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**RECEIVED**

*By Alameda County Environmental Health 2:43 pm, Oct 27, 2016*

Ms. Dilan Roe  
Alameda County Health Care Services Agency  
Department of Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502-6577

**Re: 1233 Bockman Road**  
San Lorenzo, California  
ACEH Case No: RO00003217

Dear Ms. Roe:

PaulsCorp, LLC, has retained Pangea Environmental Services, Inc. (Pangea) for environmental consulting services for the project referenced above. Pangea is submitting the attached report on my behalf.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached report are true and correct to the best of my knowledge.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Andrew J. Lavaux'.

Andrew J. Lavaux  
Managing Director Multifamily Development



October 26, 2016

Andrew Lavaux  
PAULS Corporation, LLC  
100 Saint Paul Street  
Denver, Colorado 80206

Re: **Interim Remediation Report**  
Bockman Road Property  
1233 Bockman Road  
San Lorenzo, California 94577  
ACDEH Case # RO00003217

Dear Mr. Lavaux:

On behalf of PAULS Corporation, LLC, PANGEA Environmental Services, Inc. (PANGEA) prepared this *Interim Remediation Report* for the subject property. This report documents soil excavation activities and post-excavation compliance sampling in the area of the former auto repair facility of the subject site. The work was conducted in accordance with the *Site Management Plan* (SMP). The SMP provided procedures and to address potential soil impacts that might be encountered during site grading work at the western portion of the Site.

If you have any questions or comments, please call me at (510) 435-8664 or email [briddell@pangeaenv.com](mailto:briddell@pangeaenv.com).  
Sincerely,

**PANGEA Environmental Services, Inc.**

A handwritten signature in blue ink, appearing to read "Bob Clark-Riddell".

Bob Clark-Riddell, P.E.  
Principal Engineer

Attachment: *Interim Remediation Report*

**PANGEA Environmental Services, Inc.**

1710 Franklin Street, Suite 200, Oakland, CA 94612 Telephone 510.836.3700 Facsimile 510.836.3709 [www.pangeaenv.com](http://www.pangeaenv.com)



## INTERIM REMEDIATION REPORT

**Bockman Road Property  
1233 Bockman Road  
San Leandro, California 94577  
ACDEH Case # RO00003217**

**October 26, 2016**

*Prepared for:*

Andrew Lavaux  
PAULS Corporation, LLC  
100 Saint Paul Street  
Denver, Colorado 80206

*Prepared by:*

PANGEA Environmental Services, Inc.  
1710 Franklin Street, Suite 200  
Oakland, California 94612

*Written by:*



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Ron Scheele, P.G.  
Principal Geologist

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Bob Clark-Riddell, P.E.  
Principal Engineer

**PANGEA Environmental Services, Inc.**

1710 Franklin Street, Suite 200, Oakland, CA 94612 Telephone 510.836.3700 Facsimile 510.836.3709 [www.pangeaenv.com](http://www.pangeaenv.com)

## INTRODUCTION

On behalf of PAULS Corporation, LLC (PaulsCorp, LLC), PANGEA Environmental Services, Inc. (PANGEA) has prepared this *Interim Remediation Report* (IRR) for the subject property located at 1233 Bockman Road in San Lorenzo, California (Site) (Figure 1). This IRR documents soil excavation activities in the area of the former auto repair facility. The work was conducted in accordance with a *Site Management Plan* (SMP) prepared by ENGEO dated May 16, 2016 and a *SMP Supplement* prepared by PANGEA dated August 17, 2016. The SMP and SMP Supplement provided procedures and protocols to address potential soil impacts that might be encountered while developing the Site and to facilitate grading work at the western portion of the Site.

Upon encountering soil impact, PANGEA further characterized and managed Site soil in August and September 2016 consistent with SMP procedures. PANGEA notified the Alameda County Department of Environmental Health (ACDEH) and assisted with the excavation of impacted soil and associated confirmation sampling. SMP implementation involved the following activities:

- Hoist area exploratory excavation and confirmation sampling on August 30, 2016.
- Additional soil gas characterization in the hoist area on September 1, 2016.
- Exploratory excavation and sampling on September 2, 2016, followed by extensive soil excavation and confirmation soil sampling on September 7 and 8, 2016.
- Groundwater characterization on September 7 and 8, 2016.
- Post-excavation confirmation soil gas assessment on September 19 and October 20, 2016.

These activities, the Site background, and our conclusions and recommendations are described below.



## **SITE BACKGROUND**

### **Site Description and History**

The Site consists of an approximately 3.87-acre lot along Bockman road in San Lorenzo, California (Figure 2). The property is owned and being redeveloped by PaulsCorp, LLC into 53 two-story residential units. The assessor parcel number (APN) for the Site is 411-63-17. The subject property is relatively flat and lies at an elevation of about 20 feet (ft) above mean sea level. There are currently no buildings onsite but historically the Site consisted of a strip mall and associated parking lot and an automotive repair facility in the west portion of the Site (Figure 3). The Site is surrounded in all directions by single and multi-family residences.

### **Previous Environmental Work**

Previous environmental work included two Phase I Environmental Site Assessments performed in 2004 and 2015 and several subsurface investigations in 2015 and 2016. Details of the previous work conducted at the Site is documented in Engeo's *Phase II Environmental Site Assessment* dated July 2, 2015, Engeo's *Revised Phase II Environmental Site Assessment* dated August 2, 2016, PANGEA's *Site Assessment Report (SAR)* dated August 26, 2016 and PANGEA's *Draft Corrective Action Plan (Draft CAP)* dated October 7, 2016 (Revised October 14, 2016). All sampling locations at the Site are shown on Figure 2. Soil, groundwater and soil gas sampling data is summarized in Tables 1, 2, and 3, respectively.

In the area of the former auto repair facility specifically, six soil samples from two initial soil borings (S-1 and S-2) were collected by Engeo in June 2015. An additional soil sample from a third soil boring (SV-28) was collected by PANGEA in August 2016. Two grab groundwater samples (GW-1) were collected by Engeo in June 2015 and July 2016, and three subsequent grab groundwater samples (SB-7, SB-13 and Pit) were collected by PANGEA in August and September 2016. One initial soil gas sample (SG-1) was collected by Engeo in August 2015, and two additional soil gas samples (SV-28 and SV-29) were collected by PANGEA in August and September, 2016. As indicated above, these sampling activities are described in Engeo's Phase II SAR, and PANGEA's SAR and Draft CAP. The apparent primary condition of concern was the detection of tetrachloroethylene (PCE) in soil gas in SV-28 near the 2016 Tier 1 Environmental Screening Level (ESL) established by the San Francisco Bay Regional Water Quality Control Board. Subsequent assessment performed in conjunction with the SMP implementation is documented below.

## **Site Geology and Hydrogeology**

The Site property is located within the East Bay Plain subbasin, which is part of the larger Santa Clara Valley Groundwater Basin. The East Bay Plain subbasin is a northwest trending alluvial plain bounded to the north by San Pablo bay, to the east by the contact with Franciscan Basement rock, and to the south by the Niles Cone Groundwater basin. The basin extends beneath San Francisco Bay to the west. Groundwater is generally found very near the surface throughout the basin.

The East Bay Plain subbasin aquifer system consists of unconsolidated sediments of Quaternary age. The Early Holocene Temescal Formation is the most recently deposited and consists of primarily silts and clays with some gravel layers.

The relatively flat Site lies at an elevation of approximately 20 feet above mean sea level to the east of San Francisco Bay (Figure 1). Soil beneath the Site consists of sandy gravel fill to approximately 1 ft below grade surface (bgs) underlain by 2 to 3 ft of moderately plastic clay. The clay layer is underlain by silt to 9 ft bgs and clay to a total explored depth of 10 ft bgs. In portions of the Site, a discontinuous, one-foot thick sand lens is intermittently observed between 6 and 10 feet bgs. PANGEA observed groundwater between 7 and 9 feet bgs. Based on data from neighboring sites, static groundwater is approximately 8 ft bgs (1201 Bockman) and groundwater flows to the northwest. Further lithologic and groundwater data including a geologic cross-section can be found in PANGEA's SAR and Draft CAP.

## **HOIST AREA EXPLORATORY EXCAVATION**

During initial Site grading activities, PANGEA was notified of potential VOC-impacted soil in the vicinity of the former auto repair facility and the hoist area. PANGEA responded to the Site on August 30, 2016.

PANGEA worked with Site construction contractor DCI Construction Inc. (DCI) of Walnut Creek, California, to perform the exploratory soil excavation and associated sampling. Prior to excavation, the Site was marked for Underground Service Alert (USA) and a subsurface utility contractor was used to clear the planned excavation area. A site safety plan was prepared to protect human health and minimize nuisance to nearby residences. The area was secured by a chain-link fence.

On August 30, 2016, PANGEA supervised the removal of approximately 90 cubic yards (CY) of soil from the vicinity of two former two hydraulic hoists located within the footprint of the former auto repair building. Soil was excavated to a depth of 8 ft bgs surrounding soil gas probe SV-32. The exploratory excavation was conducted to search for potential hoists and for potential source material contributing to the PCE impact reported in soil gas well SV-28. The excavation extent is shown on Figure 3. Three confirmation soil samples (H-1, H-2, and H-3) were collected at 8 ft from the bottom of the excavation within the footprint of

the former auto repair building. Soil samples were analyzed for total petroleum hydrocarbons as diesel (TPHd) and TPH as motor oil (TPHmo) by EPA Method 8015B volatile organic compounds (VOC) by EPA Method 8260B, semi-volatile organic compounds (SVOC) by EPA Method 8270, and polychlorinated biphenyls (PCB) by EPA Method 8082.

Low levels of diesel- and motor-range hydrocarbons were detected in samples H-1 and H-3 from the hydraulic hoist area. No PCBs or VOCs were detected, except for a trace levels of naphthalene (0.0084 mg/kg) and acetone (maximum of 0.059 mg/kg). The laboratory analytical reports are presented in Appendix D. Soil analytical results from excavation soil sampling are summarized in Table 1. TPH concentrations after excavation are presented on Figure 4. VOC concentrations in soil after excavation are presented on Figure 5.

### **ADDITIONAL SOIL GAS CHARACTERIZATION IN HOIST AREA**

To further characterize PCE impact in soil gas previously detected in well SV-28, three soil gas wells were installed on August 30, 2016. Soil gas wells SV-30 and SV-31 were installed west of well SV-28 and well SV-32 was installed adjacent to former well SV-28 in accordance with Alameda County Public Works Agency (ACPWA) permit #W2016-0636. A copy of the permit is provided in Appendix A. Soil gas probe locations are shown on Figure 3.

The soil gas wells were installed by Penecore to a depth of 7 ft. All soil vapor probes were constructed by setting a vapor implant attached to ¼-inch Teflon™ tubing at 6 or 6.5 feet bgs and backfilling the annular space with Monterey #3 sand pack up to 5 feet bgs. A ½ foot of dry bentonite crumbles was poured on top of the sand and the remaining annular space was backfilled with hydrated bentonite. The Teflon™ tubing was set in a 2-inch PVC riser and capped to prevent moisture from entering.

On September 1, 2016, PANGEA sampled wells SV-30 through SV-32. Due to the naturally tight formation, the soil vapor probes were purged upon install between 24 and 48 hours prior to sampling. Samples were collected by connecting a 1-liter Summa™ canister to the tubing through a flow rate regulator calibrated to a rate of approximately 100-200 milliliters per minute (mL/min). To further evaluate potential leakage within the sampling system, a leak-check enclosure/shroud was placed over the sample train and isopropyl alcohol was introduced into the shroud. A PID was used to monitor and maintain a minimum 10% concentration of isopropyl alcohol within the shroud during sample collection. Soil vapor probe field forms are provided in Appendix B. Soil gas samples were transported to Curtis and Tompkins (C&T) following chain-of-custody protocol. Samples were analyzed for VOCs by EPA Method TO-15. Following soil gas sampling, soil vapor probes SV-30, SV-31, and SV-32 were destroyed per permit requirements.

VOCs including PCE, benzene, toluene, ethylbenzene, xylenes, and chloroform were detected in various soil gas samples. No VOCs were detected above their respective residential ESLs for soil gas. Soil gas sample

results for PCE, benzene and ethylbenzene are shown on Figures 7 through 9 and summarized in Table 3. Soil gas analytical reports are presented in Appendix D.

## IMPACTED SOIL DELINEATION AND EXCAVATION

During grading close to Bockman Road, DCI encountered stained hydrocarbon-impacted soil in shallow soil. To further assess the presence of impacted soil, PANGEA assisted with shallow soil sampling and exploratory pit excavation sampling.

On September 2, 2016, PANGEA collected five shallow soil samples (SS-1 through SS-5) south and southeast of the former auto repair building at a depth of 2.5 ft bgs. Initial hydrocarbon screening of the top 2.5 ft of shallow soil with a PID detected reading of 0.5 ppm in soil sample SS-3 located southeast of the former building. Fill material including pea gravel, wood and piping was encountered while collecting soil sample SS-3. The fill material could represent a former underground storage (UST) tank pit with old piping leading back to the auto repair building, so four deeper pits (Pit-1 through Pit-4) were excavated to 8 to 10 ft bgs. Additional soil samples (SS-6 through SS-9) were collected from these four pits. Pit-1 was dug in the area where the fill material was initially identified; hydrocarbon odors and staining soil were observed between 3 and 6 ft bgs in Pit-1. Hydrocarbon screening of the soil showed PID readings of 7.8 ppm in Pit-1 (SS-6 at 8 ft bgs) and **110 ppm** in Pit-4 (SS-9 at 8 ft bgs). No PID readings were detected in soil samples from Pit-2 (SS-7 at 8 ft) and Pit-3 (SS-8 at 8 ft bgs).

Based on the elevated PID readings (a maximum of 110 ppm), lab data, and apparent historic hydrocarbon release in this area, extensive excavation was conducted to remove any obviously impacted material based on field observations. Excavation was performed to help remove VOCs that would otherwise represent a potential vapor intrusion concern beneath the future residences.

On September 7 and 8, 2016, approximately 600 CY of impacted soil was excavated around and between Pit-1 and Pit-4 to depths ranging from 8 to 12 ft, respectively. The excavation extent and depth is shown on Figure 3. TPH-impacted soil previously detected at 2.5 ft in SS-2 (**1,400 mg/kg TPHd**) and at 8.0 ft in SS-9 (**650 mg/kg TPHd**) were over-excavated, along with VOC-impacted soil at 8.0 ft in SS-6 (**0.0084 mg/kg naphthalene**).

Following soil excavation activities, confirmation soil samples were collected from the sidewalls (SW-1 through SW-6) and bottom of the excavation (BS-1 through BS-7). Soil samples were analyzed for total petroleum hydrocarbons as gasoline (TPHg) by EPA Method 8015B and VOCs by EPA Method 8260B.

No TPH or VOC were detected in any of the 13 confirmation soil samples. TPH concentrations in soil after excavation are presented on Figure 4 and VOC concentrations in soil after excavation are presented on

Figure 5. Soil sample results are summarized in Table 1. The laboratory analytical reports are presented in Appendix D.

After confirmation sampling, DCI backfilled and compacted the excavation areas using graded material available at the Site, in preparation for their building construction. PANGEA did not supervise backfilling/compaction activities.

Soil excavated from the former auto repair area was stockpiled onsite for soil profiling for disposal. Five 4-pt composite samples were analyzed for TPHg/TPHd/TPHmo by EPA Method 8015B, VOC by EPA Method 8260B, PCB by EPA Method 8082, and CAM-17 Metals by EPA Method 6010B/7471A. PANGEA is assisting with soil profiling for disposal at an appropriate facility.

## **GROUNDWATER CHARACTERIZATION**

During the soil excavation, groundwater was observed at 8 ft bgs. On September 7, 2016, PANGEA collected a grab groundwater sample (Pit) from the center of the open excavation. On September 8, 2016, PANGEA coordinated the drilling of three soil borings (SB-11 through SB-13) by Penecore Drilling of Woodland, California to characterize groundwater in the vicinity of the hydrocarbon impact found in soil. Soil borings were drilled in accordance with ACPWA permit # W2016-0637 and a copy of the permit is provided in Appendix A. Of the three borings advanced, only SB-13 produced sufficient water for sample collection when left open overnight.

Groundwater was sampled by setting 1-inch slotted PVC in the open boring and using a peristaltic pump to pull water through Teflon™ tubing. Water was collected into 40 milliliter vials preserved with hydrochloric acid. The vials were stored on ice and transported to Curtis & Tompkins (C&T) following chain-of-custody protocol. Samples were analyzed for VOCs by EPA Method 8260B and TPHg/TPHd/TPHmo by EPA Method 8015B. The laboratory analytical reports are presented in Appendix D. The borings were destroyed by tremie grouting Portland cement under the supervision of an ACPWA inspector and per permit guidelines.

Low levels of hydrocarbons were detected in the grab groundwater samples. No VOCs were detected except for a trace detection of N-butylbenzene (0.64 ug/L) and 1,2,4-trimethylbenzene (1.6 ug/L) in the Pit sample. Grab groundwater analytical results are summarized in Table 2 and PCE, benzene and ethylbenzene concentrations are presented on Figure 6.

## **POST-EXCAVATION SOIL GAS CONFIRMATION SAMPLING**

In September and October 2016, ten (10) temporary soil vapor probes (SV-41 through SV-50) were installed to evaluate soil gas conditions following interim soil remediation. The probe locations are shown on Figure 3. The soil vapor probes were installed by Penecore following the procedures described above and in

accordance with ACPWA permit #'s W2016-0651 and W2016-0762. A copy of the permit is provided in Appendix A. The soil vapor probes have the same well specifications as previous probes.

On September 19, 2016, PANGEA coordinated the installation of soil vapor probes SV-41 through SV-45. A soil gas sample could not be collected from SV-44 due the present of water in the probe's tubing. Benzene was detected in probe SV-41 in excess of 2016 Tier 1 ESLs. To provide additional data as required by ACDEH, PANGEA subsequently coordinate the installation of soil vapor probes SV-46 through SV-50. Sampling techniques were consistent with the aforementioned protocol. Soil vapor probe field forms are provided in Appendix B. Soil gas samples were transported to Curtis and Tompkins (C&T) following chain-of-custody protocol. Samples were analyzed for VOCs by EPA Method TO-15. Following soil gas sampling, soil vapor probes SV-41 through SV-45 were drilled out and destroyed per permit requirements.

VOCs including PCE, benzene, toluene, ethylbenzene, xylenes, and chloroform were detected in various samples. No VOCs were detected above their respective residential ESLs for soil gas except for benzene in SV-41. Soil gas sample results for PCE, benzene and ethylbenzene are shown on Figures 7 through 9 and summarized in Table 3. Soil gas analytical reports are presented in Appendix D.

Following the removal of SV-28, PCE was detected in 3 soil gas samples and at a maximum concentration of 20 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) (SV-45). All soil gas samples were below the residential ESL for PCE in soil gas of  $250 \mu\text{g}/\text{m}^3$ . Benzene was detected in 11 samples and at a maximum concentration of  $49 \mu\text{g}/\text{m}^3$  in SV-41. All soil gas samples were below the residential ESL for benzene in soil gas of  $48 \mu\text{g}/\text{m}^3$  except for SV-41. Adjacent soil vapor probes within the footprint of building #2 (SV-42, SV-49 and SV-50) were all be the benzene ESL. Ethylbenzene was detected in 7 samples and at a maximum concentration of  $9.4 \mu\text{g}/\text{m}^3$  in SV-45. All soil gas samples were below the residential ESL for ethylbenzene in soil gas of  $560 \mu\text{g}/\text{m}^3$ .

## 95UCL Calculations

To better estimate representative soil gas concentrations at the Site for evaluation of human health risk, GSI Environmental of Oakland, California calculated the 95 percent upper confidence limit (95UCL) of the arithmetic mean of applicable data for comparison to 2016 Tier I ESLs. Consistent with U.S.EPA<sup>1</sup>, the exposure point concentration used to estimate human health risks are represented by the 95UCL. According to U.S. EPA<sup>2</sup>, although the 95UCL “does not reflect the maximum concentration that could be contacted at

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<sup>1</sup> U.S. EPA. 2002. Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, D.C. December.

<sup>2</sup> U.S. EPA. 1989. Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part A). Interim Final. EPA-540/1-89/002. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, D.C. December.

any one time, it is regarded as a reasonable estimate of the concentration likely to be contacted over time. This is because in most situations, assuming long-term contact with the maximum concentration is not reasonable.” To evaluate the concentrations of benzene and PCE reported in soil vapor at the Site, the average and UCL concentrations were calculated using Version 5.0 of the ProUCL software recommended by U.S. EPA<sup>3</sup>.

Soil gas data for benzene and PCE used in the 95UCL calculation are summarized on Tables 1 and 2 in Appendix C. Table 1 uses a smaller data set in the vicinity of the former auto repair area/hoist. Table 2 uses a larger data set within planned Buildings 1 and 2. Each table evaluated soil gas data 1) prior to soil removal at SV-28 (where elevated PCE had been reported), and 2) after soil removal at SV-28. A short description from GSI is also provided in Appendix C.

As shown in Tables 1 and 2 in Appendix C, the average and 95UCL concentrations for benzene and PCE are below their respective residential ESLs. For planned Buildings 1 and 2, the 95UCL of 23.4 ug/m<sup>3</sup> benzene is below the ESL of 48 ug/m<sup>3</sup>, and the 95UCL of 10.5 ug/m<sup>3</sup> PCE is well below the ESL of 240 ug/m<sup>3</sup>.

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<sup>3</sup> U.S. EPA. 2013. ProUCL Version 5.0. September.

## CONCLUSIONS AND RECOMMENDATIONS

Based on the above information, PANGEA offers the following conclusions and recommendations:

- Approximately 690 CY of impacted soil was excavated from the vicinity of the former auto repair facility. The soil excavation removed soil with TPHd concentrations above Tier 1 ESLs. Based on the 110 ppm PID reading, the excavation also removed hydrocarbon/VOC impact that could have represented a potential vapor intrusion risk for future occupants.
- Confirmation soil sampling data indicates that residual impact is well below ESLs.
- Confirmation soil gas sampling indicates that soil excavation has removed PCE-impacted soil that was likely contributing to the small PCE “hotspot” in soil gas located beneath the former auto repair building.
- The calculated average and 95UCL concentrations for VOCs in soil gas (benzene and PCE) are below their respective residential ESLs.
- No significant chemical impact has been identified in Site groundwater.
- Available data suggests that conditions near the former auto repair area do not pose a significant risk to human health and/or the environment. PANGEA recommends no further action at this portion of the Site.

## ATTACHMENTS

- Figure 1 – Vicinity Map
- Figure 2 – Site Map
- Figure 3 – Site Map (Former Auto Repair Area)
- Figure 4 – TPH in Soil After Excavation
- Figure 5 – VOCs in Groundwater
- Figure 6 – VOCs in Soil
- Figure 7 – PCE in Soil Gas
- Figure 8 – Benzene in Soil Gas
- Figure 9 – Ethylbenzene in Soil Gas
  
- Table 1 – Soil Analytical Data
- Table 2 – Groundwater Analytical Data
- Table 3 – Soil Gas Analytical Data
  
- Appendix A – Permits
- Appendix B – Soil Vapor Probe Field Forms
- Appendix C – 95% UCL
- Appendix D – Laboratory Analytical Reports





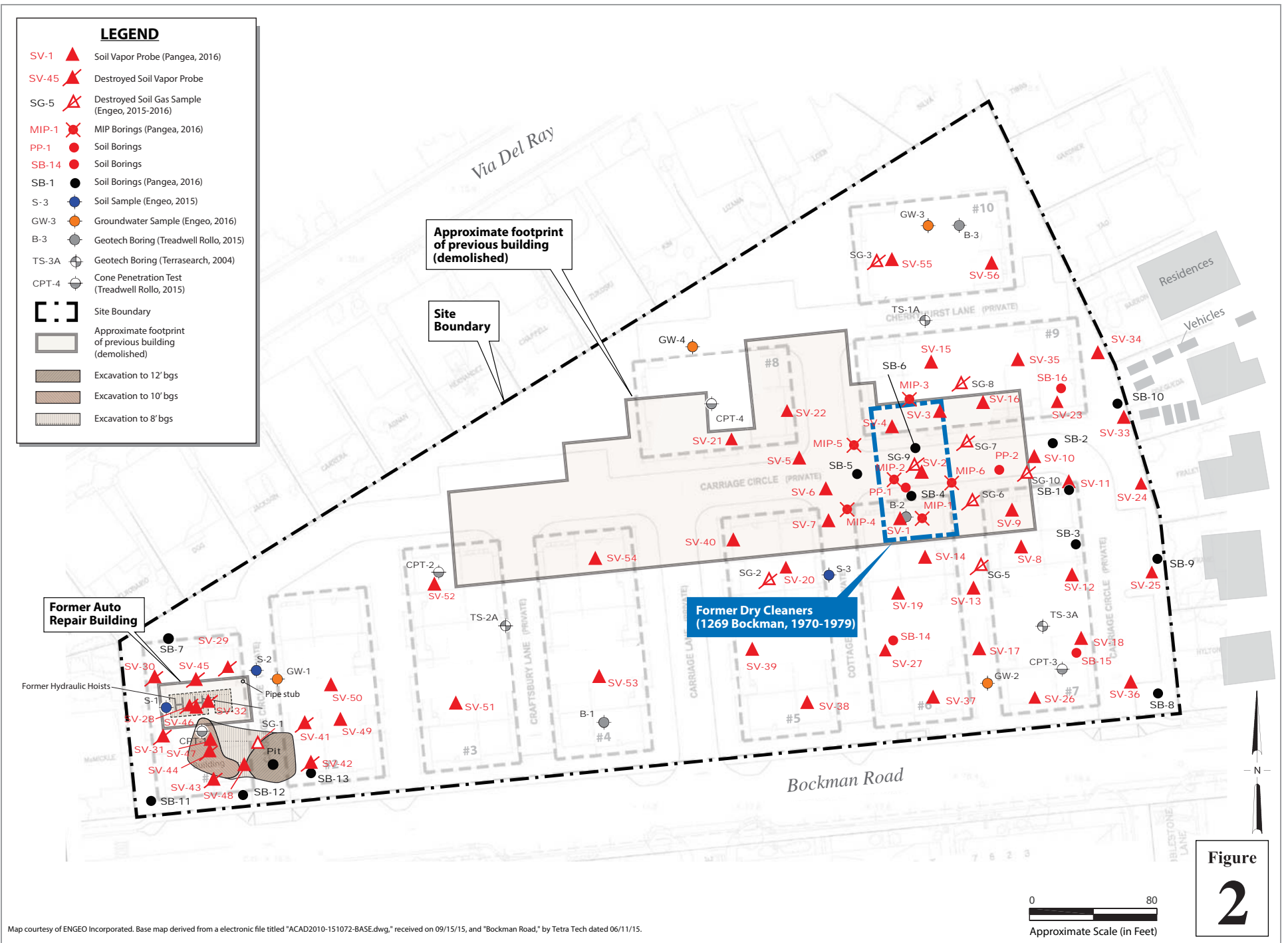
1233 Bockman Road  
 San Lorenzo, California



Vicinity Map

Figure  
**1**

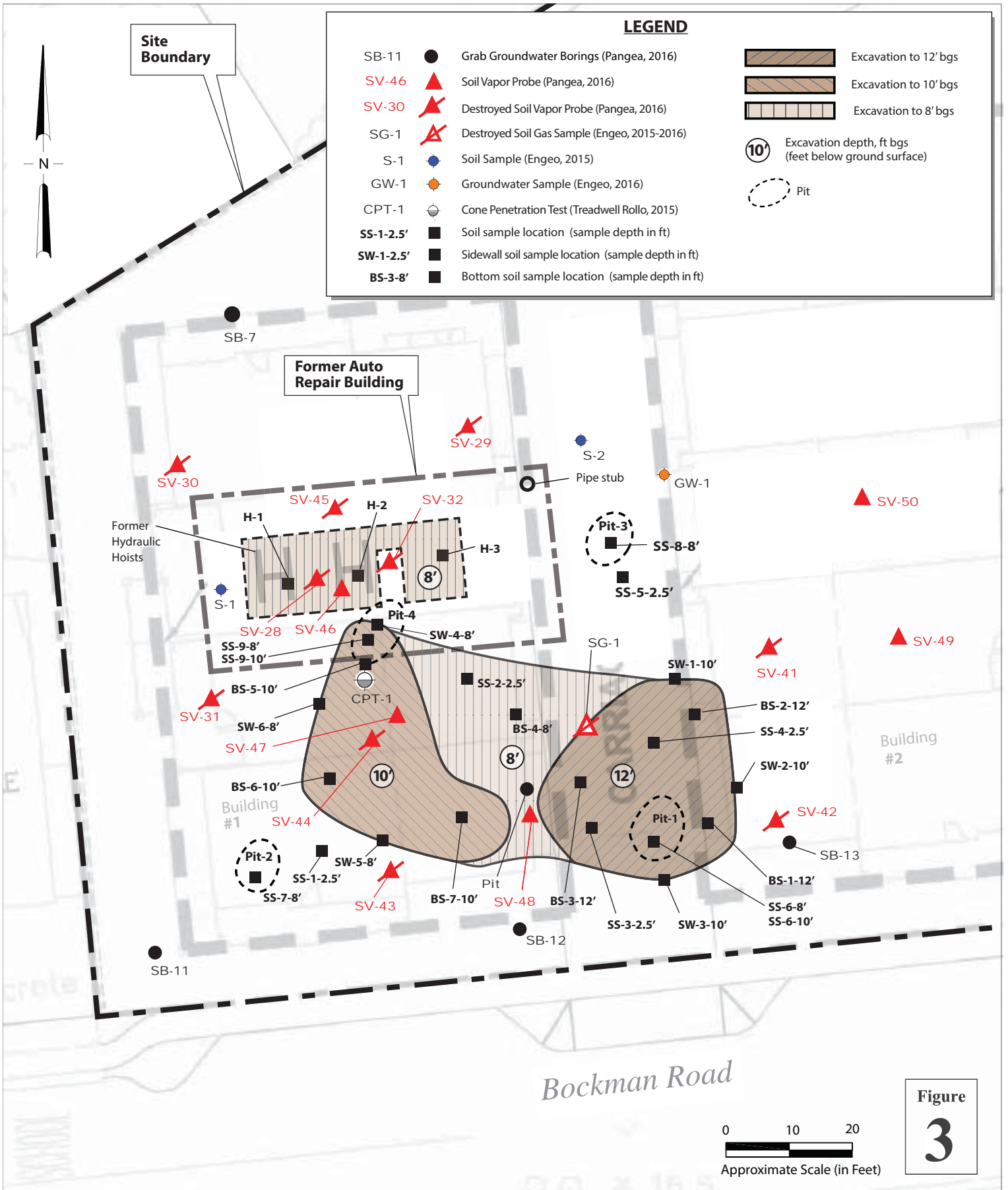




1233 Bockman Road  
San Lorenzo, California



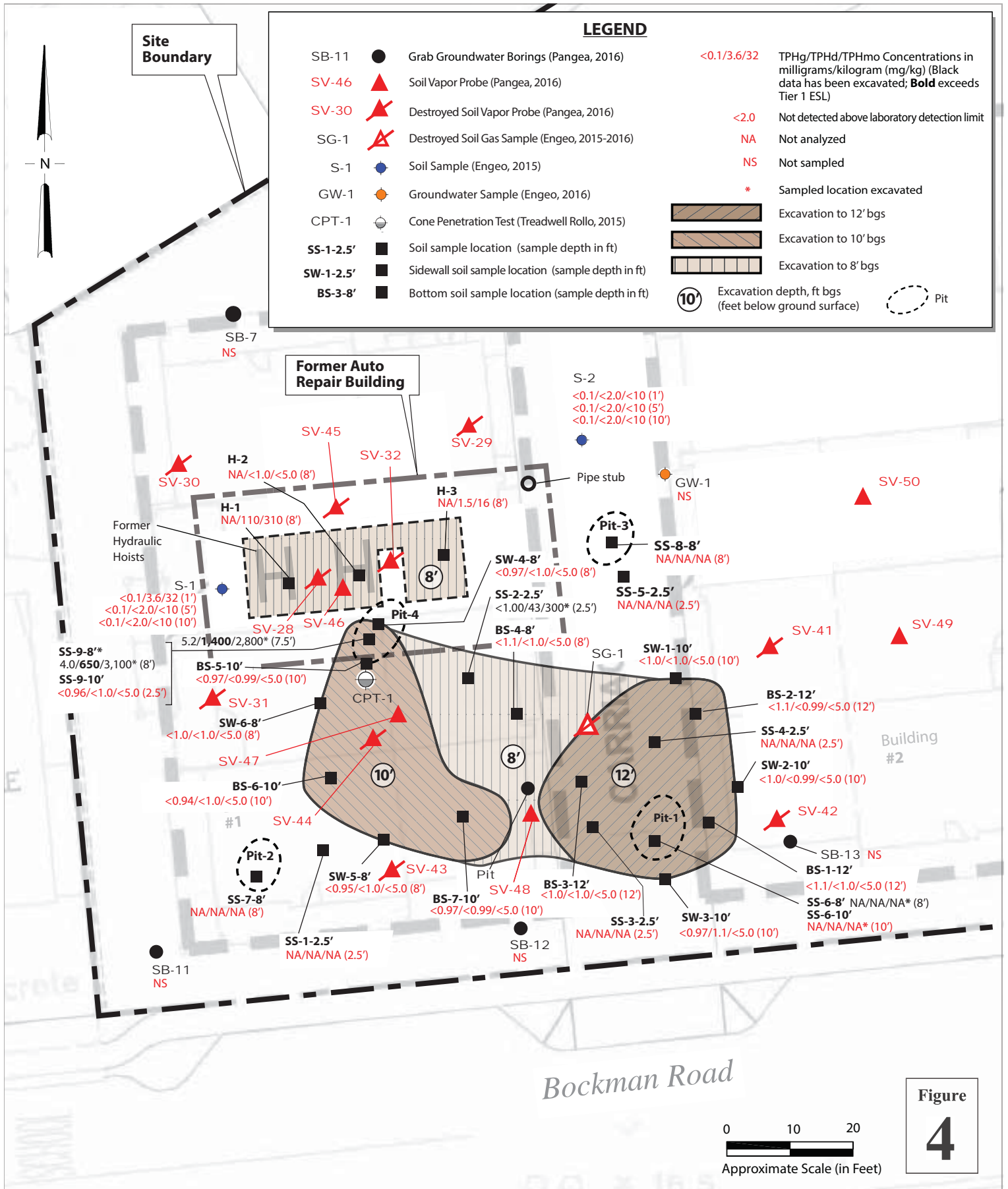
Site Map



1233 Bockman Road  
San Lorenzo, California



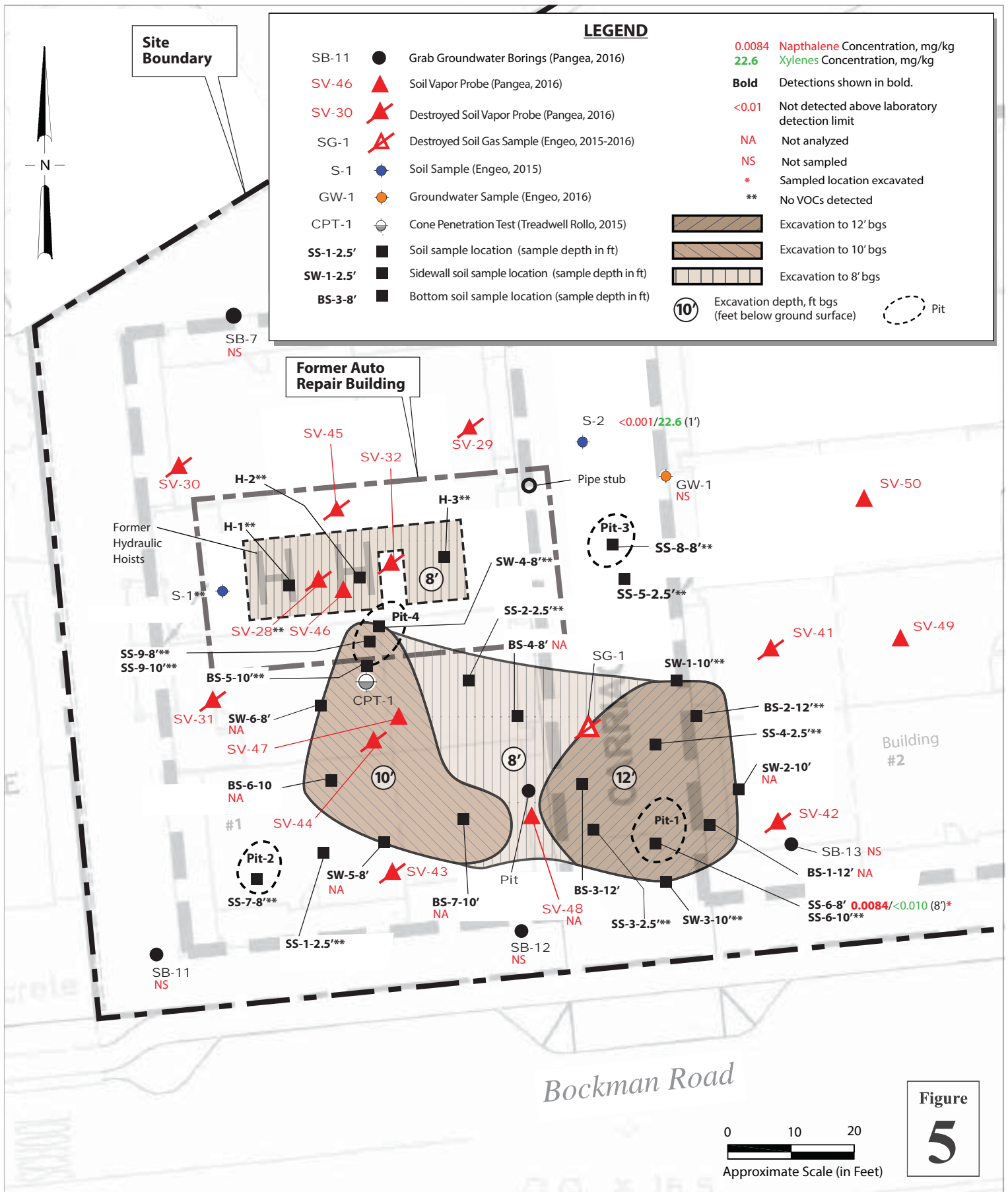
Site Map  
(Former Auto Repair Area)



1233 Bockman Road  
San Lorenzo, California



TPH in Soil after  
Excavation

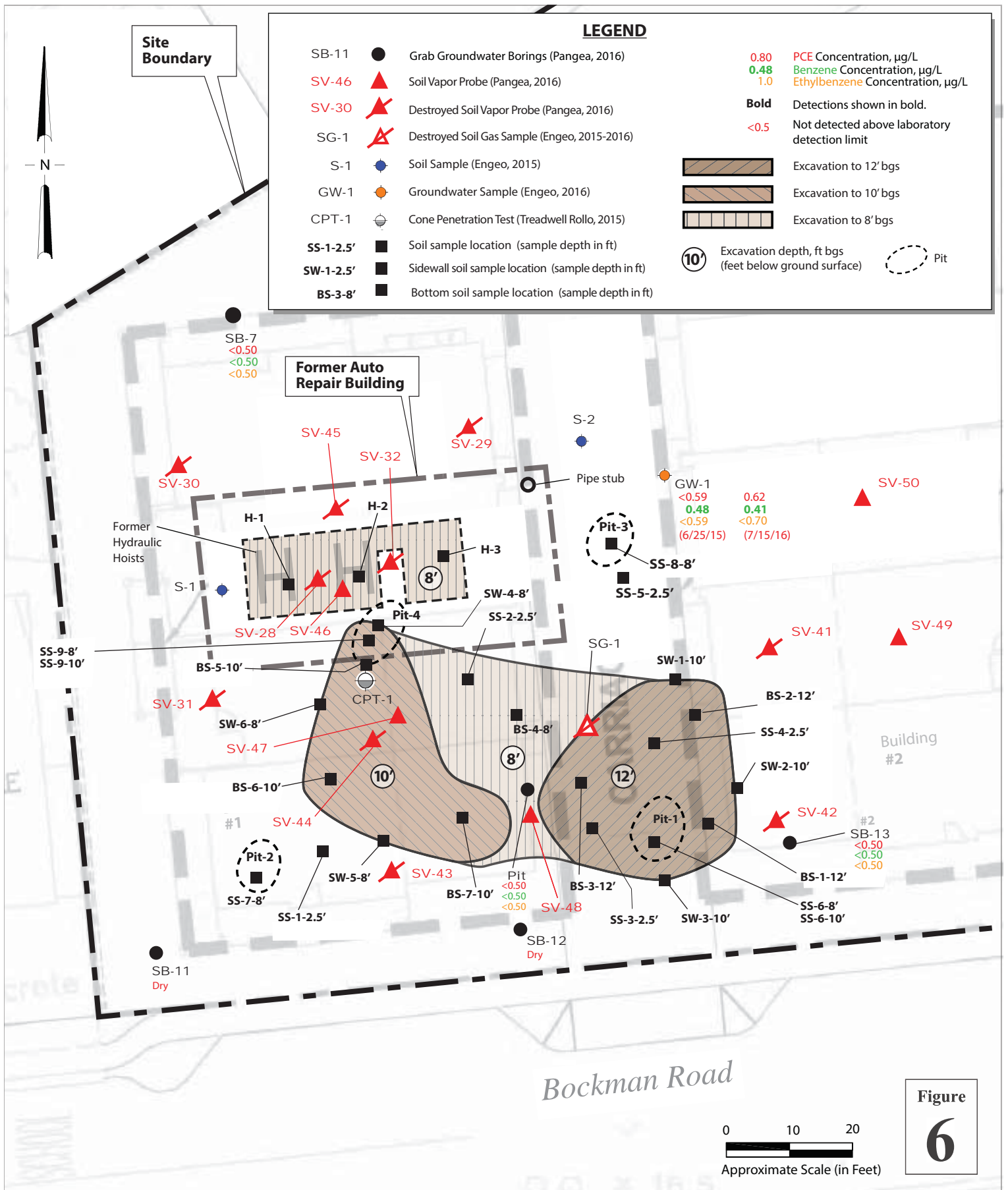


1233 Bockman Road  
San Lorenzo, California



VOCs in Soil after  
Excavation

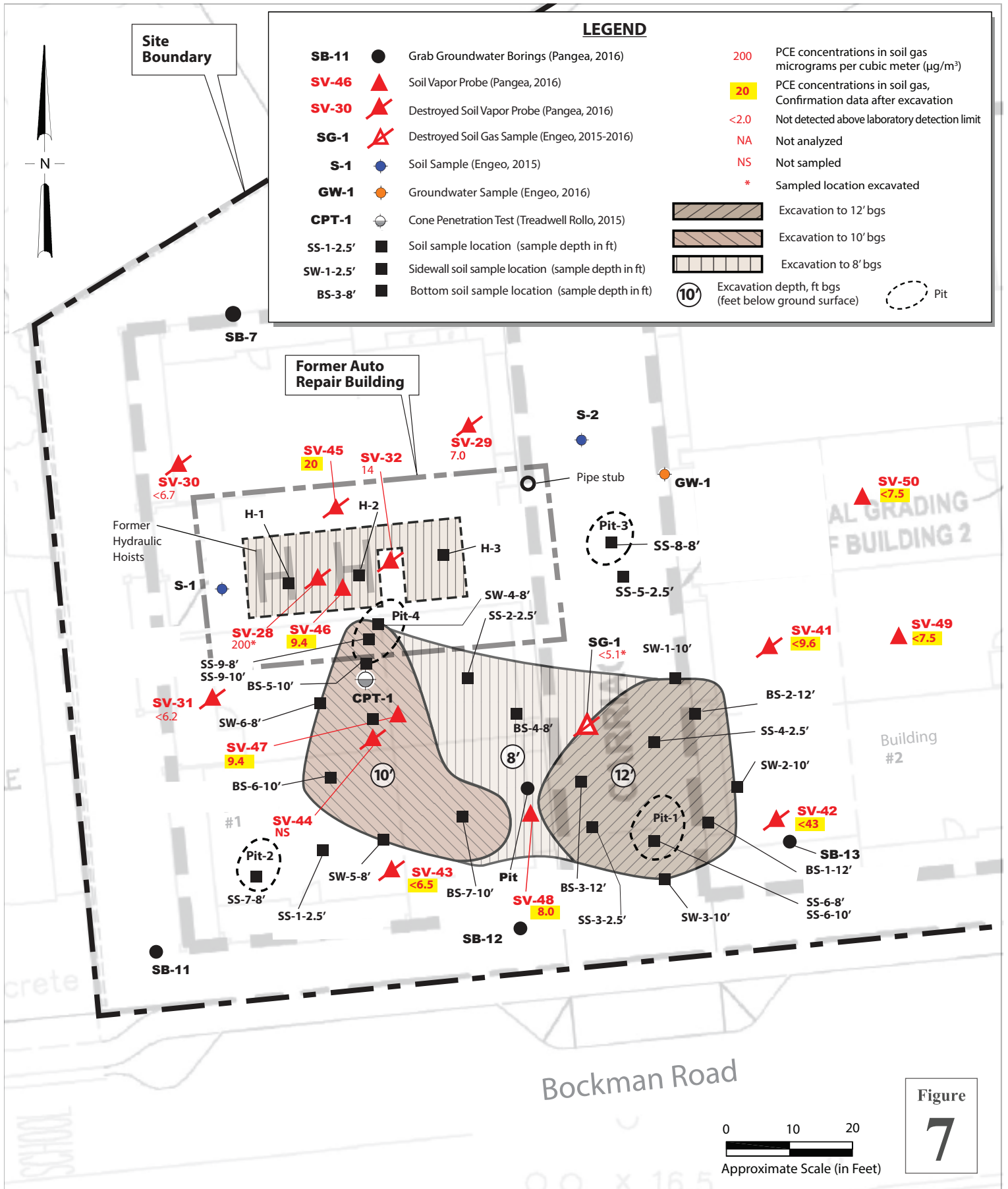




1233 Bockman Road  
San Lorenzo, California



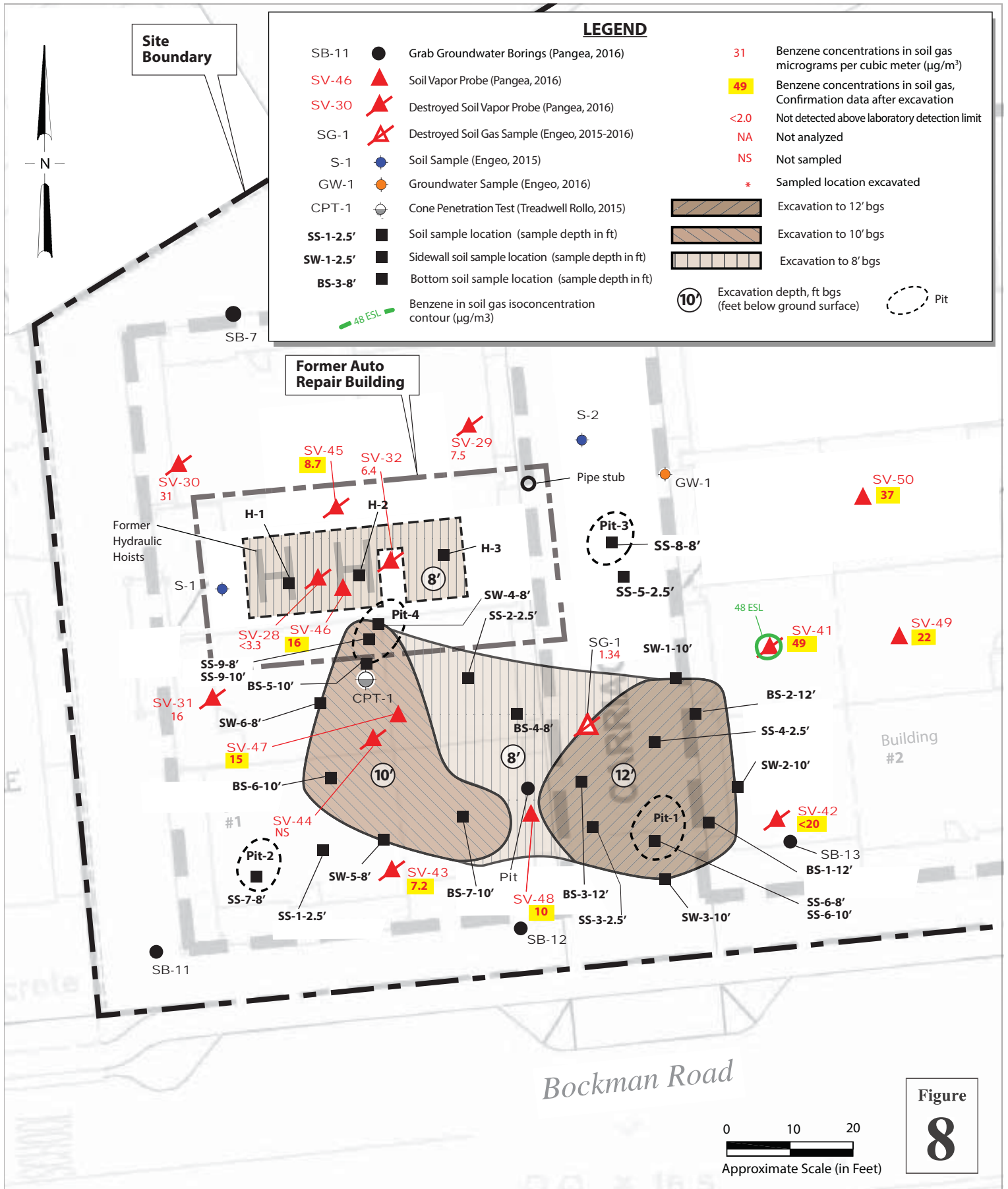
VOCs in Groundwater



1233 Bockman Road  
San Lorenzo, California



PCE in Soil Gas

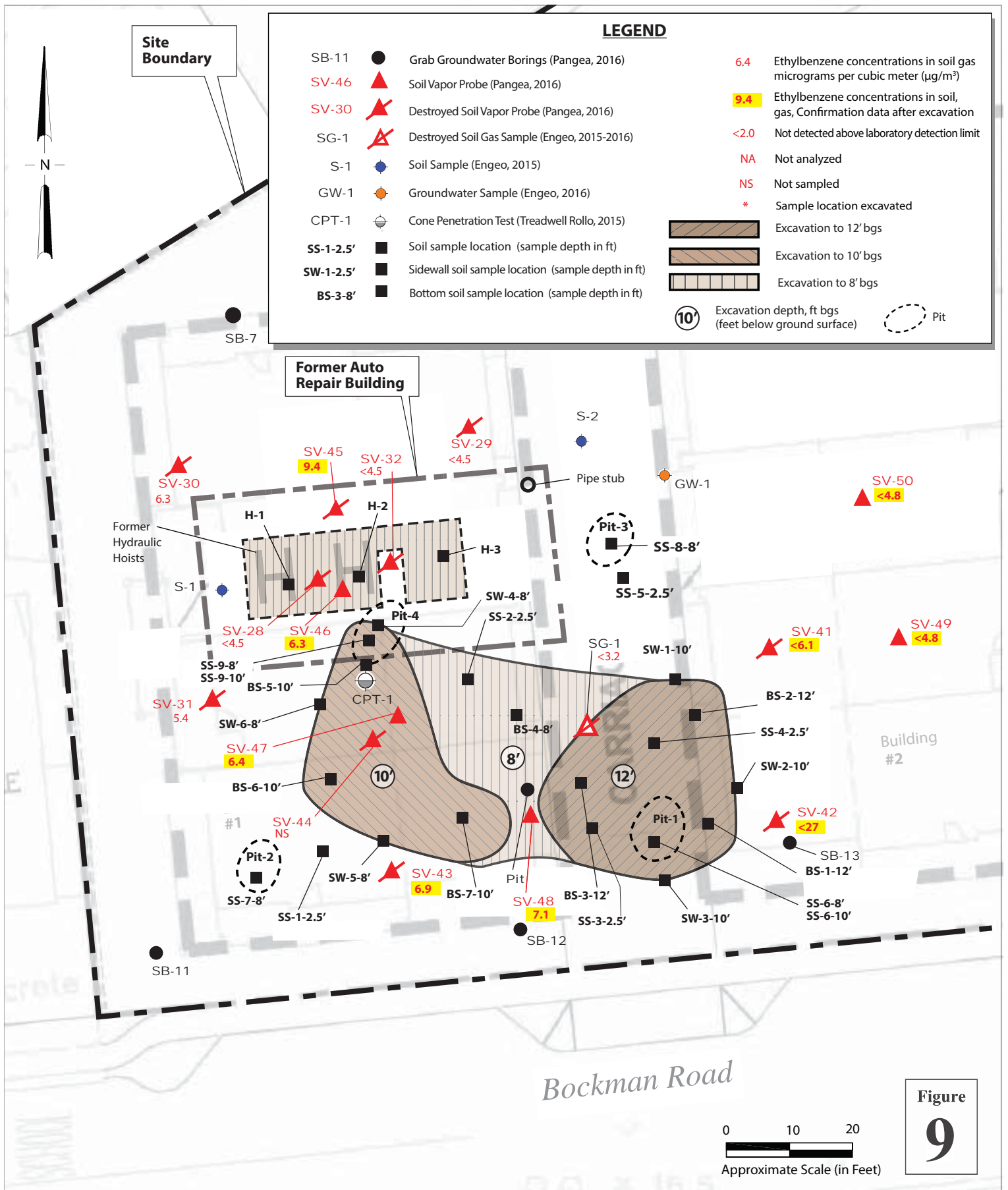


1233 Bockman Road  
San Lorenzo, California



Benzene in Soil Gas





1233 Bockman Road  
San Lorenzo, California



Ethylbenzene in Soil Gas

# Pangea

Table 1. Soil Analytical Data - 1233 Bockman Road, San Lorenzo California

Boring / Sample ID	Date Sampled	Sample Depth (ft bgs)	TPHlg	TPHd	TPHmo	Lead	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Naphthalene	1,2-DCA	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	Chloroform	Acetone	Other VOCs	SVOCs	PCBs	Notes	
Direct Exposure ESL - residential, shallow soil:			740	230	11,000	80	0.23	970	5.1	560	42	3.3	0.37	0.6	1.2	19	160	0.0082	0.30	59,000	varies	varies	varies		
← mg/Kg →																									
<b>Soil Borings - ENGENO Site Assessment 2015</b>																									
S-1	6/25/2015	1	<0.1	3.6	32	13	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---		
	6/25/2015	5	<0.1	<2.0	<10	5.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---		
	6/25/2015	10	<0.1	<2.0	<10	5.6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---		
S-2	6/25/2015	1	<0.1	<2.0	<10	7.6	<0.01	<0.01	<0.01	22.6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---		
	6/25/2015	5	<0.1	<2.0	<10	8.3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---		
	6/25/2015	10	<0.1	<2.0	<10	4.9	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---		
S-3	6/25/2015	1	<0.1	14	230	1.3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---		
	6/25/2015	5	<0.1	<2.0	17	6.3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---		
	6/25/2015	10	<0.1	<2.0	<10	5.6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	---	<0.021	---	---		
<b>Soil Borings in Dry Cleaner Area - PANGEA 2016</b>																									
SB-1	8/3/2016	3.5	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.02	<0.049	---	---
		6.5	<0.96	---	---	---	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.0087	<0.0043	<0.017	<0.043	---	---
		8	---	---	---	---	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0099	<0.005	<0.02	<0.050	---	---
SB-2	8/3/2016	1	---	---	---	3.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		3	---	---	---	8.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		3.5	---	---	---	---	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0091	<0.0045	<0.018	<0.045	---	---	
		6	---	---	---	6.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		6.5	<1.1	---	---	---	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.02	<0.050	---	---
		8	---	---	---	---	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0093	<0.0046	<0.019	<0.046	---	---	
SB-3	8/3/2016	3.5	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	0.027	<0.049	---	---	
		6.5	<0.99	---	---	---	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0091	<0.0045	<0.018	<0.045	---	---	
		8	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.02	<0.049	---	---	
SB-4	8/3/2016	3.5	---	---	---	---	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0097	<0.0048	<0.019	<0.048	---	---	
		5.5	<0.99	---	---	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0097	<0.0049	<0.019	<0.049	---	---	
		8	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.02	<0.049	---	---	
SB-5	8/3/2016	3.5	---	---	---	---	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0099	<0.005	<0.02	<0.050	---	---	
		5.5	<1.1	---	---	---	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0097	<0.0048	<0.019	<0.048	---	---	
		8	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.02	<0.049	---	---	
SB-6	8/3/2016	1	---	---	---	7.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		3	---	---	---	5.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
		3.5	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0097	<0.0049	<0.019	<0.049	---	---	
		6	<0.98	---	---	---	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0093	<0.0047	<0.019	<0.047	---	---
		8	---	---	---	---	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.0089	<0.0044	<0.018	<0.044	---	---	
SB-7	9/8/2016	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no samples taken from boring	
SB-8	9/8/2016	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no samples taken from boring	
SB-9	9/8/2016	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no samples taken from boring	

# Pangea

**Table 1. Soil Analytical Data - 1233 Bockman Road, San Lorenzo California**

Boring / Sample ID	Date Sampled	Sample Depth (ft bgs)	TPHlg	TPHd	TPHmo	Lead	Benzene	Toluene	Ethylbenzene	Xylenes	MTHF	Naphthalene	1,2-DCA	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	Chloroform	Acetone	Other VOCs	SVOCs	PCBs	Notes		
Direct Exposure ESL - residential, shallow soil:			740	230	11,000	80	0.23	970	5.1	560	42	3.3	0.37	0.6	1.2	19	160	0.0082	0.30	59,000	varies	varies	varies			
←----- mg/Kg -----→																										
SB-10	9/8/2016	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no samples taken from boring	
SB-11	9/8/2016	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no samples taken from boring	
SB-12	9/8/2016	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no samples taken from boring	
SB-13	9/8/2016	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no samples taken from boring	
SB-14	10/20/2016	7	---	---	---	---	<0.0031	<0.0031	<0.0031	<0.0062	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0062	<0.0031	<0.012	<0.031	---	---	---		
SB-15	10/20/2016	3	---	---	---	---	<0.0034	<0.0034	<0.0034	<0.0068	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0068	<0.0034	<0.014	<0.034	---	---	---		
SB-16	10/20/2016	4	---	---	---	---	<0.0040	<0.0040	<0.0040	<0.0080	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0079	<0.0040	<0.016	<0.0040	---	---	---		
<b>Soil Sampling in Auto Repair Area - PANGEA 2016</b>																										
SV-28	8/22/2016	7.5	5.2	1,400	2,800	---	<0.0048	<0.0048	<0.0048	<0.0096	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0095	<0.0048	<0.019	<0.048	---	---	---	Excavated to 8'	
SS-1	9/2/2016	2.5	---	---	---	---	<0.0047	<0.0047	<0.0047	<0.0094	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	<0.0094	<0.0047	<0.019	<0.047	---	---	---		
SS-2	9/2/2016	2.5	<1.0	43	300	---	<0.0046	<0.0046	<0.0046	<0.0092	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0093	<0.0046	<0.019	<0.046	---	---	---	Excavated to 8'	
SS-3	9/2/2016	2.5	---	---	---	---	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.020	<0.050	---	---	---		
SS-4	9/2/2016	2.5	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	0.059	<0.049	---	---	---		
SS-5	9/2/2016	2.5	---	---	---	---	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	0.050	<0.050	---	---	---		
SS-6	9/2/2016	8	---	---	---	---	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	0.0084	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.020	<0.050	---	---	---	Excavated to 12'	
	9/2/2016	10	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0097	<0.0049	<0.019	<0.049	---	---	---	
SS-7	9/2/2016	8	---	---	---	---	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0097	<0.0049	<0.019	<0.049	---	---	---	
SS-8	9/2/2016	8	---	---	---	---	<0.0045	<0.0045	<0.0045	<0.0090	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0045	<0.0090	<0.0045	<0.018	<0.045	---	---	---	
SS-9	9/2/2016	8	4.0	650	3,100	---	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	0.030	<0.049	---	---	---	Excavated to 10'	
	9/2/2016	10	<0.96	<1.0	<5.0	---	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0099	<0.0049	<0.020	<0.049	<0.660 a	---	---		
<b>Confirmation Samples at Auto Repair Area</b>																										
H-1	8/30/2016	8	---	110	310	---	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0095	<0.0048	<0.019	<0.048	<0.660 a	<0.024	bottom of excavation sample	
H-2	8/30/2016	8	---	<1.0	<5.0	---	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0095	<0.0048	<0.019	<0.048	---	<0.024	bottom of excavation sample	
H-3	8/30/2016	8	---	1.5	16	---	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0046	<0.0092	<0.0046	<0.018	<0.048	---	<0.024	bottom of excavation sample		
BS-1-12	9/7/2016	12	<1.1	<1.0	<5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	bottom of excavation sample	
BS-2-12	9/7/2016	12	<1.1	<0.99	<5.0	---	<0.0048	<0.0048	<0.0048	<0.0096	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0097	<0.0048	<0.019	<0.048	---	---	bottom of excavation sample		

# Pangea

**Table 1. Soil Analytical Data - 1233 Bockman Road, San Lorenzo California**

Boring / Sample ID	Date Sampled	Sample Depth (ft bgs)	TPH <sub>g</sub>	TPH <sub>d</sub>	TPH <sub>mo</sub>	Lead	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Naphthalene	1,2-DCA	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	Chloroform	Acetone	Other VOC's	SVOCS	PCBs	Notes	
Direct Exposure ESL - residential, shallow soil:			740	230	11,000	80	0.23	970	5.1	560	42	3.3	0.37	0.6	1.2	19	160	0.0082	0.30	59,000	varies	varies	varies		
mg/Kg																									
BS-3-12	9/7/2016	12	<1.0	<1.0	<5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	bottom of excavation sample
BS-4-8	9/7/2016	8	<1.1	<1.0	<5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	bottom of excavation sample
BS-5-10	9/7/2016	10	<0.97	<0.99	<5.0	---	<0.0048	<0.0048	<0.0048	<0.0096	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0097	<0.0048	<0.019	<0.048	---	---	---	bottom of excavation sample
BS-6-10	9/7/2016	10	<0.94	<1.0	<5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	bottom of excavation sample
BS-7-10	9/7/2016	10	<0.97	<0.99	<5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	bottom of excavation sample
SW-1-10	9/7/2016	10	<1.0	<1.0	<5.0	---	<0.0049	<0.0049	<0.0049	<0.0098	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.0099	<0.0049	<0.020	<0.049	---	---	---	excavation sidewall sample
SW-2-10	9/7/2016	10	<1.0	<0.99	<5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	excavation sidewall sample
SW-3-10	9/8/2016	10	<0.97	1.1	<5.0	---	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0099	<0.0049	<0.020	<0.050	---	---	---	excavation sidewall sample
SW-4-8	9/7/2016	8	<0.97	<1.0	<5.0	---	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0099	<0.0050	<0.020	<0.050	---	---	---	excavation sidewall sample
SW-5-8	9/7/2016	8	<0.95	<1.0	<5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	excavation sidewall sample
SW-6-8	9/7/2016	8	<1.0	<1.0	<5.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	excavation sidewall sample

**Explanation:**

TPH<sub>d</sub> and TPH<sub>mo</sub> analyzed by EPA Method 8015, TPH<sub>g</sub> and VOC's analyzed by EPA Method 8260

Benzene, Toluene, Ethylbenzene and Xylenes by EPA Method 8021.

TPH<sub>g</sub> = Total Petroleum Hydrocarbons as gasoline

TPH<sub>d</sub> = Total Petroleum Hydrocarbons as diesel

TPH<sub>mo</sub> = Total Petroleum Hydrocarbons as motor oil

MTBE = Methyl tert-butyl ether

1,2-DCA = 1,2-Dichloroethane

PCE = Tetrachloroethene

TCE = Trichloroethene

cis-1,2-DCE = cis-1,2-Dichloroethene

VOCs = Volatile organic compounds by EPA Method 8260.

SVOCS = Semi-volatile organic compounds by EPA Method 8270.

PCB = Total polychlorinated biphenyls including Aroclors 1016, 1221, 1232, 1242, 1248, 1254, and 1260

mg/Kg = Milligrams per kilogram

ft bgs = Depth below ground surface (bgs) in feet.

ESL = Environmental Screening Level, from California Regional Water Quality Control Board - San Francisco Bay Region, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Revised February 2016 (Revision 3).

< n = Chemical not present at a concentration in excess of detection limit shown.

a = All chemicals below show reporting limit (except benzoic acid reporting level was 1.7 mg/kg). See laboratory report for lower reporting limits for other chemicals.

ND = not detected

contaminant detections highlighted in gray

# Pangea

**Table 2. Groundwater Analytical Data - 1233 Bockman Road, San Lorenzo, California**

Boring / Sample ID	Date Sampled	Depth to Water (ft bgs)	TPHlg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-DCA	PCE	TCE	Chloroform	Other VOCs	Notes
			µg/L													
Tier 1 ESL - Groundwater:			100	100	n/a	1.0	40	13	20	0.12	0.5	3.0	5.0	50	varies	
Vapor Intrusion ESL - shallow groundwater, residential:			100	100	n/a	1.1	3,600	13	1,300	20	6.1	3.0	5.6	2.3	varies	
Vapor Intrusion ESL - shallow groundwater, commercial:			5,000	5,000	n/a	9.7	30,000	110	11,000	170	53	26	49	20	varies	
<b>Grab Groundwater Samples - ENGEO Site Assessment</b>																
GW-1	6/25/2015	15-25 <sup>a</sup>	51	---	---	0.48	0.42	<0.59	0.26	0.28	<0.17	<0.59	<0.59	<0.59	ND	
	7/15/2016	12-17 <sup>b</sup>	<41	---	---	0.41	<0.20	<0.70	<0.55	<1.7	0.15	0.62	<0.70	<0.70	ND	
GW-2	6/25/2015	15-25 <sup>a</sup>	<50	---	---	<0.50	<0.50	<0.50	<1.0	<0.16	<0.17	<0.50	<0.50	<0.50	ND	
	7/15/2016	12-17 <sup>b</sup>	<41	---	---	<0.22	<0.20	<0.70	<0.55	<1.7	<0.15	<0.33	<0.70	<0.70	ND	
GW-3	6/25/2015	15-25 <sup>a</sup>	<50	---	---	<0.50	<0.50	<0.50	<1.0	<0.16	<0.17	<0.50	<0.50	<0.50	ND	
	7/15/2016	12-17 <sup>b</sup>	53.2	---	---	<0.22	<0.20	<0.70	<0.55	<1.7	<0.13	<0.33	<0.70	<0.70	ND	
GW-4	7/15/2016	12-17 <sup>b</sup>	<41	---	---	<0.22	<0.20	<0.70	<0.55	<1.7	<0.15	<0.33	<0.70	<0.70	ND	
<b>Grab Groundwater Samples - PANGEA</b>																
MIP-1	7/25/2016	8-12	<50	---	---	<0.5	0.70	<0.5	<1.0	<2.0	<0.5	<0.5	<0.5	2.3	<10	
MIP-2	7/25/2016	8-12	<50	---	---	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	0.80	<0.5	3.6	<10	
MIP-3	7/25/2016	8-12	<50	---	---	<0.5	3.3	<0.5	<1.0	<2.0	<0.5	<0.5	<0.5	8.1	<10	
MIP-4	7/25/2016	8-12	<50	---	---	<0.5	1.5	<0.5	0.60	<2.0	<0.5	<0.5	<0.5	13	<10	
MIP-5	7/25/2016	8-12	<50	---	---	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	<0.5	<0.5	<0.5	<10	
MIP-6	7/25/2016	8-12	<50	---	---	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	<0.5	<0.5	2.6	<10	
SB-1	8/3/2016	8	<50	---	---	<0.5	<0.5	1.0	6.2	<2.0	<0.5	<0.5	<0.5	<0.5	<10	
SB-7	8/22/2016	8	--	---	---	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5	<0.5	<0.5	<0.5	<10	

# Pangea

**Table 2. Groundwater Analytical Data - 1233 Bockman Road, San Lorenzo, California**

Boring / Sample ID	Date Sampled	Depth to Water (ft bgs)	TPH <sub>g</sub>	TPH <sub>d</sub>	TPH <sub>mo</sub>	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-DCA	PCE	TCE	Chloroform	Other VOCs	Notes
			µg/L													
Tier 1 ESL - Groundwater:			100	100	n/a	1.0	40	13	20	0.12	0.5	3.0	5.0	50	varies	
Vapor Intrusion ESL - shallow groundwater, residential:			100	100	n/a	1.1	3,600	13	1,300	20	6.1	3.0	5.6	2.3	varies	
Vapor Intrusion ESL - shallow groundwater, commercial:			5,000	5,000	n/a	9.7	30,000	110	11,000	170	53	26	49	20	varies	
SB-8	9/7/2016	8	<50	590	17,000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<10	
SB-9	9/7/2016	8	<50	380	4,300	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<10	
SB-10	9/8/2016	dry	--	---	---	---	---	---	---	---	---	---	---	---	---	
SB-11	9/8/2016	dry	--	---	---	---	---	---	---	---	---	---	---	---	---	
SB-12	9/8/2016	dry	--	---	---	---	---	---	---	---	---	---	---	---	---	
SB-13	9/8/2016	7	<50	<50	<250	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<10	
Pit	9/7/2016	8	64	73	<250	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<10 <sup>e</sup>	

**Explanation:**

TPH<sub>g</sub> = Gasoline range Total Petroleum Hydrocarbons by EPA Method SW8021B/8015Bm.

TPH<sub>d</sub> = Diesel Range Total Petroleum Hydrocarbons by EPA Method SW8015B.

TPH<sub>mo</sub> = Motor Oil Range Total Petroleum Hydrocarbons by EPA Method SW8015B.

VOCs = Volatile Organic Compounds by EPA Method 8260B.

1,2-DCA = 1,2-Dichloroethane

PCE = Tetrachloroethene

TCE = Trichloroethene

µg/L = micrograms per Liter

ft bgs = feet below grade surface.

ESL = Environmental screening level established by the SFB-RWQCB, Interim Final - November 2007 and amended in February 2016, (Rev. 3)

--- = Not analyzed or not available.

a = ENGEO report dated 07/02/2015 states samples were taken at first encountered groundwater which ranged between 15-25 ft bgs

b = ENGEO report dated 08/02/2016 states samples were taken at first encountered groundwater which ranged between 12-17 ft bgs

c = N-butylbenzene (0.64 µg/L) and 1,2,4-trimethylbenzene (1.6 µg/L)

d7 = strongly aged gasoline or diesel range compounds are significant in the TPH(g) chromatogram

e2 = diesel range compounds are significant; no recognizable pattern

e7 = oil range compounds are significant

# Pangea

**Table 2. Groundwater Analytical Data - 1233 Bockman Road, San Lorenzo, California**

Boring / Sample ID	Date Sampled	Depth to Water (ft bgs)	TPH <sub>g</sub>	TPH <sub>d</sub>	TPH <sub>m</sub>	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-DCA	PCE	TCE	Chloroform	Other VOCs	Notes
			µg/L													
Tier 1 ESL - Groundwater:			100	100	n/a	1.0	40	13	20	0.12	0.5	3.0	5.0	50	varies	
Vapor Intrusion ESL - shallow groundwater, residential:			100	100	n/a	1.1	3,600	13	1,300	20	6.1	3.0	5.6	2.3	varies	
Vapor Intrusion ESL - shallow groundwater, commercial:			5,000	5,000	n/a	9.7	30,000	110	11,000	170	53	26	49	20	varies	

c4/c11 = gasoline range compounds are significant; and/or stoddard solvent/mineral spirit?

**Bold** indicates concentration meets or exceeds Residential Vapor Intrusion ESL

< n = Chemical not present at a concentration in excess of laboratory detection limit shown.

Contaminant detections highlighted in gray

# Pangea

**Table 3. Soil Gas Analytical Data - 1233 Bockman Road, San Lorenzo, California**

Boring/ Sample ID	Date Sampled	Sample Depth (ft bgs)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-DCA	PCE	TCE	Chloroform	Other VOCs	Isopropyl Alcohol (Leak Check Compound)	Carbon Dioxide	Oxygen	Methane	Notes
			ug/m <sup>3</sup>										%	%	%		
Residential ESL - Soil/Subslab Gas:			48	160,000	560	52,000	41	54	240	240	61	Varies	NA	NA	NA	NA	
<b>Soil Gas Samples - Engeo 2015 - 2016</b>																	
SG-1	06/25/15	5.0	1.34	6.33	<3.2	<6.5	<7.8	<3.1	<5.1	<8.1	4.92	--	<30	--	--	--	
SG-2	06/25/15	5.0	2.45	18.3	1.81	14.83	<7.8	<3.1	<5.1	<8.1	<7.4	--	<30	--	--	--	
SG-5	06/24/16	10	<19	<26	<27	<44	<140	<55	<24	<150	<130	--	--	--	--	--	
SG-6	06/24/16	7.0	<1.6	4.1	143	260	<5.2	<2.1	256	<5.4	<4.9	--	--	--	--	--	
SG-7	06/24/16	10	21.9	20.9	<4.9	<9.9	<12	<4.7	24.4	<12	<11	--	--	--	--	--	
SG-8	06/24/16	7.0	9.18	19.1	232	1,172	<5.2	<2.1	16.7	<5.4	<4.9	--	--	--	--	--	
SG-9	06/24/16	7.0	3.84	9.96	<2.2	4.69	<5.2	<2.1	256	<5.4	<4.9	--	--	--	--	--	
SG-10	06/24/16	10	61.8	76.2	<2.0	6.97	<10	<4.1	<1.8	<11	<9.8	--	--	--	--	--	
<b>Soil Gas Samples - Pangea 2016</b>																	
SV-1	07/27/16	6.0	<3.5	<4.2	<4.8	<4.8	<23	<4.5	49	<5.9	<5.4	--	<11	--	--	--	
SV-2	07/27/16	6.0	<7.1	<8.3	<9.6	<9.6	<46	<8.9	1,500	<12	<11	--	<22	--	--	--	
SV-3	07/27/16	6.0	14	14	4.7	7.7	<22	<4.2	820	<5.6	<5.1	--	140	--	--	--	
SV-4	07/27/16	6.0	18	7.5	<7.6	<7.6	<36	<7.0	150	<9.4	<8.5	--	<17	--	--	--	
	09/01/16	6.0	<6.2	<7.3	<8.4	<16.8	<40	<7.8	190	<10	<9.4	--	<19	--	--	--	SV-4 resample
SV-5	07/27/16	6.0	3.8	<3.7	<4.3	<4.3	<21	<4.0	710	<5.3	<4.8	--	<9.6	--	--	--	
SV-6	07/27/16	6.0	12	<3.8	<4.4	<4.4	<21	<4.1	430	<5.4	<4.9	--	<9.9	--	--	--	
SV-7	07/27/16	6.0	18	27	<5.1	<5.1	<25	<4.7	15	<6.3	<5.7	--	<12	--	--	--	
SV-8	07/28/16	6.0	<4.9*	<11*	<10*	<15*	--	<14*	640	<8.7*	<9.4*	--	<22*	--	--	--	
Shroud (SV-8)	07/28/16	--	--	--	--	--	--	--	--	--	--	--	130,000	--	--	--	
SV-9	09/01/16	6.0	<5.2	<6.1	<7.1	<14.2	<34	<6.6	<11	<8.8	<8.0	--	62	--	--	--	
SV-10	07/28/16	6.0	<4.9*	<11*	<10*	<15*	--	<14*	2,000	170*	<9.4*	--	<22*	--	--	--	
SV-11	07/28/16	6.0	<4.9*	<11*	<10*	<15*	--	<14*	2,600	150*	<9.4*	--	<22*	--	--	--	
SV-12	07/28/16	6.0	<4.9*	<11*	<10*	110*	--	<14*	930	76*	<9.4*	--	<22*	--	--	--	
SV-13	07/28/16	6.0	<4.9*	<11*	380	1,470	--	<14*	100*	<8.7*	<9.4*	--	<22*	--	--	--	
SV-14	07/27/16	6.0	3.4	3.6	160	980	<20	<3.8	17	<5.1	<4.6	--	64	--	--	--	
SV-15	07/27/16	6.0	25	9.2	<4.6	8.6	<22	<4.3	85	6.1	<5.2	--	<10	--	--	--	
SV-16	07/27/16	6.0	35	13	<11	<11	<52	<10	<17	<13	<12	--	<24	--	--	--	
SV-17	07/28/16	6.0	34	13	28	191	--	<4.1	20	9.7	<5.0	--	150	--	--	--	
SV-18	07/28/16	6.0	54	59	1,100	3,190	--	<4.1	66	<5.5	<5.0	--	7.9*	--	--	--	
SV-19	07/28/16	6.0	15	40	900	2,490	--	<4.1	20	11	<5.0	--	8.7*	--	--	--	
SV-20	08/05/16	6.0	66*	160	4,300	18,400	17*	<130	<8.6*	<170	<160	--	<310	--	--	--	
SV-21	08/05/16	6.0	5.6*	<11	330	3,090	3.2*	<12	160	<16	<15	--	<29	--	--	--	
	09/01/16	6.0	<3.2	<3.8	<4.3	9.7	<21	<4.0	220	<5.4	<4.9	--	<9.8	--	--	--	resample SV-21
SV-22	08/05/16	6.0	21*	<82	340	18,100	10*	<88	24*	<120	<110	--	<210	--	--	--	
	09/01/16	6.0	<3.3	<3.9	<4.5	30.7	<21	<4.1	46	<5.5	8.0	--	<10	--	--	--	resample SV-22
SV-23	08/05/16	6.0	24*	150	8,700	34,000	19*	<130	9.0*	<170	<150	--	<310	--	--	--	



# Pangea

**Table 3. Soil Gas Analytical Data - 1233 Bockman Road, San Lorenzo, California**

Boring/ Sample ID	Date Sampled	Sample Depth (ft bgs)	ug/m <sup>3</sup>											%			Notes	
			Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-DCA	PCE	TCE	Chloroform	Other VOCs	Isopropyl Alcohol (Leak Check Compound)	Carbon Dioxide	Oxygen	Methane		
Residential ESL - Soil/Subslab Gas:			<b>48</b>	<b>160,000</b>	<b>560</b>	<b>52,000</b>	<b>41</b>	<b>54</b>	<b>240</b>	<b>240</b>	<b>61</b>	<b>Varies</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>		
SV-24	08/05/16	6.0	42	45	1,300	5,500	13*	<35	<2.4*	<47	<43	--	<86	--	--	--	--	
Shroud (SV-24)	08/05/16	--	--	--	--	--	--	--	--	--	--	--	180,000	--	--	--	--	
SV-25	08/05/16	6.0	39	47	270	1,440	<1.2*	<11	1.2*	<14	<13	--	<26	--	--	--	--	
SV-26	08/05/16	6.0	23	28	180	920	2.6*	<4.4	7.6	<5.8	<5.3	--	<11	--	--	--	--	
SV-27	08/05/16	6.0	73	48	230	1,250	3.9*	<7.9	<0.53*	<11	<9.6	--	<19	--	--	--	--	
SV-28	08/23/16	6.0	<3.3	<3.9	<4.5	<9.0	<22	<4.2	200	9.6	<5.1	--	1,800	--	--	--	--	auto repair area, well destroyed 08/23/16
SV-29	08/23/16	6.0	7.5	<3.9	<4.5	17.1	<21	<4.1	7.0	<5.5	<5.0	--	83	--	--	--	--	auto repair area, well destroyed 08/23/16
SV-30	09/01/16	6.0	31	42	6.3	33.3	<21	<4.0	<6.7	<5.3	6.6	--	<9.7	--	--	--	--	auto repair area, well destroyed 09/01/16
SV-31	09/01/16	6.0	16	34	6.4	40	<19	<3.7	<6.2	<4.9	<4.5	--	<9.0	--	--	--	--	auto repair area, well destroyed 09/01/16
SV-32	09/01/16	6.0	6.4	3.9	<4.5	<9.0	<21	<4.1	14	<5.5	<5.0	--	<10	--	--	--	--	auto repair area, well destroyed 09/01/16
SV-33	09/01/16	6.0	20	27	<4.2	8.8	<20	<3.9	<6.6	<5.2	<4.7	--	<9.5	--	--	--	--	
SV-34	09/01/16	6.0	17	33	4.7	24.3	<22	<4.3	<7.3	<5.7	<5.2	--	<11	--	--	--	--	
SV-35	09/01/16	6.0	36	100	16	79	<20	<3.8	<6.4	<5.1	5.8	--	<9.3	--	--	--	--	
SV-36	09/01/16	6.0	33	72	11	53	<22	<4.2	<7.1	<5.6	<5.1	--	<10	--	--	--	--	
SV-37	09/01/16	6.0	43	110	17	85	<21	<4.0	<6.6	<5.3	<4.8	--	<9.6	--	--	--	--	
SV-38	09/01/16	6.0	48	120	24	120	<20	<3.9	<6.5	<5.2	<4.7	--	<9.4	--	--	--	--	
SV-39	09/01/16	6.0	19	30	<4.1	12	<20	<3.8	<6.4	<5.1	<4.6	--	<9.3	--	--	--	--	
SV-40	09/01/16	6.0	29	51	<4.7	22.2	<23	<4.4	26	<5.9	17	--	<11	--	--	--	--	
SV-41	09/19/16	6.0	49	31	<6.1	7.6	<30	<5.7	<9.6	<7.6	<6.9	#	<14	--	2.9	--	--	auto repair area, well destroyed 10/3/16
SV-42	09/19/16	6.0	<20	<24	<27	<54	<130	<25	<43	<34	<31	#	<62	--	11	--	--	auto repair area, well destroyed 10/3/16
SV-43	09/19/16	6.5	7.2	23	6.9	32.2	<20	<3.9	<6.5	<5.2	<4.7	#	<9.5	--	10	--	--	auto repair area, well destroyed 10/3/16
SV-44	09/19/16	6.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	auto repair area, NOT sampled, water in well, well destroyed
SV-45	09/19/16	6.0	8.7	33	9.4	43.3	<23	<4.4	20	<5.8	<5.2	#	<11	--	4.5	--	--	auto repair area, well destroyed 10/3/16
SV-46	10/20/16	5.0	16	17	6.3	30.3	<22	<4.2	9.4	<5.6	<5.1	#	<10	0.76	2.0	0.93	--	
SV-47	10/20/16	5.0	15	19	6.4	38	<20	<3.9	9.4	13	<4.7	#	32	0.69	2.5	0.86	--	
SV-48	10/20/16	5.0	10	15	7.1	67	<23	<4.4	8.0	<5.9	<5.3	#	14	0.94	2.4	<0.22	--	
SV-49	10/20/16	5.0	22	26	<4.8	12	<23	<4.5	<7.5	<5.9	<5.4	#	<11	5.6	1.7	0.33	--	
SV-50	10/20/16	5.0	37	36	<4.8	13	<23	<4.5	<7.5	<5.9	8.2	#	14	3.7	2.4	0.35	--	

# Pangea

**Table 3. Soil Gas Analytical Data - 1233 Bockman Road, San Lorenzo, California**

Boring/ Sample ID	Date Sampled	Sample Depth (ft bgs)														Notes
			Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-DCA	PCE	TCE	Chloroform	Other VOCs	Isopropyl Alcohol (Leak Check Compound)	Carbon Dioxide	Oxygen	
Residential ESL - Soil/Subslab Gas:			ug/m <sup>3</sup>										%	%	%	
			48	160,000	560	52,000	41	54	240	240	61	Varies	NA	NA	NA	NA

**Abbreviations:**

DCA = 1,2-dichloroethane

PCE = Tetrachloroethene

TCE = Trichloroethene

1,1,1-TCA = 1,1,1-Trichloroethane

VOCs by EPA Method TO-15.

See lab report for trace concentrations of other VOCs

ug/m<sup>3</sup> = Micrograms per cubic meter of air.

ft bgs = Feet below ground surface

ESL = Environmental Screening Level for Shallow Soil Gas for Evaluation of Potential Vapor Intrusion (Table E-2). Established by the SFBRWQCB, Interim Final - November 2007; Feb 2016 (Rev. 3)

ND = not detected above laboratory reporting limits.

-- = Not analyzed

< n = Chemical not present at a concentration in excess of laboratory detection limit shown.

**Bold** concentrations exceed residential ESL.

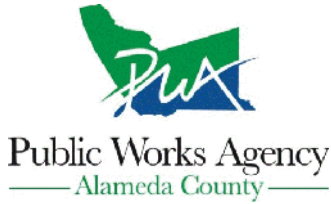
\* = Represents an estimated concentration (j-flag value) below the reporting limit, or indicates that there was no detection above the method detection limit.

# = other VOCs detected below screening level thresholds. See lab report for details.

contaminant detections highlighted in gray

**APPENDIX A**  
Permits

# Alameda County Public Works Agency - Water Resources Well Permit



399 Elmhurst Street  
Hayward, CA 94544-1395  
Telephone: (510)670-6633 Fax:(510)782-1939

**Application Approved on: 08/29/2016 By jamesy**

**Permit Numbers: W2016-0636 to W2016-0637**  
**Permits Valid from 08/30/2016 to 08/30/2016**

**Application Id:** 1472490361392  
**Site Location:** 1233 Bockman Road  
**Project Start Date:** 08/30/2016  
**Assigned Inspector:** Contact Marcelino Vialpando at (510) 670-5760 or Marcelino@acpwa.org

**City of Project Site:**Alameda

**Completion Date:**08/30/2016

**Applicant:** Pangea Environmental Services, Inc. - Patrick Groff  
1710 Franklin ST #200, Oakland, CA 94612  
**Property Owner:** Andrew Lavaux  
100 St. Paul Street, #300, Denver, CA 80206  
**Client:** Andrew Lavaux  
100 St. Paul Street, #300, Denver, CA 80206

**Phone:** 925-818-0010

**Phone:** --

**Phone:** --

	<b>Total Due:</b>	\$530.00
<b>Receipt Number: WR2016-0427</b>	<b>Total Amount Paid:</b>	\$530.00
<b>Payer Name : Robert Clark-Riddell</b>	Paid By: VISA	<b>PAID IN FULL</b>

**Works Requesting Permits:**

Borehole(s) for Investigation-Vapor Sampling 24 to 48 hours only - 11 Boreholes  
Driller: Penecore Drilling - Lic #: 906899 - Method: DP

**Work Total: \$265.00**

**Specifications**

Permit Number	Issued Dt	Expire Dt	# Boreholes	Hole Diam	Max Depth
W2016-0636	08/29/2016	11/28/2016	11	2.25 in.	7.00 ft

**Specific Work Permit Conditions**

1. Boreholes shall not be left open for a period of more than 24 hours. All boreholes left open more than 24 hours will need approval from Alameda County Public Works Agency, Water Resources Section. All boreholes shall be backfilled according to permit destruction requirements and all concrete material and asphalt material shall be to Caltrans Spec or County/City Codes. No borehole(s) shall be left in a manner to act as a conduit at any time.
2. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.
3. Prior to any drilling activities, it shall be the applicant's responsibility to contact and coordinate an Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits or agreements required for that Federal, State, County or City, and follow all City or County Ordinances. No work shall begin until all the permits and requirements have been approved or obtained. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County an Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained.
4. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost and liability in connection with or resulting from the exercise of this Permit including, but not limited to,

# Alameda County Public Works Agency - Water Resources Well Permit

property damage, personal injury and wrongful death.

5. Applicant shall contact assigned inspector listed on the top of the permit at least five (5) working days prior to starting, once the permit has been approved. Confirm the scheduled date(s) at least 24 hours prior to drilling.
6. Permittee, permittee's contractors, consultants or agents shall be responsible to assure that all material or waters generated during drilling, boring destruction, and/or other activities associated with this Permit will be safely handled, properly managed, and disposed of according to all applicable federal, state, and local statutes regulating such. In no case shall these materials and/or waters be allowed to enter, or potentially enter, on or off-site storm sewers, dry wells, or waterways or be allowed to move off the property where work is being completed.
7. Copy of approved drilling permit must be on site at all times. Failure to present or show proof of the approved permit application on site shall result in a fine of \$500.00.
8. Electronic Reporting Regulations (Chapter 30, Division 3 of Title 23 & Division 3 of Title 27, CCR) require electronic submission of any report or data required by a regulatory agency from a cleanup site. Submission dates are set by a Regional Water Board or by a regulatory agency. Once a report/data is successfully uploaded, as required, you have met the reporting requirement (i.e. the compliance measure for electronic submittals is the actual upload itself). The upload date should be on or prior to the regulatory due date.

9. NOTE:

Under California laws, the owner/operator are responsible for reporting the contamination to the governmental regulatory agencies under Section 25295(a). The owner/operator is liable for civil penalties under Section 25299(a)(4) and criminal penalties under Section 25299(d) for failure to report a leak. The owner/operator is liable for civil penalties under Section 25299(b)(4) for knowing failure to ensure compliance with the law by the operator. These penalty provisions do not apply to a potential buyer.

10. Permit is valid only for the purpose specified herein. No changes in construction procedures, as described on this permit application. Temp Vapor wells shall not be converted to monitoring Vapor wells, without a separate permit application process.

11. Vapor monitoring wells constructed with tubing shall be decommissioned by complete removal of tubing, grout seal, and fill material of sand or bentonite. Fill material may be removed by hand auger if material can be removed completely.

Vapor monitoring wells constructed with pvc pipe less than 2" shall be overdrilled to total depth.

Vapor monitoring wells constructed with 2" pvc pipe or larger may be grouted by tremie pipe (any depth) or pressure grouted (less than 30', 25 psi for 5 min).

---

Borehole(s) for Investigation-Environmental/Monitoring Study - 4 Boreholes

Driller: Penecore Drilling - Lic #: 906899 - Method: DP

**Work Total: \$265.00**

**Specifications**

Permit Number	Issued Dt	Expire Dt	# Boreholes	Hole Diam	Max Depth
W2016-0637	08/29/2016	11/28/2016	4	2.25 in.	15.00 ft

**Specific Work Permit Conditions**

## Alameda County Public Works Agency - Water Resources Well Permit

1. Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings. All cuttings remaining or unused shall be containerized and hauled off site. The containers shall be clearly labeled to the ownership of the container and labeled hazardous or non-hazardous.
  2. Boreholes shall not be left open for a period of more than 24 hours. All boreholes left open more than 24 hours will need approval from Alameda County Public Works Agency, Water Resources Section. All boreholes shall be backfilled according to permit destruction requirements and all concrete material and asphalt material shall be to Caltrans Spec or County/City Codes. No borehole(s) shall be left in a manner to act as a conduit at any time.
  3. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.
  4. Applicant shall contact assigned inspector listed on the top of the permit at least five (5) working days prior to starting, once the permit has been approved. Confirm the scheduled date(s) at least 24 hours prior to drilling.
  5. Copy of approved drilling permit must be on site at all times. Failure to present or show proof of the approved permit application on site shall result in a fine of \$500.00.
  6. Electronic Reporting Regulations (Chapter 30, Division 3 of Title 23 & Division 3 of Title 27, CCR) require electronic submission of any report or data required by a regulatory agency from a cleanup site. Submission dates are set by a Regional Water Board or by a regulatory agency. Once a report/data is successfully uploaded, as required, you have met the reporting requirement (i.e. the compliance measure for electronic submittals is the actual upload itself). The upload date should be on or prior to the regulatory due date.
  7. NOTE:  
Under California laws, the owner/operator are responsible for reporting the contamination to the governmental regulatory agencies under Section 25295(a). The owner/operator is liable for civil penalties under Section 25299(a)(4) and criminal penalties under Section 25299(d) for failure to report a leak. The owner/operator is liable for civil penalties under Section 25299(b)(4) for knowing failure to ensure compliance with the law by the operator. These penalty provisions do not apply to a potential buyer.
  8. Prior to any drilling activities onto any public right-of-ways, it shall be the applicants responsibilities to contact and coordinate a Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits required for that City or to the County and follow all City or County Ordinances. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County a Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained.
  9. Permit is valid only for the purpose specified herein. No changes in construction procedures, as described on this permit application. Boreholes shall not be converted to monitoring wells, without a permit application process.
-

# Alameda County Public Works Agency - Water Resources Well Permit



Public Works Agency  
—Alameda County—

399 Elmhurst Street  
Hayward, CA 94544-1395  
Telephone: (510)670-6633 Fax:(510)782-1939

Application Approved on: 09/06/2016 By jamesy

Permit Numbers: W2016-0650 to W2016-0651  
Permits Valid from 09/07/2016 to 09/07/2016

Application Id: 1472856646183  
Site Location: 1233 Bockman Road, San Lorenzo  
Project Start Date: 09/07/2016  
Assigned Inspector: Contact Marcelino Vialpando at (510) 670-5760 or Marcelino@acpwa.org

City of Project Site: San Lorenzo

Completion Date: 09/07/2016

Applicant: Pangea Environmental Services, Inc. - Patrick Groff  
1710 Franklin ST #200, Oakland, CA 94612  
Phone: 925-818-0010  
Property Owner: Andrew Lavaux  
100 St. Paul Street, #300, Denver, CA 80206  
Phone: --  
Client: Andrew Lavaux  
100 St. Paul Street, #300, Denver, CA 80206  
Phone: --

Receipt Number: WR2016-0438 Total Due: \$530.00  
Payer Name : Robert Clark-Riddell Total Amount Paid: \$530.00  
Paid By: VISA PAID IN FULL

## Works Requesting Permits:

Borehole(s) for Investigation-Environmental/Monitoring Study - 6 Boreholes

Driller: Penecore Drilling - Lic #: 906899 - Method: DP

Work Total: \$265.00

### Specifications

Permit Number	Issued Dt	Expire Dt	# Boreholes	Hole Diam	Max Depth
W2016-0650	09/06/2016	12/06/2016	6	2.25 in.	12.00 ft

### Specific Work Permit Conditions

1. Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings. All cuttings remaining or unused shall be containerized and hauled off site. The containers shall be clearly labeled to the ownership of the container and labeled hazardous or non-hazardous.
2. Boreholes shall not be left open for a period of more than 24 hours. All boreholes left open more than 24 hours will need approval from Alameda County Public Works Agency, Water Resources Section. All boreholes shall be backfilled according to permit destruction requirements and all concrete material and asphalt material shall be to Caltrans Spec or County/City Codes. No borehole(s) shall be left in a manner to act as a conduit at any time.
3. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.
4. Applicant shall contact assigned inspector listed on the top of the permit at least five (5) working days prior to starting, once the permit has been approved. Confirm the scheduled date(s) at least 24 hours prior to drilling.
5. Copy of approved drilling permit must be on site at all times. Failure to present or show proof of the approved permit application on site shall result in a fine of \$500.00.
6. Electronic Reporting Regulations (Chapter 30, Division 3 of Title 23 & Division 3 of Title 27, CCR) require electronic

## Alameda County Public Works Agency - Water Resources Well Permit

submission of any report or data required by a regulatory agency from a cleanup site. Submission dates are set by a Regional Water Board or by a regulatory agency. Once a report/data is successfully uploaded, as required, you have met the reporting requirement (i.e. the compliance measure for electronic submittals is the actual upload itself). The upload date should be on or prior to the regulatory due date.

### 7. NOTE:

Under California laws, the owner/operator are responsible for reporting the contamination to the governmental regulatory agencies under Section 25295(a). The owner/operator is liable for civil penalties under Section 25299(a)(4) and criminal penalties under Section 25299(d) for failure to report a leak. The owner/operator is liable for civil penalties under Section 25299(b)(4) for knowing failure to ensure compliance with the law by the operator. These penalty provisions do not apply to a potential buyer.

8. Prior to any drilling activities onto any public right-of-ways, it shall be the applicants responsibilities to contact and coordinate a Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits required for that City or to the County and follow all City or County Ordinances. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County a Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained.

9. Permit is valid only for the purpose specified herein. No changes in construction procedures, as described on this permit application. Boreholes shall not be converted to monitoring wells, without a permit application process.

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Borehole(s) for Investigation-Vapor Sampling 24 to 48 hours only - 6 Boreholes

Driller: Penecore Drilling - Lic #: 906899 - Method: DP

**Work Total: \$265.00**

### Specifications

Permit Number	Issued Dt	Expire Dt	# Boreholes	Hole Diam	Max Depth
W2016-0651	09/06/2016	12/06/2016	6	2.25 in.	7.00 ft

### Specific Work Permit Conditions

1. Boreholes shall not be left open for a period of more than 24 hours. All boreholes left open more than 24 hours will need approval from Alameda County Public Works Agency, Water Resources Section. All boreholes shall be backfilled according to permit destruction requirements and all concrete material and asphalt material shall be to Caltrans Spec or County/City Codes. No borehole(s) shall be left in a manner to act as a conduit at any time.
2. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.
3. Prior to any drilling activities, it shall be the applicant's responsibility to contact and coordinate an Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits or agreements required for that Federal, State, County or City, and follow all City or County Ordinances. No work shall begin until all the permits and requirements have been approved or obtained. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County an Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained.
4. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend



## Alameda County Public Works Agency - Water Resources Well Permit

and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost and liability in connection with or resulting from the exercise of this Permit including, but not limited to, property damage, personal injury and wrongful death.

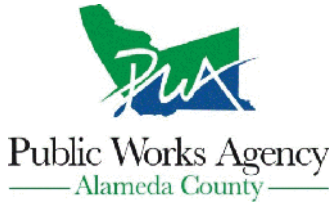
5. Applicant shall contact assigned inspector listed on the top of the permit at least five (5) working days prior to starting, once the permit has been approved. Confirm the scheduled date(s) at least 24 hours prior to drilling.
6. Permittee, permittee's contractors, consultants or agents shall be responsible to assure that all material or waters generated during drilling, boring destruction, and/or other activities associated with this Permit will be safely handled, properly managed, and disposed of according to all applicable federal, state, and local statutes regulating such. In no case shall these materials and/or waters be allowed to enter, or potentially enter, on or off-site storm sewers, dry wells, or waterways or be allowed to move off the property where work is being completed.
7. Copy of approved drilling permit must be on site at all times. Failure to present or show proof of the approved permit application on site shall result in a fine of \$500.00.
8. Electronic Reporting Regulations (Chapter 30, Division 3 of Title 23 & Division 3 of Title 27, CCR) require electronic submission of any report or data required by a regulatory agency from a cleanup site. Submission dates are set by a Regional Water Board or by a regulatory agency. Once a report/data is successfully uploaded, as required, you have met the reporting requirement (i.e. the compliance measure for electronic submittals is the actual upload itself). The upload date should be on or prior to the regulatory due date.
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10. Permit is valid only for the purpose specified herein. No changes in construction procedures, as described on this permit application. Temp Vapor wells shall not be converted to monitoring Vapor wells, without a separate permit application process.
11. Vapor monitoring wells constructed with tubing shall be decommissioned by complete removal of tubing, grout seal, and fill material of sand or bentonite. Fill material may be removed by hand auger if material can be removed completely.

Vapor monitoring wells constructed with pvc pipe less than 2" shall be overdrilled to total depth.

Vapor monitoring wells constructed with 2" pvc pipe or larger may be grouted by tremie pipe (any depth) or pressure grouted (less than 30', 25 psi for 5 min).

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# Alameda County Public Works Agency - Water Resources Well Permit



399 Elmhurst Street  
Hayward, CA 94544-1395  
Telephone: (510)670-6633 Fax:(510)782-1939

Application Approved on: 10/19/2016 By jamesy

Permit Numbers: W2016-0762 to W2016-0763  
Permits Valid from 10/20/2016 to 10/20/2016

Application Id: 1476814909893  
Site Location: 1233 Bockman Road  
San Lorenzo, CA 94580

City of Project Site: San Lorenzo

Development Site

Project Start Date: Start Date 10-20-2016 if possible  
10/20/2016  
Assigned Inspector: Contact Marcelino Vialpando at (510) 670-5760 or Marcelino@acpwa.org

Completion Date: 10/20/2016

Applicant: Pangea Environmental Services, Inc. - Patrick  
Groff

Phone: 925-818-0010

Property Owner: 1710 Franklin ST #200, Oakland, CA 94612  
Andrew Lavaux

Phone: --

Client: 100 St. Paul Street, #300, Denver, CA 80206  
Andrew Lavaux

Phone: --

Receipt Number: WR2016-0524 Total Due: \$530.00  
Payer Name : Robert Clark-Riddell Total Amount Paid: \$530.00  
Paid By: VISA PAID IN FULL

## Works Requesting Permits:

Borehole(s) for Geo Probes-Sampling 24 to 72 hours only - 15 Boreholes  
Driller: Penecore Drilling - Lic #: 906899 - Method: DP

Work Total: \$265.00

### Specifications

Permit Number	Issued Dt	Expire Dt	# Boreholes	Hole Diam	Max Depth
W2016-0762	10/19/2016	01/18/2017	15	2.25 in.	5.00 ft

### Specific Work Permit Conditions

1. Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings. All cuttings remaining or unused shall be containerized and hauled off site. The containers shall be clearly labeled to the ownership of the container and labeled hazardous or non-hazardous.
2. Boreholes shall not be left open for a period of more than 24 hours. All boreholes left open more than 24 hours will need approval from Alameda County Public Works Agency, Water Resources Section. All boreholes shall be backfilled according to permit destruction requirements and all concrete material and asphalt material shall be to Caltrans Spec or County/City Codes. No borehole(s) shall be left in a manner to act as a conduit at any time.
3. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.
4. Applicant shall contact assigned inspector listed on the top of the permit at least five (5) working days prior to starting,

# Alameda County Public Works Agency - Water Resources Well Permit

once the permit has been approved. Confirm the scheduled date(s) at least 24 hours prior to drilling.

5. Permittee, permittee's contractors, consultants or agents shall be responsible to assure that all material or waters generated during drilling, boring destruction, and/or other activities associated with this Permit will be safely handled, properly managed, and disposed of according to all applicable federal, state, and local statutes regulating such. In no case shall these materials and/or waters be allowed to enter, or potentially enter, on or off-site storm sewers, dry wells, or waterways or be allowed to move off the property where work is being completed.

6. Copy of approved drilling permit must be on site at all times. Failure to present or show proof of the approved permit application on site shall result in a fine of \$500.00.

## 7. NOTE:

Under California laws, the owner/operator are responsible for reporting the contamination to the governmental regulatory agencies under Section 25295(a). The owner/operator is liable for civil penalties under Section 25299(a)(4) and criminal penalties under Section 25299(d) for failure to report a leak. The owner/operator is liable for civil penalties under Section 25299(b)(4) for knowing failure to ensure compliance with the law by the operator. These penalty provisions do not apply to a potential buyer.

8. Prior to any drilling activities onto any public right-of-ways, it shall be the applicants responsibilities to contact and coordinate a Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits required for that City or to the County and follow all City or County Ordinances. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County a Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained.

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---

Borehole(s) for Investigation-Environmental/Monitoring Study - 3 Boreholes

Driller: Penecore Drilling - Lic #: 906899 - Method: DP

**Work Total: \$265.00**

## Specifications

Permit Number	Issued Dt	Expire Dt	# Boreholes	Hole Diam	Max Depth
W2016-0763	10/19/2016	01/18/2017	3	2.25 in.	8.00 ft

## Specific Work Permit Conditions

1. Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings. All cuttings remaining or unused shall be containerized and hauled off site. The containers shall be clearly labeled to the ownership of the container and labeled hazardous or non-hazardous.

2. Boreholes shall not be left open for a period of more than 24 hours. All boreholes left open more than 24 hours will need approval from Alameda County Public Works Agency, Water Resources Section. All boreholes shall be backfilled according to permit destruction requirements and all concrete material and asphalt material shall be to Caltrans Spec or County/City Codes. No borehole(s) shall be left in a manner to act as a conduit at any time.

3. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.

## Alameda County Public Works Agency - Water Resources Well Permit

4. Applicant shall contact assigned inspector listed on the top of the permit at least five (5) working days prior to starting, once the permit has been approved. Confirm the scheduled date(s) at least 24 hours prior to drilling.
  5. Copy of approved drilling permit must be on site at all times. Failure to present or show proof of the approved permit application on site shall result in a fine of \$500.00.
  6. Electronic Reporting Regulations (Chapter 30, Division 3 of Title 23 & Division 3 of Title 27, CCR) require electronic submission of any report or data required by a regulatory agency from a cleanup site. Submission dates are set by a Regional Water Board or by a regulatory agency. Once a report/data is successfully uploaded, as required, you have met the reporting requirement (i.e. the compliance measure for electronic submittals is the actual upload itself). The upload date should be on or prior to the regulatory due date.
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  9. Permit is valid only for the purpose specified herein. No changes in construction procedures, as described on this permit application. Boreholes shall not be converted to monitoring wells, without a permit application process.
-

**APPENDIX B**  
Soil Vapor Probe Field Forms













# DAILY LOG

Date: 9.19.16	Site Address: 1233 Bockman, San Lorenzo
Task/Purpose: Soil Gas Sampling	Project Name: Bockman Property
Log Notes By (Name): E. Lervaag	Project Number: 2030.001

## NOTES

0800 Arrive on-site set up for soil gas sampling, 5 locations SV-41, SV-42, SV-43, SV-44, SV-45
Purge Cales
- 1' sand pack by 3.25" dia
- 6" dry bent by 3.25" dia
- 15' tubing (total above ground & below ground)
- Sandpack ⇒ 612 ml
- Dry bent ⇒ 306 ml
- tubing ⇒ 75 ml
993 (1 purge volume)
x 3
2976 total purge ⇒ 19:50 sec @ 150ml/min
SV-41 field vacuum based on airflow increased too much too purge. contacted JW at office, try to purge vapor probes but if slow purge then stop. NO PURGE AT SV-41
SV-42 - NO PURGE DUE TO HIGH FIELD VACUUM
SV-43 PURGED WITH NO ISSUES
SV-44 - NO PURGE, WATER IN TUBING
SV-45 - Purged NO Problems
* NO sample collected from SV-44 due to water in tubing.
* some water in tubing in SV-42 minimal sample collected (5" Hg)
* SV-41 no purge sample
* SV-43 and SV-45 purged & sampled
430 off-site to lab (CAT)



























### SOIL GAS PURGING / SAMPLING LOG

Project Name: Buckman  
 Job Number: 2030.001  
 Date: 10-21-2016  
 Sampler(s): PQ EL  
 Sample ID / Time: \_\_\_\_\_



Probe / Well ID: 5V-50  
 Canister Serial #: 00412  
 Flow Controller #: 400204  
 Initial Vacuum: 30  
 Final Vacuum: 5

Notes: \_\_\_\_\_

**SPECIFICATIONS**

Tubing Length: \_\_\_\_\_ inches  
 Tubing Diameter: \_\_\_\_\_ inches  
 Boring Diameter: \_\_\_\_\_ inches  
 Sandpack height: \_\_\_\_\_ inches  
 Probe Length: \_\_\_\_\_ inches  
 Probe Diameter: \_\_\_\_\_ inches  
 Summa Flow Rate: \_\_\_\_\_ mL/min  
 Purge Flow Rate: \_\_\_\_\_ mL/min

*No Purge*

**PURGE VOLUME CALCULATION**

Purge Volume = tubing + sandpack  
 Tubing =  $\pi \times (\text{tubing diameter}/2)^2 \times \text{length}$   
 Tubing = \_\_\_\_\_ inches<sup>3</sup>  
 Sandpack =  $\pi \times (\text{boring diameter}/2)^2 \times \text{sandpack height} \times \text{porosity}$   
 Sandpack = \_\_\_\_\_ inches<sup>3</sup>  
 Single Purge Volume = \_\_\_\_\_ inches<sup>3</sup>  
 Total Purge Volumes = \_\_\_\_\_  
 Start Time = \_\_\_\_\_  
 Total Purge Time = \_\_\_\_\_

$\pi = 3.1416$

1 inch<sup>3</sup> = 16.4 mL

Estimated Max Porosity = 0.375

TIME	PURGE TIME (min./sec.)	He (IPA) IN SHROUD (%/PPM)	CANISTER PRESSURE ("Hg)	VOCs (ppm)	COMMENTS
		<i>No purge sample</i>			
1104					<i>Shut ia test - 98" H<sub>2</sub>O</i>
1105					<i>Stop shut ia test - 98" H<sub>2</sub>O</i>
					<i>controller gage moving <u>down</u> slowly</i>
1115	---	0.6	28		<i>Field vacuum <math>\phi</math></i>
1120	---	8.5	25		<i>controller gage start @ 28"</i>
1126	---	7.3	20		<i>Field vacuum <math>\phi</math></i>
1134	---	4.5	15		<i>"</i>
1142	---	22.5	10		<i>"</i>
1152 <del>1148</del>	---	16.2	5		<i>"</i>

## **APPENDIX C**

95% UCL

Summary statistics for benzene and tetrachloroethane (PCE) reported in soil vapor samples collected prior to and following soil removal activities at boring location SV-28 are presented in Tables 1 and 2. Table 1 presents the average and 95 percent upper confidence limit (95UCL) of the arithmetic mean of benzene and PCE concentrations reported in the vicinity of the former auto repair building prior to and following the removal of soil at SV-28. The average and UCL concentrations for benzene and PCE reported near buildings 1 and 2 prior to a following soil removal at SV-28 are presented in Table 2.

Consistent with U.S.EPA<sup>1</sup>, the exposure point concentration used to estimate human health risks are represented by the 95UCL. According to U.S. EPA<sup>2</sup>, although the 95UCL “does not reflect the maximum concentration that could be contacted at any one time, it is regarded as a reasonable estimate of the concentration likely to be contacted over time. This is because in most situations, assuming long-term contact with the maximum concentration is not reasonable.”

To evaluate the concentrations of benzene and PCE reported in soil vapor at the Site, the average and UCL concentrations were calculated using Version 5.0 of the ProUCL software recommended by U.S. EPA<sup>3</sup>. As shown in Tables 1 and 2, the average and UCL concentrations for benzene and PCE are below their respective residential ESLs.

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<sup>1</sup> U.S. EPA. 2002. Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, D.C. December.

<sup>2</sup> U.S. EPA. 1989. Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part A). Interim Final. EPA-540/1-89/002. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, D.C. December.

<sup>3</sup> U.S. EPA. 2013. ProUCL Version 5.0. September.

Table 1  
 Benzene and PCE Reported in Soil Vapor Samples  
 Vicinity of the Former Auto Repair Building  
 1233 Bockman Road, San Lorenzo, California

Vicinity of Former Auto Repair Building					
Boring/ Sample ID	Date Sampled	Soil Vapor Concentrations ( $\mu\text{g}/\text{m}^3$ )			
		Prior to Soil Removal at SV-28		Post Soil Removal at SV-28	
		Benzene	PCE	Benzene	PCE
SV-28	8/23/2016	<3.3	200	Removed	Removed
SV-29	8/23/2016	7.5	7.0	7.5	7.0
SV-30	9/1/2016	31	<6.7	31	<6.7
SV-31	9/1/2016	16	<6.2	16	<6.2
SV-32	9/1/2016	6.4	14	6.4	14
SV-45	9/19/2016	8.7	20	8.7	20
SV-46	10/20/2016	NS	NS	16	9.4
Average Detects <sup>1</sup>		13.9	60.3	14.3	12.6
95UCL <sup>2</sup>		20.7	109.4	21.9	15.3
Residential ESL - Soil Vapor <sup>3</sup>		48	240	48	240

**Notes:**

PCE = Tetrachloroethane

< = Not detected above the reporting limit

$\mu\text{g}/\text{m}^3$  = micrograms per cubic meter

<sup>1</sup> The average is the mean concentration of the detected values calculated using ProUCL Version 5.0 (EPA 2013).

<sup>2</sup> The 95 percent upper confidence limit (95UCL) on the mean was calculated using ProUCL Version 5.0 (EPA 2013).

<sup>3</sup> The residential environmental screening level (ESL) for soil vapor was obtained from the SFRWQCB (2016).

**References:**

Regional Water Quality Control Board - San Francisco Region (SFRWQCB). 2016. Environmental Screening Levels (ESLs). February.

U.S. Environmental Protection Agency (EPA). 2013. ProUCL, Version 5.0. September.

Table 2  
Benzene and PCE Reported in Soil Vapor Samples  
Vicinity of the Buildings 1 and 2  
1233 Bockman Road, San Lorenzo, California

Buildings 1 and 2					
Boring/ Sample ID	Date Sampled	Soil Vapor Concentrations ( $\mu\text{g}/\text{m}^3$ )			
		Prior to Soil Removal at SV-28		Post Soil Removal at SV-28	
		Benzene	PCE	Benzene	PCE
SG-1	6/25/2015	1.34	<5.1	1.34	<5.1
SV-28	8/23/2016	<3.3	200	Removed	Removed
SV-29	8/23/2016	7.5	7.0	7.5	7.0
SV-30	9/1/2016	31	<6.7	31	<6.7
SV-31	9/1/2016	16	<6.2	16	<6.2
SV-32	9/1/2016	6.4	14	6.4	14
SV-41	9/19/2016	49	<9.6	49	<9.6
SV-42	9/19/2016	<20	<43	<20	<43
SV-43	9/19/2016	7.2	<6.5	7.2	<6.5
SV-44	9/19/2016	NS	NS	NS	NS
SV-45	9/19/2016	8.7	20	8.7	20
SV-46	10/20/2016	NS	NS	16	9.4
SV-47	10/20/2016	NS	NS	15	9.4
SV-48	10/20/2016	NS	NS	10	8.0
SV-49	10/20/2016	NS	NS	22	<7.5
SV-50	10/20/2016	NS	NS	37	<7.5
Average Detects <sup>1</sup>		15.9	60.3	17.5	11.3
95UCL <sup>2</sup>		22.5	66.2	23.4	10.5
Residential ESL - Soil Vapor <sup>3</sup>		48	240	48	240

**Notes:**

PCE = Tetrachloroethane

< = Not detected above the reporting limit

$\mu\text{g}/\text{m}^3$  = micrograms per cubic meter

<sup>1</sup> The average is the mean concentration of the detected values calculated using ProUCL Version 5.0 (EPA 2013).

<sup>2</sup> The 95 percent upper confidence limit (95UCL) on the mean was calculated using ProUCL Version 5.0 (EPA 2013).

<sup>3</sup> The residential environmental screening level (ESL) for soil vapor was obtained from the SFRWQCB (2016).

**References:**

Regional Water Quality Control Board - San Francisco Region (SFRWQCB). 2016. Environmental Screening Levels (ESLs). February.  
U.S. Environmental Protection Agency (EPA). 2013. ProUCL, Version 5.0. September.

## **APPENDIX D**

### Laboratory Analytical Reports





**Curtis & Tompkins, Ltd.**  
Analytical Laboratories, Since 1878







Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

**Laboratory Job Number 280375  
ANALYTICAL REPORT**

Pangea Environmental  
1710 Franklin Street  
Oakland, CA 94612

Project : STANDARD  
Location : 1233 Bockman  
Level : II

<u>Sample ID</u>	<u>Lab ID</u>
H-1	280375-001
H-2	280375-002
H-3	280375-003

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: \_\_\_\_\_

Mike Dahlquist  
Project Manager  
mike.dahlquist@ctberk.com

Date: 09/06/2016

CA ELAP# 2896, NELAP# 4044-001

### CASE NARRATIVE

Laboratory number: 280375  
Client: Pangea Environmental  
Location: 1233 Bockman  
Request Date: 08/31/16  
Samples Received: 08/31/16

This data package contains sample and QC results for three soil samples, requested for the above referenced project on 08/31/16. The samples were received cold and intact.

**TPH-Extractables by GC (EPA 8015B):**

No analytical problems were encountered.

**Volatile Organics by GC/MS (EPA 8260B):**

No analytical problems were encountered.

**PCBs (EPA 8082):**

All samples underwent sulfuric acid cleanup using EPA Method 3665A. All samples underwent sulfur cleanup using the copper option in EPA Method 3660B. No analytical problems were encountered.





COOLER RECEIPT CHECKLIST



Login # 280375 Date Received 8/31/16 Number of coolers 1
Client PANGEA Project 1233 Bockman

Date Opened 8/31 By (print) SL (sign) [Signature]
Date Logged in [Signature] By (print) [Signature] (sign) [Signature]
Date Labelled [Signature] By (print) CB (sign) [Signature]

1. Did cooler come with a shipping slip (airbill, etc) YES NO
Shipping info

2A. Were custody seals present? ... YES (circle) on cooler on samples NO
How many Name Date

2B. Were custody seals intact upon arrival? YES NO N/A

3. Were custody papers dry and intact when received? YES NO

4. Were custody papers filled out properly (ink, signed, etc)? YES NO

5. Is the project identifiable from custody papers? (If so fill out top of form) YES NO

6. Indicate the packing in cooler: (if other, describe)

- Bubble Wrap, Cloth material, Foam blocks, Cardboard, Bags, Styrofoam, None, Paper towels

7. Temperature documentation: \* Notify PM if temperature exceeds 6°C

Type of ice used: Wet Blue/Gel None Temp(°C) 5.4'

Temperature blank(s) included? Thermometer# IR Gun# A

Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? YES NO
If YES, what time were they transferred to freezer?

9. Did all bottles arrive unbroken/unopened? YES NO

10. Are there any missing / extra samples? YES NO

11. Are samples in the appropriate containers for indicated tests? YES NO

12. Are sample labels present, in good condition and complete? YES NO

13. Do the sample labels agree with custody papers? YES NO

14. Was sufficient amount of sample sent for tests requested? YES NO

15. Are the samples appropriately preserved? YES NO N/A

16. Did you check preservatives for all bottles for each sample? YES NO N/A

17. Did you document your preservative check? (pH strip lot# ) YES NO N/A

18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO N/A

19. Did you change the hold time in LIMS for preserved terracores? YES NO N/A

20. Are bubbles > 6mm absent in VOA samples? YES NO N/A

21. Was the client contacted concerning this sample delivery? YES NO
If YES, Who was called? By Date:

COMMENTS

## Detections Summary for 280375

Results for any subcontracted analyses are not included in this summary.

Client : Pangea Environmental  
 Project : STANDARD  
 Location : 1233 Bockman

Client Sample ID : H-1                      Laboratory Sample ID :                      280375-001

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	110	Y	1.0	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B
Motor Oil C24-C36	310		5.0	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B

Client Sample ID : H-2                      Laboratory Sample ID :                      280375-002

No Detections

Client Sample ID : H-3                      Laboratory Sample ID :                      280375-003

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	1.5	Y	1.0	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B
Motor Oil C24-C36	16		5.0	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B

Y = Sample exhibits chromatographic pattern which does not resemble standard





## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	280375	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	STANDARD	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC849900	Batch#:	238687
Matrix:	Soil	Prepared:	09/01/16
Units:	mg/Kg	Analyzed:	09/01/16

Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	49.94	34.03	68	58-137

Surrogate	%REC	Limits
o-Terphenyl	81	59-140

## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	280375	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	STANDARD	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	238687
MSS Lab ID:	280323-004	Sampled:	08/29/16
Matrix:	Soil	Received:	08/30/16
Units:	mg/Kg	Prepared:	09/01/16
Basis:	as received	Analyzed:	09/02/16
Diln Fac:	1.000		

Type: MS Lab ID: QC849901

Analyte	MSS Result	Spiked	Result	%REC	Limits
Diesel C10-C24	<0.3065	50.03	37.43	75	46-154

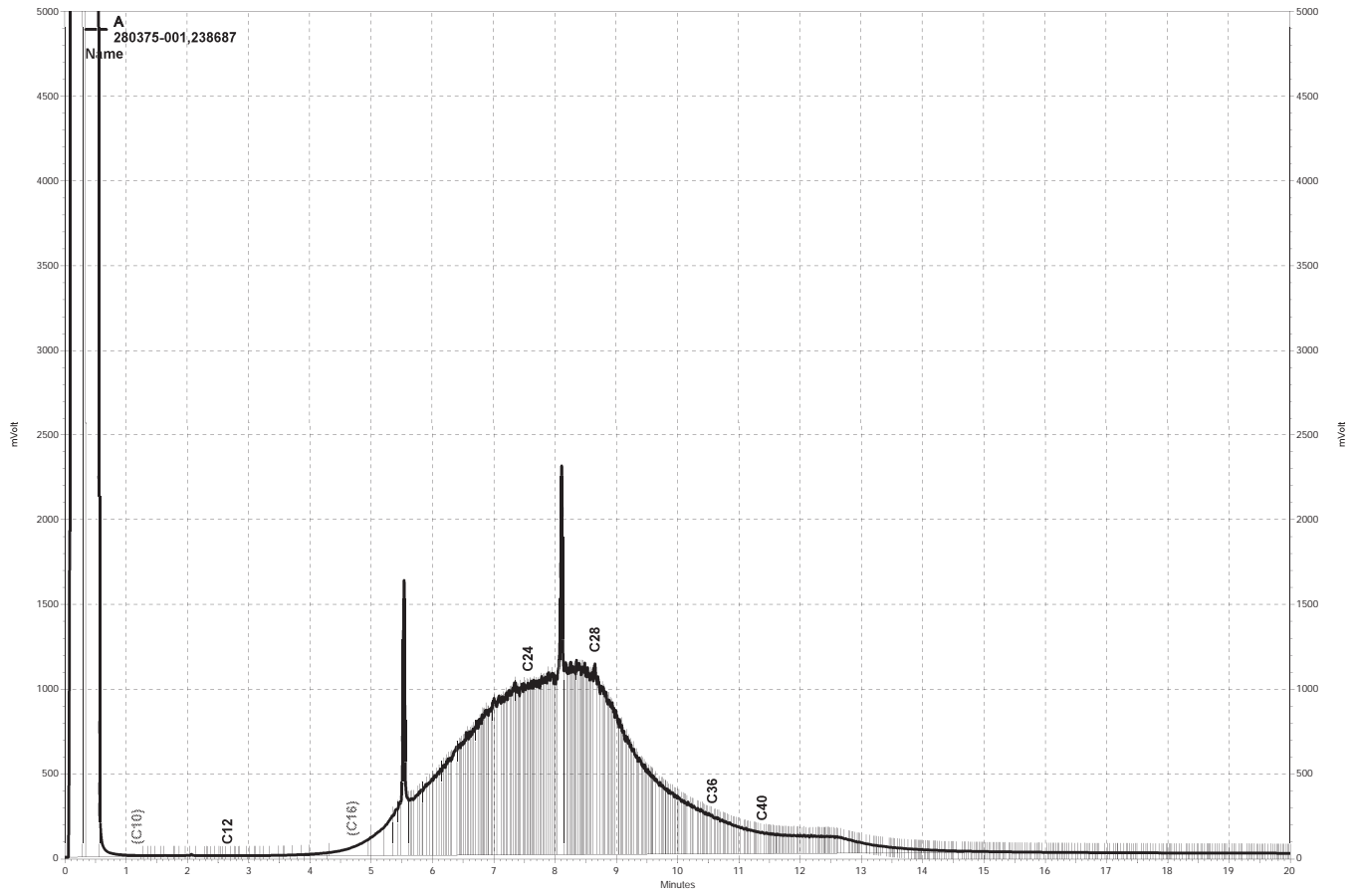
Surrogate	%REC	Limits
o-Terphenyl	94	59-140

Type: MSD Lab ID: QC849902

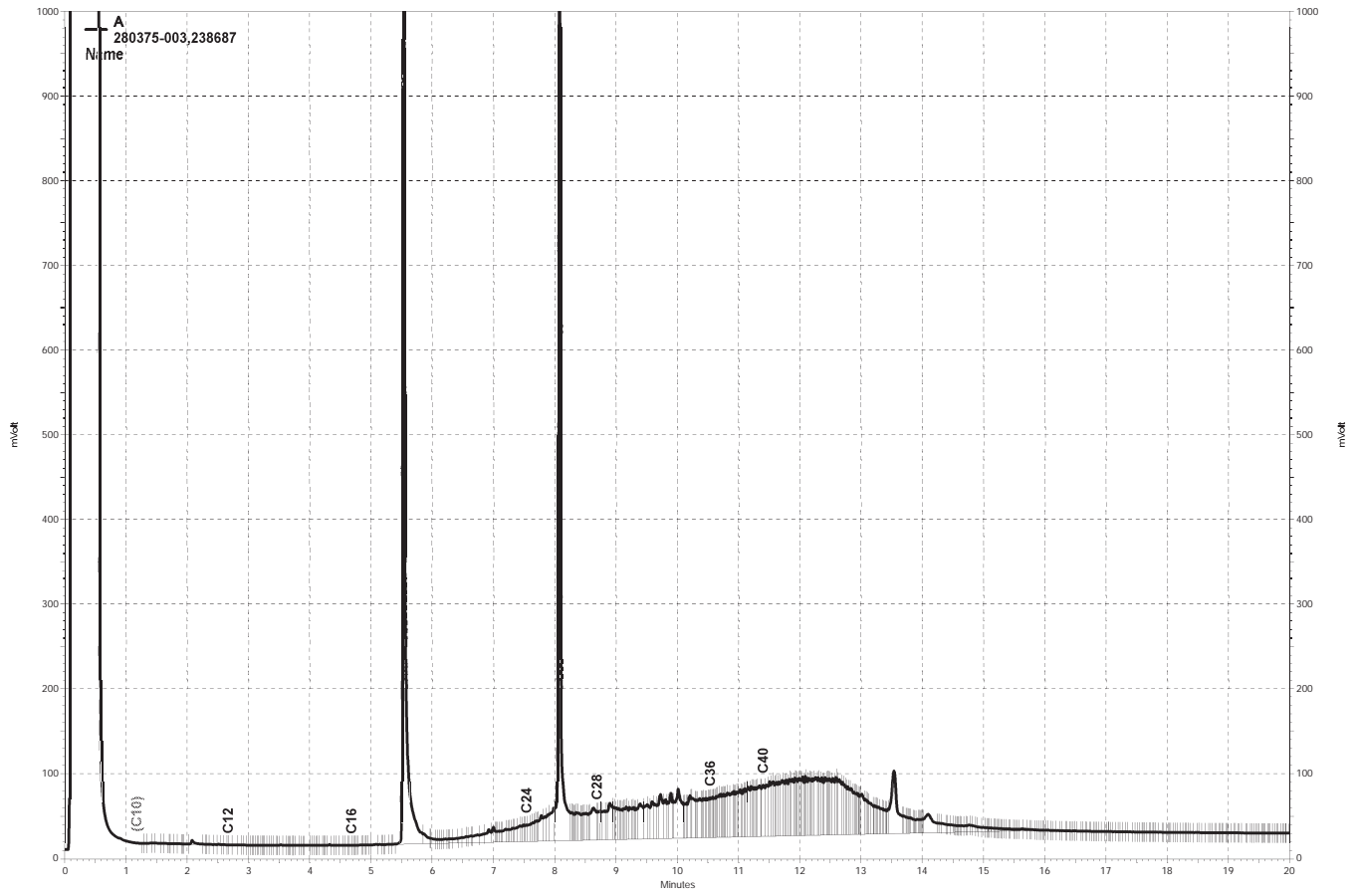
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	49.84	36.96	74	46-154	1	50

Surrogate	%REC	Limits
o-Terphenyl	82	59-140

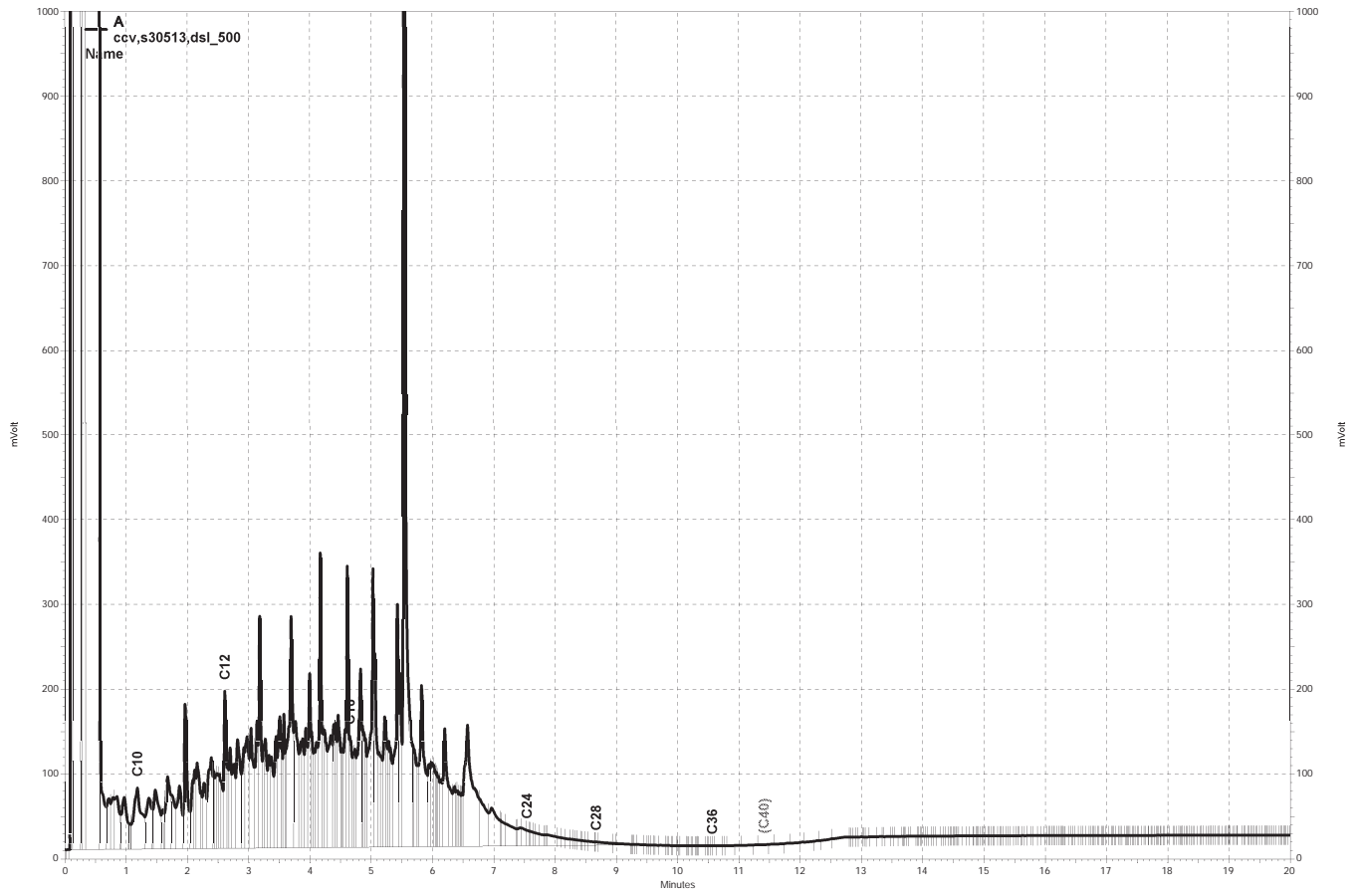
RPD= Relative Percent Difference



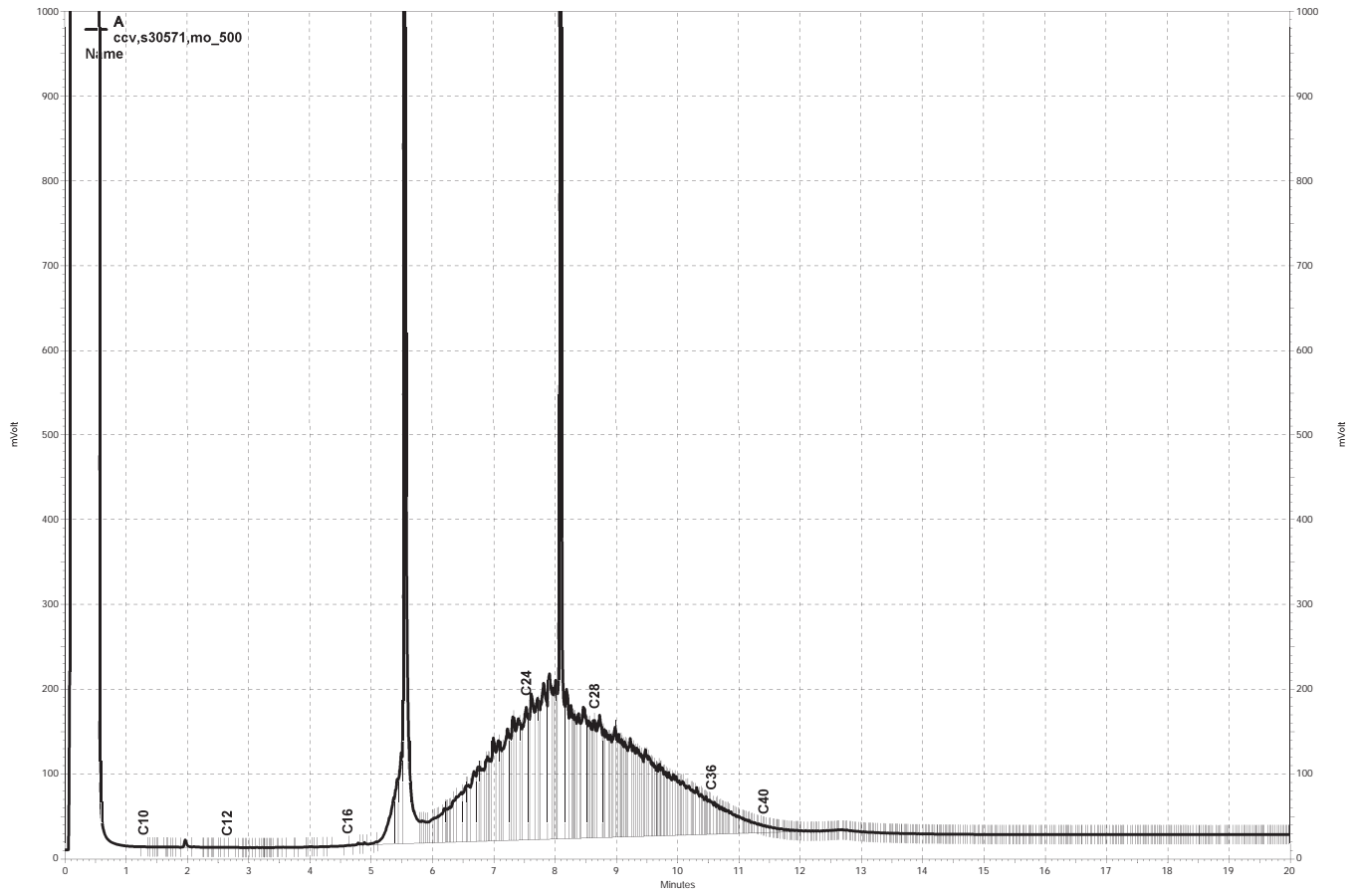
\\kraken\drive\ezchrom\Projects\GC26\data\246a024, A



\\kraken\drive\ezchrom\Projects\GC26\data\246a026, A



— \\kraken\drive\ezchrom\Projects\GC26\data\243a121, A



— \\kraken\drive\ezchrom\Projects\GC26\data\243a120, A

### Purgeable Organics by GC/MS

Lab #:	280375	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8260B
Field ID:	H-1	Diln Fac:	0.9506
Lab ID:	280375-001	Batch#:	238685
Matrix:	Soil	Sampled:	08/31/16
Units:	ug/Kg	Received:	08/31/16
Basis:	as received	Analyzed:	09/01/16

Analyte	Result	RL
Freon 12	ND	9.5
Chloromethane	ND	9.5
Vinyl Chloride	ND	9.5
Bromomethane	ND	9.5
Chloroethane	ND	9.5
Trichlorofluoromethane	ND	4.8
Acetone	ND	19
Freon 113	ND	4.8
1,1-Dichloroethene	ND	4.8
Methylene Chloride	ND	19
Carbon Disulfide	ND	4.8
MTBE	ND	4.8
trans-1,2-Dichloroethene	ND	4.8
Vinyl Acetate	ND	48
1,1-Dichloroethane	ND	4.8
2-Butanone	ND	9.5
cis-1,2-Dichloroethene	ND	4.8
2,2-Dichloropropane	ND	4.8
Chloroform	ND	4.8
Bromochloromethane	ND	4.8
1,1,1-Trichloroethane	ND	4.8
1,1-Dichloropropene	ND	4.8
Carbon Tetrachloride	ND	4.8
1,2-Dichloroethane	ND	4.8
Benzene	ND	4.8
Trichloroethene	ND	4.8
1,2-Dichloropropane	ND	4.8
Bromodichloromethane	ND	4.8
Dibromomethane	ND	4.8
4-Methyl-2-Pentanone	ND	9.5
cis-1,3-Dichloropropene	ND	4.8
Toluene	ND	4.8
trans-1,3-Dichloropropene	ND	4.8
1,1,2-Trichloroethane	ND	4.8
2-Hexanone	ND	9.5
1,3-Dichloropropane	ND	4.8
Tetrachloroethene	ND	4.8

ND= Not Detected

RL= Reporting Limit



### Purgeable Organics by GC/MS

Lab #:	280375	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8260B
Field ID:	H-1	Diln Fac:	0.9506
Lab ID:	280375-001	Batch#:	238685
Matrix:	Soil	Sampled:	08/31/16
Units:	ug/Kg	Received:	08/31/16
Basis:	as received	Analyzed:	09/01/16

Analyte	Result	RL
Dibromochloromethane	ND	4.8
1,2-Dibromoethane	ND	4.8
Chlorobenzene	ND	4.8
1,1,1,2-Tetrachloroethane	ND	4.8
Ethylbenzene	ND	4.8
m,p-Xylenes	ND	4.8
o-Xylene	ND	4.8
Styrene	ND	4.8
Bromoform	ND	4.8
Isopropylbenzene	ND	4.8
1,1,2,2-Tetrachloroethane	ND	4.8
1,2,3-Trichloropropane	ND	4.8
Propylbenzene	ND	4.8
Bromobenzene	ND	4.8
1,3,5-Trimethylbenzene	ND	4.8
2-Chlorotoluene	ND	4.8
4-Chlorotoluene	ND	4.8
tert-Butylbenzene	ND	4.8
1,2,4-Trimethylbenzene	ND	4.8
sec-Butylbenzene	ND	4.8
para-Isopropyl Toluene	ND	4.8
1,3-Dichlorobenzene	ND	4.8
1,4-Dichlorobenzene	ND	4.8
n-Butylbenzene	ND	4.8
1,2-Dichlorobenzene	ND	4.8
1,2-Dibromo-3-Chloropropane	ND	4.8
1,2,4-Trichlorobenzene	ND	4.8
Hexachlorobutadiene	ND	4.8
Naphthalene	ND	4.8
1,2,3-Trichlorobenzene	ND	4.8

Surrogate	%REC	Limits
Dibromofluoromethane	100	78-134
1,2-Dichloroethane-d4	103	80-138
Toluene-d8	98	80-120
Bromofluorobenzene	103	78-123

ND= Not Detected  
 RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280375	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8260B
Field ID:	H-2	Diln Fac:	0.9524
Lab ID:	280375-002	Batch#:	238685
Matrix:	Soil	Sampled:	08/31/16
Units:	ug/Kg	Received:	08/31/16
Basis:	as received	Analyzed:	09/01/16

Analyte	Result	RL
Freon 12	ND	9.5
Chloromethane	ND	9.5
Vinyl Chloride	ND	9.5
Bromomethane	ND	9.5
Chloroethane	ND	9.5
Trichlorofluoromethane	ND	4.8
Acetone	ND	19
Freon 113	ND	4.8
1,1-Dichloroethene	ND	4.8
Methylene Chloride	ND	19
Carbon Disulfide	ND	4.8
MTBE	ND	4.8
trans-1,2-Dichloroethene	ND	4.8
Vinyl Acetate	ND	48
1,1-Dichloroethane	ND	4.8
2-Butanone	ND	9.5
cis-1,2-Dichloroethene	ND	4.8
2,2-Dichloropropane	ND	4.8
Chloroform	ND	4.8
Bromochloromethane	ND	4.8
1,1,1-Trichloroethane	ND	4.8
1,1-Dichloropropene	ND	4.8
Carbon Tetrachloride	ND	4.8
1,2-Dichloroethane	ND	4.8
Benzene	ND	4.8
Trichloroethene	ND	4.8
1,2-Dichloropropane	ND	4.8
Bromodichloromethane	ND	4.8
Dibromomethane	ND	4.8
4-Methyl-2-Pentanone	ND	9.5
cis-1,3-Dichloropropene	ND	4.8
Toluene	ND	4.8
trans-1,3-Dichloropropene	ND	4.8
1,1,2-Trichloroethane	ND	4.8
2-Hexanone	ND	9.5
1,3-Dichloropropane	ND	4.8
Tetrachloroethene	ND	4.8

ND= Not Detected

RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280375	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8260B
Field ID:	H-2	Diln Fac:	0.9524
Lab ID:	280375-002	Batch#:	238685
Matrix:	Soil	Sampled:	08/31/16
Units:	ug/Kg	Received:	08/31/16
Basis:	as received	Analyzed:	09/01/16

Analyte	Result	RL
Dibromochloromethane	ND	4.8
1,2-Dibromoethane	ND	4.8
Chlorobenzene	ND	4.8
1,1,1,2-Tetrachloroethane	ND	4.8
Ethylbenzene	ND	4.8
m,p-Xylenes	ND	4.8
o-Xylene	ND	4.8
Styrene	ND	4.8
Bromoform	ND	4.8
Isopropylbenzene	ND	4.8
1,1,2,2-Tetrachloroethane	ND	4.8
1,2,3-Trichloropropane	ND	4.8
Propylbenzene	ND	4.8
Bromobenzene	ND	4.8
1,3,5-Trimethylbenzene	ND	4.8
2-Chlorotoluene	ND	4.8
4-Chlorotoluene	ND	4.8
tert-Butylbenzene	ND	4.8
1,2,4-Trimethylbenzene	ND	4.8
sec-Butylbenzene	ND	4.8
para-Isopropyl Toluene	ND	4.8
1,3-Dichlorobenzene	ND	4.8
1,4-Dichlorobenzene	ND	4.8
n-Butylbenzene	ND	4.8
1,2-Dichlorobenzene	ND	4.8
1,2-Dibromo-3-Chloropropane	ND	4.8
1,2,4-Trichlorobenzene	ND	4.8
Hexachlorobutadiene	ND	4.8
Naphthalene	ND	4.8
1,2,3-Trichlorobenzene	ND	4.8

Surrogate	%REC	Limits
Dibromofluoromethane	100	78-134
1,2-Dichloroethane-d4	105	80-138
Toluene-d8	98	80-120
Bromofluorobenzene	105	78-123

ND= Not Detected  
 RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280375	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8260B
Field ID:	H-3	Diln Fac:	0.9158
Lab ID:	280375-003	Batch#:	238685
Matrix:	Soil	Sampled:	08/31/16
Units:	ug/Kg	Received:	08/31/16
Basis:	as received	Analyzed:	09/01/16

Analyte	Result	RL
Freon 12	ND	9.2
Chloromethane	ND	9.2
Vinyl Chloride	ND	9.2
Bromomethane	ND	9.2
Chloroethane	ND	9.2
Trichlorofluoromethane	ND	4.6
Acetone	ND	18
Freon 113	ND	4.6
1,1-Dichloroethene	ND	4.6
Methylene Chloride	ND	18
Carbon Disulfide	ND	4.6
MTBE	ND	4.6
trans-1,2-Dichloroethene	ND	4.6
Vinyl Acetate	ND	46
1,1-Dichloroethane	ND	4.6
2-Butanone	ND	9.2
cis-1,2-Dichloroethene	ND	4.6
2,2-Dichloropropane	ND	4.6
Chloroform	ND	4.6
Bromochloromethane	ND	4.6
1,1,1-Trichloroethane	ND	4.6
1,1-Dichloropropene	ND	4.6
Carbon Tetrachloride	ND	4.6
1,2-Dichloroethane	ND	4.6
Benzene	ND	4.6
Trichloroethene	ND	4.6
1,2-Dichloropropane	ND	4.6
Bromodichloromethane	ND	4.6
Dibromomethane	ND	4.6
4-Methyl-2-Pentanone	ND	9.2
cis-1,3-Dichloropropene	ND	4.6
Toluene	ND	4.6
trans-1,3-Dichloropropene	ND	4.6
1,1,2-Trichloroethane	ND	4.6
2-Hexanone	ND	9.2
1,3-Dichloropropane	ND	4.6
Tetrachloroethene	ND	4.6

ND= Not Detected

RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280375	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8260B
Field ID:	H-3	Diln Fac:	0.9158
Lab ID:	280375-003	Batch#:	238685
Matrix:	Soil	Sampled:	08/31/16
Units:	ug/Kg	Received:	08/31/16
Basis:	as received	Analyzed:	09/01/16

Analyte	Result	RL
Dibromochloromethane	ND	4.6
1,2-Dibromoethane	ND	4.6
Chlorobenzene	ND	4.6
1,1,1,2-Tetrachloroethane	ND	4.6
Ethylbenzene	ND	4.6
m,p-Xylenes	ND	4.6
o-Xylene	ND	4.6
Styrene	ND	4.6
Bromoform	ND	4.6
Isopropylbenzene	ND	4.6
1,1,2,2-Tetrachloroethane	ND	4.6
1,2,3-Trichloropropane	ND	4.6
Propylbenzene	ND	4.6
Bromobenzene	ND	4.6
1,3,5-Trimethylbenzene	ND	4.6
2-Chlorotoluene	ND	4.6
4-Chlorotoluene	ND	4.6
tert-Butylbenzene	ND	4.6
1,2,4-Trimethylbenzene	ND	4.6
sec-Butylbenzene	ND	4.6
para-Isopropyl Toluene	ND	4.6
1,3-Dichlorobenzene	ND	4.6
1,4-Dichlorobenzene	ND	4.6
n-Butylbenzene	ND	4.6
1,2-Dichlorobenzene	ND	4.6
1,2-Dibromo-3-Chloropropane	ND	4.6
1,2,4-Trichlorobenzene	ND	4.6
Hexachlorobutadiene	ND	4.6
Naphthalene	ND	4.6
1,2,3-Trichlorobenzene	ND	4.6

Surrogate	%REC	Limits
Dibromofluoromethane	100	78-134
1,2-Dichloroethane-d4	104	80-138
Toluene-d8	98	80-120
Bromofluorobenzene	103	78-123

ND= Not Detected

RL= Reporting Limit

## Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	280375	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8260B
Matrix:	Soil	Batch#:	238685
Units:	ug/Kg	Analyzed:	09/01/16
Diln Fac:	1.000		

Type: BS Lab ID: QC849893

Analyte	Spiked	Result	%REC	Limits
1,1-Dichloroethene	25.00	23.63	95	70-134
Benzene	25.00	25.76	103	80-123
Trichloroethene	25.00	24.38	98	80-128
Toluene	25.00	24.80	99	80-120
Chlorobenzene	25.00	25.12	100	80-123

Surrogate	%REC	Limits
Dibromofluoromethane	103	78-134
1,2-Dichloroethane-d4	107	80-138
Toluene-d8	96	80-120
Bromofluorobenzene	99	78-123

Type: BSD Lab ID: QC849894

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,1-Dichloroethene	25.00	25.06	100	70-134	6	22
Benzene	25.00	27.14	109	80-123	5	21
Trichloroethene	25.00	25.61	102	80-128	5	23
Toluene	25.00	26.26	105	80-120	6	20
Chlorobenzene	25.00	26.18	105	80-123	4	20

Surrogate	%REC	Limits
Dibromofluoromethane	102	78-134
1,2-Dichloroethane-d4	107	80-138
Toluene-d8	97	80-120
Bromofluorobenzene	99	78-123

RPD= Relative Percent Difference



## Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	280375	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC849895	Batch#:	238685
Matrix:	Soil	Analyzed:	09/01/16
Units:	ug/Kg		

Analyte	Result	RL
Freon 12	ND	10
Chloromethane	ND	10
Vinyl Chloride	ND	10
Bromomethane	ND	10
Chloroethane	ND	10
Trichlorofluoromethane	ND	5.0
Acetone	ND	20
Freon 113	ND	5.0
1,1-Dichloroethene	ND	5.0
Methylene Chloride	ND	20
Carbon Disulfide	ND	5.0
MTBE	ND	5.0
trans-1,2-Dichloroethene	ND	5.0
Vinyl Acetate	ND	50
1,1-Dichloroethane	ND	5.0
2-Butanone	ND	10
cis-1,2-Dichloroethene	ND	5.0
2,2-Dichloropropane	ND	5.0
Chloroform	ND	5.0
Bromochloromethane	ND	5.0
1,1,1-Trichloroethane	ND	5.0
1,1-Dichloropropene	ND	5.0
Carbon Tetrachloride	ND	5.0
1,2-Dichloroethane	ND	5.0
Benzene	ND	5.0
Trichloroethene	ND	5.0
1,2-Dichloropropane	ND	5.0
Bromodichloromethane	ND	5.0
Dibromomethane	ND	5.0
4-Methyl-2-Pentanone	ND	10
cis-1,3-Dichloropropene	ND	5.0
Toluene	ND	5.0
trans-1,3-Dichloropropene	ND	5.0
1,1,2-Trichloroethane	ND	5.0
2-Hexanone	ND	10
1,3-Dichloropropane	ND	5.0
Tetrachloroethene	ND	5.0

ND= Not Detected

RL= Reporting Limit

## Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	280375	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC849895	Batch#:	238685
Matrix:	Soil	Analyzed:	09/01/16
Units:	ug/Kg		

Analyte	Result	RL
Dibromochloromethane	ND	5.0
1,2-Dibromoethane	ND	5.0
Chlorobenzene	ND	5.0
1,1,1,2-Tetrachloroethane	ND	5.0
Ethylbenzene	ND	5.0
m,p-Xylenes	ND	5.0
o-Xylene	ND	5.0
Styrene	ND	5.0
Bromoform	ND	5.0
Isopropylbenzene	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.0
1,2,3-Trichloropropane	ND	5.0
Propylbenzene	ND	5.0
Bromobenzene	ND	5.0
1,3,5-Trimethylbenzene	ND	5.0
2-Chlorotoluene	ND	5.0
4-Chlorotoluene	ND	5.0
tert-Butylbenzene	ND	5.0
1,2,4-Trimethylbenzene	ND	5.0
sec-Butylbenzene	ND	5.0
para-Isopropyl Toluene	ND	5.0
1,3-Dichlorobenzene	ND	5.0
1,4-Dichlorobenzene	ND	5.0
n-Butylbenzene	ND	5.0
1,2-Dichlorobenzene	ND	5.0
1,2-Dibromo-3-Chloropropane	ND	5.0
1,2,4-Trichlorobenzene	ND	5.0
Hexachlorobutadiene	ND	5.0
Naphthalene	ND	5.0
1,2,3-Trichlorobenzene	ND	5.0

Surrogate	%REC	Limits
Dibromofluoromethane	96	78-134
1,2-Dichloroethane-d4	101	80-138
Toluene-d8	98	80-120
Bromofluorobenzene	100	78-123

ND= Not Detected

RL= Reporting Limit

**Batch QC Report**

Purgeable Organics by GC/MS			
Lab #:	280375	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	STANDARD	Analysis:	EPA 8260B
Field ID:	H-2	Batch#:	238685
MSS Lab ID:	280375-002	Sampled:	08/31/16
Matrix:	Soil	Received:	08/31/16
Units:	ug/Kg	Analyzed:	09/02/16
Basis:	as received		

Type: MS Diln Fac: 0.9452  
 Lab ID: QC850018

Analyte	MSS Result	Spiked	Result	%REC	Limits
1,1-Dichloroethene	<0.5578	47.26	43.54	92	56-133
Benzene	<0.4977	47.26	45.86	97	57-120
Trichloroethene	<0.6015	47.26	44.32	94	49-145
Toluene	<0.5349	47.26	44.69	95	51-120
Chlorobenzene	<0.3356	47.26	45.00	95	47-120

Surrogate	%REC	Limits
Dibromofluoromethane	101	78-134
1,2-Dichloroethane-d4	101	80-138
Toluene-d8	96	80-120
Bromofluorobenzene	97	78-123

Type: MSD Diln Fac: 0.8977  
 Lab ID: QC850019

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,1-Dichloroethene	44.88	41.46	92	56-133	0	46
Benzene	44.88	44.20	98	57-120	1	44
Trichloroethene	44.88	42.81	95	49-145	2	46
Toluene	44.88	43.76	97	51-120	3	47
Chlorobenzene	44.88	44.11	98	47-120	3	50

Surrogate	%REC	Limits
Dibromofluoromethane	98	78-134
1,2-Dichloroethane-d4	96	80-138
Toluene-d8	98	80-120
Bromofluorobenzene	98	78-123

RPD= Relative Percent Difference







## Batch QC Report

Polychlorinated Biphenyls (PCBs)			
Lab #:	280375	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	STANDARD	Analysis:	EPA 8082
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC850015	Batch#:	238692
Matrix:	Soil	Prepared:	09/01/16
Units:	ug/Kg	Analyzed:	09/02/16

Analyte	Spiked	Result	%REC	Limits
Aroclor-1016	166.1	172.0	104	64-140
Aroclor-1260	166.1	170.4	103	65-146

Surrogate	%REC	Limits
Decachlorobiphenyl	99	25-135

## Batch QC Report

Polychlorinated Biphenyls (PCBs)			
Lab #:	280375	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	STANDARD	Analysis:	EPA 8082
Field ID:	ZZZZZZZZZZ	Batch#:	238692
MSS Lab ID:	280301-001	Sampled:	08/30/16
Matrix:	Soil	Received:	08/30/16
Units:	ug/Kg	Prepared:	09/01/16
Basis:	as received	Analyzed:	09/02/16
Diln Fac:	1.000		

Type: MS Lab ID: QC850016

Analyte	MSS Result	Spiked	Result	%REC	Limits
Aroclor-1016	<2.958	165.2	199.3	121	60-161
Aroclor-1260	7.583	165.2	173.5	100	42-166

Surrogate	%REC	Limits
Decachlorobiphenyl	87	25-135

Type: MSD Lab ID: QC850017

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Aroclor-1016	165.9	179.4	108	60-161	NC	43
Aroclor-1260	165.9	168.0	97	42-166	4	51

Surrogate	%REC	Limits
Decachlorobiphenyl	83	25-135

NC= Not Calculated

RPD= Relative Percent Difference





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2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 282355  
ANALYTICAL REPORT

Pangea Environmental  
1710 Franklin Street  
Oakland, CA 94612

Project : 1233 BOCKMAN  
Location : 1233 Bockman  
Level : II

Sample ID

Lab ID

H-1

282355-001

SS-9-10'

282355-002

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: \_\_\_\_\_

Date: 10/21/2016

Will Rice  
Project Manager  
will.rice@ctberk.com

CA ELAP# 2896, NELAP# 4044-001

**CASE NARRATIVE**

Laboratory number: 282355  
Client: Pangea Environmental  
Project: 1233 BOCKMAN  
Location: 1233 Bockman  
Request Date: 10/19/16  
Samples Received: 08/31/16, 09/02/16

This data package contains sample and QC results for two soil samples, requested for the above referenced project on 10/19/16. The samples were received cold and intact.

**Semivolatile Organics by GC/MS (EPA 8270C):**

282355-001 and 282355-002 were prepared outside of hold time; affected data was qualified with "b". No other analytical problems were encountered.

Detections Summary for 282355

Results for any subcontracted analyses are not included in this summary.

Client : Pangea Environmental  
Project : 1233 BOCKMAN  
Location : 1233 Bockman

Client Sample ID : H-1                      Laboratory Sample ID :                      282355-001

No Detections

Client Sample ID : SS-9-10'                      Laboratory Sample ID :                      282355-002

No Detections



**Semivolatile Organics by GC/MS**

Lab #:	282355	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	1233 BOCKMAN	Analysis:	EPA 8270C
Field ID:	H-1	Batch#:	240320
Lab ID:	282355-001	Sampled:	08/31/16
Matrix:	Soil	Received:	08/31/16
Units:	ug/Kg	Prepared:	10/20/16
Basis:	as received	Analyzed:	10/20/16
Diln Fac:	1.000		

Analyte	Result	RL
N-Nitrosodimethylamine	ND b	330
Phenol	ND b	330
bis(2-Chloroethyl)ether	ND b	330
2-Chlorophenol	ND b	330
1,3-Dichlorobenzene	ND b	330
1,4-Dichlorobenzene	ND b	330
Benzyl alcohol	ND b	330
1,2-Dichlorobenzene	ND b	330
2-Methylphenol	ND b	330
bis(2-Chloroisopropyl) ether	ND b	330
4-Methylphenol	ND b	330
N-Nitroso-di-n-propylamine	ND b	330
Hexachloroethane	ND b	330
Nitrobenzene	ND b	330
Isophorone	ND b	330
2-Nitrophenol	ND b	660
2,4-Dimethylphenol	ND b	330
Benzoic acid	ND b	1,700
bis(2-Chloroethoxy)methane	ND b	330
2,4-Dichlorophenol	ND b	330
1,2,4-Trichlorobenzene	ND b	330
Naphthalene	ND b	66
4-Chloroaniline	ND b	330
Hexachlorobutadiene	ND b	330
4-Chloro-3-methylphenol	ND b	330
2-Methylnaphthalene	ND b	66
Hexachlorocyclopentadiene	ND b	660
2,4,6-Trichlorophenol	ND b	330
2,4,5-Trichlorophenol	ND b	330
2-Chloronaphthalene	ND b	330
2-Nitroaniline	ND b	660
Dimethylphthalate	ND b	330
Acenaphthylene	ND b	66
2,6-Dinitrotoluene	ND b	330
3-Nitroaniline	ND b	660
Acenaphthene	ND b	66
2,4-Dinitrophenol	ND b	660
4-Nitrophenol	ND b	660
Dibenzofuran	ND b	330
2,4-Dinitrotoluene	ND b	330
Diethylphthalate	ND b	330
Fluorene	ND b	66
4-Chlorophenyl-phenylether	ND b	330
4-Nitroaniline	ND b	660
4,6-Dinitro-2-methylphenol	ND b	660
N-Nitrosodiphenylamine	ND b	330
Azobenzene	ND b	330
4-Bromophenyl-phenylether	ND b	330
Hexachlorobenzene	ND b	330
Pentachlorophenol	ND b	660
Phenanthrene	ND b	66
Anthracene	ND b	66

b= See narrative  
 ND= Not Detected  
 RL= Reporting Limit

### Semivolatile Organics by GC/MS

Lab #:	282355	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	1233 BOCKMAN	Analysis:	EPA 8270C
Field ID:	H-1	Batch#:	240320
Lab ID:	282355-001	Sampled:	08/31/16
Matrix:	Soil	Received:	08/31/16
Units:	ug/Kg	Prepared:	10/20/16
Basis:	as received	Analyzed:	10/20/16
Diln Fac:	1.000		

Analyte	Result	RL
Di-n-butylphthalate	ND b	330
Fluoranthene	ND b	66
Pyrene	ND b	66
Butylbenzylphthalate	ND b	330
3,3'-Dichlorobenzidine	ND b	660
Benzo(a)anthracene	ND b	66
Chrysene	ND b	66
bis(2-Ethylhexyl)phthalate	ND b	330
Di-n-octylphthalate	ND b	330
Benzo(b)fluoranthene	ND b	66
Benzo(k)fluoranthene	ND b	66
Benzo(a)pyrene	ND b	66
Indeno(1,2,3-cd)pyrene	ND b	66
Dibenz(a,h)anthracene	ND b	66
Benzo(g,h,i)perylene	ND b	66

Surrogate	%REC	Limits
2-Fluorophenol	118 b	25-120
Phenol-d5	108 b	36-120
2,4,6-Tribromophenol	69 b	27-120
Nitrobenzene-d5	76 b	44-120
2-Fluorobiphenyl	86 b	47-120
Terphenyl-d14	97 b	49-120

b= See narrative  
 ND= Not Detected  
 RL= Reporting Limit

### Semivolatile Organics by GC/MS

Lab #:	282355	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	1233 BOCKMAN	Analysis:	EPA 8270C
Field ID:	SS-9-10'	Batch#:	240320
Lab ID:	282355-002	Sampled:	09/02/16
Matrix:	Soil	Received:	09/02/16
Units:	ug/Kg	Prepared:	10/20/16
Basis:	as received	Analyzed:	10/20/16
Diln Fac:	1.000		

Analyte	Result	RL
N-Nitrosodimethylamine	ND b	340
Phenol	ND b	340
bis(2-Chloroethyl)ether	ND b	340
2-Chlorophenol	ND b	340
1,3-Dichlorobenzene	ND b	340
1,4-Dichlorobenzene	ND b	340
Benzyl alcohol	ND b	340
1,2-Dichlorobenzene	ND b	340
2-Methylphenol	ND b	340
bis(2-Chloroisopropyl) ether	ND b	340
4-Methylphenol	ND b	340
N-Nitroso-di-n-propylamine	ND b	340
Hexachloroethane	ND b	340
Nitrobenzene	ND b	340
Isophorone	ND b	340
2-Nitrophenol	ND b	680
2,4-Dimethylphenol	ND b	340
Benzoic acid	ND b	1,700
bis(2-Chloroethoxy)methane	ND b	340
2,4-Dichlorophenol	ND b	340
1,2,4-Trichlorobenzene	ND b	340
Naphthalene	ND b	68
4-Chloroaniline	ND b	340
Hexachlorobutadiene	ND b	340
4-Chloro-3-methylphenol	ND b	340
2-Methylnaphthalene	ND b	68
Hexachlorocyclopentadiene	ND b	680
2,4,6-Trichlorophenol	ND b	340
2,4,5-Trichlorophenol	ND b	340
2-Chloronaphthalene	ND b	340
2-Nitroaniline	ND b	680
Dimethylphthalate	ND b	340
Acenaphthylene	ND b	68
2,6-Dinitrotoluene	ND b	340
3-Nitroaniline	ND b	680
Acenaphthene	ND b	68
2,4-Dinitrophenol	ND b	680
4-Nitrophenol	ND b	680
Dibenzofuran	ND b	340
2,4-Dinitrotoluene	ND b	340
Diethylphthalate	ND b	340
Fluorene	ND b	68
4-Chlorophenyl-phenylether	ND b	340
4-Nitroaniline	ND b	680
4,6-Dinitro-2-methylphenol	ND b	680
N-Nitrosodiphenylamine	ND b	340
Azobenzene	ND b	340
4-Bromophenyl-phenylether	ND b	340
Hexachlorobenzene	ND b	340
Pentachlorophenol	ND b	680
Phenanthrene	ND b	68
Anthracene	ND b	68

b= See narrative  
 ND= Not Detected  
 RL= Reporting Limit

### Semivolatile Organics by GC/MS

Lab #:	282355	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	1233 BOCKMAN	Analysis:	EPA 8270C
Field ID:	SS-9-10'	Batch#:	240320
Lab ID:	282355-002	Sampled:	09/02/16
Matrix:	Soil	Received:	09/02/16
Units:	ug/Kg	Prepared:	10/20/16
Basis:	as received	Analyzed:	10/20/16
Diln Fac:	1.000		

Analyte	Result	RL
Di-n-butylphthalate	ND b	340
Fluoranthene	ND b	68
Pyrene	ND b	68
Butylbenzylphthalate	ND b	340
3,3'-Dichlorobenzidine	ND b	680
Benzo(a)anthracene	ND b	68
Chrysene	ND b	68
bis(2-Ethylhexyl)phthalate	ND b	340
Di-n-octylphthalate	ND b	340
Benzo(b)fluoranthene	ND b	68
Benzo(k)fluoranthene	ND b	68
Benzo(a)pyrene	ND b	68
Indeno(1,2,3-cd)pyrene	ND b	68
Dibenz(a,h)anthracene	ND b	68
Benzo(g,h,i)perylene	ND b	68

Surrogate	%REC	Limits
2-Fluorophenol	92 b	25-120
Phenol-d5	90 b	36-120
2,4,6-Tribromophenol	67 b	27-120
Nitrobenzene-d5	71 b	44-120
2-Fluorobiphenyl	76 b	47-120
Terphenyl-d14	108 b	49-120

b= See narrative  
 ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

Semivolatile Organics by GC/MS			
Lab #:	282355	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	1233 BOCKMAN	Analysis:	EPA 8270C
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC856346	Batch#:	240320
Matrix:	Soil	Prepared:	10/19/16
Units:	ug/Kg	Analyzed:	10/19/16

Analyte	Result	RL
N-Nitrosodimethylamine	ND	330
Phenol	ND	330
bis(2-Chloroethyl)ether	ND	330
2-Chlorophenol	ND	330
1,3-Dichlorobenzene	ND	330
1,4-Dichlorobenzene	ND	330
Benzyl alcohol	ND	330
1,2-Dichlorobenzene	ND	330
2-Methylphenol	ND	330
bis(2-Chloroisopropyl) ether	ND	330
4-Methylphenol	ND	330
N-Nitroso-di-n-propylamine	ND	330
Hexachloroethane	ND	330
Nitrobenzene	ND	330
Isophorone	ND	330
2-Nitrophenol	ND	670
2,4-Dimethylphenol	ND	330
Benzoic acid	ND	1,700
bis(2-Chloroethoxy)methane	ND	330
2,4-Dichlorophenol	ND	330
1,2,4-Trichlorobenzene	ND	330
Naphthalene	ND	67
4-Chloroaniline	ND	330
Hexachlorobutadiene	ND	330
4-Chloro-3-methylphenol	ND	330
2-Methylnaphthalene	ND	67
Hexachlorocyclopentadiene	ND	670
2,4,6-Trichlorophenol	ND	330
2,4,5-Trichlorophenol	ND	330
2-Chloronaphthalene	ND	330
2-Nitroaniline	ND	670
Dimethylphthalate	ND	330
Acenaphthylene	ND	67
2,6-Dinitrotoluene	ND	330
3-Nitroaniline	ND	670
Acenaphthene	ND	67
2,4-Dinitrophenol	ND	670
4-Nitrophenol	ND	670
Dibenzofuran	ND	330
2,4-Dinitrotoluene	ND	330
Diethylphthalate	ND	330
Fluorene	ND	67
4-Chlorophenyl-phenylether	ND	330
4-Nitroaniline	ND	670
4,6-Dinitro-2-methylphenol	ND	670
N-Nitrosodiphenylamine	ND	330
Azobenzene	ND	330
4-Bromophenyl-phenylether	ND	330
Hexachlorobenzene	ND	330
Pentachlorophenol	ND	670
Phenanthrene	ND	67
Anthracene	ND	67
Di-n-butylphthalate	ND	330
Fluoranthene	ND	67

ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

Semivolatile Organics by GC/MS			
Lab #:	282355	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	1233 BOCKMAN	Analysis:	EPA 8270C
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC856346	Batch#:	240320
Matrix:	Soil	Prepared:	10/19/16
Units:	ug/Kg	Analyzed:	10/19/16

Analyte	Result	RL
Pyrene	ND	67
Butylbenzylphthalate	ND	330
3,3'-Dichlorobenzidine	ND	670
Benzo(a)anthracene	ND	67
Chrysene	ND	67
bis(2-Ethylhexyl)phthalate	ND	330
Di-n-octylphthalate	ND	330
Benzo(b)fluoranthene	ND	67
Benzo(k)fluoranthene	ND	67
Benzo(a)pyrene	ND	67
Indeno(1,2,3-cd)pyrene	ND	67
Dibenz(a,h)anthracene	ND	67
Benzo(g,h,i)perylene	ND	67

Surrogate	%REC	Limits
2-Fluorophenol	82	25-120
Phenol-d5	76	36-120
2,4,6-Tribromophenol	53	27-120
Nitrobenzene-d5	59	44-120
2-Fluorobiphenyl	70	47-120
Terphenyl-d14	81	49-120

ND= Not Detected  
 RL= Reporting Limit



## Batch QC Report

Semivolatile Organics by GC/MS			
Lab #:	282355	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	1233 BOCKMAN	Analysis:	EPA 8270C
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC856347	Batch#:	240320
Matrix:	Soil	Prepared:	10/19/16
Units:	ug/Kg	Analyzed:	10/19/16

Analyte	Spiked	Result	%REC	Limits
Phenol	2,653	1,612	61	42-120
2-Chlorophenol	2,653	1,838	69	45-120
1,4-Dichlorobenzene	2,653	1,791	67	48-120
N-Nitroso-di-n-propylamine	2,653	1,709	64	27-123
1,2,4-Trichlorobenzene	2,653	1,862	70	50-120
4-Chloro-3-methylphenol	2,653	2,239	84	59-120
Acenaphthene	995.0	684.1	69	53-120
4-Nitrophenol	2,653	1,304	49	47-120
2,4-Dinitrotoluene	2,653	1,969	74	55-120
Pentachlorophenol	2,653	1,042	39	32-120
Pyrene	995.0	775.4	78	52-120

Surrogate	%REC	Limits
2-Fluorophenol	76	25-120
Phenol-d5	62	36-120
2,4,6-Tribromophenol	67	27-120
Nitrobenzene-d5	67	44-120
2-Fluorobiphenyl	72	47-120
Terphenyl-d14	77	49-120





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Analytical Laboratories, Since 1878







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2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900


Laboratory Job Number 280466  
ANALYTICAL REPORT

Pangea Environmental  
1710 Franklin Street  
Oakland, CA 94612

Project : 2030.001  
Location : 1233 Bockman  
Level : II

<u>Sample ID</u>	<u>Lab ID</u>
SV-4	280466-001
SV-9	280466-002
SV-21	280466-003
SV-22	280466-004
SV-30	280466-005
SV-31	280466-006
SV-32	280466-007
SV-33	280466-008
SV-34	280466-009
SV-35	280466-010
SV-36	280466-011
SV-37	280466-012
SV-38	280466-013
SV-39	280466-014
SV-40	280466-015

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature:   
Mike Dahlquist  
Project Manager  
mike.dahlquist@ctberk.com

Date: 09/06/2016

### CASE NARRATIVE

Laboratory number: 280466  
Client: Pangea Environmental  
Project: 2030.001  
Location: 1233 Bockman  
Request Date: 09/01/16  
Samples Received: 09/01/16

This data package contains sample and QC results for fifteen air samples, requested for the above referenced project on 09/01/16. The samples were received cold and intact.

#### Volatile Organics in Air by MS (EPA TO-15):

Low response was observed for carbon tetrachloride in the ICV analyzed 08/24/16 02:30; affected data was qualified with "b". High response was observed for 4-methyl-2-pentanone in the CCV analyzed 09/04/16 13:39; affected data was qualified with "b". High recovery was observed for 4-methyl-2-pentanone in the BS for batch 238783; the associated RPD was within limits, and this analyte was not detected at or above the RL in the associated sample. No other analytical problems were encountered.





**Curtis & Tompkins, Ltd.**  
Analytical Laboratory Since 1878  
2323 Fifth Street

Berkeley, CA 94710  
(510)486-0900 Phone  
(510)486-0532 Fax

Project No: 2030.001  
Project Name: 1233 Berkman  
EDD Format: Rpt Level: II III IV  
Turnaround Time: RUSH 48  Standard

Sampler: Simmons, Albert  
Report To: Pat Scheel  
Company: Pangson env.  
Telephone: (510) 459-6012  
Email: rscheel@pangsonenv.com

C&T LOGIN # 280466

# AIR TESTING CHAIN OF CUSTODY & PURCHASE ORDER

Page 2 of 2  
Chain of Custody #:

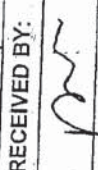
TESTING REQUESTED

TO-15	TO-3: C6-C12 GRO	TO-3M: C1-C6 Hydrocarbons	D1946: (Please Circle Targets) H <sub>2</sub> He N <sub>2</sub> O <sub>2</sub> CO CO <sub>2</sub> CH <sub>4</sub>
X			
X			

Lab No.	Sample ID.	Sampling Information				Sample Volume (Gauge Reading)
		Date Collected	Time Collected	Canister ID (Bar Code #)	Flow Controller ID	
14	SV-39	9/1/16	1409	127	178	173
15	SV-40	"	1435	174	204	175

Notes:

REQUISITIONED BY: 

RECEIVED BY: 

9/1/2016 1745 DATE/TIME  
DATE/TIME  
DATE/TIME

9/1/16 1745 DATE/TIME  
DATE/TIME  
DATE/TIME

COOLER RECEIPT CHECKLIST



Login # 280466 Date Received 9/1/16 Number of coolers 0
Client Pangea Project 1233 Bockman
Date Opened 9/1/16 By (print) CAR (sign) [Signature]
Date Logged in [Arrow] By (print) [Arrow] (sign) [Arrow]

1. Did cooler come with a shipping slip (airbill, etc) YES NO
Shipping info

2A. Were custody seals present? ... YES (circle) on cooler on samples NO
How many Name Date

2B. Were custody seals intact upon arrival? YES NO N/A

3. Were custody papers dry and intact when received? YES NO

4. Were custody papers filled out properly (ink, signed, etc)? YES NO

5. Is the project identifiable from custody papers? (If so fill out top of form) YES NO

6. Indicate the packing in cooler: (if other, describe)
Bubble Wrap Foam blocks Bags None
Cloth material Cardboard Styrofoam Paper towels

7. Temperature documentation: \* Notify PM if temperature exceeds 6°C
Type of ice used: Wet Blue/Gel None Temp(°C)

Samples Received on ice & cold without a temperature blank

Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? YES NO
If YES, what time were they transferred to freezer?

9. Did all bottles arrive unbroken/unopened? YES NO

10. Are there any missing / extra samples? YES NO

11. Are samples in the appropriate containers for indicated tests? YES NO

12. Are sample labels present, in good condition and complete? YES NO

13. Do the sample labels agree with custody papers? YES NO

14. Was sufficient amount of sample sent for tests requested? YES NO

15. Are the samples appropriately preserved? YES NO N/A

16. Did you check preservatives for all bottles for each sample? YES NO N/A

17. Did you document your preservative check? YES NO N/A

18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO N/A

19. Did you change the hold time in LIMS for preserved terracores? YES NO N/A

20. Are bubbles > 6mm absent in VOA samples? YES NO N/A

21. Was the client contacted concerning this sample delivery? YES NO
If YES, Who was called? By Date:

COMMENTS





Client Sample ID : SV-30

Laboratory Sample ID :

280466-005

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	5.5		3.9	ppbv	As Recd	1.970	EPA TO-15	METHOD
Carbon Disulfide	69		0.99	ppbv	As Recd	1.970	EPA TO-15	METHOD
n-Hexane	18		0.99	ppbv	As Recd	1.970	EPA TO-15	METHOD
Chloroform	1.4		0.99	ppbv	As Recd	1.970	EPA TO-15	METHOD
Cyclohexane	15		0.99	ppbv	As Recd	1.970	EPA TO-15	METHOD
Benzene	9.7		0.99	ppbv	As Recd	1.970	EPA TO-15	METHOD
n-Heptane	8.2		0.99	ppbv	As Recd	1.970	EPA TO-15	METHOD
Toluene	11		0.99	ppbv	As Recd	1.970	EPA TO-15	METHOD
Ethylbenzene	1.5		0.99	ppbv	As Recd	1.970	EPA TO-15	METHOD
m,p-Xylenes	6.0		0.99	ppbv	As Recd	1.970	EPA TO-15	METHOD
o-Xylene	1.7		0.99	ppbv	As Recd	1.970	EPA TO-15	METHOD
1,2,4-Trimethylbenzene	1.2		0.99	ppbv	As Recd	1.970	EPA TO-15	METHOD

Client Sample ID : SV-31

Laboratory Sample ID :

280466-006

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Carbon Disulfide	36		0.92	ppbv	As Recd	1.840	EPA TO-15	METHOD
n-Hexane	3.6		0.92	ppbv	As Recd	1.840	EPA TO-15	METHOD
Cyclohexane	3.1		0.92	ppbv	As Recd	1.840	EPA TO-15	METHOD
Benzene	5.1		0.92	ppbv	As Recd	1.840	EPA TO-15	METHOD
n-Heptane	2.4		0.92	ppbv	As Recd	1.840	EPA TO-15	METHOD
Toluene	8.9		0.92	ppbv	As Recd	1.840	EPA TO-15	METHOD
Ethylbenzene	1.5		0.92	ppbv	As Recd	1.840	EPA TO-15	METHOD
m,p-Xylenes	6.7		0.92	ppbv	As Recd	1.840	EPA TO-15	METHOD
o-Xylene	2.5		0.92	ppbv	As Recd	1.840	EPA TO-15	METHOD
1,2,4-Trimethylbenzene	0.98		0.92	ppbv	As Recd	1.840	EPA TO-15	METHOD

Client Sample ID : SV-32

Laboratory Sample ID :

280466-007

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Carbon Disulfide	13		1.0	ppbv	As Recd	2.050	EPA TO-15	METHOD
Cyclohexane	3.2		1.0	ppbv	As Recd	2.050	EPA TO-15	METHOD
Benzene	2.0		1.0	ppbv	As Recd	2.050	EPA TO-15	METHOD
Toluene	1.0		1.0	ppbv	As Recd	2.050	EPA TO-15	METHOD
Tetrachloroethene	2.1		1.0	ppbv	As Recd	2.050	EPA TO-15	METHOD

Client Sample ID : SV-33

Laboratory Sample ID :

280466-008

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Carbon Disulfide	9.2		0.97	ppbv	As Recd	1.940	EPA TO-15	METHOD
n-Hexane	1.7		0.97	ppbv	As Recd	1.940	EPA TO-15	METHOD
Cyclohexane	2.7		0.97	ppbv	As Recd	1.940	EPA TO-15	METHOD
Benzene	6.2		0.97	ppbv	As Recd	1.940	EPA TO-15	METHOD
n-Heptane	1.1		0.97	ppbv	As Recd	1.940	EPA TO-15	METHOD
Toluene	7.3		0.97	ppbv	As Recd	1.940	EPA TO-15	METHOD
m,p-Xylenes	2.0		0.97	ppbv	As Recd	1.940	EPA TO-15	METHOD

Client Sample ID : SV-34

Laboratory Sample ID :

280466-009

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Carbon Disulfide	5.9		1.1	ppbv	As Recd	2.140	EPA TO-15	METHOD
Cyclohexane	2.0		1.1	ppbv	As Recd	2.140	EPA TO-15	METHOD
Benzene	5.2		1.1	ppbv	As Recd	2.140	EPA TO-15	METHOD
Toluene	8.9		1.1	ppbv	As Recd	2.140	EPA TO-15	METHOD
Ethylbenzene	1.1		1.1	ppbv	As Recd	2.140	EPA TO-15	METHOD
m,p-Xylenes	4.5		1.1	ppbv	As Recd	2.140	EPA TO-15	METHOD
o-Xylene	1.2		1.1	ppbv	As Recd	2.140	EPA TO-15	METHOD

Client Sample ID : SV-35

Laboratory Sample ID :

280466-010

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	7.4		3.8	ppbv	As Recd	1.900	EPA TO-15	METHOD
Carbon Disulfide	35		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
n-Hexane	3.9		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
2-Butanone	1.1		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
Chloroform	1.2		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
Cyclohexane	6.5		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
Benzene	11		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
n-Heptane	4.9		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
Toluene	26		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
Ethylbenzene	3.7		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
m,p-Xylenes	14		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
o-Xylene	3.8		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
1,2,4-Trimethylbenzene	2.1		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD

Client Sample ID : SV-36

Laboratory Sample ID :

280466-011

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Carbon Disulfide	44		1.0	ppbv	As Recd	2.080	EPA TO-15	METHOD
n-Hexane	5.2		1.0	ppbv	As Recd	2.080	EPA TO-15	METHOD
Cyclohexane	7.6		1.0	ppbv	As Recd	2.080	EPA TO-15	METHOD
Benzene	10		1.0	ppbv	As Recd	2.080	EPA TO-15	METHOD
n-Heptane	4.9		1.0	ppbv	As Recd	2.080	EPA TO-15	METHOD
Toluene	19		1.0	ppbv	As Recd	2.080	EPA TO-15	METHOD
Ethylbenzene	2.5		1.0	ppbv	As Recd	2.080	EPA TO-15	METHOD
m,p-Xylenes	9.7		1.0	ppbv	As Recd	2.080	EPA TO-15	METHOD
o-Xylene	2.6		1.0	ppbv	As Recd	2.080	EPA TO-15	METHOD
1,2,4-Trimethylbenzene	1.8		1.0	ppbv	As Recd	2.080	EPA TO-15	METHOD



Client Sample ID : SV-37

Laboratory Sample ID :

280466-012

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	4.9		3.9	ppbv	As Recd	1.960	EPA TO-15	METHOD
Carbon Disulfide	82		0.98	ppbv	As Recd	1.960	EPA TO-15	METHOD
n-Hexane	11		0.98	ppbv	As Recd	1.960	EPA TO-15	METHOD
Cyclohexane	9.7		0.98	ppbv	As Recd	1.960	EPA TO-15	METHOD
Benzene	14		0.98	ppbv	As Recd	1.960	EPA TO-15	METHOD
n-Heptane	8.2		0.98	ppbv	As Recd	1.960	EPA TO-15	METHOD
4-Methyl-2-Pentanone	3.2		0.98	ppbv	As Recd	1.960	EPA TO-15	METHOD
Toluene	30		0.98	ppbv	As Recd	1.960	EPA TO-15	METHOD
Ethylbenzene	3.8		0.98	ppbv	As Recd	1.960	EPA TO-15	METHOD
m,p-Xylenes	16		0.98	ppbv	As Recd	1.960	EPA TO-15	METHOD
o-Xylene	4.0		0.98	ppbv	As Recd	1.960	EPA TO-15	METHOD
4-Ethyltoluene	1.1		0.98	ppbv	As Recd	1.960	EPA TO-15	METHOD
1,3,5-Trimethylbenzene	0.98		0.98	ppbv	As Recd	1.960	EPA TO-15	METHOD
1,2,4-Trimethylbenzene	2.7		0.98	ppbv	As Recd	1.960	EPA TO-15	METHOD

Client Sample ID : SV-38

Laboratory Sample ID :

280466-013

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	8.7		3.8	ppbv	As Recd	1.920	EPA TO-15	METHOD
Carbon Disulfide	59		0.96	ppbv	As Recd	1.920	EPA TO-15	METHOD
n-Hexane	11		0.96	ppbv	As Recd	1.920	EPA TO-15	METHOD
Cyclohexane	10		0.96	ppbv	As Recd	1.920	EPA TO-15	METHOD
Benzene	15		0.96	ppbv	As Recd	1.920	EPA TO-15	METHOD
n-Heptane	13		0.96	ppbv	As Recd	1.920	EPA TO-15	METHOD
4-Methyl-2-Pentanone	2.8		0.96	ppbv	As Recd	1.920	EPA TO-15	METHOD
Toluene	31		0.96	ppbv	As Recd	1.920	EPA TO-15	METHOD
Ethylbenzene	5.6		0.96	ppbv	As Recd	1.920	EPA TO-15	METHOD
m,p-Xylenes	22		0.96	ppbv	As Recd	1.920	EPA TO-15	METHOD
o-Xylene	5.8		0.96	ppbv	As Recd	1.920	EPA TO-15	METHOD
4-Ethyltoluene	2.1		0.96	ppbv	As Recd	1.920	EPA TO-15	METHOD
1,3,5-Trimethylbenzene	1.6		0.96	ppbv	As Recd	1.920	EPA TO-15	METHOD
1,2,4-Trimethylbenzene	5.4		0.96	ppbv	As Recd	1.920	EPA TO-15	METHOD

Client Sample ID : SV-39

Laboratory Sample ID :

280466-014

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	6.4		3.8	ppbv	As Recd	1.900	EPA TO-15	METHOD
Carbon Disulfide	9.5		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
n-Hexane	2.6		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
2-Butanone	1.2		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
Cyclohexane	2.5		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
Benzene	6.0		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
n-Heptane	2.5		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
4-Methyl-2-Pentanone	2.9		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
Toluene	7.9		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD
m,p-Xylenes	2.8		0.95	ppbv	As Recd	1.900	EPA TO-15	METHOD

Client Sample ID : SV-40

Laboratory Sample ID :

280466-015

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Carbon Disulfide	17		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
n-Hexane	2.2		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
Chloroform	3.5		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
Cyclohexane	7.1		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
Benzene	9.2		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
n-Heptane	1.3		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
Toluene	14		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
Tetrachloroethene	3.9		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
m,p-Xylenes	3.8		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
o-Xylene	1.2		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-4	Diln Fac:	3.860
Lab ID:	280466-001	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/02/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.9	ND	9.5
Freon 114	ND	1.9	ND	13
Chloromethane	ND	1.9	ND	4.0
Vinyl Chloride	ND	1.9	ND	4.9
1,3-Butadiene	ND	1.9	ND	4.3
Bromomethane	ND	1.9	ND	7.5
Chloroethane	ND	1.9	ND	5.1
Trichlorofluoromethane	ND	1.9	ND	11
Acrolein	ND	7.7	ND	18
1,1-Dichloroethene	ND	1.9	ND	7.7
Freon 113	ND	1.9	ND	15
Acetone	ND	7.7	ND	18
Carbon Disulfide	ND	1.9	ND	6.0
Isopropanol	ND	7.7	ND	19
Methylene Chloride	ND	1.9	ND	6.7
trans-1,2-Dichloroethene	ND	1.9	ND	7.7
MTBE	ND	1.9	ND	7.0
n-Hexane	ND	1.9	ND	6.8
1,1-Dichloroethane	ND	1.9	ND	7.8
Vinyl Acetate	ND	1.9	ND	6.8
cis-1,2-Dichloroethene	ND	1.9	ND	7.7
2-Butanone	ND	1.9	ND	5.7
Ethyl Acetate	ND	1.9	ND	7.0
Tetrahydrofuran	ND	1.9	ND	5.7
Chloroform	ND	1.9	ND	9.4
1,1,1-Trichloroethane	ND	1.9	ND	11
Cyclohexane	ND	1.9	ND	6.6
Carbon Tetrachloride	ND	1.9	ND	12
Benzene	ND	1.9	ND	6.2
1,2-Dichloroethane	ND	1.9	ND	7.8
n-Heptane	ND	1.9	ND	7.9
Trichloroethene	ND	1.9	ND	10
1,2-Dichloropropane	ND	1.9	ND	8.9
Bromodichloromethane	ND	1.9	ND	13
cis-1,3-Dichloropropene	ND	1.9	ND	8.8

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-4	Diln Fac:	3.860
Lab ID:	280466-001	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/02/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.9	ND	7.9
Toluene	ND	1.9	ND	7.3
trans-1,3-Dichloropropene	ND	1.9	ND	8.8
1,1,2-Trichloroethane	ND	1.9	ND	11
Tetrachloroethene	28	1.9	190	13
2-Hexanone	ND	1.9	ND	7.9
Dibromochloromethane	ND	1.9	ND	16
1,2-Dibromoethane	ND	1.9	ND	15
Chlorobenzene	ND	1.9	ND	8.9
Ethylbenzene	ND	1.9	ND	8.4
m,p-Xylenes	ND	1.9	ND	8.4
o-Xylene	ND	1.9	ND	8.4
Styrene	ND	1.9	ND	8.2
Bromoform	ND	1.9	ND	20
1,1,2,2-Tetrachloroethane	ND	1.9	ND	13
4-Ethyltoluene	ND	1.9	ND	9.5
1,3,5-Trimethylbenzene	ND	1.9	ND	9.5
1,2,4-Trimethylbenzene	ND	1.9	ND	9.5
1,3-Dichlorobenzene	ND	1.9	ND	12
1,4-Dichlorobenzene	ND	1.9	ND	12
Benzyl chloride	ND	1.9	ND	10
1,2-Dichlorobenzene	ND	1.9	ND	12
1,2,4-Trichlorobenzene	ND	1.9	ND	14
Hexachlorobutadiene	ND	1.9	ND	21
Naphthalene	ND	7.7	ND	40

Surrogate	%REC	Limits
Bromofluorobenzene	98	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-9	Diln Fac:	3.260
Lab ID:	280466-002	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/02/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.6	ND	8.1
Freon 114	ND	1.6	ND	11
Chloromethane	ND	1.6	ND	3.4
Vinyl Chloride	ND	1.6	ND	4.2
1,3-Butadiene	ND	1.6	ND	3.6
Bromomethane	ND	1.6	ND	6.3
Chloroethane	ND	1.6	ND	4.3
Trichlorofluoromethane	ND	1.6	ND	9.2
Acrolein	ND	6.5	ND	15
1,1-Dichloroethene	ND	1.6	ND	6.5
Freon 113	ND	1.6	ND	12
Acetone	11	6.5	25	15
Carbon Disulfide	2.4	1.6	7.5	5.1
Isopropanol	25	6.5	62	16
Methylene Chloride	ND	1.6	ND	5.7
trans-1,2-Dichloroethene	ND	1.6	ND	6.5
MTBE	ND	1.6	ND	5.9
n-Hexane	ND	1.6	ND	5.7
1,1-Dichloroethane	ND	1.6	ND	6.6
Vinyl Acetate	ND	1.6	ND	5.7
cis-1,2-Dichloroethene	ND	1.6	ND	6.5
2-Butanone	ND	1.6	ND	4.8
Ethyl Acetate	ND	1.6	ND	5.9
Tetrahydrofuran	ND	1.6	ND	4.8
Chloroform	ND	1.6	ND	8.0
1,1,1-Trichloroethane	ND	1.6	ND	8.9
Cyclohexane	3.1	1.6	11	5.6
Carbon Tetrachloride	ND	1.6	ND	10
Benzene	ND	1.6	ND	5.2
1,2-Dichloroethane	ND	1.6	ND	6.6
n-Heptane	ND	1.6	ND	6.7
Trichloroethene	ND	1.6	ND	8.8
1,2-Dichloropropane	ND	1.6	ND	7.5
Bromodichloromethane	ND	1.6	ND	11
cis-1,3-Dichloropropene	ND	1.6	ND	7.4

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units



### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-9	Diln Fac:	3.260
Lab ID:	280466-002	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/02/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.6	ND	6.7
Toluene	ND	1.6	ND	6.1
trans-1,3-Dichloropropene	ND	1.6	ND	7.4
1,1,2-Trichloroethane	ND	1.6	ND	8.9
Tetrachloroethene	ND	1.6	ND	11
2-Hexanone	ND	1.6	ND	6.7
Dibromochloromethane	ND	1.6	ND	14
1,2-Dibromoethane	ND	1.6	ND	13
Chlorobenzene	ND	1.6	ND	7.5
Ethylbenzene	ND	1.6	ND	7.1
m,p-Xylenes	ND	1.6	ND	7.1
o-Xylene	ND	1.6	ND	7.1
Styrene	ND	1.6	ND	6.9
Bromoform	ND	1.6	ND	17
1,1,2,2-Tetrachloroethane	ND	1.6	ND	11
4-Ethyltoluene	ND	1.6	ND	8.0
1,3,5-Trimethylbenzene	ND	1.6	ND	8.0
1,2,4-Trimethylbenzene	ND	1.6	ND	8.0
1,3-Dichlorobenzene	ND	1.6	ND	9.8
1,4-Dichlorobenzene	ND	1.6	ND	9.8
Benzyl chloride	ND	1.6	ND	8.4
1,2-Dichlorobenzene	ND	1.6	ND	9.8
1,2,4-Trichlorobenzene	ND	1.6	ND	12
Hexachlorobutadiene	ND	1.6	ND	17
Naphthalene	ND	6.5	ND	34

Surrogate	%REC	Limits
Bromofluorobenzene	107	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-21	Diln Fac:	2.000
Lab ID:	280466-003	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/02/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.0	ND	4.9
Freon 114	ND	1.0	ND	7.0
Chloromethane	ND	1.0	ND	2.1
Vinyl Chloride	ND	1.0	ND	2.6
1,3-Butadiene	ND	1.0	ND	2.2
Bromomethane	ND	1.0	ND	3.9
Chloroethane	ND	1.0	ND	2.6
Trichlorofluoromethane	ND	1.0	ND	5.6
Acrolein	ND	4.0	ND	9.2
1,1-Dichloroethene	ND	1.0	ND	4.0
Freon 113	ND	1.0	ND	7.7
Acetone	ND	4.0	ND	9.5
Carbon Disulfide	ND	1.0	ND	3.1
Isopropanol	ND	4.0	ND	9.8
Methylene Chloride	ND	1.0	ND	3.5
trans-1,2-Dichloroethene	ND	1.0	ND	4.0
MTBE	ND	1.0	ND	3.6
n-Hexane	ND	1.0	ND	3.5
1,1-Dichloroethane	ND	1.0	ND	4.0
Vinyl Acetate	ND	1.0	ND	3.5
cis-1,2-Dichloroethene	ND	1.0	ND	4.0
2-Butanone	ND	1.0	ND	2.9
Ethyl Acetate	ND	1.0	ND	3.6
Tetrahydrofuran	ND	1.0	ND	2.9
Chloroform	ND	1.0	ND	4.9
1,1,1-Trichloroethane	ND	1.0	ND	5.5
Cyclohexane	ND	1.0	ND	3.4
Carbon Tetrachloride	ND	1.0	ND	6.3
Benzene	ND	1.0	ND	3.2
1,2-Dichloroethane	ND	1.0	ND	4.0
n-Heptane	ND	1.0	ND	4.1
Trichloroethene	ND	1.0	ND	5.4
1,2-Dichloropropane	ND	1.0	ND	4.6
Bromodichloromethane	ND	1.0	ND	6.7
cis-1,3-Dichloropropene	ND	1.0	ND	4.5

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-21	Diln Fac:	2.000
Lab ID:	280466-003	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/02/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.0	ND	4.1
Toluene	ND	1.0	ND	3.8
trans-1,3-Dichloropropene	ND	1.0	ND	4.5
1,1,2-Trichloroethane	ND	1.0	ND	5.5
Tetrachloroethene	32	1.0	220	6.8
2-Hexanone	ND	1.0	ND	4.1
Dibromochloromethane	ND	1.0	ND	8.5
1,2-Dibromoethane	ND	1.0	ND	7.7
Chlorobenzene	ND	1.0	ND	4.6
Ethylbenzene	ND	1.0	ND	4.3
m,p-Xylenes	2.2	1.0	9.7	4.3
o-Xylene	ND	1.0	ND	4.3
Styrene	ND	1.0	ND	4.3
Bromoform	ND	1.0	ND	10
1,1,2,2-Tetrachloroethane	ND	1.0	ND	6.9
4-Ethyltoluene	ND	1.0	ND	4.9
1,3,5-Trimethylbenzene	ND	1.0	ND	4.9
1,2,4-Trimethylbenzene	ND	1.0	ND	4.9
1,3-Dichlorobenzene	ND	1.0	ND	6.0
1,4-Dichlorobenzene	ND	1.0	ND	6.0
Benzyl chloride	ND	1.0	ND	5.2
1,2-Dichlorobenzene	ND	1.0	ND	6.0
1,2,4-Trichlorobenzene	ND	1.0	ND	7.4
Hexachlorobutadiene	ND	1.0	ND	11
Naphthalene	ND	4.0	ND	21

Surrogate	%REC	Limits
Bromofluorobenzene	102	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-22	Diln Fac:	2.050
Lab ID:	280466-004	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/02/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.0	ND	5.1
Freon 114	ND	1.0	ND	7.2
Chloromethane	ND	1.0	ND	2.1
Vinyl Chloride	ND	1.0	ND	2.6
1,3-Butadiene	ND	1.0	ND	2.3
Bromomethane	ND	1.0	ND	4.0
Chloroethane	ND	1.0	ND	2.7
Trichlorofluoromethane	ND	1.0	ND	5.8
Acrolein	ND	4.1	ND	9.4
1,1-Dichloroethene	ND	1.0	ND	4.1
Freon 113	ND	1.0	ND	7.9
Acetone	ND	4.1	ND	9.7
Carbon Disulfide	2.1	1.0	6.6	3.2
Isopropanol	ND	4.1	ND	10
Methylene Chloride	ND	1.0	ND	3.6
trans-1,2-Dichloroethene	ND	1.0	ND	4.1
MTBE	ND	1.0	ND	3.7
n-Hexane	ND	1.0	ND	3.6
1,1-Dichloroethane	ND	1.0	ND	4.1
Vinyl Acetate	ND	1.0	ND	3.6
cis-1,2-Dichloroethene	ND	1.0	ND	4.1
2-Butanone	ND	1.0	ND	3.0
Ethyl Acetate	ND	1.0	ND	3.7
Tetrahydrofuran	ND	1.0	ND	3.0
Chloroform	1.6	1.0	8.0	5.0
1,1,1-Trichloroethane	ND	1.0	ND	5.6
Cyclohexane	ND	1.0	ND	3.5
Carbon Tetrachloride	ND	1.0	ND	6.4
Benzene	ND	1.0	ND	3.3
1,2-Dichloroethane	ND	1.0	ND	4.1
n-Heptane	ND	1.0	ND	4.2
Trichloroethene	ND	1.0	ND	5.5
1,2-Dichloropropane	ND	1.0	ND	4.7
Bromodichloromethane	ND	1.0	ND	6.9
cis-1,3-Dichloropropene	ND	1.0	ND	4.7

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-22	Diln Fac:	2.050
Lab ID:	280466-004	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/02/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.0	ND	4.2
Toluene	ND	1.0	ND	3.9
trans-1,3-Dichloropropene	ND	1.0	ND	4.7
1,1,2-Trichloroethane	ND	1.0	ND	5.6
Tetrachloroethene	6.8	1.0	46	7.0
2-Hexanone	ND	1.0	ND	4.2
Dibromochloromethane	ND	1.0	ND	8.7
1,2-Dibromoethane	ND	1.0	ND	7.9
Chlorobenzene	ND	1.0	ND	4.7
Ethylbenzene	ND	1.0	ND	4.5
m,p-Xylenes	5.6	1.0	24	4.5
o-Xylene	1.5	1.0	6.7	4.5
Styrene	ND	1.0	ND	4.4
Bromoform	ND	1.0	ND	11
1,1,2,2-Tetrachloroethane	ND	1.0	ND	7.0
4-Ethyltoluene	ND	1.0	ND	5.0
1,3,5-Trimethylbenzene	ND	1.0	ND	5.0
1,2,4-Trimethylbenzene	ND	1.0	ND	5.0
1,3-Dichlorobenzene	ND	1.0	ND	6.2
1,4-Dichlorobenzene	ND	1.0	ND	6.2
Benzyl chloride	ND	1.0	ND	5.3
1,2-Dichlorobenzene	ND	1.0	ND	6.2
1,2,4-Trichlorobenzene	ND	1.0	ND	7.6
Hexachlorobutadiene	ND	1.0	ND	11
Naphthalene	ND	4.1	ND	21

Surrogate	%REC	Limits
Bromofluorobenzene	92	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units



### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-30	Diln Fac:	1.970
Lab ID:	280466-005	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/02/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.99	ND	4.9
Freon 114	ND	0.99	ND	6.9
Chloromethane	ND	0.99	ND	2.0
Vinyl Chloride	ND	0.99	ND	2.5
1,3-Butadiene	ND	0.99	ND	2.2
Bromomethane	ND	0.99	ND	3.8
Chloroethane	ND	0.99	ND	2.6
Trichlorofluoromethane	ND	0.99	ND	5.5
Acrolein	ND	3.9	ND	9.0
1,1-Dichloroethene	ND	0.99	ND	3.9
Freon 113	ND	0.99	ND	7.5
Acetone	5.5	3.9	13	9.4
Carbon Disulfide	69	0.99	220	3.1
Isopropanol	ND	3.9	ND	9.7
Methylene Chloride	ND	0.99	ND	3.4
trans-1,2-Dichloroethene	ND	0.99	ND	3.9
MTBE	ND	0.99	ND	3.6
n-Hexane	18	0.99	62	3.5
1,1-Dichloroethane	ND	0.99	ND	4.0
Vinyl Acetate	ND	0.99	ND	3.5
cis-1,2-Dichloroethene	ND	0.99	ND	3.9
2-Butanone	ND	0.99	ND	2.9
Ethyl Acetate	ND	0.99	ND	3.5
Tetrahydrofuran	ND	0.99	ND	2.9
Chloroform	1.4	0.99	6.6	4.8
1,1,1-Trichloroethane	ND	0.99	ND	5.4
Cyclohexane	15	0.99	51	3.4
Carbon Tetrachloride	ND	0.99	ND	6.2
Benzene	9.7	0.99	31	3.1
1,2-Dichloroethane	ND	0.99	ND	4.0
n-Heptane	8.2	0.99	33	4.0
Trichloroethene	ND	0.99	ND	5.3
1,2-Dichloropropane	ND	0.99	ND	4.6
Bromodichloromethane	ND	0.99	ND	6.6
cis-1,3-Dichloropropene	ND	0.99	ND	4.5

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-30	Diln Fac:	1.970
Lab ID:	280466-005	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/02/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.99	ND	4.0
Toluene	11	0.99	42	3.7
trans-1,3-Dichloropropene	ND	0.99	ND	4.5
1,1,2-Trichloroethane	ND	0.99	ND	5.4
Tetrachloroethene	ND	0.99	ND	6.7
2-Hexanone	ND	0.99	ND	4.0
Dibromochloromethane	ND	0.99	ND	8.4
1,2-Dibromoethane	ND	0.99	ND	7.6
Chlorobenzene	ND	0.99	ND	4.5
Ethylbenzene	1.5	0.99	6.3	4.3
m,p-Xylenes	6.0	0.99	26	4.3
o-Xylene	1.7	0.99	7.3	4.3
Styrene	ND	0.99	ND	4.2
Bromoform	ND	0.99	ND	10
1,1,2,2-Tetrachloroethane	ND	0.99	ND	6.8
4-Ethyltoluene	ND	0.99	ND	4.8
1,3,5-Trimethylbenzene	ND	0.99	ND	4.8
1,2,4-Trimethylbenzene	1.2	0.99	6.1	4.8
1,3-Dichlorobenzene	ND	0.99	ND	5.9
1,4-Dichlorobenzene	ND	0.99	ND	5.9
Benzyl chloride	ND	0.99	ND	5.1
1,2-Dichlorobenzene	ND	0.99	ND	5.9
1,2,4-Trichlorobenzene	ND	0.99	ND	7.3
Hexachlorobutadiene	ND	0.99	ND	11
Naphthalene	ND	3.9	ND	21

Surrogate	%REC	Limits
Bromofluorobenzene	103	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-31	Diln Fac:	1.840
Lab ID:	280466-006	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/02/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.92	ND	4.5
Freon 114	ND	0.92	ND	6.4
Chloromethane	ND	0.92	ND	1.9
Vinyl Chloride	ND	0.92	ND	2.4
1,3-Butadiene	ND	0.92	ND	2.0
Bromomethane	ND	0.92	ND	3.6
Chloroethane	ND	0.92	ND	2.4
Trichlorofluoromethane	ND	0.92	ND	5.2
Acrolein	ND	3.7	ND	8.4
1,1-Dichloroethene	ND	0.92	ND	3.6
Freon 113	ND	0.92	ND	7.1
Acetone	ND	3.7	ND	8.7
Carbon Disulfide	36	0.92	110	2.9
Isopropanol	ND	3.7	ND	9.0
Methylene Chloride	ND	0.92	ND	3.2
trans-1,2-Dichloroethene	ND	0.92	ND	3.6
MTBE	ND	0.92	ND	3.3
n-Hexane	3.6	0.92	13	3.2
1,1-Dichloroethane	ND	0.92	ND	3.7
Vinyl Acetate	ND	0.92	ND	3.2
cis-1,2-Dichloroethene	ND	0.92	ND	3.6
2-Butanone	ND	0.92	ND	2.7
Ethyl Acetate	ND	0.92	ND	3.3
Tetrahydrofuran	ND	0.92	ND	2.7
Chloroform	ND	0.92	ND	4.5
1,1,1-Trichloroethane	ND	0.92	ND	5.0
Cyclohexane	3.1	0.92	11	3.2
Carbon Tetrachloride	ND	0.92	ND	5.8
Benzene	5.1	0.92	16	2.9
1,2-Dichloroethane	ND	0.92	ND	3.7
n-Heptane	2.4	0.92	9.9	3.8
Trichloroethene	ND	0.92	ND	4.9
1,2-Dichloropropane	ND	0.92	ND	4.3
Bromodichloromethane	ND	0.92	ND	6.2
cis-1,3-Dichloropropene	ND	0.92	ND	4.2

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-31	Diln Fac:	1.840
Lab ID:	280466-006	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/02/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.92	ND	3.8
Toluene	8.9	0.92	34	3.5
trans-1,3-Dichloropropene	ND	0.92	ND	4.2
1,1,2-Trichloroethane	ND	0.92	ND	5.0
Tetrachloroethene	ND	0.92	ND	6.2
2-Hexanone	ND	0.92	ND	3.8
Dibromochloromethane	ND	0.92	ND	7.8
1,2-Dibromoethane	ND	0.92	ND	7.1
Chlorobenzene	ND	0.92	ND	4.2
Ethylbenzene	1.5	0.92	6.4	4.0
m,p-Xylenes	6.7	0.92	29	4.0
o-Xylene	2.5	0.92	11	4.0
Styrene	ND	0.92	ND	3.9
Bromoform	ND	0.92	ND	9.5
1,1,2,2-Tetrachloroethane	ND	0.92	ND	6.3
4-Ethyltoluene	ND	0.92	ND	4.5
1,3,5-Trimethylbenzene	ND	0.92	ND	4.5
1,2,4-Trimethylbenzene	0.98	0.92	4.8	4.5
1,3-Dichlorobenzene	ND	0.92	ND	5.5
1,4-Dichlorobenzene	ND	0.92	ND	5.5
Benzyl chloride	ND	0.92	ND	4.8
1,2-Dichlorobenzene	ND	0.92	ND	5.5
1,2,4-Trichlorobenzene	ND	0.92	ND	6.8
Hexachlorobutadiene	ND	0.92	ND	9.8
Naphthalene	ND	3.7	ND	19

Surrogate	%REC	Limits
Bromofluorobenzene	109	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-32	Diln Fac:	2.050
Lab ID:	280466-007	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/03/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.0	ND	5.1
Freon 114	ND	1.0	ND	7.2
Chloromethane	ND	1.0	ND	2.1
Vinyl Chloride	ND	1.0	ND	2.6
1,3-Butadiene	ND	1.0	ND	2.3
Bromomethane	ND	1.0	ND	4.0
Chloroethane	ND	1.0	ND	2.7
Trichlorofluoromethane	ND	1.0	ND	5.8
Acrolein	ND	4.1	ND	9.4
1,1-Dichloroethene	ND	1.0	ND	4.1
Freon 113	ND	1.0	ND	7.9
Acetone	ND	4.1	ND	9.7
Carbon Disulfide	13	1.0	41	3.2
Isopropanol	ND	4.1	ND	10
Methylene Chloride	ND	1.0	ND	3.6
trans-1,2-Dichloroethene	ND	1.0	ND	4.1
MTBE	ND	1.0	ND	3.7
n-Hexane	ND	1.0	ND	3.6
1,1-Dichloroethane	ND	1.0	ND	4.1
Vinyl Acetate	ND	1.0	ND	3.6
cis-1,2-Dichloroethene	ND	1.0	ND	4.1
2-Butanone	ND	1.0	ND	3.0
Ethyl Acetate	ND	1.0	ND	3.7
Tetrahydrofuran	ND	1.0	ND	3.0
Chloroform	ND	1.0	ND	5.0
1,1,1-Trichloroethane	ND	1.0	ND	5.6
Cyclohexane	3.2	1.0	11	3.5
Carbon Tetrachloride	ND	1.0	ND	6.4
Benzene	2.0	1.0	6.4	3.3
1,2-Dichloroethane	ND	1.0	ND	4.1
n-Heptane	ND	1.0	ND	4.2
Trichloroethene	ND	1.0	ND	5.5
1,2-Dichloropropane	ND	1.0	ND	4.7
Bromodichloromethane	ND	1.0	ND	6.9
cis-1,3-Dichloropropene	ND	1.0	ND	4.7

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units



### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-32	Diln Fac:	2.050
Lab ID:	280466-007	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/03/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.0	ND	4.2
Toluene	1.0	1.0	3.9	3.9
trans-1,3-Dichloropropene	ND	1.0	ND	4.7
1,1,2-Trichloroethane	ND	1.0	ND	5.6
Tetrachloroethene	2.1	1.0	14	7.0
2-Hexanone	ND	1.0	ND	4.2
Dibromochloromethane	ND	1.0	ND	8.7
1,2-Dibromoethane	ND	1.0	ND	7.9
Chlorobenzene	ND	1.0	ND	4.7
Ethylbenzene	ND	1.0	ND	4.5
m,p-Xylenes	ND	1.0	ND	4.5
o-Xylene	ND	1.0	ND	4.5
Styrene	ND	1.0	ND	4.4
Bromoform	ND	1.0	ND	11
1,1,2,2-Tetrachloroethane	ND	1.0	ND	7.0
4-Ethyltoluene	ND	1.0	ND	5.0
1,3,5-Trimethylbenzene	ND	1.0	ND	5.0
1,2,4-Trimethylbenzene	ND	1.0	ND	5.0
1,3-Dichlorobenzene	ND	1.0	ND	6.2
1,4-Dichlorobenzene	ND	1.0	ND	6.2
Benzyl chloride	ND	1.0	ND	5.3
1,2-Dichlorobenzene	ND	1.0	ND	6.2
1,2,4-Trichlorobenzene	ND	1.0	ND	7.6
Hexachlorobutadiene	ND	1.0	ND	11
Naphthalene	ND	4.1	ND	21

Surrogate	%REC	Limits
Bromofluorobenzene	103	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-33	Diln Fac:	1.940
Lab ID:	280466-008	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/03/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.97	ND	4.8
Freon 114	ND	0.97	ND	6.8
Chloromethane	ND	0.97	ND	2.0
Vinyl Chloride	ND	0.97	ND	2.5
1,3-Butadiene	ND	0.97	ND	2.1
Bromomethane	ND	0.97	ND	3.8
Chloroethane	ND	0.97	ND	2.6
Trichlorofluoromethane	ND	0.97	ND	5.4
Acrolein	ND	3.9	ND	8.9
1,1-Dichloroethene	ND	0.97	ND	3.8
Freon 113	ND	0.97	ND	7.4
Acetone	ND	3.9	ND	9.2
Carbon Disulfide	9.2	0.97	29	3.0
Isopropanol	ND	3.9	ND	9.5
Methylene Chloride	ND	0.97	ND	3.4
trans-1,2-Dichloroethene	ND	0.97	ND	3.8
MTBE	ND	0.97	ND	3.5
n-Hexane	1.7	0.97	5.9	3.4
1,1-Dichloroethane	ND	0.97	ND	3.9
Vinyl Acetate	ND	0.97	ND	3.4
cis-1,2-Dichloroethene	ND	0.97	ND	3.8
2-Butanone	ND	0.97	ND	2.9
Ethyl Acetate	ND	0.97	ND	3.5
Tetrahydrofuran	ND	0.97	ND	2.9
Chloroform	ND	0.97	ND	4.7
1,1,1-Trichloroethane	ND	0.97	ND	5.3
Cyclohexane	2.7	0.97	9.2	3.3
Carbon Tetrachloride	ND	0.97	ND	6.1
Benzene	6.2	0.97	20	3.1
1,2-Dichloroethane	ND	0.97	ND	3.9
n-Heptane	1.1	0.97	4.5	4.0
Trichloroethene	ND	0.97	ND	5.2
1,2-Dichloropropane	ND	0.97	ND	4.5
Bromodichloromethane	ND	0.97	ND	6.5
cis-1,3-Dichloropropene	ND	0.97	ND	4.4

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-33	Diln Fac:	1.940
Lab ID:	280466-008	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/03/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.97	ND	4.0
Toluene	7.3	0.97	27	3.7
trans-1,3-Dichloropropene	ND	0.97	ND	4.4
1,1,2-Trichloroethane	ND	0.97	ND	5.3
Tetrachloroethene	ND	0.97	ND	6.6
2-Hexanone	ND	0.97	ND	4.0
Dibromochloromethane	ND	0.97	ND	8.3
1,2-Dibromoethane	ND	0.97	ND	7.5
Chlorobenzene	ND	0.97	ND	4.5
Ethylbenzene	ND	0.97	ND	4.2
m,p-Xylenes	2.0	0.97	8.8	4.2
o-Xylene	ND	0.97	ND	4.2
Styrene	ND	0.97	ND	4.1
Bromoform	ND	0.97	ND	10
1,1,2,2-Tetrachloroethane	ND	0.97	ND	6.7
4-Ethyltoluene	ND	0.97	ND	4.8
1,3,5-Trimethylbenzene	ND	0.97	ND	4.8
1,2,4-Trimethylbenzene	ND	0.97	ND	4.8
1,3-Dichlorobenzene	ND	0.97	ND	5.8
1,4-Dichlorobenzene	ND	0.97	ND	5.8
Benzyl chloride	ND	0.97	ND	5.0
1,2-Dichlorobenzene	ND	0.97	ND	5.8
1,2,4-Trichlorobenzene	ND	0.97	ND	7.2
Hexachlorobutadiene	ND	0.97	ND	10
Naphthalene	ND	3.9	ND	20

Surrogate	%REC	Limits
Bromofluorobenzene	102	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-34	Diln Fac:	2.140
Lab ID:	280466-009	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/03/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.1	ND	5.3
Freon 114	ND	1.1	ND	7.5
Chloromethane	ND	1.1	ND	2.2
Vinyl Chloride	ND	1.1	ND	2.7
1,3-Butadiene	ND	1.1	ND	2.4
Bromomethane	ND	1.1	ND	4.2
Chloroethane	ND	1.1	ND	2.8
Trichlorofluoromethane	ND	1.1	ND	6.0
Acrolein	ND	4.3	ND	9.8
1,1-Dichloroethene	ND	1.1	ND	4.2
Freon 113	ND	1.1	ND	8.2
Acetone	ND	4.3	ND	10
Carbon Disulfide	5.9	1.1	18	3.3
Isopropanol	ND	4.3	ND	11
Methylene Chloride	ND	1.1	ND	3.7
trans-1,2-Dichloroethene	ND	1.1	ND	4.2
MTBE	ND	1.1	ND	3.9
n-Hexane	ND	1.1	ND	3.8
1,1-Dichloroethane	ND	1.1	ND	4.3
Vinyl Acetate	ND	1.1	ND	3.8
cis-1,2-Dichloroethene	ND	1.1	ND	4.2
2-Butanone	ND	1.1	ND	3.2
Ethyl Acetate	ND	1.1	ND	3.9
Tetrahydrofuran	ND	1.1	ND	3.2
Chloroform	ND	1.1	ND	5.2
1,1,1-Trichloroethane	ND	1.1	ND	5.8
Cyclohexane	2.0	1.1	6.7	3.7
Carbon Tetrachloride	ND	1.1	ND	6.7
Benzene	5.2	1.1	17	3.4
1,2-Dichloroethane	ND	1.1	ND	4.3
n-Heptane	ND	1.1	ND	4.4
Trichloroethene	ND	1.1	ND	5.7
1,2-Dichloropropane	ND	1.1	ND	4.9
Bromodichloromethane	ND	1.1	ND	7.2
cis-1,3-Dichloropropene	ND	1.1	ND	4.9

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-34	Diln Fac:	2.140
Lab ID:	280466-009	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/03/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.1	ND	4.4
Toluene	8.9	1.1	33	4.0
trans-1,3-Dichloropropene	ND	1.1	ND	4.9
1,1,2-Trichloroethane	ND	1.1	ND	5.8
Tetrachloroethene	ND	1.1	ND	7.3
2-Hexanone	ND	1.1	ND	4.4
Dibromochloromethane	ND	1.1	ND	9.1
1,2-Dibromoethane	ND	1.1	ND	8.2
Chlorobenzene	ND	1.1	ND	4.9
Ethylbenzene	1.1	1.1	4.7	4.6
m,p-Xylenes	4.5	1.1	19	4.6
o-Xylene	1.2	1.1	5.3	4.6
Styrene	ND	1.1	ND	4.6
Bromoform	ND	1.1	ND	11
1,1,2,2-Tetrachloroethane	ND	1.1	ND	7.3
4-Ethyltoluene	ND	1.1	ND	5.3
1,3,5-Trimethylbenzene	ND	1.1	ND	5.3
1,2,4-Trimethylbenzene	ND	1.1	ND	5.3
1,3-Dichlorobenzene	ND	1.1	ND	6.4
1,4-Dichlorobenzene	ND	1.1	ND	6.4
Benzyl chloride	ND	1.1	ND	5.5
1,2-Dichlorobenzene	ND	1.1	ND	6.4
1,2,4-Trichlorobenzene	ND	1.1	ND	7.9
Hexachlorobutadiene	ND	1.1	ND	11
Naphthalene	ND	4.3	ND	22

Surrogate	%REC	Limits
Bromofluorobenzene	104	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-35	Diln Fac:	1.900
Lab ID:	280466-010	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/03/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.95	ND	4.7
Freon 114	ND	0.95	ND	6.6
Chloromethane	ND	0.95	ND	2.0
Vinyl Chloride	ND	0.95	ND	2.4
1,3-Butadiene	ND	0.95	ND	2.1
Bromomethane	ND	0.95	ND	3.7
Chloroethane	ND	0.95	ND	2.5
Trichlorofluoromethane	ND	0.95	ND	5.3
Acrolein	ND	3.8	ND	8.7
1,1-Dichloroethene	ND	0.95	ND	3.8
Freon 113	ND	0.95	ND	7.3
Acetone	7.4	3.8	18	9.0
Carbon Disulfide	35	0.95	110	3.0
Isopropanol	ND	3.8	ND	9.3
Methylene Chloride	ND	0.95	ND	3.3
trans-1,2-Dichloroethene	ND	0.95	ND	3.8
MTBE	ND	0.95	ND	3.4
n-Hexane	3.9	0.95	14	3.3
1,1-Dichloroethane	ND	0.95	ND	3.8
Vinyl Acetate	ND	0.95	ND	3.3
cis-1,2-Dichloroethene	ND	0.95	ND	3.8
2-Butanone	1.1	0.95	3.3	2.8
Ethyl Acetate	ND	0.95	ND	3.4
Tetrahydrofuran	ND	0.95	ND	2.8
Chloroform	1.2	0.95	5.8	4.6
1,1,1-Trichloroethane	ND	0.95	ND	5.2
Cyclohexane	6.5	0.95	22	3.3
Carbon Tetrachloride	ND	0.95	ND	6.0
Benzene	11	0.95	36	3.0
1,2-Dichloroethane	ND	0.95	ND	3.8
n-Heptane	4.9	0.95	20	3.9
Trichloroethene	ND	0.95	ND	5.1
1,2-Dichloropropane	ND	0.95	ND	4.4
Bromodichloromethane	ND	0.95	ND	6.4
cis-1,3-Dichloropropene	ND	0.95	ND	4.3

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units



### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-35	Diln Fac:	1.900
Lab ID:	280466-010	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/03/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.95	ND	3.9
Toluene	26	0.95	100	3.6
trans-1,3-Dichloropropene	ND	0.95	ND	4.3
1,1,2-Trichloroethane	ND	0.95	ND	5.2
Tetrachloroethene	ND	0.95	ND	6.4
2-Hexanone	ND	0.95	ND	3.9
Dibromochloromethane	ND	0.95	ND	8.1
1,2-Dibromoethane	ND	0.95	ND	7.3
Chlorobenzene	ND	0.95	ND	4.4
Ethylbenzene	3.7	0.95	16	4.1
m,p-Xylenes	14	0.95	63	4.1
o-Xylene	3.8	0.95	16	4.1
Styrene	ND	0.95	ND	4.0
Bromoform	ND	0.95	ND	9.8
1,1,2,2-Tetrachloroethane	ND	0.95	ND	6.5
4-Ethyltoluene	ND	0.95	ND	4.7
1,3,5-Trimethylbenzene	ND	0.95	ND	4.7
1,2,4-Trimethylbenzene	2.1	0.95	10	4.7
1,3-Dichlorobenzene	ND	0.95	ND	5.7
1,4-Dichlorobenzene	ND	0.95	ND	5.7
Benzyl chloride	ND	0.95	ND	4.9
1,2-Dichlorobenzene	ND	0.95	ND	5.7
1,2,4-Trichlorobenzene	ND	0.95	ND	7.1
Hexachlorobutadiene	ND	0.95	ND	10
Naphthalene	ND	3.8	ND	20

Surrogate	%REC	Limits
Bromofluorobenzene	106	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-36	Diln Fac:	2.080
Lab ID:	280466-011	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/03/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.0	ND	5.1
Freon 114	ND	1.0	ND	7.3
Chloromethane	ND	1.0	ND	2.1
Vinyl Chloride	ND	1.0	ND	2.7
1,3-Butadiene	ND	1.0	ND	2.3
Bromomethane	ND	1.0	ND	4.0
Chloroethane	ND	1.0	ND	2.7
Trichlorofluoromethane	ND	1.0	ND	5.8
Acrolein	ND	4.2	ND	9.5
1,1-Dichloroethene	ND	1.0	ND	4.1
Freon 113	ND	1.0	ND	8.0
Acetone	ND	4.2	ND	9.9
Carbon Disulfide	44	1.0	140	3.2
Isopropanol	ND	4.2	ND	10
Methylene Chloride	ND	1.0	ND	3.6
trans-1,2-Dichloroethene	ND	1.0	ND	4.1
MTBE	ND	1.0	ND	3.7
n-Hexane	5.2	1.0	18	3.7
1,1-Dichloroethane	ND	1.0	ND	4.2
Vinyl Acetate	ND	1.0	ND	3.7
cis-1,2-Dichloroethene	ND	1.0	ND	4.1
2-Butanone	ND	1.0	ND	3.1
Ethyl Acetate	ND	1.0	ND	3.7
Tetrahydrofuran	ND	1.0	ND	3.1
Chloroform	ND	1.0	ND	5.1
1,1,1-Trichloroethane	ND	1.0	ND	5.7
Cyclohexane	7.6	1.0	26	3.6
Carbon Tetrachloride	ND	1.0	ND	6.5
Benzene	10	1.0	33	3.3
1,2-Dichloroethane	ND	1.0	ND	4.2
n-Heptane	4.9	1.0	20	4.3
Trichloroethene	ND	1.0	ND	5.6
1,2-Dichloropropane	ND	1.0	ND	4.8
Bromodichloromethane	ND	1.0	ND	7.0
cis-1,3-Dichloropropene	ND	1.0	ND	4.7

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-36	Diln Fac:	2.080
Lab ID:	280466-011	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/03/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.0	ND	4.3
Toluene	19	1.0	72	3.9
trans-1,3-Dichloropropene	ND	1.0	ND	4.7
1,1,2-Trichloroethane	ND	1.0	ND	5.7
Tetrachloroethene	ND	1.0	ND	7.1
2-Hexanone	ND	1.0	ND	4.3
Dibromochloromethane	ND	1.0	ND	8.9
1,2-Dibromoethane	ND	1.0	ND	8.0
Chlorobenzene	ND	1.0	ND	4.8
Ethylbenzene	2.5	1.0	11	4.5
m,p-Xylenes	9.7	1.0	42	4.5
o-Xylene	2.6	1.0	11	4.5
Styrene	ND	1.0	ND	4.4
Bromoform	ND	1.0	ND	11
1,1,2,2-Tetrachloroethane	ND	1.0	ND	7.1
4-Ethyltoluene	ND	1.0	ND	5.1
1,3,5-Trimethylbenzene	ND	1.0	ND	5.1
1,2,4-Trimethylbenzene	1.8	1.0	8.7	5.1
1,3-Dichlorobenzene	ND	1.0	ND	6.3
1,4-Dichlorobenzene	ND	1.0	ND	6.3
Benzyl chloride	ND	1.0	ND	5.4
1,2-Dichlorobenzene	ND	1.0	ND	6.3
1,2,4-Trichlorobenzene	ND	1.0	ND	7.7
Hexachlorobutadiene	ND	1.0	ND	11
Naphthalene	ND	4.2	ND	22

Surrogate	%REC	Limits
Bromofluorobenzene	100	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-37	Diln Fac:	1.960
Lab ID:	280466-012	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/03/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.98	ND	4.8
Freon 114	ND	0.98	ND	6.9
Chloromethane	ND	0.98	ND	2.0
Vinyl Chloride	ND	0.98	ND	2.5
1,3-Butadiene	ND	0.98	ND	2.2
Bromomethane	ND	0.98	ND	3.8
Chloroethane	ND	0.98	ND	2.6
Trichlorofluoromethane	ND	0.98	ND	5.5
Acrolein	ND	3.9	ND	9.0
1,1-Dichloroethene	ND	0.98	ND	3.9
Freon 113	ND	0.98	ND	7.5
Acetone	4.9	3.9	12	9.3
Carbon Disulfide	82	0.98	260	3.1
Isopropanol	ND	3.9	ND	9.6
Methylene Chloride	ND	0.98	ND	3.4
trans-1,2-Dichloroethene	ND	0.98	ND	3.9
MTBE	ND	0.98	ND	3.5
n-Hexane	11	0.98	40	3.5
1,1-Dichloroethane	ND	0.98	ND	4.0
Vinyl Acetate	ND	0.98	ND	3.5
cis-1,2-Dichloroethene	ND	0.98	ND	3.9
2-Butanone	ND	0.98	ND	2.9
Ethyl Acetate	ND	0.98	ND	3.5
Tetrahydrofuran	ND	0.98	ND	2.9
Chloroform	ND	0.98	ND	4.8
1,1,1-Trichloroethane	ND	0.98	ND	5.3
Cyclohexane	9.7	0.98	33	3.4
Carbon Tetrachloride	ND	0.98	ND	6.2
Benzene	14	0.98	43	3.1
1,2-Dichloroethane	ND	0.98	ND	4.0
n-Heptane	8.2	0.98	34	4.0
Trichloroethene	ND	0.98	ND	5.3
1,2-Dichloropropane	ND	0.98	ND	4.5
Bromodichloromethane	ND	0.98	ND	6.6
cis-1,3-Dichloropropene	ND	0.98	ND	4.4

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-37	Diln Fac:	1.960
Lab ID:	280466-012	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/03/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	3.2	0.98	13	4.0
Toluene	30	0.98	110	3.7
trans-1,3-Dichloropropene	ND	0.98	ND	4.4
1,1,2-Trichloroethane	ND	0.98	ND	5.3
Tetrachloroethene	ND	0.98	ND	6.6
2-Hexanone	ND	0.98	ND	4.0
Dibromochloromethane	ND	0.98	ND	8.3
1,2-Dibromoethane	ND	0.98	ND	7.5
Chlorobenzene	ND	0.98	ND	4.5
Ethylbenzene	3.8	0.98	17	4.3
m,p-Xylenes	16	0.98	68	4.3
o-Xylene	4.0	0.98	17	4.3
Styrene	ND	0.98	ND	4.2
Bromoform	ND	0.98	ND	10
1,1,2,2-Tetrachloroethane	ND	0.98	ND	6.7
4-Ethyltoluene	1.1	0.98	5.4	4.8
1,3,5-Trimethylbenzene	0.98	0.98	4.8	4.8
1,2,4-Trimethylbenzene	2.7	0.98	13	4.8
1,3-Dichlorobenzene	ND	0.98	ND	5.9
1,4-Dichlorobenzene	ND	0.98	ND	5.9
Benzyl chloride	ND	0.98	ND	5.1
1,2-Dichlorobenzene	ND	0.98	ND	5.9
1,2,4-Trichlorobenzene	ND	0.98	ND	7.3
Hexachlorobutadiene	ND	0.98	ND	10
Naphthalene	ND	3.9	ND	21

Surrogate	%REC	Limits
Bromofluorobenzene	106	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-38	Diln Fac:	1.920
Lab ID:	280466-013	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/03/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.96	ND	4.7
Freon 114	ND	0.96	ND	6.7
Chloromethane	ND	0.96	ND	2.0
Vinyl Chloride	ND	0.96	ND	2.5
1,3-Butadiene	ND	0.96	ND	2.1
Bromomethane	ND	0.96	ND	3.7
Chloroethane	ND	0.96	ND	2.5
Trichlorofluoromethane	ND	0.96	ND	5.4
Acrolein	ND	3.8	ND	8.8
1,1-Dichloroethene	ND	0.96	ND	3.8
Freon 113	ND	0.96	ND	7.4
Acetone	8.7	3.8	21	9.1
Carbon Disulfide	59	0.96	180	3.0
Isopropanol	ND	3.8	ND	9.4
Methylene Chloride	ND	0.96	ND	3.3
trans-1,2-Dichloroethene	ND	0.96	ND	3.8
MTBE	ND	0.96	ND	3.5
n-Hexane	11	0.96	38	3.4
1,1-Dichloroethane	ND	0.96	ND	3.9
Vinyl Acetate	ND	0.96	ND	3.4
cis-1,2-Dichloroethene	ND	0.96	ND	3.8
2-Butanone	ND	0.96	ND	2.8
Ethyl Acetate	ND	0.96	ND	3.5
Tetrahydrofuran	ND	0.96	ND	2.8
Chloroform	ND	0.96	ND	4.7
1,1,1-Trichloroethane	ND	0.96	ND	5.2
Cyclohexane	10	0.96	35	3.3
Carbon Tetrachloride	ND	0.96	ND	6.0
Benzene	15	0.96	48	3.1
1,2-Dichloroethane	ND	0.96	ND	3.9
n-Heptane	13	0.96	54	3.9
Trichloroethene	ND	0.96	ND	5.2
1,2-Dichloropropane	ND	0.96	ND	4.4
Bromodichloromethane	ND	0.96	ND	6.4
cis-1,3-Dichloropropene	ND	0.96	ND	4.4

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units



### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-38	Diln Fac:	1.920
Lab ID:	280466-013	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/03/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	2.8	0.96	12	3.9
Toluene	31	0.96	120	3.6
trans-1,3-Dichloropropene	ND	0.96	ND	4.4
1,1,2-Trichloroethane	ND	0.96	ND	5.2
Tetrachloroethene	ND	0.96	ND	6.5
2-Hexanone	ND	0.96	ND	3.9
Dibromochloromethane	ND	0.96	ND	8.2
1,2-Dibromoethane	ND	0.96	ND	7.4
Chlorobenzene	ND	0.96	ND	4.4
Ethylbenzene	5.6	0.96	24	4.2
m,p-Xylenes	22	0.96	95	4.2
o-Xylene	5.8	0.96	25	4.2
Styrene	ND	0.96	ND	4.1
Bromoform	ND	0.96	ND	9.9
1,1,2,2-Tetrachloroethane	ND	0.96	ND	6.6
4-Ethyltoluene	2.1	0.96	10	4.7
1,3,5-Trimethylbenzene	1.6	0.96	7.8	4.7
1,2,4-Trimethylbenzene	5.4	0.96	27	4.7
1,3-Dichlorobenzene	ND	0.96	ND	5.8
1,4-Dichlorobenzene	ND	0.96	ND	5.8
Benzyl chloride	ND	0.96	ND	5.0
1,2-Dichlorobenzene	ND	0.96	ND	5.8
1,2,4-Trichlorobenzene	ND	0.96	ND	7.1
Hexachlorobutadiene	ND	0.96	ND	10
Naphthalene	ND	3.8	ND	20

Surrogate	%REC	Limits
Bromofluorobenzene	105	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-39	Diln Fac:	1.900
Lab ID:	280466-014	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/03/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.95	ND	4.7
Freon 114	ND	0.95	ND	6.6
Chloromethane	ND	0.95	ND	2.0
Vinyl Chloride	ND	0.95	ND	2.4
1,3-Butadiene	ND	0.95	ND	2.1
Bromomethane	ND	0.95	ND	3.7
Chloroethane	ND	0.95	ND	2.5
Trichlorofluoromethane	ND	0.95	ND	5.3
Acrolein	ND	3.8	ND	8.7
1,1-Dichloroethene	ND	0.95	ND	3.8
Freon 113	ND	0.95	ND	7.3
Acetone	6.4	3.8	15	9.0
Carbon Disulfide	9.5	0.95	29	3.0
Isopropanol	ND	3.8	ND	9.3
Methylene Chloride	ND	0.95	ND	3.3
trans-1,2-Dichloroethene	ND	0.95	ND	3.8
MTBE	ND	0.95	ND	3.4
n-Hexane	2.6	0.95	9.2	3.3
1,1-Dichloroethane	ND	0.95	ND	3.8
Vinyl Acetate	ND	0.95	ND	3.3
cis-1,2-Dichloroethene	ND	0.95	ND	3.8
2-Butanone	1.2	0.95	3.4	2.8
Ethyl Acetate	ND	0.95	ND	3.4
Tetrahydrofuran	ND	0.95	ND	2.8
Chloroform	ND	0.95	ND	4.6
1,1,1-Trichloroethane	ND	0.95	ND	5.2
Cyclohexane	2.5	0.95	8.6	3.3
Carbon Tetrachloride	ND	0.95	ND	6.0
Benzene	6.0	0.95	19	3.0
1,2-Dichloroethane	ND	0.95	ND	3.8
n-Heptane	2.5	0.95	10	3.9
Trichloroethene	ND	0.95	ND	5.1
1,2-Dichloropropane	ND	0.95	ND	4.4
Bromodichloromethane	ND	0.95	ND	6.4
cis-1,3-Dichloropropene	ND	0.95	ND	4.3

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-39	Diln Fac:	1.900
Lab ID:	280466-014	Batch#:	238737
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/03/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	2.9	0.95	12	3.9
Toluene	7.9	0.95	30	3.6
trans-1,3-Dichloropropene	ND	0.95	ND	4.3
1,1,2-Trichloroethane	ND	0.95	ND	5.2
Tetrachloroethene	ND	0.95	ND	6.4
2-Hexanone	ND	0.95	ND	3.9
Dibromochloromethane	ND	0.95	ND	8.1
1,2-Dibromoethane	ND	0.95	ND	7.3
Chlorobenzene	ND	0.95	ND	4.4
Ethylbenzene	ND	0.95	ND	4.1
m,p-Xylenes	2.8	0.95	12	4.1
o-Xylene	ND	0.95	ND	4.1
Styrene	ND	0.95	ND	4.0
Bromoform	ND	0.95	ND	9.8
1,1,2,2-Tetrachloroethane	ND	0.95	ND	6.5
4-Ethyltoluene	ND	0.95	ND	4.7
1,3,5-Trimethylbenzene	ND	0.95	ND	4.7
1,2,4-Trimethylbenzene	ND	0.95	ND	4.7
1,3-Dichlorobenzene	ND	0.95	ND	5.7
1,4-Dichlorobenzene	ND	0.95	ND	5.7
Benzyl chloride	ND	0.95	ND	4.9
1,2-Dichlorobenzene	ND	0.95	ND	5.7
1,2,4-Trichlorobenzene	ND	0.95	ND	7.1
Hexachlorobutadiene	ND	0.95	ND	10
Naphthalene	ND	3.8	ND	20

Surrogate	%REC	Limits
Bromofluorobenzene	102	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-40	Diln Fac:	2.180
Lab ID:	280466-015	Batch#:	238783
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/04/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.1	ND	5.4
Freon 114	ND	1.1	ND	7.6
Chloromethane	ND	1.1	ND	2.3
Vinyl Chloride	ND	1.1	ND	2.8
1,3-Butadiene	ND	1.1	ND	2.4
Bromomethane	ND	1.1	ND	4.2
Chloroethane	ND	1.1	ND	2.9
Trichlorofluoromethane	ND	1.1	ND	6.1
Acrolein	ND	4.4	ND	10
1,1-Dichloroethene	ND	1.1	ND	4.3
Freon 113	ND	1.1	ND	8.4
Acetone	ND	4.4	ND	10
Carbon Disulfide	17	1.1	53	3.4
Isopropanol	ND	4.4	ND	11
Methylene Chloride	ND	1.1	ND	3.8
trans-1,2-Dichloroethene	ND	1.1	ND	4.3
MTBE	ND	1.1	ND	3.9
n-Hexane	2.2	1.1	7.8	3.8
1,1-Dichloroethane	ND	1.1	ND	4.4
Vinyl Acetate	ND	1.1	ND	3.8
cis-1,2-Dichloroethene	ND	1.1	ND	4.3
2-Butanone	ND	1.1	ND	3.2
Ethyl Acetate	ND	1.1	ND	3.9
Tetrahydrofuran	ND	1.1	ND	3.2
Chloroform	3.5	1.1	17	5.3
1,1,1-Trichloroethane	ND	1.1	ND	5.9
Cyclohexane	7.1	1.1	24	3.8
Carbon Tetrachloride	ND	1.1	ND	6.9
Benzene	9.2	1.1	29	3.5
1,2-Dichloroethane	ND	1.1	ND	4.4
n-Heptane	1.3	1.1	5.2	4.5
Trichloroethene	ND	1.1	ND	5.9
1,2-Dichloropropane	ND	1.1	ND	5.0
Bromodichloromethane	ND	1.1	ND	7.3
cis-1,3-Dichloropropene	ND	1.1	ND	4.9

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-40	Diln Fac:	2.180
Lab ID:	280466-015	Batch#:	238783
Matrix:	Air	Sampled:	09/01/16
Units (V):	ppbv	Received:	09/01/16
Units (M):	ug/m3	Analyzed:	09/04/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.1	ND	4.5
Toluene	14	1.1	51	4.1
trans-1,3-Dichloropropene	ND	1.1	ND	4.9
1,1,2-Trichloroethane	ND	1.1	ND	5.9
Tetrachloroethene	3.9	1.1	26	7.4
2-Hexanone	ND	1.1	ND	4.5
Dibromochloromethane	ND	1.1	ND	9.3
1,2-Dibromoethane	ND	1.1	ND	8.4
Chlorobenzene	ND	1.1	ND	5.0
Ethylbenzene	ND	1.1	ND	4.7
m,p-Xylenes	3.8	1.1	17	4.7
o-Xylene	1.2	1.1	5.2	4.7
Styrene	ND	1.1	ND	4.6
Bromoform	ND	1.1	ND	11
1,1,2,2-Tetrachloroethane	ND	1.1	ND	7.5
4-Ethyltoluene	ND	1.1	ND	5.4
1,3,5-Trimethylbenzene	ND	1.1	ND	5.4
1,2,4-Trimethylbenzene	ND	1.1	ND	5.4
1,3-Dichlorobenzene	ND	1.1	ND	6.6
1,4-Dichlorobenzene	ND	1.1	ND	6.6
Benzyl chloride	ND	1.1	ND	5.6
1,2-Dichlorobenzene	ND	1.1	ND	6.6
1,2,4-Trichlorobenzene	ND	1.1	ND	8.1
Hexachlorobutadiene	ND	1.1	ND	12
Naphthalene	ND	4.4	ND	23

Surrogate	%REC	Limits
Bromofluorobenzene	98	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units





**Batch QC Report**

Volatile Organics in Air			
Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	238737
Units (V):	ppbv	Analyzed:	09/02/16
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits
Bromodichloromethane	5.000	5.246	105	70-130
cis-1,3-Dichloropropene	5.000	5.392	108	70-130
4-Methyl-2-Pentanone	5.000	6.381	128	70-130
Toluene	5.000	5.375	108	70-130
trans-1,3-Dichloropropene	5.000	5.310	106	70-130
1,1,2-Trichloroethane	5.000	5.079	102	70-130
Tetrachloroethene	5.000	5.107	102	70-130
2-Hexanone	5.000	5.597	112	70-130
Dibromochloromethane	5.000	4.770	95	70-130
1,2-Dibromoethane	5.000	4.931	99	70-130
Chlorobenzene	5.000	5.236	105	70-130
Ethylbenzene	5.000	5.673	113	70-130
m,p-Xylenes	10.000	11.78	118	70-130
o-Xylene	5.000	5.575	112	70-130
Styrene	5.000	5.423	108	70-130
Bromoform	5.000	4.601	92	70-130
1,1,2,2-Tetrachloroethane	5.000	5.195	104	70-130
4-Ethyltoluene	5.000	5.543	111	70-130
1,3,5-Trimethylbenzene	5.000	4.728	95	70-130
1,2,4-Trimethylbenzene	5.000	4.717	94	70-130
1,3-Dichlorobenzene	5.000	5.225	105	70-130
1,4-Dichlorobenzene	5.000	5.206	104	70-130
Benzyl chloride	5.000	5.202	104	70-130
1,2-Dichlorobenzene	5.000	4.996	100	70-130
1,2,4-Trichlorobenzene	5.000	4.458	89	70-130
Hexachlorobutadiene	5.000	5.176	104	70-130
Naphthalene	5.000	4.407	88	70-130

Surrogate	%REC	Limits
Bromofluorobenzene	110	70-130

b= See narrative

RPD= Relative Percent Difference

Result V= Result in volume units



**Batch QC Report**

Volatile Organics in Air			
Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	238737
Units (V):	ppbv	Analyzed:	09/02/16
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
Bromodichloromethane	5.000	5.278	106	70-130	1	25
cis-1,3-Dichloropropene	5.000	5.691	114	70-130	5	25
4-Methyl-2-Pentanone	5.000	6.247	125	70-130	2	25
Toluene	5.000	5.150	103	70-130	4	25
trans-1,3-Dichloropropene	5.000	5.566	111	70-130	5	25
1,1,2-Trichloroethane	5.000	5.146	103	70-130	1	25
Tetrachloroethene	5.000	5.188	104	70-130	2	25
2-Hexanone	5.000	5.353	107	70-130	4	25
Dibromochloromethane	5.000	4.714	94	70-130	1	25
1,2-Dibromoethane	5.000	4.976	100	70-130	1	25
Chlorobenzene	5.000	5.029	101	70-130	4	25
Ethylbenzene	5.000	5.603	112	70-130	1	25
m,p-Xylenes	10.000	11.42	114	70-130	3	25
o-Xylene	5.000	5.379	108	70-130	4	25
Styrene	5.000	5.282	106	70-130	3	25
Bromoform	5.000	4.657	93	70-130	1	25
1,1,2,2-Tetrachloroethane	5.000	5.084	102	70-130	2	25
4-Ethyltoluene	5.000	5.811	116	70-130	5	25
1,3,5-Trimethylbenzene	5.000	4.883	98	70-130	3	25
1,2,4-Trimethylbenzene	5.000	5.110	102	70-130	8	25
1,3-Dichlorobenzene	5.000	5.309	106	70-130	2	25
1,4-Dichlorobenzene	5.000	5.328	107	70-130	2	25
Benzyl chloride	5.000	5.154	103	70-130	1	25
1,2-Dichlorobenzene	5.000	4.981	100	70-130	0	25
1,2,4-Trichlorobenzene	5.000	4.498	90	70-130	1	25
Hexachlorobutadiene	5.000	5.559	111	70-130	7	25
Naphthalene	5.000	4.778	96	70-130	8	25

Surrogate	%REC	Limits
Bromofluorobenzene	107	70-130

b= See narrative

RPD= Relative Percent Difference

Result V= Result in volume units

## Batch QC Report

Volatile Organics in Air			
Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC850109	Diln Fac:	1.000
Matrix:	Air	Batch#:	238737
Units (V):	ppbv	Analyzed:	09/02/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	ND	2.0	ND	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Isopropanol	ND	2.0	ND	4.9
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	ND	0.50	ND	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	ND	0.50	ND	1.5
Ethyl Acetate	ND	0.50	ND	1.8
Tetrahydrofuran	ND	0.50	ND	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	ND	0.50	ND	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

## Batch QC Report

Volatile Organics in Air			
Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC850109	Diln Fac:	1.000
Matrix:	Air	Batch#:	238737
Units (V):	ppbv	Analyzed:	09/02/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.50	ND	2.0
Toluene	ND	0.50	ND	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	ND	0.50	ND	2.2
m,p-Xylenes	ND	0.50	ND	2.2
o-Xylene	ND	0.50	ND	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	ND	0.50	ND	2.5
1,3,5-Trimethylbenzene	ND	0.50	ND	2.5
1,2,4-Trimethylbenzene	ND	0.50	ND	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	96	70-130

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units





## Batch QC Report

Volatile Organics in Air			
Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	238783
Units (V):	ppbv	Analyzed:	09/04/16
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits
1,2-Dichloropropane	5.000	5.578	112	70-130
Bromodichloromethane	5.000	5.243	105	70-130
cis-1,3-Dichloropropene	5.000	5.558	111	70-130
4-Methyl-2-Pentanone	5.000	6.577 b	132 *	70-130
Toluene	5.000	5.330	107	70-130
trans-1,3-Dichloropropene	5.000	5.458	109	70-130
1,1,2-Trichloroethane	5.000	5.099	102	70-130
Tetrachloroethene	5.000	5.156	103	70-130
2-Hexanone	5.000	5.652	113	70-130
Dibromochloromethane	5.000	4.656	93	70-130
1,2-Dibromoethane	5.000	4.780	96	70-130
Chlorobenzene	5.000	5.240	105	70-130
Ethylbenzene	5.000	5.727	115	70-130
m,p-Xylenes	10.000	11.71	117	70-130
o-Xylene	5.000	5.612	112	70-130
Styrene	5.000	5.344	107	70-130
Bromoform	5.000	4.539	91	70-130
1,1,2,2-Tetrachloroethane	5.000	5.186	104	70-130
4-Ethyltoluene	5.000	5.516	110	70-130
1,3,5-Trimethylbenzene	5.000	4.590	92	70-130
1,2,4-Trimethylbenzene	5.000	4.714	94	70-130
1,3-Dichlorobenzene	5.000	5.221	104	70-130
1,4-Dichlorobenzene	5.000	5.141	103	70-130
Benzyl chloride	5.000	5.200	104	70-130
1,2-Dichlorobenzene	5.000	5.035	101	70-130
1,2,4-Trichlorobenzene	5.000	4.257	85	70-130
Hexachlorobutadiene	5.000	5.075	102	70-130
Naphthalene	5.000	4.328	87	70-130

Surrogate	%REC	Limits
Bromofluorobenzene	108	70-130

\*= Value outside of QC limits; see narrative

b= See narrative

RPD= Relative Percent Difference

Result V= Result in volume units



**Batch QC Report**

<b>Volatile Organics in Air</b>			
Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	238783
Units (V):	ppbv	Analyzed:	09/04/16
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
1,2-Dichloropropane	5.000	5.399	108	70-130	3	25
Bromodichloromethane	5.000	5.212	104	70-130	1	25
cis-1,3-Dichloropropene	5.000	5.658	113	70-130	2	25
4-Methyl-2-Pentanone	5.000	6.417 b	128	70-130	2	25
Toluene	5.000	5.381	108	70-130	1	25
trans-1,3-Dichloropropene	5.000	5.366	107	70-130	2	25
1,1,2-Trichloroethane	5.000	5.056	101	70-130	1	25
Tetrachloroethene	5.000	5.163	103	70-130	0	25
2-Hexanone	5.000	5.645	113	70-130	0	25
Dibromochloromethane	5.000	4.833	97	70-130	4	25
1,2-Dibromoethane	5.000	4.886	98	70-130	2	25
Chlorobenzene	5.000	5.009	100	70-130	5	25
Ethylbenzene	5.000	5.778	116	70-130	1	25
m,p-Xylenes	10.000	11.90	119	70-130	2	25
o-Xylene	5.000	5.540	111	70-130	1	25
Styrene	5.000	5.503	110	70-130	3	25
Bromoform	5.000	4.657	93	70-130	3	25
1,1,2,2-Tetrachloroethane	5.000	5.077	102	70-130	2	25
4-Ethyltoluene	5.000	5.543	111	70-130	0	25
1,3,5-Trimethylbenzene	5.000	4.757	95	70-130	4	25
1,2,4-Trimethylbenzene	5.000	4.900	98	70-130	4	25
1,3-Dichlorobenzene	5.000	5.166	103	70-130	1	25
1,4-Dichlorobenzene	5.000	5.064	101	70-130	2	25
Benzyl chloride	5.000	5.400	108	70-130	4	25
1,2-Dichlorobenzene	5.000	5.240	105	70-130	4	25
1,2,4-Trichlorobenzene	5.000	4.437	89	70-130	4	25
Hexachlorobutadiene	5.000	5.216	104	70-130	3	25
Naphthalene	5.000	4.470	89	70-130	3	25

Surrogate	%REC	Limits
Bromofluorobenzene	107	70-130

\*= Value outside of QC limits; see narrative

b= See narrative

RPD= Relative Percent Difference

Result V= Result in volume units

## Batch QC Report

Volatile Organics in Air			
Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC850285	Diln Fac:	1.000
Matrix:	Air	Batch#:	238783
Units (V):	ppbv	Analyzed:	09/04/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	ND	2.0	ND	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Isopropanol	ND	2.0	ND	4.9
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	ND	0.50	ND	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	ND	0.50	ND	1.5
Ethyl Acetate	ND	0.50	ND	1.8
Tetrahydrofuran	ND	0.50	ND	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	ND	0.50	ND	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

**Batch QC Report**

Volatile Organics in Air			
Lab #:	280466	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC850285	Diln Fac:	1.000
Matrix:	Air	Batch#:	238783
Units (V):	ppbv	Analyzed:	09/04/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.50	ND	2.0
Toluene	ND	0.50	ND	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	ND	0.50	ND	2.2
m,p-Xylenes	ND	0.50	ND	2.2
o-Xylene	ND	0.50	ND	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	ND	0.50	ND	2.5
1,3,5-Trimethylbenzene	ND	0.50	ND	2.5
1,2,4-Trimethylbenzene	ND	0.50	ND	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	99	70-130

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units





**Curtis & Tompkins, Ltd.**  
Analytical Laboratories, Since 1878







Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 280504  
ANALYTICAL REPORT

Pangea Environmental  
1710 Franklin Street  
Oakland, CA 94612

Project : 2030.001.003  
Location : 1233 Bockman  
Level : II

<u>Sample ID</u>	<u>Lab ID</u>
SS-6-8'	280504-001
SS-6-10'	280504-002
SS-7-8'	280504-003
SS-8-8'	280504-004
SS-9-8'	280504-005
SS-9-10'	280504-006

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature:   
Mike Dahlquist  
Project Manager  
mike.dahlquist@ctberk.com

Date: 09/06/2016

CA ELAP# 2896, NELAP# 4044-001

### CASE NARRATIVE

Laboratory number: 280504  
Client: Pangea Environmental  
Project: 2030.001.003  
Location: 1233 Bockman  
Request Date: 09/02/16  
Samples Received: 09/02/16

This data package contains sample and QC results for six soil samples, requested for the above referenced project on 09/02/16. The samples were received cold and intact.

**TPH-Purgeables and/or BTXE by GC (EPA 8015B):**

No analytical problems were encountered.

**TPH-Extractables by GC (EPA 8015B):**

SS-9-8' (lab # 280504-005) was diluted due to the dark and viscous nature of the sample extract. No other analytical problems were encountered.

**Volatile Organics by GC/MS (EPA 8260B):**

No analytical problems were encountered.





COOLER RECEIPT CHECKLIST



Curtis & Tompkins, Ltd.

Login # 280504 Date Received 9/2/16 Number of coolers 1
Client PanOlea Project 233 Brockman

Date Opened 9/2 By (print) CB (sign) Chamberlain
Date Logged in 1 By (print) DM (sign) [signature]
Date Labeled 1 By (print) CB (sign) [signature]

1. Did cooler come with a shipping slip (airbill, etc) YES NO
Shipping info

2A. Were custody seals present? ... YES (circle) on cooler on samples NO
How many Name Date

2B. Were custody seals intact upon arrival? YES NO N/A

3. Were custody papers dry and intact when received? YES NO

4. Were custody papers filled out properly (ink, signed, etc)? YES NO

5. Is the project identifiable from custody papers? (If so fill out top of form) YES NO

6. Indicate the packing in cooler: (if other, describe)

- Bubble Wrap, Foam blocks, Bags, None, Cloth material, Cardboard, Styrofoam, Paper towels

7. Temperature documentation: \* Notify PM if temperature exceeds 6°C

Type of ice used: Wet Blue/Gel None Temp(°C)

Temperature blank(s) included? Thermometer# IR Gun#

Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? YES NO
If YES, what time were they transferred to freezer?

9. Did all bottles arrive unbroken/unopened? YES NO

10. Are there any missing / extra samples? YES NO

11. Are samples in the appropriate containers for indicated tests? YES NO

12. Are sample labels present, in good condition and complete? YES NO

13. Do the sample labels agree with custody papers? YES NO

14. Was sufficient amount of sample sent for tests requested? YES NO

15. Are the samples appropriately preserved? YES NO N/A

16. Did you check preservatives for all bottles for each sample? YES NO N/A

17. Did you document your preservative check? (pH strip lot# ) YES NO N/A

18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO N/A

19. Did you change the hold time in LIMS for preserved terracores? YES NO N/A

20. Are bubbles > 6mm absent in VOA samples? YES NO N/A

21. Was the client contacted concerning this sample delivery? YES NO
If YES, Who was called? By Date:

COMMENTS

Detections Summary for 280504

Results for any subcontracted analyses are not included in this summary.

Client : Pangea Environmental  
 Project : 2030.001.003  
 Location : 1233 Bockman

Client Sample ID : SS-6-8'                      Laboratory Sample ID :                      280504-001

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Naphthalene	8.4		5.0	ug/Kg	As Recd	0.9980	EPA 8260B	EPA 5030B

Client Sample ID : SS-6-10'                      Laboratory Sample ID :                      280504-002

No Detections

Client Sample ID : SS-7-8'                      Laboratory Sample ID :                      280504-003

No Detections

Client Sample ID : SS-8-8'                      Laboratory Sample ID :                      280504-004

No Detections

Client Sample ID : SS-9-8'                      Laboratory Sample ID :                      280504-005

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	4.0		0.99	mg/Kg	As Recd	1.000	EPA 8015B	EPA 5030B
Diesel C10-C24	650		10	mg/Kg	As Recd	10.00	EPA 8015B	EPA 3550B
Motor Oil C24-C36	3,100		50	mg/Kg	As Recd	10.00	EPA 8015B	EPA 3550B
Acetone	30		20	ug/Kg	As Recd	0.9785	EPA 8260B	EPA 5030B

Client Sample ID : SS-9-10'                      Laboratory Sample ID :                      280504-006

No Detections

Total Volatile Hydrocarbons			
Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8015B
Matrix:	Soil	Batch#:	238777
Units:	mg/Kg	Sampled:	09/02/16
Basis:	as received	Received:	09/02/16
Diln Fac:	1.000		

Field ID: SS-9-8'                      Lab ID: 280504-005  
 Type: SAMPLE                          Analyzed: 09/04/16

Analyte	Result	RL
Gasoline C7-C12	4.0	0.99

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	118	78-138

Field ID: SS-9-10'                      Lab ID: 280504-006  
 Type: SAMPLE                          Analyzed: 09/04/16

Analyte	Result	RL
Gasoline C7-C12	ND	0.96

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	97	78-138

Type: BLANK                              Analyzed: 09/03/16  
 Lab ID: QC850265

Analyte	Result	RL
Gasoline C7-C12	ND	1.0

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	95	78-138

ND= Not Detected  
 RL= Reporting Limit



Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC850264	Batch#:	238777
Matrix:	Soil	Analyzed:	09/03/16
Units:	mg/Kg		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1.000	1.124	112	80-121

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	101	78-138

## Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Diln Fac:	1.000
MSS Lab ID:	280455-001	Batch#:	238777
Matrix:	Soil	Sampled:	09/01/16
Units:	mg/Kg	Received:	09/01/16
Basis:	as received	Analyzed:	09/03/16

Type: MS Lab ID: QC850266

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	0.08612	10.31	9.893	95	50-120

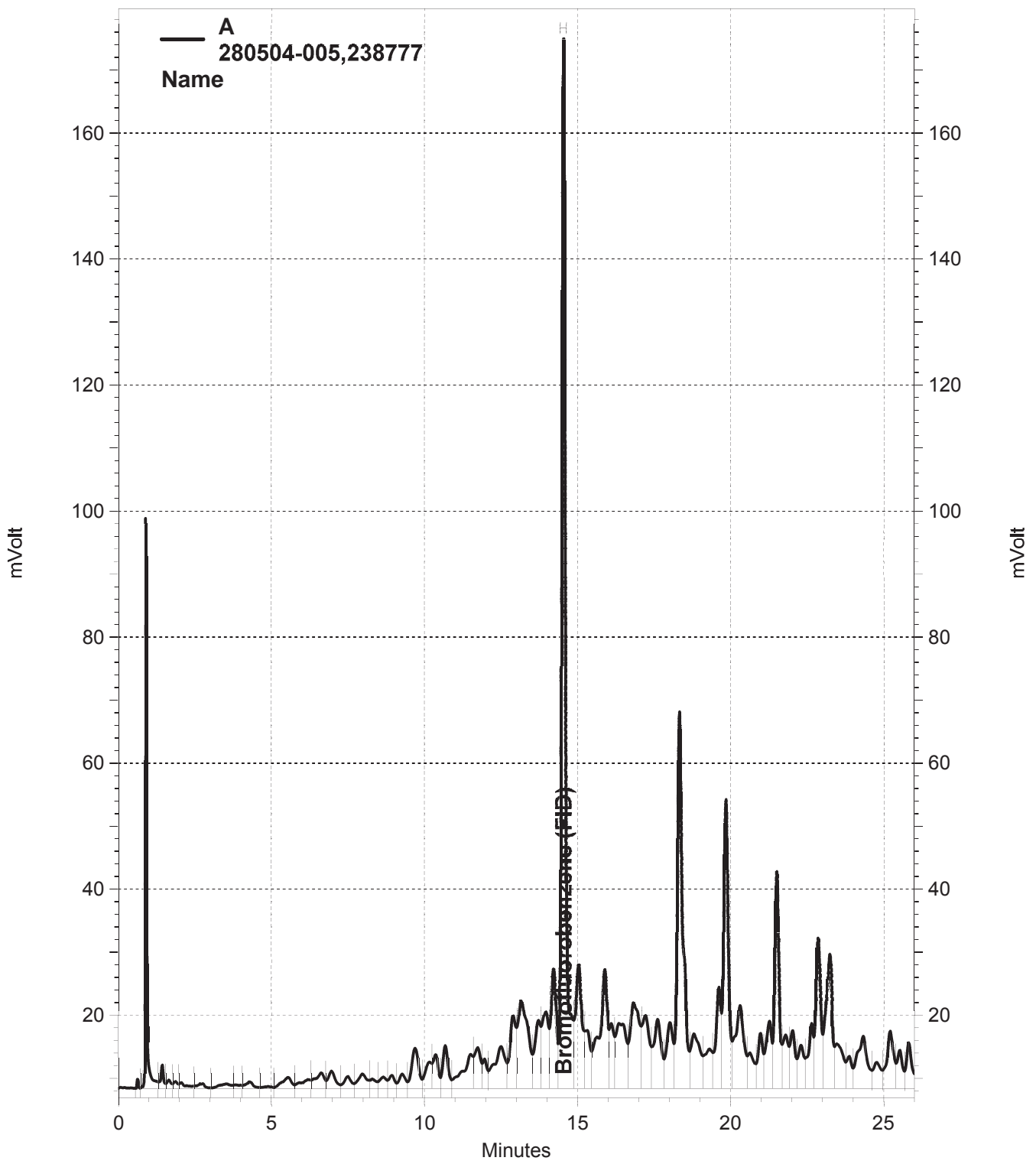
Surrogate	%REC	Limits
Bromofluorobenzene (FID)	98	78-138

Type: MSD Lab ID: QC850267

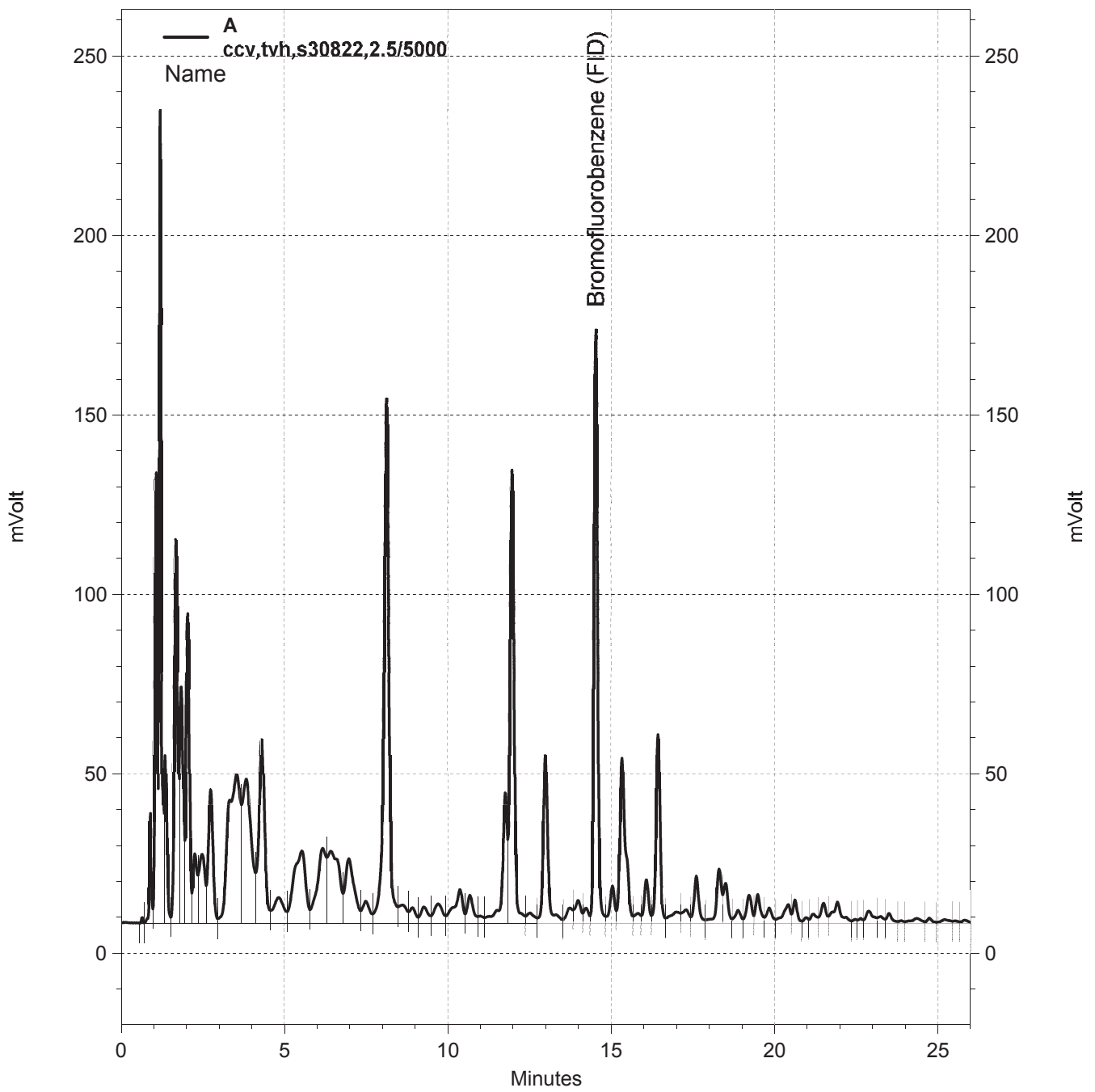
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	10.53	10.06	95	50-120	0	31

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	99	78-138

RPD= Relative Percent Difference



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Total Extractable Hydrocarbons			
Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	2030.001.003	Analysis:	EPA 8015B
Matrix:	Soil	Batch#:	238716
Units:	mg/Kg	Sampled:	09/02/16
Basis:	as received	Received:	09/02/16

Field ID:	SS-9-8'	Diln Fac:	10.00
Type:	SAMPLE	Prepared:	09/02/16
Lab ID:	280504-005	Analyzed:	09/06/16

Analyte	Result	RL
Diesel C10-C24	650	10
Motor Oil C24-C36	3,100	50

Surrogate	%REC	Limits
o-Terphenyl	DO	59-140

Field ID:	SS-9-10'	Diln Fac:	1.000
Type:	SAMPLE	Prepared:	09/02/16
Lab ID:	280504-006	Analyzed:	09/06/16

Analyte	Result	RL
Diesel C10-C24	ND	1.0
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
o-Terphenyl	84	59-140

Type:	BLANK	Prepared:	09/01/16
Lab ID:	QC850032	Analyzed:	09/02/16
Diln Fac:	1.000		

Analyte	Result	RL
Diesel C10-C24	ND	1.0
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
o-Terphenyl	102	59-140

DO= Diluted Out  
 ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	2030.001.003	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC850033	Batch#:	238716
Matrix:	Soil	Prepared:	09/01/16
Units:	mg/Kg	Analyzed:	09/02/16

Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	50.03	41.36	83	58-137

Surrogate	%REC	Limits
o-Terphenyl	91	59-140



Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	2030.001.003	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	238716
MSS Lab ID:	280340-001	Sampled:	08/30/16
Matrix:	Soil	Received:	08/30/16
Units:	mg/Kg	Prepared:	09/01/16
Basis:	as received	Analyzed:	09/02/16
Diln Fac:	1.000		

Type: MS Cleanup Method: EPA 3630C  
 Lab ID: QC850034

Analyte	MSS Result	Spiked	Result	%REC	Limits
Diesel C10-C24	2.822	50.20	43.80	82	46-154

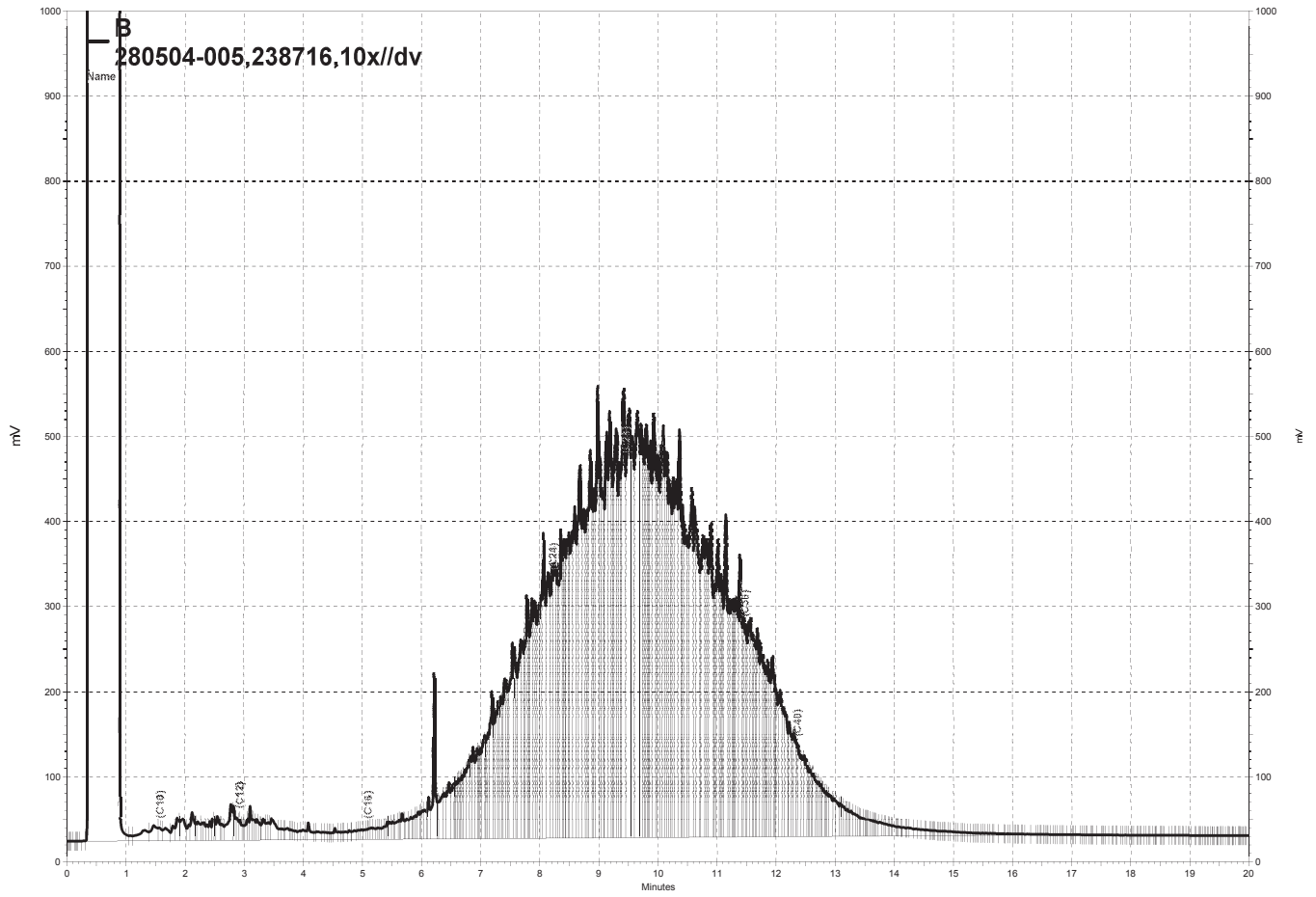
Surrogate	%REC	Limits
o-Terphenyl	82	59-140

Type: MSD Cleanup Method: EPA 3630C  
 Lab ID: QC850035

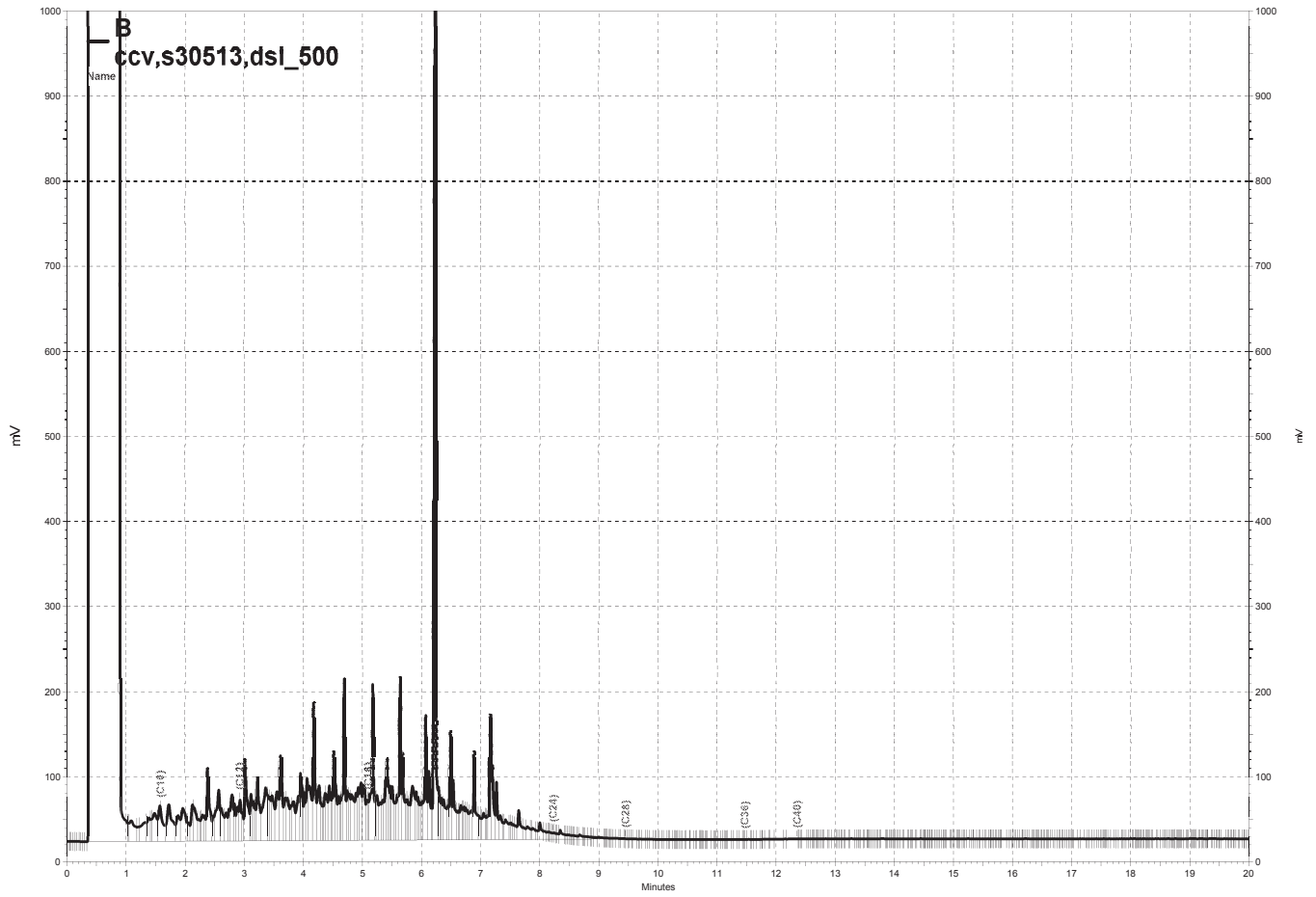
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	49.96	38.26	71	46-154	13	50

Surrogate	%REC	Limits
o-Terphenyl	67	59-140

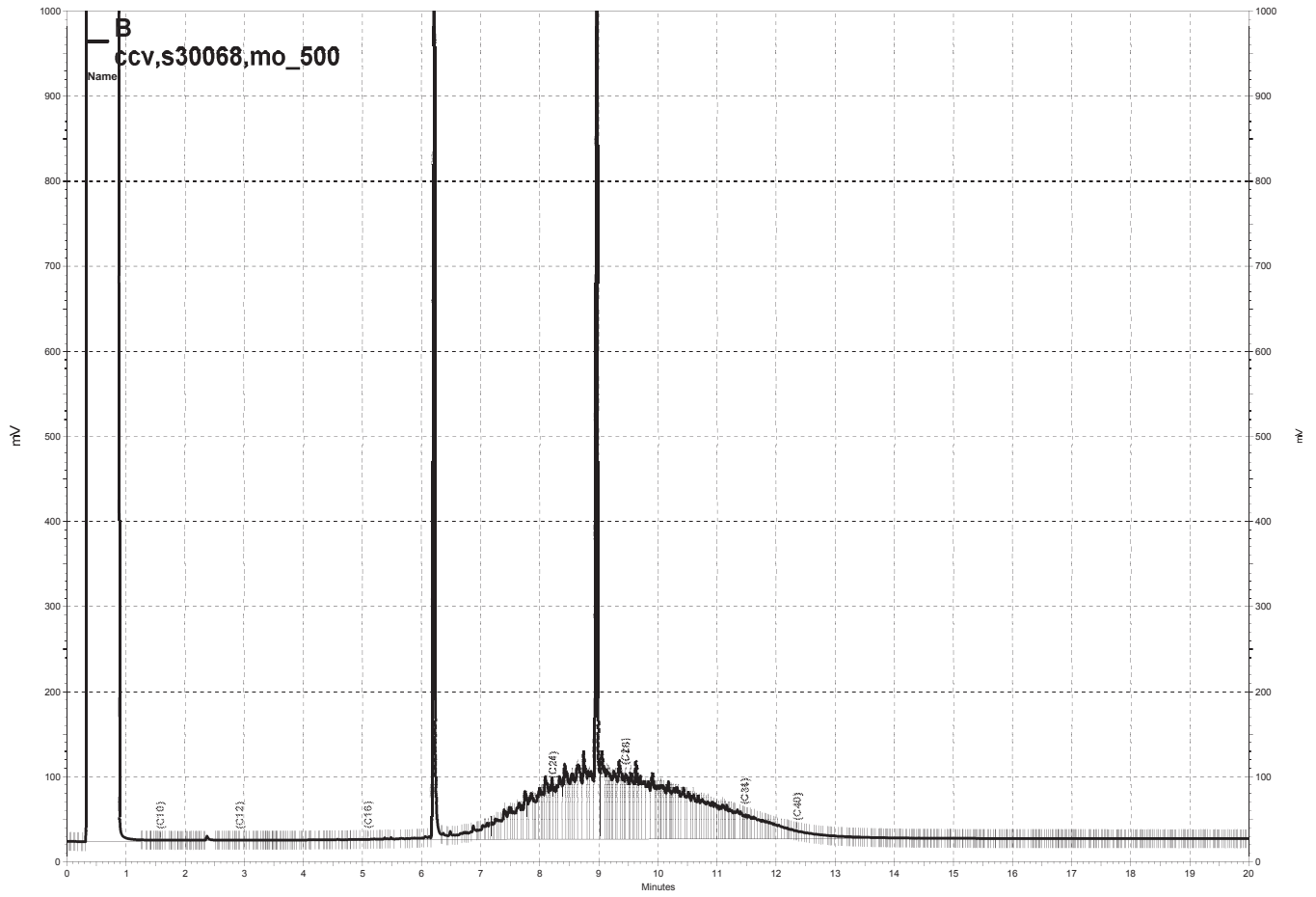
RPD= Relative Percent Difference



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\\kraken\gdrive\ezchrom\Projects\GC14B\Data\246b014, B



\\kraken\gdrive\ezchrom\Projects\GC14B\Data\246b013, B

### Purgeable Organics by GC/MS

Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-6-8'	Diln Fac:	0.9980
Lab ID:	280504-001	Batch#:	238772
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Freon 12	ND	10
Chloromethane	ND	10
Vinyl Chloride	ND	10
Bromomethane	ND	10
Chloroethane	ND	10
Trichlorofluoromethane	ND	5.0
Acetone	ND	20
Freon 113	ND	5.0
1,1-Dichloroethene	ND	5.0
Methylene Chloride	ND	20
Carbon Disulfide	ND	5.0
MTBE	ND	5.0
trans-1,2-Dichloroethene	ND	5.0
Vinyl Acetate	ND	50
1,1-Dichloroethane	ND	5.0
2-Butanone	ND	10
cis-1,2-Dichloroethene	ND	5.0
2,2-Dichloropropane	ND	5.0
Chloroform	ND	5.0
Bromochloromethane	ND	5.0
1,1,1-Trichloroethane	ND	5.0
1,1-Dichloropropene	ND	5.0
Carbon Tetrachloride	ND	5.0
1,2-Dichloroethane	ND	5.0
Benzene	ND	5.0
Trichloroethene	ND	5.0
1,2-Dichloropropane	ND	5.0
Bromodichloromethane	ND	5.0
Dibromomethane	ND	5.0
4-Methyl-2-Pentanone	ND	10
cis-1,3-Dichloropropene	ND	5.0
Toluene	ND	5.0
trans-1,3-Dichloropropene	ND	5.0
1,1,2-Trichloroethane	ND	5.0
2-Hexanone	ND	10
1,3-Dichloropropane	ND	5.0
Tetrachloroethene	ND	5.0

ND= Not Detected

RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-6-8'	Diln Fac:	0.9980
Lab ID:	280504-001	Batch#:	238772
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Dibromochloromethane	ND	5.0
1,2-Dibromoethane	ND	5.0
Chlorobenzene	ND	5.0
1,1,1,2-Tetrachloroethane	ND	5.0
Ethylbenzene	ND	5.0
m,p-Xylenes	ND	5.0
o-Xylene	ND	5.0
Styrene	ND	5.0
Bromoform	ND	5.0
Isopropylbenzene	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.0
1,2,3-Trichloropropane	ND	5.0
Propylbenzene	ND	5.0
Bromobenzene	ND	5.0
1,3,5-Trimethylbenzene	ND	5.0
2-Chlorotoluene	ND	5.0
4-Chlorotoluene	ND	5.0
tert-Butylbenzene	ND	5.0
1,2,4-Trimethylbenzene	ND	5.0
sec-Butylbenzene	ND	5.0
para-Isopropyl Toluene	ND	5.0
1,3-Dichlorobenzene	ND	5.0
1,4-Dichlorobenzene	ND	5.0
n-Butylbenzene	ND	5.0
1,2-Dichlorobenzene	ND	5.0
1,2-Dibromo-3-Chloropropane	ND	5.0
1,2,4-Trichlorobenzene	ND	5.0
Hexachlorobutadiene	ND	5.0
Naphthalene	8.4	5.0
1,2,3-Trichlorobenzene	ND	5.0

Surrogate	%REC	Limits
Dibromofluoromethane	102	78-134
1,2-Dichloroethane-d4	106	80-138
Toluene-d8	100	80-120
Bromofluorobenzene	110	78-123

ND= Not Detected  
 RL= Reporting Limit



### Purgeable Organics by GC/MS

Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-6-10'	Diln Fac:	0.9709
Lab ID:	280504-002	Batch#:	238772
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Freon 12	ND	9.7
Chloromethane	ND	9.7
Vinyl Chloride	ND	9.7
Bromomethane	ND	9.7
Chloroethane	ND	9.7
Trichlorofluoromethane	ND	4.9
Acetone	ND	19
Freon 113	ND	4.9
1,1-Dichloroethene	ND	4.9
Methylene Chloride	ND	19
Carbon Disulfide	ND	4.9
MTBE	ND	4.9
trans-1,2-Dichloroethene	ND	4.9
Vinyl Acetate	ND	49
1,1-Dichloroethane	ND	4.9
2-Butanone	ND	9.7
cis-1,2-Dichloroethene	ND	4.9
2,2-Dichloropropane	ND	4.9
Chloroform	ND	4.9
Bromochloromethane	ND	4.9
1,1,1-Trichloroethane	ND	4.9
1,1-Dichloropropene	ND	4.9
Carbon Tetrachloride	ND	4.9
1,2-Dichloroethane	ND	4.9
Benzene	ND	4.9
Trichloroethene	ND	4.9
1,2-Dichloropropane	ND	4.9
Bromodichloromethane	ND	4.9
Dibromomethane	ND	4.9
4-Methyl-2-Pentanone	ND	9.7
cis-1,3-Dichloropropene	ND	4.9
Toluene	ND	4.9
trans-1,3-Dichloropropene	ND	4.9
1,1,2-Trichloroethane	ND	4.9
2-Hexanone	ND	9.7
1,3-Dichloropropane	ND	4.9
Tetrachloroethene	ND	4.9

ND= Not Detected

RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-6-10'	Diln Fac:	0.9709
Lab ID:	280504-002	Batch#:	238772
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Dibromochloromethane	ND	4.9
1,2-Dibromoethane	ND	4.9
Chlorobenzene	ND	4.9
1,1,1,2-Tetrachloroethane	ND	4.9
Ethylbenzene	ND	4.9
m,p-Xylenes	ND	4.9
o-Xylene	ND	4.9
Styrene	ND	4.9
Bromoform	ND	4.9
Isopropylbenzene	ND	4.9
1,1,2,2-Tetrachloroethane	ND	4.9
1,2,3-Trichloropropane	ND	4.9
Propylbenzene	ND	4.9
Bromobenzene	ND	4.9
1,3,5-Trimethylbenzene	ND	4.9
2-Chlorotoluene	ND	4.9
4-Chlorotoluene	ND	4.9
tert-Butylbenzene	ND	4.9
1,2,4-Trimethylbenzene	ND	4.9
sec-Butylbenzene	ND	4.9
para-Isopropyl Toluene	ND	4.9
1,3-Dichlorobenzene	ND	4.9
1,4-Dichlorobenzene	ND	4.9
n-Butylbenzene	ND	4.9
1,2-Dichlorobenzene	ND	4.9
1,2-Dibromo-3-Chloropropane	ND	4.9
1,2,4-Trichlorobenzene	ND	4.9
Hexachlorobutadiene	ND	4.9
Naphthalene	ND	4.9
1,2,3-Trichlorobenzene	ND	4.9

Surrogate	%REC	Limits
Dibromofluoromethane	101	78-134
1,2-Dichloroethane-d4	104	80-138
Toluene-d8	104	80-120
Bromofluorobenzene	108	78-123

ND= Not Detected  
 RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-7-8'	Diln Fac:	0.9728
Lab ID:	280504-003	Batch#:	238772
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Freon 12	ND	9.7
Chloromethane	ND	9.7
Vinyl Chloride	ND	9.7
Bromomethane	ND	9.7
Chloroethane	ND	9.7
Trichlorofluoromethane	ND	4.9
Acetone	ND	19
Freon 113	ND	4.9
1,1-Dichloroethene	ND	4.9
Methylene Chloride	ND	19
Carbon Disulfide	ND	4.9
MTBE	ND	4.9
trans-1,2-Dichloroethene	ND	4.9
Vinyl Acetate	ND	49
1,1-Dichloroethane	ND	4.9
2-Butanone	ND	9.7
cis-1,2-Dichloroethene	ND	4.9
2,2-Dichloropropane	ND	4.9
Chloroform	ND	4.9
Bromochloromethane	ND	4.9
1,1,1-Trichloroethane	ND	4.9
1,1-Dichloropropene	ND	4.9
Carbon Tetrachloride	ND	4.9
1,2-Dichloroethane	ND	4.9
Benzene	ND	4.9
Trichloroethene	ND	4.9
1,2-Dichloropropane	ND	4.9
Bromodichloromethane	ND	4.9
Dibromomethane	ND	4.9
4-Methyl-2-Pentanone	ND	9.7
cis-1,3-Dichloropropene	ND	4.9
Toluene	ND	4.9
trans-1,3-Dichloropropene	ND	4.9
1,1,2-Trichloroethane	ND	4.9
2-Hexanone	ND	9.7
1,3-Dichloropropane	ND	4.9
Tetrachloroethene	ND	4.9

ND= Not Detected

RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-7-8'	Diln Fac:	0.9728
Lab ID:	280504-003	Batch#:	238772
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Dibromochloromethane	ND	4.9
1,2-Dibromoethane	ND	4.9
Chlorobenzene	ND	4.9
1,1,1,2-Tetrachloroethane	ND	4.9
Ethylbenzene	ND	4.9
m,p-Xylenes	ND	4.9
o-Xylene	ND	4.9
Styrene	ND	4.9
Bromoform	ND	4.9
Isopropylbenzene	ND	4.9
1,1,2,2-Tetrachloroethane	ND	4.9
1,2,3-Trichloropropane	ND	4.9
Propylbenzene	ND	4.9
Bromobenzene	ND	4.9
1,3,5-Trimethylbenzene	ND	4.9
2-Chlorotoluene	ND	4.9
4-Chlorotoluene	ND	4.9
tert-Butylbenzene	ND	4.9
1,2,4-Trimethylbenzene	ND	4.9
sec-Butylbenzene	ND	4.9
para-Isopropyl Toluene	ND	4.9
1,3-Dichlorobenzene	ND	4.9
1,4-Dichlorobenzene	ND	4.9
n-Butylbenzene	ND	4.9
1,2-Dichlorobenzene	ND	4.9
1,2-Dibromo-3-Chloropropane	ND	4.9
1,2,4-Trichlorobenzene	ND	4.9
Hexachlorobutadiene	ND	4.9
Naphthalene	ND	4.9
1,2,3-Trichlorobenzene	ND	4.9

Surrogate	%REC	Limits
Dibromofluoromethane	106	78-134
1,2-Dichloroethane-d4	110	80-138
Toluene-d8	99	80-120
Bromofluorobenzene	106	78-123

ND= Not Detected  
 RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-8-8'	Diln Fac:	0.9009
Lab ID:	280504-004	Batch#:	238772
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Freon 12	ND	9.0
Chloromethane	ND	9.0
Vinyl Chloride	ND	9.0
Bromomethane	ND	9.0
Chloroethane	ND	9.0
Trichlorofluoromethane	ND	4.5
Acetone	ND	18
Freon 113	ND	4.5
1,1-Dichloroethene	ND	4.5
Methylene Chloride	ND	18
Carbon Disulfide	ND	4.5
MTBE	ND	4.5
trans-1,2-Dichloroethene	ND	4.5
Vinyl Acetate	ND	45
1,1-Dichloroethane	ND	4.5
2-Butanone	ND	9.0
cis-1,2-Dichloroethene	ND	4.5
2,2-Dichloropropane	ND	4.5
Chloroform	ND	4.5
Bromochloromethane	ND	4.5
1,1,1-Trichloroethane	ND	4.5
1,1-Dichloropropene	ND	4.5
Carbon Tetrachloride	ND	4.5
1,2-Dichloroethane	ND	4.5
Benzene	ND	4.5
Trichloroethene	ND	4.5
1,2-Dichloropropane	ND	4.5
Bromodichloromethane	ND	4.5
Dibromomethane	ND	4.5
4-Methyl-2-Pentanone	ND	9.0
cis-1,3-Dichloropropene	ND	4.5
Toluene	ND	4.5
trans-1,3-Dichloropropene	ND	4.5
1,1,2-Trichloroethane	ND	4.5
2-Hexanone	ND	9.0
1,3-Dichloropropane	ND	4.5
Tetrachloroethene	ND	4.5

ND= Not Detected

RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-8-8'	Diln Fac:	0.9009
Lab ID:	280504-004	Batch#:	238772
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Dibromochloromethane	ND	4.5
1,2-Dibromoethane	ND	4.5
Chlorobenzene	ND	4.5
1,1,1,2-Tetrachloroethane	ND	4.5
Ethylbenzene	ND	4.5
m,p-Xylenes	ND	4.5
o-Xylene	ND	4.5
Styrene	ND	4.5
Bromoform	ND	4.5
Isopropylbenzene	ND	4.5
1,1,2,2-Tetrachloroethane	ND	4.5
1,2,3-Trichloropropane	ND	4.5
Propylbenzene	ND	4.5
Bromobenzene	ND	4.5
1,3,5-Trimethylbenzene	ND	4.5
2-Chlorotoluene	ND	4.5
4-Chlorotoluene	ND	4.5
tert-Butylbenzene	ND	4.5
1,2,4-Trimethylbenzene	ND	4.5
sec-Butylbenzene	ND	4.5
para-Isopropyl Toluene	ND	4.5
1,3-Dichlorobenzene	ND	4.5
1,4-Dichlorobenzene	ND	4.5
n-Butylbenzene	ND	4.5
1,2-Dichlorobenzene	ND	4.5
1,2-Dibromo-3-Chloropropane	ND	4.5
1,2,4-Trichlorobenzene	ND	4.5
Hexachlorobutadiene	ND	4.5
Naphthalene	ND	4.5
1,2,3-Trichlorobenzene	ND	4.5

Surrogate	%REC	Limits
Dibromofluoromethane	105	78-134
1,2-Dichloroethane-d4	110	80-138
Toluene-d8	102	80-120
Bromofluorobenzene	108	78-123

ND= Not Detected  
 RL= Reporting Limit



### Purgeable Organics by GC/MS

Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-9-8'	Diln Fac:	0.9785
Lab ID:	280504-005	Batch#:	238772
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Freon 12	ND	9.8
Chloromethane	ND	9.8
Vinyl Chloride	ND	9.8
Bromomethane	ND	9.8
Chloroethane	ND	9.8
Trichlorofluoromethane	ND	4.9
Acetone	30	20
Freon 113	ND	4.9
1,1-Dichloroethene	ND	4.9
Methylene Chloride	ND	20
Carbon Disulfide	ND	4.9
MTBE	ND	4.9
trans-1,2-Dichloroethene	ND	4.9
Vinyl Acetate	ND	49
1,1-Dichloroethane	ND	4.9
2-Butanone	ND	9.8
cis-1,2-Dichloroethene	ND	4.9
2,2-Dichloropropane	ND	4.9
Chloroform	ND	4.9
Bromochloromethane	ND	4.9
1,1,1-Trichloroethane	ND	4.9
1,1-Dichloropropene	ND	4.9
Carbon Tetrachloride	ND	4.9
1,2-Dichloroethane	ND	4.9
Benzene	ND	4.9
Trichloroethene	ND	4.9
1,2-Dichloropropane	ND	4.9
Bromodichloromethane	ND	4.9
Dibromomethane	ND	4.9
4-Methyl-2-Pentanone	ND	9.8
cis-1,3-Dichloropropene	ND	4.9
Toluene	ND	4.9
trans-1,3-Dichloropropene	ND	4.9
1,1,2-Trichloroethane	ND	4.9
2-Hexanone	ND	9.8
1,3-Dichloropropane	ND	4.9
Tetrachloroethene	ND	4.9

ND= Not Detected

RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-9-8'	Diln Fac:	0.9785
Lab ID:	280504-005	Batch#:	238772
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Dibromochloromethane	ND	4.9
1,2-Dibromoethane	ND	4.9
Chlorobenzene	ND	4.9
1,1,1,2-Tetrachloroethane	ND	4.9
Ethylbenzene	ND	4.9
m,p-Xylenes	ND	4.9
o-Xylene	ND	4.9
Styrene	ND	4.9
Bromoform	ND	4.9
Isopropylbenzene	ND	4.9
1,1,2,2-Tetrachloroethane	ND	4.9
1,2,3-Trichloropropane	ND	4.9
Propylbenzene	ND	4.9
Bromobenzene	ND	4.9
1,3,5-Trimethylbenzene	ND	4.9
2-Chlorotoluene	ND	4.9
4-Chlorotoluene	ND	4.9
tert-Butylbenzene	ND	4.9
1,2,4-Trimethylbenzene	ND	4.9
sec-Butylbenzene	ND	4.9
para-Isopropyl Toluene	ND	4.9
1,3-Dichlorobenzene	ND	4.9
1,4-Dichlorobenzene	ND	4.9
n-Butylbenzene	ND	4.9
1,2-Dichlorobenzene	ND	4.9
1,2-Dibromo-3-Chloropropane	ND	4.9
1,2,4-Trichlorobenzene	ND	4.9
Hexachlorobutadiene	ND	4.9
Naphthalene	ND	4.9
1,2,3-Trichlorobenzene	ND	4.9

Surrogate	%REC	Limits
Dibromofluoromethane	104	78-134
1,2-Dichloroethane-d4	106	80-138
Toluene-d8	100	80-120
Bromofluorobenzene	109	78-123

ND= Not Detected  
 RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-9-10'	Diln Fac:	0.9862
Lab ID:	280504-006	Batch#:	238772
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Freon 12	ND	9.9
Chloromethane	ND	9.9
Vinyl Chloride	ND	9.9
Bromomethane	ND	9.9
Chloroethane	ND	9.9
Trichlorofluoromethane	ND	4.9
Acetone	ND	20
Freon 113	ND	4.9
1,1-Dichloroethene	ND	4.9
Methylene Chloride	ND	20
Carbon Disulfide	ND	4.9
MTBE	ND	4.9
trans-1,2-Dichloroethene	ND	4.9
Vinyl Acetate	ND	49
1,1-Dichloroethane	ND	4.9
2-Butanone	ND	9.9
cis-1,2-Dichloroethene	ND	4.9
2,2-Dichloropropane	ND	4.9
Chloroform	ND	4.9
Bromochloromethane	ND	4.9
1,1,1-Trichloroethane	ND	4.9
1,1-Dichloropropene	ND	4.9
Carbon Tetrachloride	ND	4.9
1,2-Dichloroethane	ND	4.9
Benzene	ND	4.9
Trichloroethene	ND	4.9
1,2-Dichloropropane	ND	4.9
Bromodichloromethane	ND	4.9
Dibromomethane	ND	4.9
4-Methyl-2-Pentanone	ND	9.9
cis-1,3-Dichloropropene	ND	4.9
Toluene	ND	4.9
trans-1,3-Dichloropropene	ND	4.9
1,1,2-Trichloroethane	ND	4.9
2-Hexanone	ND	9.9
1,3-Dichloropropane	ND	4.9
Tetrachloroethene	ND	4.9

ND= Not Detected

RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-9-10'	Diln Fac:	0.9862
Lab ID:	280504-006	Batch#:	238772
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Dibromochloromethane	ND	4.9
1,2-Dibromoethane	ND	4.9
Chlorobenzene	ND	4.9
1,1,1,2-Tetrachloroethane	ND	4.9
Ethylbenzene	ND	4.9
m,p-Xylenes	ND	4.9
o-Xylene	ND	4.9
Styrene	ND	4.9
Bromoform	ND	4.9
Isopropylbenzene	ND	4.9
1,1,2,2-Tetrachloroethane	ND	4.9
1,2,3-Trichloropropane	ND	4.9
Propylbenzene	ND	4.9
Bromobenzene	ND	4.9
1,3,5-Trimethylbenzene	ND	4.9
2-Chlorotoluene	ND	4.9
4-Chlorotoluene	ND	4.9
tert-Butylbenzene	ND	4.9
1,2,4-Trimethylbenzene	ND	4.9
sec-Butylbenzene	ND	4.9
para-Isopropyl Toluene	ND	4.9
1,3-Dichlorobenzene	ND	4.9
1,4-Dichlorobenzene	ND	4.9
n-Butylbenzene	ND	4.9
1,2-Dichlorobenzene	ND	4.9
1,2-Dibromo-3-Chloropropane	ND	4.9
1,2,4-Trichlorobenzene	ND	4.9
Hexachlorobutadiene	ND	4.9
Naphthalene	ND	4.9
1,2,3-Trichlorobenzene	ND	4.9

Surrogate	%REC	Limits
Dibromofluoromethane	102	78-134
1,2-Dichloroethane-d4	103	80-138
Toluene-d8	101	80-120
Bromofluorobenzene	99	78-123

ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC850249	Batch#:	238772
Matrix:	Soil	Analyzed:	09/03/16
Units:	ug/Kg		

Analyte	Spiked	Result	%REC	Limits
1,1-Dichloroethene	25.00	23.94	96	70-134
Benzene	25.00	24.77	99	80-123
Trichloroethene	25.00	24.59	98	80-128
Toluene	25.00	24.94	100	80-120
Chlorobenzene	25.00	24.78	99	80-123

Surrogate	%REC	Limits
Dibromofluoromethane	103	78-134
1,2-Dichloroethane-d4	105	80-138
Toluene-d8	100	80-120
Bromofluorobenzene	102	78-123

## Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC850250	Batch#:	238772
Matrix:	Soil	Analyzed:	09/03/16
Units:	ug/Kg		

Analyte	Result	RL
Freon 12	ND	10
Chloromethane	ND	10
Vinyl Chloride	ND	10
Bromomethane	ND	10
Chloroethane	ND	10
Trichlorofluoromethane	ND	5.0
Acetone	ND	20
Freon 113	ND	5.0
1,1-Dichloroethene	ND	5.0
Methylene Chloride	ND	20
Carbon Disulfide	ND	5.0
MTBE	ND	5.0
trans-1,2-Dichloroethene	ND	5.0
Vinyl Acetate	ND	50
1,1-Dichloroethane	ND	5.0
2-Butanone	ND	10
cis-1,2-Dichloroethene	ND	5.0
2,2-Dichloropropane	ND	5.0
Chloroform	ND	5.0
Bromochloromethane	ND	5.0
1,1,1-Trichloroethane	ND	5.0
1,1-Dichloropropene	ND	5.0
Carbon Tetrachloride	ND	5.0
1,2-Dichloroethane	ND	5.0
Benzene	ND	5.0
Trichloroethene	ND	5.0
1,2-Dichloropropane	ND	5.0
Bromodichloromethane	ND	5.0
Dibromomethane	ND	5.0
4-Methyl-2-Pentanone	ND	10
cis-1,3-Dichloropropene	ND	5.0
Toluene	ND	5.0
trans-1,3-Dichloropropene	ND	5.0
1,1,2-Trichloroethane	ND	5.0
2-Hexanone	ND	10
1,3-Dichloropropane	ND	5.0
Tetrachloroethene	ND	5.0

ND= Not Detected

RL= Reporting Limit



## Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC850250	Batch#:	238772
Matrix:	Soil	Analyzed:	09/03/16
Units:	ug/Kg		

Analyte	Result	RL
Dibromochloromethane	ND	5.0
1,2-Dibromoethane	ND	5.0
Chlorobenzene	ND	5.0
1,1,1,2-Tetrachloroethane	ND	5.0
Ethylbenzene	ND	5.0
m,p-Xylenes	ND	5.0
o-Xylene	ND	5.0
Styrene	ND	5.0
Bromoform	ND	5.0
Isopropylbenzene	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.0
1,2,3-Trichloropropane	ND	5.0
Propylbenzene	ND	5.0
Bromobenzene	ND	5.0
1,3,5-Trimethylbenzene	ND	5.0
2-Chlorotoluene	ND	5.0
4-Chlorotoluene	ND	5.0
tert-Butylbenzene	ND	5.0
1,2,4-Trimethylbenzene	ND	5.0
sec-Butylbenzene	ND	5.0
para-Isopropyl Toluene	ND	5.0
1,3-Dichlorobenzene	ND	5.0
1,4-Dichlorobenzene	ND	5.0
n-Butylbenzene	ND	5.0
1,2-Dichlorobenzene	ND	5.0
1,2-Dibromo-3-Chloropropane	ND	5.0
1,2,4-Trichlorobenzene	ND	5.0
Hexachlorobutadiene	ND	5.0
Naphthalene	ND	5.0
1,2,3-Trichlorobenzene	ND	5.0

Surrogate	%REC	Limits
Dibromofluoromethane	102	78-134
1,2-Dichloroethane-d4	103	80-138
Toluene-d8	103	80-120
Bromofluorobenzene	107	78-123

ND= Not Detected

RL= Reporting Limit

Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	280504	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	ZZZZZZZZZZ	Batch#:	238772
MSS Lab ID:	280475-001	Sampled:	09/02/16
Matrix:	Soil	Received:	09/02/16
Units:	ug/Kg	Analyzed:	09/03/16
Basis:	as received		

Type: MS Diln Fac: 0.9346  
 Lab ID: QC850274

Analyte	MSS Result	Spiked	Result	%REC	Limits
1,1-Dichloroethene	<0.5393	46.73	45.61	98	56-133
Benzene	<0.6284	46.73	46.69	100	57-120
Trichloroethene	<0.6545	46.73	46.09	99	49-145
Toluene	<0.6883	46.73	45.91	98	51-120
Chlorobenzene	<0.5643	46.73	44.70	96	47-120

Surrogate	%REC	Limits
Dibromofluoromethane	102	78-134
1,2-Dichloroethane-d4	103	80-138
Toluene-d8	100	80-120
Bromofluorobenzene	85	78-123

Type: MSD Diln Fac: 0.9597  
 Lab ID: QC850275

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,1-Dichloroethene	47.98	44.32	92	56-133	6	46
Benzene	47.98	44.04	92	57-120	8	44
Trichloroethene	47.98	43.59	91	49-145	8	46
Toluene	47.98	43.25	90	51-120	9	47
Chlorobenzene	47.98	40.74	85	47-120	12	50

Surrogate	%REC	Limits
Dibromofluoromethane	102	78-134
1,2-Dichloroethane-d4	99	80-138
Toluene-d8	100	80-120
Bromofluorobenzene	101	78-123

RPD= Relative Percent Difference





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Analytical Laboratories, Since 1878







Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900


Laboratory Job Number 280505  
ANALYTICAL REPORT

Pangea Environmental  
1710 Franklin Street  
Oakland, CA 94612

Project : 2030.001.003  
Location : 1233 Bockman  
Level : II

<u>Sample ID</u>	<u>Lab ID</u>
SS-1-2.5'	280505-001
SS-2-2.5'	280505-002
SS-3-2.5'	280505-003
SS-4-2.5'	280505-004
SS-5-2.5'	280505-005

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature:   
Mike Dahlquist  
Project Manager  
mike.dahlquist@ctberk.com

Date: 09/06/2016

### CASE NARRATIVE

Laboratory number: 280505  
Client: Pangea Environmental  
Project: 2030.001.003  
Location: 1233 Bockman  
Request Date: 09/02/16  
Samples Received: 09/02/16

This data package contains sample and QC results for five soil samples, requested for the above referenced project on 09/02/16. The samples were received cold and intact.

**TPH-Purgeables and/or BTXE by GC (EPA 8015B):**

No analytical problems were encountered.

**TPH-Extractables by GC (EPA 8015B):**

No analytical problems were encountered.

**Volatile Organics by GC/MS (EPA 8260B):**

No analytical problems were encountered.

**CHAIN OF CUSTODY**

2323 Fifth Street  
 Berkeley, CA 94710

Phone (510) 486-0900  
 Fax (510) 486-0532

C&T LOGIN # 28USCJ

Chain of Custody # \_\_\_\_\_

Page 1 of 1

Project No: 2030.001.003  
 Project Name: 1233 Backman  
 Project P. O. No: \_\_\_\_\_

Sampler: SIMMONS, Albert  
 Report To: Ben Scheel

Company: Parker Env.  
 Telephone: (510) 459-6012  
 Email: cscheel@parkerenv.com

EDD Format:  I  II  III  IV  
 Turnaround Time:  RUSH 24HR  Standard

Lab No.	Sample ID.	SAMPLING		MATRIX	# of Containers	CHEMICAL PRESERVATIVE										
		Date Collected	Time Collected			Water	Solid	HCl	H2SO4	HNO3	NaOH	None				
	SS-1-2.5'	9/2/16	0853	X	1							X				
	SS-2-2.5'		0850													
	SS-3-2.5'		0856													
	SS-4-2.5'		0903													
	SS-5-2.5'		0917													

**ANALYTICAL REQUEST**

TPHg / d / mo	X
SRs	X
SRs	X
SRs	X
SRs	X
SRs	X
SRs	X
SRs	X
SRs	X
SRs	X
SRs	X
SRs	X
SRs	X
SRs	X
SRs	X
SRs	X
SRs	X
SRs	X
SRs	X
SRs	X
SRs	X

Notes: \_\_\_\_\_

SAMPLE RECEIPT  
 Intact  
 Cold  
 On Ice  
 Ambient

RELINQUISHED BY: \_\_\_\_\_ DATE: 9/2/16 TIME: 1721

RECEIVED BY: m DATE: 9/2/16 TIME: 1721



**COOLER RECEIPT CHECKLIST**



Login # 280505 Date Received 9/2/16 Number of coolers 1  
 Client Panacea Project 1233 Brockman  
 Date Opened 9/2 By (print) CB (sign) Chen Balla  
 Date Logged in j By (print) DTN (sign) Dringayon  
 Date Labeled j By (print) CB (sign) Chen

1. Did cooler come with a shipping slip (airbill, etc) \_\_\_\_\_ YES  NO
- Shipping info \_\_\_\_\_
- 2A. Were custody seals present? ....  YES (circle) on cooler on samples  NO  
 How many \_\_\_\_\_ Name \_\_\_\_\_ Date \_\_\_\_\_
- 2B. Were custody seals intact upon arrival? \_\_\_\_\_ YES NO  N/A
3. Were custody papers dry and intact when received? \_\_\_\_\_ YES NO
4. Were custody papers filled out properly (ink, signed, etc)? \_\_\_\_\_ YES NO
5. Is the project identifiable from custody papers? (If so fill out top of form) \_\_\_\_\_ YES NO
6. Indicate the packing in cooler: (if other, describe) \_\_\_\_\_
- Bubble Wrap     Foam blocks     Bags     None  
 Cloth material     Cardboard     Styrofoam     Paper towels

7. Temperature documentation: \* Notify PM if temperature exceeds 6°C

Type of ice used:  Wet     Blue/Gel     None    Temp(°C) \_\_\_\_\_

Temperature blank(s) included?  Thermometer# \_\_\_\_\_  IR Gun# \_\_\_\_\_

Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? \_\_\_\_\_ YES  NO
- If YES, what time were they transferred to freezer? \_\_\_\_\_
9. Did all bottles arrive unbroken/unopened? \_\_\_\_\_ YES NO
10. Are there any missing / extra samples? \_\_\_\_\_ YES NO
11. Are samples in the appropriate containers for indicated tests? \_\_\_\_\_ YES NO
12. Are sample labels present, in good condition and complete? \_\_\_\_\_ YES NO
13. Do the sample labels agree with custody papers? \_\_\_\_\_ YES NO
14. Was sufficient amount of sample sent for tests requested? \_\_\_\_\_ YES NO
15. Are the samples appropriately preserved? \_\_\_\_\_ YES NO  N/A
16. Did you check preservatives for all bottles for each sample? \_\_\_\_\_ YES NO  N/A
17. Did you document your preservative check? (pH strip lot# \_\_\_\_\_ ) YES NO  N/A
18. Did you change the hold time in LIMS for unpreserved VOAs? \_\_\_\_\_ YES NO  N/A
19. Did you change the hold time in LIMS for preserved terracores? \_\_\_\_\_ YES NO  N/A
20. Are bubbles > 6mm absent in VOA samples? \_\_\_\_\_ YES NO  N/A
21. Was the client contacted concerning this sample delivery? \_\_\_\_\_ YES  NO
- If YES, Who was called? \_\_\_\_\_ By \_\_\_\_\_ Date: \_\_\_\_\_

COMMENTS

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Detections Summary for 280505

Results for any subcontracted analyses are not included in this summary.

 Client : Pangea Environmental  
 Project : 2030.001.003  
 Location : 1233 Bockman

Client Sample ID : SS-1-2.5' Laboratory Sample ID : 280505-001

No Detections

Client Sample ID : SS-2-2.5' Laboratory Sample ID : 280505-002

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	43	Y	1.0	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B
Motor Oil C24-C36	300		5.0	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B

Client Sample ID : SS-3-2.5' Laboratory Sample ID : 280505-003

No Detections

Client Sample ID : SS-4-2.5' Laboratory Sample ID : 280505-004

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	59		20	ug/Kg	As Recd	0.9766	EPA 8260B	EPA 5030B

Client Sample ID : SS-5-2.5' Laboratory Sample ID : 280505-005

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	50		20	ug/Kg	As Recd	0.9960	EPA 8260B	EPA 5030B

Y = Sample exhibits chromatographic pattern which does not resemble standard

Total Volatile Hydrocarbons			
Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8015B
Field ID:	SS-2-2.5'	Batch#:	238777
Matrix:	Soil	Sampled:	09/02/16
Units:	mg/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16
Diln Fac:	1.000		

Type: SAMPLE Lab ID: 280505-002

Analyte	Result	RL
Gasoline C7-C12	ND	1.0

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	93	78-138

Type: BLANK Lab ID: QC850265

Analyte	Result	RL
Gasoline C7-C12	ND	1.0

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	95	78-138

ND= Not Detected  
 RL= Reporting Limit  
 Page 1 of 1

## Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC850264	Batch#:	238777
Matrix:	Soil	Analyzed:	09/03/16
Units:	mg/Kg		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1.000	1.124	112	80-121

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	101	78-138

## Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Diln Fac:	1.000
MSS Lab ID:	280455-001	Batch#:	238777
Matrix:	Soil	Sampled:	09/01/16
Units:	mg/Kg	Received:	09/01/16
Basis:	as received	Analyzed:	09/03/16

Type: MS Lab ID: QC850266

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	0.08612	10.31	9.893	95	50-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	98	78-138

Type: MSD Lab ID: QC850267

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	10.53	10.06	95	50-120	0	31

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	99	78-138

RPD= Relative Percent Difference

Total Extractable Hydrocarbons			
Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	2030.001.003	Analysis:	EPA 8015B
Field ID:	SS-2-2.5'	Diln Fac:	1.000
Matrix:	Soil	Batch#:	238716
Units:	mg/Kg	Sampled:	09/02/16
Basis:	as received	Received:	09/02/16

Type: SAMPLE Prepared: 09/02/16  
 Lab ID: 280505-002 Analyzed: 09/06/16

Analyte	Result	RL
Diesel C10-C24	43 Y	1.0
Motor Oil C24-C36	300	5.0

Surrogate	%REC	Limits
o-Terphenyl	98	59-140

Type: BLANK Prepared: 09/01/16  
 Lab ID: QC850032 Analyzed: 09/02/16

Analyte	Result	RL
Diesel C10-C24	ND	1.0
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
o-Terphenyl	102	59-140

Y= Sample exhibits chromatographic pattern which does not resemble standard  
 ND= Not Detected  
 RL= Reporting Limit



## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	2030.001.003	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC850033	Batch#:	238716
Matrix:	Soil	Prepared:	09/01/16
Units:	mg/Kg	Analyzed:	09/02/16

Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	50.03	41.36	83	58-137

Surrogate	%REC	Limits
o-Terphenyl	91	59-140

Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	2030.001.003	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	238716
MSS Lab ID:	280340-001	Sampled:	08/30/16
Matrix:	Soil	Received:	08/30/16
Units:	mg/Kg	Prepared:	09/01/16
Basis:	as received	Analyzed:	09/02/16
Diln Fac:	1.000		

Type: MS Cleanup Method: EPA 3630C  
 Lab ID: QC850034

Analyte	MSS Result	Spiked	Result	%REC	Limits
Diesel C10-C24	2.822	50.20	43.80	82	46-154

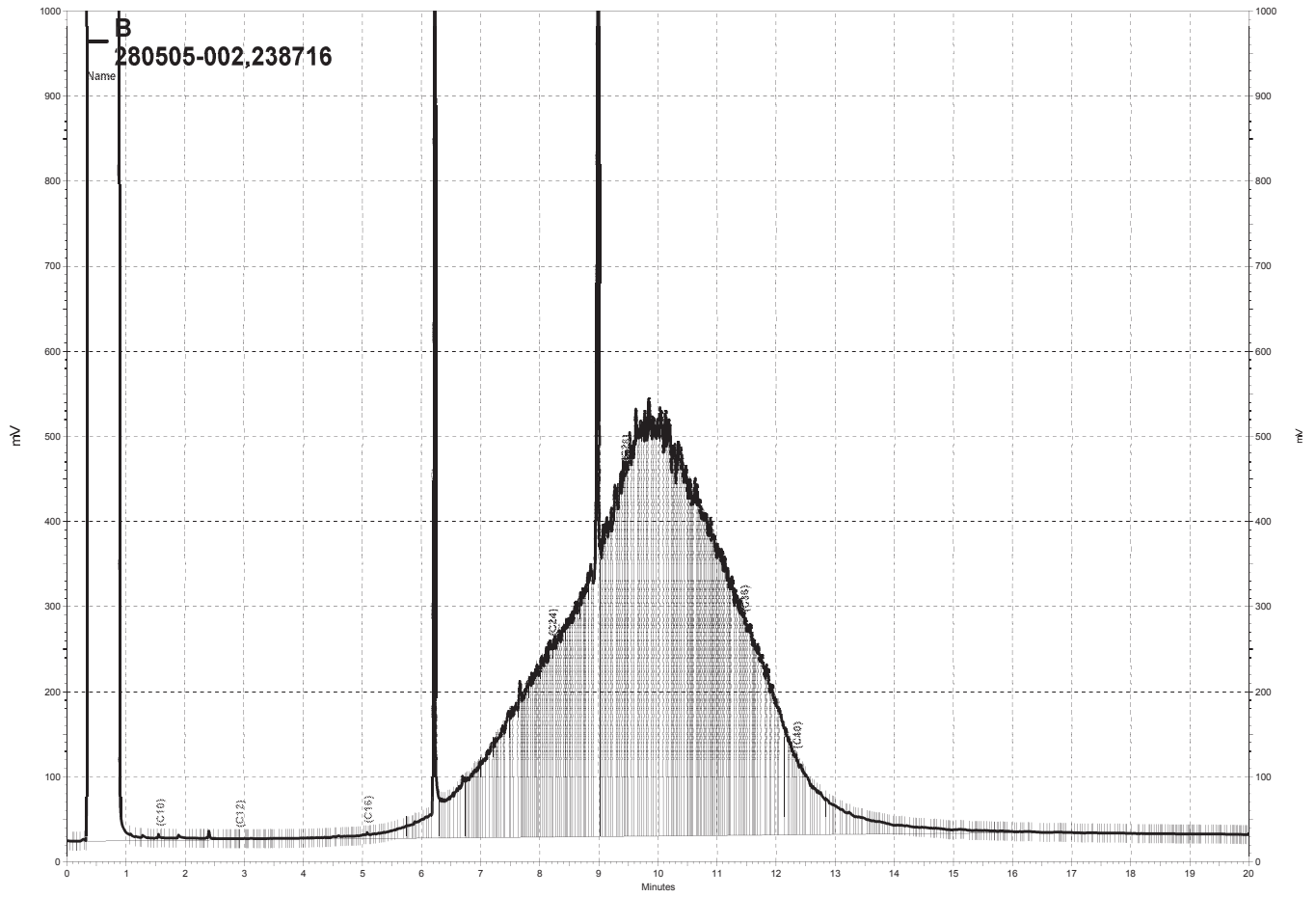
Surrogate	%REC	Limits
o-Terphenyl	82	59-140

Type: MSD Cleanup Method: EPA 3630C  
 Lab ID: QC850035

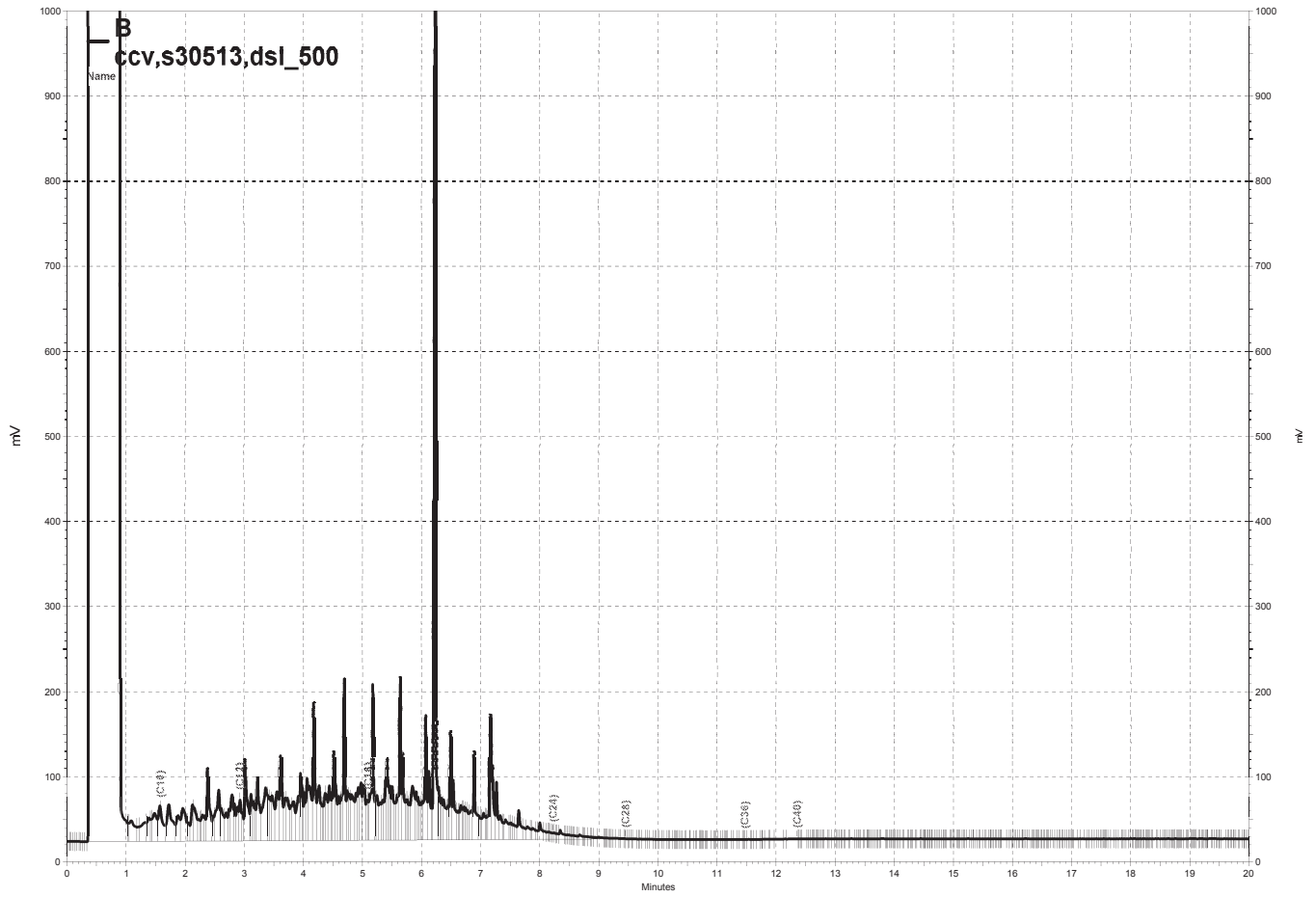
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	49.96	38.26	71	46-154	13	50

Surrogate	%REC	Limits
o-Terphenyl	67	59-140

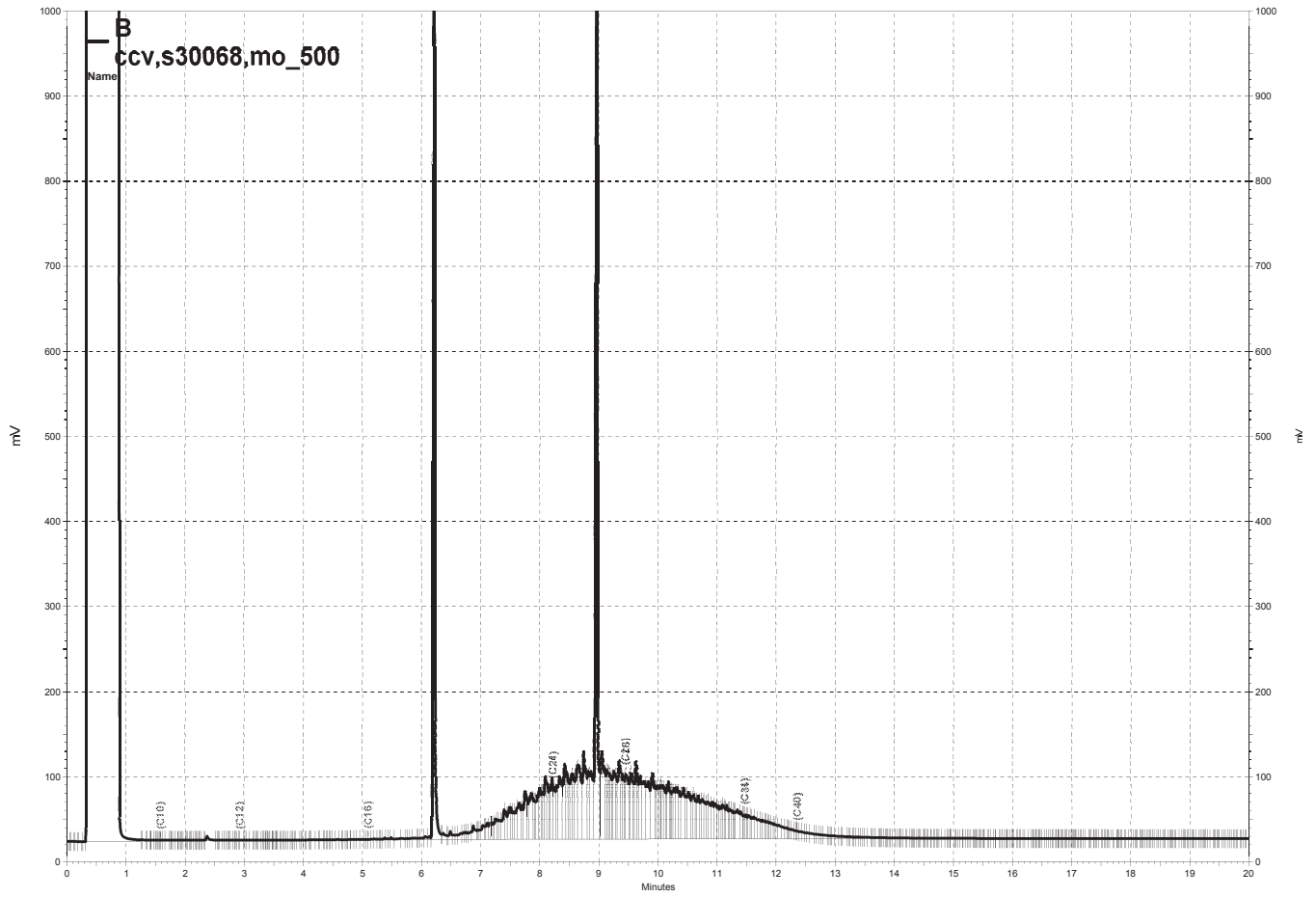
RPD= Relative Percent Difference



\\kraken\gdrive\ezchrom\Projects\GC14B\Data\250b009, B



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### Purgeable Organics by GC/MS

Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-1-2.5'	Diln Fac:	0.9416
Lab ID:	280505-001	Batch#:	238773
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Freon 12	ND	9.4
Chloromethane	ND	9.4
Vinyl Chloride	ND	9.4
Bromomethane	ND	9.4
Chloroethane	ND	9.4
Trichlorofluoromethane	ND	4.7
Acetone	ND	19
Freon 113	ND	4.7
1,1-Dichloroethene	ND	4.7
Methylene Chloride	ND	19
Carbon Disulfide	ND	4.7
MTBE	ND	4.7
trans-1,2-Dichloroethene	ND	4.7
Vinyl Acetate	ND	47
1,1-Dichloroethane	ND	4.7
2-Butanone	ND	9.4
cis-1,2-Dichloroethene	ND	4.7
2,2-Dichloropropane	ND	4.7
Chloroform	ND	4.7
Bromochloromethane	ND	4.7
1,1,1-Trichloroethane	ND	4.7
1,1-Dichloropropene	ND	4.7
Carbon Tetrachloride	ND	4.7
1,2-Dichloroethane	ND	4.7
Benzene	ND	4.7
Trichloroethene	ND	4.7
1,2-Dichloropropane	ND	4.7
Bromodichloromethane	ND	4.7
Dibromomethane	ND	4.7
4-Methyl-2-Pentanone	ND	9.4
cis-1,3-Dichloropropene	ND	4.7
Toluene	ND	4.7
trans-1,3-Dichloropropene	ND	4.7
1,1,2-Trichloroethane	ND	4.7
2-Hexanone	ND	9.4
1,3-Dichloropropane	ND	4.7
Tetrachloroethene	ND	4.7

ND= Not Detected

RL= Reporting Limit



### Purgeable Organics by GC/MS

Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-1-2.5'	Diln Fac:	0.9416
Lab ID:	280505-001	Batch#:	238773
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Dibromochloromethane	ND	4.7
1,2-Dibromoethane	ND	4.7
Chlorobenzene	ND	4.7
1,1,1,2-Tetrachloroethane	ND	4.7
Ethylbenzene	ND	4.7
m,p-Xylenes	ND	4.7
o-Xylene	ND	4.7
Styrene	ND	4.7
Bromoform	ND	4.7
Isopropylbenzene	ND	4.7
1,1,2,2-Tetrachloroethane	ND	4.7
1,2,3-Trichloropropane	ND	4.7
Propylbenzene	ND	4.7
Bromobenzene	ND	4.7
1,3,5-Trimethylbenzene	ND	4.7
2-Chlorotoluene	ND	4.7
4-Chlorotoluene	ND	4.7
tert-Butylbenzene	ND	4.7
1,2,4-Trimethylbenzene	ND	4.7
sec-Butylbenzene	ND	4.7
para-Isopropyl Toluene	ND	4.7
1,3-Dichlorobenzene	ND	4.7
1,4-Dichlorobenzene	ND	4.7
n-Butylbenzene	ND	4.7
1,2-Dichlorobenzene	ND	4.7
1,2-Dibromo-3-Chloropropane	ND	4.7
1,2,4-Trichlorobenzene	ND	4.7
Hexachlorobutadiene	ND	4.7
Naphthalene	ND	4.7
1,2,3-Trichlorobenzene	ND	4.7

Surrogate	%REC	Limits
Dibromofluoromethane	113	78-134
1,2-Dichloroethane-d4	121	80-138
Toluene-d8	98	80-120
Bromofluorobenzene	104	78-123

ND= Not Detected  
 RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-2-2.5'	Diln Fac:	0.9259
Lab ID:	280505-002	Batch#:	238773
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Freon 12	ND	9.3
Chloromethane	ND	9.3
Vinyl Chloride	ND	9.3
Bromomethane	ND	9.3
Chloroethane	ND	9.3
Trichlorofluoromethane	ND	4.6
Acetone	ND	19
Freon 113	ND	4.6
1,1-Dichloroethene	ND	4.6
Methylene Chloride	ND	19
Carbon Disulfide	ND	4.6
MTBE	ND	4.6
trans-1,2-Dichloroethene	ND	4.6
Vinyl Acetate	ND	46
1,1-Dichloroethane	ND	4.6
2-Butanone	ND	9.3
cis-1,2-Dichloroethene	ND	4.6
2,2-Dichloropropane	ND	4.6
Chloroform	ND	4.6
Bromochloromethane	ND	4.6
1,1,1-Trichloroethane	ND	4.6
1,1-Dichloropropene	ND	4.6
Carbon Tetrachloride	ND	4.6
1,2-Dichloroethane	ND	4.6
Benzene	ND	4.6
Trichloroethene	ND	4.6
1,2-Dichloropropane	ND	4.6
Bromodichloromethane	ND	4.6
Dibromomethane	ND	4.6
4-Methyl-2-Pentanone	ND	9.3
cis-1,3-Dichloropropene	ND	4.6
Toluene	ND	4.6
trans-1,3-Dichloropropene	ND	4.6
1,1,2-Trichloroethane	ND	4.6
2-Hexanone	ND	9.3
1,3-Dichloropropane	ND	4.6
Tetrachloroethene	ND	4.6

ND= Not Detected

RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-2-2.5'	Diln Fac:	0.9259
Lab ID:	280505-002	Batch#:	238773
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Dibromochloromethane	ND	4.6
1,2-Dibromoethane	ND	4.6
Chlorobenzene	ND	4.6
1,1,1,2-Tetrachloroethane	ND	4.6
Ethylbenzene	ND	4.6
m,p-Xylenes	ND	4.6
o-Xylene	ND	4.6
Styrene	ND	4.6
Bromoform	ND	4.6
Isopropylbenzene	ND	4.6
1,1,2,2-Tetrachloroethane	ND	4.6
1,2,3-Trichloropropane	ND	4.6
Propylbenzene	ND	4.6
Bromobenzene	ND	4.6
1,3,5-Trimethylbenzene	ND	4.6
2-Chlorotoluene	ND	4.6
4-Chlorotoluene	ND	4.6
tert-Butylbenzene	ND	4.6
1,2,4-Trimethylbenzene	ND	4.6
sec-Butylbenzene	ND	4.6
para-Isopropyl Toluene	ND	4.6
1,3-Dichlorobenzene	ND	4.6
1,4-Dichlorobenzene	ND	4.6
n-Butylbenzene	ND	4.6
1,2-Dichlorobenzene	ND	4.6
1,2-Dibromo-3-Chloropropane	ND	4.6
1,2,4-Trichlorobenzene	ND	4.6
Hexachlorobutadiene	ND	4.6
Naphthalene	ND	4.6
1,2,3-Trichlorobenzene	ND	4.6

Surrogate	%REC	Limits
Dibromofluoromethane	114	78-134
1,2-Dichloroethane-d4	117	80-138
Toluene-d8	100	80-120
Bromofluorobenzene	97	78-123

ND= Not Detected  
 RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-3-2.5'	Diln Fac:	0.9960
Lab ID:	280505-003	Batch#:	238773
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Freon 12	ND	10
Chloromethane	ND	10
Vinyl Chloride	ND	10
Bromomethane	ND	10
Chloroethane	ND	10
Trichlorofluoromethane	ND	5.0
Acetone	ND	20
Freon 113	ND	5.0
1,1-Dichloroethene	ND	5.0
Methylene Chloride	ND	20
Carbon Disulfide	ND	5.0
MTBE	ND	5.0
trans-1,2-Dichloroethene	ND	5.0
Vinyl Acetate	ND	50
1,1-Dichloroethane	ND	5.0
2-Butanone	ND	10
cis-1,2-Dichloroethene	ND	5.0
2,2-Dichloropropane	ND	5.0
Chloroform	ND	5.0
Bromochloromethane	ND	5.0
1,1,1-Trichloroethane	ND	5.0
1,1-Dichloropropene	ND	5.0
Carbon Tetrachloride	ND	5.0
1,2-Dichloroethane	ND	5.0
Benzene	ND	5.0
Trichloroethene	ND	5.0
1,2-Dichloropropane	ND	5.0
Bromodichloromethane	ND	5.0
Dibromomethane	ND	5.0
4-Methyl-2-Pentanone	ND	10
cis-1,3-Dichloropropene	ND	5.0
Toluene	ND	5.0
trans-1,3-Dichloropropene	ND	5.0
1,1,2-Trichloroethane	ND	5.0
2-Hexanone	ND	10
1,3-Dichloropropane	ND	5.0
Tetrachloroethene	ND	5.0

ND= Not Detected

RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-3-2.5'	Diln Fac:	0.9960
Lab ID:	280505-003	Batch#:	238773
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Dibromochloromethane	ND	5.0
1,2-Dibromoethane	ND	5.0
Chlorobenzene	ND	5.0
1,1,1,2-Tetrachloroethane	ND	5.0
Ethylbenzene	ND	5.0
m,p-Xylenes	ND	5.0
o-Xylene	ND	5.0
Styrene	ND	5.0
Bromoform	ND	5.0
Isopropylbenzene	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.0
1,2,3-Trichloropropane	ND	5.0
Propylbenzene	ND	5.0
Bromobenzene	ND	5.0
1,3,5-Trimethylbenzene	ND	5.0
2-Chlorotoluene	ND	5.0
4-Chlorotoluene	ND	5.0
tert-Butylbenzene	ND	5.0
1,2,4-Trimethylbenzene	ND	5.0
sec-Butylbenzene	ND	5.0
para-Isopropyl Toluene	ND	5.0
1,3-Dichlorobenzene	ND	5.0
1,4-Dichlorobenzene	ND	5.0
n-Butylbenzene	ND	5.0
1,2-Dichlorobenzene	ND	5.0
1,2-Dibromo-3-Chloropropane	ND	5.0
1,2,4-Trichlorobenzene	ND	5.0
Hexachlorobutadiene	ND	5.0
Naphthalene	ND	5.0
1,2,3-Trichlorobenzene	ND	5.0

Surrogate	%REC	Limits
Dibromofluoromethane	114	78-134
1,2-Dichloroethane-d4	123	80-138
Toluene-d8	96	80-120
Bromofluorobenzene	101	78-123

ND= Not Detected

RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-4-2.5'	Diln Fac:	0.9766
Lab ID:	280505-004	Batch#:	238773
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Freon 12	ND	9.8
Chloromethane	ND	9.8
Vinyl Chloride	ND	9.8
Bromomethane	ND	9.8
Chloroethane	ND	9.8
Trichlorofluoromethane	ND	4.9
Acetone	59	20
Freon 113	ND	4.9
1,1-Dichloroethene	ND	4.9
Methylene Chloride	ND	20
Carbon Disulfide	ND	4.9
MTBE	ND	4.9
trans-1,2-Dichloroethene	ND	4.9
Vinyl Acetate	ND	49
1,1-Dichloroethane	ND	4.9
2-Butanone	ND	9.8
cis-1,2-Dichloroethene	ND	4.9
2,2-Dichloropropane	ND	4.9
Chloroform	ND	4.9
Bromochloromethane	ND	4.9
1,1,1-Trichloroethane	ND	4.9
1,1-Dichloropropene	ND	4.9
Carbon Tetrachloride	ND	4.9
1,2-Dichloroethane	ND	4.9
Benzene	ND	4.9
Trichloroethene	ND	4.9
1,2-Dichloropropane	ND	4.9
Bromodichloromethane	ND	4.9
Dibromomethane	ND	4.9
4-Methyl-2-Pentanone	ND	9.8
cis-1,3-Dichloropropene	ND	4.9
Toluene	ND	4.9
trans-1,3-Dichloropropene	ND	4.9
1,1,2-Trichloroethane	ND	4.9
2-Hexanone	ND	9.8
1,3-Dichloropropane	ND	4.9
Tetrachloroethene	ND	4.9

ND= Not Detected

RL= Reporting Limit



### Purgeable Organics by GC/MS

Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-4-2.5'	Diln Fac:	0.9766
Lab ID:	280505-004	Batch#:	238773
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Dibromochloromethane	ND	4.9
1,2-Dibromoethane	ND	4.9
Chlorobenzene	ND	4.9
1,1,1,2-Tetrachloroethane	ND	4.9
Ethylbenzene	ND	4.9
m,p-Xylenes	ND	4.9
o-Xylene	ND	4.9
Styrene	ND	4.9
Bromoform	ND	4.9
Isopropylbenzene	ND	4.9
1,1,2,2-Tetrachloroethane	ND	4.9
1,2,3-Trichloropropane	ND	4.9
Propylbenzene	ND	4.9
Bromobenzene	ND	4.9
1,3,5-Trimethylbenzene	ND	4.9
2-Chlorotoluene	ND	4.9
4-Chlorotoluene	ND	4.9
tert-Butylbenzene	ND	4.9
1,2,4-Trimethylbenzene	ND	4.9
sec-Butylbenzene	ND	4.9
para-Isopropyl Toluene	ND	4.9
1,3-Dichlorobenzene	ND	4.9
1,4-Dichlorobenzene	ND	4.9
n-Butylbenzene	ND	4.9
1,2-Dichlorobenzene	ND	4.9
1,2-Dibromo-3-Chloropropane	ND	4.9
1,2,4-Trichlorobenzene	ND	4.9
Hexachlorobutadiene	ND	4.9
Naphthalene	ND	4.9
1,2,3-Trichlorobenzene	ND	4.9

Surrogate	%REC	Limits
Dibromofluoromethane	117	78-134
1,2-Dichloroethane-d4	123	80-138
Toluene-d8	98	80-120
Bromofluorobenzene	103	78-123

ND= Not Detected  
 RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-5-2.5'	Diln Fac:	0.9960
Lab ID:	280505-005	Batch#:	238773
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Freon 12	ND	10
Chloromethane	ND	10
Vinyl Chloride	ND	10
Bromomethane	ND	10
Chloroethane	ND	10
Trichlorofluoromethane	ND	5.0
Acetone	50	20
Freon 113	ND	5.0
1,1-Dichloroethene	ND	5.0
Methylene Chloride	ND	20
Carbon Disulfide	ND	5.0
MTBE	ND	5.0
trans-1,2-Dichloroethene	ND	5.0
Vinyl Acetate	ND	50
1,1-Dichloroethane	ND	5.0
2-Butanone	ND	10
cis-1,2-Dichloroethene	ND	5.0
2,2-Dichloropropane	ND	5.0
Chloroform	ND	5.0
Bromochloromethane	ND	5.0
1,1,1-Trichloroethane	ND	5.0
1,1-Dichloropropene	ND	5.0
Carbon Tetrachloride	ND	5.0
1,2-Dichloroethane	ND	5.0
Benzene	ND	5.0
Trichloroethene	ND	5.0
1,2-Dichloropropane	ND	5.0
Bromodichloromethane	ND	5.0
Dibromomethane	ND	5.0
4-Methyl-2-Pentanone	ND	10
cis-1,3-Dichloropropene	ND	5.0
Toluene	ND	5.0
trans-1,3-Dichloropropene	ND	5.0
1,1,2-Trichloroethane	ND	5.0
2-Hexanone	ND	10
1,3-Dichloropropane	ND	5.0
Tetrachloroethene	ND	5.0

ND= Not Detected

RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	SS-5-2.5'	Diln Fac:	0.9960
Lab ID:	280505-005	Batch#:	238773
Matrix:	Soil	Sampled:	09/02/16
Units:	ug/Kg	Received:	09/02/16
Basis:	as received	Analyzed:	09/03/16

Analyte	Result	RL
Dibromochloromethane	ND	5.0
1,2-Dibromoethane	ND	5.0
Chlorobenzene	ND	5.0
1,1,1,2-Tetrachloroethane	ND	5.0
Ethylbenzene	ND	5.0
m,p-Xylenes	ND	5.0
o-Xylene	ND	5.0
Styrene	ND	5.0
Bromoform	ND	5.0
Isopropylbenzene	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.0
1,2,3-Trichloropropane	ND	5.0
Propylbenzene	ND	5.0
Bromobenzene	ND	5.0
1,3,5-Trimethylbenzene	ND	5.0
2-Chlorotoluene	ND	5.0
4-Chlorotoluene	ND	5.0
tert-Butylbenzene	ND	5.0
1,2,4-Trimethylbenzene	ND	5.0
sec-Butylbenzene	ND	5.0
para-Isopropyl Toluene	ND	5.0
1,3-Dichlorobenzene	ND	5.0
1,4-Dichlorobenzene	ND	5.0
n-Butylbenzene	ND	5.0
1,2-Dichlorobenzene	ND	5.0
1,2-Dibromo-3-Chloropropane	ND	5.0
1,2,4-Trichlorobenzene	ND	5.0
Hexachlorobutadiene	ND	5.0
Naphthalene	ND	5.0
1,2,3-Trichlorobenzene	ND	5.0

Surrogate	%REC	Limits
Dibromofluoromethane	116	78-134
1,2-Dichloroethane-d4	130	80-138
Toluene-d8	98	80-120
Bromofluorobenzene	105	78-123

ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC850251	Batch#:	238773
Matrix:	Soil	Analyzed:	09/03/16
Units:	ug/Kg		

Analyte	Spiked	Result	%REC	Limits
1,1-Dichloroethene	25.00	27.93	112	70-134
Benzene	25.00	30.05	120	80-123
Trichloroethene	25.00	27.69	111	80-128
Toluene	25.00	26.85	107	80-120
Chlorobenzene	25.00	25.80	103	80-123

Surrogate	%REC	Limits
Dibromofluoromethane	105	78-134
1,2-Dichloroethane-d4	107	80-138
Toluene-d8	94	80-120
Bromofluorobenzene	93	78-123

## Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC850252	Batch#:	238773
Matrix:	Soil	Analyzed:	09/03/16
Units:	ug/Kg		

Analyte	Result	RL
Freon 12	ND	10
Chloromethane	ND	10
Vinyl Chloride	ND	10
Bromomethane	ND	10
Chloroethane	ND	10
Trichlorofluoromethane	ND	5.0
Acetone	ND	20
Freon 113	ND	5.0
1,1-Dichloroethene	ND	5.0
Methylene Chloride	ND	20
Carbon Disulfide	ND	5.0
MTBE	ND	5.0
trans-1,2-Dichloroethene	ND	5.0
Vinyl Acetate	ND	50
1,1-Dichloroethane	ND	5.0
2-Butanone	ND	10
cis-1,2-Dichloroethene	ND	5.0
2,2-Dichloropropane	ND	5.0
Chloroform	ND	5.0
Bromochloromethane	ND	5.0
1,1,1-Trichloroethane	ND	5.0
1,1-Dichloropropene	ND	5.0
Carbon Tetrachloride	ND	5.0
1,2-Dichloroethane	ND	5.0
Benzene	ND	5.0
Trichloroethene	ND	5.0
1,2-Dichloropropane	ND	5.0
Bromodichloromethane	ND	5.0
Dibromomethane	ND	5.0
4-Methyl-2-Pentanone	ND	10
cis-1,3-Dichloropropene	ND	5.0
Toluene	ND	5.0
trans-1,3-Dichloropropene	ND	5.0
1,1,2-Trichloroethane	ND	5.0
2-Hexanone	ND	10
1,3-Dichloropropane	ND	5.0
Tetrachloroethene	ND	5.0

ND= Not Detected

RL= Reporting Limit

**Batch QC Report**

<b>Purgeable Organics by GC/MS</b>			
Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC850252	Batch#:	238773
Matrix:	Soil	Analyzed:	09/03/16
Units:	ug/Kg		

<b>Analyte</b>	<b>Result</b>	<b>RL</b>
Dibromochloromethane	ND	5.0
1,2-Dibromoethane	ND	5.0
Chlorobenzene	ND	5.0
1,1,1,2-Tetrachloroethane	ND	5.0
Ethylbenzene	ND	5.0
m,p-Xylenes	ND	5.0
o-Xylene	ND	5.0
Styrene	ND	5.0
Bromoform	ND	5.0
Isopropylbenzene	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.0
1,2,3-Trichloropropane	ND	5.0
Propylbenzene	ND	5.0
Bromobenzene	ND	5.0
1,3,5-Trimethylbenzene	ND	5.0
2-Chlorotoluene	ND	5.0
4-Chlorotoluene	ND	5.0
tert-Butylbenzene	ND	5.0
1,2,4-Trimethylbenzene	ND	5.0
sec-Butylbenzene	ND	5.0
para-Isopropyl Toluene	ND	5.0
1,3-Dichlorobenzene	ND	5.0
1,4-Dichlorobenzene	ND	5.0
n-Butylbenzene	ND	5.0
1,2-Dichlorobenzene	ND	5.0
1,2-Dibromo-3-Chloropropane	ND	5.0
1,2,4-Trichlorobenzene	ND	5.0
Hexachlorobutadiene	ND	5.0
Naphthalene	ND	5.0
1,2,3-Trichlorobenzene	ND	5.0

<b>Surrogate</b>	<b>%REC</b>	<b>Limits</b>
Dibromofluoromethane	108	78-134
1,2-Dichloroethane-d4	115	80-138
Toluene-d8	98	80-120
Bromofluorobenzene	102	78-123

ND= Not Detected

RL= Reporting Limit



**Batch QC Report**

Purgeable Organics by GC/MS			
Lab #:	280505	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001.003	Analysis:	EPA 8260B
Field ID:	ZZZZZZZZZZ	Batch#:	238773
MSS Lab ID:	280500-001	Sampled:	09/01/16
Matrix:	Soil	Received:	09/02/16
Units:	ug/Kg	Analyzed:	09/03/16
Basis:	as received		

Type: MS Diln Fac: 0.9634  
 Lab ID: QC850272

Analyte	MSS Result	Spiked	Result	%REC	Limits
1,1-Dichloroethene	<0.8915	48.17	45.45	94	56-133
Benzene	<0.8561	48.17	44.09	92	57-120
Trichloroethene	<0.7924	48.17	36.10	75	49-145
Toluene	<0.6749	48.17	34.71	72	51-120
Chlorobenzene	<0.6509	48.17	28.07	58	47-120

Surrogate	%REC	Limits
Dibromofluoromethane	103	78-134
1,2-Dichloroethane-d4	110	80-138
Toluene-d8	94	80-120
Bromofluorobenzene	91	78-123

Type: MSD Diln Fac: 0.9690  
 Lab ID: QC850273

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,1-Dichloroethene	48.45	50.48	104	56-133	10	46
Benzene	48.45	47.86	99	57-120	8	44
Trichloroethene	48.45	39.14	81	49-145	8	46
Toluene	48.45	37.47	77	51-120	7	47
Chlorobenzene	48.45	31.29	65	47-120	10	50

Surrogate	%REC	Limits
Dibromofluoromethane	104	78-134
1,2-Dichloroethane-d4	113	80-138
Toluene-d8	94	80-120
Bromofluorobenzene	90	78-123

RPD= Relative Percent Difference





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2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 280614  
ANALYTICAL REPORT

Pangea Environmental  
1710 Franklin Street  
Oakland, CA 94612

Project : 1233 BOCKMAN  
Location : 1233 Bockman  
Level : II

<u>Sample ID</u>	<u>Lab ID</u>
SS-6-8'	280614-001
SS-6-10'	280614-002
SS-7-8'	280614-003
SS-8-8'	280614-004

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: \_\_\_\_\_

Date: 09/14/2016

Will Rice  
Project Manager  
will.rice@ctberk.com

CA ELAP# 2896, NELAP# 4044-001

### CASE NARRATIVE

Laboratory number: 280614  
Client: Pangea Environmental  
Project: 1233 BOCKMAN  
Location: 1233 Bockman  
Request Date: 09/07/16  
Samples Received: 09/02/16

This data package contains sample and QC results for four soil samples, requested for the above referenced project on 09/07/16. The samples were received cold and intact.

**TPH-Extractables by GC (EPA 8015B):**

No analytical problems were encountered.

## Detections Summary for 280614

Results for any subcontracted analyses are not included in this summary.

Client : Pangea Environmental  
 Project : 1233 BOCKMAN  
 Location : 1233 Bockman

Client Sample ID : SS-6-8'                      Laboratory Sample ID :                      280614-001

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	8.0	Y	0.99	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B
Motor Oil C24-C36	20		5.0	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B

Client Sample ID : SS-6-10'                      Laboratory Sample ID :                      280614-002

No Detections

Client Sample ID : SS-7-8'                      Laboratory Sample ID :                      280614-003

No Detections

Client Sample ID : SS-8-8'                      Laboratory Sample ID :                      280614-004

No Detections

Y = Sample exhibits chromatographic pattern which does not resemble standard







## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	280614	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC850741	Batch#:	238899
Matrix:	Soil	Prepared:	09/08/16
Units:	mg/Kg	Analyzed:	09/08/16

Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	50.01	36.05	72	58-137

Surrogate	%REC	Limits
o-Terphenyl	85	59-140

## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	280614	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	1233 BOCKMAN	Analysis:	EPA 8015B
Field ID:	SS-6-10'	Batch#:	238899
MSS Lab ID:	280614-002	Sampled:	09/02/16
Matrix:	Soil	Received:	09/02/16
Units:	mg/Kg	Prepared:	09/08/16
Basis:	as received	Analyzed:	09/08/16
Diln Fac:	1.000		

Type: MS Lab ID: QC850742

Analyte	MSS Result	Spiked	Result	%REC	Limits
Diesel C10-C24	0.3862	50.09	48.42	96	46-154

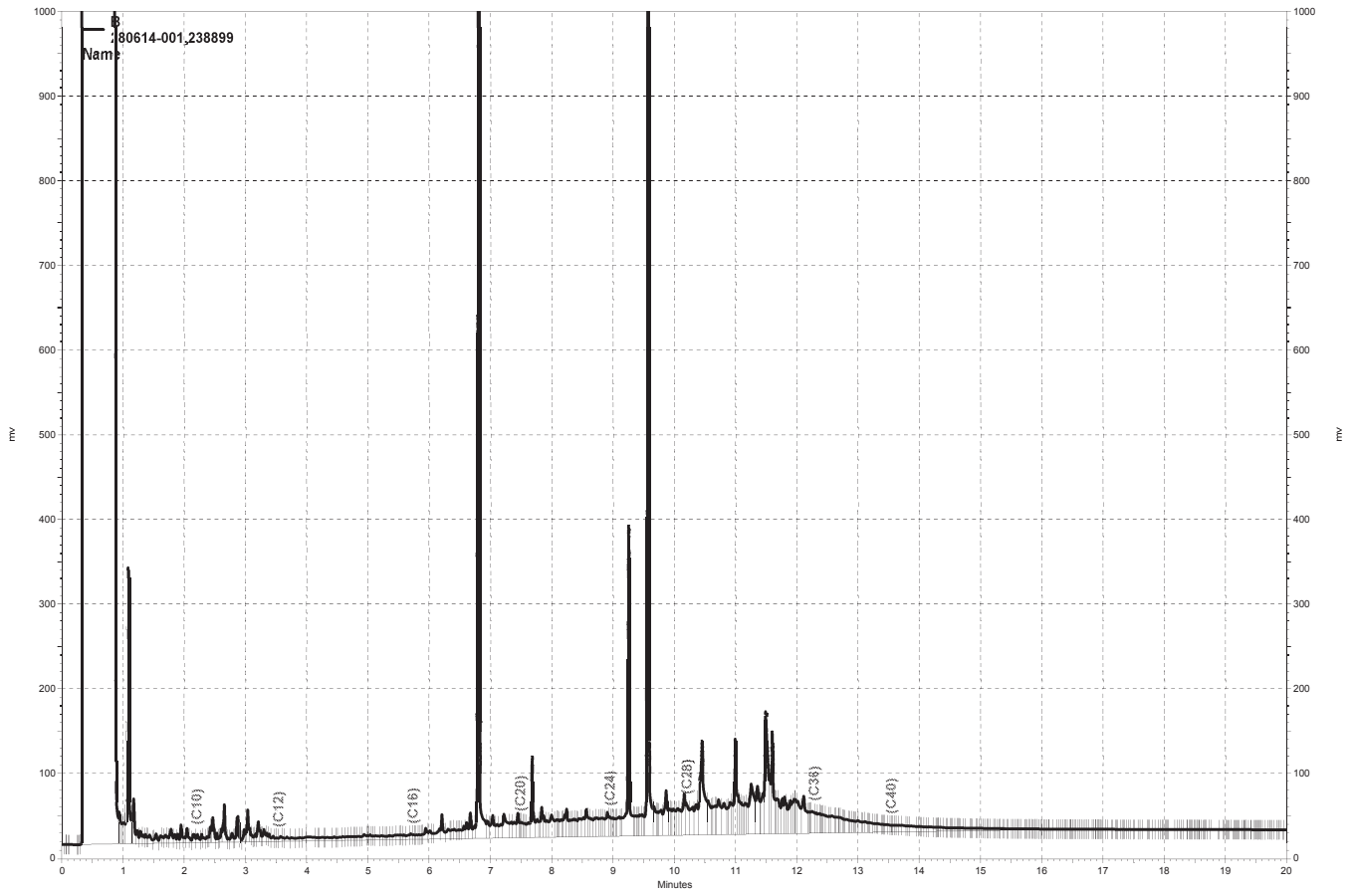
Surrogate	%REC	Limits
o-Terphenyl	113	59-140

Type: MSD Lab ID: QC850743

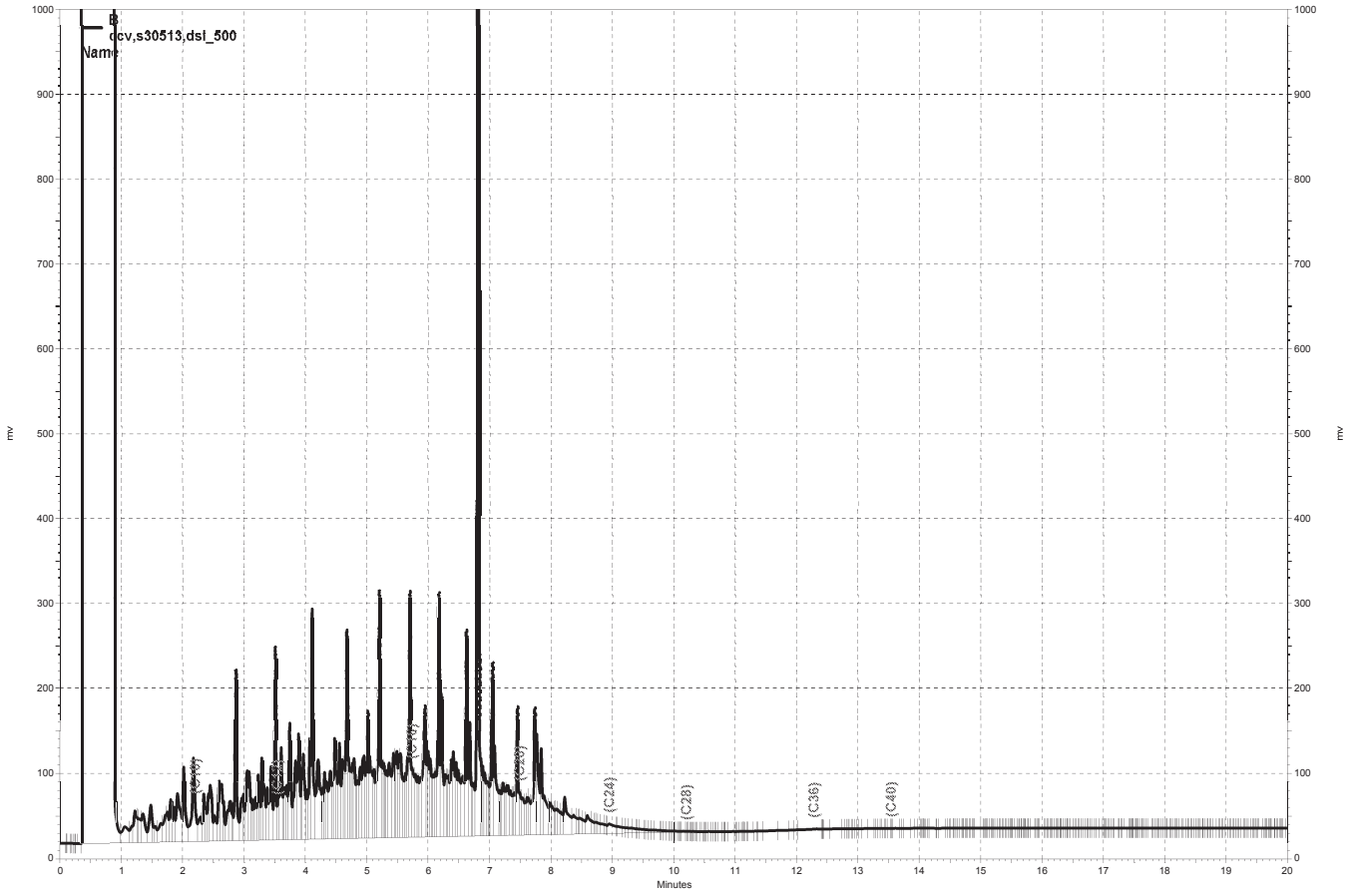
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	49.78	47.52	95	46-154	1	50

Surrogate	%REC	Limits
o-Terphenyl	114	59-140

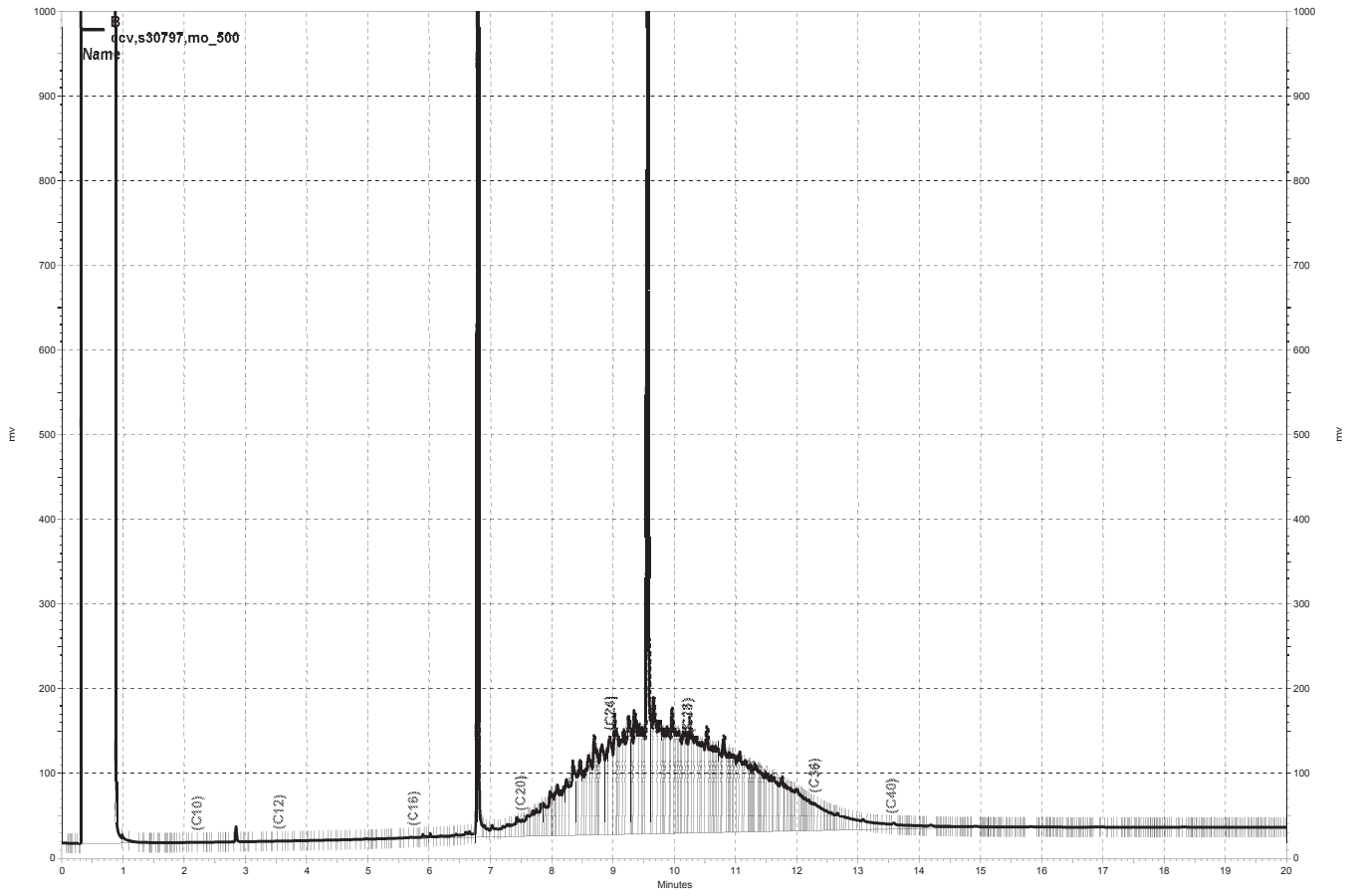
RPD= Relative Percent Difference



\\kraken\drive\ezchrom\Projects\GC15B\Data\252b024, B



\\kraken\drive\ezchrom\Projects\GC15B\Data\252b015, B



\\kraken\drive\ezchrom\Projects\GC15B\Data\252b014, B





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2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 280624  
ANALYTICAL REPORT

Pangea Environmental  
1710 Franklin Street  
Oakland, CA 94612

Project : 2030.001  
Location : 1233 Bockman  
Level : II

<u>Sample ID</u>	<u>Lab ID</u>
BS-1-12'	280624-001
BS-2-12'	280624-002
BS-3-12'	280624-003
BS-4-8'	280624-004
BS-5-10'	280624-005
BS-6-10'	280624-006
BS-7-10'	280624-007
SW-1-10'	280624-008
SW-2-10'	280624-009
SW-4-8'	280624-010
SW-5-8'	280624-011
SW-6-8'	280624-012

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: \_\_\_\_\_

Date: 09/12/2016

Will Rice  
Project Manager  
will.rice@ctberk.com

### CASE NARRATIVE

Laboratory number: 280624  
Client: Pangea Environmental  
Project: 2030.001  
Location: 1233 Bockman  
Request Date: 09/07/16  
Samples Received: 09/07/16

This data package contains sample and QC results for twelve soil samples, requested for the above referenced project on 09/07/16. The samples were received cold and intact.

**TPH-Purgeables and/or BTXE by GC (EPA 8015B):**

No analytical problems were encountered.

**TPH-Extractables by GC (EPA 8015B):**

No analytical problems were encountered.

**Volatile Organics by GC/MS (EPA 8260B):**

Low surrogate recovery was observed for bromofluorobenzene in the MS of SW-4-8' (lab # 280624-010). No other analytical problems were encountered.

# CHAIN OF CUSTODY



**Curtis & Tompkins Laboratories**  
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Phone (510) 486-0900  
 Fax (510) 486-0532

C&T LOGIN # 280624

Page \_\_\_ of \_\_\_  
 Chain of Custody # \_\_\_\_\_

Project No: 2030.001  
 Project Name: 1233 Backman  
 Project P. O. No: \_\_\_\_\_  
 EDD Format: Report Level  I  II  III  IV  
 Turnaround Time:  RUSH 3 day  Standard  Standard  
 Sampler: S. Mancos, Albert  
 Report To: Pen Scheele  
 Company: Pargen env.  
 Telephone: (510) 459-6012  
 Email: pscheele@pargenenv.com

ANALYTICAL REQUEST	
8115	
5268	
X TPHs, 2, m	X
X	X
X	X
X	X
X	X

Lab No.	Sample ID.	SAMPLING		MATRIX	# of Containers	CHEMICAL PRESERVATIVE								
		Date Collected	Time Collected			Water	Solid	HCl	H2SO4	HNO3	NaOH	None		
1	BS-1-12'	9/7/16	1030	X	1					X				
2	BS-2-12'		1100											
3	BS-3-12'		1450											
4	BS-4-8'		1530											
5	BS-5-10'		1448											
6	BS-6-10'		1445											
7	BS-7-10'		1515											
8	SW-1-10'		1500											
9	SW-2-10'		1510											
10	SW-4-8'		1550											
11	SW-5-8'		1545											
12	SW-6-8'		1540											

Notes: \_\_\_\_\_

**SAMPLE RECEIPT**  
 Intact  
 Cold  
 On Ice  
 Ambient

RELINQUISHED BY: DATE: 9/7/16 TIME: 1747

RECEIVED BY: \_\_\_\_\_ DATE: 9/16/16 TIME: 1747



**COOLER RECEIPT CHECKLIST**



Curtis & Tompkins, Ltd.

Login # 280G24 Date Received 9/7/16 Number of coolers 1  
 Client Pangea Env Project 1233 Backman  
 Date Opened 9/7 By (print) SL (sign) [Signature]  
 Date Logged in ↓ By (print) ↓ (sign) ↓  
 Date Labeled ↓ By (print) ↓ (sign) ↓

1. Did cooler come with a shipping slip (airbill, etc) \_\_\_\_\_ YES  NO  
 Shipping info \_\_\_\_\_

2A. Were custody seals present? ....  YES (circle) on cooler on samples  NO  
 How many \_\_\_\_\_ Name \_\_\_\_\_ Date \_\_\_\_\_

2B. Were custody seals intact upon arrival? \_\_\_\_\_ YES NO  N/A

3. Were custody papers dry and intact when received?  YES NO

4. Were custody papers filled out properly (ink, signed, etc)?  YES NO

5. Is the project identifiable from custody papers? (If so fill out top of form)  YES NO

6. Indicate the packing in cooler: (if other, describe) \_\_\_\_\_

- Bubble Wrap  Foam blocks  Bags  None
- Cloth material  Cardboard  Styrofoam  Paper towels

7. Temperature documentation: \* Notify PM if temperature exceeds 6°C

Type of ice used:  Wet  Blue/Gel  None Temp(°C) 3.4

Temperature blank(s) included?  Thermometer# \_\_\_\_\_  IR Gun# A

Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? \_\_\_\_\_ YES  NO  
 If YES, what time were they transferred to freezer? \_\_\_\_\_

9. Did all bottles arrive unbroken/unopened? \_\_\_\_\_ YES NO

10. Are there any missing / extra samples? \_\_\_\_\_ YES NO

11. Are samples in the appropriate containers for indicated tests? \_\_\_\_\_ YES NO

12. Are sample labels present, in good condition and complete? \_\_\_\_\_ YES NO

13. Do the sample labels agree with custody papers? SL  YES  NO

14. Was sufficient amount of sample sent for tests requested? \_\_\_\_\_ YES NO

15. Are the samples appropriately preserved? \_\_\_\_\_ YES NO  N/A

16. Did you check preservatives for all bottles for each sample? \_\_\_\_\_ YES NO  N/A

17. Did you document your preservative check? (pH strip lot# \_\_\_\_\_) YES NO  N/A

18. Did you change the hold time in LIMS for unpreserved VOAs? \_\_\_\_\_ YES NO  N/A

19. Did you change the hold time in LIMS for preserved terracores? \_\_\_\_\_ YES NO  N/A

20. Are bubbles > 6mm absent in VOA samples? \_\_\_\_\_ YES NO  N/A

21. Was the client contacted concerning this sample delivery? \_\_\_\_\_ YES  NO

If YES, Who was called? \_\_\_\_\_ By \_\_\_\_\_ Date: \_\_\_\_\_

**COMMENTS**

13.) Sample 6 is marked on the coc as "BS-G-10" but labeled as "SW-G-10" on the container; Sample 12 is marked on the coc as "SW-G-8" but labeled as "BS-G-8" on the container. Samples were identified based on their sample time.

## Detections Summary for 280624

Results for any subcontracted analyses are not included in this summary.

Client : Pangea Environmental  
Project : 2030.001  
Location : 1233 Bockman

Client Sample ID : BS-1-12'                      Laboratory Sample ID :                      280624-001

No Detections

Client Sample ID : BS-2-12'                      Laboratory Sample ID :                      280624-002

No Detections

Client Sample ID : BS-3-12'                      Laboratory Sample ID :                      280624-003

No Detections

Client Sample ID : BS-4-8'                      Laboratory Sample ID :                      280624-004

No Detections

Client Sample ID : BS-5-10'                      Laboratory Sample ID :                      280624-005

No Detections

Client Sample ID : BS-6-10'                      Laboratory Sample ID :                      280624-006

No Detections

Client Sample ID : BS-7-10'                      Laboratory Sample ID :                      280624-007

No Detections

Client Sample ID : SW-1-10'                      Laboratory Sample ID :                      280624-008

No Detections

Client Sample ID : SW-2-10'                      Laboratory Sample ID :                      280624-009

No Detections

Client Sample ID : SW-4-8'	Laboratory Sample ID :	280624-010
No Detections		
Client Sample ID : SW-5-8'	Laboratory Sample ID :	280624-011
No Detections		
Client Sample ID : SW-6-8'	Laboratory Sample ID :	280624-012
No Detections		



Total Volatile Hydrocarbons			
Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8015B
Matrix:	Soil	Batch#:	238884
Units:	mg/Kg	Sampled:	09/07/16
Basis:	as received	Received:	09/07/16
Diln Fac:	1.000		

Field ID: BS-1-12'      Lab ID: 280624-001  
 Type: SAMPLE      Analyzed: 09/08/16

Analyte	Result	RL
Gasoline C7-C12	ND	1.1

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	110	78-138

Field ID: BS-2-12'      Lab ID: 280624-002  
 Type: SAMPLE      Analyzed: 09/08/16

Analyte	Result	RL
Gasoline C7-C12	ND	1.1

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	111	78-138

Field ID: BS-3-12'      Lab ID: 280624-003  
 Type: SAMPLE      Analyzed: 09/08/16

Analyte	Result	RL
Gasoline C7-C12	ND	1.0

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	109	78-138

Field ID: BS-4-8'      Lab ID: 280624-004  
 Type: SAMPLE      Analyzed: 09/08/16

Analyte	Result	RL
Gasoline C7-C12	ND	1.1

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	109	78-138

Field ID: BS-5-10'      Lab ID: 280624-005  
 Type: SAMPLE      Analyzed: 09/08/16

Analyte	Result	RL
Gasoline C7-C12	ND	0.97

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	109	78-138

ND= Not Detected  
 RL= Reporting Limit  
 Page 1 of 3

Total Volatile Hydrocarbons			
Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8015B
Matrix:	Soil	Batch#:	238884
Units:	mg/Kg	Sampled:	09/07/16
Basis:	as received	Received:	09/07/16
Diln Fac:	1.000		

Field ID: BS-6-10'                      Lab ID: 280624-006  
 Type: SAMPLE                              Analyzed: 09/08/16

Analyte	Result	RL
Gasoline C7-C12	ND	0.94
Surrogate	%REC	Limits
Bromofluorobenzene (FID)	111	78-138

Field ID: BS-7-10'                      Lab ID: 280624-007  
 Type: SAMPLE                              Analyzed: 09/08/16

Analyte	Result	RL
Gasoline C7-C12	ND	0.97
Surrogate	%REC	Limits
Bromofluorobenzene (FID)	112	78-138

Field ID: SW-1-10'                      Lab ID: 280624-008  
 Type: SAMPLE                              Analyzed: 09/08/16

Analyte	Result	RL
Gasoline C7-C12	ND	1.0
Surrogate	%REC	Limits
Bromofluorobenzene (FID)	112	78-138

Field ID: SW-2-10'                      Lab ID: 280624-009  
 Type: SAMPLE                              Analyzed: 09/08/16

Analyte	Result	RL
Gasoline C7-C12	ND	1.0
Surrogate	%REC	Limits
Bromofluorobenzene (FID)	109	78-138

Field ID: SW-4-8'                      Lab ID: 280624-010  
 Type: SAMPLE                              Analyzed: 09/09/16

Analyte	Result	RL
Gasoline C7-C12	ND	0.97
Surrogate	%REC	Limits
Bromofluorobenzene (FID)	111	78-138

ND= Not Detected  
 RL= Reporting Limit  
 Page 2 of 3

**Total Volatile Hydrocarbons**

Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8015B
Matrix:	Soil	Batch#:	238884
Units:	mg/Kg	Sampled:	09/07/16
Basis:	as received	Received:	09/07/16
Diln Fac:	1.000		

Field ID:	SW-5-8'	Lab ID:	280624-011
Type:	SAMPLE	Analyzed:	09/09/16

Analyte	Result	RL
Gasoline C7-C12	ND	0.95

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	105	78-138

Field ID:	SW-6-8'	Lab ID:	280624-012
Type:	SAMPLE	Analyzed:	09/09/16

Analyte	Result	RL
Gasoline C7-C12	ND	1.0

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	110	78-138

Type:	BLANK	Analyzed:	09/08/16
Lab ID:	QC850687		

Analyte	Result	RL
Gasoline C7-C12	ND	1.0

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	98	78-138

ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC850688	Batch#:	238884
Matrix:	Soil	Analyzed:	09/08/16
Units:	mg/Kg		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1.000	1.037	104	80-121

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	108	78-138

## Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Diln Fac:	1.000
MSS Lab ID:	280612-001	Batch#:	238884
Matrix:	Soil	Sampled:	09/07/16
Units:	mg/Kg	Received:	09/07/16
Basis:	as received	Analyzed:	09/08/16

Type: MS Lab ID: QC850689

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	0.2763	9.524	10.09	103	50-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	116	78-138

Type: MSD Lab ID: QC850690

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	10.31	10.23	97	50-120	6	31

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	112	78-138

RPD= Relative Percent Difference



Total Extractable Hydrocarbons			
Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	2030.001	Analysis:	EPA 8015B
Matrix:	Soil	Sampled:	09/07/16
Units:	mg/Kg	Received:	09/07/16
Basis:	as received	Prepared:	09/08/16
Diln Fac:	1.000	Analyzed:	09/08/16
Batch#:	238899		

Field ID: BS-1-12'                                  Lab ID: 280624-001  
Type: SAMPLE

Analyte	Result	RL
Diesel C10-C24	ND	1.0
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
o-Terphenyl	77	59-140

Field ID: BS-2-12'                                  Lab ID: 280624-002  
Type: SAMPLE

Analyte	Result	RL
Diesel C10-C24	ND	0.99
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
o-Terphenyl	89	59-140

Field ID: BS-3-12'                                  Lab ID: 280624-003  
Type: SAMPLE

Analyte	Result	RL
Diesel C10-C24	ND	1.0
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
o-Terphenyl	92	59-140

Field ID: BS-4-8'                                  Lab ID: 280624-004  
Type: SAMPLE

Analyte	Result	RL
Diesel C10-C24	ND	1.0
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
o-Terphenyl	80	59-140

ND= Not Detected  
RL= Reporting Limit



Total Extractable Hydrocarbons			
Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	2030.001	Analysis:	EPA 8015B
Matrix:	Soil	Sampled:	09/07/16
Units:	mg/Kg	Received:	09/07/16
Basis:	as received	Prepared:	09/08/16
Diln Fac:	1.000	Analyzed:	09/08/16
Batch#:	238899		

Field ID: BS-5-10'      Lab ID: 280624-005  
 Type: SAMPLE

Analyte	Result	RL
Diesel C10-C24	ND	0.99
Motor Oil C24-C36	ND	5.0
Surrogate	%REC	Limits
o-Terphenyl	77	59-140

Field ID: BS-6-10'      Lab ID: 280624-006  
 Type: SAMPLE

Analyte	Result	RL
Diesel C10-C24	ND	1.0
Motor Oil C24-C36	ND	5.0
Surrogate	%REC	Limits
o-Terphenyl	78	59-140

Field ID: BS-7-10'      Lab ID: 280624-007  
 Type: SAMPLE

Analyte	Result	RL
Diesel C10-C24	ND	0.99
Motor Oil C24-C36	ND	5.0
Surrogate	%REC	Limits
o-Terphenyl	88	59-140

Field ID: SW-1-10'      Lab ID: 280624-008  
 Type: SAMPLE

Analyte	Result	RL
Diesel C10-C24	ND	1.0
Motor Oil C24-C36	ND	5.0
Surrogate	%REC	Limits
o-Terphenyl	88	59-140

ND= Not Detected  
 RL= Reporting Limit

Total Extractable Hydrocarbons			
Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	2030.001	Analysis:	EPA 8015B
Matrix:	Soil	Sampled:	09/07/16
Units:	mg/Kg	Received:	09/07/16
Basis:	as received	Prepared:	09/08/16
Diln Fac:	1.000	Analyzed:	09/08/16
Batch#:	238899		

Field ID: SW-2-10'  
Type: SAMPLE

Lab ID: 280624-009

Analyte	Result	RL
Diesel C10-C24	ND	0.99
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
o-Terphenyl	73	59-140

Field ID: SW-4-8'  
Type: SAMPLE

Lab ID: 280624-010

Analyte	Result	RL
Diesel C10-C24	ND	1.0
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
o-Terphenyl	93	59-140

Field ID: SW-5-8'  
Type: SAMPLE

Lab ID: 280624-011

Analyte	Result	RL
Diesel C10-C24	ND	1.0
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
o-Terphenyl	102	59-140

Field ID: SW-6-8'  
Type: SAMPLE

Lab ID: 280624-012

Analyte	Result	RL
Diesel C10-C24	ND	1.0
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
o-Terphenyl	99	59-140

ND= Not Detected  
RL= Reporting Limit

Total Extractable Hydrocarbons			
Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	2030.001	Analysis:	EPA 8015B
Matrix:	Soil	Sampled:	09/07/16
Units:	mg/Kg	Received:	09/07/16
Basis:	as received	Prepared:	09/08/16
Diln Fac:	1.000	Analyzed:	09/08/16
Batch#:	238899		

Type: BLANK Lab ID: QC850740

Analyte	Result	RL
Diesel C10-C24	ND	0.99
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
o-Terphenyl	110	59-140

Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	2030.001	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC850741	Batch#:	238899
Matrix:	Soil	Prepared:	09/08/16
Units:	mg/Kg	Analyzed:	09/08/16

Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	50.01	36.05	72	58-137

Surrogate	%REC	Limits
o-Terphenyl	85	59-140

## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	2030.001	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	238899
MSS Lab ID:	280614-002	Sampled:	09/02/16
Matrix:	Soil	Received:	09/02/16
Units:	mg/Kg	Prepared:	09/08/16
Basis:	as received	Analyzed:	09/08/16
Diln Fac:	1.000		

Type: MS Lab ID: QC850742

Analyte	MSS Result	Spiked	Result	%REC	Limits
Diesel C10-C24	0.3862	50.09	48.42	96	46-154

Surrogate	%REC	Limits
o-Terphenyl	113	59-140

Type: MSD Lab ID: QC850743

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	49.78	47.52	95	46-154	1	50

Surrogate	%REC	Limits
o-Terphenyl	114	59-140

RPD= Relative Percent Difference

### Purgeable Organics by GC/MS

Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8260B
Field ID:	BS-2-12'	Diln Fac:	0.9690
Lab ID:	280624-002	Batch#:	238879
Matrix:	Soil	Sampled:	09/07/16
Units:	ug/Kg	Received:	09/07/16
Basis:	as received	Analyzed:	09/08/16

Analyte	Result	RL
Freon 12	ND	9.7
Chloromethane	ND	9.7
Vinyl Chloride	ND	9.7
Bromomethane	ND	9.7
Chloroethane	ND	9.7
Trichlorofluoromethane	ND	4.8
Acetone	ND	19
Freon 113	ND	4.8
1,1-Dichloroethene	ND	4.8
Methylene Chloride	ND	19
Carbon Disulfide	ND	4.8
MTBE	ND	4.8
trans-1,2-Dichloroethene	ND	4.8
Vinyl Acetate	ND	48
1,1-Dichloroethane	ND	4.8
2-Butanone	ND	9.7
cis-1,2-Dichloroethene	ND	4.8
2,2-Dichloropropane	ND	4.8
Chloroform	ND	4.8
Bromochloromethane	ND	4.8
1,1,1-Trichloroethane	ND	4.8
1,1-Dichloropropene	ND	4.8
Carbon Tetrachloride	ND	4.8
1,2-Dichloroethane	ND	4.8
Benzene	ND	4.8
Trichloroethene	ND	4.8
1,2-Dichloropropane	ND	4.8
Bromodichloromethane	ND	4.8
Dibromomethane	ND	4.8
4-Methyl-2-Pentanone	ND	9.7
cis-1,3-Dichloropropene	ND	4.8
Toluene	ND	4.8
trans-1,3-Dichloropropene	ND	4.8
1,1,2-Trichloroethane	ND	4.8
2-Hexanone	ND	9.7
1,3-Dichloropropane	ND	4.8
Tetrachloroethene	ND	4.8

ND= Not Detected

RL= Reporting Limit



### Purgeable Organics by GC/MS

Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8260B
Field ID:	BS-2-12'	Diln Fac:	0.9690
Lab ID:	280624-002	Batch#:	238879
Matrix:	Soil	Sampled:	09/07/16
Units:	ug/Kg	Received:	09/07/16
Basis:	as received	Analyzed:	09/08/16

Analyte	Result	RL
Dibromochloromethane	ND	4.8
1,2-Dibromoethane	ND	4.8
Chlorobenzene	ND	4.8
1,1,1,2-Tetrachloroethane	ND	4.8
Ethylbenzene	ND	4.8
m,p-Xylenes	ND	4.8
o-Xylene	ND	4.8
Styrene	ND	4.8
Bromoform	ND	4.8
Isopropylbenzene	ND	4.8
1,1,2,2-Tetrachloroethane	ND	4.8
1,2,3-Trichloropropane	ND	4.8
Propylbenzene	ND	4.8
Bromobenzene	ND	4.8
1,3,5-Trimethylbenzene	ND	4.8
2-Chlorotoluene	ND	4.8
4-Chlorotoluene	ND	4.8
tert-Butylbenzene	ND	4.8
1,2,4-Trimethylbenzene	ND	4.8
sec-Butylbenzene	ND	4.8
para-Isopropyl Toluene	ND	4.8
1,3-Dichlorobenzene	ND	4.8
1,4-Dichlorobenzene	ND	4.8
n-Butylbenzene	ND	4.8
1,2-Dichlorobenzene	ND	4.8
1,2-Dibromo-3-Chloropropane	ND	4.8
1,2,4-Trichlorobenzene	ND	4.8
Hexachlorobutadiene	ND	4.8
Naphthalene	ND	4.8
1,2,3-Trichlorobenzene	ND	4.8

Surrogate	%REC	Limits
Dibromofluoromethane	104	78-134
1,2-Dichloroethane-d4	108	80-138
Toluene-d8	101	80-120
Bromofluorobenzene	103	78-123

ND= Not Detected  
 RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8260B
Field ID:	BS-5-10'	Diln Fac:	0.9671
Lab ID:	280624-005	Batch#:	238879
Matrix:	Soil	Sampled:	09/07/16
Units:	ug/Kg	Received:	09/07/16
Basis:	as received	Analyzed:	09/08/16

Analyte	Result	RL
Freon 12	ND	9.7
Chloromethane	ND	9.7
Vinyl Chloride	ND	9.7
Bromomethane	ND	9.7
Chloroethane	ND	9.7
Trichlorofluoromethane	ND	4.8
Acetone	ND	19
Freon 113	ND	4.8
1,1-Dichloroethene	ND	4.8
Methylene Chloride	ND	19
Carbon Disulfide	ND	4.8
MTBE	ND	4.8
trans-1,2-Dichloroethene	ND	4.8
Vinyl Acetate	ND	48
1,1-Dichloroethane	ND	4.8
2-Butanone	ND	9.7
cis-1,2-Dichloroethene	ND	4.8
2,2-Dichloropropane	ND	4.8
Chloroform	ND	4.8
Bromochloromethane	ND	4.8
1,1,1-Trichloroethane	ND	4.8
1,1-Dichloropropene	ND	4.8
Carbon Tetrachloride	ND	4.8
1,2-Dichloroethane	ND	4.8
Benzene	ND	4.8
Trichloroethene	ND	4.8
1,2-Dichloropropane	ND	4.8
Bromodichloromethane	ND	4.8
Dibromomethane	ND	4.8
4-Methyl-2-Pentanone	ND	9.7
cis-1,3-Dichloropropene	ND	4.8
Toluene	ND	4.8
trans-1,3-Dichloropropene	ND	4.8
1,1,2-Trichloroethane	ND	4.8
2-Hexanone	ND	9.7
1,3-Dichloropropane	ND	4.8
Tetrachloroethene	ND	4.8

ND= Not Detected

RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8260B
Field ID:	BS-5-10'	Diln Fac:	0.9671
Lab ID:	280624-005	Batch#:	238879
Matrix:	Soil	Sampled:	09/07/16
Units:	ug/Kg	Received:	09/07/16
Basis:	as received	Analyzed:	09/08/16

Analyte	Result	RL
Dibromochloromethane	ND	4.8
1,2-Dibromoethane	ND	4.8
Chlorobenzene	ND	4.8
1,1,1,2-Tetrachloroethane	ND	4.8
Ethylbenzene	ND	4.8
m,p-Xylenes	ND	4.8
o-Xylene	ND	4.8
Styrene	ND	4.8
Bromoform	ND	4.8
Isopropylbenzene	ND	4.8
1,1,2,2-Tetrachloroethane	ND	4.8
1,2,3-Trichloropropane	ND	4.8
Propylbenzene	ND	4.8
Bromobenzene	ND	4.8
1,3,5-Trimethylbenzene	ND	4.8
2-Chlorotoluene	ND	4.8
4-Chlorotoluene	ND	4.8
tert-Butylbenzene	ND	4.8
1,2,4-Trimethylbenzene	ND	4.8
sec-Butylbenzene	ND	4.8
para-Isopropyl Toluene	ND	4.8
1,3-Dichlorobenzene	ND	4.8
1,4-Dichlorobenzene	ND	4.8
n-Butylbenzene	ND	4.8
1,2-Dichlorobenzene	ND	4.8
1,2-Dibromo-3-Chloropropane	ND	4.8
1,2,4-Trichlorobenzene	ND	4.8
Hexachlorobutadiene	ND	4.8
Naphthalene	ND	4.8
1,2,3-Trichlorobenzene	ND	4.8

Surrogate	%REC	Limits
Dibromofluoromethane	103	78-134
1,2-Dichloroethane-d4	107	80-138
Toluene-d8	99	80-120
Bromofluorobenzene	105	78-123

ND= Not Detected  
 RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8260B
Field ID:	SW-1-10'	Diln Fac:	0.9862
Lab ID:	280624-008	Batch#:	238879
Matrix:	Soil	Sampled:	09/07/16
Units:	ug/Kg	Received:	09/07/16
Basis:	as received	Analyzed:	09/08/16

Analyte	Result	RL
Freon 12	ND	9.9
Chloromethane	ND	9.9
Vinyl Chloride	ND	9.9
Bromomethane	ND	9.9
Chloroethane	ND	9.9
Trichlorofluoromethane	ND	4.9
Acetone	ND	20
Freon 113	ND	4.9
1,1-Dichloroethene	ND	4.9
Methylene Chloride	ND	20
Carbon Disulfide	ND	4.9
MTBE	ND	4.9
trans-1,2-Dichloroethene	ND	4.9
Vinyl Acetate	ND	49
1,1-Dichloroethane	ND	4.9
2-Butanone	ND	9.9
cis-1,2-Dichloroethene	ND	4.9
2,2-Dichloropropane	ND	4.9
Chloroform	ND	4.9
Bromochloromethane	ND	4.9
1,1,1-Trichloroethane	ND	4.9
1,1-Dichloropropene	ND	4.9
Carbon Tetrachloride	ND	4.9
1,2-Dichloroethane	ND	4.9
Benzene	ND	4.9
Trichloroethene	ND	4.9
1,2-Dichloropropane	ND	4.9
Bromodichloromethane	ND	4.9
Dibromomethane	ND	4.9
4-Methyl-2-Pentanone	ND	9.9
cis-1,3-Dichloropropene	ND	4.9
Toluene	ND	4.9
trans-1,3-Dichloropropene	ND	4.9
1,1,2-Trichloroethane	ND	4.9
2-Hexanone	ND	9.9
1,3-Dichloropropane	ND	4.9
Tetrachloroethene	ND	4.9

ND= Not Detected

RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8260B
Field ID:	SW-1-10'	Diln Fac:	0.9862
Lab ID:	280624-008	Batch#:	238879
Matrix:	Soil	Sampled:	09/07/16
Units:	ug/Kg	Received:	09/07/16
Basis:	as received	Analyzed:	09/08/16

Analyte	Result	RL
Dibromochloromethane	ND	4.9
1,2-Dibromoethane	ND	4.9
Chlorobenzene	ND	4.9
1,1,1,2-Tetrachloroethane	ND	4.9
Ethylbenzene	ND	4.9
m,p-Xylenes	ND	4.9
o-Xylene	ND	4.9
Styrene	ND	4.9
Bromoform	ND	4.9
Isopropylbenzene	ND	4.9
1,1,2,2-Tetrachloroethane	ND	4.9
1,2,3-Trichloropropane	ND	4.9
Propylbenzene	ND	4.9
Bromobenzene	ND	4.9
1,3,5-Trimethylbenzene	ND	4.9
2-Chlorotoluene	ND	4.9
4-Chlorotoluene	ND	4.9
tert-Butylbenzene	ND	4.9
1,2,4-Trimethylbenzene	ND	4.9
sec-Butylbenzene	ND	4.9
para-Isopropyl Toluene	ND	4.9
1,3-Dichlorobenzene	ND	4.9
1,4-Dichlorobenzene	ND	4.9
n-Butylbenzene	ND	4.9
1,2-Dichlorobenzene	ND	4.9
1,2-Dibromo-3-Chloropropane	ND	4.9
1,2,4-Trichlorobenzene	ND	4.9
Hexachlorobutadiene	ND	4.9
Naphthalene	ND	4.9
1,2,3-Trichlorobenzene	ND	4.9

Surrogate	%REC	Limits
Dibromofluoromethane	102	78-134
1,2-Dichloroethane-d4	105	80-138
Toluene-d8	102	80-120
Bromofluorobenzene	107	78-123

ND= Not Detected  
 RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8260B
Field ID:	SW-4-8'	Diln Fac:	0.9921
Lab ID:	280624-010	Batch#:	238879
Matrix:	Soil	Sampled:	09/07/16
Units:	ug/Kg	Received:	09/07/16
Basis:	as received	Analyzed:	09/08/16

Analyte	Result	RL
Freon 12	ND	9.9
Chloromethane	ND	9.9
Vinyl Chloride	ND	9.9
Bromomethane	ND	9.9
Chloroethane	ND	9.9
Trichlorofluoromethane	ND	5.0
Acetone	ND	20
Freon 113	ND	5.0
1,1-Dichloroethene	ND	5.0
Methylene Chloride	ND	20
Carbon Disulfide	ND	5.0
MTBE	ND	5.0
trans-1,2-Dichloroethene	ND	5.0
Vinyl Acetate	ND	50
1,1-Dichloroethane	ND	5.0
2-Butanone	ND	9.9
cis-1,2-Dichloroethene	ND	5.0
2,2-Dichloropropane	ND	5.0
Chloroform	ND	5.0
Bromochloromethane	ND	5.0
1,1,1-Trichloroethane	ND	5.0
1,1-Dichloropropene	ND	5.0
Carbon Tetrachloride	ND	5.0
1,2-Dichloroethane	ND	5.0
Benzene	ND	5.0
Trichloroethene	ND	5.0
1,2-Dichloropropane	ND	5.0
Bromodichloromethane	ND	5.0
Dibromomethane	ND	5.0
4-Methyl-2-Pentanone	ND	9.9
cis-1,3-Dichloropropene	ND	5.0
Toluene	ND	5.0
trans-1,3-Dichloropropene	ND	5.0
1,1,2-Trichloroethane	ND	5.0
2-Hexanone	ND	9.9
1,3-Dichloropropane	ND	5.0
Tetrachloroethene	ND	5.0

ND= Not Detected

RL= Reporting Limit



### Purgeable Organics by GC/MS

Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8260B
Field ID:	SW-4-8'	Diln Fac:	0.9921
Lab ID:	280624-010	Batch#:	238879
Matrix:	Soil	Sampled:	09/07/16
Units:	ug/Kg	Received:	09/07/16
Basis:	as received	Analyzed:	09/08/16

Analyte	Result	RL
Dibromochloromethane	ND	5.0
1,2-Dibromoethane	ND	5.0
Chlorobenzene	ND	5.0
1,1,1,2-Tetrachloroethane	ND	5.0
Ethylbenzene	ND	5.0
m,p-Xylenes	ND	5.0
o-Xylene	ND	5.0
Styrene	ND	5.0
Bromoform	ND	5.0
Isopropylbenzene	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.0
1,2,3-Trichloropropane	ND	5.0
Propylbenzene	ND	5.0
Bromobenzene	ND	5.0
1,3,5-Trimethylbenzene	ND	5.0
2-Chlorotoluene	ND	5.0
4-Chlorotoluene	ND	5.0
tert-Butylbenzene	ND	5.0
1,2,4-Trimethylbenzene	ND	5.0
sec-Butylbenzene	ND	5.0
para-Isopropyl Toluene	ND	5.0
1,3-Dichlorobenzene	ND	5.0
1,4-Dichlorobenzene	ND	5.0
n-Butylbenzene	ND	5.0
1,2-Dichlorobenzene	ND	5.0
1,2-Dibromo-3-Chloropropane	ND	5.0
1,2,4-Trichlorobenzene	ND	5.0
Hexachlorobutadiene	ND	5.0
Naphthalene	ND	5.0
1,2,3-Trichlorobenzene	ND	5.0

Surrogate	%REC	Limits
Dibromofluoromethane	104	78-134
1,2-Dichloroethane-d4	105	80-138
Toluene-d8	101	80-120
Bromofluorobenzene	108	78-123

ND= Not Detected  
 RL= Reporting Limit

Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8260B
Matrix:	Soil	Batch#:	238879
Units:	ug/Kg	Analyzed:	09/08/16
Diln Fac:	1.000		

Type: BS Lab ID: QC850669

Analyte	Spiked	Result	%REC	Limits
1,1-Dichloroethene	25.00	25.08	100	70-134
Benzene	25.00	25.96	104	80-123
Trichloroethene	25.00	25.47	102	80-128
Toluene	25.00	25.21	101	80-120
Chlorobenzene	25.00	25.04	100	80-123

Surrogate	%REC	Limits
Dibromofluoromethane	103	78-134
1,2-Dichloroethane-d4	105	80-138
Toluene-d8	100	80-120
Bromofluorobenzene	102	78-123

Type: BSD Lab ID: QC850670

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,1-Dichloroethene	25.00	21.79	87	70-134	14	22
Benzene	25.00	22.92	92	80-123	12	21
Trichloroethene	25.00	22.77	91	80-128	11	23
Toluene	25.00	22.77	91	80-120	10	20
Chlorobenzene	25.00	22.86	91	80-123	9	20

Surrogate	%REC	Limits
Dibromofluoromethane	99	78-134
1,2-Dichloroethane-d4	103	80-138
Toluene-d8	101	80-120
Bromofluorobenzene	99	78-123

RPD= Relative Percent Difference

## Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC850671	Batch#:	238879
Matrix:	Soil	Analyzed:	09/08/16
Units:	ug/Kg		

Analyte	Result	RL
Freon 12	ND	10
Chloromethane	ND	10
Vinyl Chloride	ND	10
Bromomethane	ND	10
Chloroethane	ND	10
Trichlorofluoromethane	ND	5.0
Acetone	ND	20
Freon 113	ND	5.0
1,1-Dichloroethene	ND	5.0
Methylene Chloride	ND	20
Carbon Disulfide	ND	5.0
MTBE	ND	5.0
trans-1,2-Dichloroethene	ND	5.0
Vinyl Acetate	ND	50
1,1-Dichloroethane	ND	5.0
2-Butanone	ND	10
cis-1,2-Dichloroethene	ND	5.0
2,2-Dichloropropane	ND	5.0
Chloroform	ND	5.0
Bromochloromethane	ND	5.0
1,1,1-Trichloroethane	ND	5.0
1,1-Dichloropropene	ND	5.0
Carbon Tetrachloride	ND	5.0
1,2-Dichloroethane	ND	5.0
Benzene	ND	5.0
Trichloroethene	ND	5.0
1,2-Dichloropropane	ND	5.0
Bromodichloromethane	ND	5.0
Dibromomethane	ND	5.0
4-Methyl-2-Pentanone	ND	10
cis-1,3-Dichloropropene	ND	5.0
Toluene	ND	5.0
trans-1,3-Dichloropropene	ND	5.0
1,1,2-Trichloroethane	ND	5.0
2-Hexanone	ND	10
1,3-Dichloropropane	ND	5.0
Tetrachloroethene	ND	5.0

ND= Not Detected

RL= Reporting Limit

## Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC850671	Batch#:	238879
Matrix:	Soil	Analyzed:	09/08/16
Units:	ug/Kg		

Analyte	Result	RL
Dibromochloromethane	ND	5.0
1,2-Dibromoethane	ND	5.0
Chlorobenzene	ND	5.0
1,1,1,2-Tetrachloroethane	ND	5.0
Ethylbenzene	ND	5.0
m,p-Xylenes	ND	5.0
o-Xylene	ND	5.0
Styrene	ND	5.0
Bromoform	ND	5.0
Isopropylbenzene	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.0
1,2,3-Trichloropropane	ND	5.0
Propylbenzene	ND	5.0
Bromobenzene	ND	5.0
1,3,5-Trimethylbenzene	ND	5.0
2-Chlorotoluene	ND	5.0
4-Chlorotoluene	ND	5.0
tert-Butylbenzene	ND	5.0
1,2,4-Trimethylbenzene	ND	5.0
sec-Butylbenzene	ND	5.0
para-Isopropyl Toluene	ND	5.0
1,3-Dichlorobenzene	ND	5.0
1,4-Dichlorobenzene	ND	5.0
n-Butylbenzene	ND	5.0
1,2-Dichlorobenzene	ND	5.0
1,2-Dibromo-3-Chloropropane	ND	5.0
1,2,4-Trichlorobenzene	ND	5.0
Hexachlorobutadiene	ND	5.0
Naphthalene	ND	5.0
1,2,3-Trichlorobenzene	ND	5.0

Surrogate	%REC	Limits
Dibromofluoromethane	101	78-134
1,2-Dichloroethane-d4	100	80-138
Toluene-d8	100	80-120
Bromofluorobenzene	104	78-123

ND= Not Detected

RL= Reporting Limit

## Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	280624	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8260B
Field ID:	SW-4-8'	Batch#:	238879
MSS Lab ID:	280624-010	Sampled:	09/07/16
Matrix:	Soil	Received:	09/07/16
Units:	ug/Kg	Analyzed:	09/08/16
Basis:	as received		

Type: MS Diln Fac: 0.9960  
 Lab ID: QC850705

Analyte	MSS Result	Spiked	Result	%REC	Limits
1,1-Dichloroethene	<0.5939	49.80	47.95	96	56-133
Benzene	<0.6920	49.80	48.53	97	57-120
Trichloroethene	<0.7207	49.80	48.48	97	49-145
Toluene	<0.7579	49.80	48.12	97	51-120
Chlorobenzene	<0.6213	49.80	47.16	95	47-120

Surrogate	%REC	Limits
Dibromofluoromethane	102	78-134
1,2-Dichloroethane-d4	102	80-138
Toluene-d8	99	80-120
Bromofluorobenzene	72 *	78-123

Type: MSD Diln Fac: 0.9843  
 Lab ID: QC850706

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,1-Dichloroethene	49.21	49.70	101	56-133	5	46
Benzene	49.21	48.85	99	57-120	2	44
Trichloroethene	49.21	49.45	100	49-145	3	46
Toluene	49.21	48.29	98	51-120	2	47
Chlorobenzene	49.21	48.35	98	47-120	4	50

Surrogate	%REC	Limits
Dibromofluoromethane	102	78-134
1,2-Dichloroethane-d4	102	80-138
Toluene-d8	99	80-120
Bromofluorobenzene	78	78-123

\*= Value outside of QC limits; see narrative

RPD= Relative Percent Difference





**Curtis & Tompkins, Ltd.**  
Analytical Laboratories, Since 1878







Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 280694  
ANALYTICAL REPORT

Pangea Environmental  
1710 Franklin Street  
Oakland, CA 94612

Project : 1233 BOCKMAN  
Location : 1233 Bockman  
Level : II

Sample ID  
SW-3-10'

Lab ID  
280694-001

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: \_\_\_\_\_

Date: 09/13/2016

Will Rice  
Project Manager  
will.rice@ctberk.com

CA ELAP# 2896, NELAP# 4044-001



### CASE NARRATIVE

Laboratory number: 280694  
Client: Pangea Environmental  
Project: 1233 BOCKMAN  
Location: 1233 Bockman  
Request Date: 09/08/16  
Samples Received: 09/08/16

This data package contains sample and QC results for one soil sample, requested for the above referenced project on 09/08/16. The sample was received cold and intact.

**TPH-Purgeables and/or BTXE by GC (EPA 8015B):**

No analytical problems were encountered.

**TPH-Extractables by GC (EPA 8015B):**

No analytical problems were encountered.

**Volatile Organics by GC/MS (EPA 8260B):**

No analytical problems were encountered.



**Curtis & Tompkins Laboratories**  
**ENVIRONMENTAL ANALYTICAL TESTING LABORATORY**  
 In Business Since 1878

2323 Fifth Street  
 Berkeley, CA 94710

Phone (510) 486-0900  
 Fax (510) 486-0532

Project No: 2030.001

Sampler: Simmons Albert

Project Name: 1233 Bockman

Report To: Ron Scheele

Project P. O. No:

Company: Pangea Env

EDD Format: Report Level  II  III  IV

Telephone: (510) 459-6012

Turnaround Time:  RUSH  Standard

Email: [rscheele@pangeaenv.com](mailto:rscheele@pangeaenv.com)

# CHAIN OF CUSTODY

Page 1 of 1  
 Chain of Custody # \_\_\_\_\_



C&T LOGIN # 280694

## ANALYTICAL REQUEST

8415	X	TPH g-l-mv
8260	X	VOCs

Lab No.	Sample ID.	SAMPLING		MATRIX		CHEMICAL PRESERVATIVE				
		Date Collected	Time Collected	Water	Solid	HCl	H2SO4	HNO3	NaOH	None
	SW-3-10'	9/8/16	1400		X					X

Notes:

SAMPLE RECEIPT <input type="checkbox"/> Intact <input type="checkbox"/> Cold <input type="checkbox"/> On Ice <input type="checkbox"/> Ambient	RELINQUISHED BY:  9/8/16 DATE: 9/8/16 TIME: 1622	RECEIVED BY:  9/16 DATE: 9/16 TIME: 1622
---	--	--

**COOLER RECEIPT CHECKLIST**



Curtis & Tompkins, Ltd.

Login # 280694 Date Received 9/8/16 Number of coolers 1  
 Client Pangea Env. Project 1233 Backman  
 Date Opened 9/8 By (print) CB (sign) Charles M...  
 Date Logged in ↓ By (print) SE (sign) [Signature]  
 Date Labeled ↓ By (print) ↓ (sign) ↓

1. Did cooler come with a shipping slip (airbill, etc) \_\_\_\_\_ YES  NO  
 Shipping info \_\_\_\_\_
- 2A. Were custody seals present? ....  YES (circle) on cooler on samples  NO  
 How many \_\_\_\_\_ Name \_\_\_\_\_ Date \_\_\_\_\_
- 2B. Were custody seals intact upon arrival? \_\_\_\_\_ YES NO  N/A
3. Were custody papers dry and intact when received? \_\_\_\_\_ YES NO
4. Were custody papers filled out properly (ink, signed, etc)? \_\_\_\_\_ YES NO
5. Is the project identifiable from custody papers? (If so fill out top of form) \_\_\_\_\_ YES NO
6. Indicate the packing in cooler: (if other, describe) \_\_\_\_\_  
 Bubble Wrap  Foam blocks  Bags  None  
 Cloth material  Cardboard  Styrofoam  Paper towels

7. Temperature documentation: \* Notify PM if temperature exceeds 6°C  
 Type of ice used:  Wet  Blue/Gel  None Temp(°C) 9.8°  
 Temperature blank(s) included?  Thermometer# \_\_\_\_\_  IR Gun# 3  
 Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? \_\_\_\_\_ YES  NO  
 If YES, what time were they transferred to freezer? \_\_\_\_\_
9. Did all bottles arrive unbroken/unopened? \_\_\_\_\_ YES NO
10. Are there any missing / extra samples? \_\_\_\_\_ YES NO
11. Are samples in the appropriate containers for indicated tests? \_\_\_\_\_ YES NO
12. Are sample labels present, in good condition and complete? \_\_\_\_\_ YES NO
13. Do the sample labels agree with custody papers? \_\_\_\_\_ YES NO
14. Was sufficient amount of sample sent for tests requested? \_\_\_\_\_ YES NO
15. Are the samples appropriately preserved? \_\_\_\_\_ YES NO  N/A
16. Did you check preservatives for all bottles for each sample? \_\_\_\_\_ YES NO  N/A
17. Did you document your preservative check? (pH strip lot# \_\_\_\_\_) YES NO  N/A
18. Did you change the hold time in LIMS for unpreserved VOAs? \_\_\_\_\_ YES NO  N/A
19. Did you change the hold time in LIMS for preserved terracores? \_\_\_\_\_ YES NO  N/A
20. Are bubbles > 6mm absent in VOA samples? \_\_\_\_\_ YES NO  N/A
21. Was the client contacted concerning this sample delivery? \_\_\_\_\_ YES  NO  
 If YES, Who was called? \_\_\_\_\_ By \_\_\_\_\_ Date: \_\_\_\_\_

**COMMENTS**

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Detections Summary for 280694

Results for any subcontracted analyses are not included in this summary.

Client : Pangea Environmental  
 Project : 1233 BOCKMAN  
 Location : 1233 Bockman

Client Sample ID : SW-3-10'

Laboratory Sample ID :

280694-001

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	1.1	Y	1.0	mg/Kg	As Recd	1.000	EPA 8015B	EPA 3550B

Y = Sample exhibits chromatographic pattern which does not resemble standard



Total Volatile Hydrocarbons			
Lab #:	280694	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8015B
Field ID:	SW-3-10'	Diln Fac:	1.000
Matrix:	Soil	Batch#:	238925
Units:	mg/Kg	Sampled:	09/08/16
Basis:	as received	Received:	09/08/16

Type: SAMPLE Analyzed: 09/10/16  
 Lab ID: 280694-001

Analyte	Result	RL
Gasoline C7-C12	ND	0.97

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	93	78-138

Type: BLANK Analyzed: 09/09/16  
 Lab ID: QC850827

Analyte	Result	RL
Gasoline C7-C12	ND	1.0

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	91	78-138

ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	280694	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC850828	Batch#:	238925
Matrix:	Soil	Analyzed:	09/09/16
Units:	mg/Kg		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1.000	1.113	111	80-121

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	99	78-138



Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	280694	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Diln Fac:	1.000
MSS Lab ID:	280672-001	Batch#:	238925
Matrix:	Soil	Sampled:	09/08/16
Units:	mg/Kg	Received:	09/08/16
Basis:	as received	Analyzed:	09/09/16

Type: MS Lab ID: QC850829

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	0.1230	9.434	8.259	86	50-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	97	78-138

Type: MSD Lab ID: QC850830

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	9.434	8.446	88	50-120	2	31

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	101	78-138

RPD= Relative Percent Difference

Total Extractable Hydrocarbons			
Lab #:	280694	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	2030.001	Analysis:	EPA 8015B
Field ID:	SW-3-10'	Batch#:	238926
Matrix:	Soil	Sampled:	09/08/16
Units:	mg/Kg	Received:	09/08/16
Basis:	as received	Prepared:	09/09/16
Diln Fac:	1.000	Analyzed:	09/09/16

Type: SAMPLE Lab ID: 280694-001

Analyte	Result	RL
Diesel C10-C24	1.1 Y	1.0
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
o-Terphenyl	86	59-140

Type: BLANK Lab ID: QC850835

Analyte	Result	RL
Diesel C10-C24	ND	1.0
Motor Oil C24-C36	ND	5.0

Surrogate	%REC	Limits
o-Terphenyl	96	59-140

Y= Sample exhibits chromatographic pattern which does not resemble standard  
 ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	280694	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	2030.001	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC850836	Batch#:	238926
Matrix:	Soil	Prepared:	09/09/16
Units:	mg/Kg	Analyzed:	09/09/16

Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	49.95	34.23	69	58-137

Surrogate	%REC	Limits
o-Terphenyl	69	59-140

## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	280694	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 3550B
Project#:	2030.001	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	238926
MSS Lab ID:	280689-009	Sampled:	09/08/16
Matrix:	Soil	Received:	09/08/16
Units:	mg/Kg	Prepared:	09/09/16
Basis:	as received	Analyzed:	09/10/16
Diln Fac:	1.000		

Type: MS Lab ID: QC850837

Analyte	MSS Result	Spiked	Result	%REC	Limits
Diesel C10-C24	0.6874	49.97	47.28	93	46-154

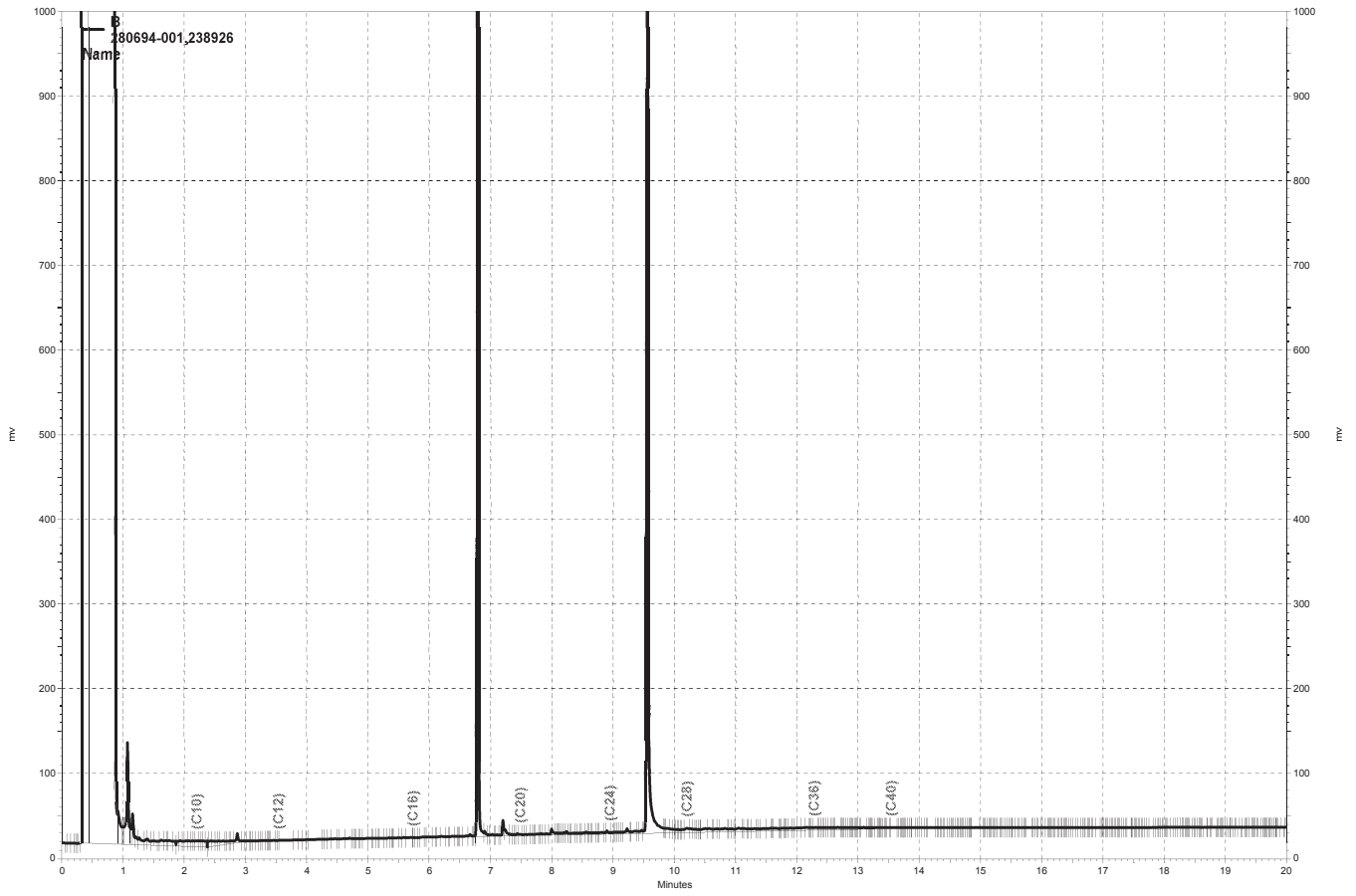
Surrogate	%REC	Limits
o-Terphenyl	95	59-140

Type: MSD Lab ID: QC850838

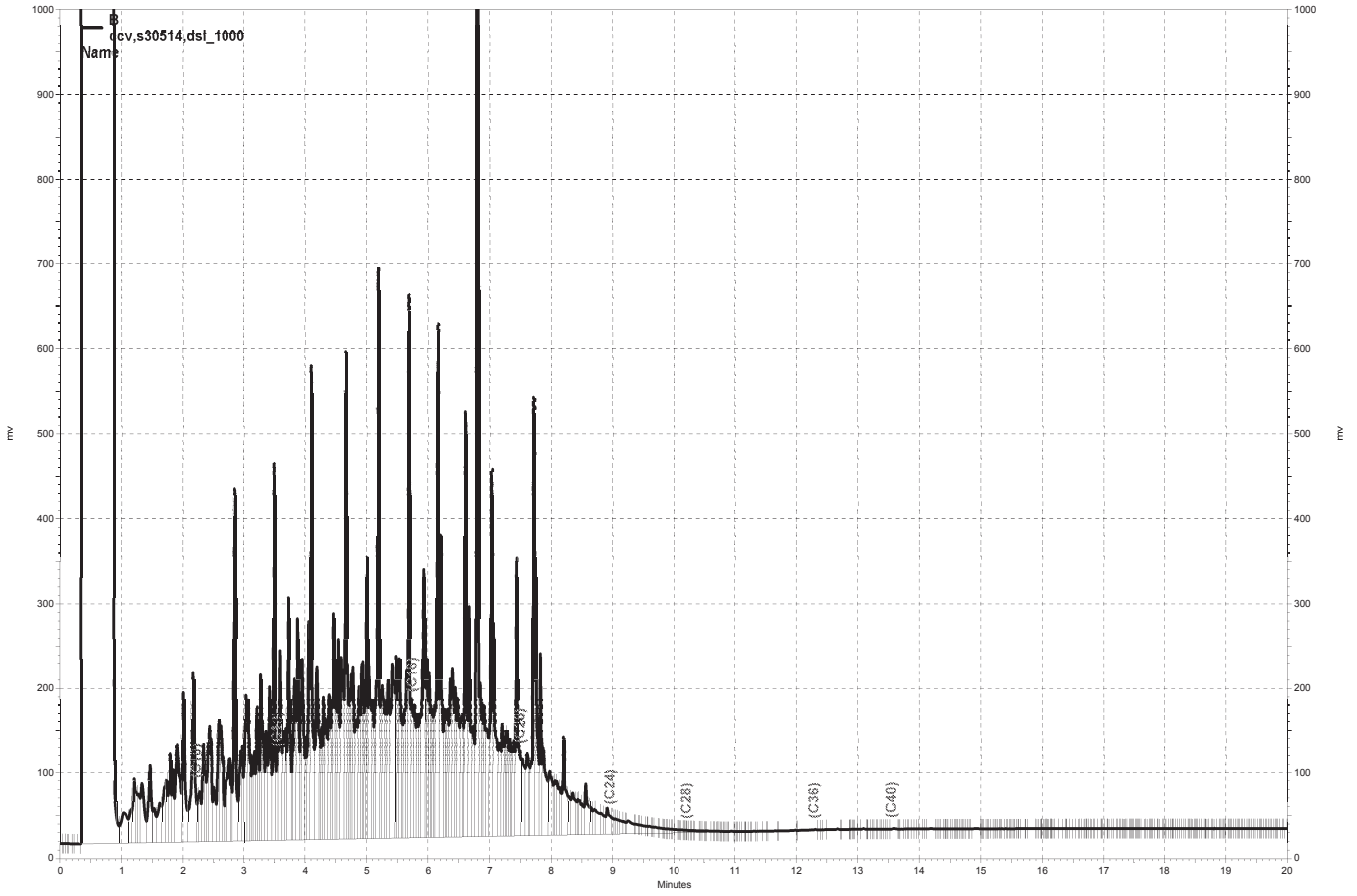
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	50.04	42.97	85	46-154	10	50

Surrogate	%REC	Limits
o-Terphenyl	86	59-140

RPD= Relative Percent Difference

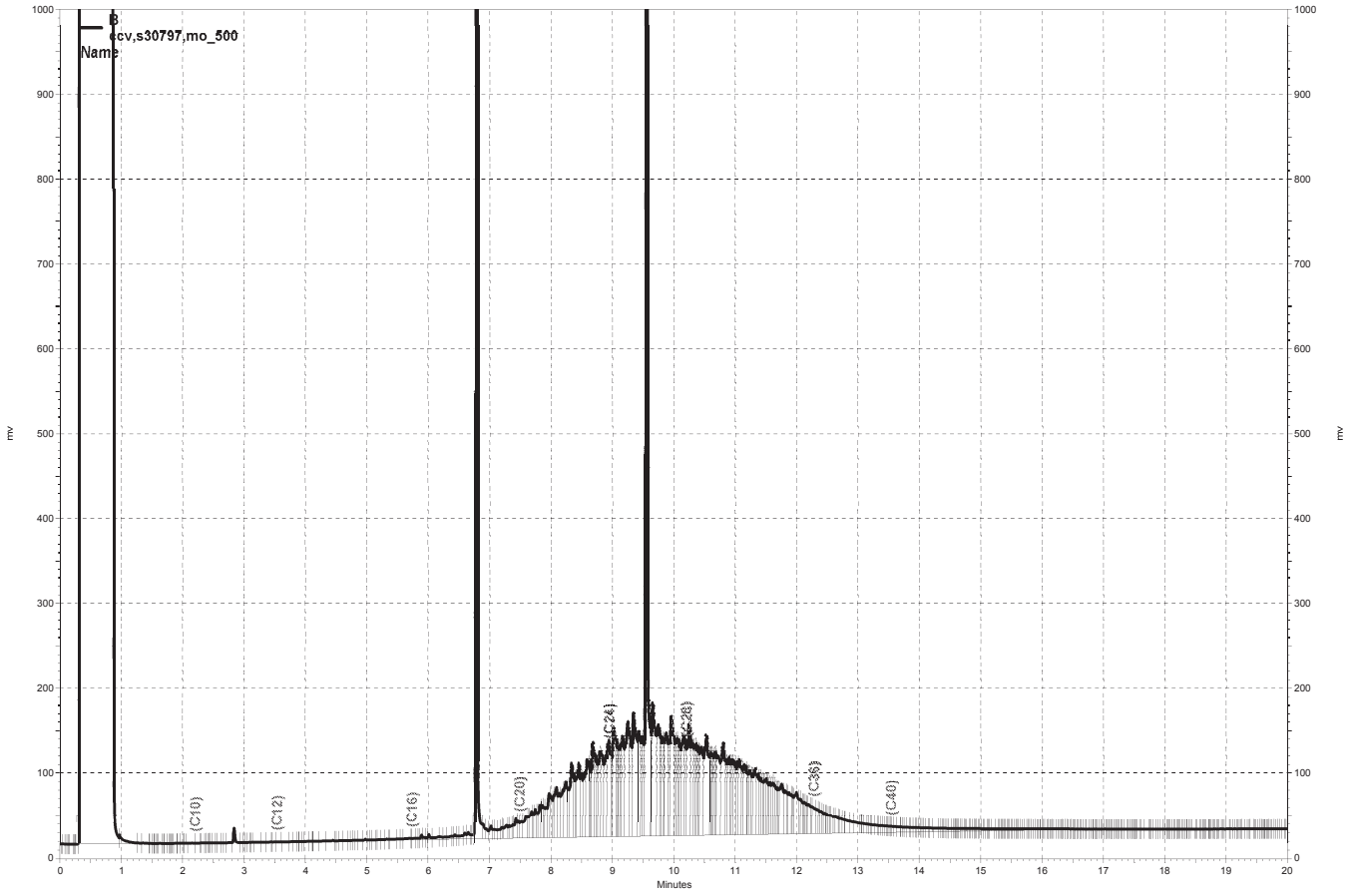


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### Purgeable Organics by GC/MS

Lab #:	280694	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8260B
Field ID:	SW-3-10'	Diln Fac:	0.9940
Lab ID:	280694-001	Batch#:	238917
Matrix:	Soil	Sampled:	09/08/16
Units:	ug/Kg	Received:	09/08/16
Basis:	as received	Analyzed:	09/09/16

Analyte	Result	RL
Freon 12	ND	9.9
Chloromethane	ND	9.9
Vinyl Chloride	ND	9.9
Bromomethane	ND	9.9
Chloroethane	ND	9.9
Trichlorofluoromethane	ND	5.0
Acetone	ND	20
Freon 113	ND	5.0
1,1-Dichloroethene	ND	5.0
Methylene Chloride	ND	20
Carbon Disulfide	ND	5.0
MTBE	ND	5.0
trans-1,2-Dichloroethene	ND	5.0
Vinyl Acetate	ND	50
1,1-Dichloroethane	ND	5.0
2-Butanone	ND	9.9
cis-1,2-Dichloroethene	ND	5.0
2,2-Dichloropropane	ND	5.0
Chloroform	ND	5.0
Bromochloromethane	ND	5.0
1,1,1-Trichloroethane	ND	5.0
1,1-Dichloropropene	ND	5.0
Carbon Tetrachloride	ND	5.0
1,2-Dichloroethane	ND	5.0
Benzene	ND	5.0
Trichloroethene	ND	5.0
1,2-Dichloropropane	ND	5.0
Bromodichloromethane	ND	5.0
Dibromomethane	ND	5.0
4-Methyl-2-Pentanone	ND	9.9
cis-1,3-Dichloropropene	ND	5.0
Toluene	ND	5.0
trans-1,3-Dichloropropene	ND	5.0
1,1,2-Trichloroethane	ND	5.0
2-Hexanone	ND	9.9
1,3-Dichloropropane	ND	5.0
Tetrachloroethene	ND	5.0

ND= Not Detected

RL= Reporting Limit

### Purgeable Organics by GC/MS

Lab #:	280694	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8260B
Field ID:	SW-3-10'	Diln Fac:	0.9940
Lab ID:	280694-001	Batch#:	238917
Matrix:	Soil	Sampled:	09/08/16
Units:	ug/Kg	Received:	09/08/16
Basis:	as received	Analyzed:	09/09/16

Analyte	Result	RL
Dibromochloromethane	ND	5.0
1,2-Dibromoethane	ND	5.0
Chlorobenzene	ND	5.0
1,1,1,2-Tetrachloroethane	ND	5.0
Ethylbenzene	ND	5.0
m,p-Xylenes	ND	5.0
o-Xylene	ND	5.0
Styrene	ND	5.0
Bromoform	ND	5.0
Isopropylbenzene	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.0
1,2,3-Trichloropropane	ND	5.0
Propylbenzene	ND	5.0
Bromobenzene	ND	5.0
1,3,5-Trimethylbenzene	ND	5.0
2-Chlorotoluene	ND	5.0
4-Chlorotoluene	ND	5.0
tert-Butylbenzene	ND	5.0
1,2,4-Trimethylbenzene	ND	5.0
sec-Butylbenzene	ND	5.0
para-Isopropyl Toluene	ND	5.0
1,3-Dichlorobenzene	ND	5.0
1,4-Dichlorobenzene	ND	5.0
n-Butylbenzene	ND	5.0
1,2-Dichlorobenzene	ND	5.0
1,2-Dibromo-3-Chloropropane	ND	5.0
1,2,4-Trichlorobenzene	ND	5.0
Hexachlorobutadiene	ND	5.0
Naphthalene	ND	5.0
1,2,3-Trichlorobenzene	ND	5.0

Surrogate	%REC	Limits
Dibromofluoromethane	103	78-134
1,2-Dichloroethane-d4	104	80-138
Toluene-d8	100	80-120
Bromofluorobenzene	108	78-123

ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	280694	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8260B
Matrix:	Soil	Batch#:	238917
Units:	ug/Kg	Analyzed:	09/09/16
Diln Fac:	1.000		

Type: BS Lab ID: QC850804

Analyte	Spiked	Result	%REC	Limits
1,1-Dichloroethene	25.00	25.13	101	70-134
Benzene	25.00	25.71	103	80-123
Trichloroethene	25.00	25.14	101	80-128
Toluene	25.00	24.99	100	80-120
Chlorobenzene	25.00	24.78	99	80-123

Surrogate	%REC	Limits
Dibromofluoromethane	101	78-134
1,2-Dichloroethane-d4	106	80-138
Toluene-d8	99	80-120
Bromofluorobenzene	99	78-123

Type: BSD Lab ID: QC850805

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,1-Dichloroethene	25.00	21.55	86	70-134	15	22
Benzene	25.00	22.72	91	80-123	12	21
Trichloroethene	25.00	21.91	88	80-128	14	23
Toluene	25.00	22.23	89	80-120	12	20
Chlorobenzene	25.00	22.40	90	80-123	10	20

Surrogate	%REC	Limits
Dibromofluoromethane	100	78-134
1,2-Dichloroethane-d4	101	80-138
Toluene-d8	99	80-120
Bromofluorobenzene	99	78-123

RPD= Relative Percent Difference

## Batch QC Report

Purgeable Organics by GC/MS			
Lab #:	280694	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC850806	Batch#:	238917
Matrix:	Soil	Analyzed:	09/09/16
Units:	ug/Kg		

Analyte	Result	RL
Freon 12	ND	10
Chloromethane	ND	10
Vinyl Chloride	ND	10
Bromomethane	ND	10
Chloroethane	ND	10
Trichlorofluoromethane	ND	5.0
Acetone	ND	20
Freon 113	ND	5.0
1,1-Dichloroethene	ND	5.0
Methylene Chloride	ND	20
Carbon Disulfide	ND	5.0
MTBE	ND	5.0
trans-1,2-Dichloroethene	ND	5.0
Vinyl Acetate	ND	50
1,1-Dichloroethane	ND	5.0
2-Butanone	ND	10
cis-1,2-Dichloroethene	ND	5.0
2,2-Dichloropropane	ND	5.0
Chloroform	ND	5.0
Bromochloromethane	ND	5.0
1,1,1-Trichloroethane	ND	5.0
1,1-Dichloropropene	ND	5.0
Carbon Tetrachloride	ND	5.0
1,2-Dichloroethane	ND	5.0
Benzene	ND	5.0
Trichloroethene	ND	5.0
1,2-Dichloropropane	ND	5.0
Bromodichloromethane	ND	5.0
Dibromomethane	ND	5.0
4-Methyl-2-Pentanone	ND	10
cis-1,3-Dichloropropene	ND	5.0
Toluene	ND	5.0
trans-1,3-Dichloropropene	ND	5.0
1,1,2-Trichloroethane	ND	5.0
2-Hexanone	ND	10
1,3-Dichloropropane	ND	5.0
Tetrachloroethene	ND	5.0

ND= Not Detected

RL= Reporting Limit

**Batch QC Report**

<b>Purgeable Organics by GC/MS</b>			
Lab #:	280694	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5030B
Project#:	2030.001	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC850806	Batch#:	238917
Matrix:	Soil	Analyzed:	09/09/16
Units:	ug/Kg		

<b>Analyte</b>	<b>Result</b>	<b>RL</b>
Dibromochloromethane	ND	5.0
1,2-Dibromoethane	ND	5.0
Chlorobenzene	ND	5.0
1,1,1,2-Tetrachloroethane	ND	5.0
Ethylbenzene	ND	5.0
m,p-Xylenes	ND	5.0
o-Xylene	ND	5.0
Styrene	ND	5.0
Bromoform	ND	5.0
Isopropylbenzene	ND	5.0
1,1,2,2-Tetrachloroethane	ND	5.0
1,2,3-Trichloropropane	ND	5.0
Propylbenzene	ND	5.0
Bromobenzene	ND	5.0
1,3,5-Trimethylbenzene	ND	5.0
2-Chlorotoluene	ND	5.0
4-Chlorotoluene	ND	5.0
tert-Butylbenzene	ND	5.0
1,2,4-Trimethylbenzene	ND	5.0
sec-Butylbenzene	ND	5.0
para-Isopropyl Toluene	ND	5.0
1,3-Dichlorobenzene	ND	5.0
1,4-Dichlorobenzene	ND	5.0
n-Butylbenzene	ND	5.0
1,2-Dichlorobenzene	ND	5.0
1,2-Dibromo-3-Chloropropane	ND	5.0
1,2,4-Trichlorobenzene	ND	5.0
Hexachlorobutadiene	ND	5.0
Naphthalene	ND	5.0
1,2,3-Trichlorobenzene	ND	5.0

<b>Surrogate</b>	<b>%REC</b>	<b>Limits</b>
Dibromofluoromethane	101	78-134
1,2-Dichloroethane-d4	100	80-138
Toluene-d8	97	80-120
Bromofluorobenzene	104	78-123

ND= Not Detected

RL= Reporting Limit

**Batch QC Report**

Purgeable Organics by GC/MS			
Lab #:	280694	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	EPA 5035
Project#:	2030.001	Analysis:	EPA 8260B
Field ID:	ZZZZZZZZZZ	Batch#:	238917
MSS Lab ID:	280689-001	Sampled:	09/08/16
Matrix:	Soil	Received:	09/08/16
Units:	ug/Kg	Analyzed:	09/09/16
Basis:	as received		

Type: MS Diln Fac: 1.548  
 Lab ID: QC850831

Analyte	MSS Result	Spiked	Result	%REC	Limits
1,1-Dichloroethene	<0.6197	77.40	78.40	101	56-133
Benzene	<0.7220	77.40	76.20	98	57-120
Trichloroethene	<0.7520	77.40	75.25	97	49-145
Toluene	<0.7909	77.40	72.70	94	51-120
Chlorobenzene	<0.6484	77.40	69.41	90	47-120

Surrogate	%REC	Limits
Dibromofluoromethane	103	78-134
1,2-Dichloroethane-d4	106	80-138
Toluene-d8	99	80-120
Bromofluorobenzene	86	78-123

Type: MSD Diln Fac: 1.114  
 Lab ID: QC850832

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
1,1-Dichloroethene	55.68	50.62	91	56-133	11	46
Benzene	55.68	50.72	91	57-120	8	44
Trichloroethene	55.68	51.60	93	49-145	5	46
Toluene	55.68	48.93	88	51-120	7	47
Chlorobenzene	55.68	47.49	85	47-120	5	50

Surrogate	%REC	Limits
Dibromofluoromethane	99	78-134
1,2-Dichloroethane-d4	105	80-138
Toluene-d8	97	80-120
Bromofluorobenzene	80	78-123

RPD= Relative Percent Difference





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Analytical Laboratories, Since 1878







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2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 281165  
ANALYTICAL REPORT

Pangea Environmental  
1710 Franklin Street  
Oakland, CA 94612

Project : 1233 BOCKMAN  
Location : 1233 Bockman  
Level : II

<u>Sample ID</u>	<u>Lab ID</u>
SV-41	281165-001
SV-42	281165-002
SV-43	281165-003
SV-45	281165-004

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: \_\_\_\_\_

Date: 09/26/2016

Will Rice  
Project Manager  
will.rice@ctberk.com

### CASE NARRATIVE

Laboratory number: 281165  
Client: Pangea Environmental  
Project: 1233 BOCKMAN  
Location: 1233 Bockman  
Request Date: 09/19/16  
Samples Received: 09/19/16

This data package contains sample and QC results for four air samples, requested for the above referenced project on 09/19/16. The samples were received cold and intact.

**Volatile Organics in Air by MS (EPA TO-15):**

Low response was observed for carbon tetrachloride in the ICV analyzed 08/24/16 02:30; affected data was qualified with "b". No other analytical problems were encountered.

**Volatile Organics in Air GC (ASTM D1946):**

No analytical problems were encountered.

**Curtis & Tompkins, Ltd.**  
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(510)486-0532 Fax

# AIR TESTING CHAIN OF CUSTODY & PURCHASE ORDER

Page 1 of 1  
Chain of Custody #:

C&T LOGIN # 281165  
Sampler: E. Lervog  
Report To: Ron Schaele  
Company: Panga Env. Svcs  
Telephone: 510-831-3700  
Email: r.schaele@pangaenv.com

TESTING REQUESTED

Lab No.	Sample ID.	Sampling Information			Canister ID (Bar Code #)	Flow Controller ID	Sample Volume (Gauge Reading)
		Date Collected	Time Collected				
1	SV-41	9/19/16	1358	00050	A00140	29/10	
2	SV-42		1540	00093	A00209	38/25	
3	SV-43		1041	00049	A00221	28/2	
4	SV-45	9/19/16	1121	00283	A00208	30/5	


Project No: 1233 Backman  
Project Name:  
EDD Format:    Rpt Level: II III IV  
Turnaround Time: 3 DAY  Rush  Standard

Notes:

RELIQUISHED BY: [Signature] 9/19/16 709 DATE/TIME  
RECEIVED BY: [Signature] 9/19/16 1709 DATE/TIME

**COOLER RECEIPT CHECKLIST**



Login # 281165 Date Received 9/19/16 Number of coolers 0  
 Client Pangea Project 1233 Bockman  
 Date Opened 9/19/16 By (print) CAR (sign) [Signature]  
 Date Logged in ↓ By (print) ↓ (sign) ↓

1. Did cooler come with a shipping slip (airbill, etc) \_\_\_\_\_ YES NO  
 Shipping info \_\_\_\_\_
- 2A. Were custody seals present? ....  YES (circle) on cooler on samples  NO  
 How many \_\_\_\_\_ Name \_\_\_\_\_ Date \_\_\_\_\_
- 2B. Were custody seals intact upon arrival? \_\_\_\_\_ YES NO N/A
3. Were custody papers dry and intact when received? \_\_\_\_\_ YES NO
4. Were custody papers filled out properly (ink, signed, etc)? \_\_\_\_\_ YES NO
5. Is the project identifiable from custody papers? (If so fill out top of form) \_\_\_\_\_ YES NO
6. Indicate the packing in cooler: (if other, describe) \_\_\_\_\_  
 Bubble Wrap     Foam blocks     Bags     None  
 Cloth material     Cardboard     Styrofoam     Paper towels
7. Temperature documentation: \* Notify PM if temperature exceeds 6°C  
 Type of ice used:  Wet     Blue/Gel     None    Temp(°C) \_\_\_\_\_  
 Samples Received on ice & cold without a temperature blank  
 Samples received on ice directly from the field. Cooling process had begun
8. Were Method 5035 sampling containers present? \_\_\_\_\_ YES NO  
 If YES, what time were they transferred to freezer? \_\_\_\_\_
9. Did all bottles arrive unbroken/unopened? \_\_\_\_\_ YES NO
10. Are there any missing / extra samples? \_\_\_\_\_ YES NO
11. Are samples in the appropriate containers for indicated tests? \_\_\_\_\_ YES NO
12. Are sample labels present, in good condition and complete? \_\_\_\_\_ YES NO
13. Do the sample labels agree with custody papers? \_\_\_\_\_ YES NO
14. Was sufficient amount of sample sent for tests requested? \_\_\_\_\_ YES NO
15. Are the samples appropriately preserved? \_\_\_\_\_ YES NO N/A
16. Did you check preservatives for all bottles for each sample? \_\_\_\_\_ YES NO N/A
17. Did you document your preservative check? \_\_\_\_\_ YES NO N/A
18. Did you change the hold time in LIMS for unpreserved VOAs? \_\_\_\_\_ YES NO N/A
19. Did you change the hold time in LIMS for preserved terracores? \_\_\_\_\_ YES NO N/A
20. Are bubbles > 6mm absent in VOA samples? \_\_\_\_\_ YES NO N/A
21. Was the client contacted concerning this sample delivery? \_\_\_\_\_ YES NO  
 If YES, Who was called? \_\_\_\_\_ By \_\_\_\_\_ Date: \_\_\_\_\_

COMMENTS  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

### Detections Summary for 281165

Results for any subcontracted analyses are not included in this summary.

Client : Pangea Environmental  
 Project : 1233 BOCKMAN  
 Location : 1233 Bockman

Client Sample ID : SV-41

Laboratory Sample ID :

281165-001

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	33		5.7	ppbv	As Recd	2.830	EPA TO-15	METHOD
Carbon Disulfide	2.8		1.4	ppbv	As Recd	2.830	EPA TO-15	METHOD
MTBE	7.9		1.4	ppbv	As Recd	2.830	EPA TO-15	METHOD
n-Hexane	4.3		1.4	ppbv	As Recd	2.830	EPA TO-15	METHOD
2-Butanone	3.6		1.4	ppbv	As Recd	2.830	EPA TO-15	METHOD
Benzene	15		1.4	ppbv	As Recd	2.830	EPA TO-15	METHOD
n-Heptane	1.9		1.4	ppbv	As Recd	2.830	EPA TO-15	METHOD
Toluene	8.4		1.4	ppbv	As Recd	2.830	EPA TO-15	METHOD
m,p-Xylenes	1.7		1.4	ppbv	As Recd	2.830	EPA TO-15	METHOD
Oxygen	29,000		3,900	ppmv	As Recd	3.910	ASTM D1946	METHOD

Client Sample ID : SV-42

Laboratory Sample ID :

281165-002

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	34		25	ppbv	As Recd	12.60	EPA TO-15	METHOD
Oxygen	110,000		18,000	ppmv	As Recd	17.90	ASTM D1946	METHOD

Client Sample ID : SV-43

Laboratory Sample ID :

281165-003

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	5.2		3.9	ppbv	As Recd	1.930	EPA TO-15	METHOD
Carbon Disulfide	4.4		0.97	ppbv	As Recd	1.930	EPA TO-15	METHOD
Tetrahydrofuran	2.3		0.97	ppbv	As Recd	1.930	EPA TO-15	METHOD
Benzene	2.2		0.97	ppbv	As Recd	1.930	EPA TO-15	METHOD
Toluene	6.1		0.97	ppbv	As Recd	1.930	EPA TO-15	METHOD
Ethylbenzene	1.6		0.97	ppbv	As Recd	1.930	EPA TO-15	METHOD
m,p-Xylenes	5.7		0.97	ppbv	As Recd	1.930	EPA TO-15	METHOD
o-Xylene	1.7		0.97	ppbv	As Recd	1.930	EPA TO-15	METHOD
1,2,4-Trimethylbenzene	1.6		0.97	ppbv	As Recd	1.930	EPA TO-15	METHOD
Oxygen	100,000		2,700	ppmv	As Recd	2.740	ASTM D1946	METHOD



Client Sample ID : SV-45

Laboratory Sample ID :

281165-004

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Carbon Disulfide	4.6		1.1	ppbv	As Recd	2.150	EPA TO-15	METHOD
Benzene	2.7		1.1	ppbv	As Recd	2.150	EPA TO-15	METHOD
Toluene	8.7		1.1	ppbv	As Recd	2.150	EPA TO-15	METHOD
Tetrachloroethene	3.0		1.1	ppbv	As Recd	2.150	EPA TO-15	METHOD
Ethylbenzene	2.2		1.1	ppbv	As Recd	2.150	EPA TO-15	METHOD
m,p-Xylenes	7.7		1.1	ppbv	As Recd	2.150	EPA TO-15	METHOD
o-Xylene	2.2		1.1	ppbv	As Recd	2.150	EPA TO-15	METHOD
1,2,4-Trimethylbenzene	1.5		1.1	ppbv	As Recd	2.150	EPA TO-15	METHOD
Oxygen	45,000		3,000	ppmv	As Recd	2.990	ASTM D1946	METHOD



### Volatile Organics in Air

Lab #:	281165	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	1233 BOCKMAN	Analysis:	EPA TO-15
Field ID:	SV-41	Diln Fac:	2.830
Lab ID:	281165-001	Batch#:	239330
Matrix:	Air	Sampled:	09/19/16
Units (V):	ppbv	Received:	09/19/16
Units (M):	ug/m3	Analyzed:	09/22/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.4	ND	7.0
Freon 114	ND	1.4	ND	9.9
Chloromethane	ND	1.4	ND	2.9
Vinyl Chloride	ND	1.4	ND	3.6
1,3-Butadiene	ND	1.4	ND	3.1
Bromomethane	ND	1.4	ND	5.5
Chloroethane	ND	1.4	ND	3.7
Trichlorofluoromethane	ND	1.4	ND	7.9
Acrolein	ND	5.7	ND	13
1,1-Dichloroethene	ND	1.4	ND	5.6
Freon 113	ND	1.4	ND	11
Acetone	33	5.7	79	13
Carbon Disulfide	2.8	1.4	8.7	4.4
Isopropanol	ND	5.7	ND	14
Methylene Chloride	ND	1.4	ND	4.9
trans-1,2-Dichloroethene	ND	1.4	ND	5.6
MTBE	7.9	1.4	28	5.1
n-Hexane	4.3	1.4	15	5.0
1,1-Dichloroethane	ND	1.4	ND	5.7
Vinyl Acetate	ND	1.4	ND	5.0
cis-1,2-Dichloroethene	ND	1.4	ND	5.6
2-Butanone	3.6	1.4	11	4.2
Ethyl Acetate	ND	1.4	ND	5.1
Tetrahydrofuran	ND	1.4	ND	4.2
Chloroform	ND	1.4	ND	6.9
1,1,1-Trichloroethane	ND	1.4	ND	7.7
Cyclohexane	ND	1.4	ND	4.9
Carbon Tetrachloride	ND	1.4	ND	8.9
Benzene	15	1.4	49	4.5
1,2-Dichloroethane	ND	1.4	ND	5.7
n-Heptane	1.9	1.4	7.6	5.8
Trichloroethene	ND	1.4	ND	7.6
1,2-Dichloropropane	ND	1.4	ND	6.5
Bromodichloromethane	ND	1.4	ND	9.5
cis-1,3-Dichloropropene	ND	1.4	ND	6.4

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	281165	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	1233 BOCKMAN	Analysis:	EPA TO-15
Field ID:	SV-41	Diln Fac:	2.830
Lab ID:	281165-001	Batch#:	239330
Matrix:	Air	Sampled:	09/19/16
Units (V):	ppbv	Received:	09/19/16
Units (M):	ug/m3	Analyzed:	09/22/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.4	ND	5.8
Toluene	8.4	1.4	31	5.3
trans-1,3-Dichloropropene	ND	1.4	ND	6.4
1,1,2-Trichloroethane	ND	1.4	ND	7.7
Tetrachloroethene	ND	1.4	ND	9.6
2-Hexanone	ND	1.4	ND	5.8
Dibromochloromethane	ND	1.4	ND	12
1,2-Dibromoethane	ND	1.4	ND	11
Chlorobenzene	ND	1.4	ND	6.5
Ethylbenzene	ND	1.4	ND	6.1
m,p-Xylenes	1.7	1.4	7.6	6.1
o-Xylene	ND	1.4	ND	6.1
Styrene	ND	1.4	ND	6.0
Bromoform	ND	1.4	ND	15
1,1,2,2-Tetrachloroethane	ND	1.4	ND	9.7
4-Ethyltoluene	ND	1.4	ND	7.0
1,3,5-Trimethylbenzene	ND	1.4	ND	7.0
1,2,4-Trimethylbenzene	ND	1.4	ND	7.0
1,3-Dichlorobenzene	ND	1.4	ND	8.5
1,4-Dichlorobenzene	ND	1.4	ND	8.5
Benzyl chloride	ND	1.4	ND	7.3
1,2-Dichlorobenzene	ND	1.4	ND	8.5
1,2,4-Trichlorobenzene	ND	1.4	ND	11
Hexachlorobutadiene	ND	1.4	ND	15
Naphthalene	ND	5.7	ND	30

Surrogate	%REC	Limits
Bromofluorobenzene	104	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	281165	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	1233 BOCKMAN	Analysis:	EPA TO-15
Field ID:	SV-42	Diln Fac:	12.60
Lab ID:	281165-002	Batch#:	239330
Matrix:	Air	Sampled:	09/19/16
Units (V):	ppbv	Received:	09/19/16
Units (M):	ug/m3	Analyzed:	09/22/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	6.3	ND	31
Freon 114	ND	6.3	ND	44
Chloromethane	ND	6.3	ND	13
Vinyl Chloride	ND	6.3	ND	16
1,3-Butadiene	ND	6.3	ND	14
Bromomethane	ND	6.3	ND	24
Chloroethane	ND	6.3	ND	17
Trichlorofluoromethane	ND	6.3	ND	35
Acrolein	ND	25	ND	58
1,1-Dichloroethene	ND	6.3	ND	25
Freon 113	ND	6.3	ND	48
Acetone	34	25	82	60
Carbon Disulfide	ND	6.3	ND	20
Isopropanol	ND	25	ND	62
Methylene Chloride	ND	6.3	ND	22
trans-1,2-Dichloroethene	ND	6.3	ND	25
MTBE	ND	6.3	ND	23
n-Hexane	ND	6.3	ND	22
1,1-Dichloroethane	ND	6.3	ND	25
Vinyl Acetate	ND	6.3	ND	22
cis-1,2-Dichloroethene	ND	6.3	ND	25
2-Butanone	ND	6.3	ND	19
Ethyl Acetate	ND	6.3	ND	23
Tetrahydrofuran	ND	6.3	ND	19
Chloroform	ND	6.3	ND	31
1,1,1-Trichloroethane	ND	6.3	ND	34
Cyclohexane	ND	6.3	ND	22
Carbon Tetrachloride	ND	6.3	ND	40
Benzene	ND	6.3	ND	20
1,2-Dichloroethane	ND	6.3	ND	25
n-Heptane	ND	6.3	ND	26
Trichloroethene	ND	6.3	ND	34
1,2-Dichloropropane	ND	6.3	ND	29
Bromodichloromethane	ND	6.3	ND	42
cis-1,3-Dichloropropene	ND	6.3	ND	29

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	281165	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	1233 BOCKMAN	Analysis:	EPA TO-15
Field ID:	SV-42	Diln Fac:	12.60
Lab ID:	281165-002	Batch#:	239330
Matrix:	Air	Sampled:	09/19/16
Units (V):	ppbv	Received:	09/19/16
Units (M):	ug/m3	Analyzed:	09/22/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	6.3	ND	26
Toluene	ND	6.3	ND	24
trans-1,3-Dichloropropene	ND	6.3	ND	29
1,1,2-Trichloroethane	ND	6.3	ND	34
Tetrachloroethene	ND	6.3	ND	43
2-Hexanone	ND	6.3	ND	26
Dibromochloromethane	ND	6.3	ND	54
1,2-Dibromoethane	ND	6.3	ND	48
Chlorobenzene	ND	6.3	ND	29
Ethylbenzene	ND	6.3	ND	27
m,p-Xylenes	ND	6.3	ND	27
o-Xylene	ND	6.3	ND	27
Styrene	ND	6.3	ND	27
Bromoform	ND	6.3	ND	65
1,1,2,2-Tetrachloroethane	ND	6.3	ND	43
4-Ethyltoluene	ND	6.3	ND	31
1,3,5-Trimethylbenzene	ND	6.3	ND	31
1,2,4-Trimethylbenzene	ND	6.3	ND	31
1,3-Dichlorobenzene	ND	6.3	ND	38
1,4-Dichlorobenzene	ND	6.3	ND	38
Benzyl chloride	ND	6.3	ND	33
1,2-Dichlorobenzene	ND	6.3	ND	38
1,2,4-Trichlorobenzene	ND	6.3	ND	47
Hexachlorobutadiene	ND	6.3	ND	67
Naphthalene	ND	25	ND	130

Surrogate	%REC	Limits
Bromofluorobenzene	102	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	281165	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	1233 BOCKMAN	Analysis:	EPA TO-15
Field ID:	SV-43	Diln Fac:	1.930
Lab ID:	281165-003	Batch#:	239330
Matrix:	Air	Sampled:	09/19/16
Units (V):	ppbv	Received:	09/19/16
Units (M):	ug/m3	Analyzed:	09/22/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.97	ND	4.8
Freon 114	ND	0.97	ND	6.7
Chloromethane	ND	0.97	ND	2.0
Vinyl Chloride	ND	0.97	ND	2.5
1,3-Butadiene	ND	0.97	ND	2.1
Bromomethane	ND	0.97	ND	3.7
Chloroethane	ND	0.97	ND	2.5
Trichlorofluoromethane	ND	0.97	ND	5.4
Acrolein	ND	3.9	ND	8.9
1,1-Dichloroethene	ND	0.97	ND	3.8
Freon 113	ND	0.97	ND	7.4
Acetone	5.2	3.9	12	9.2
Carbon Disulfide	4.4	0.97	14	3.0
Isopropanol	ND	3.9	ND	9.5
Methylene Chloride	ND	0.97	ND	3.4
trans-1,2-Dichloroethene	ND	0.97	ND	3.8
MTBE	ND	0.97	ND	3.5
n-Hexane	ND	0.97	ND	3.4
1,1-Dichloroethane	ND	0.97	ND	3.9
Vinyl Acetate	ND	0.97	ND	3.4
cis-1,2-Dichloroethene	ND	0.97	ND	3.8
2-Butanone	ND	0.97	ND	2.8
Ethyl Acetate	ND	0.97	ND	3.5
Tetrahydrofuran	2.3	0.97	6.8	2.8
Chloroform	ND	0.97	ND	4.7
1,1,1-Trichloroethane	ND	0.97	ND	5.3
Cyclohexane	ND	0.97	ND	3.3
Carbon Tetrachloride	ND	0.97	ND	6.1
Benzene	2.2	0.97	7.2	3.1
1,2-Dichloroethane	ND	0.97	ND	3.9
n-Heptane	ND	0.97	ND	4.0
Trichloroethene	ND	0.97	ND	5.2
1,2-Dichloropropane	ND	0.97	ND	4.5
Bromodichloromethane	ND	0.97	ND	6.5
cis-1,3-Dichloropropene	ND	0.97	ND	4.4

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	281165	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	1233 BOCKMAN	Analysis:	EPA TO-15
Field ID:	SV-43	Diln Fac:	1.930
Lab ID:	281165-003	Batch#:	239330
Matrix:	Air	Sampled:	09/19/16
Units (V):	ppbv	Received:	09/19/16
Units (M):	ug/m3	Analyzed:	09/22/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.97	ND	4.0
Toluene	6.1	0.97	23	3.6
trans-1,3-Dichloropropene	ND	0.97	ND	4.4
1,1,2-Trichloroethane	ND	0.97	ND	5.3
Tetrachloroethene	ND	0.97	ND	6.5
2-Hexanone	ND	0.97	ND	4.0
Dibromochloromethane	ND	0.97	ND	8.2
1,2-Dibromoethane	ND	0.97	ND	7.4
Chlorobenzene	ND	0.97	ND	4.4
Ethylbenzene	1.6	0.97	6.9	4.2
m,p-Xylenes	5.7	0.97	25	4.2
o-Xylene	1.7	0.97	7.2	4.2
Styrene	ND	0.97	ND	4.1
Bromoform	ND	0.97	ND	10
1,1,2,2-Tetrachloroethane	ND	0.97	ND	6.6
4-Ethyltoluene	ND	0.97	ND	4.7
1,3,5-Trimethylbenzene	ND	0.97	ND	4.7
1,2,4-Trimethylbenzene	1.6	0.97	8.0	4.7
1,3-Dichlorobenzene	ND	0.97	ND	5.8
1,4-Dichlorobenzene	ND	0.97	ND	5.8
Benzyl chloride	ND	0.97	ND	5.0
1,2-Dichlorobenzene	ND	0.97	ND	5.8
1,2,4-Trichlorobenzene	ND	0.97	ND	7.2
Hexachlorobutadiene	ND	0.97	ND	10
Naphthalene	ND	3.9	ND	20

Surrogate	%REC	Limits
Bromofluorobenzene	98	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units



### Volatile Organics in Air

Lab #:	281165	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	1233 BOCKMAN	Analysis:	EPA TO-15
Field ID:	SV-45	Diln Fac:	2.150
Lab ID:	281165-004	Batch#:	239330
Matrix:	Air	Sampled:	09/19/16
Units (V):	ppbv	Received:	09/19/16
Units (M):	ug/m3	Analyzed:	09/22/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.1	ND	5.3
Freon 114	ND	1.1	ND	7.5
Chloromethane	ND	1.1	ND	2.2
Vinyl Chloride	ND	1.1	ND	2.7
1,3-Butadiene	ND	1.1	ND	2.4
Bromomethane	ND	1.1	ND	4.2
Chloroethane	ND	1.1	ND	2.8
Trichlorofluoromethane	ND	1.1	ND	6.0
Acrolein	ND	4.3	ND	9.9
1,1-Dichloroethene	ND	1.1	ND	4.3
Freon 113	ND	1.1	ND	8.2
Acetone	ND	4.3	ND	10
Carbon Disulfide	4.6	1.1	14	3.3
Isopropanol	ND	4.3	ND	11
Methylene Chloride	ND	1.1	ND	3.7
trans-1,2-Dichloroethene	ND	1.1	ND	4.3
MTBE	ND	1.1	ND	3.9
n-Hexane	ND	1.1	ND	3.8
1,1-Dichloroethane	ND	1.1	ND	4.4
Vinyl Acetate	ND	1.1	ND	3.8
cis-1,2-Dichloroethene	ND	1.1	ND	4.3
2-Butanone	ND	1.1	ND	3.2
Ethyl Acetate	ND	1.1	ND	3.9
Tetrahydrofuran	ND	1.1	ND	3.2
Chloroform	ND	1.1	ND	5.2
1,1,1-Trichloroethane	ND	1.1	ND	5.9
Cyclohexane	ND	1.1	ND	3.7
Carbon Tetrachloride	ND	1.1	ND	6.8
Benzene	2.7	1.1	8.7	3.4
1,2-Dichloroethane	ND	1.1	ND	4.4
n-Heptane	ND	1.1	ND	4.4
Trichloroethene	ND	1.1	ND	5.8
1,2-Dichloropropane	ND	1.1	ND	5.0
Bromodichloromethane	ND	1.1	ND	7.2
cis-1,3-Dichloropropene	ND	1.1	ND	4.9

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	281165	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	1233 BOCKMAN	Analysis:	EPA TO-15
Field ID:	SV-45	Diln Fac:	2.150
Lab ID:	281165-004	Batch#:	239330
Matrix:	Air	Sampled:	09/19/16
Units (V):	ppbv	Received:	09/19/16
Units (M):	ug/m3	Analyzed:	09/22/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.1	ND	4.4
Toluene	8.7	1.1	33	4.1
trans-1,3-Dichloropropene	ND	1.1	ND	4.9
1,1,2-Trichloroethane	ND	1.1	ND	5.9
Tetrachloroethene	3.0	1.1	20	7.3
2-Hexanone	ND	1.1	ND	4.4
Dibromochloromethane	ND	1.1	ND	9.2
1,2-Dibromoethane	ND	1.1	ND	8.3
Chlorobenzene	ND	1.1	ND	4.9
Ethylbenzene	2.2	1.1	9.4	4.7
m,p-Xylenes	7.7	1.1	34	4.7
o-Xylene	2.2	1.1	9.3	4.7
Styrene	ND	1.1	ND	4.6
Bromoform	ND	1.1	ND	11
1,1,2,2-Tetrachloroethane	ND	1.1	ND	7.4
4-Ethyltoluene	ND	1.1	ND	5.3
1,3,5-Trimethylbenzene	ND	1.1	ND	5.3
1,2,4-Trimethylbenzene	1.5	1.1	7.2	5.3
1,3-Dichlorobenzene	ND	1.1	ND	6.5
1,4-Dichlorobenzene	ND	1.1	ND	6.5
Benzyl chloride	ND	1.1	ND	5.6
1,2-Dichlorobenzene	ND	1.1	ND	6.5
1,2,4-Trichlorobenzene	ND	1.1	ND	8.0
Hexachlorobutadiene	ND	1.1	ND	11
Naphthalene	ND	4.3	ND	23

Surrogate	%REC	Limits
Bromofluorobenzene	102	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

## Batch QC Report

Volatile Organics in Air			
Lab #:	281165	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	1233 BOCKMAN	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	239330
Units (V):	ppbv	Analyzed:	09/21/16
Diln Fac:	1.000		

Type: BS Lab ID: QC852433

Analyte	Spiked	Result (V)	%REC	Limits
Freon 12	5.000	5.075	102	70-130
Freon 114	5.000	4.969	99	70-130
Chloromethane	5.000	3.987	80	70-130
Vinyl Chloride	5.000	4.878	98	70-130
1,3-Butadiene	5.000	4.516	90	70-130
Bromomethane	5.000	4.700	94	70-130
Chloroethane	5.000	4.495	90	70-130
Trichlorofluoromethane	5.000	5.405	108	70-130
Acrolein	5.000	5.304	106	70-130
1,1-Dichloroethene	5.000	5.456	109	70-130
Freon 113	5.000	5.413	108	70-130
Acetone	5.000	3.692	74	70-130
Carbon Disulfide	5.000	5.247	105	70-130
Isopropanol	5.000	4.374	87	70-130
Methylene Chloride	5.000	4.278	86	70-130
trans-1,2-Dichloroethene	5.000	5.759	115	70-130
MTBE	5.000	5.543	111	70-130
n-Hexane	5.000	4.999	100	70-130
1,1-Dichloroethane	5.000	4.989	100	70-130
Vinyl Acetate	5.000	6.400	128	70-130
cis-1,2-Dichloroethene	5.000	5.695	114	70-130
2-Butanone	5.000	4.867	97	70-130
Ethyl Acetate	5.000	4.868	97	70-130
Tetrahydrofuran	5.000	4.742	95	70-130
Chloroform	5.000	5.073	101	70-130
1,1,1-Trichloroethane	5.000	4.613	92	70-130
Cyclohexane	5.000	4.690	94	70-130
Carbon Tetrachloride	5.000	4.863 b	97	70-130
Benzene	5.000	4.976	100	70-130
1,2-Dichloroethane	5.000	4.720	94	70-130
n-Heptane	5.000	5.200	104	70-130
Trichloroethene	5.000	4.948	99	70-130
1,2-Dichloropropane	5.000	5.013	100	70-130

b= See narrative

RPD= Relative Percent Difference

Result V= Result in volume units

## Batch QC Report

Volatile Organics in Air			
Lab #:	281165	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	1233 BOCKMAN	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	239330
Units (V):	ppbv	Analyzed:	09/21/16
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits
Bromodichloromethane	5.000	4.843	97	70-130
cis-1,3-Dichloropropene	5.000	4.998	100	70-130
4-Methyl-2-Pentanone	5.000	5.783	116	70-130
Toluene	5.000	4.846	97	70-130
trans-1,3-Dichloropropene	5.000	4.933	99	70-130
1,1,2-Trichloroethane	5.000	4.505	90	70-130
Tetrachloroethene	5.000	4.607	92	70-130
2-Hexanone	5.000	5.001	100	70-130
Dibromochloromethane	5.000	4.231	85	70-130
1,2-Dibromoethane	5.000	4.195	84	70-130
Chlorobenzene	5.000	4.682	94	70-130
Ethylbenzene	5.000	5.298	106	70-130
m,p-Xylenes	10.000	10.40	104	70-130
o-Xylene	5.000	5.011	100	70-130
Styrene	5.000	4.783	96	70-130
Bromoform	5.000	4.369	87	70-130
1,1,2,2-Tetrachloroethane	5.000	4.511	90	70-130
4-Ethyltoluene	5.000	4.490	90	70-130
1,3,5-Trimethylbenzene	5.000	3.944	79	70-130
1,2,4-Trimethylbenzene	5.000	4.008	80	70-130
1,3-Dichlorobenzene	5.000	4.642	93	70-130
1,4-Dichlorobenzene	5.000	4.486	90	70-130
Benzyl chloride	5.000	4.654	93	70-130
1,2-Dichlorobenzene	5.000	4.475	90	70-130
1,2,4-Trichlorobenzene	5.000	3.842	77	70-130
Hexachlorobutadiene	5.000	4.566	91	70-130
Naphthalene	5.000	4.007	80	70-130

Surrogate	%REC	Limits
Bromofluorobenzene	104	70-130

b= See narrative

RPD= Relative Percent Difference

Result V= Result in volume units

## Batch QC Report

Volatile Organics in Air			
Lab #:	281165	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	1233 BOCKMAN	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	239330
Units (V):	ppbv	Analyzed:	09/21/16
Diln Fac:	1.000		

Type: BSD Lab ID: QC852434

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
Freon 12	5.000	4.884	98	70-130	4	25
Freon 114	5.000	4.752	95	70-130	4	25
Chloromethane	5.000	3.658	73	70-130	9	25
Vinyl Chloride	5.000	4.607	92	70-130	6	25
1,3-Butadiene	5.000	4.342	87	70-130	4	25
Bromomethane	5.000	4.499	90	70-130	4	25
Chloroethane	5.000	4.404	88	70-130	2	25
Trichlorofluoromethane	5.000	5.215	104	70-130	4	25
Acrolein	5.000	5.056	101	70-130	5	25
1,1-Dichloroethene	5.000	5.217	104	70-130	4	25
Freon 113	5.000	5.201	104	70-130	4	25
Acetone	5.000	3.553	71	70-130	4	25
Carbon Disulfide	5.000	4.954	99	70-130	6	25
Isopropanol	5.000	4.317	86	70-130	1	25
Methylene Chloride	5.000	3.978	80	70-130	7	25
trans-1,2-Dichloroethene	5.000	5.572	111	70-130	3	25
MTBE	5.000	5.258	105	70-130	5	25
n-Hexane	5.000	4.844	97	70-130	3	25
1,1-Dichloroethane	5.000	4.721	94	70-130	6	25
Vinyl Acetate	5.000	6.048	121	70-130	6	25
cis-1,2-Dichloroethene	5.000	5.351	107	70-130	6	25
2-Butanone	5.000	4.740	95	70-130	3	25
Ethyl Acetate	5.000	4.722	94	70-130	3	25
Tetrahydrofuran	5.000	4.706	94	70-130	1	25
Chloroform	5.000	5.001	100	70-130	1	25
1,1,1-Trichloroethane	5.000	4.521	90	70-130	2	25
Cyclohexane	5.000	4.465	89	70-130	5	25
Carbon Tetrachloride	5.000	4.719 b	94	70-130	3	25
Benzene	5.000	4.680	94	70-130	6	25
1,2-Dichloroethane	5.000	4.724	94	70-130	0	25
n-Heptane	5.000	5.225	105	70-130	0	25
Trichloroethene	5.000	4.845	97	70-130	2	25
1,2-Dichloropropane	5.000	4.750	95	70-130	5	25

b= See narrative

RPD= Relative Percent Difference

Result V= Result in volume units

**Batch QC Report**

Volatile Organics in Air			
Lab #:	281165	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	1233 BOCKMAN	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	239330
Units (V):	ppbv	Analyzed:	09/21/16
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
Bromodichloromethane	5.000	4.569	91	70-130	6	25
cis-1,3-Dichloropropene	5.000	4.856	97	70-130	3	25
4-Methyl-2-Pentanone	5.000	5.929	119	70-130	2	25
Toluene	5.000	4.830	97	70-130	0	25
trans-1,3-Dichloropropene	5.000	4.971	99	70-130	1	25
1,1,2-Trichloroethane	5.000	4.188	84	70-130	7	25
Tetrachloroethene	5.000	4.484	90	70-130	3	25
2-Hexanone	5.000	5.078	102	70-130	2	25
Dibromochloromethane	5.000	3.840	77	70-130	10	25
1,2-Dibromoethane	5.000	4.097	82	70-130	2	25
Chlorobenzene	5.000	4.700	94	70-130	0	25
Ethylbenzene	5.000	5.286	106	70-130	0	25
m,p-Xylenes	10.000	10.37	104	70-130	0	25
o-Xylene	5.000	5.057	101	70-130	1	25
Styrene	5.000	4.754	95	70-130	1	25
Bromoform	5.000	4.320	86	70-130	1	25
1,1,2,2-Tetrachloroethane	5.000	4.412	88	70-130	2	25
4-Ethyltoluene	5.000	4.402	88	70-130	2	25
1,3,5-Trimethylbenzene	5.000	3.853	77	70-130	2	25
1,2,4-Trimethylbenzene	5.000	3.925	79	70-130	2	25
1,3-Dichlorobenzene	5.000	4.499	90	70-130	3	25
1,4-Dichlorobenzene	5.000	4.524	90	70-130	1	25
Benzyl chloride	5.000	4.870	97	70-130	5	25
1,2-Dichlorobenzene	5.000	4.473	89	70-130	0	25
1,2,4-Trichlorobenzene	5.000	3.715	74	70-130	3	25
Hexachlorobutadiene	5.000	4.414	88	70-130	3	25
Naphthalene	5.000	3.955	79	70-130	1	25

Surrogate	%REC	Limits
Bromofluorobenzene	102	70-130

b= See narrative

RPD= Relative Percent Difference

Result V= Result in volume units



## Batch QC Report

Volatile Organics in Air			
Lab #:	281165	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	1233 BOCKMAN	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC852435	Diln Fac:	1.000
Matrix:	Air	Batch#:	239330
Units (V):	ppbv	Analyzed:	09/21/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	ND	2.0	ND	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Isopropanol	ND	2.0	ND	4.9
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	ND	0.50	ND	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	ND	0.50	ND	1.5
Ethyl Acetate	ND	0.50	ND	1.8
Tetrahydrofuran	ND	0.50	ND	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	ND	0.50	ND	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

## Batch QC Report

Volatile Organics in Air			
Lab #:	281165	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	1233 BOCKMAN	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC852435	Diln Fac:	1.000
Matrix:	Air	Batch#:	239330
Units (V):	ppbv	Analyzed:	09/21/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.50	ND	2.0
Toluene	ND	0.50	ND	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	ND	0.50	ND	2.2
m,p-Xylenes	ND	0.50	ND	2.2
o-Xylene	ND	0.50	ND	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	ND	0.50	ND	2.5
1,3,5-Trimethylbenzene	ND	0.50	ND	2.5
1,2,4-Trimethylbenzene	ND	0.50	ND	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	99	70-130

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Fixed Gas Analysis

Lab #:	281165	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	1233 BOCKMAN	Analysis:	ASTM D1946
Analyte:	Oxygen	Batch#:	239417
Matrix:	Air	Sampled:	09/19/16
Units:	ppmv	Received:	09/19/16
Units (Mol %):	MOL %	Analyzed:	09/22/16

Field ID	Type	Lab ID	Result	RL	Result (Mol %)	RL	Diln Fac
SV-41	SAMPLE	281165-001	29,000	3,900	2.9	0.39	3.910
SV-42	SAMPLE	281165-002	110,000	18,000	11	1.8	17.90
SV-43	SAMPLE	281165-003	100,000	2,700	10	0.27	2.740
SV-45	SAMPLE	281165-004	45,000	3,000	4.5	0.30	2.990
	BLANK	QC852784	ND	1,000	ND	0.10	1.000

ND= Not Detected

RL= Reporting Limit

Result Mol %= Result in Mole Percent

Batch QC Report

**Fixed Gas Analysis**

Lab #:	281165	Location:	1233 Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	1233 BOCKMAN	Analysis:	ASTM D1946
Analyte:	Oxygen	Units (Mol %):	MOL %
Field ID:	SV-41	Batch#:	239417
MSS Lab ID:	281165-001	Sampled:	09/19/16
Matrix:	Air	Received:	09/19/16
Units:	ppmv	Analyzed:	09/22/16

Type	Lab ID	MSS Result	Spiked	Result	RL	Result (Mol %)	RL	%REC	Limits	RPD	Lim	Diln	Fac
BS	QC852781			NA									
BSD	QC852782			NA									
LCS	QC852783		2,000	1,807				90	70-130			1.000	
SDUP	QC852785	28,810		28,750	3,910	2.875	0.3910			0	30	3.910	

NA= Not Analyzed

RL= Reporting Limit

RPD= Relative Percent Difference

Result Mol %= Result in Mole Percent







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2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 282480
ANALYTICAL REPORT

Pangea Environmental
1710 Franklin Street
Oakland, CA 94612

Project : 2030.001
Location : Bockman
Level : II

Table with 2 columns: Sample ID, Lab ID. Rows include SV-46 through SV-56 and SHROUD.

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Handwritten signature of Will Rice

Signature: \_\_\_\_\_

Date: 10/26/2016

Will Rice
Project Manager
will.rice@ctberk.com

### CASE NARRATIVE

Laboratory number: 282480  
Client: Pangea Environmental  
Project: 2030.001  
Location: Bockman  
Request Date: 10/21/16  
Samples Received: 10/21/16

This data package contains sample and QC results for twelve air samples, requested for the above referenced project on 10/21/16. The samples were received cold and intact.

#### Volatile Organics in Air by MS (EPA TO-15):

High response was observed for vinyl acetate in the CCV analyzed 10/21/16 13:41; affected data was qualified with "b". High recovery was observed for vinyl acetate in the BS for batch 240422; the associated RPD was within limits, and this analyte was not detected at or above the RL in the associated samples. High surrogate recoveries were observed for bromofluorobenzene in SV-47 (lab # 282480-002) and SV-48 (lab # 282480-003). No other analytical problems were encountered.

#### Volatile Organics in Air GC (ASTM D1946):

No analytical problems were encountered.



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**AIR TESTING CHAIN OF CUSTODY  
 & PURCHASE ORDER**

Page 1 of 1  
 Chain of Custody # : TESTING REQUESTED

C&T LOGIN # 282480  
 Sampler: Patrick Croff  
 Report To: Ron Scheele  
 Company: Vanguard  
 Telephone: (510)283-3160  
 Email: rscheele@vanguardenv.com

Project No: 2030.001  
 Project Name: Bockman  
 EDD Format: II III IV  
 Turnaround Time:  RUSH  Standard

Lab No.	Sample ID.	Sampling Information				Sample Volume (Gauge Reading)
		Date Collected	Time Collected	Canister ID (Bar Code #)	Flow Controller ID	
1	SV-46	10-21-16	0932	00319	A00222	30/5
2	SV-47	"	1006	00282	A00295	39/5
3	SV-48	"	1032	00144	A00298	39/7
4	SV-49	"	1048	00172	A00296	39/7
5	SV-50	"	1115	00412	A00204	39/5
6	SV-51	"	1151	00190	A06305	30/5
7	SV-52	"	1210	00261	A00184	30/5.5
8	SV-53	"	1231	00286	A00188	29/6
9	SV-54	"	1255	00064	A00297	30/4.5
10	SV-55	"	1349	00162	A00206	24.5/6.0
11	SV-56	"	1409	00307	A00189	29/6
12	Shred	"	1411	00111	A00299	24/5

TO-15  
 Fixed Gas:  
 O<sub>2</sub>, CO<sub>2</sub>, CH<sub>4</sub>

Notes: EDF request

RELINQUISHED BY: [Signature] 10-21-16 1710 DATE/TIME

RECEIVED BY: [Signature] 10/21/16 17:10 DATE/TIME

**COOLER RECEIPT CHECKLIST**



Login # 282480 Date Received 10/21/16 Number of coolers 1  
 Client Pangea Project Bockman

Date Opened 10/21/16 By (print) FWA (sign) [Signature]  
 Date Logged in ↓ By (print) ↓ (sign) ↓  
 Date Labeled ↓ By (print) ↓ (sign) ↓

1. Did cooler come with a shipping slip (airbill, etc) YES ~~NO~~  
 Shipping info \_\_\_\_\_

2A. Were custody seals present? ....  YES (circle) on cooler on samples  NO  
 How many \_\_\_\_\_ Name \_\_\_\_\_ Date \_\_\_\_\_

2B. Were custody seals intact upon arrival? \_\_\_\_\_ YES NO N/A

3. Were custody papers dry and intact when received? YES NO

4. Were custody papers filled out properly (ink, signed, etc)? YES NO

5. Is the project identifiable from custody papers? (If so fill out top of form) YES NO

6. Indicate the packing in cooler: (if other, describe) \_\_\_\_\_

- Bubble Wrap  Foam blocks  Bags  None
- Cloth material  Cardboard  Styrofoam  Paper towels

7. Temperature documentation: \* Notify PM if temperature exceeds 6°C

Type of ice used:  Wet  Blue/Gel  None Temp(°C) \_\_\_\_\_

Temperature blank(s) included?  Thermometer# \_\_\_\_\_  IR Gun# \_\_\_\_\_

Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? YES ~~NO~~  
 If YES, what time were they transferred to freezer? \_\_\_\_\_

9. Did all bottles arrive unbroken/unopened? YES NO

10. Are there any missing / extra samples? YES ~~NO~~

11. Are samples in the appropriate containers for indicated tests? YES NO

12. Are sample labels present, in good condition and complete? YES NO

13. Do the sample labels agree with custody papers? YES NO

14. Was sufficient amount of sample sent for tests requested? YES NO

15. Are the samples appropriately preserved? YES NO N/A

16. Did you check preservatives for all bottles for each sample? YES NO N/A

17. Did you document your preservative check? (pH strip lot# \_\_\_\_\_) YES NO N/A

18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO N/A

19. Did you change the hold time in LIMS for preserved terracores? YES NO N/A

20. Are bubbles > 6mm absent in VOA samples? YES NO N/A

21. Was the client contacted concerning this sample delivery? YES ~~NO~~

If YES, Who was called? \_\_\_\_\_ By \_\_\_\_\_ Date: \_\_\_\_\_

**COMMENTS**

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

### Detections Summary for 282480

Results for any subcontracted analyses are not included in this summary.

Client : Pangea Environmental  
 Project : 2030.001  
 Location : Bockman

Client Sample ID : SV-46

Laboratory Sample ID :

282480-001

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Freon 12	73		1.0	ppbv	As Recd	2.070	EPA TO-15	METHOD
Trichlorofluoromethane	3.9		1.0	ppbv	As Recd	2.070	EPA TO-15	METHOD
Acetone	24		4.1	ppbv	As Recd	2.070	EPA TO-15	METHOD
Carbon Disulfide	32		1.0	ppbv	As Recd	2.070	EPA TO-15	METHOD
n-Hexane	54		1.0	ppbv	As Recd	2.070	EPA TO-15	METHOD
2-Butanone	3.7		1.0	ppbv	As Recd	2.070	EPA TO-15	METHOD
Benzene	5.0		1.0	ppbv	As Recd	2.070	EPA TO-15	METHOD
n-Heptane	25		1.0	ppbv	As Recd	2.070	EPA TO-15	METHOD
Toluene	4.5		1.0	ppbv	As Recd	2.070	EPA TO-15	METHOD
Tetrachloroethene	1.4		1.0	ppbv	As Recd	2.070	EPA TO-15	METHOD
Ethylbenzene	1.5		1.0	ppbv	As Recd	2.070	EPA TO-15	METHOD
m,p-Xylenes	4.8		1.0	ppbv	As Recd	2.070	EPA TO-15	METHOD
o-Xylene	2.1		1.0	ppbv	As Recd	2.070	EPA TO-15	METHOD
4-Ethyltoluene	2.6		1.0	ppbv	As Recd	2.070	EPA TO-15	METHOD
1,3,5-Trimethylbenzene	2.4		1.0	ppbv	As Recd	2.070	EPA TO-15	METHOD
1,2,4-Trimethylbenzene	6.7		1.0	ppbv	As Recd	2.070	EPA TO-15	METHOD
Carbon Dioxide	7,600		2,100	ppmv	As Recd	2.070	ASTM D1946	METHOD
Oxygen	20,000		2,100	ppmv	As Recd	2.070	ASTM D1946	METHOD
Methane	9,300		2,100	ppmv	As Recd	2.070	ASTM D1946	METHOD

Client Sample ID : SV-47

Laboratory Sample ID :

282480-002

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Freon 12	1.9		0.96	ppbv	As Recd	1.910	EPA TO-15	METHOD
Acetone	44		3.8	ppbv	As Recd	1.910	EPA TO-15	METHOD
Carbon Disulfide	48		0.96	ppbv	As Recd	1.910	EPA TO-15	METHOD
Isopropanol	13		3.8	ppbv	As Recd	1.910	EPA TO-15	METHOD
n-Hexane	54		0.96	ppbv	As Recd	1.910	EPA TO-15	METHOD
2-Butanone	10		0.96	ppbv	As Recd	1.910	EPA TO-15	METHOD
Benzene	4.7		0.96	ppbv	As Recd	1.910	EPA TO-15	METHOD
n-Heptane	50		0.96	ppbv	As Recd	1.910	EPA TO-15	METHOD
Trichloroethene	2.5		0.96	ppbv	As Recd	1.910	EPA TO-15	METHOD
Toluene	4.9		0.96	ppbv	As Recd	1.910	EPA TO-15	METHOD
Tetrachloroethene	1.4		0.96	ppbv	As Recd	1.910	EPA TO-15	METHOD
Ethylbenzene	1.5		0.96	ppbv	As Recd	1.910	EPA TO-15	METHOD
m,p-Xylenes	5.7		0.96	ppbv	As Recd	1.910	EPA TO-15	METHOD
o-Xylene	3.1		0.96	ppbv	As Recd	1.910	EPA TO-15	METHOD
4-Ethyltoluene	2.5		0.96	ppbv	As Recd	1.910	EPA TO-15	METHOD
1,3,5-Trimethylbenzene	2.6		0.96	ppbv	As Recd	1.910	EPA TO-15	METHOD
1,2,4-Trimethylbenzene	7.8		0.96	ppbv	As Recd	1.910	EPA TO-15	METHOD
Carbon Dioxide	6,900		1,900	ppmv	As Recd	1.910	ASTM D1946	METHOD
Oxygen	25,000		1,900	ppmv	As Recd	1.910	ASTM D1946	METHOD
Methane	8,600		1,900	ppmv	As Recd	1.910	ASTM D1946	METHOD

Client Sample ID : SV-48

Laboratory Sample ID :

282480-003

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Freon 12	2.2		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
Acetone	27		4.4	ppbv	As Recd	2.180	EPA TO-15	METHOD
Carbon Disulfide	13		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
Isopropanol	5.9		4.4	ppbv	As Recd	2.180	EPA TO-15	METHOD
n-Hexane	16		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
2-Butanone	2.2		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
Cyclohexane	29		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
Benzene	3.2		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
n-Heptane	9.2		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
Toluene	3.9		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
Tetrachloroethene	1.2		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
Ethylbenzene	1.6		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
m,p-Xylenes	9.8		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
o-Xylene	5.5		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
4-Ethyltoluene	2.8		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
1,3,5-Trimethylbenzene	2.4		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
1,2,4-Trimethylbenzene	6.4		1.1	ppbv	As Recd	2.180	EPA TO-15	METHOD
Carbon Dioxide	9,400		2,200	ppmv	As Recd	2.180	ASTM D1946	METHOD
Oxygen	24,000		2,200	ppmv	As Recd	2.180	ASTM D1946	METHOD

Client Sample ID : SV-49

Laboratory Sample ID :

282480-004

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	23		4.4	ppbv	As Recd	2.200	EPA TO-15	METHOD
Carbon Disulfide	3.2		1.1	ppbv	As Recd	2.200	EPA TO-15	METHOD
MTBE	2.3		1.1	ppbv	As Recd	2.200	EPA TO-15	METHOD
n-Hexane	2.8		1.1	ppbv	As Recd	2.200	EPA TO-15	METHOD
2-Butanone	5.4		1.1	ppbv	As Recd	2.200	EPA TO-15	METHOD
Benzene	6.8		1.1	ppbv	As Recd	2.200	EPA TO-15	METHOD
n-Heptane	1.7		1.1	ppbv	As Recd	2.200	EPA TO-15	METHOD
Toluene	7.0		1.1	ppbv	As Recd	2.200	EPA TO-15	METHOD
2-Hexanone	1.7		1.1	ppbv	As Recd	2.200	EPA TO-15	METHOD
m,p-Xylenes	2.7		1.1	ppbv	As Recd	2.200	EPA TO-15	METHOD
Carbon Dioxide	56,000		2,200	ppmv	As Recd	2.200	ASTM D1946	METHOD
Oxygen	17,000		2,200	ppmv	As Recd	2.200	ASTM D1946	METHOD
Methane	3,300		2,200	ppmv	As Recd	2.200	ASTM D1946	METHOD

Client Sample ID : SV-50

Laboratory Sample ID :

282480-005

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	34		4.4	ppbv	As Recd	2.210	EPA TO-15	METHOD
Carbon Disulfide	23		1.1	ppbv	As Recd	2.210	EPA TO-15	METHOD
Isopropanol	5.7		4.4	ppbv	As Recd	2.210	EPA TO-15	METHOD
MTBE	1.2		1.1	ppbv	As Recd	2.210	EPA TO-15	METHOD
n-Hexane	4.1		1.1	ppbv	As Recd	2.210	EPA TO-15	METHOD
cis-1,2-Dichloroethene	2.1		1.1	ppbv	As Recd	2.210	EPA TO-15	METHOD
2-Butanone	6.0		1.1	ppbv	As Recd	2.210	EPA TO-15	METHOD
Chloroform	1.7		1.1	ppbv	As Recd	2.210	EPA TO-15	METHOD
Benzene	11		1.1	ppbv	As Recd	2.210	EPA TO-15	METHOD
n-Heptane	2.3		1.1	ppbv	As Recd	2.210	EPA TO-15	METHOD
Toluene	9.5		1.1	ppbv	As Recd	2.210	EPA TO-15	METHOD
m,p-Xylenes	3.0		1.1	ppbv	As Recd	2.210	EPA TO-15	METHOD
Carbon Dioxide	37,000		2,200	ppmv	As Recd	2.210	ASTM D1946	METHOD
Oxygen	24,000		2,200	ppmv	As Recd	2.210	ASTM D1946	METHOD
Methane	3,500		2,200	ppmv	As Recd	2.210	ASTM D1946	METHOD

Client Sample ID : SV-51

Laboratory Sample ID :

282480-006

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	4.5		4.1	ppbv	As Recd	2.050	EPA TO-15	METHOD
Carbon Disulfide	2.7		1.0	ppbv	As Recd	2.050	EPA TO-15	METHOD
Isopropanol	5.0		4.1	ppbv	As Recd	2.050	EPA TO-15	METHOD
Cyclohexane	1.7		1.0	ppbv	As Recd	2.050	EPA TO-15	METHOD
Benzene	2.3		1.0	ppbv	As Recd	2.050	EPA TO-15	METHOD
Toluene	2.3		1.0	ppbv	As Recd	2.050	EPA TO-15	METHOD
m,p-Xylenes	1.6		1.0	ppbv	As Recd	2.050	EPA TO-15	METHOD

Client Sample ID : SV-52

Laboratory Sample ID :

282480-007

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	4.5		4.1	ppbv	As Recd	2.040	EPA TO-15	METHOD
Isopropanol	5.2		4.1	ppbv	As Recd	2.040	EPA TO-15	METHOD
Cyclohexane	1.2		1.0	ppbv	As Recd	2.040	EPA TO-15	METHOD
Benzene	1.5		1.0	ppbv	As Recd	2.040	EPA TO-15	METHOD
Toluene	1.2		1.0	ppbv	As Recd	2.040	EPA TO-15	METHOD
Tetrachloroethene	3.4		1.0	ppbv	As Recd	2.040	EPA TO-15	METHOD

Client Sample ID : SV-53

Laboratory Sample ID :

282480-008

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	13		4.2	ppbv	As Recd	2.110	EPA TO-15	METHOD
Carbon Disulfide	10		1.1	ppbv	As Recd	2.110	EPA TO-15	METHOD
Isopropanol	6.1		4.2	ppbv	As Recd	2.110	EPA TO-15	METHOD
n-Hexane	1.2		1.1	ppbv	As Recd	2.110	EPA TO-15	METHOD
2-Butanone	1.9		1.1	ppbv	As Recd	2.110	EPA TO-15	METHOD
Chloroform	6.2		1.1	ppbv	As Recd	2.110	EPA TO-15	METHOD
Benzene	2.9		1.1	ppbv	As Recd	2.110	EPA TO-15	METHOD
Trichloroethene	1.1		1.1	ppbv	As Recd	2.110	EPA TO-15	METHOD
Toluene	2.6		1.1	ppbv	As Recd	2.110	EPA TO-15	METHOD
Tetrachloroethene	2.8		1.1	ppbv	As Recd	2.110	EPA TO-15	METHOD
m,p-Xylenes	1.9		1.1	ppbv	As Recd	2.110	EPA TO-15	METHOD
1,2,4-Trimethylbenzene	1.2		1.1	ppbv	As Recd	2.110	EPA TO-15	METHOD

Client Sample ID : SV-54

Laboratory Sample ID :

282480-009

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Freon 12	2.7		1.0	ppbv	As Recd	1.990	EPA TO-15	METHOD
Acetone	7.1		4.0	ppbv	As Recd	1.990	EPA TO-15	METHOD
Carbon Disulfide	1.4		1.0	ppbv	As Recd	1.990	EPA TO-15	METHOD
Isopropanol	13		4.0	ppbv	As Recd	1.990	EPA TO-15	METHOD
Benzene	1.8		1.0	ppbv	As Recd	1.990	EPA TO-15	METHOD
Toluene	1.6		1.0	ppbv	As Recd	1.990	EPA TO-15	METHOD
Tetrachloroethene	6.1		1.0	ppbv	As Recd	1.990	EPA TO-15	METHOD
m,p-Xylenes	1.1		1.0	ppbv	As Recd	1.990	EPA TO-15	METHOD



Client Sample ID : SV-55

Laboratory Sample ID :

282480-010

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	15		4.3	ppbv	As Recd	2.130	EPA TO-15	METHOD
Carbon Disulfide	38		1.1	ppbv	As Recd	2.130	EPA TO-15	METHOD
n-Hexane	2.5		1.1	ppbv	As Recd	2.130	EPA TO-15	METHOD
Benzene	25		1.1	ppbv	As Recd	2.130	EPA TO-15	METHOD
n-Heptane	3.0		1.1	ppbv	As Recd	2.130	EPA TO-15	METHOD
Toluene	26		1.1	ppbv	As Recd	2.130	EPA TO-15	METHOD
Ethylbenzene	2.1		1.1	ppbv	As Recd	2.130	EPA TO-15	METHOD
m,p-Xylenes	8.7		1.1	ppbv	As Recd	2.130	EPA TO-15	METHOD
o-Xylene	2.4		1.1	ppbv	As Recd	2.130	EPA TO-15	METHOD
1,2,4-Trimethylbenzene	1.6		1.1	ppbv	As Recd	2.130	EPA TO-15	METHOD

Client Sample ID : SV-56

Laboratory Sample ID :

282480-011

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Acetone	30		4.2	ppbv	As Recd	2.120	EPA TO-15	METHOD
Carbon Disulfide	33		1.1	ppbv	As Recd	2.120	EPA TO-15	METHOD
n-Hexane	1.5		1.1	ppbv	As Recd	2.120	EPA TO-15	METHOD
2-Butanone	1.4		1.1	ppbv	As Recd	2.120	EPA TO-15	METHOD
Chloroform	1.4		1.1	ppbv	As Recd	2.120	EPA TO-15	METHOD
Benzene	24		1.1	ppbv	As Recd	2.120	EPA TO-15	METHOD
n-Heptane	2.5		1.1	ppbv	As Recd	2.120	EPA TO-15	METHOD
Toluene	23		1.1	ppbv	As Recd	2.120	EPA TO-15	METHOD
Ethylbenzene	2.3		1.1	ppbv	As Recd	2.120	EPA TO-15	METHOD
m,p-Xylenes	10		1.1	ppbv	As Recd	2.120	EPA TO-15	METHOD
o-Xylene	2.8		1.1	ppbv	As Recd	2.120	EPA TO-15	METHOD
1,2,4-Trimethylbenzene	2.0		1.1	ppbv	As Recd	2.120	EPA TO-15	METHOD
Carbon Dioxide	10,000		2,100	ppmv	As Recd	2.120	ASTM D1946	METHOD
Oxygen	150,000		2,100	ppmv	As Recd	2.120	ASTM D1946	METHOD

Client Sample ID : SHROUD

Laboratory Sample ID :

282480-012

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Isopropanol	39,000		1,600	ppbv	As Recd	824.0	EPA TO-15	METHOD

### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-46	Diln Fac:	2.070
Lab ID:	282480-001	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/22/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	73	1.0	360	5.1
Freon 114	ND	1.0	ND	7.2
Chloromethane	ND	1.0	ND	2.1
Vinyl Chloride	ND	1.0	ND	2.6
1,3-Butadiene	ND	1.0	ND	2.3
Bromomethane	ND	1.0	ND	4.0
Chloroethane	ND	1.0	ND	2.7
Trichlorofluoromethane	3.9	1.0	22	5.8
Acrolein	ND	4.1	ND	9.5
1,1-Dichloroethene	ND	1.0	ND	4.1
Freon 113	ND	1.0	ND	7.9
Acetone	24	4.1	57	9.8
Carbon Disulfide	32	1.0	98	3.2
Isopropanol	ND	4.1	ND	10
Methylene Chloride	ND	1.0	ND	3.6
trans-1,2-Dichloroethene	ND	1.0	ND	4.1
MTBE	ND	1.0	ND	3.7
n-Hexane	54	1.0	190	3.6
1,1-Dichloroethane	ND	1.0	ND	4.2
Vinyl Acetate	ND	1.0	ND	3.6
cis-1,2-Dichloroethene	ND	1.0	ND	4.1
2-Butanone	3.7	1.0	11	3.1
Ethyl Acetate	ND	1.0	ND	3.7
Tetrahydrofuran	ND	1.0	ND	3.1
Chloroform	ND	1.0	ND	5.1
1,1,1-Trichloroethane	ND	1.0	ND	5.6
Cyclohexane	ND	1.0	ND	3.6
Carbon Tetrachloride	ND	1.0	ND	6.5
Benzene	5.0	1.0	16	3.3
1,2-Dichloroethane	ND	1.0	ND	4.2
n-Heptane	25	1.0	100	4.2
Trichloroethene	ND	1.0	ND	5.6
1,2-Dichloropropane	ND	1.0	ND	4.8
Bromodichloromethane	ND	1.0	ND	6.9
cis-1,3-Dichloropropene	ND	1.0	ND	4.7

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-46	Diln Fac:	2.070
Lab ID:	282480-001	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/22/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.0	ND	4.2
Toluene	4.5	1.0	17	3.9
trans-1,3-Dichloropropene	ND	1.0	ND	4.7
1,1,2-Trichloroethane	ND	1.0	ND	5.6
Tetrachloroethene	1.4	1.0	9.4	7.0
2-Hexanone	ND	1.0	ND	4.2
Dibromochloromethane	ND	1.0	ND	8.8
1,2-Dibromoethane	ND	1.0	ND	8.0
Chlorobenzene	ND	1.0	ND	4.8
Ethylbenzene	1.5	1.0	6.3	4.5
m,p-Xylenes	4.8	1.0	21	4.5
o-Xylene	2.1	1.0	9.3	4.5
Styrene	ND	1.0	ND	4.4
Bromoform	ND	1.0	ND	11
1,1,2,2-Tetrachloroethane	ND	1.0	ND	7.1
4-Ethyltoluene	2.6	1.0	13	5.1
1,3,5-Trimethylbenzene	2.4	1.0	12	5.1
1,2,4-Trimethylbenzene	6.7	1.0	33	5.1
1,3-Dichlorobenzene	ND	1.0	ND	6.2
1,4-Dichlorobenzene	ND	1.0	ND	6.2
Benzyl chloride	ND	1.0	ND	5.4
1,2-Dichlorobenzene	ND	1.0	ND	6.2
1,2,4-Trichlorobenzene	ND	1.0	ND	7.7
Hexachlorobutadiene	ND	1.0	ND	11
Naphthalene	ND	4.1	ND	22

Surrogate	%REC	Limits
Bromofluorobenzene	119	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-47	Diln Fac:	1.910
Lab ID:	282480-002	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/22/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	1.9	0.96	9.2	4.7
Freon 114	ND	0.96	ND	6.7
Chloromethane	ND	0.96	ND	2.0
Vinyl Chloride	ND	0.96	ND	2.4
1,3-Butadiene	ND	0.96	ND	2.1
Bromomethane	ND	0.96	ND	3.7
Chloroethane	ND	0.96	ND	2.5
Trichlorofluoromethane	ND	0.96	ND	5.4
Acrolein	ND	3.8	ND	8.8
1,1-Dichloroethene	ND	0.96	ND	3.8
Freon 113	ND	0.96	ND	7.3
Acetone	44	3.8	100	9.1
Carbon Disulfide	48	0.96	150	3.0
Isopropanol	13	3.8	32	9.4
Methylene Chloride	ND	0.96	ND	3.3
trans-1,2-Dichloroethene	ND	0.96	ND	3.8
MTBE	ND	0.96	ND	3.4
n-Hexane	54	0.96	190	3.4
1,1-Dichloroethane	ND	0.96	ND	3.9
Vinyl Acetate	ND	0.96	ND	3.4
cis-1,2-Dichloroethene	ND	0.96	ND	3.8
2-Butanone	10	0.96	29	2.8
Ethyl Acetate	ND	0.96	ND	3.4
Tetrahydrofuran	ND	0.96	ND	2.8
Chloroform	ND	0.96	ND	4.7
1,1,1-Trichloroethane	ND	0.96	ND	5.2
Cyclohexane	ND	0.96	ND	3.3
Carbon Tetrachloride	ND	0.96	ND	6.0
Benzene	4.7	0.96	15	3.1
1,2-Dichloroethane	ND	0.96	ND	3.9
n-Heptane	50	0.96	200	3.9
Trichloroethene	2.5	0.96	13	5.1
1,2-Dichloropropane	ND	0.96	ND	4.4
Bromodichloromethane	ND	0.96	ND	6.4

\*= Value outside of QC limits; see narrative

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

Volatile Organics in Air			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-47	Diln Fac:	1.910
Lab ID:	282480-002	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/22/16

Analyte	Result (V)	RL	Result (M)	RL
cis-1,3-Dichloropropene	ND	0.96	ND	4.3
4-Methyl-2-Pentanone	ND	0.96	ND	3.9
Toluene	4.9	0.96	19	3.6
trans-1,3-Dichloropropene	ND	0.96	ND	4.3
1,1,2-Trichloroethane	ND	0.96	ND	5.2
Tetrachloroethene	1.4	0.96	9.4	6.5
2-Hexanone	ND	0.96	ND	3.9
Dibromochloromethane	ND	0.96	ND	8.1
1,2-Dibromoethane	ND	0.96	ND	7.3
Chlorobenzene	ND	0.96	ND	4.4
Ethylbenzene	1.5	0.96	6.4	4.1
m,p-Xylenes	5.7	0.96	25	4.1
o-Xylene	3.1	0.96	13	4.1
Styrene	ND	0.96	ND	4.1
Bromoform	ND	0.96	ND	9.9
1,1,2,2-Tetrachloroethane	ND	0.96	ND	6.6
4-Ethyltoluene	2.5	0.96	12	4.7
1,3,5-Trimethylbenzene	2.6	0.96	13	4.7
1,2,4-Trimethylbenzene	7.8	0.96	38	4.7
1,3-Dichlorobenzene	ND	0.96	ND	5.7
1,4-Dichlorobenzene	ND	0.96	ND	5.7
Benzyl chloride	ND	0.96	ND	4.9
1,2-Dichlorobenzene	ND	0.96	ND	5.7
1,2,4-Trichlorobenzene	ND	0.96	ND	7.1
Hexachlorobutadiene	ND	0.96	ND	10
Naphthalene	ND	3.8	ND	20

Surrogate	%REC	Limits
Bromofluorobenzene	126 *	80-121

\*= Value outside of QC limits; see narrative

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-48	Diln Fac:	2.180
Lab ID:	282480-003	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/22/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	2.2	1.1	11	5.4
Freon 114	ND	1.1	ND	7.6
Chloromethane	ND	1.1	ND	2.3
Vinyl Chloride	ND	1.1	ND	2.8
1,3-Butadiene	ND	1.1	ND	2.4
Bromomethane	ND	1.1	ND	4.2
Chloroethane	ND	1.1	ND	2.9
Trichlorofluoromethane	ND	1.1	ND	6.1
Acrolein	ND	4.4	ND	10
1,1-Dichloroethene	ND	1.1	ND	4.3
Freon 113	ND	1.1	ND	8.4
Acetone	27	4.4	64	10
Carbon Disulfide	13	1.1	41	3.4
Isopropanol	5.9	4.4	14	11
Methylene Chloride	ND	1.1	ND	3.8
trans-1,2-Dichloroethene	ND	1.1	ND	4.3
MTBE	ND	1.1	ND	3.9
n-Hexane	16	1.1	58	3.8
1,1-Dichloroethane	ND	1.1	ND	4.4
Vinyl Acetate	ND	1.1	ND	3.8
cis-1,2-Dichloroethene	ND	1.1	ND	4.3
2-Butanone	2.2	1.1	6.4	3.2
Ethyl Acetate	ND	1.1	ND	3.9
Tetrahydrofuran	ND	1.1	ND	3.2
Chloroform	ND	1.1	ND	5.3
1,1,1-Trichloroethane	ND	1.1	ND	5.9
Cyclohexane	29	1.1	100	3.8
Carbon Tetrachloride	ND	1.1	ND	6.9
Benzene	3.2	1.1	10	3.5
1,2-Dichloroethane	ND	1.1	ND	4.4
n-Heptane	9.2	1.1	38	4.5
Trichloroethene	ND	1.1	ND	5.9
1,2-Dichloropropane	ND	1.1	ND	5.0
Bromodichloromethane	ND	1.1	ND	7.3

\*= Value outside of QC limits; see narrative

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units



Volatile Organics in Air			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-48	Diln Fac:	2.180
Lab ID:	282480-003	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/22/16

Analyte	Result (V)	RL	Result (M)	RL
cis-1,3-Dichloropropene	ND	1.1	ND	4.9
4-Methyl-2-Pentanone	ND	1.1	ND	4.5
Toluene	3.9	1.1	15	4.1
trans-1,3-Dichloropropene	ND	1.1	ND	4.9
1,1,2-Trichloroethane	ND	1.1	ND	5.9
Tetrachloroethene	1.2	1.1	8.0	7.4
2-Hexanone	ND	1.1	ND	4.5
Dibromochloromethane	ND	1.1	ND	9.3
1,2-Dibromoethane	ND	1.1	ND	8.4
Chlorobenzene	ND	1.1	ND	5.0
Ethylbenzene	1.6	1.1	7.1	4.7
m,p-Xylenes	9.8	1.1	43	4.7
o-Xylene	5.5	1.1	24	4.7
Styrene	ND	1.1	ND	4.6
Bromoform	ND	1.1	ND	11
1,1,2,2-Tetrachloroethane	ND	1.1	ND	7.5
4-Ethyltoluene	2.8	1.1	14	5.4
1,3,5-Trimethylbenzene	2.4	1.1	12	5.4
1,2,4-Trimethylbenzene	6.4	1.1	32	5.4
1,3-Dichlorobenzene	ND	1.1	ND	6.6
1,4-Dichlorobenzene	ND	1.1	ND	6.6
Benzyl chloride	ND	1.1	ND	5.6
1,2-Dichlorobenzene	ND	1.1	ND	6.6
1,2,4-Trichlorobenzene	ND	1.1	ND	8.1
Hexachlorobutadiene	ND	1.1	ND	12
Naphthalene	ND	4.4	ND	23

Surrogate	%REC	Limits
Bromofluorobenzene	127 *	80-121

\*= Value outside of QC limits; see narrative

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-49	Diln Fac:	2.200
Lab ID:	282480-004	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/22/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.1	ND	5.4
Freon 114	ND	1.1	ND	7.7
Chloromethane	ND	1.1	ND	2.3
Vinyl Chloride	ND	1.1	ND	2.8
1,3-Butadiene	ND	1.1	ND	2.4
Bromomethane	ND	1.1	ND	4.3
Chloroethane	ND	1.1	ND	2.9
Trichlorofluoromethane	ND	1.1	ND	6.2
Acrolein	ND	4.4	ND	10
1,1-Dichloroethene	ND	1.1	ND	4.4
Freon 113	ND	1.1	ND	8.4
Acetone	23	4.4	55	10
Carbon Disulfide	3.2	1.1	10	3.4
Isopropanol	ND	4.4	ND	11
Methylene Chloride	ND	1.1	ND	3.8
trans-1,2-Dichloroethene	ND	1.1	ND	4.4
MTBE	2.3	1.1	8.1	4.0
n-Hexane	2.8	1.1	9.9	3.9
1,1-Dichloroethane	ND	1.1	ND	4.5
Vinyl Acetate	ND	1.1	ND	3.9
cis-1,2-Dichloroethene	ND	1.1	ND	4.4
2-Butanone	5.4	1.1	16	3.2
Ethyl Acetate	ND	1.1	ND	4.0
Tetrahydrofuran	ND	1.1	ND	3.2
Chloroform	ND	1.1	ND	5.4
1,1,1-Trichloroethane	ND	1.1	ND	6.0
Cyclohexane	ND	1.1	ND	3.8
Carbon Tetrachloride	ND	1.1	ND	6.9
Benzene	6.8	1.1	22	3.5
1,2-Dichloroethane	ND	1.1	ND	4.5
n-Heptane	1.7	1.1	6.9	4.5
Trichloroethene	ND	1.1	ND	5.9
1,2-Dichloropropane	ND	1.1	ND	5.1
Bromodichloromethane	ND	1.1	ND	7.4
cis-1,3-Dichloropropene	ND	1.1	ND	5.0

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-49	Diln Fac:	2.200
Lab ID:	282480-004	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/22/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.1	ND	4.5
Toluene	7.0	1.1	26	4.1
trans-1,3-Dichloropropene	ND	1.1	ND	5.0
1,1,2-Trichloroethane	ND	1.1	ND	6.0
Tetrachloroethene	ND	1.1	ND	7.5
2-Hexanone	1.7	1.1	6.9	4.5
Dibromochloromethane	ND	1.1	ND	9.4
1,2-Dibromoethane	ND	1.1	ND	8.5
Chlorobenzene	ND	1.1	ND	5.1
Ethylbenzene	ND	1.1	ND	4.8
m,p-Xylenes	2.7	1.1	12	4.8
o-Xylene	ND	1.1	ND	4.8
Styrene	ND	1.1	ND	4.7
Bromoform	ND	1.1	ND	11
1,1,2,2-Tetrachloroethane	ND	1.1	ND	7.6
4-Ethyltoluene	ND	1.1	ND	5.4
1,3,5-Trimethylbenzene	ND	1.1	ND	5.4
1,2,4-Trimethylbenzene	ND	1.1	ND	5.4
1,3-Dichlorobenzene	ND	1.1	ND	6.6
1,4-Dichlorobenzene	ND	1.1	ND	6.6
Benzyl chloride	ND	1.1	ND	5.7
1,2-Dichlorobenzene	ND	1.1	ND	6.6
1,2,4-Trichlorobenzene	ND	1.1	ND	8.2
Hexachlorobutadiene	ND	1.1	ND	12
Naphthalene	ND	4.4	ND	23

Surrogate	%REC	Limits
Bromofluorobenzene	109	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-50	Diln Fac:	2.210
Lab ID:	282480-005	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/22/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.1	ND	5.5
Freon 114	ND	1.1	ND	7.7
Chloromethane	ND	1.1	ND	2.3
Vinyl Chloride	ND	1.1	ND	2.8
1,3-Butadiene	ND	1.1	ND	2.4
Bromomethane	ND	1.1	ND	4.3
Chloroethane	ND	1.1	ND	2.9
Trichlorofluoromethane	ND	1.1	ND	6.2
Acrolein	ND	4.4	ND	10
1,1-Dichloroethene	ND	1.1	ND	4.4
Freon 113	ND	1.1	ND	8.5
Acetone	34	4.4	82	10
Carbon Disulfide	23	1.1	70	3.4
Isopropanol	5.7	4.4	14	11
Methylene Chloride	ND	1.1	ND	3.8
trans-1,2-Dichloroethene	ND	1.1	ND	4.4
MTBE	1.2	1.1	4.2	4.0
n-Hexane	4.1	1.1	14	3.9
1,1-Dichloroethane	ND	1.1	ND	4.5
Vinyl Acetate	ND	1.1	ND	3.9
cis-1,2-Dichloroethene	2.1	1.1	8.4	4.4
2-Butanone	6.0	1.1	18	3.3
Ethyl Acetate	ND	1.1	ND	4.0
Tetrahydrofuran	ND	1.1	ND	3.3
Chloroform	1.7	1.1	8.2	5.4
1,1,1-Trichloroethane	ND	1.1	ND	6.0
Cyclohexane	ND	1.1	ND	3.8
Carbon Tetrachloride	ND	1.1	ND	7.0
Benzene	11	1.1	37	3.5
1,2-Dichloroethane	ND	1.1	ND	4.5
n-Heptane	2.3	1.1	9.3	4.5
Trichloroethene	ND	1.1	ND	5.9
1,2-Dichloropropane	ND	1.1	ND	5.1
Bromodichloromethane	ND	1.1	ND	7.4
cis-1,3-Dichloropropene	ND	1.1	ND	5.0

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

Volatile Organics in Air			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-50	Diln Fac:	2.210
Lab ID:	282480-005	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/22/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.1	ND	4.5
Toluene	9.5	1.1	36	4.2
trans-1,3-Dichloropropene	ND	1.1	ND	5.0
1,1,2-Trichloroethane	ND	1.1	ND	6.0
Tetrachloroethene	ND	1.1	ND	7.5
2-Hexanone	ND	1.1	ND	4.5
Dibromochloromethane	ND	1.1	ND	9.4
1,2-Dibromoethane	ND	1.1	ND	8.5
Chlorobenzene	ND	1.1	ND	5.1
Ethylbenzene	ND	1.1	ND	4.8
m,p-Xylenes	3.0	1.1	13	4.8
o-Xylene	ND	1.1	ND	4.8
Styrene	ND	1.1	ND	4.7
Bromoform	ND	1.1	ND	11
1,1,2,2-Tetrachloroethane	ND	1.1	ND	7.6
4-Ethyltoluene	ND	1.1	ND	5.4
1,3,5-Trimethylbenzene	ND	1.1	ND	5.4
1,2,4-Trimethylbenzene	ND	1.1	ND	5.4
1,3-Dichlorobenzene	ND	1.1	ND	6.6
1,4-Dichlorobenzene	ND	1.1	ND	6.6
Benzyl chloride	ND	1.1	ND	5.7
1,2-Dichlorobenzene	ND	1.1	ND	6.6
1,2,4-Trichlorobenzene	ND	1.1	ND	8.2
Hexachlorobutadiene	ND	1.1	ND	12
Naphthalene	ND	4.4	ND	23

Surrogate	%REC	Limits
Bromofluorobenzene	109	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-51	Diln Fac:	2.050
Lab ID:	282480-006	Batch#:	240483
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/24/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.0	ND	5.1
Freon 114	ND	1.0	ND	7.2
Chloromethane	ND	1.0	ND	2.1
Vinyl Chloride	ND	1.0	ND	2.6
1,3-Butadiene	ND	1.0	ND	2.3
Bromomethane	ND	1.0	ND	4.0
Chloroethane	ND	1.0	ND	2.7
Trichlorofluoromethane	ND	1.0	ND	5.8
Acrolein	ND	4.1	ND	9.4
1,1-Dichloroethene	ND	1.0	ND	4.1
Freon 113	ND	1.0	ND	7.9
Acetone	4.5	4.1	11	9.7
Carbon Disulfide	2.7	1.0	8.4	3.2
Isopropanol	5.0	4.1	12	10
Methylene Chloride	ND	1.0	ND	3.6
trans-1,2-Dichloroethene	ND	1.0	ND	4.1
MTBE	ND	1.0	ND	3.7
n-Hexane	ND	1.0	ND	3.6
1,1-Dichloroethane	ND	1.0	ND	4.1
Vinyl Acetate	ND	1.0	ND	3.6
cis-1,2-Dichloroethene	ND	1.0	ND	4.1
2-Butanone	ND	1.0	ND	3.0
Ethyl Acetate	ND	1.0	ND	3.7
Tetrahydrofuran	ND	1.0	ND	3.0
Chloroform	ND	1.0	ND	5.0
1,1,1-Trichloroethane	ND	1.0	ND	5.6
Cyclohexane	1.7	1.0	6.0	3.5
Carbon Tetrachloride	ND	1.0	ND	6.4
Benzene	2.3	1.0	7.4	3.3
1,2-Dichloroethane	ND	1.0	ND	4.1
n-Heptane	ND	1.0	ND	4.2
Trichloroethene	ND	1.0	ND	5.5
1,2-Dichloropropane	ND	1.0	ND	4.7
Bromodichloromethane	ND	1.0	ND	6.9
cis-1,3-Dichloropropene	ND	1.0	ND	4.7

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-51	Diln Fac:	2.050
Lab ID:	282480-006	Batch#:	240483
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/24/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.0	ND	4.2
Toluene	2.3	1.0	8.8	3.9
trans-1,3-Dichloropropene	ND	1.0	ND	4.7
1,1,2-Trichloroethane	ND	1.0	ND	5.6
Tetrachloroethene	ND	1.0	ND	7.0
2-Hexanone	ND	1.0	ND	4.2
Dibromochloromethane	ND	1.0	ND	8.7
1,2-Dibromoethane	ND	1.0	ND	7.9
Chlorobenzene	ND	1.0	ND	4.7
Ethylbenzene	ND	1.0	ND	4.5
m,p-Xylenes	1.6	1.0	7.0	4.5
o-Xylene	ND	1.0	ND	4.5
Styrene	ND	1.0	ND	4.4
Bromoform	ND	1.0	ND	11
1,1,2,2-Tetrachloroethane	ND	1.0	ND	7.0
4-Ethyltoluene	ND	1.0	ND	5.0
1,3,5-Trimethylbenzene	ND	1.0	ND	5.0
1,2,4-Trimethylbenzene	ND	1.0	ND	5.0
1,3-Dichlorobenzene	ND	1.0	ND	6.2
1,4-Dichlorobenzene	ND	1.0	ND	6.2
Benzyl chloride	ND	1.0	ND	5.3
1,2-Dichlorobenzene	ND	1.0	ND	6.2
1,2,4-Trichlorobenzene	ND	1.0	ND	7.6
Hexachlorobutadiene	ND	1.0	ND	11
Naphthalene	ND	4.1	ND	21

Surrogate	%REC	Limits
Bromofluorobenzene	96	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units



### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-52	Diln Fac:	2.040
Lab ID:	282480-007	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/21/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.0	ND	5.0
Freon 114	ND	1.0	ND	7.1
Chloromethane	ND	1.0	ND	2.1
Vinyl Chloride	ND	1.0	ND	2.6
1,3-Butadiene	ND	1.0	ND	2.3
Bromomethane	ND	1.0	ND	4.0
Chloroethane	ND	1.0	ND	2.7
Trichlorofluoromethane	ND	1.0	ND	5.7
Acrolein	ND	4.1	ND	9.4
1,1-Dichloroethene	ND	1.0	ND	4.0
Freon 113	ND	1.0	ND	7.8
Acetone	4.5	4.1	11	9.7
Carbon Disulfide	ND	1.0	ND	3.2
Isopropanol	5.2	4.1	13	10
Methylene Chloride	ND	1.0	ND	3.5
trans-1,2-Dichloroethene	ND	1.0	ND	4.0
MTBE	ND	1.0	ND	3.7
n-Hexane	ND	1.0	ND	3.6
1,1-Dichloroethane	ND	1.0	ND	4.1
Vinyl Acetate	ND	1.0	ND	3.6
cis-1,2-Dichloroethene	ND	1.0	ND	4.0
2-Butanone	ND	1.0	ND	3.0
Ethyl Acetate	ND	1.0	ND	3.7
Tetrahydrofuran	ND	1.0	ND	3.0
Chloroform	ND	1.0	ND	5.0
1,1,1-Trichloroethane	ND	1.0	ND	5.6
Cyclohexane	1.2	1.0	4.1	3.5
Carbon Tetrachloride	ND	1.0	ND	6.4
Benzene	1.5	1.0	4.7	3.3
1,2-Dichloroethane	ND	1.0	ND	4.1
n-Heptane	ND	1.0	ND	4.2
Trichloroethene	ND	1.0	ND	5.5
1,2-Dichloropropane	ND	1.0	ND	4.7
Bromodichloromethane	ND	1.0	ND	6.8
cis-1,3-Dichloropropene	ND	1.0	ND	4.6

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-52	Diln Fac:	2.040
Lab ID:	282480-007	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/21/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.0	ND	4.2
Toluene	1.2	1.0	4.6	3.8
trans-1,3-Dichloropropene	ND	1.0	ND	4.6
1,1,2-Trichloroethane	ND	1.0	ND	5.6
Tetrachloroethene	3.4	1.0	23	6.9
2-Hexanone	ND	1.0	ND	4.2
Dibromochloromethane	ND	1.0	ND	8.7
1,2-Dibromoethane	ND	1.0	ND	7.8
Chlorobenzene	ND	1.0	ND	4.7
Ethylbenzene	ND	1.0	ND	4.4
m,p-Xylenes	ND	1.0	ND	4.4
o-Xylene	ND	1.0	ND	4.4
Styrene	ND	1.0	ND	4.3
Bromoform	ND	1.0	ND	11
1,1,2,2-Tetrachloroethane	ND	1.0	ND	7.0
4-Ethyltoluene	ND	1.0	ND	5.0
1,3,5-Trimethylbenzene	ND	1.0	ND	5.0
1,2,4-Trimethylbenzene	ND	1.0	ND	5.0
1,3-Dichlorobenzene	ND	1.0	ND	6.1
1,4-Dichlorobenzene	ND	1.0	ND	6.1
Benzyl chloride	ND	1.0	ND	5.3
1,2-Dichlorobenzene	ND	1.0	ND	6.1
1,2,4-Trichlorobenzene	ND	1.0	ND	7.6
Hexachlorobutadiene	ND	1.0	ND	11
Naphthalene	ND	4.1	ND	21

Surrogate	%REC	Limits
Bromofluorobenzene	94	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-53	Diln Fac:	2.110
Lab ID:	282480-008	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/21/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.1	ND	5.2
Freon 114	ND	1.1	ND	7.4
Chloromethane	ND	1.1	ND	2.2
Vinyl Chloride	ND	1.1	ND	2.7
1,3-Butadiene	ND	1.1	ND	2.3
Bromomethane	ND	1.1	ND	4.1
Chloroethane	ND	1.1	ND	2.8
Trichlorofluoromethane	ND	1.1	ND	5.9
Acrolein	ND	4.2	ND	9.7
1,1-Dichloroethene	ND	1.1	ND	4.2
Freon 113	ND	1.1	ND	8.1
Acetone	13	4.2	32	10
Carbon Disulfide	10	1.1	32	3.3
Isopropanol	6.1	4.2	15	10
Methylene Chloride	ND	1.1	ND	3.7
trans-1,2-Dichloroethene	ND	1.1	ND	4.2
MTBE	ND	1.1	ND	3.8
n-Hexane	1.2	1.1	4.4	3.7
1,1-Dichloroethane	ND	1.1	ND	4.3
Vinyl Acetate	ND	1.1	ND	3.7
cis-1,2-Dichloroethene	ND	1.1	ND	4.2
2-Butanone	1.9	1.1	5.7	3.1
Ethyl Acetate	ND	1.1	ND	3.8
Tetrahydrofuran	ND	1.1	ND	3.1
Chloroform	6.2	1.1	30	5.2
1,1,1-Trichloroethane	ND	1.1	ND	5.8
Cyclohexane	ND	1.1	ND	3.6
Carbon Tetrachloride	ND	1.1	ND	6.6
Benzene	2.9	1.1	9.3	3.4
1,2-Dichloroethane	ND	1.1	ND	4.3
n-Heptane	ND	1.1	ND	4.3
Trichloroethene	1.1	1.1	5.7	5.7
1,2-Dichloropropane	ND	1.1	ND	4.9
Bromodichloromethane	ND	1.1	ND	7.1
cis-1,3-Dichloropropene	ND	1.1	ND	4.8

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-53	Diln Fac:	2.110
Lab ID:	282480-008	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/21/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.1	ND	4.3
Toluene	2.6	1.1	9.6	4.0
trans-1,3-Dichloropropene	ND	1.1	ND	4.8
1,1,2-Trichloroethane	ND	1.1	ND	5.8
Tetrachloroethene	2.8	1.1	19	7.2
2-Hexanone	ND	1.1	ND	4.3
Dibromochloromethane	ND	1.1	ND	9.0
1,2-Dibromoethane	ND	1.1	ND	8.1
Chlorobenzene	ND	1.1	ND	4.9
Ethylbenzene	ND	1.1	ND	4.6
m,p-Xylenes	1.9	1.1	8.3	4.6
o-Xylene	ND	1.1	ND	4.6
Styrene	ND	1.1	ND	4.5
Bromoform	ND	1.1	ND	11
1,1,2,2-Tetrachloroethane	ND	1.1	ND	7.2
4-Ethyltoluene	ND	1.1	ND	5.2
1,3,5-Trimethylbenzene	ND	1.1	ND	5.2
1,2,4-Trimethylbenzene	1.2	1.1	5.7	5.2
1,3-Dichlorobenzene	ND	1.1	ND	6.3
1,4-Dichlorobenzene	ND	1.1	ND	6.3
Benzyl chloride	ND	1.1	ND	5.5
1,2-Dichlorobenzene	ND	1.1	ND	6.3
1,2,4-Trichlorobenzene	ND	1.1	ND	7.8
Hexachlorobutadiene	ND	1.1	ND	11
Naphthalene	ND	4.2	ND	22

Surrogate	%REC	Limits
Bromofluorobenzene	93	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-54	Diln Fac:	1.990
Lab ID:	282480-009	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/22/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	2.7	1.0	14	4.9
Freon 114	ND	1.0	ND	7.0
Chloromethane	ND	1.0	ND	2.1
Vinyl Chloride	ND	1.0	ND	2.5
1,3-Butadiene	ND	1.0	ND	2.2
Bromomethane	ND	1.0	ND	3.9
Chloroethane	ND	1.0	ND	2.6
Trichlorofluoromethane	ND	1.0	ND	5.6
Acrolein	ND	4.0	ND	9.1
1,1-Dichloroethene	ND	1.0	ND	3.9
Freon 113	ND	1.0	ND	7.6
Acetone	7.1	4.0	17	9.5
Carbon Disulfide	1.4	1.0	4.4	3.1
Isopropanol	13	4.0	32	9.8
Methylene Chloride	ND	1.0	ND	3.5
trans-1,2-Dichloroethene	ND	1.0	ND	3.9
MTBE	ND	1.0	ND	3.6
n-Hexane	ND	1.0	ND	3.5
1,1-Dichloroethane	ND	1.0	ND	4.0
Vinyl Acetate	ND	1.0	ND	3.5
cis-1,2-Dichloroethene	ND	1.0	ND	3.9
2-Butanone	ND	1.0	ND	2.9
Ethyl Acetate	ND	1.0	ND	3.6
Tetrahydrofuran	ND	1.0	ND	2.9
Chloroform	ND	1.0	ND	4.9
1,1,1-Trichloroethane	ND	1.0	ND	5.4
Cyclohexane	ND	1.0	ND	3.4
Carbon Tetrachloride	ND	1.0	ND	6.3
Benzene	1.8	1.0	5.6	3.2
1,2-Dichloroethane	ND	1.0	ND	4.0
n-Heptane	ND	1.0	ND	4.1
Trichloroethene	ND	1.0	ND	5.3
1,2-Dichloropropane	ND	1.0	ND	4.6
Bromodichloromethane	ND	1.0	ND	6.7
cis-1,3-Dichloropropene	ND	1.0	ND	4.5

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

Volatile Organics in Air			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-54	Diln Fac:	1.990
Lab ID:	282480-009	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/22/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.0	ND	4.1
Toluene	1.6	1.0	6.0	3.7
trans-1,3-Dichloropropene	ND	1.0	ND	4.5
1,1,2-Trichloroethane	ND	1.0	ND	5.4
Tetrachloroethene	6.1	1.0	41	6.7
2-Hexanone	ND	1.0	ND	4.1
Dibromochloromethane	ND	1.0	ND	8.5
1,2-Dibromoethane	ND	1.0	ND	7.6
Chlorobenzene	ND	1.0	ND	4.6
Ethylbenzene	ND	1.0	ND	4.3
m,p-Xylenes	1.1	1.0	4.7	4.3
o-Xylene	ND	1.0	ND	4.3
Styrene	ND	1.0	ND	4.2
Bromoform	ND	1.0	ND	10
1,1,2,2-Tetrachloroethane	ND	1.0	ND	6.8
4-Ethyltoluene	ND	1.0	ND	4.9
1,3,5-Trimethylbenzene	ND	1.0	ND	4.9
1,2,4-Trimethylbenzene	ND	1.0	ND	4.9
1,3-Dichlorobenzene	ND	1.0	ND	6.0
1,4-Dichlorobenzene	ND	1.0	ND	6.0
Benzyl chloride	ND	1.0	ND	5.2
1,2-Dichlorobenzene	ND	1.0	ND	6.0
1,2,4-Trichlorobenzene	ND	1.0	ND	7.4
Hexachlorobutadiene	ND	1.0	ND	11
Naphthalene	ND	4.0	ND	21

Surrogate	%REC	Limits
Bromofluorobenzene	97	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-55	Diln Fac:	2.130
Lab ID:	282480-010	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/22/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.1	ND	5.3
Freon 114	ND	1.1	ND	7.4
Chloromethane	ND	1.1	ND	2.2
Vinyl Chloride	ND	1.1	ND	2.7
1,3-Butadiene	ND	1.1	ND	2.4
Bromomethane	ND	1.1	ND	4.1
Chloroethane	ND	1.1	ND	2.8
Trichlorofluoromethane	ND	1.1	ND	6.0
Acrolein	ND	4.3	ND	9.8
1,1-Dichloroethene	ND	1.1	ND	4.2
Freon 113	ND	1.1	ND	8.2
Acetone	15	4.3	36	10
Carbon Disulfide	38	1.1	120	3.3
Isopropanol	ND	4.3	ND	10
Methylene Chloride	ND	1.1	ND	3.7
trans-1,2-Dichloroethene	ND	1.1	ND	4.2
MTBE	ND	1.1	ND	3.8
n-Hexane	2.5	1.1	8.9	3.8
1,1-Dichloroethane	ND	1.1	ND	4.3
Vinyl Acetate	ND	1.1	ND	3.7
cis-1,2-Dichloroethene	ND	1.1	ND	4.2
2-Butanone	ND	1.1	ND	3.1
Ethyl Acetate	ND	1.1	ND	3.8
Tetrahydrofuran	ND	1.1	ND	3.1
Chloroform	ND	1.1	ND	5.2
1,1,1-Trichloroethane	ND	1.1	ND	5.8
Cyclohexane	ND	1.1	ND	3.7
Carbon Tetrachloride	ND	1.1	ND	6.7
Benzene	25	1.1	81	3.4
1,2-Dichloroethane	ND	1.1	ND	4.3
n-Heptane	3.0	1.1	12	4.4
Trichloroethene	ND	1.1	ND	5.7
1,2-Dichloropropane	ND	1.1	ND	4.9
Bromodichloromethane	ND	1.1	ND	7.1
cis-1,3-Dichloropropene	ND	1.1	ND	4.8

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units



### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-55	Diln Fac:	2.130
Lab ID:	282480-010	Batch#:	240422
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/22/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.1	ND	4.4
Toluene	26	1.1	98	4.0
trans-1,3-Dichloropropene	ND	1.1	ND	4.8
1,1,2-Trichloroethane	ND	1.1	ND	5.8
Tetrachloroethene	ND	1.1	ND	7.2
2-Hexanone	ND	1.1	ND	4.4
Dibromochloromethane	ND	1.1	ND	9.1
1,2-Dibromoethane	ND	1.1	ND	8.2
Chlorobenzene	ND	1.1	ND	4.9
Ethylbenzene	2.1	1.1	8.9	4.6
m,p-Xylenes	8.7	1.1	38	4.6
o-Xylene	2.4	1.1	10	4.6
Styrene	ND	1.1	ND	4.5
Bromoform	ND	1.1	ND	11
1,1,2,2-Tetrachloroethane	ND	1.1	ND	7.3
4-Ethyltoluene	ND	1.1	ND	5.2
1,3,5-Trimethylbenzene	ND	1.1	ND	5.2
1,2,4-Trimethylbenzene	1.6	1.1	8.1	5.2
1,3-Dichlorobenzene	ND	1.1	ND	6.4
1,4-Dichlorobenzene	ND	1.1	ND	6.4
Benzyl chloride	ND	1.1	ND	5.5
1,2-Dichlorobenzene	ND	1.1	ND	6.4
1,2,4-Trichlorobenzene	ND	1.1	ND	7.9
Hexachlorobutadiene	ND	1.1	ND	11
Naphthalene	ND	4.3	ND	22

Surrogate	%REC	Limits
Bromofluorobenzene	112	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-56	Diln Fac:	2.120
Lab ID:	282480-011	Batch#:	240483
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/24/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	1.1	ND	5.2
Freon 114	ND	1.1	ND	7.4
Chloromethane	ND	1.1	ND	2.2
Vinyl Chloride	ND	1.1	ND	2.7
1,3-Butadiene	ND	1.1	ND	2.3
Bromomethane	ND	1.1	ND	4.1
Chloroethane	ND	1.1	ND	2.8
Trichlorofluoromethane	ND	1.1	ND	6.0
Acrolein	ND	4.2	ND	9.7
1,1-Dichloroethene	ND	1.1	ND	4.2
Freon 113	ND	1.1	ND	8.1
Acetone	30	4.2	70	10
Carbon Disulfide	33	1.1	100	3.3
Isopropanol	ND	4.2	ND	10
Methylene Chloride	ND	1.1	ND	3.7
trans-1,2-Dichloroethene	ND	1.1	ND	4.2
MTBE	ND	1.1	ND	3.8
n-Hexane	1.5	1.1	5.1	3.7
1,1-Dichloroethane	ND	1.1	ND	4.3
Vinyl Acetate	ND	1.1	ND	3.7
cis-1,2-Dichloroethene	ND	1.1	ND	4.2
2-Butanone	1.4	1.1	4.1	3.1
Ethyl Acetate	ND	1.1	ND	3.8
Tetrahydrofuran	ND	1.1	ND	3.1
Chloroform	1.4	1.1	6.7	5.2
1,1,1-Trichloroethane	ND	1.1	ND	5.8
Cyclohexane	ND	1.1	ND	3.6
Carbon Tetrachloride	ND	1.1	ND	6.7
Benzene	24	1.1	78	3.4
1,2-Dichloroethane	ND	1.1	ND	4.3
n-Heptane	2.5	1.1	10	4.3
Trichloroethene	ND	1.1	ND	5.7
1,2-Dichloropropane	ND	1.1	ND	4.9
Bromodichloromethane	ND	1.1	ND	7.1
cis-1,3-Dichloropropene	ND	1.1	ND	4.8

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

Volatile Organics in Air			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SV-56	Diln Fac:	2.120
Lab ID:	282480-011	Batch#:	240483
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/24/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	1.1	ND	4.3
Toluene	23	1.1	85	4.0
trans-1,3-Dichloropropene	ND	1.1	ND	4.8
1,1,2-Trichloroethane	ND	1.1	ND	5.8
Tetrachloroethene	ND	1.1	ND	7.2
2-Hexanone	ND	1.1	ND	4.3
Dibromochloromethane	ND	1.1	ND	9.0
1,2-Dibromoethane	ND	1.1	ND	8.1
Chlorobenzene	ND	1.1	ND	4.9
Ethylbenzene	2.3	1.1	9.8	4.6
m,p-Xylenes	10	1.1	43	4.6
o-Xylene	2.8	1.1	12	4.6
Styrene	ND	1.1	ND	4.5
Bromoform	ND	1.1	ND	11
1,1,2,2-Tetrachloroethane	ND	1.1	ND	7.3
4-Ethyltoluene	ND	1.1	ND	5.2
1,3,5-Trimethylbenzene	ND	1.1	ND	5.2
1,2,4-Trimethylbenzene	2.0	1.1	10	5.2
1,3-Dichlorobenzene	ND	1.1	ND	6.4
1,4-Dichlorobenzene	ND	1.1	ND	6.4
Benzyl chloride	ND	1.1	ND	5.5
1,2-Dichlorobenzene	ND	1.1	ND	6.4
1,2,4-Trichlorobenzene	ND	1.1	ND	7.9
Hexachlorobutadiene	ND	1.1	ND	11
Naphthalene	ND	4.2	ND	22

Surrogate	%REC	Limits
Bromofluorobenzene	103	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

### Volatile Organics in Air

Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SHROUD	Diln Fac:	824.0
Lab ID:	282480-012	Batch#:	240537
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/26/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	410	ND	2,000
Freon 114	ND	410	ND	2,900
Chloromethane	ND	410	ND	850
Vinyl Chloride	ND	410	ND	1,100
1,3-Butadiene	ND	410	ND	910
Bromomethane	ND	410	ND	1,600
Chloroethane	ND	410	ND	1,100
Trichlorofluoromethane	ND	410	ND	2,300
Acrolein	ND	1,600	ND	3,800
1,1-Dichloroethene	ND	410	ND	1,600
Freon 113	ND	410	ND	3,200
Acetone	ND	1,600	ND	3,900
Carbon Disulfide	ND	410	ND	1,300
Isopropanol	39,000	1,600	95,000	4,100
Methylene Chloride	ND	410	ND	1,400
trans-1,2-Dichloroethene	ND	410	ND	1,600
MTBE	ND	410	ND	1,500
n-Hexane	ND	410	ND	1,500
1,1-Dichloroethane	ND	410	ND	1,700
Vinyl Acetate	ND	410	ND	1,500
cis-1,2-Dichloroethene	ND	410	ND	1,600
2-Butanone	ND	410	ND	1,200
Ethyl Acetate	ND	410	ND	1,500
Tetrahydrofuran	ND	410	ND	1,200
Chloroform	ND	410	ND	2,000
1,1,1-Trichloroethane	ND	410	ND	2,200
Cyclohexane	ND	410	ND	1,400
Carbon Tetrachloride	ND	410	ND	2,600
Benzene	ND	410	ND	1,300
1,2-Dichloroethane	ND	410	ND	1,700
n-Heptane	ND	410	ND	1,700
Trichloroethene	ND	410	ND	2,200
1,2-Dichloropropane	ND	410	ND	1,900
Bromodichloromethane	ND	410	ND	2,800
cis-1,3-Dichloropropene	ND	410	ND	1,900

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

Volatile Organics in Air			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Field ID:	SHROUD	Diln Fac:	824.0
Lab ID:	282480-012	Batch#:	240537
Matrix:	Air	Sampled:	10/21/16
Units (V):	ppbv	Received:	10/21/16
Units (M):	ug/m3	Analyzed:	10/26/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	410	ND	1,700
Toluene	ND	410	ND	1,600
trans-1,3-Dichloropropene	ND	410	ND	1,900
1,1,2-Trichloroethane	ND	410	ND	2,200
Tetrachloroethene	ND	410	ND	2,800
2-Hexanone	ND	410	ND	1,700
Dibromochloromethane	ND	410	ND	3,500
1,2-Dibromoethane	ND	410	ND	3,200
Chlorobenzene	ND	410	ND	1,900
Ethylbenzene	ND	410	ND	1,800
m,p-Xylenes	ND	410	ND	1,800
o-Xylene	ND	410	ND	1,800
Styrene	ND	410	ND	1,800
Bromoform	ND	410	ND	4,300
1,1,2,2-Tetrachloroethane	ND	410	ND	2,800
4-Ethyltoluene	ND	410	ND	2,000
1,3,5-Trimethylbenzene	ND	410	ND	2,000
1,2,4-Trimethylbenzene	ND	410	ND	2,000
1,3-Dichlorobenzene	ND	410	ND	2,500
1,4-Dichlorobenzene	ND	410	ND	2,500
Benzyl chloride	ND	410	ND	2,100
1,2-Dichlorobenzene	ND	410	ND	2,500
1,2,4-Trichlorobenzene	ND	410	ND	3,100
Hexachlorobutadiene	ND	410	ND	4,400
Naphthalene	ND	1,600	ND	8,600

Surrogate	%REC	Limits
Bromofluorobenzene	95	80-121

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units



**Batch QC Report**

<b>Volatile Organics in Air</b>			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	240422
Units (V):	ppbv	Analyzed:	10/21/16
Diln Fac:	1.000		

<b>Analyte</b>	<b>Spiked</b>	<b>Result (V)</b>	<b>%REC</b>	<b>Limits</b>
1,2-Dichloropropane	10.00	10.84	108	70-130
Bromodichloromethane	10.00	10.39	104	70-130
cis-1,3-Dichloropropene	10.00	10.89	109	70-130
4-Methyl-2-Pentanone	10.00	12.29	123	70-130
Toluene	10.00	9.810	98	70-130
trans-1,3-Dichloropropene	10.00	10.17	102	70-130
1,1,2-Trichloroethane	10.00	11.40	114	70-130
Tetrachloroethene	10.00	10.31	103	70-130
2-Hexanone	10.00	11.52	115	70-130
Dibromochloromethane	10.00	9.378	94	70-130
1,2-Dibromoethane	10.00	10.15	102	70-130
Chlorobenzene	10.00	8.129	81	70-130
Ethylbenzene	10.00	9.269	93	70-130
m,p-Xylenes	20.00	20.82	104	70-130
o-Xylene	10.00	10.27	103	70-130
Styrene	10.00	9.271	93	70-130
Bromoform	10.00	9.541	95	70-130
1,1,2,2-Tetrachloroethane	10.00	9.292	93	70-130
4-Ethyltoluene	10.00	10.37	104	70-130
1,3,5-Trimethylbenzene	10.00	9.479	95	70-130
1,2,4-Trimethylbenzene	10.00	10.31	103	70-130
1,3-Dichlorobenzene	10.00	9.752	98	70-130
1,4-Dichlorobenzene	10.00	8.782	88	70-130
Benzyl chloride	10.00	9.033	90	70-130
1,2-Dichlorobenzene	10.00	8.739	87	70-130
1,2,4-Trichlorobenzene	10.00	11.67	117	70-130
Hexachlorobutadiene	10.00	11.67	117	70-130
Naphthalene	10.00	12.94	129	70-130

<b>Surrogate</b>	<b>%REC</b>	<b>Limits</b>
Bromofluorobenzene	108	70-130

\*= Value outside of QC limits; see narrative

b= See narrative

RPD= Relative Percent Difference

Result V= Result in volume units





**Batch QC Report**

<b>Volatile Organics in Air</b>			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	240422
Units (V):	ppbv	Analyzed:	10/21/16
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
1,2-Dichloropropane	10.00	10.75	108	70-130	1	25
Bromodichloromethane	10.00	10.12	101	70-130	3	25
cis-1,3-Dichloropropene	10.00	10.52	105	70-130	3	25
4-Methyl-2-Pentanone	10.00	12.09	121	70-130	2	25
Toluene	10.00	10.01	100	70-130	2	25
trans-1,3-Dichloropropene	10.00	10.19	102	70-130	0	25
1,1,2-Trichloroethane	10.00	11.07	111	70-130	3	25
Tetrachloroethene	10.00	10.52	105	70-130	2	25
2-Hexanone	10.00	11.76	118	70-130	2	25
Dibromochloromethane	10.00	8.966	90	70-130	4	25
1,2-Dibromoethane	10.00	9.887	99	70-130	3	25
Chlorobenzene	10.00	8.306	83	70-130	2	25
Ethylbenzene	10.00	9.297	93	70-130	0	25
m,p-Xylenes	20.00	20.87	104	70-130	0	25
o-Xylene	10.00	9.920	99	70-130	3	25
Styrene	10.00	9.095	91	70-130	2	25
Bromoform	10.00	9.385	94	70-130	2	25
1,1,2,2-Tetrachloroethane	10.00	9.392	94	70-130	1	25
4-Ethyltoluene	10.00	9.918	99	70-130	4	25
1,3,5-Trimethylbenzene	10.00	9.114	91	70-130	4	25
1,2,4-Trimethylbenzene	10.00	10.19	102	70-130	1	25
1,3-Dichlorobenzene	10.00	9.812	98	70-130	1	25
1,4-Dichlorobenzene	10.00	9.159	92	70-130	4	25
Benzyl chloride	10.00	8.945	89	70-130	1	25
1,2-Dichlorobenzene	10.00	8.912	89	70-130	2	25
1,2,4-Trichlorobenzene	10.00	11.86	119	70-130	2	25
Hexachlorobutadiene	10.00	11.61	116	70-130	1	25
Naphthalene	10.00	12.37	124	70-130	5	25

Surrogate	%REC	Limits
Bromofluorobenzene	104	70-130

\*= Value outside of QC limits; see narrative

b= See narrative

RPD= Relative Percent Difference

Result V= Result in volume units

**Batch QC Report**

Volatile Organics in Air			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC856746	Diln Fac:	1.000
Matrix:	Air	Batch#:	240422
Units (V):	ppbv	Analyzed:	10/21/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	ND	2.0	ND	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Isopropanol	ND	2.0	ND	4.9
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	ND	0.50	ND	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	ND	0.50	ND	1.5
Ethyl Acetate	ND	0.50	ND	1.8
Tetrahydrofuran	ND	0.50	ND	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	ND	0.50	ND	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

**Batch QC Report**

Volatile Organics in Air			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC856746	Diln Fac:	1.000
Matrix:	Air	Batch#:	240422
Units (V):	ppbv	Analyzed:	10/21/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.50	ND	2.0
Toluene	ND	0.50	ND	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	ND	0.50	ND	2.2
m,p-Xylenes	ND	0.50	ND	2.2
o-Xylene	ND	0.50	ND	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	ND	0.50	ND	2.5
1,3,5-Trimethylbenzene	ND	0.50	ND	2.5
1,2,4-Trimethylbenzene	ND	0.50	ND	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	91	70-130

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units



**Batch QC Report**

<b>Volatile Organics in Air</b>			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	240483
Units (V):	ppbv	Analyzed:	10/24/16
Diln Fac:	1.000		

<b>Analyte</b>	<b>Spiked</b>	<b>Result (V)</b>	<b>%REC</b>	<b>Limits</b>
cis-1,3-Dichloropropene	10.00	10.81	108	70-130
4-Methyl-2-Pentanone	10.00	12.44	124	70-130
Toluene	10.00	9.919	99	70-130
trans-1,3-Dichloropropene	10.00	10.32	103	70-130
1,1,2-Trichloroethane	10.00	11.44	114	70-130
Tetrachloroethene	10.00	10.67	107	70-130
2-Hexanone	10.00	12.00	120	70-130
Dibromochloromethane	10.00	9.396	94	70-130
1,2-Dibromoethane	10.00	10.01	100	70-130
Chlorobenzene	10.00	8.107	81	70-130
Ethylbenzene	10.00	9.121	91	70-130
m,p-Xylenes	20.00	21.04	105	70-130
o-Xylene	10.00	10.18	102	70-130
Styrene	10.00	9.095	91	70-130
Bromoform	10.00	9.668	97	70-130
1,1,2,2-Tetrachloroethane	10.00	9.491	95	70-130
4-Ethyltoluene	10.00	10.55	106	70-130
1,3,5-Trimethylbenzene	10.00	9.598	96	70-130
1,2,4-Trimethylbenzene	10.00	10.40	104	70-130
1,3-Dichlorobenzene	10.00	9.817	98	70-130
1,4-Dichlorobenzene	10.00	9.248	92	70-130
Benzyl chloride	10.00	9.265	93	70-130
1,2-Dichlorobenzene	10.00	9.056	91	70-130
1,2,4-Trichlorobenzene	10.00	12.32	123	70-130
Hexachlorobutadiene	10.00	12.19	122	70-130
Naphthalene	10.00	13.03	130	70-130

<b>Surrogate</b>	<b>%REC</b>	<b>Limits</b>
Bromofluorobenzene	109	70-130

RPD= Relative Percent Difference

Result V= Result in volume units





**Batch QC Report**

<b>Volatile Organics in Air</b>			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	240483
Units (V):	ppbv	Analyzed:	10/24/16
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
cis-1,3-Dichloropropene	10.00	10.63	106	70-130	2	25
4-Methyl-2-Pentanone	10.00	12.09	121	70-130	3	25
Toluene	10.00	9.643	96	70-130	3	25
trans-1,3-Dichloropropene	10.00	10.08	101	70-130	2	25
1,1,2-Trichloroethane	10.00	11.34	113	70-130	1	25
Tetrachloroethene	10.00	10.40	104	70-130	3	25
2-Hexanone	10.00	11.56	116	70-130	4	25
Dibromochloromethane	10.00	9.057	91	70-130	4	25
1,2-Dibromoethane	10.00	9.954	100	70-130	1	25
Chlorobenzene	10.00	8.084	81	70-130	0	25
Ethylbenzene	10.00	9.119	91	70-130	0	25
m,p-Xylenes	20.00	21.07	105	70-130	0	25
o-Xylene	10.00	10.12	101	70-130	1	25
Styrene	10.00	8.827	88	70-130	3	25
Bromoform	10.00	9.503	95	70-130	2	25
1,1,2,2-Tetrachloroethane	10.00	9.420	94	70-130	1	25
4-Ethyltoluene	10.00	10.16	102	70-130	4	25
1,3,5-Trimethylbenzene	10.00	9.235	92	70-130	4	25
1,2,4-Trimethylbenzene	10.00	10.45	104	70-130	0	25
1,3-Dichlorobenzene	10.00	9.671	97	70-130	1	25
1,4-Dichlorobenzene	10.00	9.114	91	70-130	1	25
Benzyl chloride	10.00	8.917	89	70-130	4	25
1,2-Dichlorobenzene	10.00	9.165	92	70-130	1	25
1,2,4-Trichlorobenzene	10.00	11.82	118	70-130	4	25
Hexachlorobutadiene	10.00	11.71	117	70-130	4	25
Naphthalene	10.00	12.80	128	70-130	2	25

Surrogate	%REC	Limits
Bromofluorobenzene	104	70-130

RPD= Relative Percent Difference

Result V= Result in volume units

**Batch QC Report**

Volatile Organics in Air			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC856987	Diln Fac:	1.000
Matrix:	Air	Batch#:	240483
Units (V):	ppbv	Analyzed:	10/24/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	ND	2.0	ND	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Isopropanol	ND	2.0	ND	4.9
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	ND	0.50	ND	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	ND	0.50	ND	1.5
Ethyl Acetate	ND	0.50	ND	1.8
Tetrahydrofuran	ND	0.50	ND	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	ND	0.50	ND	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

**Batch QC Report**

Volatile Organics in Air			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC856987	Diln Fac:	1.000
Matrix:	Air	Batch#:	240483
Units (V):	ppbv	Analyzed:	10/24/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.50	ND	2.0
Toluene	ND	0.50	ND	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	ND	0.50	ND	2.2
m,p-Xylenes	ND	0.50	ND	2.2
o-Xylene	ND	0.50	ND	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	ND	0.50	ND	2.5
1,3,5-Trimethylbenzene	ND	0.50	ND	2.5
1,2,4-Trimethylbenzene	ND	0.50	ND	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	93	70-130

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units



**Batch QC Report**

<b>Volatile Organics in Air</b>			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	240537
Units (V):	ppbv	Analyzed:	10/25/16
Diln Fac:	1.000		

<b>Analyte</b>	<b>Spiked</b>	<b>Result (V)</b>	<b>%REC</b>	<b>Limits</b>
cis-1,3-Dichloropropene	10.00	10.87	109	70-130
4-Methyl-2-Pentanone	10.00	12.68	127	70-130
Toluene	10.00	9.624	96	70-130
trans-1,3-Dichloropropene	10.00	10.54	105	70-130
1,1,2-Trichloroethane	10.00	10.91	109	70-130
Tetrachloroethene	10.00	9.666	97	70-130
2-Hexanone	10.00	11.58	116	70-130
Dibromochloromethane	10.00	8.644	86	70-130
1,2-Dibromoethane	10.00	9.575	96	70-130
Chlorobenzene	10.00	8.168	82	70-130
Ethylbenzene	10.00	9.157	92	70-130
m,p-Xylenes	20.00	21.08	105	70-130
o-Xylene	10.00	9.780	98	70-130
Styrene	10.00	8.732	87	70-130
Bromoform	10.00	9.147	91	70-130
1,1,2,2-Tetrachloroethane	10.00	9.163	92	70-130
4-Ethyltoluene	10.00	10.18	102	70-130
1,3,5-Trimethylbenzene	10.00	9.249	92	70-130
1,2,4-Trimethylbenzene	10.00	10.03	100	70-130
1,3-Dichlorobenzene	10.00	9.561	96	70-130
1,4-Dichlorobenzene	10.00	8.792	88	70-130
Benzyl chloride	10.00	9.043	90	70-130
1,2-Dichlorobenzene	10.00	8.663	87	70-130
1,2,4-Trichlorobenzene	10.00	11.64	116	70-130
Hexachlorobutadiene	10.00	11.13	111	70-130
Naphthalene	10.00	12.33	123	70-130

<b>Surrogate</b>	<b>%REC</b>	<b>Limits</b>
Bromofluorobenzene	112	70-130

RPD= Relative Percent Difference

Result V= Result in volume units

## Batch QC Report

Volatile Organics in Air			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	240537
Units (V):	ppbv	Analyzed:	10/25/16
Diln Fac:	1.000		

Type: BSD Lab ID: QC857206

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
Freon 12	10.00	8.798	88	70-130	2	25
Freon 114	10.00	9.089	91	70-130	2	25
Chloromethane	10.00	8.851	89	70-130	4	25
Vinyl Chloride	10.00	9.471	95	70-130	4	25
1,3-Butadiene	10.00	8.508	85	70-130	2	25
Bromomethane	10.00	9.050	91	70-130	3	25
Chloroethane	10.00	9.880	99	70-130	2	25
Trichlorofluoromethane	10.00	9.566	96	70-130	3	25
Acrolein	10.00	7.706	77	70-130	2	25
1,1-Dichloroethene	10.00	10.99	110	70-130	0	25
Freon 113	10.00	9.874	99	70-130	2	25
Acetone	10.00	8.193	82	70-130	2	25
Carbon Disulfide	10.00	8.335	83	70-130	3	25
Isopropanol	10.00	8.394	84	70-130	3	25
Methylene Chloride	10.00	9.048	90	70-130	3	25
trans-1,2-Dichloroethene	10.00	11.12	111	70-130	1	25
MTBE	10.00	9.733	97	70-130	0	25
n-Hexane	10.00	8.734	87	70-130	2	25
1,1-Dichloroethane	10.00	9.677	97	70-130	1	25
Vinyl Acetate	10.00	12.75	128	70-130	0	25
cis-1,2-Dichloroethene	10.00	9.318	93	70-130	1	25
2-Butanone	10.00	11.75	117	70-130	1	25
Ethyl Acetate	10.00	8.102	81	70-130	2	25
Tetrahydrofuran	10.00	11.01	110	70-130	3	25
Chloroform	10.00	8.930	89	70-130	1	25
1,1,1-Trichloroethane	10.00	9.414	94	70-130	3	25
Cyclohexane	10.00	10.02	100	70-130	2	25
Carbon Tetrachloride	10.00	8.451	85	70-130	1	25
Benzene	10.00	10.54	105	70-130	4	25
1,2-Dichloroethane	10.00	10.24	102	70-130	3	25
n-Heptane	10.00	10.46	105	70-130	0	25
Trichloroethene	10.00	8.963	90	70-130	1	25
1,2-Dichloropropane	10.00	10.67	107	70-130	1	25
Bromodichloromethane	10.00	10.09	101	70-130	1	25

RPD= Relative Percent Difference

Result V= Result in volume units

**Batch QC Report**

<b>Volatile Organics in Air</b>			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Matrix:	Air	Batch#:	240537
Units (V):	ppbv	Analyzed:	10/25/16
Diln Fac:	1.000		

Analyte	Spiked	Result (V)	%REC	Limits	RPD	Lim
cis-1,3-Dichloropropene	10.00	10.59	106	70-130	3	25
4-Methyl-2-Pentanone	10.00	12.48	125	70-130	2	25
Toluene	10.00	9.419	94	70-130	2	25
trans-1,3-Dichloropropene	10.00	10.00	100	70-130	5	25
1,1,2-Trichloroethane	10.00	10.56	106	70-130	3	25
Tetrachloroethene	10.00	9.632	96	70-130	0	25
2-Hexanone	10.00	11.56	116	70-130	0	25
Dibromochloromethane	10.00	8.386	84	70-130	3	25
1,2-Dibromoethane	10.00	9.346	93	70-130	2	25
Chlorobenzene	10.00	8.057	81	70-130	1	25
Ethylbenzene	10.00	9.059	91	70-130	1	25
m,p-Xylenes	20.00	20.64	103	70-130	2	25
o-Xylene	10.00	9.888	99	70-130	1	25
Styrene	10.00	8.878	89	70-130	2	25
Bromoform	10.00	8.843	88	70-130	3	25
1,1,2,2-Tetrachloroethane	10.00	9.019	90	70-130	2	25
4-Ethyltoluene	10.00	9.921	99	70-130	3	25
1,3,5-Trimethylbenzene	10.00	9.186	92	70-130	1	25
1,2,4-Trimethylbenzene	10.00	9.913	99	70-130	1	25
1,3-Dichlorobenzene	10.00	9.466	95	70-130	1	25
1,4-Dichlorobenzene	10.00	8.882	89	70-130	1	25
Benzyl chloride	10.00	9.035	90	70-130	0	25
1,2-Dichlorobenzene	10.00	8.917	89	70-130	3	25
1,2,4-Trichlorobenzene	10.00	11.67	117	70-130	0	25
Hexachlorobutadiene	10.00	11.42	114	70-130	3	25
Naphthalene	10.00	12.40	124	70-130	1	25

Surrogate	%REC	Limits
Bromofluorobenzene	107	70-130

RPD= Relative Percent Difference

Result V= Result in volume units



**Batch QC Report**

Volatile Organics in Air			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC857207	Diln Fac:	1.000
Matrix:	Air	Batch#:	240537
Units (V):	ppbv	Analyzed:	10/25/16

Analyte	Result (V)	RL	Result (M)	RL
Freon 12	ND	0.50	ND	2.5
Freon 114	ND	0.50	ND	3.5
Chloromethane	ND	0.50	ND	1.0
Vinyl Chloride	ND	0.50	ND	1.3
1,3-Butadiene	ND	0.50	ND	1.1
Bromomethane	ND	0.50	ND	1.9
Chloroethane	ND	0.50	ND	1.3
Trichlorofluoromethane	ND	0.50	ND	2.8
Acrolein	ND	2.0	ND	4.6
1,1-Dichloroethene	ND	0.50	ND	2.0
Freon 113	ND	0.50	ND	3.8
Acetone	ND	2.0	ND	4.8
Carbon Disulfide	ND	0.50	ND	1.6
Isopropanol	ND	2.0	ND	4.9
Methylene Chloride	ND	0.50	ND	1.7
trans-1,2-Dichloroethene	ND	0.50	ND	2.0
MTBE	ND	0.50	ND	1.8
n-Hexane	ND	0.50	ND	1.8
1,1-Dichloroethane	ND	0.50	ND	2.0
Vinyl Acetate	ND	0.50	ND	1.8
cis-1,2-Dichloroethene	ND	0.50	ND	2.0
2-Butanone	ND	0.50	ND	1.5
Ethyl Acetate	ND	0.50	ND	1.8
Tetrahydrofuran	ND	0.50	ND	1.5
Chloroform	ND	0.50	ND	2.4
1,1,1-Trichloroethane	ND	0.50	ND	2.7
Cyclohexane	ND	0.50	ND	1.7
Carbon Tetrachloride	ND	0.50	ND	3.1
Benzene	ND	0.50	ND	1.6
1,2-Dichloroethane	ND	0.50	ND	2.0
n-Heptane	ND	0.50	ND	2.0
Trichloroethene	ND	0.50	ND	2.7
1,2-Dichloropropane	ND	0.50	ND	2.3
Bromodichloromethane	ND	0.50	ND	3.4
cis-1,3-Dichloropropene	ND	0.50	ND	2.3

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units

**Batch QC Report**

Volatile Organics in Air			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	EPA TO-15
Type:	BLANK	Units (M):	ug/m3
Lab ID:	QC857207	Diln Fac:	1.000
Matrix:	Air	Batch#:	240537
Units (V):	ppbv	Analyzed:	10/25/16

Analyte	Result (V)	RL	Result (M)	RL
4-Methyl-2-Pentanone	ND	0.50	ND	2.0
Toluene	ND	0.50	ND	1.9
trans-1,3-Dichloropropene	ND	0.50	ND	2.3
1,1,2-Trichloroethane	ND	0.50	ND	2.7
Tetrachloroethene	ND	0.50	ND	3.4
2-Hexanone	ND	0.50	ND	2.0
Dibromochloromethane	ND	0.50	ND	4.3
1,2-Dibromoethane	ND	0.50	ND	3.8
Chlorobenzene	ND	0.50	ND	2.3
Ethylbenzene	ND	0.50	ND	2.2
m,p-Xylenes	ND	0.50	ND	2.2
o-Xylene	ND	0.50	ND	2.2
Styrene	ND	0.50	ND	2.1
Bromoform	ND	0.50	ND	5.2
1,1,2,2-Tetrachloroethane	ND	0.50	ND	3.4
4-Ethyltoluene	ND	0.50	ND	2.5
1,3,5-Trimethylbenzene	ND	0.50	ND	2.5
1,2,4-Trimethylbenzene	ND	0.50	ND	2.5
1,3-Dichlorobenzene	ND	0.50	ND	3.0
1,4-Dichlorobenzene	ND	0.50	ND	3.0
Benzyl chloride	ND	0.50	ND	2.6
1,2-Dichlorobenzene	ND	0.50	ND	3.0
1,2,4-Trichlorobenzene	ND	0.50	ND	3.7
Hexachlorobutadiene	ND	0.50	ND	5.3
Naphthalene	ND	2.0	ND	10

Surrogate	%REC	Limits
Bromofluorobenzene	90	70-130

ND= Not Detected

RL= Reporting Limit

Result M= Result in mass units

Result V= Result in volume units





## Batch QC Report

Fixed Gas Analysis			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	ASTM D1946
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC856736	Batch#:	240420
Matrix:	Air	Analyzed:	10/21/16
Units:	ppmv		

Analyte	Spiked	Result	%REC	Limits
Carbon Dioxide	2,000	1,823	91	70-130
Oxygen	2,000	1,763	88	70-130
Methane	2,000	1,846	92	70-130

## Batch QC Report

Fixed Gas Analysis			
Lab #:	282480	Location:	Bockman
Client:	Pangea Environmental	Prep:	METHOD
Project#:	2030.001	Analysis:	ASTM D1946
Field ID:	ZZZZZZZZZZ	Units (Mol %):	MOL %
Type:	SDUP	Diln Fac:	1.920
MSS Lab ID:	282350-001	Batch#:	240420
Lab ID:	QC856738	Sampled:	10/19/16
Matrix:	Air	Received:	10/19/16
Units:	ppmv	Analyzed:	10/21/16

Analyte	MSS Result	Result	RL	Result (Mol %)	RL	RPD	Lim
Carbon Dioxide	59,010	58,990	1,920	5.899	0.1920	0	30
Oxygen	11,750	11,700	1,920	1.170	0.1920	0	30
Methane	7,604	7,545	1,920	0.7545	0.1920	1	30

RL= Reporting Limit

RPD= Relative Percent Difference

Result Mol %= Result in Mole Percent



# McC Campbell Analytical, Inc.

"When Quality Counts"

## Analytical Report

**WorkOrder:** 1609301

**Report Created for:** Pangea Environmental Svcs., Inc.

1710 Franklin Street, Ste. 200  
Oakland, CA 94612

**Project Contact:** Ron Scheele

**Project P.O.:**

**Project Name:** 2030.001; 1233 Bockman

**Project Received:** 09/08/2016

Analytical Report reviewed & approved for release on 09/13/2016 by:

Angela Rydelius,  
Laboratory Manager

*The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in the case narrative.*







## Glossary of Terms & Qualifier Definitions

**Client:** Pangea Environmental Svcs., Inc.  
**Project:** 2030.001; 1233 Bockman  
**WorkOrder:** 1609301

### Glossary Abbreviation

%D	Serial Dilution Percent Difference
95% Interval	95% Confident Interval
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test (Serial Dilution)
DUP	Duplicate
EDL	Estimated Detection Limit
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
N/A	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PDSD	Post Digestion Spike Duplicate
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.)
RPD	Relative Percent Deviation
RRT	Relative Retention Time
SPK Val	Spike Value
SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)

### Analytical Qualifiers

d7 strongly aged gasoline or diesel range compounds are significant in the TPH(g) chromatogram  
e4/e11 gasoline range compounds are significant.; and/or stoddard solvent/mineral spirit (?)



## Analytical Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Received:** 9/8/16 16:30  
**Date Prepared:** 9/9/16  
**Project:** 2030.001; 1233 Bockman

**WorkOrder:** 1609301  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L

### Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Pit-1-W	1609301-001B	Water	09/07/2016 13:00	GC16	126364
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Acetone	ND		10	1	09/09/2016 03:33
tert-Amyl methyl ether (TAME)	ND		0.50	1	09/09/2016 03:33
Benzene	ND		0.50	1	09/09/2016 03:33
Bromobenzene	ND		0.50	1	09/09/2016 03:33
Bromochloromethane	ND		0.50	1	09/09/2016 03:33
Bromodichloromethane	ND		0.50	1	09/09/2016 03:33
Bromoform	ND		0.50	1	09/09/2016 03:33
Bromomethane	ND		0.50	1	09/09/2016 03:33
2-Butanone (MEK)	ND		2.0	1	09/09/2016 03:33
t-Butyl alcohol (TBA)	ND		2.0	1	09/09/2016 03:33
n-Butyl benzene	<b>0.64</b>		0.50	1	09/09/2016 03:33
sec-Butyl benzene	ND		0.50	1	09/09/2016 03:33
tert-Butyl benzene	ND		0.50	1	09/09/2016 03:33
Carbon Disulfide	ND		0.50	1	09/09/2016 03:33
Carbon Tetrachloride	ND		0.50	1	09/09/2016 03:33
Chlorobenzene	ND		0.50	1	09/09/2016 03:33
Chloroethane	ND		0.50	1	09/09/2016 03:33
Chloroform	ND		0.50	1	09/09/2016 03:33
Chloromethane	ND		0.50	1	09/09/2016 03:33
2-Chlorotoluene	ND		0.50	1	09/09/2016 03:33
4-Chlorotoluene	ND		0.50	1	09/09/2016 03:33
Dibromochloromethane	ND		0.50	1	09/09/2016 03:33
1,2-Dibromo-3-chloropropane	ND		0.20	1	09/09/2016 03:33
1,2-Dibromoethane (EDB)	ND		0.50	1	09/09/2016 03:33
Dibromomethane	ND		0.50	1	09/09/2016 03:33
1,2-Dichlorobenzene	ND		0.50	1	09/09/2016 03:33
1,3-Dichlorobenzene	ND		0.50	1	09/09/2016 03:33
1,4-Dichlorobenzene	ND		0.50	1	09/09/2016 03:33
Dichlorodifluoromethane	ND		0.50	1	09/09/2016 03:33
1,1-Dichloroethane	ND		0.50	1	09/09/2016 03:33
1,2-Dichloroethane (1,2-DCA)	ND		0.50	1	09/09/2016 03:33
1,1-Dichloroethene	ND		0.50	1	09/09/2016 03:33
cis-1,2-Dichloroethene	ND		0.50	1	09/09/2016 03:33
trans-1,2-Dichloroethene	ND		0.50	1	09/09/2016 03:33
1,2-Dichloropropane	ND		0.50	1	09/09/2016 03:33
1,3-Dichloropropane	ND		0.50	1	09/09/2016 03:33
2,2-Dichloropropane	ND		0.50	1	09/09/2016 03:33

(Cont.)

NELAP 4033ORELAP

 Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Received:** 9/8/16 16:30  
**Date Prepared:** 9/9/16  
**Project:** 2030.001; 1233 Bockman

**WorkOrder:** 1609301  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L

### Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Pit-1-W	1609301-001B	Water	09/07/2016 13:00	GC16	126364
Analytes	Result	RL	DF	Date Analyzed	
1,1-Dichloropropene	ND	0.50	1	09/09/2016 03:33	
cis-1,3-Dichloropropene	ND	0.50	1	09/09/2016 03:33	
trans-1,3-Dichloropropene	ND	0.50	1	09/09/2016 03:33	
Diisopropyl ether (DIPE)	ND	0.50	1	09/09/2016 03:33	
Ethylbenzene	ND	0.50	1	09/09/2016 03:33	
Ethyl tert-butyl ether (ETBE)	ND	0.50	1	09/09/2016 03:33	
Freon 113	ND	0.50	1	09/09/2016 03:33	
Hexachlorobutadiene	ND	0.50	1	09/09/2016 03:33	
Hexachloroethane	ND	0.50	1	09/09/2016 03:33	
2-Hexanone	ND	0.50	1	09/09/2016 03:33	
Isopropylbenzene	ND	0.50	1	09/09/2016 03:33	
4-Isopropyl toluene	ND	0.50	1	09/09/2016 03:33	
Methyl-t-butyl ether (MTBE)	ND	0.50	1	09/09/2016 03:33	
Methylene chloride	ND	0.50	1	09/09/2016 03:33	
4-Methyl-2-pentanone (MIBK)	ND	0.50	1	09/09/2016 03:33	
Naphthalene	ND	0.50	1	09/09/2016 03:33	
n-Propyl benzene	ND	0.50	1	09/09/2016 03:33	
Styrene	ND	0.50	1	09/09/2016 03:33	
1,1,1,2-Tetrachloroethane	ND	0.50	1	09/09/2016 03:33	
1,1,2,2-Tetrachloroethane	ND	0.50	1	09/09/2016 03:33	
Tetrachloroethene	ND	0.50	1	09/09/2016 03:33	
Toluene	ND	0.50	1	09/09/2016 03:33	
1,2,3-Trichlorobenzene	ND	0.50	1	09/09/2016 03:33	
1,2,4-Trichlorobenzene	ND	0.50	1	09/09/2016 03:33	
1,1,1-Trichloroethane	ND	0.50	1	09/09/2016 03:33	
1,1,2-Trichloroethane	ND	0.50	1	09/09/2016 03:33	
Trichloroethene	ND	0.50	1	09/09/2016 03:33	
Trichlorofluoromethane	ND	0.50	1	09/09/2016 03:33	
1,2,3-Trichloropropane	ND	0.50	1	09/09/2016 03:33	
1,2,4-Trimethylbenzene	1.6	0.50	1	09/09/2016 03:33	
1,3,5-Trimethylbenzene	ND	0.50	1	09/09/2016 03:33	
Vinyl Chloride	ND	0.50	1	09/09/2016 03:33	
Xylenes, Total	ND	0.50	1	09/09/2016 03:33	

(Cont.)

NELAP 4033ORELAP

 Angela Rydelius, Lab Manager



# Analytical Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Received:** 9/8/16 16:30  
**Date Prepared:** 9/9/16  
**Project:** 2030.001; 1233 Bockman

**WorkOrder:** 1609301  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L

## Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Pit-1-W	1609301-001B	Water	09/07/2016 13:00	GC16	126364

Analytes	Result	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>	
Dibromofluoromethane	107		70-130	09/09/2016 03:33
Toluene-d8	104		70-130	09/09/2016 03:33
4-BFB	106		70-130	09/09/2016 03:33

Analyst(s): HK



## Analytical Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Received:** 9/8/16 16:30  
**Date Prepared:** 9/13/16  
**Project:** 2030.001; 1233 Bockman

**WorkOrder:** 1609301  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8021B/8015Bm  
**Unit:** µg/L

### Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Pit-1-W	1609301-001A	Water	09/07/2016 13:00	GC3	126366

Analytes	Result	RL	DF	Date Analyzed
TPH(g)	64	50	1	09/13/2016 12:00
MTBE	---	5.0	1	09/13/2016 12:00
Benzene	---	0.50	1	09/13/2016 12:00
Toluene	---	0.50	1	09/13/2016 12:00
Ethylbenzene	---	0.50	1	09/13/2016 12:00
Xylenes	---	1.5	1	09/13/2016 12:00

Surrogates	REC (%)	Limits	Date Analyzed
aaa-TFT	98	70-130	09/13/2016 12:00

**Analyst(s):** IA

**Analytical Comments:** d7



## Analytical Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Received:** 9/8/16 16:30  
**Date Prepared:** 9/8/16  
**Project:** 2030.001; 1233 Bockman

**WorkOrder:** 1609301  
**Extraction Method:** SW3510C  
**Analytical Method:** SW8015B  
**Unit:** µg/L

### Total Extractable Petroleum Hydrocarbons w/out SG Clean-Up

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
Pit-1-W	1609301-001A	Water	09/07/2016 13:00	GC6A	126271
<b>Analytes</b>					
	<b>Result</b>		<b>RL</b>	<b>DF</b>	<b>Date Analyzed</b>
TPH-Diesel (C10-C23)	73		50	1	09/09/2016 13:56
TPH-Motor Oil (C18-C36)	ND		250	1	09/09/2016 13:56
<b>Surrogates</b>					
	<b>REC (%)</b>		<b>Limits</b>		
C9	91		70-130		09/09/2016 13:56
<b>Analyst(s):</b> TK		<b>Analytical Comments:</b> e4/e11			



## Quality Control Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Prepared:** 9/8/16  
**Date Analyzed:** 9/8/16  
**Instrument:** GC16  
**Matrix:** Water  
**Project:** 2030.001; 1233 Bockman

**WorkOrder:** 1609301  
**BatchID:** 126364  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L  
**Sample ID:** MB/LCS-126364  
 1609266-001BMS/MSD

### QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Acetone	ND	-	10	-	-	-	-
tert-Amyl methyl ether (TAME)	ND	7.88	0.50	10	-	79	54-140
Benzene	ND	9.79	0.50	10	-	98	47-158
Bromobenzene	ND	-	0.50	-	-	-	-
Bromochloromethane	ND	-	0.50	-	-	-	-
Bromodichloromethane	ND	-	0.50	-	-	-	-
Bromoform	ND	-	0.50	-	-	-	-
Bromomethane	ND	-	0.50	-	-	-	-
2-Butanone (MEK)	ND	-	2.0	-	-	-	-
t-Butyl alcohol (TBA)	ND	23.6	2.0	40	-	59	42-140
n-Butyl benzene	ND	-	0.50	-	-	-	-
sec-Butyl benzene	ND	-	0.50	-	-	-	-
tert-Butyl benzene	ND	-	0.50	-	-	-	-
Carbon Disulfide	ND	-	0.50	-	-	-	-
Carbon Tetrachloride	ND	-	0.50	-	-	-	-
Chlorobenzene	ND	9.59	0.50	10	-	96	43-157
Chloroethane	ND	-	0.50	-	-	-	-
Chloroform	ND	-	0.50	-	-	-	-
Chloromethane	ND	-	0.50	-	-	-	-
2-Chlorotoluene	ND	-	0.50	-	-	-	-
4-Chlorotoluene	ND	-	0.50	-	-	-	-
Dibromochloromethane	ND	-	0.50	-	-	-	-
1,2-Dibromo-3-chloropropane	ND	-	0.20	-	-	-	-
1,2-Dibromoethane (EDB)	ND	8.62	0.50	10	-	86	44-155
Dibromomethane	ND	-	0.50	-	-	-	-
1,2-Dichlorobenzene	ND	-	0.50	-	-	-	-
1,3-Dichlorobenzene	ND	-	0.50	-	-	-	-
1,4-Dichlorobenzene	ND	-	0.50	-	-	-	-
Dichlorodifluoromethane	ND	-	0.50	-	-	-	-
1,1-Dichloroethane	ND	-	0.50	-	-	-	-
1,2-Dichloroethane (1,2-DCA)	ND	8.20	0.50	10	-	82	66-125
1,1-Dichloroethene	ND	10.1	0.50	10	-	101	47-149
cis-1,2-Dichloroethene	ND	-	0.50	-	-	-	-
trans-1,2-Dichloroethene	ND	-	0.50	-	-	-	-
1,2-Dichloropropane	ND	-	0.50	-	-	-	-
1,3-Dichloropropane	ND	-	0.50	-	-	-	-
2,2-Dichloropropane	ND	-	0.50	-	-	-	-

(Cont.)

NELAP 4033ORELAP

 QA/QC Officer





## Quality Control Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Prepared:** 9/8/16  
**Date Analyzed:** 9/8/16  
**Instrument:** GC16  
**Matrix:** Water  
**Project:** 2030.001; 1233 Bockman

**WorkOrder:** 1609301  
**BatchID:** 126364  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L  
**Sample ID:** MB/LCS-126364  
 1609266-001BMS/MSD

### QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
1,1-Dichloropropene	ND	-	0.50	-	-	-	-
cis-1,3-Dichloropropene	ND	-	0.50	-	-	-	-
trans-1,3-Dichloropropene	ND	-	0.50	-	-	-	-
Diisopropyl ether (DIPE)	ND	9.11	0.50	10	-	91	57-136
Ethylbenzene	ND	-	0.50	-	-	-	-
Ethyl tert-butyl ether (ETBE)	ND	8.36	0.50	10	-	84	55-137
Freon 113	ND	-	0.50	-	-	-	-
Hexachlorobutadiene	ND	-	0.50	-	-	-	-
Hexachloroethane	ND	-	0.50	-	-	-	-
2-Hexanone	ND	-	0.50	-	-	-	-
Isopropylbenzene	ND	-	0.50	-	-	-	-
4-Isopropyl toluene	ND	-	0.50	-	-	-	-
Methyl-t-butyl ether (MTBE)	ND	8.00	0.50	10	-	80	53-139
Methylene chloride	ND	-	0.50	-	-	-	-
4-Methyl-2-pentanone (MIBK)	ND	-	0.50	-	-	-	-
Naphthalene	ND	-	0.50	-	-	-	-
n-Propyl benzene	ND	-	0.50	-	-	-	-
Styrene	ND	-	0.50	-	-	-	-
1,1,1,2-Tetrachloroethane	ND	-	0.50	-	-	-	-
1,1,2,2-Tetrachloroethane	ND	-	0.50	-	-	-	-
Tetrachloroethene	ND	-	0.50	-	-	-	-
Toluene	ND	9.69	0.50	10	-	97	52-137
1,2,3-Trichlorobenzene	ND	-	0.50	-	-	-	-
1,2,4-Trichlorobenzene	ND	-	0.50	-	-	-	-
1,1,1-Trichloroethane	ND	-	0.50	-	-	-	-
1,1,2-Trichloroethane	ND	-	0.50	-	-	-	-
Trichloroethene	ND	9.23	0.50	10	-	92	43-157
Trichlorofluoromethane	ND	-	0.50	-	-	-	-
1,2,3-Trichloropropane	ND	-	0.50	-	-	-	-
1,2,4-Trimethylbenzene	ND	-	0.50	-	-	-	-
1,3,5-Trimethylbenzene	ND	-	0.50	-	-	-	-
Vinyl Chloride	ND	-	0.50	-	-	-	-
Xylenes, Total	ND	-	0.50	-	-	-	-



## Quality Control Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Prepared:** 9/8/16  
**Date Analyzed:** 9/8/16  
**Instrument:** GC16  
**Matrix:** Water  
**Project:** 2030.001; 1233 Bockman

**WorkOrder:** 1609301  
**BatchID:** 126364  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L  
**Sample ID:** MB/LCS-126364  
 1609266-001BMS/MSD

### QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
<b>Surrogate Recovery</b>							
Dibromofluoromethane	26.2	25.8		25	105	103	70-130
Toluene-d8	26.9	26.9		25	108	108	70-130
4-BFB	2.42	2.62		2.5	97	105	70-130

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
tert-Amyl methyl ether (TAME)	NR	NR		ND<25	NR	NR	-	NR	
Benzene	NR	NR		1100	NR	NR	-	NR	
t-Butyl alcohol (TBA)	NR	NR		ND<100	NR	NR	-	NR	
Chlorobenzene	NR	NR		ND<25	NR	NR	-	NR	
1,2-Dibromoethane (EDB)	NR	NR		ND<25	NR	NR	-	NR	
1,2-Dichloroethane (1,2-DCA)	NR	NR		ND<25	NR	NR	-	NR	
1,1-Dichloroethene	NR	NR		ND<25	NR	NR	-	NR	
Diisopropyl ether (DIPE)	NR	NR		ND<25	NR	NR	-	NR	
Ethyl tert-butyl ether (ETBE)	NR	NR		ND<25	NR	NR	-	NR	
Methyl-t-butyl ether (MTBE)	NR	NR		ND<25	NR	NR	-	NR	
Toluene	NR	NR		320	NR	NR	-	NR	
Trichloroethene	NR	NR		ND<25	NR	NR	-	NR	
<b>Surrogate Recovery</b>									
Dibromofluoromethane	NR	NR			NR	NR	-	NR	
Toluene-d8	NR	NR			NR	NR	-	NR	
4-BFB	NR	NR			NR	NR	-	NR	



## Quality Control Report

<b>Client:</b> Pangea Environmental Svcs., Inc.	<b>WorkOrder:</b> 1609301
<b>Date Prepared:</b> 9/8/16 - 9/9/16	<b>BatchID:</b> 126366
<b>Date Analyzed:</b> 9/8/16 - 9/9/16	<b>Extraction Method:</b> SW5030B
<b>Instrument:</b> GC3	<b>Analytical Method:</b> SW8021B/8015Bm
<b>Matrix:</b> Water	<b>Unit:</b> µg/L
<b>Project:</b> 2030.001; 1233 Bockman	<b>Sample ID:</b> MB/LCS-126366 1609160-001AMS/MSD

### QC Summary Report for SW8021B/8015Bm

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
TPH(btex)	ND	62.4	40	60	-	104	70-130
MTBE	ND	9.37	5.0	10	-	94	70-130
Benzene	ND	9.97	0.50	10	-	100	70-130
Toluene	ND	10.4	0.50	10	-	104	70-130
Ethylbenzene	ND	10.7	0.50	10	-	107	70-130
Xylenes	ND	33.8	1.5	30	-	113	70-130
<b>Surrogate Recovery</b>							
aaa-TFT	10.7	10.1		10	107	101	70-130

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
TPH(btex)	60.5	61.7	60	ND	101	103	70-130	1.89	20
MTBE	10.4	10.1	10	ND	104	101	70-130	2.49	20
Benzene	10.7	10.6	10	ND	107	106	70-130	0.383	20
Toluene	11.1	11.0	10	ND	111	110	70-130	0.929	20
Ethylbenzene	11.3	11.4	10	ND	113	115	70-130	1.10	20
Xylenes	35.8	36.3	30	ND	119	121	70-130	1.48	20
<b>Surrogate Recovery</b>									
aaa-TFT	10.9	10.8	10		109	108	70-130	1.14	20



## Quality Control Report

<b>Client:</b> Pangea Environmental Svcs., Inc.	<b>WorkOrder:</b> 1609301
<b>Date Prepared:</b> 9/7/16	<b>BatchID:</b> 126271
<b>Date Analyzed:</b> 9/8/16	<b>Extraction Method:</b> SW3510C
<b>Instrument:</b> GC11A	<b>Analytical Method:</b> SW8015B
<b>Matrix:</b> Water	<b>Unit:</b> µg/L
<b>Project:</b> 2030.001; 1233 Bockman	<b>Sample ID:</b> MB/LCS/LCSD-126271

### QC Report for SW8015B w/out SG Clean-Up

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
TPH-Diesel (C10-C23)	ND	50	-	-	-
TPH-Motor Oil (C18-C36)	ND	250	-	-	-
<b>Surrogate Recovery</b>					
C9	528		625	84	65-122

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH-Diesel (C10-C23)	1120	1240	1000	112	124	61-157	9.83	30
<b>Surrogate Recovery</b>								
C9	548	526	625	88	84	65-122	4.03	30

**WorkOrder: 1609301**      **ClientCode: PEO**

WaterTrax     WriteOn     EDF     Excel     EQulS     Email     HardCopy     ThirdParty     J-flag

**Report to:** Ron Scheele      **Bill to:** Bob Clark-Riddell  
 Pangea Environmental Svcs., Inc.      Pangea Environmental Svcs., Inc.  
 1710 Franklin Street, Ste. 200      1710 Franklin Street, Ste. 200  
 Oakland, CA 94612      Oakland, CA 94612  
 (510) 836-3700      FAX: (510) 836-3709

**Requested TAT: 3 days;**

**Date Received: 09/08/2016**  
**Date Logged: 09/08/2016**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12

1609301-001	Pit-1-W	Water	9/7/2016 13:00	<input type="checkbox"/>	B	A	A											
-------------	---------	-------	----------------	--------------------------	---	---	---	--	--	--	--	--	--	--	--	--	--	--

**Test Legend:**

1	8260B_W	2	G-MBTEx_W	3	TPH(DMO)_W	4	
5		6		7		8	
9		10		11		12	

**Prepared by: Alexandra Iniguez**

The following SampleID: 001A contains testgroup Multi Range\_W.

**Comments:**

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days). Hazardous samples will be returned to client or disposed of at client expense.



## WORK ORDER SUMMARY

**Client Name:** PANGEA ENVIRONMENTAL SVCS., INC.

**QC Level:** LEVEL 2

**Work Order:** 1609301

**Project:** 2030.001; 1233 Bockman

**Client Contact:** Ron Scheele

**Date Logged:** 9/8/2016

**Comments:**

**Contact's Email:** [Rscheele@pangeaenv.com](mailto:Rscheele@pangeaenv.com)

WaterTrax  WriteOn  EDF  Excel  Fax  Email  HardCopy  ThirdParty  J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1609301-001A	Pit-1-W	Water	Multi-Range TPH(g,d,mo) by EPA 8015Bm	4	VOA w/ HCl	<input type="checkbox"/>	9/7/2016 13:00	3 days	Trace	<input type="checkbox"/>	
1609301-001B	Pit-1-W	Water	SW8260B (VOCs)	2	VOA w/ HCl	<input type="checkbox"/>	9/7/2016 13:00	3 days	Trace	<input type="checkbox"/>	

**NOTES:** - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

1009301

# CHAIN OF CUSTODY **RUSH**

Page \_\_\_ of \_\_\_

Chain of Custody # \_\_\_\_\_



2323 Fifth Street  
Berkeley, CA 94710  
Phone (510) 486-0900  
Fax (510) 486-0532

C&T LOGIN # 280619w

## ANALYTICAL REQUEST

Project No: 2030.001 Sampler: Simmons, Alhert  
Project Name: 1233 Bullman Report To: Ron Scheele  
Project P. O. No: \_\_\_\_\_ Company: Paragon env.  
EDD Format: Report Level  II  III  IV Telephone: (510) 459-6012  
Turnaround Time:  RUSH 3 day  Standard  Email: rscheele@paragonenv.com

Lab No.	Sample ID.	SAMPLING		MATRIX		# of Containers	CHEMICAL PRESERVATIVE										
		Date Collected	Time Collected	Water	Solid		HCl	H2SO4	HNO3	NaOH	None						
1	PT-I-W	9/7/16	1300	X		6	X										

ANALYTICAL REQUEST
X TPLs, d, w
X VOCs
8260

Notes:

SAMPLE RECEIPT

Intact  
 Cold  
 On Ice  
 Ambient

RELINQUISHED BY:

[Signature] 9/7/16 DATE: 1747 TIME:  
Pat Dough 9/8/16 DATE: 13:57 TIME:  
[Signature] 9/8/16 DATE: 1630 TIME:

RECEIVED BY:

[Signature] 9/7/16 DATE: 1747 TIME:  
[Signature] 9/8/16 DATE: 1357 TIME:  
[Signature] 9/8/16 DATE: 1630 TIME:





### Sample Receipt Checklist

Client Name: **Pangea Environmental Svcs., Inc.**  
 Project Name: **2030.001; 1233 Bockman**  
 WorkOrder No: **1609301** Matrix: Water  
 Carrier: Bernie Cummins (MAI Courier)

Date and Time Received: **9/8/2016 16:30**  
 Date Logged: **9/8/2016**  
 Received by: **Alexandra Iniguez**  
 Logged by: **Alexandra Iniguez**

**Chain of Custody (COC) Information**

Chain of custody present? Yes  No   
 Chain of custody signed when relinquished and received? Yes  No   
 Chain of custody agrees with sample labels? Yes  No   
 Sample IDs noted by Client on COC? Yes  No   
 Date and Time of collection noted by Client on COC? Yes  No   
 Sampler's name noted on COC? Yes  No

**Sample Receipt Information**

Custody seals intact on shipping container/cooler? Yes  No  NA   
 Shipping container/cooler in good condition? Yes  No   
 Samples in proper containers/bottles? Yes  No   
 Sample containers intact? Yes  No   
 Sufficient sample volume for indicated test? Yes  No

**Sample Preservation and Hold Time (HT) Information**

All samples received within holding time? Yes  No   
 Sample/Temp Blank temperature Temp: 2.9°C NA   
 Water - VOA vials have zero headspace / no bubbles? Yes  No  NA   
 Sample labels checked for correct preservation? Yes  No   
 pH acceptable upon receipt (Metal: <2; 522: <4; 218.7: >8)? Yes  No  NA   
 Samples Received on Ice? Yes  No

(Ice Type: WET ICE )

**UCMR3 Samples:**

Total Chlorine tested and acceptable upon receipt for EPA 522? Yes  No  NA   
 Free Chlorine tested and acceptable upon receipt for EPA 218.7, 300.1, 537, 539? Yes  No  NA

-----  
 Comments:



# McC Campbell Analytical, Inc.

"When Quality Counts"

## Analytical Report

**WorkOrder:** 1609334

**Report Created for:** Pangea Environmental Svcs., Inc.

1710 Franklin Street, Ste. 200  
Oakland, CA 94612

**Project Contact:** Ron Scheele

**Project P.O.:**

**Project Name:** 2030.001

**Project Received:** 09/08/2016

Analytical Report reviewed & approved for release on 09/15/2016 by:

Angela Rydelius,  
Laboratory Manager

*The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in the case narrative.*





## Glossary of Terms & Qualifier Definitions

**Client:** Pangea Environmental Svcs., Inc.  
**Project:** 2030.001  
**WorkOrder:** 1609334

### Glossary Abbreviation

%D	Serial Dilution Percent Difference
95% Interval	95% Confident Interval
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test (Serial Dilution)
DUP	Duplicate
EDL	Estimated Detection Limit
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
N/A	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PDSD	Post Digestion Spike Duplicate
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.)
RPD	Relative Percent Deviation
RRT	Relative Retention Time
SPK Val	Spike Value
SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)

### Analytical Qualifiers

e2	diesel range compounds are significant; no recognizable pattern
e7	oil range compounds are significant



## Analytical Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Received:** 9/8/16 18:45  
**Date Prepared:** 9/9/16-9/10/16  
**Project:** 2030.001

**WorkOrder:** 1609334  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L

### Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB-8-W	1609334-001B	Water	09/07/2016 10:00	GC16	126430

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	10	1	09/10/2016 01:45
tert-Amyl methyl ether (TAME)	ND	0.50	1	09/10/2016 01:45
Benzene	ND	0.50	1	09/10/2016 01:45
Bromobenzene	ND	0.50	1	09/10/2016 01:45
Bromochloromethane	ND	0.50	1	09/10/2016 01:45
Bromodichloromethane	ND	0.50	1	09/10/2016 01:45
Bromoform	ND	0.50	1	09/10/2016 01:45
Bromomethane	ND	0.50	1	09/10/2016 01:45
2-Butanone (MEK)	ND	2.0	1	09/10/2016 01:45
t-Butyl alcohol (TBA)	ND	2.0	1	09/10/2016 01:45
n-Butyl benzene	ND	0.50	1	09/10/2016 01:45
sec-Butyl benzene	ND	0.50	1	09/10/2016 01:45
tert-Butyl benzene	ND	0.50	1	09/10/2016 01:45
Carbon Disulfide	ND	0.50	1	09/10/2016 01:45
Carbon Tetrachloride	ND	0.50	1	09/10/2016 01:45
Chlorobenzene	ND	0.50	1	09/10/2016 01:45
Chloroethane	ND	0.50	1	09/10/2016 01:45
Chloroform	ND	0.50	1	09/10/2016 01:45
Chloromethane	ND	0.50	1	09/10/2016 01:45
2-Chlorotoluene	ND	0.50	1	09/10/2016 01:45
4-Chlorotoluene	ND	0.50	1	09/10/2016 01:45
Dibromochloromethane	ND	0.50	1	09/10/2016 01:45
1,2-Dibromo-3-chloropropane	ND	0.20	1	09/10/2016 01:45
1,2-Dibromoethane (EDB)	ND	0.50	1	09/10/2016 01:45
Dibromomethane	ND	0.50	1	09/10/2016 01:45
1,2-Dichlorobenzene	ND	0.50	1	09/10/2016 01:45
1,3-Dichlorobenzene	ND	0.50	1	09/10/2016 01:45
1,4-Dichlorobenzene	ND	0.50	1	09/10/2016 01:45
Dichlorodifluoromethane	ND	0.50	1	09/10/2016 01:45
1,1-Dichloroethane	ND	0.50	1	09/10/2016 01:45
1,2-Dichloroethane (1,2-DCA)	ND	0.50	1	09/10/2016 01:45
1,1-Dichloroethene	ND	0.50	1	09/10/2016 01:45
cis-1,2-Dichloroethene	ND	0.50	1	09/10/2016 01:45
trans-1,2-Dichloroethene	ND	0.50	1	09/10/2016 01:45
1,2-Dichloropropane	ND	0.50	1	09/10/2016 01:45
1,3-Dichloropropane	ND	0.50	1	09/10/2016 01:45
2,2-Dichloropropane	ND	0.50	1	09/10/2016 01:45

(Cont.)



## Analytical Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Received:** 9/8/16 18:45  
**Date Prepared:** 9/9/16-9/10/16  
**Project:** 2030.001

**WorkOrder:** 1609334  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L

### Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB-8-W	1609334-001B	Water	09/07/2016 10:00	GC16	126430

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	0.50	1	09/10/2016 01:45
cis-1,3-Dichloropropene	ND	0.50	1	09/10/2016 01:45
trans-1,3-Dichloropropene	ND	0.50	1	09/10/2016 01:45
Diisopropyl ether (DIPE)	ND	0.50	1	09/10/2016 01:45
Ethylbenzene	ND	0.50	1	09/10/2016 01:45
Ethyl tert-butyl ether (ETBE)	ND	0.50	1	09/10/2016 01:45
Freon 113	ND	0.50	1	09/10/2016 01:45
Hexachlorobutadiene	ND	0.50	1	09/10/2016 01:45
Hexachloroethane	ND	0.50	1	09/10/2016 01:45
2-Hexanone	ND	0.50	1	09/10/2016 01:45
Isopropylbenzene	ND	0.50	1	09/10/2016 01:45
4-Isopropyl toluene	ND	0.50	1	09/10/2016 01:45
Methyl-t-butyl ether (MTBE)	ND	0.50	1	09/10/2016 01:45
Methylene chloride	ND	0.50	1	09/10/2016 01:45
4-Methyl-2-pentanone (MIBK)	ND	0.50	1	09/10/2016 01:45
Naphthalene	ND	0.50	1	09/10/2016 01:45
n-Propyl benzene	ND	0.50	1	09/10/2016 01:45
Styrene	ND	0.50	1	09/10/2016 01:45
1,1,1,2-Tetrachloroethane	ND	0.50	1	09/10/2016 01:45
1,1,2,2-Tetrachloroethane	ND	0.50	1	09/10/2016 01:45
Tetrachloroethene	ND	0.50	1	09/10/2016 01:45
Toluene	ND	0.50	1	09/10/2016 01:45
1,2,3-Trichlorobenzene	ND	0.50	1	09/10/2016 01:45
1,2,4-Trichlorobenzene	ND	0.50	1	09/10/2016 01:45
1,1,1-Trichloroethane	ND	0.50	1	09/10/2016 01:45
1,1,2-Trichloroethane	ND	0.50	1	09/10/2016 01:45
Trichloroethene	ND	0.50	1	09/10/2016 01:45
Trichlorofluoromethane	ND	0.50	1	09/10/2016 01:45
1,2,3-Trichloropropane	ND	0.50	1	09/10/2016 01:45
1,2,4-Trimethylbenzene	ND	0.50	1	09/10/2016 01:45
1,3,5-Trimethylbenzene	ND	0.50	1	09/10/2016 01:45
Vinyl Chloride	ND	0.50	1	09/10/2016 01:45
Xylenes, Total	ND	0.50	1	09/10/2016 01:45

(Cont.)

NELAP 4033ORELAP

 Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Received:** 9/8/16 18:45  
**Date Prepared:** 9/9/16-9/10/16  
**Project:** 2030.001

**WorkOrder:** 1609334  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L

### Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB-8-W	1609334-001B	Water	09/07/2016 10:00	GC16	126430

Analytes	Result	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>	
Dibromofluoromethane	104	70-130		09/10/2016 01:45
Toluene-d8	111	70-130		09/10/2016 01:45
4-BFB	109	70-130		09/10/2016 01:45

Analyst(s): HK



## Analytical Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Received:** 9/8/16 18:45  
**Date Prepared:** 9/9/16-9/10/16  
**Project:** 2030.001

**WorkOrder:** 1609334  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L

### Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB-9-W	1609334-002B	Water	09/07/2016 10:45	GC16	126430

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	10	1	09/10/2016 02:24
tert-Amyl methyl ether (TAME)	ND	0.50	1	09/10/2016 02:24
Benzene	ND	0.50	1	09/10/2016 02:24
Bromobenzene	ND	0.50	1	09/10/2016 02:24
Bromochloromethane	ND	0.50	1	09/10/2016 02:24
Bromodichloromethane	ND	0.50	1	09/10/2016 02:24
Bromoform	ND	0.50	1	09/10/2016 02:24
Bromomethane	ND	0.50	1	09/10/2016 02:24
2-Butanone (MEK)	ND	2.0	1	09/10/2016 02:24
t-Butyl alcohol (TBA)	ND	2.0	1	09/10/2016 02:24
n-Butyl benzene	ND	0.50	1	09/10/2016 02:24
sec-Butyl benzene	ND	0.50	1	09/10/2016 02:24
tert-Butyl benzene	ND	0.50	1	09/10/2016 02:24
Carbon Disulfide	ND	0.50	1	09/10/2016 02:24
Carbon Tetrachloride	ND	0.50	1	09/10/2016 02:24
Chlorobenzene	ND	0.50	1	09/10/2016 02:24
Chloroethane	ND	0.50	1	09/10/2016 02:24
Chloroform	ND	0.50	1	09/10/2016 02:24
Chloromethane	ND	0.50	1	09/10/2016 02:24
2-Chlorotoluene	ND	0.50	1	09/10/2016 02:24
4-Chlorotoluene	ND	0.50	1	09/10/2016 02:24
Dibromochloromethane	ND	0.50	1	09/10/2016 02:24
1,2-Dibromo-3-chloropropane	ND	0.20	1	09/10/2016 02:24
1,2-Dibromoethane (EDB)	ND	0.50	1	09/10/2016 02:24
Dibromomethane	ND	0.50	1	09/10/2016 02:24
1,2-Dichlorobenzene	ND	0.50	1	09/10/2016 02:24
1,3-Dichlorobenzene	ND	0.50	1	09/10/2016 02:24
1,4-Dichlorobenzene	ND	0.50	1	09/10/2016 02:24
Dichlorodifluoromethane	ND	0.50	1	09/10/2016 02:24
1,1-Dichloroethane	ND	0.50	1	09/10/2016 02:24
1,2-Dichloroethane (1,2-DCA)	ND	0.50	1	09/10/2016 02:24
1,1-Dichloroethene	ND	0.50	1	09/10/2016 02:24
cis-1,2-Dichloroethene	ND	0.50	1	09/10/2016 02:24
trans-1,2-Dichloroethene	ND	0.50	1	09/10/2016 02:24
1,2-Dichloropropane	ND	0.50	1	09/10/2016 02:24
1,3-Dichloropropane	ND	0.50	1	09/10/2016 02:24
2,2-Dichloropropane	ND	0.50	1	09/10/2016 02:24

(Cont.)





## Analytical Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Received:** 9/8/16 18:45  
**Date Prepared:** 9/9/16-9/10/16  
**Project:** 2030.001

**WorkOrder:** 1609334  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L

### Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB-9-W	1609334-002B	Water	09/07/2016 10:45	GC16	126430

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	0.50	1	09/10/2016 02:24
cis-1,3-Dichloropropene	ND	0.50	1	09/10/2016 02:24
trans-1,3-Dichloropropene	ND	0.50	1	09/10/2016 02:24
Diisopropyl ether (DIPE)	ND	0.50	1	09/10/2016 02:24
Ethylbenzene	ND	0.50	1	09/10/2016 02:24
Ethyl tert-butyl ether (ETBE)	ND	0.50	1	09/10/2016 02:24
Freon 113	ND	0.50	1	09/10/2016 02:24
Hexachlorobutadiene	ND	0.50	1	09/10/2016 02:24
Hexachloroethane	ND	0.50	1	09/10/2016 02:24
2-Hexanone	ND	0.50	1	09/10/2016 02:24
Isopropylbenzene	ND	0.50	1	09/10/2016 02:24
4-Isopropyl toluene	ND	0.50	1	09/10/2016 02:24
Methyl-t-butyl ether (MTBE)	ND	0.50	1	09/10/2016 02:24
Methylene chloride	ND	0.50	1	09/10/2016 02:24
4-Methyl-2-pentanone (MIBK)	ND	0.50	1	09/10/2016 02:24
Naphthalene	ND	0.50	1	09/10/2016 02:24
n-Propyl benzene	ND	0.50	1	09/10/2016 02:24
Styrene	ND	0.50	1	09/10/2016 02:24
1,1,1,2-Tetrachloroethane	ND	0.50	1	09/10/2016 02:24
1,1,2,2-Tetrachloroethane	ND	0.50	1	09/10/2016 02:24
Tetrachloroethene	ND	0.50	1	09/10/2016 02:24
Toluene	ND	0.50	1	09/10/2016 02:24
1,2,3-Trichlorobenzene	ND	0.50	1	09/10/2016 02:24
1,2,4-Trichlorobenzene	ND	0.50	1	09/10/2016 02:24
1,1,1-Trichloroethane	ND	0.50	1	09/10/2016 02:24
1,1,2-Trichloroethane	ND	0.50	1	09/10/2016 02:24
Trichloroethene	ND	0.50	1	09/10/2016 02:24
Trichlorofluoromethane	ND	0.50	1	09/10/2016 02:24
1,2,3-Trichloropropane	ND	0.50	1	09/10/2016 02:24
1,2,4-Trimethylbenzene	ND	0.50	1	09/10/2016 02:24
1,3,5-Trimethylbenzene	ND	0.50	1	09/10/2016 02:24
Vinyl Chloride	ND	0.50	1	09/10/2016 02:24
Xylenes, Total	ND	0.50	1	09/10/2016 02:24

(Cont.)

NELAP 4033ORELAP

 Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Received:** 9/8/16 18:45  
**Date Prepared:** 9/9/16-9/10/16  
**Project:** 2030.001

**WorkOrder:** 1609334  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L

### Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB-9-W	1609334-002B	Water	09/07/2016 10:45	GC16	126430

Analytes	Result	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>	
Dibromofluoromethane	104	70-130		09/10/2016 02:24
Toluene-d8	112	70-130		09/10/2016 02:24
4-BFB	103	70-130		09/10/2016 02:24

Analyst(s): HK



## Analytical Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Received:** 9/8/16 18:45  
**Date Prepared:** 9/9/16-9/10/16  
**Project:** 2030.001

**WorkOrder:** 1609334  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L

### Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB-13-W	1609334-003B	Water	09/08/2016 13:00	GC16	126430

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	10	1	09/09/2016 15:18
tert-Amyl methyl ether (TAME)	ND	0.50	1	09/09/2016 15:18
Benzene	ND	0.50	1	09/09/2016 15:18
Bromobenzene	ND	0.50	1	09/09/2016 15:18
Bromochloromethane	ND	0.50	1	09/09/2016 15:18
Bromodichloromethane	ND	0.50	1	09/09/2016 15:18
Bromoform	ND	0.50	1	09/09/2016 15:18
Bromomethane	ND	0.50	1	09/09/2016 15:18
2-Butanone (MEK)	ND	2.0	1	09/09/2016 15:18
t-Butyl alcohol (TBA)	ND	2.0	1	09/09/2016 15:18
n-Butyl benzene	ND	0.50	1	09/09/2016 15:18
sec-Butyl benzene	ND	0.50	1	09/09/2016 15:18
tert-Butyl benzene	ND	0.50	1	09/09/2016 15:18
Carbon Disulfide	ND	0.50	1	09/09/2016 15:18
Carbon Tetrachloride	ND	0.50	1	09/09/2016 15:18
Chlorobenzene	ND	0.50	1	09/09/2016 15:18
Chloroethane	ND	0.50	1	09/09/2016 15:18
Chloroform	ND	0.50	1	09/09/2016 15:18
Chloromethane	ND	0.50	1	09/09/2016 15:18
2-Chlorotoluene	ND	0.50	1	09/09/2016 15:18
4-Chlorotoluene	ND	0.50	1	09/09/2016 15:18
Dibromochloromethane	ND	0.50	1	09/09/2016 15:18
1,2-Dibromo-3-chloropropane	ND	0.20	1	09/09/2016 15:18
1,2-Dibromoethane (EDB)	ND	0.50	1	09/09/2016 15:18
Dibromomethane	ND	0.50	1	09/09/2016 15:18
1,2-Dichlorobenzene	ND	0.50	1	09/09/2016 15:18
1,3-Dichlorobenzene	ND	0.50	1	09/09/2016 15:18
1,4-Dichlorobenzene	ND	0.50	1	09/09/2016 15:18
Dichlorodifluoromethane	ND	0.50	1	09/09/2016 15:18
1,1-Dichloroethane	ND	0.50	1	09/09/2016 15:18
1,2-Dichloroethane (1,2-DCA)	ND	0.50	1	09/09/2016 15:18
1,1-Dichloroethene	ND	0.50	1	09/09/2016 15:18
cis-1,2-Dichloroethene	ND	0.50	1	09/09/2016 15:18
trans-1,2-Dichloroethene	ND	0.50	1	09/09/2016 15:18
1,2-Dichloropropane	ND	0.50	1	09/09/2016 15:18
1,3-Dichloropropane	ND	0.50	1	09/09/2016 15:18
2,2-Dichloropropane	ND	0.50	1	09/09/2016 15:18

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## Analytical Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Received:** 9/8/16 18:45  
**Date Prepared:** 9/9/16-9/10/16  
**Project:** 2030.001

**WorkOrder:** 1609334  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L

### Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB-13-W	1609334-003B	Water	09/08/2016 13:00	GC16	126430

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	0.50	1	09/09/2016 15:18
cis-1,3-Dichloropropene	ND	0.50	1	09/09/2016 15:18
trans-1,3-Dichloropropene	ND	0.50	1	09/09/2016 15:18
Diisopropyl ether (DIPE)	ND	0.50	1	09/09/2016 15:18
Ethylbenzene	ND	0.50	1	09/09/2016 15:18
Ethyl tert-butyl ether (ETBE)	ND	0.50	1	09/09/2016 15:18
Freon 113	ND	0.50	1	09/09/2016 15:18
Hexachlorobutadiene	ND	0.50	1	09/09/2016 15:18
Hexachloroethane	ND	0.50	1	09/09/2016 15:18
2-Hexanone	ND	0.50	1	09/09/2016 15:18
Isopropylbenzene	ND	0.50	1	09/09/2016 15:18
4-Isopropyl toluene	ND	0.50	1	09/09/2016 15:18
Methyl-t-butyl ether (MTBE)	ND	0.50	1	09/09/2016 15:18
Methylene chloride	ND	0.50	1	09/09/2016 15:18
4-Methyl-2-pentanone (MIBK)	ND	0.50	1	09/09/2016 15:18
Naphthalene	ND	0.50	1	09/09/2016 15:18
n-Propyl benzene	ND	0.50	1	09/09/2016 15:18
Styrene	ND	0.50	1	09/09/2016 15:18
1,1,1,2-Tetrachloroethane	ND	0.50	1	09/09/2016 15:18
1,1,2,2-Tetrachloroethane	ND	0.50	1	09/09/2016 15:18
Tetrachloroethene	ND	0.50	1	09/09/2016 15:18
Toluene	ND	0.50	1	09/09/2016 15:18
1,2,3-Trichlorobenzene	ND	0.50	1	09/09/2016 15:18
1,2,4-Trichlorobenzene	ND	0.50	1	09/09/2016 15:18
1,1,1-Trichloroethane	ND	0.50	1	09/09/2016 15:18
1,1,2-Trichloroethane	ND	0.50	1	09/09/2016 15:18
Trichloroethene	ND	0.50	1	09/09/2016 15:18
Trichlorofluoromethane	ND	0.50	1	09/09/2016 15:18
1,2,3-Trichloropropane	ND	0.50	1	09/09/2016 15:18
1,2,4-Trimethylbenzene	ND	0.50	1	09/09/2016 15:18
1,3,5-Trimethylbenzene	ND	0.50	1	09/09/2016 15:18
Vinyl Chloride	ND	0.50	1	09/09/2016 15:18
Xylenes, Total	ND	0.50	1	09/09/2016 15:18

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NELAP 4033ORELAP

 Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Received:** 9/8/16 18:45  
**Date Prepared:** 9/9/16-9/10/16  
**Project:** 2030.001

**WorkOrder:** 1609334  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L

### Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB-13-W	1609334-003B	Water	09/08/2016 13:00	GC16	126430

Analytes	Result	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>	
Dibromofluoromethane	106	70-130		09/09/2016 15:18
Toluene-d8	108	70-130		09/09/2016 15:18
4-BFB	96	70-130		09/09/2016 15:18

Analyst(s): HK



## Analytical Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Received:** 9/8/16 18:45  
**Date Prepared:** 9/12/16-9/14/16  
**Project:** 2030.001

**WorkOrder:** 1609334  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8021B/8015Bm  
**Unit:** µg/L

### Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB-8-W	1609334-001A	Water	09/07/2016 10:00	GC19	126513

Analytes	Result	RL	DF	Date Analyzed
TPH(g)	ND	50	1	09/12/2016 17:48
MTBE	---	5.0	1	09/12/2016 17:48
Benzene	---	0.50	1	09/12/2016 17:48
Toluene	---	0.50	1	09/12/2016 17:48
Ethylbenzene	---	0.50	1	09/12/2016 17:48
Xylenes	---	1.5	1	09/12/2016 17:48
Surrogates	REC (%)	Limits		
aaa-TFT	103	70-130		09/12/2016 17:48

Analyst(s): IA

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB-9-W	1609334-002A	Water	09/07/2016 10:45	GC19	126513

Analytes	Result	RL	DF	Date Analyzed
TPH(g)	ND	50	1	09/12/2016 18:49
MTBE	---	5.0	1	09/12/2016 18:49
Benzene	---	0.50	1	09/12/2016 18:49
Toluene	---	0.50	1	09/12/2016 18:49
Ethylbenzene	---	0.50	1	09/12/2016 18:49
Xylenes	---	1.5	1	09/12/2016 18:49
Surrogates	REC (%)	Limits		
aaa-TFT	97	70-130		09/12/2016 18:49

Analyst(s): IA



## Analytical Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Received:** 9/8/16 18:45  
**Date Prepared:** 9/12/16-9/14/16  
**Project:** 2030.001

**WorkOrder:** 1609334  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8021B/8015Bm  
**Unit:** µg/L

### Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB-13-W	1609334-003A	Water	09/08/2016 13:00	GC3	126513
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
TPH(g)	ND		50	1	09/14/2016 07:34
MTBE	---		5.0	1	09/14/2016 07:34
Benzene	---		0.50	1	09/14/2016 07:34
Toluene	---		0.50	1	09/14/2016 07:34
Ethylbenzene	---		0.50	1	09/14/2016 07:34
Xylenes	---		1.5	1	09/14/2016 07:34
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>		
aaa-TFT	106		70-130		09/14/2016 07:34
<u>Analyst(s):</u> IA					





## Analytical Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Received:** 9/8/16 18:45  
**Date Prepared:** 9/8/16  
**Project:** 2030.001

**WorkOrder:** 1609334  
**Extraction Method:** SW3510C  
**Analytical Method:** SW8015B  
**Unit:** µg/L

### Total Extractable Petroleum Hydrocarbons w/out SG Clean-Up

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB-8-W	1609334-001A	Water	09/07/2016 10:00	GC9b	126344

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	590	500	10	09/13/2016 10:16
TPH-Motor Oil (C18-C36)	17,000	2500	10	09/13/2016 10:16

Surrogates	REC (%)	Limits	Date Analyzed
C9	92	70-130	09/13/2016 10:16

Analyst(s): TK

Analytical Comments: e7,e2

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB-9-W	1609334-002A	Water	09/07/2016 10:45	GC11B	126344

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	380	300	2	09/12/2016 12:00
TPH-Motor Oil (C18-C36)	4300	1500	2	09/12/2016 12:00

Surrogates	REC (%)	Limits	Date Analyzed
C9	82	70-130	09/12/2016 12:00

Analyst(s): TK

Analytical Comments: e7,e2

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB-13-W	1609334-003A	Water	09/08/2016 13:00	GC6B	126344

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	50	1	09/12/2016 15:02
TPH-Motor Oil (C18-C36)	ND	250	1	09/12/2016 15:02

Surrogates	REC (%)	Limits	Date Analyzed
C9	89	70-130	09/12/2016 15:02

Analyst(s): TK



## Quality Control Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Prepared:** 9/9/16  
**Date Analyzed:** 9/9/16  
**Instrument:** GC16  
**Matrix:** Water  
**Project:** 2030.001

**WorkOrder:** 1609334  
**BatchID:** 126430  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L  
**Sample ID:** MB/LCS-126430  
 1609334-003BMS/MSD

### QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Acetone	ND	-	10	-	-	-	-
tert-Amyl methyl ether (TAME)	ND	8.50	0.50	10	-	85	54-140
Benzene	ND	9.91	0.50	10	-	99	47-158
Bromobenzene	ND	-	0.50	-	-	-	-
Bromochloromethane	ND	-	0.50	-	-	-	-
Bromodichloromethane	ND	-	0.50	-	-	-	-
Bromoform	ND	-	0.50	-	-	-	-
Bromomethane	ND	-	0.50	-	-	-	-
2-Butanone (MEK)	ND	-	2.0	-	-	-	-
t-Butyl alcohol (TBA)	ND	24.8	2.0	40	-	62	42-140
n-Butyl benzene	ND	-	0.50	-	-	-	-
sec-Butyl benzene	ND	-	0.50	-	-	-	-
tert-Butyl benzene	ND	-	0.50	-	-	-	-
Carbon Disulfide	ND	-	0.50	-	-	-	-
Carbon Tetrachloride	ND	-	0.50	-	-	-	-
Chlorobenzene	ND	10.1	0.50	10	-	101	43-157
Chloroethane	ND	-	0.50	-	-	-	-
Chloroform	ND	-	0.50	-	-	-	-
Chloromethane	ND	-	0.50	-	-	-	-
2-Chlorotoluene	ND	-	0.50	-	-	-	-
4-Chlorotoluene	ND	-	0.50	-	-	-	-
Dibromochloromethane	ND	-	0.50	-	-	-	-
1,2-Dibromo-3-chloropropane	ND	-	0.20	-	-	-	-
1,2-Dibromoethane (EDB)	ND	9.01	0.50	10	-	90	44-155
Dibromomethane	ND	-	0.50	-	-	-	-
1,2-Dichlorobenzene	ND	-	0.50	-	-	-	-
1,3-Dichlorobenzene	ND	-	0.50	-	-	-	-
1,4-Dichlorobenzene	ND	-	0.50	-	-	-	-
Dichlorodifluoromethane	ND	-	0.50	-	-	-	-
1,1-Dichloroethane	ND	-	0.50	-	-	-	-
1,2-Dichloroethane (1,2-DCA)	ND	8.92	0.50	10	-	89	66-125
1,1-Dichloroethene	ND	9.88	0.50	10	-	99	47-149
cis-1,2-Dichloroethene	ND	-	0.50	-	-	-	-
trans-1,2-Dichloroethene	ND	-	0.50	-	-	-	-
1,2-Dichloropropane	ND	-	0.50	-	-	-	-
1,3-Dichloropropane	ND	-	0.50	-	-	-	-
2,2-Dichloropropane	ND	-	0.50	-	-	-	-

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 QA/QC Officer



## Quality Control Report

<b>Client:</b> Pangea Environmental Svcs., Inc.	<b>WorkOrder:</b> 1609334
<b>Date Prepared:</b> 9/9/16	<b>BatchID:</b> 126430
<b>Date Analyzed:</b> 9/9/16	<b>Extraction Method:</b> SW5030B
<b>Instrument:</b> GC16	<b>Analytical Method:</b> SW8260B
<b>Matrix:</b> Water	<b>Unit:</b> µg/L
<b>Project:</b> 2030.001	<b>Sample ID:</b> MB/LCS-126430 1609334-003BMS/MSD

### QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
1,1-Dichloropropene	ND	-	0.50	-	-	-	-
cis-1,3-Dichloropropene	ND	-	0.50	-	-	-	-
trans-1,3-Dichloropropene	ND	-	0.50	-	-	-	-
Diisopropyl ether (DIPE)	ND	9.22	0.50	10	-	92	57-136
Ethylbenzene	ND	-	0.50	-	-	-	-
Ethyl tert-butyl ether (ETBE)	ND	8.92	0.50	10	-	89	55-137
Freon 113	ND	-	0.50	-	-	-	-
Hexachlorobutadiene	ND	-	0.50	-	-	-	-
Hexachloroethane	ND	-	0.50	-	-	-	-
2-Hexanone	ND	-	0.50	-	-	-	-
Isopropylbenzene	ND	-	0.50	-	-	-	-
4-Isopropyl toluene	ND	-	0.50	-	-	-	-
Methyl-t-butyl ether (MTBE)	ND	8.44	0.50	10	-	84	53-139
Methylene chloride	ND	-	0.50	-	-	-	-
4-Methyl-2-pentanone (MIBK)	ND	-	0.50	-	-	-	-
Naphthalene	ND	-	0.50	-	-	-	-
n-Propyl benzene	ND	-	0.50	-	-	-	-
Styrene	ND	-	0.50	-	-	-	-
1,1,1,2-Tetrachloroethane	ND	-	0.50	-	-	-	-
1,1,2,2-Tetrachloroethane	ND	-	0.50	-	-	-	-
Tetrachloroethene	ND	-	0.50	-	-	-	-
Toluene	ND	10.1	0.50	10	-	101	52-137
1,2,3-Trichlorobenzene	ND	-	0.50	-	-	-	-
1,2,4-Trichlorobenzene	ND	-	0.50	-	-	-	-
1,1,1-Trichloroethane	ND	-	0.50	-	-	-	-
1,1,2-Trichloroethane	ND	-	0.50	-	-	-	-
Trichloroethene	ND	9.63	0.50	10	-	96	43-157
Trichlorofluoromethane	ND	-	0.50	-	-	-	-
1,2,3-Trichloropropane	ND	-	0.50	-	-	-	-
1,2,4-Trimethylbenzene	ND	-	0.50	-	-	-	-
1,3,5-Trimethylbenzene	ND	-	0.50	-	-	-	-
Vinyl Chloride	ND	-	0.50	-	-	-	-
Xylenes, Total	ND	-	0.50	-	-	-	-



## Quality Control Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Prepared:** 9/9/16  
**Date Analyzed:** 9/9/16  
**Instrument:** GC16  
**Matrix:** Water  
**Project:** 2030.001

**WorkOrder:** 1609334  
**BatchID:** 126430  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L  
**Sample ID:** MB/LCS-126430  
 1609334-003BMS/MSD

### QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
<b>Surrogate Recovery</b>							
Dibromofluoromethane	26.2	26.4		25	105	105	70-130
Toluene-d8	27.5	27.8		25	110	111	70-130
4-BFB	2.66	2.94		2.5	106	118	70-130

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
tert-Amyl methyl ether (TAME)	8.28	8.27	10	ND	83	83	69-139	0	20
Benzene	9.12	8.93	10	ND	91	89	69-141	2.19	20
t-Butyl alcohol (TBA)	28.7	29.1	40	ND	68	69	41-152	1.15	20
Chlorobenzene	9.45	9.33	10	ND	95	93	77-120	1.30	20
1,2-Dibromoethane (EDB)	9.02	8.87	10	ND	90	89	76-135	1.75	20
1,2-Dichloroethane (1,2-DCA)	8.38	8.32	10	ND	84	83	73-139	0.685	20
1,1-Dichloroethene	9.58	9.24	10	ND	96	92	59-140	3.54	20
Diisopropyl ether (DIPE)	8.92	8.76	10	ND	89	88	72-140	1.84	20
Ethyl tert-butyl ether (ETBE)	8.50	8.49	10	ND	85	85	71-140	0	20
Methyl-t-butyl ether (MTBE)	8.38	8.41	10	ND	84	84	73-139	0	20
Toluene	8.92	8.90	10	ND	89	88	71-128	0.218	20
Trichloroethene	8.91	8.66	10	ND	89	87	64-132	2.83	20
<b>Surrogate Recovery</b>									
Dibromofluoromethane	26.3	26.5	25		105	106	73-131	0.813	20
Toluene-d8	27.0	27.2	25		108	109	72-117	0.753	20
4-BFB	2.60	2.61	2.5		104	105	74-116	0.431	20



## Quality Control Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Prepared:** 9/12/16  
**Date Analyzed:** 9/12/16  
**Instrument:** GC19  
**Matrix:** Water  
**Project:** 2030.001

**WorkOrder:** 1609334  
**BatchID:** 126513  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8021B/8015Bm  
**Unit:** µg/L  
**Sample ID:** MB/LCS-126513  
 1609335-002AMS/MSD

### QC Summary Report for SW8021B/8015Bm

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
TPH(btex)	ND	53.8	40	60	-	90	70-130
MTBE	ND	9.80	5.0	10	-	98	70-130
Benzene	ND	9.25	0.50	10	-	92	70-130
Toluene	ND	9.51	0.50	10	-	95	70-130
Ethylbenzene	ND	9.98	0.50	10	-	100	70-130
Xylenes	ND	30.1	1.5	30	-	100	70-130
<b>Surrogate Recovery</b>							
aaa-TFT	9.81	9.50		10	98	95	70-130

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
TPH(btex)	60.8	60.7	60	ND	101	101	70-130	0	20
MTBE	9.72	10.4	10	ND	92	99	70-130	6.85	20
Benzene	9.80	10.3	10	ND	98	103	70-130	5.36	20
Toluene	10.2	10.6	10	ND	101	106	70-130	4.82	20
Ethylbenzene	10.6	10.7	10	ND	106	107	70-130	1.36	20
Xylenes	31.8	31.8	30	ND	106	106	70-130	0	20
<b>Surrogate Recovery</b>									
aaa-TFT	9.58	9.84	10		96	98	70-130	2.69	20



## Quality Control Report

**Client:** Pangea Environmental Svcs., Inc.  
**Date Prepared:** 9/8/16  
**Date Analyzed:** 9/9/16  
**Instrument:** GC39A  
**Matrix:** Water  
**Project:** 2030.001

**WorkOrder:** 1609334  
**BatchID:** 126344  
**Extraction Method:** SW3510C  
**Analytical Method:** SW8015B  
**Unit:** µg/L  
**Sample ID:** MB/LCS/LCSD-126344

### QC Report for SW8015B w/out SG Clean-Up

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
TPH-Diesel (C10-C23)	ND	50	-	-	-
TPH-Motor Oil (C18-C36)	ND	250	-	-	-
<b>Surrogate Recovery</b>					
C9	544		625	87	65-122

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH-Diesel (C10-C23)	1200	1230	1000	120	123	61-157	2.46	30
<b>Surrogate Recovery</b>								
C9	544	562	625	87	90	65-122	3.21	30

**WorkOrder: 1609334**      **ClientCode: PEO**

WaterTrax     WriteOn     EDF     Excel     HardCopy     ThirdParty     J-flag  
 EQulS     Email

**Report to:** Ron Scheele      **Bill to:** Bob Clark-Riddell  
 Pangea Environmental Svcs., Inc.      Pangea Environmental Svcs., Inc.  
 1710 Franklin Street, Ste. 200      1710 Franklin Street, Ste. 200  
 Oakland, CA 94612      Oakland, CA 94612  
 (510) 836-3700      FAX: (510) 836-3709  
 Email: Rscheele@pangeaenv.com  
 cc/3rd Party:

**Requested TAT: 5 days;**  
**Date Received: 09/08/2016**  
**Date Logged: 09/08/2016**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)													
					1	2	3	4	5	6	7	8	9	10	11	12		
1609334-001	SB-8-W	Water	9/7/2016 10:00	<input type="checkbox"/>	B	A	A											
1609334-002	SB-9-W	Water	9/7/2016 10:45	<input type="checkbox"/>	B	A	A											
1609334-003	SB-13-W	Water	9/8/2016 13:00	<input type="checkbox"/>	B	A	A											

**Test Legend:**

1	8260B_W	3	TPH(DMO)_W
2	G-MBTEx_W	4	
5		7	
9		11	
		12	

**Prepared by: Agustina Venegas**

The following SampleIDs: 001A, 002A, 003A contain testgroup Multi Range\_W.

**Comments:**

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days). Hazardous samples will be returned to client or disposed of at client expense.





## WORK ORDER SUMMARY

**Client Name:** PANGEA ENVIRONMENTAL SVCS., INC.

**Work Order:** 1609334

**Project:** 2030.001

**QC Level:** LEVEL 2

**Client Contact:** Ron Scheele

**Date Logged:** 9/8/2016

**Comments:**

**Contact's Email:** Rscheele@pangeaenv.com

WaterTrax  WriteOn  EDF  Excel  Fax  Email  HardCopy  ThirdParty  J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1609334-001A	SB-8-W	Water	Multi-Range TPH(g,d,mo) by EPA 8015Bm	2	aVOA w/ HCl	<input type="checkbox"/>	9/7/2016 10:00	5 days	Present	<input type="checkbox"/>	
1609334-001B	SB-8-W	Water	SW8260B (VOCs)	1	aVOA w/ HCl	<input type="checkbox"/>	9/7/2016 10:00	5 days	Present	<input type="checkbox"/>	
1609334-002A	SB-9-W	Water	Multi-Range TPH(g,d,mo) by EPA 8015Bm	2	aVOA w/ HCl	<input type="checkbox"/>	9/7/2016 10:45	5 days	Present	<input type="checkbox"/>	
1609334-002B	SB-9-W	Water	SW8260B (VOCs)	1	aVOA w/ HCl	<input type="checkbox"/>	9/7/2016 10:45	5 days	Present	<input type="checkbox"/>	
1609334-003A	SB-13-W	Water	Multi-Range TPH(g,d,mo) by EPA 8015Bm	2	aVOA w/ HCl	<input type="checkbox"/>	9/8/2016 13:00	5 days	Trace	<input type="checkbox"/>	
1609334-003B	SB-13-W	Water	SW8260B (VOCs)	1	500mL aG, unprsv. aVOA w/ HCl	<input type="checkbox"/>	9/8/2016 13:00	5 days	Trace	<input type="checkbox"/>	

**NOTES:** - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

160922A



**McCAMPBELL ANALYTICAL, INC.**

1534 Willow Pass Rd. Pittsburg, Ca. 94565-1701  
 Telephone: (877) 252-9262 / Fax: (925) 252-9269  
 www.mccampbell.com main@mccampbell.com

Report To: Ron Scheele Bill To: Pangea Env.

Company: Pangea Env.

Email: rscheele@pangeaenv.com

Email: rscheele@pangeaenv.com Tel: (910) 459-6012

Project Name#: 2030.001

Project Location: 1A33 Beckman PO #

Sampler Signature: [Signature]

SAMPLE ID Location / Field Point	Sampling		#Containers	Matrix	Preservative	TPH as Diesel (8015) + Motor Oil 9071	Oil & Grease Total Petroleum (1664 / 9071)	Oil & Grease Total Petroleum (418.1)	EPA 505/ 608 / 8081 (CI Pesticides)	EPA 608 / 8082 PCB's : Aroclors only	EPA 507 / 8141 (NP Pesticides)	EPA 515 / 8151 (Acidic CI Herbicides)	EPA 524.2 / 624 / 8260 (VOCs)	EPA 525.2 / 625 / 8270 (SVOCs)	EPA 8270 SIM / 8310 (PAHs / PNAS)	CAM 17 Metals (200.8 / 6020)**	LUFT 5 Metals (200.8 / 6020)**	Metals (200.8 / 6020)	Baylands Requirements	Lab to filter sample for dissolved metals analysis	
	Date	Time																			
SB-8-w	9/7/16	1000	3	H <sub>2</sub> O	HCl	X															
SB-9-w	9/7/16	1045	3	"	HCl	X							X								
SB-13-w	9/8/16	1300	5	"	HCl + NaOH None = AMB	X							X								

\*\*MAI clients MUST disclose any dangerous chemicals known to be present in their submitted samples in concentrations that may cause immediate harm or serious future health endangerment as a result of brief, gloved, open air, sample handling by MAI staff. Non-disclosure incurs an immediate \$250 surcharge and the client is subject to full legal liability for harm suffered. Thank you for your understanding and for allowing us to work safely.

\*\*\* If metals are requested for water samples and the water type (Matrix) is not specified on the chain of custody, MAI will default to metals by E200.8.

Please provide an adequate volume of sample for testing being submitted. If the volume is not sufficient for a MS/MSD a LCS/LCSD will be prepared in its place and noted in the report.

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time	Comments / Instructions
<u>[Signature]</u>	9/8/16	1845	<u>[Signature]</u>	9/8	1845	

Matrix Code: DW=Drinking Water, GW=Ground Water, WW=Waste Water, SW=Seawater, S=Soil, SL=Sludge, A=Air, WP=Wipe, O=Other  
 Preservative Code: 1=4°C 2=HCl 3=H<sub>2</sub>SO<sub>4</sub> 4=HNO<sub>3</sub> 5=NaOH 6=ZnOAc/NaOH 7=None Temp 6.8 °C Initials [Signature]



### Sample Receipt Checklist

Client Name: **Pangea Environmental Svcs., Inc.**  
 Project Name: **2030.001**  
 WorkOrder №: **1609334** Matrix: Water  
 Carrier: Client Drop-In

Date and Time Received: **9/8/2016 18:45**  
 Date Logged: **9/8/2016**  
 Received by: **Agustina Venegas**  
 Logged by: **Agustina Venegas**

#### Chain of Custody (COC) Information

Chain of custody present? Yes  No   
 Chain of custody signed when relinquished and received? Yes  No   
 Chain of custody agrees with sample labels? Yes  No   
 Sample IDs noted by Client on COC? Yes  No   
 Date and Time of collection noted by Client on COC? Yes  No   
 Sampler's name noted on COC? Yes  No

#### Sample Receipt Information

Custody seals intact on shipping container/cooler? Yes  No  NA   
 Shipping container/cooler in good condition? Yes  No   
 Samples in proper containers/bottles? Yes  No   
 Sample containers intact? Yes  No   
 Sufficient sample volume for indicated test? Yes  No

#### Sample Preservation and Hold Time (HT) Information

All samples received within holding time? Yes  No   
 Sample/Temp Blank temperature Temp: 6.8°C NA   
 Water - VOA vials have zero headspace / no bubbles? Yes  No  NA   
 Sample labels checked for correct preservation? Yes  No   
 pH acceptable upon receipt (Metal: <2; 522: <4; 218.7: >8)? Yes  No  NA   
 Samples Received on Ice? Yes  No   
 (Ice Type: WET ICE )

#### UCMR3 Samples:

Total Chlorine tested and acceptable upon receipt for EPA 522? Yes  No  NA   
 Free Chlorine tested and acceptable upon receipt for EPA 218.7, 300.1, 537, 539? Yes  No  NA

Comments: