Sampled:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Prepared:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Analyzed:	09/07/17	09/07/17	09/07/17	09/07/17	
AA ID No:	7I11014-01	7I11014-02	7I11014-03	7I11014-04	
Client ID No:	SVP-109-5	SVP-109-10	SVP-108-5	SVP-108-10	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	2000	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<40 [3]	0.020
Allyl chloride	<0.020	<0.020	<0.020	<40 [3]	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<40 [3]	0.020
Benzene	<0.020	<0.020	<0.020	<40 [3]	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<40 [3]	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<40 [3]	0.020
Bromoform	<0.020	<0.020	<0.020	<40 [3]	0.020
Bromomethane	<0.020	<0.020	<0.020	<40 [3]	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<40 [3]	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<40 [3]	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<40000 [3]	20
Carbon Disulfide	<0.020	<0.020	<0.020	<40 [3]	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<40 [3]	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<40 [3]	0.020
Chloroethane	<0.020	<0.020	<0.020	<40 [3]	0.020
Chloroform	<0.020	<0.020	<0.020	<40 [3]	0.020
Chloromethane	<0.020	<0.020	<0.020	<40 [3]	0.020
Cyclohexane	<0.020	<0.020	<0.020	<40 [3]	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<40 [3]	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<40 [3]	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<40 [3]	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<40 [3]	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<40 [3]	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<40 [3]	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<40 [3]	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<40 [3]	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<40 [3]	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17
Units: ug/L

Date Sampled:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Prepared:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Analyzed:	09/07/17	09/07/17	09/07/17	09/07/17	
AA ID No:	7I11014-01	7I11014-02	7I11014-03	7I11014-04	
Client ID No:	SVP-109-5	SVP-109-10	SVP-108-5	SVP-108-10	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	2000	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<40 [3]	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<40 [3]	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<40 [3]	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<40 [3]	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<40 [3]	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<40 [3]	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<40 [3]	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<40 [3]	0.020
Ethanol	<0.020	<0.020	<0.020	<40 [3]	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<40 [3]	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<40 [3]	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<40 [3]	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<40 [3]	0.020
Heptane	<0.020	<0.020	<0.020	<40 [3]	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<40 [3]	0.020
n-Hexane	<0.020	<0.020	<0.020	<40 [3]	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<40 [3]	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<400 [3]	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<40 [3]	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<40 [3]	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<40 [3]	0.020
Naphthalene	<0.020	<0.020	<0.020	<40 [3]	0.020
Propylene	<0.020	<0.020	<0.020	<40 [3]	0.020
Styrene	<0.020	<0.020	<0.020	<40 [3]	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<40 [3]	0.020
Tetrachloroethylene (PCE)	**0.056**	**0.12**	<0.020	<40 [3]	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<40 [3]	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17
Units: ug/L

Date Sampled:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Prepared:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Analyzed:	09/07/17	09/07/17	09/07/17	09/07/17	
AA ID No:	7I11014-01	7I11014-02	7I11014-03	7I11014-04	
Client ID No:	SVP-109-5	SVP-109-10	SVP-108-5	SVP-108-10	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	2000	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<40 [3]	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<40 [3]	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<40 [3]	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<40 [3]	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<40 [3]	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<40 [3]	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	<40 [3]	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<40 [3]	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<40 [3]	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<40 [3]	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<40 [3]	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<40 [3]	0.020
Vinyl chloride	<0.020	<0.020	<0.020	<40 [3]	0.020
o-Xylene	<0.020	<0.020	<0.020	<40 [3]	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<40 [3]	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<40 [3]	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<40 [3]	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<40 [3]	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<40 [3]	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<40 [3]	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<40 [3]	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	101%	99%	103%	108% [3]	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17
Units: ug/L

Date Sampled:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Prepared:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Analyzed:	09/07/17	09/07/17	09/07/17	09/07/17	
AA ID No:	7I11014-05	7I11014-06	7I11014-07	7I11014-08	
Client ID No:	SVP-108-10 DUP	SVP-107-5	SVP-107-10	Ambient Air	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	2000	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<40 [3]	<0.020	<0.020	<0.020	0.020
Allyl chloride	<40 [3]	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<40 [3]	<0.020	<0.020	<0.020	0.020
Benzene	<40 [3]	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<40 [3]	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<40 [3]	<0.020	<0.020	<0.020	0.020
Bromoform	<40 [3]	<0.020	<0.020	<0.020	0.020
Bromomethane	<40 [3]	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<40 [3]	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<40 [3]	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<40000 [3]	<20	<20	<20	20
Carbon Disulfide	<40 [3]	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<40 [3]	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<40 [3]	<0.020	<0.020	<0.020	0.020
Chloroethane	<40 [3]	<0.020	<0.020	<0.020	0.020
Chloroform	<40 [3]	<0.020	<0.020	<0.020	0.020
Chloromethane	<40 [3]	<0.020	<0.020	<0.020	0.020
Cyclohexane	<40 [3]	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<40 [3]	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<40 [3]	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<40 [3]	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<40 [3]	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<40 [3]	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<40 [3]	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<40 [3]	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<40 [3]	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<40 [3]	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17
Units: ug/L

Date Sampled:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Prepared:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Analyzed:	09/07/17	09/07/17	09/07/17	09/07/17	
AA ID No:	7I11014-05	7I11014-06	7I11014-07	7I11014-08	
Client ID No:	SVP-108-10 DUP	SVP-107-5	SVP-107-10	Ambient Air	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	2000	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<40 [3]	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<40 [3]	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<40 [3]	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<40 [3]	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<40 [3]	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<40 [3]	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<40 [3]	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<40 [3]	<0.020	<0.020	<0.020	0.020
Ethanol	<40 [3]	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<40 [3]	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<40 [3]	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<40 [3]	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<40 [3]	<0.020	<0.020	<0.020	0.020
Heptane	<40 [3]	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<40 [3]	<0.020	<0.020	<0.020	0.020
n-Hexane	<40 [3]	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<40 [3]	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<400 [3]	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<40 [3]	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<40 [3]	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<40 [3]	<0.020	<0.020	<0.020	0.020
Naphthalene	<40 [3]	<0.020	<0.020	<0.020	0.020
Propylene	<40 [3]	<0.020	<0.020	<0.020	0.020
Styrene	<40 [3]	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<40 [3]	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<40 [3]	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<40 [3]	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17
Units: ug/L

Date Sampled:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Prepared:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Analyzed:	09/07/17	09/07/17	09/07/17	09/07/17	
AA ID No:	7I11014-05	7I11014-06	7I11014-07	7I11014-08	
Client ID No:	SVP-108-10 DUP	SVP-107-5	SVP-107-10	Ambient Air	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	2000	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<40 [3]	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<40 [3]	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<40 [3]	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<40 [3]	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<40 [3]	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<40 [3]	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<40 [3]	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<40 [3]	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<40 [3]	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	<40 [3]	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<40 [3]	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<40 [3]	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<40 [3]	<0.020	<0.020	<0.020	0.020
o-Xylene	<40 [3]	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<40 [3]	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<40 [3]	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<40 [3]	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<40 [3]	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<40 [3]	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<40 [3]	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<40 [3]	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	104% [3]	99%	97%	119%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17
Units: ug/L

Date Sampled:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Prepared:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Analyzed:	09/07/17	09/07/17	09/07/17	09/07/17	
AA ID No:	7I11014-09	7I11014-10	7I11014-11	7I11014-12	
Client ID No:	SVP-106-5	SVP-106-10	SVP-105-5	SVP-105-10	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17
Units: ug/L

Date Sampled:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Prepared:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Analyzed:	09/07/17	09/07/17	09/07/17	09/07/17	
AA ID No:	7I11014-09	7I11014-10	7I11014-11	7I11014-12	
Client ID No:	SVP-106-5	SVP-106-10	SVP-105-5	SVP-105-10	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17
Units: ug/L

Date Sampled:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Prepared:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Analyzed:	09/07/17	09/07/17	09/07/17	09/07/17	
AA ID No:	7I11014-09	7I11014-10	7I11014-11	7I11014-12	
Client ID No:	SVP-106-5	SVP-106-10	SVP-105-5	SVP-105-10	
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	101%	107%	103%	90%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17
Units: % by Volume

Date Sampled:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Prepared:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Analyzed:	09/07/17	09/07/17	09/07/17	09/07/17	
AA ID No:	7I11014-01	7I11014-02	7I11014-03	7I11014-04	
Client ID No:	SVP-109-5	SVP-109-10	SVP-108-5	SVP-108-10	
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**	**15**	**17**	**16**	0.10
Carbon Dioxide	**3.2**	**3.0**	**0.35**	**1.9**	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187317
Project No:	[none]	**Date Received:**	09/08/17
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	09/12/17
Method:	Fixed Gases by TCD	**Units:**	% by Volume

Date Sampled:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Prepared:	09/07/17	09/07/17	09/07/17	09/07/17	
Date Analyzed:	09/07/17	09/07/17	09/07/17	09/07/17	
AA ID No:	7I11014-05	7I11014-06	7I11014-07	7I11014-09	
Client ID No:	SVP-108-10 DUP	SVP-107-5	SVP-107-10	SVP-106-5	
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	**16**	**15**	**17**	**16**	0.10
Carbon Dioxide	**1.9**	**1.1**	**0.27**	**0.88**	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17
Units: % by Volume

Date Sampled:	09/07/17	09/07/17	09/07/17	
Date Prepared:	09/07/17	09/07/17	09/07/17	
Date Analyzed:	09/07/17	09/07/17	09/07/17	
AA ID No:	7I11014-10	7I11014-11	7I11014-12	
Client ID No:	SVP-106-10	SVP-105-5	SVP-105-10	
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	**16**	**16**	**15**	0.10
Carbon Dioxide	**1.5**	**1.1**	**1.6**	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by EPA TO-3 - Quality Control										
*Batch B7I1136 - *** DEFAULT PREP ****										
Blank (B7I1136-BLK1)				Prepared & Analyzed: 09/07/17						
Gasoline Range Organics (GRO)	<20	20	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.141*		*ug/L*	*0.14*		*98.5*	*70-130*			
LCS (B7I1136-BS1)				Prepared & Analyzed: 09/07/17						
Gasoline Range Organics (GRO)	**0.902**	20	ug/L	0.82		110	70-130			
Surrogate: 4-Bromofluorobenzene	*0.128*		*ug/L*	*0.14*		*89.6*	*70-130*			
LCS Dup (B7I1136-BSD1)				Prepared & Analyzed: 09/07/17						
Gasoline Range Organics (GRO)	**1.00**	20	ug/L	0.82		122	70-130	10.3	30	
Surrogate: 4-Bromofluorobenzene	*0.149*		*ug/L*	*0.14*		*104*	*70-130*			
Duplicate (B7I1136-DUP1)		**Source: 7I11014-04**		Prepared & Analyzed: 09/07/17						
Gasoline Range Organics (GRO)	**7630**	1600	ug/L		7420			2.86	30	
Surrogate: 4-Bromofluorobenzene	*0.149*		*ug/L*	*0.14*		*104*	*70-130*			
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B7I1134 - *** DEFAULT PREP ****										
Blank (B7I1134-BLK1)				Prepared & Analyzed: 09/07/17						
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							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B7I1134 - *** DEFAULT PREP ****										
Blank (B7I1134-BLK1) Continued				Prepared & Analyzed: 09/07/17						
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							
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							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B7I1134 - *** DEFAULT PREP ****										
Blank (B7I1134-BLK1) Continued				Prepared & Analyzed: 09/07/17						
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							
Surrogate: 4-Bromofluorobenzene	*0.141*		*ug/L*	*0.14*		*98.5*	*70-130*			
LCS (B7I1134-BS1)				Prepared & Analyzed: 09/07/17						

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B7I1134 - *** DEFAULT PREP ****										
LCS (B7I1134-BS1) Continued				Prepared & Analyzed: 09/07/17						
Acetone	**0.0285**	0.020	ug/L	0.024		120	70-130		30	
Benzene	**0.0334**	0.020	ug/L	0.032		105	70-130		30	
Benzyl chloride	**0.0817**	0.020	ug/L	0.052		158	70-130		30	**
Bromodichloromethane	**0.0897**	0.020	ug/L	0.067		134	70-130		30	**
Bromoform	**0.169**	0.020	ug/L	0.10		164	70-130		30	**
Bromomethane	**0.0451**	0.020	ug/L	0.039		116	70-130		30	
2-Butanone (MEK)	**0.0435**	0.020	ug/L	0.029		147	70-130		30	**
Carbon Disulfide	**0.0487**	0.020	ug/L	0.031		156	70-130		30	**
Carbon Tetrachloride	**0.0909**	0.020	ug/L	0.063		144	70-130		30	**
Chlorobenzene	**0.0596**	0.020	ug/L	0.046		129	70-130		30	
Chloroethane	**0.0302**	0.020	ug/L	0.026		114	70-130		30	
Chloroform	**0.0639**	0.020	ug/L	0.049		131	70-130		30	**
Chloromethane	**0.0228**	0.020	ug/L	0.021		110	70-130		30	
Dibromochloromethane	**0.120**	0.020	ug/L	0.085		141	70-130		30	**
1,2-Dibromoethane (EDB)	**0.101**	0.020	ug/L	0.077		131	70-130		30	**
1,2-Dichlorobenzene	**0.0881**	0.020	ug/L	0.060		147	70-130		30	**
1,3-Dichlorobenzene	**0.0856**	0.020	ug/L	0.060		142	70-130		30	**
1,4-Dichlorobenzene	**0.0821**	0.020	ug/L	0.060		136	70-130		30	**
Dichlorodifluoromethane (R12)	**0.0576**	0.020	ug/L	0.049		116	70-130		30	
1,1-Dichloroethane	**0.0487**	0.020	ug/L	0.040		120	70-130		30	
1,2-Dichloroethane (EDC)	**0.0588**	0.020	ug/L	0.040		145	70-130		30	**
cis-1,2-Dichloroethylene	**0.0470**	0.020	ug/L	0.040		119	70-130		30	
1,1-Dichloroethylene	**0.0458**	0.020	ug/L	0.040		116	70-130		30	
trans-1,2-Dichloroethylene	**0.0443**	0.020	ug/L	0.040		112	70-130		30	
1,2-Dichloropropane	**0.0579**	0.020	ug/L	0.046		125	70-130		30	
trans-1,3-Dichloropropylene	**0.0651**	0.020	ug/L	0.045		144	70-130		30	**
cis-1,3-Dichloropropylene	**0.0555**	0.020	ug/L	0.045		122	70-130		30	
Dichlorotetrafluoroethane	**0.0810**	0.020	ug/L	0.070		116	70-130		30	
Ethylbenzene	**0.0688**	0.020	ug/L	0.043		158	70-130		30	**
4-Ethyltoluene	**0.0758**	0.020	ug/L	0.049		154	70-130		30	**
Hexachlorobutadiene	**0.198**	0.020	ug/L	0.11		186	70-130		30	**
2-Hexanone (MBK)	**0.0560**	0.020	ug/L	0.041		137	70-130		30	**

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B7I1134 - *** DEFAULT PREP ****										
LCS (B7I1134-BS1) Continued				Prepared & Analyzed: 09/07/17						
Isopropanol (IPA)	**0.0387**	0.20	ug/L	0.025		157	70-130		30	**
Methylene Chloride	**0.0393**	0.020	ug/L	0.035		113	70-130		30	
4-Methyl-2-pentanone (MIBK)	**0.0580**	0.020	ug/L	0.041		142	70-130		30	**
Styrene	**0.0610**	0.020	ug/L	0.043		143	70-130		30	**
1,1,2,2-Tetrachloroethane	**0.109**	0.020	ug/L	0.069		159	70-130		30	**
Tetrachloroethylene (PCE)	**0.0755**	0.020	ug/L	0.068		111	70-130		30	
Toluene	**0.0574**	0.020	ug/L	0.038		152	70-130		30	**
1,2,4-Trichlorobenzene	**0.103**	0.020	ug/L	0.074		139	70-130		30	**
1,1,2-Trichloroethane	**0.0733**	0.020	ug/L	0.055		134	70-130		30	**
1,1,1-Trichloroethane	**0.0721**	0.020	ug/L	0.055		132	70-130		30	**
Trichloroethylene (TCE)	**0.0549**	0.020	ug/L	0.054		102	70-130		30	
Trichlorofluoromethane (R11)	**0.0746**	0.020	ug/L	0.056		133	70-130		30	**
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0879**	0.020	ug/L	0.077		115	70-130		30	
1,3,5-Trimethylbenzene	**0.0701**	0.020	ug/L	0.049		143	70-130		30	**
1,2,4-Trimethylbenzene	**0.0697**	0.020	ug/L	0.049		142	70-130		30	**
Vinyl acetate	**0.0513**	0.020	ug/L	0.035		146	70-130		30	**
Vinyl chloride	**0.0284**	0.020	ug/L	0.026		111	70-130		30	
o-Xylene	**0.0723**	0.020	ug/L	0.043		166	70-130		30	**
m,p-Xylenes	**0.136**	0.020	ug/L	0.087		156	70-130		30	**
1,2,3-Trichloropropane	**0.108**	0.020	ug/L	0.060		178	70-130		30	**
sec-Butylbenzene	**0.0802**	0.020	ug/L	0.055		146	70-130		30	**
Isopropylbenzene	**0.0756**	0.020	ug/L	0.049		154	70-130		30	**
n-Propylbenzene	**0.0735**	0.020	ug/L	0.049		150	70-130		30	**
4-Isopropyltoluene	**0.0766**	0.020	ug/L	0.055		140	70-130		30	**
Surrogate: 4-Bromofluorobenzene	*0.165*		*ug/L*	*0.14*		*115*	*70-130*			
LCS Dup (B7I1134-BSD1)				Prepared & Analyzed: 09/07/17						
Acetone	**0.0236**	0.020	ug/L	0.024		99.5	70-130	18.6	30	
Benzene	**0.0358**	0.020	ug/L	0.032		112	70-130	7.01	30	
Benzyl chloride	**0.0676**	0.020	ug/L	0.052		130	70-130	18.9	30	
Bromodichloromethane	**0.0927**	0.020	ug/L	0.067		138	70-130	3.38	30	**

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B7I1134 - *** DEFAULT PREP ****										
LCS Dup (B7I1134-BSD1) Continued				Prepared & Analyzed: 09/07/17						
Bromoform	**0.171**	0.020	ug/L	0.10		166	70-130	1.34	30	**
Bromomethane	**0.0562**	0.020	ug/L	0.039		145	70-130	21.9	30	**
2-Butanone (MEK)	**0.0287**	0.020	ug/L	0.029		97.2	70-130	41.0	30	AA-C1
Carbon Disulfide	**0.0372**	0.020	ug/L	0.031		120	70-130	26.8	30	
Carbon Tetrachloride	**0.0905**	0.020	ug/L	0.063		144	70-130	0.416	30	**
Chlorobenzene	**0.0598**	0.020	ug/L	0.046		130	70-130	0.309	30	
Chloroethane	**0.0379**	0.020	ug/L	0.026		144	70-130	22.5	30	**
Chloroform	**0.0682**	0.020	ug/L	0.049		140	70-130	6.51	30	**
Chloromethane	**0.0197**	0.020	ug/L	0.021		95.2	70-130	14.7	30	
Dibromochloromethane	**0.122**	0.020	ug/L	0.085		143	70-130	1.62	30	**
1,2-Dibromoethane (EDB)	**0.0973**	0.020	ug/L	0.077		127	70-130	3.57	30	
1,2-Dichlorobenzene	**0.0711**	0.020	ug/L	0.060		118	70-130	21.4	30	
1,3-Dichlorobenzene	**0.0732**	0.020	ug/L	0.060		122	70-130	15.5	30	
1,4-Dichlorobenzene	**0.0689**	0.020	ug/L	0.060		115	70-130	17.4	30	
Dichlorodifluoromethane (R12)	**0.0777**	0.020	ug/L	0.049		157	70-130	29.8	30	**
1,1-Dichloroethane	**0.0520**	0.020	ug/L	0.040		128	70-130	6.67	30	
1,2-Dichloroethane (EDC)	**0.0647**	0.020	ug/L	0.040		160	70-130	9.50	30	**
cis-1,2-Dichloroethylene	**0.0411**	0.020	ug/L	0.040		104	70-130	13.4	30	
1,1-Dichloroethylene	**0.0405**	0.020	ug/L	0.040		102	70-130	12.4	30	
trans-1,2-Dichloroethylene	**0.0425**	0.020	ug/L	0.040		107	70-130	4.20	30	
1,2-Dichloropropane	**0.0593**	0.020	ug/L	0.046		128	70-130	2.52	30	
trans-1,3-Dichloropropylene	**0.0624**	0.020	ug/L	0.045		138	70-130	4.27	30	**
cis-1,3-Dichloropropylene	**0.0550**	0.020	ug/L	0.045		121	70-130	0.986	30	
Dichlorotetrafluoroethane	**0.0930**	0.020	ug/L	0.070		133	70-130	13.9	30	**
Ethylbenzene	**0.0452**	0.020	ug/L	0.043		104	70-130	41.4	30	AA-C1
4-Ethyltoluene	**0.0616**	0.020	ug/L	0.049		125	70-130	20.6	30	
Hexachlorobutadiene	**0.166**	0.020	ug/L	0.11		155	70-130	18.0	30	**
2-Hexanone (MBK)	**0.0533**	0.020	ug/L	0.041		130	70-130	5.02	30	
Isopropanol (IPA)	**0.0359**	0.20	ug/L	0.025		146	70-130	7.52	30	**
Methylene Chloride	**0.0384**	0.020	ug/L	0.035		110	70-130	2.24	30	
4-Methyl-2-pentanone (MIBK)	**0.0478**	0.020	ug/L	0.041		117	70-130	19.3	30	
Styrene	**0.0412**	0.020	ug/L	0.043		96.8	70-130	38.6	30	AA-C1

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B7I1134 - *** DEFAULT PREP ****										
LCS Dup (B7I1134-BSD1) Continued				Prepared & Analyzed: 09/07/17						
1,1,2,2-Tetrachloroethane	**0.0888**	0.020	ug/L	0.069		129	70-130	20.4	30	
Tetrachloroethylene (PCE)	**0.0823**	0.020	ug/L	0.068		121	70-130	8.69	30	
Toluene	**0.0422**	0.020	ug/L	0.038		112	70-130	30.6	30	AA-C1
1,2,4-Trichlorobenzene	**0.0984**	0.020	ug/L	0.074		133	70-130	4.42	30	**
1,1,2-Trichloroethane	**0.0669**	0.020	ug/L	0.055		123	70-130	9.18	30	
1,1,1-Trichloroethane	**0.0802**	0.020	ug/L	0.055		147	70-130	10.6	30	**
Trichloroethylene (TCE)	**0.0686**	0.020	ug/L	0.054		128	70-130	22.2	30	
Trichlorofluoromethane (R11)	**0.0920**	0.020	ug/L	0.056		164	70-130	20.9	30	**
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0879**	0.020	ug/L	0.077		115	70-130	0.00	30	
1,3,5-Trimethylbenzene	**0.0602**	0.020	ug/L	0.049		122	70-130	15.3	30	
1,2,4-Trimethylbenzene	**0.0585**	0.020	ug/L	0.049		119	70-130	17.5	30	
Vinyl acetate	**0.0445**	0.020	ug/L	0.035		126	70-130	14.3	30	
Vinyl chloride	**0.0261**	0.020	ug/L	0.026		102	70-130	8.54	30	
o-Xylene	**0.0509**	0.020	ug/L	0.043		117	70-130	34.7	30	AA-C1
m,p-Xylenes	**0.0946**	0.020	ug/L	0.087		109	70-130	35.8	30	AA-C1
1,2,3-Trichloropropane	**0.0824**	0.020	ug/L	0.060		137	70-130	26.5	30	**
sec-Butylbenzene	**0.0666**	0.020	ug/L	0.055		121	70-130	18.5	30	
Isopropylbenzene	**0.0573**	0.020	ug/L	0.049		117	70-130	27.5	30	
n-Propylbenzene	**0.0591**	0.020	ug/L	0.049		120	70-130	21.6	30	
4-Isopropyltoluene	**0.0679**	0.020	ug/L	0.055		124	70-130	12.2	30	
Surrogate: 4-Bromofluorobenzene	*0.127*		*ug/L*	*0.14*		*88.4*	*70-130*			
Duplicate (B7I1134-DUP1)			**Source: 7I11014-04**	Prepared & Analyzed: 09/07/17						
Acetone	**<40**	40	ug/L		<40				30	
Allyl chloride	**<40**	40	ug/L		<40				30	
tert-Amyl Methyl Ether (TAME)	**<40**	40	ug/L		<40				30	
Benzene	**<40**	40	ug/L		<40				30	
Benzyl chloride	**<40**	40	ug/L		<40				30	
Bromodichloromethane	**<40**	40	ug/L		<40				30	
Bromoform	**<40**	40	ug/L		<40				30	
Bromomethane	**<40**	40	ug/L		<40				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B7I1134 - *** DEFAULT PREP ****										
Duplicate (B7I1134-DUP1) Continued		**Source: 7I11014-04**		Prepared & Analyzed: 09/07/17						
1,3-Butadiene	**<40**	40	ug/L		<40				30	
2-Butanone (MEK)	**<40**	40	ug/L		<40				30	
tert-Butyl alcohol (TBA)	**<40000**	40000	ug/L		<40000				30	
Carbon Disulfide	**<40**	40	ug/L		<40				30	
Carbon Tetrachloride	**<40**	40	ug/L		<40				30	
Chlorobenzene	**<40**	40	ug/L		<40				30	
Chloroethane	**<40**	40	ug/L		<40				30	
Chloroform	**<40**	40	ug/L		<40				30	
Chloromethane	**<40**	40	ug/L		<40				30	
Cyclohexane	**<40**	40	ug/L		<40				30	
Dibromochloromethane	**<40**	40	ug/L		<40				30	
1,2-Dibromoethane (EDB)	**<40**	40	ug/L		<40				30	
1,2-Dichlorobenzene	**<40**	40	ug/L		<40				30	
1,3-Dichlorobenzene	**<40**	40	ug/L		<40				30	
1,4-Dichlorobenzene	**<40**	40	ug/L		<40				30	
Dichlorodifluoromethane (R12)	**<40**	40	ug/L		<40				30	
1,1-Dichloroethane	**<40**	40	ug/L		<40				30	
1,2-Dichloroethane (EDC)	**<40**	40	ug/L		<40				30	
cis-1,2-Dichloroethylene	**<40**	40	ug/L		<40				30	
1,1-Dichloroethylene	**<40**	40	ug/L		<40				30	
trans-1,2-Dichloroethylene	**<40**	40	ug/L		<40				30	
1,2-Dichloropropane	**<40**	40	ug/L		<40				30	
trans-1,3-Dichloropropylene	**<40**	40	ug/L		<40				30	
cis-1,3-Dichloropropylene	**<40**	40	ug/L		<40				30	
Dichlorotetrafluoroethane	**<40**	40	ug/L		<40				30	
Diisopropyl ether (DIPE)	**<40**	40	ug/L		<40				30	
1,4-Dioxane	**<40**	40	ug/L		<40				30	
Ethanol	**<40**	40	ug/L		<40				30	
Ethyl Acetate	**<40**	40	ug/L		<40				30	
Ethylbenzene	**<40**	40	ug/L		<40				30	
Ethyl-tert-Butyl Ether (ETBE)	**<40**	40	ug/L		<40				30	
4-Ethyltoluene	**<40**	40	ug/L		<40				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B7I1134 - *** DEFAULT PREP ****										
Duplicate (B7I1134-DUP1) Continued	**Source: 7I11014-04**		Prepared & Analyzed: 09/07/17							
Heptane	**<40**	40	ug/L		<40				30	
Hexachlorobutadiene	**<40**	40	ug/L		<40				30	
n-Hexane	**<40**	40	ug/L		<40				30	
2-Hexanone (MBK)	**<40**	40	ug/L		<40				30	
Isopropanol (IPA)	**<400**	400	ug/L		<400				30	
Methyl-tert-Butyl Ether (MTBE)	**<40**	40	ug/L		<40				30	
Methylene Chloride	**<40**	40	ug/L		<40				30	
4-Methyl-2-pentanone (MIBK)	**<40**	40	ug/L		<40				30	
Naphthalene	**<40**	40	ug/L		<40				30	
Propylene	**<40**	40	ug/L		<40				30	
Styrene	**<40**	40	ug/L		<40				30	
1,1,2,2-Tetrachloroethane	**<40**	40	ug/L		<40				30	
Tetrachloroethylene (PCE)	**<40**	40	ug/L		<40				30	
Tetrahydrofuran (THF)	**<40**	40	ug/L		<40				30	
Toluene	**<40**	40	ug/L		<40				30	
1,2,4-Trichlorobenzene	**<40**	40	ug/L		<40				30	
1,1,2-Trichloroethane	**<40**	40	ug/L		<40				30	
1,1,1-Trichloroethane	**<40**	40	ug/L		<40				30	
Trichloroethylene (TCE)	**<40**	40	ug/L		<40				30	
Trichlorofluoromethane (R11)	**<40**	40	ug/L		<40				30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**<40**	40	ug/L		<40				30	
1,3,5-Trimethylbenzene	**<40**	40	ug/L		<40				30	
1,2,4-Trimethylbenzene	**<40**	40	ug/L		<40				30	
2,2,4-Trimethylpentane	**<40**	40	ug/L		<40				30	
Vinyl acetate	**<40**	40	ug/L		<40				30	
Vinyl bromide	**<40**	40	ug/L		<40				30	
Vinyl chloride	**<40**	40	ug/L		<40				30	
o-Xylene	**<40**	40	ug/L		<40				30	
m,p-Xylenes	**<40**	40	ug/L		<40				30	
1,2,3-Trichloropropane	**<40**	40	ug/L		<40				30	
sec-Butylbenzene	**<40**	40	ug/L		<40				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B7I1134 - *** DEFAULT PREP ****										
Duplicate (B7I1134-DUP1) Continued			**Source: 7I11014-04**	Prepared & Analyzed: 09/07/17						
Isopropylbenzene	**<40**	40	ug/L		<40				30	
n-Propylbenzene	**<40**	40	ug/L		<40				30	
4-Isopropyltoluene	**<40**	40	ug/L		<40				30	
n-Butylbenzene	**<40**	40	ug/L		<40				30	
Surrogate: 4-Bromofluorobenzene	*0.149*		*ug/L*	*0.14*		*104*	*70-130*			
Fixed Gases by TCD - Quality Control										
*Batch B7I1218 - *** DEFAULT PREP ****										
Blank (B7I1218-BLK1)				Prepared & Analyzed: 09/07/17						
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B7I1218-BS1)				Prepared & Analyzed: 09/07/17						
Methane	**4.24**	0.10	% by Volume	4.5		94.2	75-125			
Oxygen	**3.77**	0.10	% by Volume	4.0		94.2	75-125			
Carbon Dioxide	**12.4**	0.10	% by Volume	15		82.4	75-125			
LCS Dup (B7I1218-BSD1)				Prepared & Analyzed: 09/07/17						
Methane	**4.28**	0.10	% by Volume	4.5		95.2	75-125	1.06	30	
Oxygen	**3.73**	0.10	% by Volume	4.0		93.3	75-125	0.960	30	
Carbon Dioxide	**12.3**	0.10	% by Volume	15		82.0	75-125	0.478	30	
Duplicate (B7I1218-DUP1)			**Source: 7I11014-04**	Prepared & Analyzed: 09/07/17						
Methane	**<0.10**	0.10	% by Volume		<0.10				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: [none]
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187317
Date Received: 09/08/17
Date Reported: 09/12/17

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
*Batch B7I1218 - *** DEFAULT PREP ****										
Duplicate (B7I1218-DUP1) Continued			**Source: 7I11014-04**	Prepared & Analyzed: 09/07/17						
Oxygen	**15.7**	0.10	% by Volume		15.6			0.389	30	
Carbon Dioxide	**1.90**	0.10	% by Volume		1.91			0.577	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187317
Project No:	[none]	**Date Received:**	09/08/17
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	09/12/17

Special Notes

[1] = ****** : Exceeds upper control limit.

[2] = **AA-C1** : Exceeds RPD control limit.

[3] = **R-05** : The sample was diluted due to the presence of high levels of non-target analytes resulting in elevated reporting limits.

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.: 13660
70049663
Page 1 of 1

Client: CH2MHILL
Project Name / No.: KINDER MORGAN NORWALK
Sampler's Name: William [illegible]
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)

Please enter the TAT Turnaround Codes ** below

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	TO15	TO3	FIXED GASES							Special Instructions
SVP-109-5	7I1104-1	9-7-17	0756	V	3	X	X	X							
SVP-109-10	-2		0758	V	3	X	X	X							
SVP-108-5	-3		0910	V	3	X	X	X							
SVP-108-10	-4		0930	V	3	X	X	X							
SVP-108-10 DUP	-5		0930	V	3	X	X	X							
SVP-107-5	-6		1010	V	3	X	X	X							
SVP-107-10	-7		1013	V	3	X	X	X							
AMBIENT AIR	-8		1020	V	1	X	X								
SVP-106-5	-9		1047	V	3	X	X	X							
SVP-106-10	-10		1049	V	3	X	X	X							
SVP-105-5	-11		1125	V	3	X	X	X							
SVP-105-10	-12	↓	1127	V	3	X	X	X							

For Laboratory Use
REVIEWED
Date 9/18/17 Time 10:00
TAT 5 Days Sign: [signature]

Relinquished by	Date	Time	Received by
[signature]	9-7-17	1230	[signature]
[signature]	9/8/17	10:00	[signature]

A.A. Project No.: MB187317/7I11014

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

Attachment E
March 2019 Soil Vapor Analytical Results

Table 8. Field Measurements and Laboratory Soil Vapor Analytical Results - March 2019

SFPP Norwalk Pump Station, Norwalk, California

Analyte Type	Analyte	Unit	Current Residential Soil Gas Screening Level [a, b]	Current Commercial Soil Gas Screening Level [a, b]	SVM-1-5 03/18/2019 SVM-1 5-5.5	SVM-1-14.5 03/18/2019 SVM-1 14.5-15	SVM-2-5 03/18/2019 SVM-2 5-5.5	SVM-3-5 03/18/2019 SVM-3 5-5.5	SVM-3-15 03/18/2019 SVM-3 15-15.5	SVM-5-5 03/19/2019 SVM-5 5-5.5	SVM-5-15.5 03/19/2019 SVM-5 15.5-16	SVM-6-6.5 03/19/2019 SVM-6 6.5-7	SVM-6-15.5 03/19/2019 SVM-6 15.5-16	SVM-7-7 03/19/2019 SVM-7 7-7.5
Field Measurements	Pressure	inches H_2O	---	---	-0.16	-2.02	-0.19	0.00	-0.16	-0.16	-1.10	0.00	-0.37	-0.09
	PID	ppmv	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COPCs[c]	1,2,4-Trimethylbenzene	µg/L	63	262	<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	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
	1,3,5-Trimethylbenzene	µg/L	63	262	<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	**1.4**	<0.2	<0.2	<0.2	**0.72**	<0.2	<0.2	<0.2
	Benzene	µg/L	0.097	0.42	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
	Ethylbenzene	µg/L	1.1	4.9	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Isopropylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	m,p-Xylenes	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Methyl tert-butyl ether (MTBE)	µg/L	11	47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Naphthalene	µg/L	0.083	0.36	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
	n-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Propylbenzene	µg/L	1000	4400	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	o-Xylene	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	sec-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	tert-Butanol (TBA)	µg/L	---	---	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	Toluene	µg/L	5200	22400	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Other Detected Compounds	Acetone	µg/L	32000	140000	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.027**	<0.02	<0.02	<0.02
	Carbon Disulfide				<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Chloroform				<0.02	<0.02	<0.02	**0.021**	<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
	Tetrachloroethylene (PCE)	µg/L	0.46	2.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Tetrahydrofuran (THF)				<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
Fixed Gases	Methane	% v/v	---	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
	Oxygen	% v/v	---	---	**18**	**18**	**18**	**16**	**17**	**19**	**19**	**19**	**19**	**19**
	Carbon Dioxide	% v/v	---	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	**0.16**	**0.26**

Notes:

[a] Source for the Indoor Air Screening Levels: DTSC, 2016. Human Health Risk Assessment (HHRA) Note Number 3:
DTSC Recommended Methodology for useof 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-June-2018.pdf

[b] 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

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

SVM-11-7	Blue highlighting indicates onsite soil vapor probe locations
10	Yellow highlighting indicates concentration exceeds human health screening level under residential scenario.

TPH-g = total petroleum hydrocarbons quantified as gasoline
11/12/2018 - 11/14/2018 = sample date
SVM-1 = sample location
SVM-1-5 = sample ID
5-5.5 = sample depth in feet below ground surface
--- = 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

Table 8. Field Measurements and Laboratory Soil Vapor Analytical Results - March 2019

SFPP Norwalk Pump Station, Norwalk, California

Analyte Type	Analyte	Unit	Current Residential Soil Gas Screening Level [a, b]	Current Commercial Soil Gas Screening Level [a, b]	SVM-7-13.25 03/19/2019 SVM-7 13.25-13.75	SVM-7-13.25 DUP 03/19/2019 SVM-7 13.25-13.75	SVM-8-5 03/19/2019 SVM-8 5-5.5	SVM-8-15 03/19/2019 SVM-8 15-15.5	SVM-10-15.5 03/19/2019 SVM-10 15.5-16	SVM-11-7 03/18/2019 SVM-11 7-7.5	SVM-11-15 03/18/2019 SVM-11 15-15.5	SVM-11-21 03/18/2019 SVM-11 21-21.5	SVM-12-7 03/18/2019 SVM-12 7-7.5	SVM-12-15 03/18/2019 SVM-12 15-15.5
Field Measurements	Pressure	inches H_2O	---	---	-0.19	-0.19	-0.05	-0.24	0.0	-0.30	-0.02	-0.34	0.00	0.0
	PID	ppmv	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0
COPCs[c]	1,2,4-Trimethylbenzene	µg/L	63	262	<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	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
	1,3,5-Trimethylbenzene	µg/L	63	262	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	2-Propanol (leak test compound)	µg/L	---	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Benzene	µg/L	0.097	0.42	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
	Ethylbenzene	µg/L	1.1	4.9	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Isopropylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	m,p-Xylenes	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Methyl tert-butyl ether (MTBE)	µg/L	11	47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Naphthalene	µg/L	0.083	0.36	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
	n-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Propylbenzene	µg/L	1000	4400	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	o-Xylene	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	sec-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	tert-Butanol (TBA)	µg/L	---	---	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	Toluene	µg/L	5200	22400	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Other Detected Compounds	Acetone	µg/L	32000	140000	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Carbon Disulfide				<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Chloroform				<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
	Tetrachloroethylene (PCE)	µg/L	0.46	2.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.08**	<0.01	<0.01
	Tetrahydrofuran (THF)				<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
Fixed Gases	Methane	% v/v	---	---	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2
	Oxygen	% v/v	---	---	**18**	**18**	**19**	**19**	**15**	**18**	**15**	**10**	**17**	**16**
	Carbon Dioxide	% v/v	---	---	**0.43**	**0.41**	<0.1	**0.14**	**3.4**	<0.2	**0.42**	**5.3**	**0.25**	**0.86**

Notes:

[a] Source for the Indoor Air Screening Levels: DTSC, 2016. Human Health Risk Assessment (HHRA) Note Number 3:
DTSC Recommended Methodology for useof 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-June-2018.pdf

[b] 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

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

SVM-11-7	Blue highlighting indicates onsite soil vapor probe locations
10	Yellow highlighting indicates concentration exceeds human health screening level under residential scenar

TPH-g = total petroleum hydrocarbons quantified as gasoline
11/12/2018 - 11/14/2018 = sample date
SVM-1 = sample location
SVM-1-5 = sample ID
5-5.5 = sample depth in feet below ground surface
--- = 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

Table 8. Field Measurements and Laboratory Soil Vapor Analytical Results - March 2019

SFPP Norwalk Pump Station, Norwalk, California

Analyte Type	Analyte	Unit	Current Residential Soil Gas Screening Level [a, b]	Current Commercial Soil Gas Screening Level [a, b]	SVM-12-22 03/18/2019 SVM-12 22-22.5	SVM-12-22 DUP 03/18/2019 SVM-12 22-22.5	SVM-13-7 03/18/2019 SVM-13 7-7.5	SVM-13-15.5 03/18/2019 SVM-13 15.5-16	SVM-13-22.5 03/18/2019 SVM-13 22.5-23	SVM-14R-7 03/18/2019 SVM-14R 7-7.5	SVM-14R-15 03/18/2019 SVM-14R 15-15.5	SVM-14R-22 03/18/2019 SVM-14R 22-22.5	SVM-15-7 03/19/2019 SVM-15 7-7.5	SVM-15-15 03/19/2019 SVM-15 15-15.5
Field Measurements	Pressure	inches H_2O	---	---	0.0	0.0	-3.61	-16.71	-18.20	-1.0	-37.2	54	-0.13	-0.24
	PID	ppmv	---	---	0.1	0.1	9.0	1.9	5.4	0.1	0.0	0.7	0.0	0.0
COPCs[c]	1,2,4-Trimethylbenzene	µg/L	63	262	<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	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
	1,3,5-Trimethylbenzene	µg/L	63	262	<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	**2.9**	<0.2	<0.2	<0.2	<0.2
	Benzene	µg/L	0.097	0.42	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	**0.0089**	<0.003
	Ethylbenzene	µg/L	1.1	4.9	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Isopropylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	m,p-Xylenes	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.029**	<0.02
	Methyl tert-butyl ether (MTBE)	µg/L	11	47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Naphthalene	µg/L	0.083	0.36	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
	n-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Propylbenzene	µg/L	1000	4400	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	o-Xylene	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	sec-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	tert-Butanol (TBA)	µg/L	---	---	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	Toluene	µg/L	5200	22400	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.044**	<0.02
Other Detected Compounds	Acetone	µg/L	32000	140000	<0.02	<0.02	<0.02	<0.02	<0.02	**0.062**	**0.024**	<0.02	<0.02	<0.02
	Carbon Disulfide				<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Chloroform				<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	**0.03**	**0.032**	<0.02	**0.16**	<0.02
	Tetrachloroethylene (PCE)	µg/L	0.46	2.0	**0.011**	**0.013**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Tetrahydrofuran (THF)				<0.02	<0.02	<0.02	<0.02	**0.022**	<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
Fixed Gases	Methane	% v/v	---	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1
	Oxygen	% v/v	---	---	**14**	**14**	**18**	**17**	**17**	**18**	**17**	**14**	**18**	**19**
	Carbon Dioxide	% v/v	---	---	**2.2**	**2.8**	<0.2	<0.2	**0.47**	<0.2	<0.2	**1.9**	<0.1	**0.1**

Notes:

[a] Source for the Indoor Air Screening Levels: DTSC, 2016. Human Health Risk Assessment (HHRA) Note Number 3:
DTSC Recommended Methodology for useof 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-June-2018.pdf

[b] 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

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

SVM-11-7	Blue highlighting indicates onsite soil vapor probe locations
10	Yellow highlighting indicates concentration exceeds human health screening level under residential scenar

TPH-g = total petroleum hydrocarbons quantified as gasoline
11/12/2018 - 11/14/2018 = sample date
SVM-1 = sample location
SVM-1-5 = sample ID
5-5.5 = sample depth in feet below ground surface
--- = 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

Table 8. Field Measurements and Laboratory Soil Vapor Analytical Results - March 2019

SFPP Norwalk Pump Station, Norwalk, California

Analyte Type	Analyte	Unit	Current Residential Soil Gas Screening Level [a, b]	Current Commercial Soil Gas Screening Level [a, b]	SVM-15-22 03/19/2019 SVM-15 22-22.5	SVM-16-7 03/19/2019 SVM-16 7-7.5	SVM-16-15.5 03/19/2019 SVM-16 15.5-16	SVM-16-22 03/19/2019 SVM-16 22-22.5	Ambient Air 03/18/2019	Ambient Air 03/19/2019
Field Measurements	Pressure	inches H_2O	---	---	-3.09	0.0	-0.19	-0.27	---	---
	PID	ppmv	---	---	0.0	0.0	0.0	0.0	---	---
COPCs[c]	1,2,4-Trimethylbenzene	µg/L	63	262	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	1,2-Dichloroethane	µg/L	0.11	0.47	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
	1,3,5-Trimethylbenzene	µg/L	63	262	<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
	Benzene	µg/L	0.097	0.42	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
	Ethylbenzene	µg/L	1.1	4.9	<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
	m,p-Xylenes	µg/L	100	440	<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
	Naphthalene	µg/L	0.083	0.36	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
	n-Butylbenzene	µg/L	---	---	<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
	o-Xylene	µg/L	100	440	<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
	tert-Butanol (TBA)	µg/L	---	---	<20	<20	<20	<20	<20	<20
	Toluene	µg/L	5200	22400	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Other Detected Compounds	Acetone	µg/L	32000	140000	<0.02	**0.021**	<0.02	<0.02	**0.021**	<0.02
	Carbon Disulfide				<0.02	**0.02**	<0.02	<0.02	<0.02	<0.02
	Chloroform				<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Ethanol	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	**0.032**	<0.02
	Tetrachloroethylene (PCE)	µg/L	0.46	2.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Tetrahydrofuran (THF)				<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
Fixed Gases	Methane	% v/v	---	---	<0.1	<0.1	<0.1	<0.1	---	---
	Oxygen	% v/v	---	---	**18**	**19**	**18**	**3.6**	---	---
	Carbon Dioxide	% v/v	---	---	**0.76**	**0.21**	**0.5**	**11**	---	---

Notes:

[a] Source for the Indoor Air Screening Levels: DTSC, 2016. Human Health Risk Assessment (HHRA) Note Number 3:
DTSC Recommended Methodology for useof 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-June-2018.pdf

[b] 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

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

SVM-11-7	Blue highlighting indicates onsite soil vapor probe locations
10	Yellow highlighting indicates concentration exceeds human health screening level under residential scenar

TPH-g = total petroleum hydrocarbons quantified as gasoline
11/12/2018 - 11/14/2018 = sample date
SVM-1 = sample location
SVM-1-5 = sample ID
5-5.5 = sample depth in feet below ground surface
--- = 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