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9 November 2017
Project 750635603

Mr. Keith Nowell, PG
Alameda County Health Care Services Agency
Environmental Health Department
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

Subject: Additional Environmental Information
Cleanup Case No. RO03236
3000 Broadway SPE LLC
3000 Broadway Redevelopment
Oakland, California
Langan Project: 731635604

Dear Mr. Nowell:

I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document submitted on my behalf to ACDEH's FTP server and the SWRCB's GeoTracker website.

Sincerely yours,



Alan Chamorro
3000 Broadway SPE LLC

501 14th Street, 3rd Floor Oakland, CA 94612 T: 510.874.7000 F: 510.874.7001

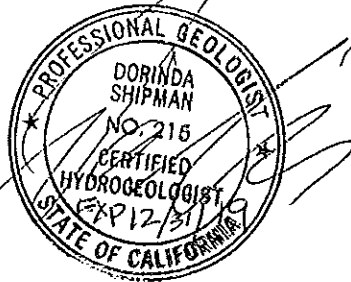
To: Ms. Dilan Roe and Mr. Keith Nowell
Alameda County Department of Environmental Health (ACDEH)

CC: Alan Chamorro, Paul Gryfakis, and Tom Clyman – 3000 Broadway SPE LLC

From: Dorinda Shipman, Principal
Joshua Graber, Associate
Karianne Staehlin, Senior Staff Scientist

Date: 9 November 2017

Re: Additional Environmental Information
3000 Broadway Redevelopment
Oakland, California
Langan Project No.: 750635604



On behalf of 3000 Broadway SPE LLC (Client), Langan Engineering and Environmental Services, Inc. (Langan) has prepared this memorandum presenting additional environmental information associated with the proposed 3000 Broadway Redevelopment project, as requested by the Alameda County Department of Environmental Health (ACDEH). The 3000 Broadway Redevelopment project includes Assessor Parcel Numbers (APN) 09-0704-011-01, 09-0704-012, 09-0704-010, and 09-0704-009 and the associated property addresses of 3000 and 3020 Broadway; 250, 260, and 288 30th Street; and 3007 and 3009 Brook Street (site) in Oakland, California (Figure 1).

Our recent subsurface investigations, conducted at the site and downgradient of the site, have encountered both soil and groundwater that was impacted by total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), and, to a lesser extent, polycyclic aromatic hydrocarbons (PAHs). The additional environmental sampling was performed to further evaluate and delineate the extent of contaminated soil and groundwater at the site and to determine the appropriate extent of the proposed vapor mitigation system (VMS) associated with the development.

The scope of the additional environmental sampling was detailed in our *Work Plan for Additional Environmental Sampling, 3000 Broadway Redevelopment, Oakland, California* (Work Plan) dated 7 September 2017. The Work Plan was approved via email by ACDEH on 14 September 2017. Additionally, the ACDEH requested that the groundwater monitoring wells be sampled as part of this investigation. Prior to drilling, Langan obtained the necessary permit from Alameda County Public Works Agency (ACPWA). This memorandum provides a summary of soil and groundwater sampling activities and associated analytical results, which were conducted in accordance with the Work Plan.

GROUNDWATER MONITORING WELLS

On 30 March 2017, groundwater monitoring wells GW-1 and GW-2 were installed within the 260 30th Street building, to an approximate depth of 18 feet below current grade (bgs), with screened intervals between 8 and 18 feet bgs. On 19 May 2017, groundwater monitoring wells GW-3, GW-4, and GW-5 were installed outside and downgradient of the existing building, along the Brook Street right-of-way, to an approximate depth of 15 feet bgs, with screened intervals between 5 and 15 feet bgs. The approximate locations of the groundwater monitoring wells are shown on Figure 2. The survey data, including location and elevations of both top of casing (TOC) and the ground surface, are presented in Table 1.

Groundwater Monitoring Well Sampling

Langan had initially sampled groundwater monitoring wells GW-1 and GW-2 on 5 April 2017 and groundwater monitoring wells GW-3, GW-4, and GW-5 on 25 May 2017. Groundwater elevations were calculated based on depth-to-water measurements taken on 2 June 2017.

ACDEH subsequently requested a second groundwater sampling event, which was performed on 29 September 2017. Each well was purged and sampled using low-flow sampling methods, including use of a low-flow peristaltic pump. The purged groundwater was diverted through a multi-parameter water quality meter fitted with a flow-through cell, and water quality parameters were recorded until they had stabilized. All field parameters recorded during sampling are presented in Table 2, including the depth-to-water measurements for all five monitoring wells. The initial groundwater elevations collected on 2 June 2017 are also presented in Table 2. Compared to the June 2017 groundwater elevations, the late-September 2017 groundwater elevations were between 0.49 and 1.81 feet lower in elevation, with the most significant changes observed in monitoring wells GW-4 and GW-5, which are furthest south and east relative to other monitoring wells at the site. The inferred groundwater direction at the site and adjacent to the site is to the southeast, towards Glen Echo Creek.

Groundwater samples were placed on ice in a cooler following collection and shipped under chain-of-custody (COC) procedures to McCampbell Analytical, Inc. (McCampbell), a State of California-certified analytical laboratory. Each sample was submitted for analysis for TPH as gasoline (TPHg), TPH as diesel (TPHd), TPH as motor oil (TPHmo), and VOCs.

Groundwater Analytical Results

Groundwater monitoring well analytical results for non-metal parameters are presented in Table 3 and were compared to the San Francisco Bay Regional Water Quality Control Board's (RWQCB) Tier 1 environmental screening levels (ESLs) summary table, residential vapor intrusion ESLs (Table GW-1), and direct exposure ESLs (Table GW-1) (RWQCB, February 2016 [Rev. 3]). During the September 2017 sampling event, TPHg was detected at or above the laboratory reporting limit (50 micrograms per liter ($\mu\text{g/L}$)) in two (GW-1 and GW-2) of the five samples analyzed at concentrations of 97 $\mu\text{g/L}$ and 61 $\mu\text{g/L}$, respectively, however, none of the detected TPHg detections exceed established ESLs. TPHd and TPHmo were not detected

above the laboratory reporting limits (50 µg/L and 250 µg/L, respectively) in the five samples analyzed.

During the September 2017 sampling event, three VOCs, including cis-1,2-dichloroethene (cis-1,2-DCE), trichloroethene (TCE), and trans-1,2-DCE and were detected in one or more of the samples analyzed. Cis-1,2-DCE was detected in four of the five samples analyzed, with concentrations ranging from 9.6 µg/L to 1,000 µg/L, all of which exceed the shared Tier 1 ESL and direct exposure ESL of, 6.0 µg/L. Cis-1,2-DCE was highest in monitoring well GW-1 and was not detected in monitoring well GW-3. Only the two on-site samples, from GW-1 and GW-2, contained cis-1,2 DCE at concentrations that exceed the residential vapor intrusion ESL of 110 µg/L. TCE was detected above the laboratory reporting limits in each of the five samples analyzed with concentrations ranging from 2.1 µg/L to 8,400 µg/L, four of which exceed the Tier 1 ESL residential vapor intrusion ESL, and direct exposure ESL, of 5.0 µg/L, 5.6 µg/L, and 5.0 µg/L, respectively. Trans-1,2-DCE was detected in one of the five samples analyzed (GW-5) at a concentration of 0.84 µg/L, which does not exceed the established ESLs. Vinyl chloride was previously detected in monitoring well GW-5, but was not detected during this sampling event in any of the monitoring wells sampled. Analytical results for TCE and cis-1,2-DCE associated with the groundwater monitoring wells are presented on Figure 3.

Overall, groundwater monitoring wells GW-1 and GW-2, which are located within the 260 30th Street property, continue to have significantly higher concentrations of VOCs than groundwater monitoring wells GW-3, GW-4, and GW-5, which are located within the Brooke Street right-of-way.

GRAB-GROUNDWATER AND SOIL SAMPLING

ACDEH requested additional borings for the collection of grab-groundwater and soil samples in order to further evaluate and delineate the extent of contaminated groundwater and soil that had been previously encountered and to determine the appropriate extent of the proposed VMS associated with the development. On 29 September 2017, three borings (B-46, B-47, and B-48) were advanced using a direct-push drill rig utilizing Geoprobe® technology and operated by Gregg Drilling and Testing (Gregg), a C-57 licensed drilling company based in Martinez, California. The borings were advanced to a maximum depth of 24 feet bgs in the locations shown on Figure 2. Boring B-46 was advanced along the northern property line of the 3009 Brooke Street property in the upgradient direction relative to the site. Borings B-47 and B-48 were collected within the 260 30th Street property. Grab-groundwater samples were collected from each of the three borings by inserting a temporary 1-inch PVC casing with ten feet of pre-packed sand screen. In order to limit the volatilization of any VOCs in groundwater samples, each grab-groundwater sample was collected using low-flow sampling methods, using a peristaltic pump.

To evaluate soil to be left in place, soil samples were collected at depths just below the anticipated excavation depth associated with the proposed development. Additionally, deeper samples were collected and placed on hold at the laboratory. Soil samples were collected from 10feetbgs in boring B-46 and 14 feet bgs in borings B-47 and B-48. Due to detections of

petroleum hydrocarbons and VOCs in the soil sample from boring B-47 at 14 feet bgs, the deeper samples at 16- and 20- feet bgs were also analyzed. Upon completing sampling activities, each boring was grouted to the surface with neat cement grout, under supervision of an ACPWA inspector and in accordance with the ACPWA permit and general requirements.

Grab-groundwater and soil samples were placed on ice in a cooler following collection and shipped under COC procedures to McCampbell Analytical. Each grab-groundwater sample and select soil samples were submitted for TPHg, TPHd, TPHmo, and VOC analysis. Boring logs from B-46 through B-48 are presented in Appendix A as Figures A-1 through A-3. The material encountered was classified according to the system described on Figure A-4. The laboratory analytical results for the grab-groundwater and soil samples are presented in Tables 4 and 5, respectively. Copies of the certified laboratory analytical reports are presented in Appendix B.

Grab-Groundwater Analytical Results

Grab-groundwater analytical results for non-metal parameters are presented in Table 4 and were compared to the RWQCB Tier 1 ESLs, residential vapor intrusion ESLs (Table GW-1), and direct exposure ESLs (Table GW-1) (RWQCB, February 2016 [Rev. 3]). Due to the elevated concentrations of TPHd and TPHmo detected in grab-groundwater sample B-47-GW, the sample was resubmitted for the same analyses after silica gel cleanup.

TPHg was not detected above the laboratory reporting limit (50 µg/L) in the three samples analyzed. TPHd was detected in each of the samples analyzed. TPHd was detected at elevated concentrations in sample B-47-GW, located closest to the 260 30th Street property. TPHd was detected at a concentration of 78,000 µg/L without silica gel cleanup and at a concentration of 92,000 µg/L with silica gel cleanup. TPHd was detected at significantly lower concentrations of 78 µg/L and 120 µg/L in samples B-48-GW and B-46-GW, respectively. TPHd detections in B-46-GW and B-47-GW exceed the Tier 1 ESL, 100 µg/L. TPHmo was detected at concentrations of 390 µg/L and 330,000 µg/L (without silica gel cleanup) in samples from B-46-GW and B-47-GW, respectively. After the silica gel cleanup was used, TPHmo was detected at a concentration of 280,000 µg/L in sample B-47-GW. The detected concentration of TPHmo in sample B-47-GW exceeds the Tier 1 ESL of 50,000 µg/L.

Five VOCs, including cis-1,2-DCE, TCE, tetrachloroethene (PCE), chloroform, and 1,2-dichloroethane (1,2-DCA) were detected in one or more of the grab-groundwater samples analyzed from borings B-46, B-47, and B-48. Cis-1,2-DCE was only detected at or above the laboratory reporting limit (0.50 µg/L) in sample B-47-GW, at a concentration of 83 µg/L, which exceeds the shared Tier 1 and direct exposure ESL, 6.0 µg/L, but does not exceed the residential vapor intrusion ESL, 110 µg/L. TCE was detected at or above the laboratory reporting limit (0.50 µg/L) in two (B-47-GW and B-48-GW) of the three samples analyzed at concentrations of 130 µg/L and 0.72 µg/L, respectively. Only the B-47-GW concentration exceeds established ESLs. Of the three samples analyzed, only sample B-48-GW detected PCE, chloroform, and 1,2-DCA at or above laboratory reporting limits, at concentrations of 1.7 µg/L, 2.1 µg/L, and 0.53 µg/L, respectively. Of those contaminants, only 1,2-DCA exceeds established ESLs. The 1,2-DCA detection of 0.53 µg/L exceeds the shared Tier 1 and direct

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exposure ESL of 0.5 µg/L, but not the residential vapor intrusion ESL, 6.1 µg/L. TCE results in grab-groundwater samples are presented on Figure 3.

Soil Analytical Results

Soil samples were collected just below the anticipated excavation depth in order to evaluate soil near the proposed slab elevation. Additional, deeper soil samples were collected and placed on hold at the laboratory. Soil analytical results for non-metal parameters are presented in Table 5 and were compared to both the RWQCB Tier 1 ESLs summary table, and direct exposure ESLs (Table S-1) for shallow residential soils (RWQCB, February 2016 [Rev. 3]).

TPHg was not detected at or above the laboratory reporting limit (1.0 milligram per kilogram (mg/kg)) in the five samples analyzed. TPHd was detected in three of the five samples analyzed at concentrations ranging from 3.9 mg/kg to 360 mg/kg. Only the TPHd detection in sample B-47-14.0, at a concentration of 360 mg/kg, exceeds the shared Tier 1 ESL and direct exposure ESL of 230 mg/kg. TPHd was detected at a low concentration of 180 mg/kg in sample B-47-16.0 collected from a depth of 16 feet and was not detected at or above the laboratory reporting limit (1 mg/kg) in sample B-47-20.0 collected from a depth of 20 feet in boring B-47. TPHmo was detected in three of the five samples analyzed at concentrations ranging from 6.9 mg/kg to 1,300 mg/kg, neither of which exceed established ESLs. Trace concentrations of cis-1,2-DCE and TCE were only detected in sample B-47-14.0, but at concentrations below established ESLs. No VOCs were detected in the soil samples collected from boring B-47 at depths of 16 and 20 feet bgs. The lack of TPH detections in deeper soil samples suggests that the TPHd and TPHmo detections reported in groundwater are likely from the shallower soil, which is proposed for excavation.

ACDEH-REQUESTED INFORMATION

An updated sampling plan overview table, as requested, is presented in Table 6. The table provides an overall summary of the environmental borings completed at the site to date, including parcel numbers, addresses, and historical use information. Additionally, the table summarizes all subsurface work previously conducted at the site by both Langan and others, including soil, groundwater, and soil vapor sampling. Any significant exceedances detected in the laboratory analytical results are noted in a separate "ESL exceedance" column within the table. All analytical results were compared to the RWQCB Tier 1 ESLs for groundwater (RWQCB, Tier 1 ESLs, February 2016 [Rev. 3]).

DISCUSSION AND NEXT STEPS

The soil and groundwater data collected in September 2017 provides additional information with which to delineate the groundwater plume at the site. Overall, TPH compounds are highest in the vicinity of the 260 30th Street property and specifically along the eastern half of this building. As shown in Figure 2, boring B-47 is located closest to the 260 30th Street property, including the previously investigated floor drain and previous borings, exhibited elevated concentrations of petroleum hydrocarbons and VOCs. TPH concentrations are

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generally one or more orders of magnitude higher in the turbid grab-groundwater samples when compared to nearby monitoring well samples, which suggests that the grab-groundwater analytical results are biased high.

Analytical results indicate that TPH concentrations in grab-groundwater decrease significantly in the upgradient (B-46-GW) and cross-gradient (B-12-GW and B-48-GW) directions. TPH concentrations also decrease significantly in the downgradient direction in borings B-27 and B-28 and were not detected in downgradient groundwater monitoring wells GW-3, GW-4, or GW-5 during either the May or September 2017 sampling events. Therefore, it appears that significant TPH impacts are limited to within the site boundary and mostly occur beneath the 260 30th Street property.

TCE has been identified as the main contaminant of concern at the site. TCE concentrations are generally highest in the vicinity of GW-1 and GW-2, near the former floor drain. Analytical results indicate that TCE concentrations significantly decrease in the downgradient and crossgradient directions. Furthermore, the lack of significant detections in monitoring wells GW-3 and GW-5 indicate that the TCE plume is relatively narrow. Additionally, the non-detection and low-level detection of TCE in grab-groundwater samples B-46-GW and B-48-GW, respectively, define and delineate the extent of the TCE plume in the upgradient and cross-gradient directions to the north and west, respectively.

The site redevelopment proposes soil excavation to remove soil exceeding the Tier I ESLs and construction dewatering to remove the most contaminated groundwater. The excavation proposed in the *Soil and Groundwater Management Plan, 3000 Broadway Redevelopment, Oakland, California* (SGMP), dated 17 May 2017, extends to the depth of wells GW-1 and GW-2, and deeper groundwater samples collected previously indicate that significant contamination is limited to the shallow (i.e. less than 18 feet bgs) soil. The development is also proposed to have a VMS. The extent of the VMS will be presented in more detail in a *Revised Basis of Design for Vapor Mitigation System* letter associated with the property and will extend to the northern property line along 3009 Brooke Street and beyond boring B-48, which did not have any residential vapor intrusion ESL exceedances.

In addition to the groundwater information and analytical results presented in this memorandum, all previous subsurface information has been summarized in our prior reports, which have been submitted to ACDEH and uploaded to the State of California's GeoTracker database for the site. Based on the cumulative subsurface work and analytical results associated with the proposed site development, we believe that previously, identified data gaps have been addressed.

As detailed in our SGMP, during site development we propose to over-excavate soil containing compounds exceeding their Tier 1 ESLs from the 260 30th Street property. In order to achieve excavation depths, dewatering and treatment is anticipated. We anticipate that the proposed over-excavation and dewatering activities will remove the source of the site's contamination. Groundwater monitoring wells GW-1 and GW-2 will be removed during excavation, and groundwater wells GW-3, GW-4, and GW-5 are expected to remain active throughout site

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development activities and will be monitored following the excavation and dewatering activities to assess changes to groundwater concentrations off-site.

Please do not hesitate to contact us with any questions, or if we can provide any additional information.

Attachments:

Table 1 – Groundwater Monitoring Well Survey Data

Table 2 – Groundwater Monitoring Well Field Parameters

Table 3 – Groundwater Monitoring Well Analytical Results for Non-Metals

Table 4 – Grab-Groundwater Analytical Results for Non-Metals

Table 5 – Soil Analytical Results for Non-Metals

Table 6 – Summary of Environmental Borings and Concerns

Figure 1 – Site Location Map

Figure 2 – Site Plan with Sampling Locations

Figure 3 – Site Plan with TCE Concentrations in Groundwater

Appendix A – Boring Logs

Appendix B – Certified Analytical Reports Including Chain of Custody Records

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TABLES

Table 1
Groundwater Monitoring Well Survey Data
3000 Broadway Redevelopment
Oakland, California

Langan Project: 750635604
November 2017

Well Number and Screened Interval (feet bgs)	Description	NAD 83 Northing	NAD83 Easting	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Elevation (NAVD 88)
GW-1 (8-18)	GW-1 TOC	2125373.99	6052933.38	37.8187478	-122.2613336	44.08
	GW-1 Concrete Surface	2125374.46	6052933.3	37.8187491	-122.2613339	41.92
GW-2 (8-18)	GW-2 TOC	2125360.49	6052950.91	37.8187116	-122.261272	43.96
	GW-2 Concrete Surface	2125360.94	6052950.97	37.8187129	-122.2612718	41.90
GW-3 (5-15)	GW-3 TOC	2125372.86	6052985.83	37.8187474	-122.261152	37.78
	GW-3 Well Box	2125372.97	6052986.13	37.8187477	-122.2611509	38.03
GW-4 (5-15)	GW-4 TOC	2125315.68	6052996.07	37.8185909	-122.2611128	34.38
	GW-4 Well Box	2125315.67	6052996.07	37.8185909	-122.2611128	34.67
GW-5 (5-15)	GW-5 TOC	2125276.29	6052958.01	37.8184808	-122.2612419	33.85
	GW-5 Well Box	2125276.37	6052957.94	37.818481	-122.2612422	34.37

Notes:

bgs - below ground surface

TOC - Top of Casing

NAD 83 - North American Datum of 1983

NAVD 88 - North American Vertical Datum of 1988

**Table 2
Groundwater Monitoring Well Field Parameters
3000 Broadway Redevelopment
Oakland, California**

Well Number and Screened Interval (Feet bgs)	TOC Elevation (NAVD 88)	Depth to Water Elevation (2 June 2017) (NAVD 88)	Depth to Water Elevation (29 September 2017) (NAVD 88)	Date	Time	Depth to Water (from TOC) (Feet)	Temperature (°C)	Conductivity (mS/cm)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)	Notes
GW-1 (8-18)	44.08	31.69	30.98	9/29/2017	8:50	13.1	18.75	0.757	7.67	189	3.88	36.7	Clear; no odor
					8:55	--	19.22	0.754	6.78	209	2.03	55.9	
					9:00	--	19.35	0.752	6.39	236	2.14	38.9	
					9:05	13.45	19.65	0.757	6.38	243	1.36	19.8	
					9:10	--	19.73	0.754	6.43	244	1.05	27.0	
					9:15	--	19.80	0.760	6.51	244	0.89	21.3	
					9:20	13.56	19.81	0.760	6.55	244	1.30	10.0	
					9:25	--	19.84	0.756	6.60	246	1.34	6.2	
					9:30	13.6	19.86	0.757	6.61	247	1.28	4.3	
Sample GW-1 Collected													
GW-2 (8-18)	43.96	31.39	30.76	9/29/2017	10:05	13.2	19.94	0.734	6.95	271	2.39	64.2	Clear; weak petroleum hydrocarbon odor
					10:10	--	20.04	0.732	6.83	273	0.49	53.3	
					10:15	--	20.11	0.729	6.72	271	0.35	28.2	
					10:20	14.0	20.22	0.737	6.71	265	0.29	16.7	
					10:25	--	20.29	0.736	6.74	260	0.27	14.9	
					10:30	14.25	20.33	0.729	6.74	256	0.28	14.5	
					10:34	14.3	Sample GW-2 Collected						
GW-3 (5-15)	37.78	30.67	30.18	9/29/2017	13:00	7.6	23.34	0.767	6.97	281	3.56	2.2	Clear; no odor
					13:05	--	23.64	0.760	6.76	287	1.57	1.9	
					13:10	--	23.58	0.758	6.67	291	1.24	1.2	
					13:15	8.5	23.67	0.755	6.65	294	1.06	1.5	
					13:20	--	23.74	0.753	6.64	296	1.04	1.2	
					13:25	8.9	23.75	0.751	6.64	298	0.98	1.2	
					13:30	9.05	Sample GW-3 Collected						
GW-4 (5-15)	34.38	26.39	24.68	9/29/2017	11:30	9.7	20.68	0.803	7.01	279	2.54	6.3	Clear; no odor
					11:35	--	20.82	0.766	7.04	282	2.36	2.4	
					11:40	--	20.93	0.749	6.96	287	2.09	1.1	
					11:45	10.65	20.95	0.766	6.98	289	1.56	0.2	
					11:50	--	20.98	0.786	7.02	289	1.15	0.2	
					11:55	--	20.97	0.811	7.07	285	1.00	0.0	
					12:00	11.35	20.97	0.820	7.12	283	0.73	0.0	
					12:05	--	20.95	0.822	7.15	281	0.72	0.0	
					12:10	--	20.94	0.824	7.17	279	0.76	0.0	
Sample GW-4 Collected													
GW-5 (5-15)	33.85	26.56	24.75	9/29/2017	14:05	9.1	25.83	0.572	6.91	297	4.35	0.1	Clear; weak petroleum hydrocarbon odor
					14:10	--	25.42	0.559	7.06	305	3.58	0.0	
					14:15	--	25.25	0.568	7.05	306	3.43	0.0	
					14:20	10.12	25.20	0.589	7.06	306	2.31	0.0	
					14:25	--	25.16	0.596	7.11	305	2.41	0.0	
					14:30	10.41	25.10	0.599	7.11	301	2.55	0.0	
					14:32	10.62	Sample GW-5 Collected						

Notes:
 TOC - top of well casing
 bgs - below ground surface
 NAVD 88 - North American Vertical Datum of 1988
 °C - degrees Celcius
 mS/cm - millisiemens per centimeter
 ORP - oxidation-reduction potential
 DO - dissolved oxygen
 mV - millivolts
 mg/L - milligrams per liter
 NTU - nephelometric turbidity unit
 -- - Not measured

Table 3
Groundwater Monitoring Well Analytical Results for Non-Metals
3000 Broadway Redevelopment
Oakland, California

Sample ID	Date Sampled	HEM: Oil & Grease (mg/L)	TPHg	TPHd	TPHmo	VOCs								PAHs			Phenolics	Total Cyanide
						cis-1,2 DCE	trans-1,2 DCE	1,2,4-TCB	TCE	PCE	Vinyl Chloride	Xylenes	All Other VOCs	2-Methyl-naphthalene	Naphthalene	All Other PAHs		
						(µg/L)												
GW-1	04/05/17	--	67	< 50	< 250	170	< 25	< 25	1,200	< 25	< 25	< 25	ND (< 10 - < 500)	< 0.0500	< 0.0590	ND	--	--
	09/29/17	--	97	< 50	< 250	1,000	< 250	< 250	8,400	< 250	< 250	< 250	ND (< 250 - < 5,000)	--	--	--	--	--
GW-2	04/05/17	--	130	56	< 250	300	< 50	< 50	2,400	< 50	< 50	< 50	ND (< 20 - < 1,000)	< 0.0500	< 0.0500	ND	--	--
	06/02/17	< 5.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.1	< 1.0
GW-3	09/29/17	--	61	< 50	< 250	470	< 100	< 100	3,600	< 100	< 100	< 100	ND (< 40 - < 2,000)	--	--	--	--	--
	05/25/17	--	< 50	< 50	< 250	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	ND (< 0.20 - < 10)	< 0.0500	< 0.0500	ND	--	--
GW-4	09/29/17	--	< 50	< 50	< 250	47	< 17	< 17	300	< 17	< 17	< 17	ND (< 6.7 - < 330)	--	--	--	--	--
	05/25/17	--	< 50	< 50	< 250	12	2.8	< 0.50	6.9	< 0.50	3.3	< 0.50	ND (< 0.20 - < 10)	< 0.0500	0.0565	ND	--	--
GW-5	09/29/17	--	< 50	< 50	< 250	9.6	0.84	< 0.50	14	< 0.50	< 0.50	< 0.50	ND (< 0.20 - < 10)	--	--	--	--	--
	Tier 1 ESL	--	100	100	50,000	6.0	10.0	5.0	5.0	3.0	0.061	20	Various	2.1	0.17	Various	5.0	--
Residential Vapor Intrusion ESL	--	--	--	--	--	110	1,000	240	5.6	3.0	0.061	1,300	Various	--	20	Various	--	--
Direct Exposure ESL	--	--	220	150	50,000	6.0	10.0	5.0	5.0	5.0	0.5	20	Various	36	0.17	Various	4,200	150

Notes:
mg/L - Milligrams per liter
µg/L - Micrograms per liter
HEM - Hexane extractable material
TPHg - Total Petroleum Hydrocarbons as Gasoline, EPA Method 8015B
TPHd - Total Petroleum Hydrocarbons as Diesel Range, EPA Method 8015B
TPHmo - Total Petroleum Hydrocarbons as Motor Oil, EPA Method 8015B
VOCs - Volatile Organics Compounds, EPA Method 8260B
PAHs - Polycyclic aromatic hydrocarbons, EPA Method 8310
cis-1,2-DCE - cis-1,2-dichloroethene
trans-1,2-DCE - trans-1,2-dichloroethene
1,2,4-TCB - 1,2,4-trichlorobenzene
TCE - Trichloroethene
PCE - Tetrachloroethene
< 50 - Analyte was not detected above the laboratory reporting limit (50 µg/L)
< 5.0 - Analyte was not detected above the laboratory reporting limit (5.0 mg/L)
ND - Not detected at or above the laboratory reporting limit(s)
-- - Sample not analyzed or not established
ESL - Environmental screening level(s)
Various - ESLs, where established, vary for each of the multiple compounds analyzed
Bold - Detection exceeds established ESL
Tier 1 ESL - San Francisco Bay Regional Water Quality Control Board's Environmental Screening Levels - *Tier 1 Groundwater*. February 2016 [Rev. 3]
Residential Vapor Intrusion ESL - San Francisco Bay Regional Water Quality Control Board's Environmental Screening Levels - Residential Groundwater Vapor Intrusion Human Health Risk Levels (Table GW-3) for Shallow Groundwater. February 2016 [Rev. 3]
Direct Exposure ESL - San Francisco Bay Regional Water Quality Control Board's Environmental Screening Levels - Groundwater Direct Exposure Human Health Risk Levels (Table GW-1) MCL Priority. February 2016 [Rev. 3]

Table 4
Grab-Groundwater Analytical Results for Non-Metals
3000 Broadway Redevelopment
Oakland, California

Sample ID	Date Sampled	TPHg	TPHd	TPHmo	VOCs					PAHs		
					cis- 1,2 DCE	TCE	PCE	Xylenes	All Other VOCs	2- Methyl-naphthalene	Naphthalene	All Other PAHs
(µg/L)												
B-11-GW	04/02/16	250	460	6,900	< 0.50	< 0.50	< 0.50	0.88	acetone = 15 benzene = 0.65 bromodichloromethane = 0.61 t-butyl alcohol = 12 sec-butyl benzene = 0.67 tert-butyl benzene = 0.96 chlorobenzene = 0.65 isopropylbenzene = 1.3 n-propyl benzene = 0.93	--	< 0.50	--
B-12-GW	04/09/16	< 50	< 50	< 250	< 0.50	< 0.50	< 0.50	< 0.50	toluene = 0.50	--	< 0.50	--
B-13-GW	11/03/16	< 50	< 50	< 250	< 0.50	1.8	< 0.50	< 0.50	chloroform = 0.62	--	< 0.50	--
B-17-GW	02/03/17	< 50	< 50	< 250	2.7	3.5	0.58	< 0.50	chloroform = 3.3	< 0.50	< 0.50	< 0.50
B-18-GW	02/02/17	55	200	1,200	350	2,000	< 100	< 100	ND	0.54	0.62	< 0.50
B-19-GW	02/02/17	< 50	< 100	630	4.5	41	< 1.2	< 1.2	ND	< 0.50	< 0.50	< 0.50
B-20-GW	02/02/17	75	2,400	8,600	460	4,700	< 120	< 120	ND	< 0.50	< 0.50	< 0.50
B-21-GW	02/02/17	< 50	< 100	510	19	170	< 5.0	< 5.0	ND	< 0.50	< 0.50	< 0.50
B-22-GW	02/02/17	120	< 100	680	2,200	6,100	< 120	< 120	ND	< 0.50	< 0.50	< 0.50
B-23-GW	02/03/17	250	40,000	110,000	210	470	< 12	< 12	chlorobenzene = 19	4.6	3.5	benzo (a) anthracene = 0.64 fluorene = 0.83 1-methylnaphthalene = 3.0 phenanthrene = 1.2
B-24-GW	02/02/17	1,400	250,000	500,000	1,600	590	< 50	< 50	ND	3.4	3.5	fluorene = 3.3 1-methylnaphthalene = 2.8 pyrene = 1.4
B-25-GW	02/03/17	66	5,100	18,000	29	210	< 5.0	< 5.0	ND	--	< 5.0	--
B-26-GW	02/03/17	110	770	1,300	20	63	< 2.5	< 2.5	1,2,3-trichlorobenzene = 3.7 1,2,4-trimethylbenzene = 3.1	< 0.50	0.64	ND
B-27-GW	02/03/17	59	< 100	540	4.8	48	< 1.7	9.4	ND	--	< 1.7	--
B-28-GW	02/03/17	< 50	< 100	960	37	230	< 10	< 10	ND	--	< 10	--
B-30-GW	02/04/17	< 50	< 50	< 250	< 0.5	1.4	< 0.5	< 0.5	ND	< 0.50	< 0.50	ND
B-31-GW	03/29/17	< 50	110	870	72	68	< 1.7	< 1.7	chloroform = 1.8	< 0.0500	0.0632	ND
B-34-GW	03/29/17	< 50	140	700	26	160	< 2.5	< 2.5	chloroform = 2.9	< 0.0500	0.0735	ND
B-35-GW	03/29/17	< 50	140	1,100	1.0	4.3	< 0.50	< 0.50	vinyl chloride = 0.79	< 0.0500	< 0.0500	ND
B-36-GW	04/11/17	< 50	120	580	4.7	28	< 0.50	< 0.50	methyl t-butyl ether = 1.6	< 0.500	< 0.500	ND
GGW-2	03/30/17	< 50	150	420	< 0.5	5.2	< 0.50	< 0.50	ND	< 0.50	< 0.50	< 0.50
B-46-GW	09/29/17	< 50	120	390	< 0.50	< 0.50	< 0.50	< 0.50	ND	--	--	--
B-47-GW	09/29/17	< 50	78,000	330,000	83	130	< 5.0	< 5.0	ND	--	--	--
	9/29/2017 ¹	--	92,000	280,000	--	--	--	--	--	--	--	--
B-48-GW	09/29/17	< 50	78	< 250	< 0.50	0.72	1.7	< 0.50	chloroform = 2.1 1,2-DCA = 0.53	--	--	--
Tier 1 ESL		100	100	50,000	6.0	5.0	3.0	20	Various	2.1	0.17	Various
Residential Vapor Intrusion ESL		--	--	--	110	5.6	3.0	1,300	Various	--	20	Various
Direct Exposure ESL		220	150	50,000	6.0	5.0	5.0	20	Various	36	0.17	Various

Notes:

1 - Sample run using silica gel cleanup method 3630A

µg/L - micrograms per liter

TPHg - Total Petroleum Hydrocarbons as Gasoline, EPA Method 8015B

TPHd - Total Petroleum Hydrocarbons as Diesel Range, EPA Method 8015B

TPHmo - Total Petroleum Hydrocarbons as Motor Oil, EPA Method 8015B

VOCs - Volatile Organic Compounds, EPA Method 8260B

PAHs - Polycyclic aromatic hydrocarbons, EPA Method 8310

cis-1,2-DCE - cis-1,2-dichloroethene

TCE - Trichloroethene

PCE - Tetrachloroethene

1,2-DCA - 1,2-dichloroethane

< 0.50 - Analyte was not detected above the laboratory reporting limit (0.50 µg/L)

ND - Not detected at or above the laboratory reporting limit(s)

-- - Sample not analyzed or not established

ESL - Environmental screening level(s)

Various - ESLs, where established, vary for each of the multiple compounds analyzed

Bold - Detection exceeds established ESL

Tier 1 ESL - San Francisco Bay Regional Water Quality Control Board's Environmental Screening Levels - Tier 1 Groundwater, February 2016 [Rev. 3]

Residential Vapor Intrusion ESL - San Francisco Bay Regional Water Quality Control Board's Environmental Screening Levels - Residential Groundwater Vapor Intrusion Human Health Risk Levels (Table GW-3) for Shallow Groundwater February 2016 [Rev. 3]

Direct Exposure ESL - San Francisco Bay Regional Water Quality Control Board's Environmental Screening Levels - Groundwater Direct Exposure Human Health Risk Levels (Table GW-1) MCL Priority, February 2016 [Rev. 3]

ESLs for Other VOCs	Tier 1 ESL	Residential VI ESL	Direct Exposure ESL
Benzo(a)anthracene	0.027	--	0.034
Chloroform	2.3	2.3	80
1,2-DCA	0.5	6.1	0.5
vinyl chloride	0.061	0.061	0.5

**Table 5
Soil Analytical Results for Non-Metals
3000 Broadway Redevelopment
Oakland, California**

Sample ID	Sample Depth (Feet)	Date Sampled	TPHg	TPHd	TPHmo	VOCs				PAHs		
						cis-1,2-DCE	TCE	PCE	All Other VOCs	2-Methyl-naphthalene	Naphthalene	All Other PAHs
(mg/kg)												
B-16-6.0	6	11/03/16	810	2,900	6,100	< 0.20	< 0.20	2.0	n-butyl benzene = 0.35 1,2-dichlorobenzene = 0.53 1,1,2,2-tetrachloroethane = 0.35 1,2,4-trimethylbenzene = 1.4 1,3,5-trimethylbenzene = 0.44	0.26	0.22	benzo (a) anthracene = 0.13 fluorene = 0.13 1-methylnaphthalene = 0.21 phenanthrene = 0.38 pyrene = 0.14
B-16-10.0	10	11/03/16	460	1,600	3,600	0.29	0.29	0.059	n-butyl benzene = 0.17 sec-butyl benzene = 0.072 1,2-dichlorobenzene = 0.37 n-propyl benzene = 0.068 1,2,4-trimethylbenzene = 0.77 1,3,5-trimethylbenzene = 0.26 xylenes = 0.15	0.19	0.15	benzo (a) anthracene = 0.10 1-methylnaphthalene = 0.13 phenanthrene = 0.16
B-16-20.5	20.5	11/03/16	15	46	100	< 0.0050	0.017	0.013	1,2,4-trimethylbenzene = 0.012	< 0.010	< 0.010	< 0.010
B-17-10.0	10	02/03/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	< 0.010	< 0.010	< 0.010
B-18-10.0	10	02/02/17	< 1.0	< 1.0	< 5.0	1.1	6.4	< 1.0	ND	< 0.010	< 0.010	< 0.010
B-18-15.0	15	02/02/17	< 1.0	< 1.0	< 5.0	0.063	0.025	< 0.0050	ND	< 0.010	< 0.010	< 0.010
B-18-20.0	20	02/02/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	< 0.010	< 0.010	< 0.010
B-19-10.0	10	02/01/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	< 0.010	< 0.010	< 0.010
B-20-10.0	10	02/01/17	< 1.0	< 1.0	< 5.0	0.011	0.21	< 0.010	ND	< 0.010	< 0.010	< 0.010
B-20-15.0	15	02/01/17	< 1.0	< 1.0	< 5.0	< 0.0050	0.021	< 0.0050	ND	--	< 0.0050	--
B-20-20.0	20	02/01/17	< 1.0	< 1.0	< 5.0	< 0.0050	0.0097	< 0.0050	ND	--	< 0.0050	--
B-21-10.0	10	02/02/17	< 1.0	< 1.0	< 5.0	0.065	0.50	< 0.025	ND	< 0.010	< 0.010	< 0.010
B-21-15.0	15	02/02/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	--	< 0.0050	--
B-22-10.0	10	02/01/17	< 1.0	< 1.0	< 5.0	0.81	5.0	< 0.33	ND	< 0.010	< 0.010	< 0.010
B-22-15.0	15	02/01/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	< 0.010	< 0.010	< 0.010
B-22-20.0	20	02/01/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	< 0.010	< 0.010	< 0.010
B-23-10.0	10	02/02/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	< 0.010	< 0.010	< 0.010
B-23-12.5	12.5	02/02/17	20	8.1	25	< 0.0050	< 0.0050	< 0.0050	n-butyl benzene = 0.010 sec-butyl benzene = 0.0066 1,2-dichlorobenzene = 0.0061 1,2,4-trimethylbenzene = 0.024 1,3,5-trimethylbenzene = 0.0098	--	0.0064	--
B-23-16.0	16	02/02/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	--	< 0.005	--
B-24-8.0	8	02/01/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	< 0.010	< 0.010	< 0.010
B-24-10.0	10	02/01/17	12	70	180	0.012	0.010	< 0.0050	n-butyl benzene = 0.012 sec-butyl benzene = 0.012 chlorobenzene = 0.0069 4-isopropyl toluene = 0.0080 1,2,4-trimethylbenzene = 0.0099	0.032	0.012	fluorene = 0.013 1-methylnaphthalene = 0.021 phenanthrene = 0.037 pyrene = 0.012
B-24-15.0	15	02/01/17	< 1.0	< 1.0	< 5.0	0.14	0.047	< 0.0050	ND	< 0.010	< 0.010	< 0.010
B-24-20.0	20	02/01/17	< 1.0	< 1.0	< 5.0	< 0.0050	0.030	< 0.0050	ND	< 0.010	< 0.010	< 0.010
B-25-10.0	10	02/02/17	18	33	150	< 0.0050	0.011	< 0.0050	ND	< 0.010	< 0.010	< 0.010
B-25-15.5	15.5	02/02/17	2.9	42	170	< 0.0050	0.0074	< 0.0050	ND	< 0.010	< 0.010	< 0.010
B-25-20.0	20	02/02/17	< 1.0	< 1.0	< 5.0	< 0.0050	0.0075	< 0.0050	ND	< 0.010	< 0.010	< 0.010
B-26-10.0	10	02/02/17	170	1,500	2,800	< 0.10	< 0.10	< 0.10	n-butyl benzene = 0.21 sec-butyl benzene = 0.19 4-isopropyl toluene = 0.17 n-propylbenzene = 0.12 1,2,4-trimethylbenzene = 0.67 1,3,5-methylbenzene = 0.25	0.095	0.25	fluorene = 0.020 1-methylnaphthalene = 0.058
B-26-15.0	15	02/02/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	< 0.010	< 0.010	< 0.010
B-27-10.0	10	02/03/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	< 0.010	< 0.010	< 0.010
B-28-8.0	8	02/03/17	< 1.0	< 1.0	< 5.0	< 0.0050	0.017	< 0.0050	ND	< 0.010	< 0.010	< 0.010
B-30-10.0	10	02/04/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	< 0.01	< 0.01	ND
B-31-12.5	12.5	3/29/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	--	--	--
B-31-15.0	15	3/29/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	--	--	--
B-32-10.0	10	3/29/17	< 1.0	< 1.0	< 5.0	0.51	5.2	< 0.5	ND	--	--	--
B-32-12.5	12.5	3/29/17	< 1.0	< 1.0	< 5.0	0.04	0.28	< 0.020	ND	--	--	--
B-32-15.0	15	3/29/17	< 1.0	< 1.0	< 5.0	< 0.0050	0.011	< 0.0050	ND	--	--	--
B-32-20.0	20	3/29/17	--	--	--	< 0.0050	< 0.0050	< 0.0050	ND	--	--	--
B-33-13.5	13.5	3/25/17	1,200	1,100	2,900	< 1.0	19	4.6	1,2-dibromo-3-chloropropane = 0.85 1,2,4-trimethylbenzene = 1.4	0.28	0.14	fluorene = 0.057 1-methylnaphthalene = 0.28 phenanthrene = 0.15
B-33-17.5	17.5	3/25/17	420	250	810	< 0.33	4.3	1.5	1,2,4-trimethylbenzene = 0.35	0.17	0.081	1-methylnaphthalene = 0.15 phenanthrene = 0.060
B-33-20.0	20	3/25/17	< 1.0	< 1.0	< 5.0	< 0.0050	0.0098	< 0.0050	ND	< 0.0050	< 0.0050	ND
B-34-8.0	8	3/29/17	< 1.0	< 1.0	< 5.0	0.027	0.39	< 0.020	ND	--	--	--
B-34-12.5	12.5	3/29/17	< 1.0	< 1.0	< 5.0	0.011	0.043	< 0.0050	ND	--	--	--
B-34-15.0	15	3/29/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	--	--	--
B-35-10.0	10	3/29/17	< 1.0	1.5	6.6	< 0.0050	< 0.0050	< 0.0050	ND	--	--	--
B-36-2.5	2.5	4/11/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	--	--	--
B-36-8.0	8	4/11/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	--	--	--
B-36-12.0	12	4/11/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	--	--	--
B-46-10.0	10	9/29/17	< 1.0	3.9	6.9	< 0.0050	< 0.0050	< 0.0050	ND	--	--	--
B-47-14.0	14	9/29/17	< 1.0	360	1,300	0.011	0.12	< 0.0050	ND	--	--	--
B-47-16.0	16	9/29/17	< 1.0	180	410	< 0.0050	< 0.0050	< 0.0050	ND	--	--	--
B-47-20.0	20	9/29/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	--	--	--
B-48-14.0	14	9/29/17	< 1.0	< 1.0	< 5.0	< 0.0050	< 0.0050	< 0.0050	ND	--	--	--
Tier 1 ESL			100	230	5,100	0.19	0.46	0.42	Various	0.25	0.033	Various
Direct Exposure ESL			740	230	11,000	19	1.2	0.6	Various	240	3.3	Various

Notes:

mg/kg - Milligrams per kilogram

TPHg - Total Petroleum Hydrocarbons as Gasoline, EPA Method 8015B

TPHd - Total Petroleum Hydrocarbons as Diesel Range, EPA Method 8015B

TPHmo - Total Petroleum Hydrocarbons as Motor Oil, EPA Method 8015B

VOCs - Volatile organic compounds, EPA Method 8260B

PAHs - Polycyclic aromatic hydrocarbons, EPA Method 8310

Cis-1,2-DCE - Cis-1,2-dichloroethene

TCE - Trichloroethene

PCE - Tetrachloroethene

< 0.20 - Analyte was not detected above the laboratory reporting limit (0.20 mg/kg)

ND - Not detected at or above the laboratory reporting limit(s)

-- Sample not analyzed

Various - Environmental screening levels, where established, vary for each of the multiple compounds analyzed

ESL - Environmental screening level(s)

Bold - Detection exceeds Tier 1 ESL

Tier 1 ESL - San Francisco Bay Regional Water Quality Control Board's Environmental Screening Levels - Tier 1 Soil February 2016 [Rev. 3]

Direct Exposure ESL - San Francisco Bay Regional Water Quality Control Board's Environmental Screening Levels - Direct Exposure Human Health Risk Levels (Table S-1) for Residential Shallow Soil Exposure.

February 2016 [Rev. 3]

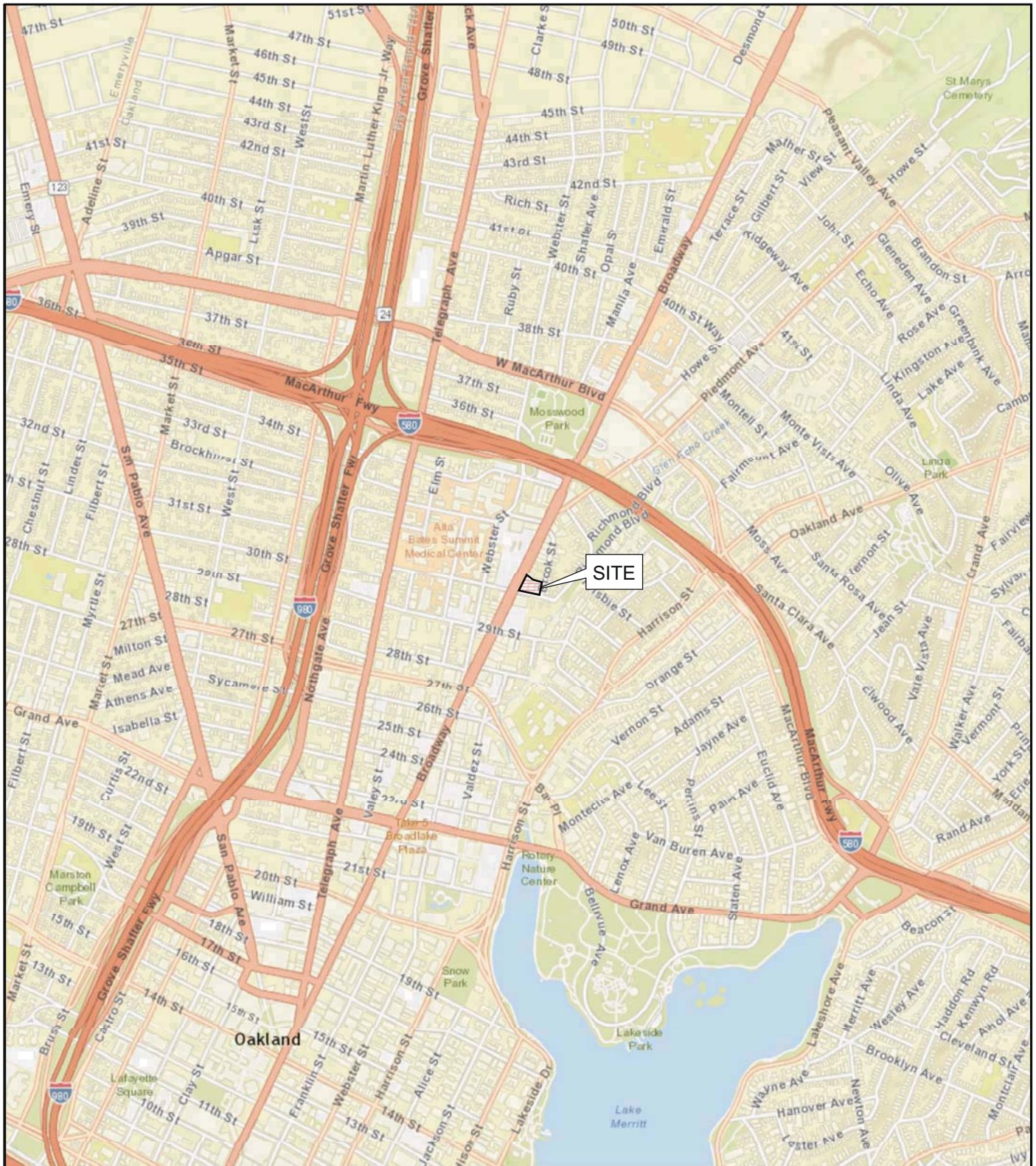
Soil material proposed for over-excavation and off-site disposal

**Table 6
Summary of Environmental Borings and Concerns
3000 Broadway Redevelopment
Oakland, California**

APN #	Street Address	Historical Use	Scope/Purpose of Sampling	Associated Borings / Sampling Locations	Media Collected	ESL Exceedances		
09-0704-011-01	3020 Broadway	Automotive sales	Characterize soil for off-site disposal	B-1 through B-4	Soil	Soil B-3: Lead (top 6.5 feet) B-4: Lead (top 6.5 feet)		
			Geotechnical/Environmental borings, groundwater sample collected from B-13 to evaluate upgradient VOC concentrations	B-13 and B-14	Groundwater	No groundwater exceedances B-14 was advanced for geotechnical purposes and did not have environmental samples collected		
			Groundwater elevation evaluation	B-29	No Environmental Sampling	No samples collected		
			Characterize soil for off-site disposal	B-37 through B-39	Soil	No exceedances		
	250 30th Street	Automotive repair and service facility	Assess potential soil and groundwater impacts related to closed-in-place 1,000-gallon waste oil UST	SB-1 through SB-4 (Faultline Associates, Inc.)	Soil	Soil SB-1-15: TPHg, TPHd, TPHmo, ethylbenzene, and xylenes		
				B1 through B4 (P&D Environmental, Inc.)	Soil and Groundwater	Groundwater B1-W: TPHg, TPHd, ethylbenzene, xylenes, and naphthalene B3-W: TPHd B4-W: TPHg		
				B-11 and B-12	Groundwater	Groundwater B-11-GW: TPHg and TPHd		
			Characterize soil for off-site disposal	B-7 and B-8	Soil	No exceedances		
			Geotechnical boring	B-15	No Environmental Sampling	No samples collected		
			Additional environmental sampling as requested by ACEH	B-47 and B-48	Soil and Groundwater	Soil B-47-14.0: TPHd Groundwater B-47-GW: TPHd, TPHmo, cis-1,2-DCE, and TCE B-48-GW: 1,2-DCA		
	260 30th Street (including Brook Street)	Automotive repair and service facility	Characterize soil for off-site disposal	B-9 and B-10	Soil	No exceedances		
				Geotechnical boring; environmental soil samples collected when TPH-impacted soil was encountered	B-16	Soil	Soil B-16-6.0: TPHg, TPHd, TPHmo, PCE, and 1,1,2,2-tetrachloroethane B-16-10.0: TPHg, TPHd, and cis-1,2-DCE	
			To further delineate vertical and historical distribution of VOCs and petroleum hydrocarbons in both soil and groundwater	B-17 through B-26	Soil and Groundwater	Soil B-18-10.0: TCE and cis-1,2-DCE B-21-10.0: TCE B-22-10.0: TCE and cis-1,2-DCE B-26-10.0: TPHg and TPHd		
						Groundwater B-17-GW: Chloroform B-18-GW: TPHd, TCE, and cis-1,2-DCE B-19-GW: TCE B-20-GW: TPHd, TCE, and cis-1,2-DCE B-21-GW: TCE and cis-1,2-DCE B-22-GW: TPHg, TCE, and cis-1,2-DCE B-23-GW: TPHg, TPHd, TPHmo, TCE, cis-1,2-DCE, and benzo (a) anthracene B-24-GW: TPHg, TPHd, TPHmo, TCE, and cis-1,2-DCE B-25-GW: TPHd, TCE, and cis-1,2-DCE B-26-GW: TPHg, TPHd, TCE, and cis-1,2-DCE		
						B-27 and B-28 (Brook Street)	Soil and Groundwater	Groundwater B-27-GW: TCE B-28-GW: TCE and cis-1,2-DCE
						MIP-1 through MIP-4	No Sampling	
						B-31 through B-35	Soil and Groundwater	Soil B-32-10.0: TCE and cis-1,2-DCE B-33-13.5: TPHg, TPHd, TCE, and PCE B-33-17.5: TPHg, TPHd, TCE, and PCE Groundwater No groundwater sampled at B-32 and B-33 B-31-GW: TPHd, TCE, and cis-1,2-DCE B-34-GW: TPHd, TCE, cis-1,2-DCE, and chloroform B-35-GW: TPHd and vinyl chloride
						B-36 (Brook Street)	Soil and Groundwater	Groundwater B-36-GW: TPHd and TCE
						GGW-1 and GGW-2	Deeper Groundwater	Groundwater GGW-1 was dry, due to clay (no sample collected) GGW-2: TPHg and TCE
						GW-1 and GW-2	Groundwater well samples	Groundwater GW-1: TCE and cis-1,2-DCE GW-2: TCE and cis-1,2-DCE
						GW-3 through GW-5 (Brook Street)	Groundwater well samples	Groundwater GW-4: TCE and cis-1,2-DCE GW-5: TCE and cis-1,2-DCE
Assess potential for vapor intrusion off-site	SV-1 and SV-2	Soil Vapor				No exceedances		
09-0704-012	3000 Broadway	Automotive sales and most recently a restaurant	Characterize soil for off-site disposal	B-40 and B-41	Soil	No exceedances		
	288 30th Street	Automotive repair and service facility	Characterize soil for off-site disposal	B-5 and B-6	Soil	No exceedances		
			Characterize soil for off-site disposal, and assess potential soil and groundwater impacts related to former USTs	B-30	Soil and Groundwater	No exceedances		
09-0704-010	3007 Brook Street	Private residence	Characterize soil for off-site disposal	B-44	Soil	Soil B-44: Lead (top 4 feet)		
09-0704-009	3009 Brook Street	Private residence	Characterize soil for off-site disposal	B-42, B-43, and B-45	Soil	Soil B-42: Lead (top 4 feet)		
			Additional environmental sampling as requested by ACEH	B-46	Soil and Groundwater	Groundwater B-46-GW: TPHd		

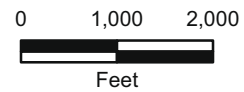
Notes:
APN - Assessor Parcel Number
ESL - Environmental screening limit (Tier 1 ESLs)
Tier 1 ESLs - San Francisco Bay Regional Water Quality Control Board's Environmental Screening Levels - Tier 1 Soil, February 2016 [Rev. 3]
UST - Underground storage tank
VOCs - Volatile organic compounds
TPHg - Total petroleum hydrocarbons as gasoline
TPHd - Total petroleum hydrocarbons as diesel
TPHmo - Total petroleum hydrocarbons as motor oil
TCE - Trichloroethylene
PCE - Tetrachloroethylene
cis-1,2-DCE - cis-1,2-dichloroethylene
1,2-DCA - 1,2-dichloroethane

FIGURES



NOTES:

World street basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online.
Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, IPC, NRCAN.



3000 BROADWAY REDEVELOPMENT
Oakland, California

SITE LOCATION MAP

LANGAN

Date 08/31/17

Project No. 750635604

Figure 1

\\langan.com\data\OAK\data6\750635604\Project Data\CAD\04\2D-DesignFiles\Environmental\750635604-N-SP0103.dwg 10/03/17



EXPLANATION

- B-46** ● Approximate location of environmental boring by Langan, September 2017
- GGW-1** ● Approximate location of deep grab groundwater sample by Langan, March 2017
- GW-1** ◼ Approximate location of groundwater monitoring well
- SV-1** ● Approximate location of soil vapor sample by Langan, April 2017
- MIP-1** ● Approximate location of MIP by Langan, March 2017
- B-31** ● Approximate location of soil and/or groundwater boring by Langan, March and April 2017
- B-37** ● Approximate location of soil sampling boring for composite characterization, 20 feet bgs max. by Langan, April 2017
- B-42** ● Approximate location of boring for composite characterization, 8 feet bgs max. by Langan, April 2017
- B-17** ● Approximate location of environmental boring by Langan, February 2017
- B-3** ● Approximate location of 20-foot boring by Langan Treadwell Rollo, April 2016
- B-5** ● Approximate location of 15-foot boring by Langan Treadwell Rollo, April 2016
- B-7** ● Approximate location of 10-foot boring by Langan Treadwell Rollo, April 2016
- ▨ Approximate location of abandoned in-place 1,000-gallon waste oil UST, March 1997
- ▨ Approximate location of former USTs (350-gallon gasoline and 1,000-gallon diesel), removed in July 1992
- ▨ Approximate location of floor drain
- - - - - Approximate footprint of proposed 3000 Broadway Redevelopment
- - - - - Approximate location of drain line piping

3000 BROADWAY REDEVELOPMENT Oakland, California		
SITE PLAN WITH SAMPLING LOCATIONS		
Date 09/03/17	Project No. 750635604	Figure 2
LANGAN		



- EXPLANATION**
- B-46** Approximate location of environmental boring by Langan, September 2017
 - GGW-1** Approximate location of deep grab groundwater sample by Langan, March 2017
 - GW-1** Approximate location of groundwater monitoring well
 - SV-1** Approximate location of soil vapor sample by Langan, April 2017
 - MIP-1** Approximate location of MIP by Langan, March 2017
 - B-31** Approximate location of soil and/or groundwater boring by Langan, March and April 2017
 - B-37** Approximate location of soil sampling boring for composite characterization, 20 feet bgs max. by Langan, April 2017
 - B-42** Approximate location of boring for composite characterization, 8 feet bgs max. by Langan, April 2017
 - B-17** Approximate location of environmental boring by Langan, February 2017
 - B-3** Approximate location of 20-foot boring by Langan Treadwell Rollo, April 2016
 - B-5** Approximate location of 15-foot boring by Langan Treadwell Rollo, April 2016
 - B-7** Approximate location of 10-foot boring by Langan Treadwell Rollo, April 2016
 - Approximate location of abandoned in-place 1,000-gallon waste oil UST, March 1997
 - Approximate location of former USTs (350-gallon gasoline and 1,000-gallon diesel), removed in July 1992
 - Approximate location of floor drain
 - Approximate footprint of proposed 3000 Broadway Redevelopment
 - Approximate location of drain line piping
 - [230]** TCE concentrations in groundwater (µg/L), concentration in bold exceed cleanup criteria

GW-1	cis- 1,2 DCE	TCE
04/05/17	170	1,200
09/29/17	1,000	8,400

GW-3	cis- 1,2 DCE	TCE
05/25/17	< 0.50	< 0.50
09/29/17	< 0.50	2.1

GW-2	cis- 1,2 DCE	TCE
04/05/17	300	2,400
09/29/17	470	3,600

GW-4	cis- 1,2 DCE	TCE
05/25/17	51	320
09/29/17	47	300

GW-5	cis- 1,2 DCE	TCE
05/25/17	12	6.9
09/29/17	9.6	14

3000 BROADWAY REDEVELOPMENT
Oakland, California

SITE PLAN WITH TCE CONCENTRATIONS IN GROUNDWATER

Date 11/07/17 | Project No. 750635604 | Figure 3

LANGAN

C:\Users\cyoung\appdata\local\temp\AcPublish_9052\750635604-N-SP0104.dwg 11/09/17

0 30 Feet
Approximate scale
Reference: Nearmap aerial imagery 2017.

APPENDIX A
BORING LOGS

PROJECT: **3000 BROADWAY REDEVELOPMENT**
Oakland, California

Log of Boring B-46

PAGE 1 OF 1

Boring location: See Figure 2

Logged by: K. Staehlin

Date started: 9/29/17

Date finished: 9/29/17

Drilling method: Direct Push

Hammer weight/drop: NA

Hammer type: NA

Sampler: Continuous

DEPTH (feet)	SAMPLES				PID (ppm)	LITHOLOGY	MATERIAL DESCRIPTION
	Sample ID	Sample	Blow Count	Recovery (inches)			
1					0.0	ML	SILT with CLAY (ML) brown to orange-brown, soft, dry to moist, no odor
2							increasing fines
3					0.1		
4					0.1		CLAY with SILT (CL) orange-brown with gray mottling, medium stiff, moist, no odor
5					0.0		
6					0.0	CL	chert and gravel from 6 to 7 feet bgs
7				36/36			gray
8					0.0		
9					0.0		
10	B-46-10.0	●		48/48	0.0		SILT with CLAY (ML) gray with orange mottling, stiff to very stiff, moist, no odor
11							
12	B-46-12.0	●				ML	
13					0.0		
14	B-46-14.0	●		48/48	0.0		increasing sand and moisture
15					0.0		
16					0.0		▽ (09/29/17)
17					0.0		
18				48/48	0.0	CL	CLAY (CL) brown with orange mottling, medium stiff to stiff, moist, no odor
19					0.0		increasing sand
20					0.0		
21					0.0	SP	SAND with SILT and CLAY (SP) light brown, medium dense to dense, moist, no odor
22				48/48	0.0		wet saturated from 20.5 to 22.5 feet red-brown
23							
24					0.0	ML	SANDY SILT (ML) gray with some orange mottling, stiff, moist, no odor

TEST ENVIRONMENTAL INCHES 750635604 - 3000 - BROADWAY B-46 TO B-48.GPJ T&R.GDT 10/3/17

Boring terminated at a depth of 24 feet below ground surface.
Boring backfilled with cement grout.
Groundwater encountered at 16.1 feet below ground surface during drilling.

LANGAN

Project No.:
750635604

Figure:
A-1

PROJECT: **3000 BROADWAY REDEVELOPMENT**
Oakland, California

Log of Boring B-47

PAGE 1 OF 1

Boring location: See Figure 2

Logged by: K. Staehlin

Date started: 9/29/17

Date finished: 9/29/17

Drilling method: Direct Push

Hammer weight/drop: NA

Hammer type: NA

Sampler: Continuous

TEST ENVIRONMENTAL INCHES 750635604 - 3000 - BROADWAY B-46 TO B-48.GPJ T&R.GDT 10/3/17

DEPTH (feet)	SAMPLES				PID (ppm)	LITHOLOGY	MATERIAL DESCRIPTION
	Sample ID	Sample	Blow Count	Recovery (inches)			
1							14 inch-thick concrete slab
2				34/34	0.3	ML	SILT with CLAY (ML) orange-brown, medium stiff to stiff, dry to moist, no odor
3					0.3		increasing in sand
4					0.0	SP	SAND with GRAVEL and CLAY (SP) brown, medium dense, moist to wet, subangular gravel less than 3/4 in diameter, no odor
5				36/48	0.036		▽ (09/29/17) wet at 7.5 feet bgs
6					0.0		
7					0.0	SP	
8					0.0		
9				0/48			
10					0.0		saturated from 12 to 15 feet bgs
11					0.0	CL	
12				36/48	0.0		SILTY CLAY (CL) light brown with orange mottling, medium stiff, moist, no odor
13					0.0	SP	
14	B-47-14.0	●			0.0		SAND with GRAVEL and CLAY (SP) brown, medium dense, wet to saturated, no odor
15					0.0	ML	
16	B-47-16.0	●		48/48	0.0		SANDY SILT (ML) gray to orange-brown, medium stiff to stiff, moist, no odor
17					0.0		
18							
19							
20	B-47-20.0	●					
21							
22							
23							
24							
25							

Boring terminated at a depth of 20 feet below ground surface.
Boring bacfilled with cement grout.
Groundwater encountered at 6.5 feet below ground surface during drilling.

LANGAN

Project No.: 750635604

Figure: A-2

PROJECT: **3000 BROADWAY REDEVELOPMENT**
Oakland, California

Log of Boring B-48

PAGE 1 OF 1

Boring location: See Figure 2

Logged by: K. Staehlin

Date started: 9/29/17

Date finished: 9/29/17

Drilling method: Direct Push

Hammer weight/drop: NA

Hammer type: NA

Sampler: Continuous

TEST ENVIRONMENTAL INCHES 750635604 - 3000 - BROADWAY B-46 TO B-48.GPJ T&R.GDT 10/3/17

DEPTH (feet)	SAMPLES				PID (ppm)	LITHOLOGY	MATERIAL DESCRIPTION
	Sample ID	Sample	Blow Count	Recovery (inches)			
1					0.0		6 inch-thick concrete slab
2				30/42			CLAY (CL) brown with orange mottling, soft, moist, no odor
3					0.0		medium stiff
4					0.0	CL	
5					0.0		stiff
6				48/48	0.0		
7					0.0		
8					0.0		SILT with CLAY (ML) brown with dark brown and orange mottling, soft to medium stiff, moist, no odor
9					0.0		
10				48/48	0.0	ML	
11					0.0		stiff
12					0.0		
13					0.0		
14	B-48-14.0	●		48/48	0.0	CL	CLAY (CL) (09/29/17) brown, medium stiff to stiff, moist, no odor
15					0.0		SILT with CLAY (ML) brown, medium stiff to stiff, moist, no odor
16	B-48-16.0	●			0.0	ML	
17					0.0		wet
18				48/48	0.0		
19					0.0	SM	SILTY SAND with GRAVEL (SM) orange-brown, medium dense to dense, moist to wet, no odor red-brown
20	B-48-20.0	●			0.0		
21					0.0		SANDY CLAY (CL) brown, wet to saturated, soft to medium stiff, no odor
22				24/48	0.0	CL	
23					0.0		
24					0.0		

Boring terminated at a depth of 24 feet below ground surface.
Boring backfilled with cement grout.
Groundwater encountered at 14.2 feet below ground surface during drilling.

LANGAN

Project No.: 750635604

Figure: A-3

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions	Symbols	Typical Names
Coarse-Grained Soils <small>(more than half of soil > no. 200 sieve size)</small>	Gravels <small>(More than half of coarse fraction > no. 4 sieve size)</small>	GW Well-graded gravels or gravel-sand mixtures, little or no fines
		GP Poorly-graded gravels or gravel-sand mixtures, little or no fines
		GM Silty gravels, gravel-sand-silt mixtures
		GC Clayey gravels, gravel-sand-clay mixtures
	Sands <small>(More than half of coarse fraction < no. 4 sieve size)</small>	SW Well-graded sands or gravelly sands, little or no fines
		SP Poorly-graded sands or gravelly sands, little or no fines
		SM Silty sands, sand-silt mixtures
Fine -Grained Soils <small>(more than half of soil < no. 200 sieve size)</small>	Silts and Clays <small>LL = < 50</small>	ML Inorganic silts and clayey silts of low plasticity, sandy silts, gravelly silts
		CL Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
		OL Organic silts and organic silt-clays of low plasticity
	Silts and Clays <small>LL = > 50</small>	MH Inorganic silts of high plasticity
		CH Inorganic clays of high plasticity, fat clays
		OH Organic silts and clays of high plasticity
Highly Organic Soils	PT Peat and other highly organic soils	

SAMPLE DESIGNATIONS/SYMBOLS

GRAIN SIZE CHART		
Classification	Range of Grain Sizes	
	U.S. Standard Sieve Size	Grain Size in Millimeters
Boulders	Above 12"	Above 305
Cobbles	12" to 3"	305 to 76.2
Gravel coarse fine	3" to No. 4	76.2 to 4.76
	3" to 3/4" 3/4" to No. 4	76.2 to 19.1 19.1 to 4.76
Sand coarse medium fine	No. 4 to No. 200	4.76 to 0.075
	No. 4 to No. 10	4.76 to 2.00
	No. 10 to No. 40	2.00 to 0.420
	No. 40 to No. 200	0.420 to 0.075
Silt and Clay	Below No. 200	Below 0.075

- Sample taken with Sprague & Henwood split-barrel sampler with a 3.0-inch outside diameter and a 2.43-inch inside diameter. Darkened area indicates soil recovered
- Classification sample taken with Standard Penetration Test sampler
- Undisturbed sample taken with thin-walled tube
- Disturbed sample
- Sampling attempted with no recovery
- Core sample
- Analytical laboratory sample
- Sample taken with Direct Push or Drive sampler

Unstabilized groundwater level

Stabilized groundwater level

SAMPLER TYPE

- | | |
|--|---|
| <p>C Core barrel</p> <p>CA California split-barrel sampler with 2.5-inch outside diameter and a 1.93-inch inside diameter</p> <p>D&M Dames & Moore piston sampler using 2.5-inch outside diameter, thin-walled tube</p> <p>O Osterberg piston sampler using 3.0-inch outside diameter, thin-walled Shelby tube</p> | <p>PT Pitcher tube sampler using 3.0-inch outside diameter, thin-walled Shelby tube</p> <p>S&H Sprague & Henwood split-barrel sampler with a 3.0-inch outside diameter and a 2.43-inch inside diameter</p> <p>SPT Standard Penetration Test (SPT) split-barrel sampler with a 2.0-inch outside diameter and a 1.5-inch inside diameter</p> <p>ST Shelby Tube (3.0-inch outside diameter, thin-walled tube) advanced with hydraulic pressure</p> |
|--|---|

3000 BROADWAY REDEVELOPMENT
Oakland, California

LANGAN

CLASSIFICATION CHART

Date 10/02/17	Project No. 750635604	Figure A-4
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APPENDIX B

**CERTIFIED ANALYTICAL REPORTS INCLUDING
CHAIN OF CUSTODY RECORDS**



McC Campbell Analytical, Inc.

"When Quality Counts"

Analytical Report

WorkOrder: 1710035

Report Created for: Langan

555 Montgomery St., Suite 1300
San Francisco, CA 94111

Project Contact: Josh Graber

Project P.O.:

Project Name: 750635604; 3000 Broadway Redevelopment

Project Received: 10/02/2017

Analytical Report reviewed & approved for release on 10/09/2017 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: Langan
Project: 750635604; 3000 Broadway Redevelopment
WorkOrder: 1710035

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
ERS	External reference sample. Second source calibration verification.
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)



Glossary of Terms & Qualifier Definitions

Client: Langan
Project: 750635604; 3000 Broadway Redevelopment
WorkOrder: 1710035

Analytical Qualifiers

S Surrogate spike recovery outside accepted recovery limits
c2 Surrogate recovery outside of the control limits due to matrix interference.
c4 Surrogate recovery outside of the control limits due to coelution with another peak(s) / cluttered chromatogram.
d6 One to a few isolated non-target peaks present in the TPH(g) chromatogram



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-1	1710035-001A	Water	09/29/2017 09:32	GC18 10091710.D	146715
Analytes	Result	RL	DF	Date Analyzed	
Acetone	ND	5000	500	10/09/2017 13:06	
tert-Amyl methyl ether (TAME)	ND	250	500	10/09/2017 13:06	
Benzene	ND	250	500	10/09/2017 13:06	
Bromobenzene	ND	250	500	10/09/2017 13:06	
Bromochloromethane	ND	250	500	10/09/2017 13:06	
Bromodichloromethane	ND	250	500	10/09/2017 13:06	
Bromoform	ND	250	500	10/09/2017 13:06	
Bromomethane	ND	250	500	10/09/2017 13:06	
2-Butanone (MEK)	ND	1000	500	10/09/2017 13:06	
t-Butyl alcohol (TBA)	ND	1000	500	10/09/2017 13:06	
n-Butyl benzene	ND	250	500	10/09/2017 13:06	
sec-Butyl benzene	ND	250	500	10/09/2017 13:06	
tert-Butyl benzene	ND	250	500	10/09/2017 13:06	
Carbon Disulfide	ND	250	500	10/09/2017 13:06	
Carbon Tetrachloride	ND	250	500	10/09/2017 13:06	
Chlorobenzene	ND	250	500	10/09/2017 13:06	
Chloroethane	ND	250	500	10/09/2017 13:06	
Chloroform	ND	250	500	10/09/2017 13:06	
Chloromethane	ND	250	500	10/09/2017 13:06	
2-Chlorotoluene	ND	250	500	10/09/2017 13:06	
4-Chlorotoluene	ND	250	500	10/09/2017 13:06	
Dibromochloromethane	ND	250	500	10/09/2017 13:06	
1,2-Dibromo-3-chloropropane	ND	100	500	10/09/2017 13:06	
1,2-Dibromoethane (EDB)	ND	250	500	10/09/2017 13:06	
Dibromomethane	ND	250	500	10/09/2017 13:06	
1,2-Dichlorobenzene	ND	250	500	10/09/2017 13:06	
1,3-Dichlorobenzene	ND	250	500	10/09/2017 13:06	
1,4-Dichlorobenzene	ND	250	500	10/09/2017 13:06	
Dichlorodifluoromethane	ND	250	500	10/09/2017 13:06	
1,1-Dichloroethane	ND	250	500	10/09/2017 13:06	
1,2-Dichloroethane (1,2-DCA)	ND	250	500	10/09/2017 13:06	
1,1-Dichloroethene	ND	250	500	10/09/2017 13:06	
cis-1,2-Dichloroethene	1000	250	500	10/09/2017 13:06	
trans-1,2-Dichloroethene	ND	250	500	10/09/2017 13:06	
1,2-Dichloropropane	ND	250	500	10/09/2017 13:06	
1,3-Dichloropropane	ND	250	500	10/09/2017 13:06	
2,2-Dichloropropane	ND	250	500	10/09/2017 13:06	

(Cont.)



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-1	1710035-001A	Water	09/29/2017 09:32	GC18 10091710.D	146715

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	250	500	10/09/2017 13:06
cis-1,3-Dichloropropene	ND	250	500	10/09/2017 13:06
trans-1,3-Dichloropropene	ND	250	500	10/09/2017 13:06
Diisopropyl ether (DIPE)	ND	250	500	10/09/2017 13:06
Ethylbenzene	ND	250	500	10/09/2017 13:06
Ethyl tert-butyl ether (ETBE)	ND	250	500	10/09/2017 13:06
Freon 113	ND	250	500	10/09/2017 13:06
Hexachlorobutadiene	ND	250	500	10/09/2017 13:06
Hexachloroethane	ND	250	500	10/09/2017 13:06
2-Hexanone	ND	250	500	10/09/2017 13:06
Isopropylbenzene	ND	250	500	10/09/2017 13:06
4-Isopropyl toluene	ND	250	500	10/09/2017 13:06
Methyl-t-butyl ether (MTBE)	ND	250	500	10/09/2017 13:06
Methylene chloride	ND	250	500	10/09/2017 13:06
4-Methyl-2-pentanone (MIBK)	ND	250	500	10/09/2017 13:06
Naphthalene	ND	250	500	10/09/2017 13:06
n-Propyl benzene	ND	250	500	10/09/2017 13:06
Styrene	ND	250	500	10/09/2017 13:06
1,1,1,2-Tetrachloroethane	ND	250	500	10/09/2017 13:06
1,1,2,2-Tetrachloroethane	ND	250	500	10/09/2017 13:06
Tetrachloroethene	ND	250	500	10/09/2017 13:06
Toluene	ND	250	500	10/09/2017 13:06
1,2,3-Trichlorobenzene	ND	250	500	10/09/2017 13:06
1,2,4-Trichlorobenzene	ND	250	500	10/09/2017 13:06
1,1,1-Trichloroethane	ND	250	500	10/09/2017 13:06
1,1,2-Trichloroethane	ND	250	500	10/09/2017 13:06
Trichloroethene	8400	250	500	10/09/2017 13:06
Trichlorofluoromethane	ND	250	500	10/09/2017 13:06
1,2,3-Trichloropropane	ND	250	500	10/09/2017 13:06
1,2,4-Trimethylbenzene	ND	250	500	10/09/2017 13:06
1,3,5-Trimethylbenzene	ND	250	500	10/09/2017 13:06
Vinyl Chloride	ND	250	500	10/09/2017 13:06
Xylenes, Total	ND	250	500	10/09/2017 13:06

(Cont.)



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-1	1710035-001A	Water	09/29/2017 09:32	GC18 10091710.D	146715

Analytes	Result	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>	<u>Qualifiers</u>	<u>Limits</u>	
Dibromofluoromethane	111		78-134	10/09/2017 13:06
Toluene-d8	122	S	82-120	10/09/2017 13:06
4-BFB	100		69-131	10/09/2017 13:06

Analyst(s): AK

Analytical Comments: c2



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-2	1710035-002A	Water	09/29/2017 10:34	GC16 10091709.D	146715
Analytes	Result	RL	DF	Date Analyzed	
Acetone	ND	2000	200	10/09/2017 12:24	
tert-Amyl methyl ether (TAME)	ND	100	200	10/09/2017 12:24	
Benzene	ND	100	200	10/09/2017 12:24	
Bromobenzene	ND	100	200	10/09/2017 12:24	
Bromochloromethane	ND	100	200	10/09/2017 12:24	
Bromodichloromethane	ND	100	200	10/09/2017 12:24	
Bromoform	ND	100	200	10/09/2017 12:24	
Bromomethane	ND	100	200	10/09/2017 12:24	
2-Butanone (MEK)	ND	400	200	10/09/2017 12:24	
t-Butyl alcohol (TBA)	ND	400	200	10/09/2017 12:24	
n-Butyl benzene	ND	100	200	10/09/2017 12:24	
sec-Butyl benzene	ND	100	200	10/09/2017 12:24	
tert-Butyl benzene	ND	100	200	10/09/2017 12:24	
Carbon Disulfide	ND	100	200	10/09/2017 12:24	
Carbon Tetrachloride	ND	100	200	10/09/2017 12:24	
Chlorobenzene	ND	100	200	10/09/2017 12:24	
Chloroethane	ND	100	200	10/09/2017 12:24	
Chloroform	ND	100	200	10/09/2017 12:24	
Chloromethane	ND	100	200	10/09/2017 12:24	
2-Chlorotoluene	ND	100	200	10/09/2017 12:24	
4-Chlorotoluene	ND	100	200	10/09/2017 12:24	
Dibromochloromethane	ND	100	200	10/09/2017 12:24	
1,2-Dibromo-3-chloropropane	ND	40	200	10/09/2017 12:24	
1,2-Dibromoethane (EDB)	ND	100	200	10/09/2017 12:24	
Dibromomethane	ND	100	200	10/09/2017 12:24	
1,2-Dichlorobenzene	ND	100	200	10/09/2017 12:24	
1,3-Dichlorobenzene	ND	100	200	10/09/2017 12:24	
1,4-Dichlorobenzene	ND	100	200	10/09/2017 12:24	
Dichlorodifluoromethane	ND	100	200	10/09/2017 12:24	
1,1-Dichloroethane	ND	100	200	10/09/2017 12:24	
1,2-Dichloroethane (1,2-DCA)	ND	100	200	10/09/2017 12:24	
1,1-Dichloroethene	ND	100	200	10/09/2017 12:24	
cis-1,2-Dichloroethene	470	100	200	10/09/2017 12:24	
trans-1,2-Dichloroethene	ND	100	200	10/09/2017 12:24	
1,2-Dichloropropane	ND	100	200	10/09/2017 12:24	
1,3-Dichloropropane	ND	100	200	10/09/2017 12:24	
2,2-Dichloropropane	ND	100	200	10/09/2017 12:24	

(Cont.)



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-2	1710035-002A	Water	09/29/2017 10:34	GC16 10091709.D	146715

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	100	200	10/09/2017 12:24
cis-1,3-Dichloropropene	ND	100	200	10/09/2017 12:24
trans-1,3-Dichloropropene	ND	100	200	10/09/2017 12:24
Diisopropyl ether (DIPE)	ND	100	200	10/09/2017 12:24
Ethylbenzene	ND	100	200	10/09/2017 12:24
Ethyl tert-butyl ether (ETBE)	ND	100	200	10/09/2017 12:24
Freon 113	ND	100	200	10/09/2017 12:24
Hexachlorobutadiene	ND	100	200	10/09/2017 12:24
Hexachloroethane	ND	100	200	10/09/2017 12:24
2-Hexanone	ND	100	200	10/09/2017 12:24
Isopropylbenzene	ND	100	200	10/09/2017 12:24
4-Isopropyl toluene	ND	100	200	10/09/2017 12:24
Methyl-t-butyl ether (MTBE)	ND	100	200	10/09/2017 12:24
Methylene chloride	ND	100	200	10/09/2017 12:24
4-Methyl-2-pentanone (MIBK)	ND	100	200	10/09/2017 12:24
Naphthalene	ND	100	200	10/09/2017 12:24
n-Propyl benzene	ND	100	200	10/09/2017 12:24
Styrene	ND	100	200	10/09/2017 12:24
1,1,1,2-Tetrachloroethane	ND	100	200	10/09/2017 12:24
1,1,2,2-Tetrachloroethane	ND	100	200	10/09/2017 12:24
Tetrachloroethene	ND	100	200	10/09/2017 12:24
Toluene	ND	100	200	10/09/2017 12:24
1,2,3-Trichlorobenzene	ND	100	200	10/09/2017 12:24
1,2,4-Trichlorobenzene	ND	100	200	10/09/2017 12:24
1,1,1-Trichloroethane	ND	100	200	10/09/2017 12:24
1,1,2-Trichloroethane	ND	100	200	10/09/2017 12:24
Trichloroethene	3600	100	200	10/09/2017 12:24
Trichlorofluoromethane	ND	100	200	10/09/2017 12:24
1,2,3-Trichloropropane	ND	100	200	10/09/2017 12:24
1,2,4-Trimethylbenzene	ND	100	200	10/09/2017 12:24
1,3,5-Trimethylbenzene	ND	100	200	10/09/2017 12:24
Vinyl Chloride	ND	100	200	10/09/2017 12:24
Xylenes, Total	ND	100	200	10/09/2017 12:24

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Analytical Report

Client: Langan **WorkOrder:** 1710035
Date Received: 10/2/17 16:55 **Extraction Method:** SW5030B
Date Prepared: 10/8/17-10/9/17 **Analytical Method:** SW8260B
Project: 750635604; 3000 Broadway Redevelopment **Unit:** µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-2	1710035-002A	Water	09/29/2017 10:34	GC16 10091709.D	146715

Analytes	Result	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>	<u>Limits</u>		
Dibromofluoromethane	128	78-134		10/09/2017 12:24
Toluene-d8	107	82-120		10/09/2017 12:24
4-BFB	101	69-131		10/09/2017 12:24

Analyst(s): AK



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-3	1710035-003A	Water	09/29/2017 13:30	GC38 10091712.D	146715

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	10	1	10/09/2017 16:07
tert-Amyl methyl ether (TAME)	ND	0.50	1	10/09/2017 16:07
Benzene	ND	0.50	1	10/09/2017 16:07
Bromobenzene	ND	0.50	1	10/09/2017 16:07
Bromochloromethane	ND	0.50	1	10/09/2017 16:07
Bromodichloromethane	ND	0.50	1	10/09/2017 16:07
Bromoform	ND	0.50	1	10/09/2017 16:07
Bromomethane	ND	0.50	1	10/09/2017 16:07
2-Butanone (MEK)	ND	2.0	1	10/09/2017 16:07
t-Butyl alcohol (TBA)	ND	2.0	1	10/09/2017 16:07
n-Butyl benzene	ND	0.50	1	10/09/2017 16:07
sec-Butyl benzene	ND	0.50	1	10/09/2017 16:07
tert-Butyl benzene	ND	0.50	1	10/09/2017 16:07
Carbon Disulfide	ND	0.50	1	10/09/2017 16:07
Carbon Tetrachloride	ND	0.50	1	10/09/2017 16:07
Chlorobenzene	ND	0.50	1	10/09/2017 16:07
Chloroethane	ND	0.50	1	10/09/2017 16:07
Chloroform	ND	0.50	1	10/09/2017 16:07
Chloromethane	ND	0.50	1	10/09/2017 16:07
2-Chlorotoluene	ND	0.50	1	10/09/2017 16:07
4-Chlorotoluene	ND	0.50	1	10/09/2017 16:07
Dibromochloromethane	ND	0.50	1	10/09/2017 16:07
1,2-Dibromo-3-chloropropane	ND	0.20	1	10/09/2017 16:07
1,2-Dibromoethane (EDB)	ND	0.50	1	10/09/2017 16:07
Dibromomethane	ND	0.50	1	10/09/2017 16:07
1,2-Dichlorobenzene	ND	0.50	1	10/09/2017 16:07
1,3-Dichlorobenzene	ND	0.50	1	10/09/2017 16:07
1,4-Dichlorobenzene	ND	0.50	1	10/09/2017 16:07
Dichlorodifluoromethane	ND	0.50	1	10/09/2017 16:07
1,1-Dichloroethane	ND	0.50	1	10/09/2017 16:07
1,2-Dichloroethane (1,2-DCA)	ND	0.50	1	10/09/2017 16:07
1,1-Dichloroethene	ND	0.50	1	10/09/2017 16:07
cis-1,2-Dichloroethene	ND	0.50	1	10/09/2017 16:07
trans-1,2-Dichloroethene	ND	0.50	1	10/09/2017 16:07
1,2-Dichloropropane	ND	0.50	1	10/09/2017 16:07
1,3-Dichloropropane	ND	0.50	1	10/09/2017 16:07
2,2-Dichloropropane	ND	0.50	1	10/09/2017 16:07

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Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-3	1710035-003A	Water	09/29/2017 13:30	GC38 10091712.D	146715

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	0.50	1	10/09/2017 16:07
cis-1,3-Dichloropropene	ND	0.50	1	10/09/2017 16:07
trans-1,3-Dichloropropene	ND	0.50	1	10/09/2017 16:07
Diisopropyl ether (DIPE)	ND	0.50	1	10/09/2017 16:07
Ethylbenzene	ND	0.50	1	10/09/2017 16:07
Ethyl tert-butyl ether (ETBE)	ND	0.50	1	10/09/2017 16:07
Freon 113	ND	0.50	1	10/09/2017 16:07
Hexachlorobutadiene	ND	0.50	1	10/09/2017 16:07
Hexachloroethane	ND	0.50	1	10/09/2017 16:07
2-Hexanone	ND	0.50	1	10/09/2017 16:07
Isopropylbenzene	ND	0.50	1	10/09/2017 16:07
4-Isopropyl toluene	ND	0.50	1	10/09/2017 16:07
Methyl-t-butyl ether (MTBE)	ND	0.50	1	10/09/2017 16:07
Methylene chloride	ND	0.50	1	10/09/2017 16:07
4-Methyl-2-pentanone (MIBK)	ND	0.50	1	10/09/2017 16:07
Naphthalene	ND	0.50	1	10/09/2017 16:07
n-Propyl benzene	ND	0.50	1	10/09/2017 16:07
Styrene	ND	0.50	1	10/09/2017 16:07
1,1,1,2-Tetrachloroethane	ND	0.50	1	10/09/2017 16:07
1,1,2,2-Tetrachloroethane	ND	0.50	1	10/09/2017 16:07
Tetrachloroethene	ND	0.50	1	10/09/2017 16:07
Toluene	ND	0.50	1	10/09/2017 16:07
1,2,3-Trichlorobenzene	ND	0.50	1	10/09/2017 16:07
1,2,4-Trichlorobenzene	ND	0.50	1	10/09/2017 16:07
1,1,1-Trichloroethane	ND	0.50	1	10/09/2017 16:07
1,1,2-Trichloroethane	ND	0.50	1	10/09/2017 16:07
Trichloroethene	2.1	0.50	1	10/09/2017 16:07
Trichlorofluoromethane	ND	0.50	1	10/09/2017 16:07
1,2,3-Trichloropropane	ND	0.50	1	10/09/2017 16:07
1,2,4-Trimethylbenzene	ND	0.50	1	10/09/2017 16:07
1,3,5-Trimethylbenzene	ND	0.50	1	10/09/2017 16:07
Vinyl Chloride	ND	0.50	1	10/09/2017 16:07
Xylenes, Total	ND	0.50	1	10/09/2017 16:07

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Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-3	1710035-003A	Water	09/29/2017 13:30	GC38 10091712.D	146715

Analytes	Result	RL	DF	Date Analyzed
Surrogates	REC (%)	Limits		
Dibromofluoromethane	109	78-134		10/09/2017 16:07
Toluene-d8	103	82-120		10/09/2017 16:07
4-BFB	114	69-131		10/09/2017 16:07

Analyst(s): JEM



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-4	1710035-004A	Water	09/29/2017 12:10	GC28 10091709.D	146715
Analytes	Result	RL	DF	Date Analyzed	
Acetone	ND	330	33	10/09/2017 12:23	
tert-Amyl methyl ether (TAME)	ND	17	33	10/09/2017 12:23	
Benzene	ND	17	33	10/09/2017 12:23	
Bromobenzene	ND	17	33	10/09/2017 12:23	
Bromochloromethane	ND	17	33	10/09/2017 12:23	
Bromodichloromethane	ND	17	33	10/09/2017 12:23	
Bromoform	ND	17	33	10/09/2017 12:23	
Bromomethane	ND	17	33	10/09/2017 12:23	
2-Butanone (MEK)	ND	67	33	10/09/2017 12:23	
t-Butyl alcohol (TBA)	ND	67	33	10/09/2017 12:23	
n-Butyl benzene	ND	17	33	10/09/2017 12:23	
sec-Butyl benzene	ND	17	33	10/09/2017 12:23	
tert-Butyl benzene	ND	17	33	10/09/2017 12:23	
Carbon Disulfide	ND	17	33	10/09/2017 12:23	
Carbon Tetrachloride	ND	17	33	10/09/2017 12:23	
Chlorobenzene	ND	17	33	10/09/2017 12:23	
Chloroethane	ND	17	33	10/09/2017 12:23	
Chloroform	ND	17	33	10/09/2017 12:23	
Chloromethane	ND	17	33	10/09/2017 12:23	
2-Chlorotoluene	ND	17	33	10/09/2017 12:23	
4-Chlorotoluene	ND	17	33	10/09/2017 12:23	
Dibromochloromethane	ND	17	33	10/09/2017 12:23	
1,2-Dibromo-3-chloropropane	ND	6.7	33	10/09/2017 12:23	
1,2-Dibromoethane (EDB)	ND	17	33	10/09/2017 12:23	
Dibromomethane	ND	17	33	10/09/2017 12:23	
1,2-Dichlorobenzene	ND	17	33	10/09/2017 12:23	
1,3-Dichlorobenzene	ND	17	33	10/09/2017 12:23	
1,4-Dichlorobenzene	ND	17	33	10/09/2017 12:23	
Dichlorodifluoromethane	ND	17	33	10/09/2017 12:23	
1,1-Dichloroethane	ND	17	33	10/09/2017 12:23	
1,2-Dichloroethane (1,2-DCA)	ND	17	33	10/09/2017 12:23	
1,1-Dichloroethene	ND	17	33	10/09/2017 12:23	
cis-1,2-Dichloroethene	47	17	33	10/09/2017 12:23	
trans-1,2-Dichloroethene	ND	17	33	10/09/2017 12:23	
1,2-Dichloropropane	ND	17	33	10/09/2017 12:23	
1,3-Dichloropropane	ND	17	33	10/09/2017 12:23	
2,2-Dichloropropane	ND	17	33	10/09/2017 12:23	

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Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-4	1710035-004A	Water	09/29/2017 12:10	GC28 10091709.D	146715

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	17	33	10/09/2017 12:23
cis-1,3-Dichloropropene	ND	17	33	10/09/2017 12:23
trans-1,3-Dichloropropene	ND	17	33	10/09/2017 12:23
Diisopropyl ether (DIPE)	ND	17	33	10/09/2017 12:23
Ethylbenzene	ND	17	33	10/09/2017 12:23
Ethyl tert-butyl ether (ETBE)	ND	17	33	10/09/2017 12:23
Freon 113	ND	17	33	10/09/2017 12:23
Hexachlorobutadiene	ND	17	33	10/09/2017 12:23
Hexachloroethane	ND	17	33	10/09/2017 12:23
2-Hexanone	ND	17	33	10/09/2017 12:23
Isopropylbenzene	ND	17	33	10/09/2017 12:23
4-Isopropyl toluene	ND	17	33	10/09/2017 12:23
Methyl-t-butyl ether (MTBE)	ND	17	33	10/09/2017 12:23
Methylene chloride	ND	17	33	10/09/2017 12:23
4-Methyl-2-pentanone (MIBK)	ND	17	33	10/09/2017 12:23
Naphthalene	ND	17	33	10/09/2017 12:23
n-Propyl benzene	ND	17	33	10/09/2017 12:23
Styrene	ND	17	33	10/09/2017 12:23
1,1,1,2-Tetrachloroethane	ND	17	33	10/09/2017 12:23
1,1,2,2-Tetrachloroethane	ND	17	33	10/09/2017 12:23
Tetrachloroethene	ND	17	33	10/09/2017 12:23
Toluene	ND	17	33	10/09/2017 12:23
1,2,3-Trichlorobenzene	ND	17	33	10/09/2017 12:23
1,2,4-Trichlorobenzene	ND	17	33	10/09/2017 12:23
1,1,1-Trichloroethane	ND	17	33	10/09/2017 12:23
1,1,2-Trichloroethane	ND	17	33	10/09/2017 12:23
Trichloroethene	300	17	33	10/09/2017 12:23
Trichlorofluoromethane	ND	17	33	10/09/2017 12:23
1,2,3-Trichloropropane	ND	17	33	10/09/2017 12:23
1,2,4-Trimethylbenzene	ND	17	33	10/09/2017 12:23
1,3,5-Trimethylbenzene	ND	17	33	10/09/2017 12:23
Vinyl Chloride	ND	17	33	10/09/2017 12:23
Xylenes, Total	ND	17	33	10/09/2017 12:23

(Cont.)



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-4	1710035-004A	Water	09/29/2017 12:10	GC28 10091709.D	146715

Analytes	Result	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>	
Dibromofluoromethane	106	78-134		10/09/2017 12:23
Toluene-d8	110	82-120		10/09/2017 12:23
4-BFB	106	69-131		10/09/2017 12:23

Analyst(s): AK



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-5	1710035-005A	Water	09/29/2017 14:32	GC10 10071739.D	146723
Analytes	Result	RL	DF	Date Analyzed	
Acetone	ND	10	1	10/08/2017 11:50	
tert-Amyl methyl ether (TAME)	ND	0.50	1	10/08/2017 11:50	
Benzene	ND	0.50	1	10/08/2017 11:50	
Bromobenzene	ND	0.50	1	10/08/2017 11:50	
Bromochloromethane	ND	0.50	1	10/08/2017 11:50	
Bromodichloromethane	ND	0.50	1	10/08/2017 11:50	
Bromoform	ND	0.50	1	10/08/2017 11:50	
Bromomethane	ND	0.50	1	10/08/2017 11:50	
2-Butanone (MEK)	ND	2.0	1	10/08/2017 11:50	
t-Butyl alcohol (TBA)	ND	2.0	1	10/08/2017 11:50	
n-Butyl benzene	ND	0.50	1	10/08/2017 11:50	
sec-Butyl benzene	ND	0.50	1	10/08/2017 11:50	
tert-Butyl benzene	ND	0.50	1	10/08/2017 11:50	
Carbon Disulfide	ND	0.50	1	10/08/2017 11:50	
Carbon Tetrachloride	ND	0.50	1	10/08/2017 11:50	
Chlorobenzene	ND	0.50	1	10/08/2017 11:50	
Chloroethane	ND	0.50	1	10/08/2017 11:50	
Chloroform	ND	0.50	1	10/08/2017 11:50	
Chloromethane	ND	0.50	1	10/08/2017 11:50	
2-Chlorotoluene	ND	0.50	1	10/08/2017 11:50	
4-Chlorotoluene	ND	0.50	1	10/08/2017 11:50	
Dibromochloromethane	ND	0.50	1	10/08/2017 11:50	
1,2-Dibromo-3-chloropropane	ND	0.20	1	10/08/2017 11:50	
1,2-Dibromoethane (EDB)	ND	0.50	1	10/08/2017 11:50	
Dibromomethane	ND	0.50	1	10/08/2017 11:50	
1,2-Dichlorobenzene	ND	0.50	1	10/08/2017 11:50	
1,3-Dichlorobenzene	ND	0.50	1	10/08/2017 11:50	
1,4-Dichlorobenzene	ND	0.50	1	10/08/2017 11:50	
Dichlorodifluoromethane	ND	0.50	1	10/08/2017 11:50	
1,1-Dichloroethane	ND	0.50	1	10/08/2017 11:50	
1,2-Dichloroethane (1,2-DCA)	ND	0.50	1	10/08/2017 11:50	
1,1-Dichloroethene	ND	0.50	1	10/08/2017 11:50	
cis-1,2-Dichloroethene	9.6	0.50	1	10/08/2017 11:50	
trans-1,2-Dichloroethene	0.84	0.50	1	10/08/2017 11:50	
1,2-Dichloropropane	ND	0.50	1	10/08/2017 11:50	
1,3-Dichloropropane	ND	0.50	1	10/08/2017 11:50	
2,2-Dichloropropane	ND	0.50	1	10/08/2017 11:50	

(Cont.)



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-5	1710035-005A	Water	09/29/2017 14:32	GC10 10071739.D	146723

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	0.50	1	10/08/2017 11:50
cis-1,3-Dichloropropene	ND	0.50	1	10/08/2017 11:50
trans-1,3-Dichloropropene	ND	0.50	1	10/08/2017 11:50
Diisopropyl ether (DIPE)	ND	0.50	1	10/08/2017 11:50
Ethylbenzene	ND	0.50	1	10/08/2017 11:50
Ethyl tert-butyl ether (ETBE)	ND	0.50	1	10/08/2017 11:50
Freon 113	ND	0.50	1	10/08/2017 11:50
Hexachlorobutadiene	ND	0.50	1	10/08/2017 11:50
Hexachloroethane	ND	0.50	1	10/08/2017 11:50
2-Hexanone	ND	0.50	1	10/08/2017 11:50
Isopropylbenzene	ND	0.50	1	10/08/2017 11:50
4-Isopropyl toluene	ND	0.50	1	10/08/2017 11:50
Methyl-t-butyl ether (MTBE)	ND	0.50	1	10/08/2017 11:50
Methylene chloride	ND	0.50	1	10/08/2017 11:50
4-Methyl-2-pentanone (MIBK)	ND	0.50	1	10/08/2017 11:50
Naphthalene	ND	0.50	1	10/08/2017 11:50
n-Propyl benzene	ND	0.50	1	10/08/2017 11:50
Styrene	ND	0.50	1	10/08/2017 11:50
1,1,1,2-Tetrachloroethane	ND	0.50	1	10/08/2017 11:50
1,1,2,2-Tetrachloroethane	ND	0.50	1	10/08/2017 11:50
Tetrachloroethene	ND	0.50	1	10/08/2017 11:50
Toluene	ND	0.50	1	10/08/2017 11:50
1,2,3-Trichlorobenzene	ND	0.50	1	10/08/2017 11:50
1,2,4-Trichlorobenzene	ND	0.50	1	10/08/2017 11:50
1,1,1-Trichloroethane	ND	0.50	1	10/08/2017 11:50
1,1,2-Trichloroethane	ND	0.50	1	10/08/2017 11:50
Trichloroethene	14	0.50	1	10/08/2017 11:50
Trichlorofluoromethane	ND	0.50	1	10/08/2017 11:50
1,2,3-Trichloropropane	ND	0.50	1	10/08/2017 11:50
1,2,4-Trimethylbenzene	ND	0.50	1	10/08/2017 11:50
1,3,5-Trimethylbenzene	ND	0.50	1	10/08/2017 11:50
Vinyl Chloride	ND	0.50	1	10/08/2017 11:50
Xylenes, Total	ND	0.50	1	10/08/2017 11:50

(Cont.)



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-5	1710035-005A	Water	09/29/2017 14:32	GC10 10071739.D	146723

Analytes	Result	RL	DF	Date Analyzed
Surrogates	REC (%)	Limits		
Dibromofluoromethane	107	78-134		10/08/2017 11:50
Toluene-d8	110	82-120		10/08/2017 11:50
4-BFB	95	69-131		10/08/2017 11:50

Analyst(s): AK



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/3/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
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
GW-1	1710035-001B	Water	09/29/2017 09:32	GC3 10031712.D	146457

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	97	50	1	10/03/2017 17:36
MTBE	---	5.0	1	10/03/2017 17:36
Benzene	---	0.50	1	10/03/2017 17:36
Toluene	---	0.50	1	10/03/2017 17:36
Ethylbenzene	---	0.50	1	10/03/2017 17:36
Xylenes	---	1.5	1	10/03/2017 17:36

Surrogates	REC (%)	Qualifiers	Limits	Date Analyzed
aaa-TFT	3811	S	89-115	10/03/2017 17:36

Analyst(s): IA

Analytical Comments: d6,c4

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-2	1710035-002B	Water	09/29/2017 10:34	GC3 10031713.D	146457

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	61	50	1	10/03/2017 18:07
MTBE	---	5.0	1	10/03/2017 18:07
Benzene	---	0.50	1	10/03/2017 18:07
Toluene	---	0.50	1	10/03/2017 18:07
Ethylbenzene	---	0.50	1	10/03/2017 18:07
Xylenes	---	1.5	1	10/03/2017 18:07

Surrogates	REC (%)	Qualifiers	Limits	Date Analyzed
aaa-TFT	3002	S	89-115	10/03/2017 18:07

Analyst(s): IA

Analytical Comments: d6,c4



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/3/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
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
GW-3	1710035-003B	Water	09/29/2017 13:30	GC3 10031715.D	146457

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND	50	1	10/03/2017 19:08
MTBE	---	5.0	1	10/03/2017 19:08
Benzene	---	0.50	1	10/03/2017 19:08
Toluene	---	0.50	1	10/03/2017 19:08
Ethylbenzene	---	0.50	1	10/03/2017 19:08
Xylenes	---	1.5	1	10/03/2017 19:08

Surrogates	REC (%)	Qualifiers	Limits	Date Analyzed
aaa-TFT	139	S	89-115	10/03/2017 19:08

Analyst(s): IA Analytical Comments: c4

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-4	1710035-004B	Water	09/29/2017 12:10	GC3 10031716.D	146457

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND	50	1	10/03/2017 19:39
MTBE	---	5.0	1	10/03/2017 19:39
Benzene	---	0.50	1	10/03/2017 19:39
Toluene	---	0.50	1	10/03/2017 19:39
Ethylbenzene	---	0.50	1	10/03/2017 19:39
Xylenes	---	1.5	1	10/03/2017 19:39

Surrogates	REC (%)	Qualifiers	Limits	Date Analyzed
aaa-TFT	1072	S	89-115	10/03/2017 19:39

Analyst(s): IA Analytical Comments: c4



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/3/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
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
GW-5	1710035-005B	Water	09/29/2017 14:32	GC3 10031718.D	146457

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND	50	1	10/03/2017 20:40
MTBE	---	5.0	1	10/03/2017 20:40
Benzene	---	0.50	1	10/03/2017 20:40
Toluene	---	0.50	1	10/03/2017 20:40
Ethylbenzene	---	0.50	1	10/03/2017 20:40
Xylenes	---	1.5	1	10/03/2017 20:40

Surrogates	REC (%)	Qualifiers	Limits	Date Analyzed
aaa-TFT	226	S	89-115	10/03/2017 20:40

Analyst(s): IA

Analytical Comments: c4



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/2/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
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
GW-1	1710035-001B	Water	09/29/2017 09:32	GC11A 10051752.D	146368

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	50	1	10/06/2017 06:51
TPH-Motor Oil (C18-C36)	ND	250	1	10/06/2017 06:51

Surrogates	REC (%)	Limits	Date Analyzed
C9	98	61-139	10/06/2017 06:51

Analyst(s): TK

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-2	1710035-002B	Water	09/29/2017 10:34	GC39A 10061710.D	146368

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	50	1	10/06/2017 17:11
TPH-Motor Oil (C18-C36)	ND	250	1	10/06/2017 17:11

Surrogates	REC (%)	Limits	Date Analyzed
C9	100	61-139	10/06/2017 17:11

Analyst(s): TK

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-3	1710035-003B	Water	09/29/2017 13:30	GC11A 10051756.D	146368

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	50	1	10/06/2017 08:09
TPH-Motor Oil (C18-C36)	ND	250	1	10/06/2017 08:09

Surrogates	REC (%)	Limits	Date Analyzed
C9	100	61-139	10/06/2017 08:09

Analyst(s): TK



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/2/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
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
GW-4	1710035-004B	Water	09/29/2017 12:10	GC11A 10051758.D	146368

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	50	1	10/06/2017 08:48
TPH-Motor Oil (C18-C36)	ND	250	1	10/06/2017 08:48

Surrogates	REC (%)	Limits	Date Analyzed
C9	104	61-139	10/06/2017 08:48

Analyst(s): TK

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
GW-5	1710035-005B	Water	09/29/2017 14:32	GC11A 10051760.D	146368

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	50	1	10/06/2017 09:27
TPH-Motor Oil (C18-C36)	ND	250	1	10/06/2017 09:27

Surrogates	REC (%)	Limits	Date Analyzed
C9	103	61-139	10/06/2017 09:27

Analyst(s): TK



Quality Control Report

Client: Langan
Date Prepared: 10/8/17
Date Analyzed: 10/8/17
Instrument: GC18
Matrix: Water
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
BatchID: 146715
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L
Sample ID: MB/LCS/LCSD-146715

QC Summary Report for SW8260B

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
Acetone	ND	10	-	-	-
tert-Amyl methyl ether (TAME)	ND	0.50	-	-	-
Benzene	ND	0.50	-	-	-
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	2.0	-	-	-
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	0.50	-	-	-
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	0.50	-	-	-
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	0.50	-	-	-
1,1-Dichloroethene	ND	0.50	-	-	-
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	-	-	-
1,1-Dichloropropene	ND	0.50	-	-	-
cis-1,3-Dichloropropene	ND	0.50	-	-	-

(Cont.)



Quality Control Report

Client: Langan	WorkOrder: 1710035
Date Prepared: 10/8/17	BatchID: 146715
Date Analyzed: 10/8/17	Extraction Method: SW5030B
Instrument: GC18	Analytical Method: SW8260B
Matrix: Water	Unit: µg/L
Project: 750635604; 3000 Broadway Redevelopment	Sample ID: MB/LCS/LCSD-146715

QC Summary Report for SW8260B

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
trans-1,3-Dichloropropene	ND	0.50	-	-	-
Diisopropyl ether (DIPE)	ND	0.50	-	-	-
Ethylbenzene	ND	0.50	-	-	-
Ethyl tert-butyl ether (ETBE)	ND	0.50	-	-	-
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	0.50	-	-	-
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	0.50	-	-	-
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	0.50	-	-	-
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	-	-	-

Surrogate Recovery

Dibromofluoromethane	28.68	25	115	91-133
Toluene-d8	30.52	25	122	87-127
4-BFB	2.659	2.5	106	66-140

(Cont.)



Quality Control Report

Client: Langan
Date Prepared: 10/8/17
Date Analyzed: 10/8/17
Instrument: GC18
Matrix: Water
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
BatchID: 146715
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L
Sample ID: MB/LCS/LCSD-146715

QC Summary Report for SW8260B

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Acetone	184	188	200	92	94	47-122	2.26	20
tert-Amyl methyl ether (TAME)	9.80	9.63	10	98	96	62-121	1.69	20
Benzene	9.64	9.90	10	96	99	74-121	2.65	20
Bromobenzene	9.04	9.27	10	90	93	63-127	2.53	20
Bromochloromethane	9.44	9.43	10	94	94	70-126	0	20
Bromodichloromethane	9.97	10.1	10	100	101	66-127	1.16	20
Bromoform	9.30	9.39	10	93	94	60-119	1.00	20
Bromomethane	9.08	9.56	10	91	96	32-155	5.10	20
2-Butanone (MEK)	36.7	37.4	40	92	93	51-117	1.87	20
t-Butyl alcohol (TBA)	38.7	39.1	40	97	98	41-122	1.03	20
n-Butyl benzene	11.2	11.8	10	113	118	73-137	4.41	20
sec-Butyl benzene	10.3	10.7	10	103	107	71-137	3.98	20
tert-Butyl benzene	8.91	9.38	10	89	94	61-136	5.20	20
Carbon Disulfide	9.84	10.4	10	98	104	61-139	5.20	20
Carbon Tetrachloride	9.46	9.76	10	95	98	69-137	3.09	20
Chlorobenzene	10.2	10.4	10	101	104	71-122	2.03	20
Chloroethane	8.83	9.15	10	88	92	54-132	3.62	20
Chloroform	9.83	10.0	10	98	101	73-122	2.27	20
Chloromethane	9.49	10.2	10	95	101	48-136	6.65	20
2-Chlorotoluene	8.54	8.78	10	85	88	65-134	2.85	20
4-Chlorotoluene	9.61	10.0	10	96	100	65-130	3.95	20
Dibromochloromethane	9.56	9.56	10	96	96	65-121	0	20
1,2-Dibromo-3-chloropropane	3.64	3.55	4	91	89	41-132	2.57	20
1,2-Dibromoethane (EDB)	9.54	9.55	10	95	95	67-125	0	20
Dibromomethane	10.0	9.98	10	100	100	68-121	0	20
1,2-Dichlorobenzene	9.01	9.08	10	90	91	69-128	0.843	20
1,3-Dichlorobenzene	9.98	10.1	10	100	101	71-131	1.59	20
1,4-Dichlorobenzene	10.2	10.4	10	102	104	70-128	1.97	20
Dichlorodifluoromethane	9.01	9.07	10	90	91	21-158	0.744	20
1,1-Dichloroethane	9.74	10.0	10	97	101	73-123	3.18	20
1,2-Dichloroethane (1,2-DCA)	10.1	10.2	10	101	101	61-127	0	20
1,1-Dichloroethene	10.0	10.6	10	101	106	68-130	5.05	20
cis-1,2-Dichloroethene	9.82	10.1	10	98	101	72-123	2.89	20
trans-1,2-Dichloroethene	9.95	10.3	10	100	103	64-138	3.42	20
1,2-Dichloropropane	9.42	9.49	10	94	95	71-121	0.795	20
1,3-Dichloropropane	10.0	9.98	10	101	100	69-120	0.780	20
2,2-Dichloropropane	10.9	11.2	10	109	112	64-142	2.54	20
1,1-Dichloropropene	10.1	10.5	10	101	105	70-130	3.65	20
cis-1,3-Dichloropropene	9.58	9.52	10	96	95	58-136	0.524	20

(Cont.)

CA ELAP 1644 • NELAP 4033ORELAP

QA/QC Officer



Quality Control Report

Client: Langan
Date Prepared: 10/8/17
Date Analyzed: 10/8/17
Instrument: GC18
Matrix: Water
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
BatchID: 146715
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L
Sample ID: MB/LCS/LCSD-146715

QC Summary Report for SW8260B

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
trans-1,3-Dichloropropene	9.27	9.25	10	93	92	66-119	0.244	20
Diisopropyl ether (DIPE)	9.47	9.38	10	95	94	66-123	0.908	20
Ethylbenzene	10.6	10.9	10	106	109	71-125	2.94	20
Ethyl tert-butyl ether (ETBE)	8.79	8.64	10	88	86	67-122	1.78	20
Freon 113	9.87	10.3	10	99	103	68-132	4.04	20
Hexachlorobutadiene	9.89	9.84	10	99	98	56-155	0.507	20
Hexachloroethane	8.95	9.34	10	90	93	61-129	4.22	20
2-Hexanone	9.46	9.60	10	95	96	51-115	1.49	20
Isopropylbenzene	11.2	11.6	10	112	116	66-134	3.84	20
4-Isopropyl toluene	11.4	11.8	10	114	119	70-136	3.72	20
Methyl-t-butyl ether (MTBE)	9.91	9.80	10	99	98	64-118	1.05	20
Methylene chloride	8.93	9.12	10	89	91	62-121	2.11	20
4-Methyl-2-pentanone (MIBK)	10.4	10.2	10	103	102	51-115	0.968	20
Naphthalene	9.84	9.68	10	98	97	55-137	1.63	20
n-Propyl benzene	8.52	8.96	10	85	90	63-140	5.02	20
Styrene	9.46	9.62	10	95	96	62-133	1.62	20
1,1,1,2-Tetrachloroethane	9.37	9.47	10	94	95	69-128	1.05	20
1,1,2,2-Tetrachloroethane	10.4	10.6	10	104	105	60-118	1.80	20
Tetrachloroethene	9.66	9.91	10	97	99	63-136	2.57	20
Toluene	9.08	9.28	10	91	93	67-124	2.26	20
1,2,3-Trichlorobenzene	9.21	8.92	10	92	89	57-145	3.22	20
1,2,4-Trichlorobenzene	9.41	9.14	10	94	91	60-144	2.92	20
1,1,1-Trichloroethane	10.3	10.6	10	103	106	70-133	3.43	20
1,1,2-Trichloroethane	10.0	9.99	10	100	100	65-125	0	20
Trichloroethene	9.68	10.0	10	97	100	67-133	3.70	20
Trichlorofluoromethane	10.3	10.8	10	103	108	59-145	4.03	20
1,2,3-Trichloropropane	9.16	9.40	10	92	94	65-115	2.55	20
1,2,4-Trimethylbenzene	10.2	10.5	10	102	105	67-136	3.52	20
1,3,5-Trimethylbenzene	8.84	9.26	10	88	93	68-135	4.64	20
Vinyl Chloride	8.55	9.01	10	86	90	53-146	5.20	20
Xylenes, Total	28.2	28.9	30	94	96	68-128	2.73	20
Surrogate Recovery								
Dibromofluoromethane	29.1	29.0	25	116	116	91-133	0	20
Toluene-d8	30.6	30.5	25	122	122	87-127	0	20
4-BFB	2.96	3.02	2.5	118	121	66-140	2.03	20

(Cont.)

CA ELAP 1644 • NELAP 4033ORELAP

QA/QC Officer



Quality Control Report

Client: Langan
Date Prepared: 10/8/17
Date Analyzed: 10/8/17
Instrument: GC10
Matrix: Water
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
BatchID: 146723
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L
Sample ID: MB/LCS/LCSD-146723

QC Summary Report for SW8260B

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
Acetone	ND	10	-	-	-
tert-Amyl methyl ether (TAME)	ND	0.50	-	-	-
Benzene	ND	0.50	-	-	-
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	2.0	-	-	-
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	0.50	-	-	-
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	0.50	-	-	-
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	0.50	-	-	-
1,1-Dichloroethene	ND	0.50	-	-	-
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	-	-	-
1,1-Dichloropropene	ND	0.50	-	-	-
cis-1,3-Dichloropropene	ND	0.50	-	-	-

(Cont.)



Quality Control Report

Client:	Langan	WorkOrder:	1710035
Date Prepared:	10/8/17	BatchID:	146723
Date Analyzed:	10/8/17	Extraction Method:	SW5030B
Instrument:	GC10	Analytical Method:	SW8260B
Matrix:	Water	Unit:	µg/L
Project:	750635604; 3000 Broadway Redevelopment	Sample ID:	MB/LCS/LCSD-146723

QC Summary Report for SW8260B

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
trans-1,3-Dichloropropene	ND	0.50	-	-	-
Diisopropyl ether (DIPE)	ND	0.50	-	-	-
Ethylbenzene	ND	0.50	-	-	-
Ethyl tert-butyl ether (ETBE)	ND	0.50	-	-	-
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	0.50	-	-	-
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	0.50	-	-	-
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	0.50	-	-	-
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	-	-	-

Surrogate Recovery

Dibromofluoromethane	27.48		25	110	91-133
Toluene-d8	27.01		25	108	87-127
4-BFB	2.502		2.5	100	66-140

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QA/QC Officer



Quality Control Report

Client: Langan
Date Prepared: 10/8/17
Date Analyzed: 10/8/17
Instrument: GC10
Matrix: Water
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
BatchID: 146723
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L
Sample ID: MB/LCS/LCSD-146723

QC Summary Report for SW8260B

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Acetone	195	182	200	98	91	47-122	6.72	20
tert-Amyl methyl ether (TAME)	10.5	9.81	10	105	98	62-121	6.68	20
Benzene	10.3	9.84	10	103	98	74-121	4.61	20
Bromobenzene	10.8	10.0	10	108	100	63-127	7.55	20
Bromochloromethane	10.4	9.80	10	104	98	70-126	6.02	20
Bromodichloromethane	10.7	10.2	10	107	103	66-127	4.10	20
Bromoform	9.54	8.91	10	95	89	60-119	6.90	20
Bromomethane	9.41	8.95	10	94	90	32-155	4.92	20
2-Butanone (MEK)	40.8	38.4	40	102	96	51-117	5.97	20
t-Butyl alcohol (TBA)	39.0	37.2	40	97	93	41-122	4.74	20
n-Butyl benzene	11.1	10.6	10	111	106	73-137	4.67	20
sec-Butyl benzene	10.0	9.56	10	100	96	71-137	4.41	20
tert-Butyl benzene	10.5	10.1	10	105	101	61-136	3.96	20
Carbon Disulfide	10.5	10.0	10	105	100	61-139	4.49	20
Carbon Tetrachloride	10.2	9.91	10	102	99	69-137	3.26	20
Chlorobenzene	10.6	10.2	10	106	102	71-122	4.14	20
Chloroethane	9.35	8.82	10	93	88	54-132	5.86	20
Chloroform	10.3	9.88	10	103	99	73-122	4.54	20
Chloromethane	10.5	10.1	10	105	101	48-136	4.00	20
2-Chlorotoluene	11.2	10.4	10	111	105	65-134	6.44	20
4-Chlorotoluene	10.6	9.96	10	107	100	65-130	6.73	20
Dibromochloromethane	10.1	9.35	10	101	94	65-121	7.27	20
1,2-Dibromo-3-chloropropane	4.00	3.72	4	100	93	41-132	7.20	20
1,2-Dibromoethane (EDB)	10.8	10.1	10	108	101	67-125	6.85	20
Dibromomethane	10.5	9.71	10	105	97	68-121	7.71	20
1,2-Dichlorobenzene	10.2	9.70	10	102	97	69-128	5.44	20
1,3-Dichlorobenzene	11.1	10.6	10	111	106	71-131	5.08	20
1,4-Dichlorobenzene	10.3	9.77	10	103	98	70-128	5.45	20
Dichlorodifluoromethane	9.41	8.95	10	94	89	21-158	5.05	20
1,1-Dichloroethane	10.2	9.58	10	102	96	73-123	5.85	20
1,2-Dichloroethane (1,2-DCA)	10.3	9.72	10	103	97	61-127	5.75	20
1,1-Dichloroethene	10.1	9.71	10	101	97	68-130	3.51	20
cis-1,2-Dichloroethene	10.2	9.80	10	102	98	72-123	3.60	20
trans-1,2-Dichloroethene	10.2	9.89	10	102	99	64-138	3.55	20
1,2-Dichloropropane	10.0	9.55	10	101	95	71-121	5.14	20
1,3-Dichloropropane	10.5	9.89	10	105	99	69-120	6.01	20
2,2-Dichloropropane	11.3	10.9	10	113	109	64-142	3.77	20
1,1-Dichloropropene	10.3	10.0	10	103	100	70-130	3.04	20
cis-1,3-Dichloropropene	11.6	10.9	10	116	109	58-136	6.28	20

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CA ELAP 1644 • NELAP 4033ORELAP

QA/QC Officer



Quality Control Report

Client: Langan
Date Prepared: 10/8/17
Date Analyzed: 10/8/17
Instrument: GC10
Matrix: Water
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
BatchID: 146723
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L
Sample ID: MB/LCS/LCSD-146723

QC Summary Report for SW8260B

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
trans-1,3-Dichloropropene	10.6	10.0	10	106	100	66-119	5.55	20
Diisopropyl ether (DIPE)	10.2	9.68	10	102	97	66-123	5.03	20
Ethylbenzene	10.4	9.88	10	104	99	71-125	5.27	20
Ethyl tert-butyl ether (ETBE)	10.5	9.98	10	105	100	67-122	5.17	20
Freon 113	9.40	9.01	10	94	90	68-132	4.23	20
Hexachlorobutadiene	10.8	10.7	10	108	107	56-155	0.558	20
Hexachloroethane	11.2	10.7	10	112	107	61-129	3.93	20
2-Hexanone	9.89	9.32	10	99	93	51-115	5.95	20
Isopropylbenzene	11.0	10.3	10	110	103	66-134	6.62	20
4-Isopropyl toluene	10.7	10.3	10	107	103	70-136	3.76	20
Methyl-t-butyl ether (MTBE)	10.2	9.58	10	102	96	64-118	6.05	20
Methylene chloride	9.67	9.16	10	97	92	62-121	5.43	20
4-Methyl-2-pentanone (MIBK)	11.2	10.4	10	112	103	51-115	7.67	20
Naphthalene	11.4	11.0	10	114	110	55-137	4.41	20
n-Propyl benzene	11.0	10.5	10	110	105	63-140	4.87	20
Styrene	10.7	10.1	10	107	101	62-133	6.12	20
1,1,1,2-Tetrachloroethane	10.8	10.4	10	108	104	69-128	3.98	20
1,1,2,2-Tetrachloroethane	10.9	10.3	10	109	103	60-118	5.16	20
Tetrachloroethene	10.3	9.84	10	103	98	63-136	4.75	20
Toluene	10.5	10.1	10	105	101	67-124	4.32	20
1,2,3-Trichlorobenzene	11.3	10.8	10	113	108	57-145	4.77	20
1,2,4-Trichlorobenzene	12.0	11.6	10	120	116	60-144	3.34	20
1,1,1-Trichloroethane	10.3	10.0	10	103	100	70-133	2.92	20
1,1,2-Trichloroethane	10.6	9.95	10	106	100	65-125	6.63	20
Trichloroethene	10.1	9.59	10	101	96	67-133	5.22	20
Trichlorofluoromethane	9.84	9.45	10	98	95	59-145	4.03	20
1,2,3-Trichloropropane	11.1	10.2	10	111	102	65-115	8.50	20
1,2,4-Trimethylbenzene	10.8	10.3	10	108	103	67-136	4.39	20
1,3,5-Trimethylbenzene	10.7	10.3	10	107	103	68-135	4.05	20
Vinyl Chloride	11.5	10.7	10	115	107	53-146	6.91	20
Xylenes, Total	31.6	29.8	30	105	99	68-128	5.97	20
Surrogate Recovery								
Dibromofluoromethane	27.2	27.5	25	109	110	91-133	1.02	20
Toluene-d8	27.3	27.3	25	109	109	87-127	0	20
4-BFB	2.84	2.77	2.5	114	111	66-140	2.42	20



Quality Control Report

Client: Langan
Date Prepared: 10/3/17
Date Analyzed: 10/3/17
Instrument: GC3
Matrix: Water
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
BatchID: 146457
Extraction Method: SW5030B
Analytical Method: SW8021B/8015Bm
Unit: µg/L
Sample ID: MB/LCS-146457
 1710035-004BMS/MSD

QC Summary Report for SW8021B/8015Bm

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
TPH(g) (C6-C12)	ND	50	-	-	-
MTBE	ND	5.0	-	-	-
Benzene	ND	0.50	-	-	-
Toluene	ND	0.50	-	-	-
Ethylbenzene	ND	0.50	-	-	-
Xylenes	ND	1.5	-	-	-

Surrogate Recovery

aaa-TFT	10.38		10	104	89-116
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Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH(btex)	58.6	-	60	98	-	78-116	-	-
MTBE	8.89	-	10	89	-	72-122	-	-
Benzene	9.64	-	10	96	-	81-123	-	-
Toluene	10.0	-	10	100	-	83-129	-	-
Ethylbenzene	10.6	-	10	106	-	88-126	-	-
Xylenes	32.9	-	30	110	-	87-131	-	-

Surrogate Recovery

aaa-TFT	10.2	-	10	102	-	89-116	-	-
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Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
TPH(btex)	58.6	59.2	60	ND	98	99	63-133	1.02	20
MTBE	8.53	8.83	10	ND	85	88	69-122	3.41	20
Benzene	8.75	9.28	10	ND	86	91	84-125	5.89	20
Toluene	9.14	9.73	10	ND	91	97	87-131	6.25	20
Ethylbenzene	9.48	10.2	10	ND	95	102	92-126	7.34	20
Xylenes	29.6	31.3	30	ND	99	104	88-132	5.34	20

Surrogate Recovery

aaa-TFT	10.3	10.1	10		103	101	90-117	1.88	20
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Quality Control Report

Client: Langan
Date Prepared: 10/2/17
Date Analyzed: 10/2/17
Instrument: GC6A
Matrix: Water
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710035
BatchID: 146368
Extraction Method: SW3510C
Analytical Method: SW8015B
Unit: µg/L
Sample ID: MB/LCS/LCSD-146368

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	-	-	-
Surrogate Recovery					
C9	665.6		625	106	68-127

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH-Diesel (C10-C23)	1170	1140	1000	117	114	86-142	2.73	30
Surrogate Recovery								
C9	669	653	625	107	104	68-127	2.40	30



1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

WaterTrax WriteOn EDF

CHAIN-OF-CUSTODY RECORD

WorkOrder: 1710035

ClientCode: TWRF

Excel EQuIS Email HardCopy ThirdParty J-flag
 Detection Summary Dry-Weight

Report to:

Josh Graber
Langan
555 Montgomery St., Suite 1300
San Francisco, CA 94111
(415) 955-5244 FAX: (415) 955-9041

Email: jgrab@langan.com
cc/3rd Party: kstaehlin@langan.com;
PO:
ProjectNo: 750635604; 3000 Broadway
Redevelopment

Bill to:

Accounts Payable
Langan
555 Montgomery St., Suite 1300
San Francisco, CA 94111
Langan_InvoiceCapture@concur.solutio

Requested TAT: 5 days;

Date Received: 10/02/2017

Date Logged: 10/02/2017

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	
1710035-001	GW-1	Water	9/29/2017 09:32	<input type="checkbox"/>	A	B	B										
1710035-002	GW-2	Water	9/29/2017 10:34	<input type="checkbox"/>	A	B	B										
1710035-003	GW-3	Water	9/29/2017 13:30	<input type="checkbox"/>	A	B	B										
1710035-004	GW-4	Water	9/29/2017 12:10	<input type="checkbox"/>	A	B	B										
1710035-005	GW-5	Water	9/29/2017 14:32	<input type="checkbox"/>	A	B	B										

Test Legend:

1	8260B_W	2	G-MBTEX_W	3	TPH(DMO)_W	4	
5		6		7		8	
9		10		11		12	

Prepared by: Kena Ponce

The following SampleIDs: 001B, 002B, 003B, 004B, 005B 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: LANGAN
Client Contact: Josh Graber
Contact's Email: jgraber@langan.com

Project: 750635604; 3000 Broadway Redevelopment

Work Order: 1710035
QC Level: LEVEL 2
Date Logged: 10/2/2017

Comments:

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
1710035-001A	GW-1	Water	SW8260B (VOCs)	2	VOA w/ HCl	<input type="checkbox"/>	9/29/2017 9:32	5 days	Trace	<input type="checkbox"/>	
1710035-001B	GW-1	Water	Multi-Range TPH(g,d,mo) by EPA 8015Bm	4	2 VOAs w/HCL + 2-aVOAs (multi-range)	<input type="checkbox"/>	9/29/2017 9:32	5 days	Trace	<input type="checkbox"/>	
1710035-002A	GW-2	Water	SW8260B (VOCs)	2	VOA w/ HCl	<input type="checkbox"/>	9/29/2017 10:34	5 days	Trace	<input type="checkbox"/>	
1710035-002B	GW-2	Water	Multi-Range TPH(g,d,mo) by EPA 8015Bm	4	2 VOAs w/HCL + 2-aVOAs (multi-range)	<input type="checkbox"/>	9/29/2017 10:34	5 days	Trace	<input type="checkbox"/>	
1710035-003A	GW-3	Water	SW8260B (VOCs)	2	VOA w/ HCl	<input type="checkbox"/>	9/29/2017 13:30	5 days	Trace	<input type="checkbox"/>	
1710035-003B	GW-3	Water	Multi-Range TPH(g,d,mo) by EPA 8015Bm	4	2 VOAs w/HCL + 2-aVOAs (multi-range)	<input type="checkbox"/>	9/29/2017 13:30	5 days	Trace	<input type="checkbox"/>	
1710035-004A	GW-4	Water	SW8260B (VOCs)	2	VOA w/ HCl	<input type="checkbox"/>	9/29/2017 12:10	5 days	Trace	<input type="checkbox"/>	
1710035-004B	GW-4	Water	Multi-Range TPH(g,d,mo) by EPA 8015Bm	4	2 VOAs w/HCL + 2-aVOAs (multi-range)	<input type="checkbox"/>	9/29/2017 12:10	5 days	Trace	<input type="checkbox"/>	
1710035-005A	GW-5	Water	SW8260B (VOCs)	2	VOA w/ HCl	<input type="checkbox"/>	9/29/2017 14:32	5 days	Trace	<input type="checkbox"/>	
1710035-005B	GW-5	Water	Multi-Range TPH(g,d,mo) by EPA 8015Bm	4	2 VOAs w/HCL + 2-aVOAs (multi-range)	<input type="checkbox"/>	9/29/2017 14:32	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.

* PLEASE C.C. ANNIE S. AT *
 KSTAEHLIN@LANGAN.com 11036

LANGAN

CHAIN OF CUSTODY RECORD

- 555 Montgomery Street, Suite 1300, San Francisco, CA 94111
- 501 14th Street, Third Floor, Oakland CA 94612
- 3320 Data Drive, Suite 350, Rancho Cordova, CA 95670-7982
- 4030 Moorpark Ave. Suite 210, San Jose, CA 95117-1849

171035-

Site Name: 3000 BROADWAY REDEVELOPMENT
 Job Number: 750635604
 Project Manager/Contact: JOSHUA GNABER
 Samplers: KSS
 Recorder (Signature Required): [Signature]

Turnaround
Time
STANDARD

Field Sample Identification No.	Date	Time	Lab Sample No.	Matrix & Preservative								Analysis Requested		Silica gel clean-up	Hold	Remarks		
				Soil	Water	Air	Other	HCL	H ₂ SO ₄	HNO ₃	Ice	TPH	VOCs					
GW-1	9/29/17	0932		X				4										
GW-2	}	1034		X				4										
GW-3		1330		X				4										
GW-4		1210		X					4									
GW-5	9/29/17	1432		X				4										* PLEASE USE LOWEST POSSIBLE REPORTING LIMITS FOR VOCs.

Relinquished by: (Signature) <u>[Signature]</u>	Date: _____	Time: _____	Received by: (Signature) <u>Basil</u>	Date: <u>10/02/17</u>	Time: <u>10:45</u>
Relinquished by: (Signature) <u>Basil</u>	Date: <u>10/2/17</u>	Time: <u>1655</u>	Received by: (Signature) <u>[Signature]</u>	Date: <u>10/2/17</u>	Time: <u>1655</u>
Relinquished by: (Signature) _____	Date: _____	Time: _____	Received by Lab: (Signature) _____	Date: _____	Time: _____

Sent to Laboratory (Name): MCCAMPBELL ANALYTICAL

Laboratory Comments/Notes: _____

Method of Shipment: Lab courier Fed Ex Airborne UPS
 Hand Carried Private Courier (Co. Name) _____



Sample Receipt Checklist

Client Name: **Langan**
 Project Name: **750635604; 3000 Broadway Redevelopment**
 WorkOrder No: **1710035** Matrix: Water
 Carrier: Basit Sheikh (MAI Courier)

Date and Time Received: **10/2/2017 16:55**
 Date Logged: **10/2/2017**
 Received by: **Kena Ponce**
 Logged by: **Kena Ponce**

Chain of Custody (COC) Information

Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample IDs noted by Client on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Date and Time of collection noted by Client on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sampler's name noted on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
COC agrees with Quote?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper containers/bottles?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>
Sample/Temp Blank temperature	Temp: 10°C		NA <input type="checkbox"/>
Water - VOA vials have zero headspace / no bubbles?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>
Sample labels checked for correct preservation?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
pH acceptable upon receipt (Metal: <2; 522: <4; 218.7: >8)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Samples Received on Ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

(Ice Type: WET ICE)

UCMR Samples:

Total Chlorine tested and acceptable upon receipt for EPA 522?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Free Chlorine tested and acceptable upon receipt for EPA 218.7, 300.1, 537, 539?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>

Comments:



McC Campbell Analytical, Inc.

"When Quality Counts"

Analytical Report

WorkOrder: 1710036

Report Created for: Langan

555 Montgomery St., Suite 1300
San Francisco, CA 94111

Project Contact: Josh Graber

Project P.O.:

Project Name: 750635604; 3000 Broadway Redevelopment

Project Received: 10/02/2017

Analytical Report reviewed & approved for release on 10/09/2017 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: Langan
Project: 750635604; 3000 Broadway Redevelopment
WorkOrder: 1710036

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
ERS	External reference sample. Second source calibration verification.
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)



Glossary of Terms & Qualifier Definitions

Client: Langan
Project: 750635604; 3000 Broadway Redevelopment
WorkOrder: 1710036

Analytical Qualifiers

S	Surrogate spike recovery outside accepted recovery limits
c2	Surrogate recovery outside of the control limits due to matrix interference.
c4	Surrogate recovery outside of the control limits due to coelution with another peak(s) / cluttered chromatogram.
d6	One to a few isolated non-target peaks present in the TPH(g) chromatogram
e2	Diesel range compounds are significant; no recognizable pattern
e7	Oil range compounds are significant



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/2/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-46-10.0	1710036-001A	Soil	09/29/2017 12:03	GC10 10061725.D	146413

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	0.10	1	10/06/2017 23:16
tert-Amyl methyl ether (TAME)	ND	0.0050	1	10/06/2017 23:16
Benzene	ND	0.0050	1	10/06/2017 23:16
Bromobenzene	ND	0.0050	1	10/06/2017 23:16
Bromochloromethane	ND	0.0050	1	10/06/2017 23:16
Bromodichloromethane	ND	0.0050	1	10/06/2017 23:16
Bromoform	ND	0.0050	1	10/06/2017 23:16
Bromomethane	ND	0.0050	1	10/06/2017 23:16
2-Butanone (MEK)	ND	0.020	1	10/06/2017 23:16
t-Butyl alcohol (TBA)	ND	0.050	1	10/06/2017 23:16
n-Butyl benzene	ND	0.0050	1	10/06/2017 23:16
sec-Butyl benzene	ND	0.0050	1	10/06/2017 23:16
tert-Butyl benzene	ND	0.0050	1	10/06/2017 23:16
Carbon Disulfide	ND	0.0050	1	10/06/2017 23:16
Carbon Tetrachloride	ND	0.0050	1	10/06/2017 23:16
Chlorobenzene	ND	0.0050	1	10/06/2017 23:16
Chloroethane	ND	0.0050	1	10/06/2017 23:16
Chloroform	ND	0.0050	1	10/06/2017 23:16
Chloromethane	ND	0.0050	1	10/06/2017 23:16
2-Chlorotoluene	ND	0.0050	1	10/06/2017 23:16
4-Chlorotoluene	ND	0.0050	1	10/06/2017 23:16
Dibromochloromethane	ND	0.0050	1	10/06/2017 23:16
1,2-Dibromo-3-chloropropane	ND	0.0040	1	10/06/2017 23:16
1,2-Dibromoethane (EDB)	ND	0.0040	1	10/06/2017 23:16
Dibromomethane	ND	0.0050	1	10/06/2017 23:16
1,2-Dichlorobenzene	ND	0.0050	1	10/06/2017 23:16
1,3-Dichlorobenzene	ND	0.0050	1	10/06/2017 23:16
1,4-Dichlorobenzene	ND	0.0050	1	10/06/2017 23:16
Dichlorodifluoromethane	ND	0.0050	1	10/06/2017 23:16
1,1-Dichloroethane	ND	0.0050	1	10/06/2017 23:16
1,2-Dichloroethane (1,2-DCA)	ND	0.0040	1	10/06/2017 23:16
1,1-Dichloroethene	ND	0.0050	1	10/06/2017 23:16
cis-1,2-Dichloroethene	ND	0.0050	1	10/06/2017 23:16
trans-1,2-Dichloroethene	ND	0.0050	1	10/06/2017 23:16
1,2-Dichloropropane	ND	0.0050	1	10/06/2017 23:16
1,3-Dichloropropane	ND	0.0050	1	10/06/2017 23:16
2,2-Dichloropropane	ND	0.0050	1	10/06/2017 23:16

(Cont.)



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/2/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-46-10.0	1710036-001A	Soil	09/29/2017 12:03	GC10 10061725.D	146413

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	0.0050	1	10/06/2017 23:16
cis-1,3-Dichloropropene	ND	0.0050	1	10/06/2017 23:16
trans-1,3-Dichloropropene	ND	0.0050	1	10/06/2017 23:16
Diisopropyl ether (DIPE)	ND	0.0050	1	10/06/2017 23:16
Ethylbenzene	ND	0.0050	1	10/06/2017 23:16
Ethyl tert-butyl ether (ETBE)	ND	0.0050	1	10/06/2017 23:16
Freon 113	ND	0.0050	1	10/06/2017 23:16
Hexachlorobutadiene	ND	0.0050	1	10/06/2017 23:16
Hexachloroethane	ND	0.0050	1	10/06/2017 23:16
2-Hexanone	ND	0.0050	1	10/06/2017 23:16
Isopropylbenzene	ND	0.0050	1	10/06/2017 23:16
4-Isopropyl toluene	ND	0.0050	1	10/06/2017 23:16
Methyl-t-butyl ether (MTBE)	ND	0.0050	1	10/06/2017 23:16
Methylene chloride	ND	0.0050	1	10/06/2017 23:16
4-Methyl-2-pentanone (MIBK)	ND	0.0050	1	10/06/2017 23:16
Naphthalene	ND	0.0050	1	10/06/2017 23:16
n-Propyl benzene	ND	0.0050	1	10/06/2017 23:16
Styrene	ND	0.0050	1	10/06/2017 23:16
1,1,1,2-Tetrachloroethane	ND	0.0050	1	10/06/2017 23:16
1,1,2,2-Tetrachloroethane	ND	0.0050	1	10/06/2017 23:16
Tetrachloroethene	ND	0.0050	1	10/06/2017 23:16
Toluene	ND	0.0050	1	10/06/2017 23:16
1,2,3-Trichlorobenzene	ND	0.0050	1	10/06/2017 23:16
1,2,4-Trichlorobenzene	ND	0.0050	1	10/06/2017 23:16
1,1,1-Trichloroethane	ND	0.0050	1	10/06/2017 23:16
1,1,2-Trichloroethane	ND	0.0050	1	10/06/2017 23:16
Trichloroethene	ND	0.0050	1	10/06/2017 23:16
Trichlorofluoromethane	ND	0.0050	1	10/06/2017 23:16
1,2,3-Trichloropropane	ND	0.0050	1	10/06/2017 23:16
1,2,4-Trimethylbenzene	ND	0.0050	1	10/06/2017 23:16
1,3,5-Trimethylbenzene	ND	0.0050	1	10/06/2017 23:16
Vinyl Chloride	ND	0.0050	1	10/06/2017 23:16
Xylenes, Total	ND	0.0050	1	10/06/2017 23:16

(Cont.)



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/2/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-46-10.0	1710036-001A	Soil	09/29/2017 12:03	GC10 10061725.D	146413

Analytes	Result	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>	<u>Limits</u>		
Dibromofluoromethane	109	82-136		10/06/2017 23:16
Toluene-d8	117	92-139		10/06/2017 23:16
4-BFB	113	82-135		10/06/2017 23:16
Benzene-d6	94	55-122		10/06/2017 23:16
Ethylbenzene-d10	104	58-141		10/06/2017 23:16
1,2-DCB-d4	81	51-107		10/06/2017 23:16

Analyst(s): AK



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/2/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-14.0	1710036-004A	Soil	09/29/2017 10:22	GC28 10091712.D	146413

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	0.10	1	10/09/2017 14:23
tert-Amyl methyl ether (TAME)	ND	0.0050	1	10/09/2017 14:23
Benzene	ND	0.0050	1	10/09/2017 14:23
Bromobenzene	ND	0.0050	1	10/09/2017 14:23
Bromochloromethane	ND	0.0050	1	10/09/2017 14:23
Bromodichloromethane	ND	0.0050	1	10/09/2017 14:23
Bromoform	ND	0.0050	1	10/09/2017 14:23
Bromomethane	ND	0.0050	1	10/09/2017 14:23
2-Butanone (MEK)	ND	0.020	1	10/09/2017 14:23
t-Butyl alcohol (TBA)	ND	0.050	1	10/09/2017 14:23
n-Butyl benzene	ND	0.0050	1	10/09/2017 14:23
sec-Butyl benzene	ND	0.0050	1	10/09/2017 14:23
tert-Butyl benzene	ND	0.0050	1	10/09/2017 14:23
Carbon Disulfide	ND	0.0050	1	10/09/2017 14:23
Carbon Tetrachloride	ND	0.0050	1	10/09/2017 14:23
Chlorobenzene	ND	0.0050	1	10/09/2017 14:23
Chloroethane	ND	0.0050	1	10/09/2017 14:23
Chloroform	ND	0.0050	1	10/09/2017 14:23
Chloromethane	ND	0.0050	1	10/09/2017 14:23
2-Chlorotoluene	ND	0.0050	1	10/09/2017 14:23
4-Chlorotoluene	ND	0.0050	1	10/09/2017 14:23
Dibromochloromethane	ND	0.0050	1	10/09/2017 14:23
1,2-Dibromo-3-chloropropane	ND	0.0040	1	10/09/2017 14:23
1,2-Dibromoethane (EDB)	ND	0.0040	1	10/09/2017 14:23
Dibromomethane	ND	0.0050	1	10/09/2017 14:23
1,2-Dichlorobenzene	ND	0.0050	1	10/09/2017 14:23
1,3-Dichlorobenzene	ND	0.0050	1	10/09/2017 14:23
1,4-Dichlorobenzene	ND	0.0050	1	10/09/2017 14:23
Dichlorodifluoromethane	ND	0.0050	1	10/09/2017 14:23
1,1-Dichloroethane	ND	0.0050	1	10/09/2017 14:23
1,2-Dichloroethane (1,2-DCA)	ND	0.0040	1	10/09/2017 14:23
1,1-Dichloroethene	ND	0.0050	1	10/09/2017 14:23
cis-1,2-Dichloroethene	0.011	0.0050	1	10/09/2017 14:23
trans-1,2-Dichloroethene	ND	0.0050	1	10/09/2017 14:23
1,2-Dichloropropane	ND	0.0050	1	10/09/2017 14:23
1,3-Dichloropropane	ND	0.0050	1	10/09/2017 14:23
2,2-Dichloropropane	ND	0.0050	1	10/09/2017 14:23

(Cont.)



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/2/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-14.0	1710036-004A	Soil	09/29/2017 10:22	GC28 10091712.D	146413

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	0.0050	1	10/09/2017 14:23
cis-1,3-Dichloropropene	ND	0.0050	1	10/09/2017 14:23
trans-1,3-Dichloropropene	ND	0.0050	1	10/09/2017 14:23
Diisopropyl ether (DIPE)	ND	0.0050	1	10/09/2017 14:23
Ethylbenzene	ND	0.0050	1	10/09/2017 14:23
Ethyl tert-butyl ether (ETBE)	ND	0.0050	1	10/09/2017 14:23
Freon 113	ND	0.0050	1	10/09/2017 14:23
Hexachlorobutadiene	ND	0.0050	1	10/09/2017 14:23
Hexachloroethane	ND	0.0050	1	10/09/2017 14:23
2-Hexanone	ND	0.0050	1	10/09/2017 14:23
Isopropylbenzene	ND	0.0050	1	10/09/2017 14:23
4-Isopropyl toluene	ND	0.0050	1	10/09/2017 14:23
Methyl-t-butyl ether (MTBE)	ND	0.0050	1	10/09/2017 14:23
Methylene chloride	ND	0.0050	1	10/09/2017 14:23
4-Methyl-2-pentanone (MIBK)	ND	0.0050	1	10/09/2017 14:23
Naphthalene	ND	0.0050	1	10/09/2017 14:23
n-Propyl benzene	ND	0.0050	1	10/09/2017 14:23
Styrene	ND	0.0050	1	10/09/2017 14:23
1,1,1,2-Tetrachloroethane	ND	0.0050	1	10/09/2017 14:23
1,1,2,2-Tetrachloroethane	ND	0.0050	1	10/09/2017 14:23
Tetrachloroethene	ND	0.0050	1	10/09/2017 14:23
Toluene	ND	0.0050	1	10/09/2017 14:23
1,2,3-Trichlorobenzene	ND	0.0050	1	10/09/2017 14:23
1,2,4-Trichlorobenzene	ND	0.0050	1	10/09/2017 14:23
1,1,1-Trichloroethane	ND	0.0050	1	10/09/2017 14:23
1,1,2-Trichloroethane	ND	0.0050	1	10/09/2017 14:23
Trichloroethene	0.12	0.0050	1	10/09/2017 14:23
Trichlorofluoromethane	ND	0.0050	1	10/09/2017 14:23
1,2,3-Trichloropropane	ND	0.0050	1	10/09/2017 14:23
1,2,4-Trimethylbenzene	ND	0.0050	1	10/09/2017 14:23
1,3,5-Trimethylbenzene	ND	0.0050	1	10/09/2017 14:23
Vinyl Chloride	ND	0.0050	1	10/09/2017 14:23
Xylenes, Total	ND	0.0050	1	10/09/2017 14:23

(Cont.)



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/2/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-14.0	1710036-004A	Soil	09/29/2017 10:22	GC28 10091712.D	146413

Analytes	Result	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>	<u>Limits</u>		
Dibromofluoromethane	102	82-136		10/09/2017 14:23
Toluene-d8	115	92-139		10/09/2017 14:23
4-BFB	112	82-135		10/09/2017 14:23
Benzene-d6	80	55-122		10/09/2017 14:23
Ethylbenzene-d10	83	58-141		10/09/2017 14:23
1,2-DCB-d4	67	51-107		10/09/2017 14:23

Analyst(s): JEM



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/2/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-48-14.0	1710036-007A	Soil	09/29/2017 09:16	GC16 10071711.D	146413

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	0.10	1	10/07/2017 14:13
tert-Amyl methyl ether (TAME)	ND	0.0050	1	10/07/2017 14:13
Benzene	ND	0.0050	1	10/07/2017 14:13
Bromobenzene	ND	0.0050	1	10/07/2017 14:13
Bromochloromethane	ND	0.0050	1	10/07/2017 14:13
Bromodichloromethane	ND	0.0050	1	10/07/2017 14:13
Bromoform	ND	0.0050	1	10/07/2017 14:13
Bromomethane	ND	0.0050	1	10/07/2017 14:13
2-Butanone (MEK)	ND	0.020	1	10/07/2017 14:13
t-Butyl alcohol (TBA)	ND	0.050	1	10/07/2017 14:13
n-Butyl benzene	ND	0.0050	1	10/07/2017 14:13
sec-Butyl benzene	ND	0.0050	1	10/07/2017 14:13
tert-Butyl benzene	ND	0.0050	1	10/07/2017 14:13
Carbon Disulfide	ND	0.0050	1	10/07/2017 14:13
Carbon Tetrachloride	ND	0.0050	1	10/07/2017 14:13
Chlorobenzene	ND	0.0050	1	10/07/2017 14:13
Chloroethane	ND	0.0050	1	10/07/2017 14:13
Chloroform	ND	0.0050	1	10/07/2017 14:13
Chloromethane	ND	0.0050	1	10/07/2017 14:13
2-Chlorotoluene	ND	0.0050	1	10/07/2017 14:13
4-Chlorotoluene	ND	0.0050	1	10/07/2017 14:13
Dibromochloromethane	ND	0.0050	1	10/07/2017 14:13
1,2-Dibromo-3-chloropropane	ND	0.0040	1	10/07/2017 14:13
1,2-Dibromoethane (EDB)	ND	0.0040	1	10/07/2017 14:13
Dibromomethane	ND	0.0050	1	10/07/2017 14:13
1,2-Dichlorobenzene	ND	0.0050	1	10/07/2017 14:13
1,3-Dichlorobenzene	ND	0.0050	1	10/07/2017 14:13
1,4-Dichlorobenzene	ND	0.0050	1	10/07/2017 14:13
Dichlorodifluoromethane	ND	0.0050	1	10/07/2017 14:13
1,1-Dichloroethane	ND	0.0050	1	10/07/2017 14:13
1,2-Dichloroethane (1,2-DCA)	ND	0.0040	1	10/07/2017 14:13
1,1-Dichloroethene	ND	0.0050	1	10/07/2017 14:13
cis-1,2-Dichloroethene	ND	0.0050	1	10/07/2017 14:13
trans-1,2-Dichloroethene	ND	0.0050	1	10/07/2017 14:13
1,2-Dichloropropane	ND	0.0050	1	10/07/2017 14:13
1,3-Dichloropropane	ND	0.0050	1	10/07/2017 14:13
2,2-Dichloropropane	ND	0.0050	1	10/07/2017 14:13

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Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/2/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-48-14.0	1710036-007A	Soil	09/29/2017 09:16	GC16 10071711.D	146413

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	0.0050	1	10/07/2017 14:13
cis-1,3-Dichloropropene	ND	0.0050	1	10/07/2017 14:13
trans-1,3-Dichloropropene	ND	0.0050	1	10/07/2017 14:13
Diisopropyl ether (DIPE)	ND	0.0050	1	10/07/2017 14:13
Ethylbenzene	ND	0.0050	1	10/07/2017 14:13
Ethyl tert-butyl ether (ETBE)	ND	0.0050	1	10/07/2017 14:13
Freon 113	ND	0.0050	1	10/07/2017 14:13
Hexachlorobutadiene	ND	0.0050	1	10/07/2017 14:13
Hexachloroethane	ND	0.0050	1	10/07/2017 14:13
2-Hexanone	ND	0.0050	1	10/07/2017 14:13
Isopropylbenzene	ND	0.0050	1	10/07/2017 14:13
4-Isopropyl toluene	ND	0.0050	1	10/07/2017 14:13
Methyl-t-butyl ether (MTBE)	ND	0.0050	1	10/07/2017 14:13
Methylene chloride	ND	0.0050	1	10/07/2017 14:13
4-Methyl-2-pentanone (MIBK)	ND	0.0050	1	10/07/2017 14:13
Naphthalene	ND	0.0050	1	10/07/2017 14:13
n-Propyl benzene	ND	0.0050	1	10/07/2017 14:13
Styrene	ND	0.0050	1	10/07/2017 14:13
1,1,1,2-Tetrachloroethane	ND	0.0050	1	10/07/2017 14:13
1,1,2,2-Tetrachloroethane	ND	0.0050	1	10/07/2017 14:13
Tetrachloroethene	ND	0.0050	1	10/07/2017 14:13
Toluene	ND	0.0050	1	10/07/2017 14:13
1,2,3-Trichlorobenzene	ND	0.0050	1	10/07/2017 14:13
1,2,4-Trichlorobenzene	ND	0.0050	1	10/07/2017 14:13
1,1,1-Trichloroethane	ND	0.0050	1	10/07/2017 14:13
1,1,2-Trichloroethane	ND	0.0050	1	10/07/2017 14:13
Trichloroethene	ND	0.0050	1	10/07/2017 14:13
Trichlorofluoromethane	ND	0.0050	1	10/07/2017 14:13
1,2,3-Trichloropropane	ND	0.0050	1	10/07/2017 14:13
1,2,4-Trimethylbenzene	ND	0.0050	1	10/07/2017 14:13
1,3,5-Trimethylbenzene	ND	0.0050	1	10/07/2017 14:13
Vinyl Chloride	ND	0.0050	1	10/07/2017 14:13
Xylenes, Total	ND	0.0050	1	10/07/2017 14:13

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Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/2/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-48-14.0	1710036-007A	Soil	09/29/2017 09:16	GC16 10071711.D	146413

Analytes	Result	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>	<u>Limits</u>		
Dibromofluoromethane	114	82-136		10/07/2017 14:13
Toluene-d8	117	92-139		10/07/2017 14:13
4-BFB	115	82-135		10/07/2017 14:13
Benzene-d6	93	55-122		10/07/2017 14:13
Ethylbenzene-d10	110	58-141		10/07/2017 14:13
1,2-DCB-d4	85	51-107		10/07/2017 14:13

Analyst(s): AK



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-46-GW	1710036-010B	Water	09/29/2017 14:00	GC10 10071740.D	146723

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	10	1	10/08/2017 12:30
tert-Amyl methyl ether (TAME)	ND	0.50	1	10/08/2017 12:30
Benzene	ND	0.50	1	10/08/2017 12:30
Bromobenzene	ND	0.50	1	10/08/2017 12:30
Bromochloromethane	ND	0.50	1	10/08/2017 12:30
Bromodichloromethane	ND	0.50	1	10/08/2017 12:30
Bromoform	ND	0.50	1	10/08/2017 12:30
Bromomethane	ND	0.50	1	10/08/2017 12:30
2-Butanone (MEK)	ND	2.0	1	10/08/2017 12:30
t-Butyl alcohol (TBA)	ND	2.0	1	10/08/2017 12:30
n-Butyl benzene	ND	0.50	1	10/08/2017 12:30
sec-Butyl benzene	ND	0.50	1	10/08/2017 12:30
tert-Butyl benzene	ND	0.50	1	10/08/2017 12:30
Carbon Disulfide	ND	0.50	1	10/08/2017 12:30
Carbon Tetrachloride	ND	0.50	1	10/08/2017 12:30
Chlorobenzene	ND	0.50	1	10/08/2017 12:30
Chloroethane	ND	0.50	1	10/08/2017 12:30
Chloroform	ND	0.50	1	10/08/2017 12:30
Chloromethane	ND	0.50	1	10/08/2017 12:30
2-Chlorotoluene	ND	0.50	1	10/08/2017 12:30
4-Chlorotoluene	ND	0.50	1	10/08/2017 12:30
Dibromochloromethane	ND	0.50	1	10/08/2017 12:30
1,2-Dibromo-3-chloropropane	ND	0.20	1	10/08/2017 12:30
1,2-Dibromoethane (EDB)	ND	0.50	1	10/08/2017 12:30
Dibromomethane	ND	0.50	1	10/08/2017 12:30
1,2-Dichlorobenzene	ND	0.50	1	10/08/2017 12:30
1,3-Dichlorobenzene	ND	0.50	1	10/08/2017 12:30
1,4-Dichlorobenzene	ND	0.50	1	10/08/2017 12:30
Dichlorodifluoromethane	ND	0.50	1	10/08/2017 12:30
1,1-Dichloroethane	ND	0.50	1	10/08/2017 12:30
1,2-Dichloroethane (1,2-DCA)	ND	0.50	1	10/08/2017 12:30
1,1-Dichloroethene	ND	0.50	1	10/08/2017 12:30
cis-1,2-Dichloroethene	ND	0.50	1	10/08/2017 12:30
trans-1,2-Dichloroethene	ND	0.50	1	10/08/2017 12:30
1,2-Dichloropropane	ND	0.50	1	10/08/2017 12:30
1,3-Dichloropropane	ND	0.50	1	10/08/2017 12:30
2,2-Dichloropropane	ND	0.50	1	10/08/2017 12:30

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Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-46-GW	1710036-010B	Water	09/29/2017 14:00	GC10 10071740.D	146723

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	0.50	1	10/08/2017 12:30
cis-1,3-Dichloropropene	ND	0.50	1	10/08/2017 12:30
trans-1,3-Dichloropropene	ND	0.50	1	10/08/2017 12:30
Diisopropyl ether (DIPE)	ND	0.50	1	10/08/2017 12:30
Ethylbenzene	ND	0.50	1	10/08/2017 12:30
Ethyl tert-butyl ether (ETBE)	ND	0.50	1	10/08/2017 12:30
Freon 113	ND	0.50	1	10/08/2017 12:30
Hexachlorobutadiene	ND	0.50	1	10/08/2017 12:30
Hexachloroethane	ND	0.50	1	10/08/2017 12:30
2-Hexanone	ND	0.50	1	10/08/2017 12:30
Isopropylbenzene	ND	0.50	1	10/08/2017 12:30
4-Isopropyl toluene	ND	0.50	1	10/08/2017 12:30
Methyl-t-butyl ether (MTBE)	ND	0.50	1	10/08/2017 12:30
Methylene chloride	ND	0.50	1	10/08/2017 12:30
4-Methyl-2-pentanone (MIBK)	ND	0.50	1	10/08/2017 12:30
Naphthalene	ND	0.50	1	10/08/2017 12:30
n-Propyl benzene	ND	0.50	1	10/08/2017 12:30
Styrene	ND	0.50	1	10/08/2017 12:30
1,1,1,2-Tetrachloroethane	ND	0.50	1	10/08/2017 12:30
1,1,2,2-Tetrachloroethane	ND	0.50	1	10/08/2017 12:30
Tetrachloroethene	ND	0.50	1	10/08/2017 12:30
Toluene	ND	0.50	1	10/08/2017 12:30
1,2,3-Trichlorobenzene	ND	0.50	1	10/08/2017 12:30
1,2,4-Trichlorobenzene	ND	0.50	1	10/08/2017 12:30
1,1,1-Trichloroethane	ND	0.50	1	10/08/2017 12:30
1,1,2-Trichloroethane	ND	0.50	1	10/08/2017 12:30
Trichloroethene	ND	0.50	1	10/08/2017 12:30
Trichlorofluoromethane	ND	0.50	1	10/08/2017 12:30
1,2,3-Trichloropropane	ND	0.50	1	10/08/2017 12:30
1,2,4-Trimethylbenzene	ND	0.50	1	10/08/2017 12:30
1,3,5-Trimethylbenzene	ND	0.50	1	10/08/2017 12:30
Vinyl Chloride	ND	0.50	1	10/08/2017 12:30
Xylenes, Total	ND	0.50	1	10/08/2017 12:30

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Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-46-GW	1710036-010B	Water	09/29/2017 14:00	GC10 10071740.D	146723

Analytes	Result	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>	
Dibromofluoromethane	107	78-134		10/08/2017 12:30
Toluene-d8	108	82-120		10/08/2017 12:30
4-BFB	95	69-131		10/08/2017 12:30

Analyst(s): AK



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-GW	1710036-011B	Water	09/29/2017 13:30	GC28 10091714.D	146723

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	100	10	10/09/2017 15:42
tert-Amyl methyl ether (TAME)	ND	5.0	10	10/09/2017 15:42
Benzene	ND	5.0	10	10/09/2017 15:42
Bromobenzene	ND	5.0	10	10/09/2017 15:42
Bromochloromethane	ND	5.0	10	10/09/2017 15:42
Bromodichloromethane	ND	5.0	10	10/09/2017 15:42
Bromoform	ND	5.0	10	10/09/2017 15:42
Bromomethane	ND	5.0	10	10/09/2017 15:42
2-Butanone (MEK)	ND	20	10	10/09/2017 15:42
t-Butyl alcohol (TBA)	ND	20	10	10/09/2017 15:42
n-Butyl benzene	ND	5.0	10	10/09/2017 15:42
sec-Butyl benzene	ND	5.0	10	10/09/2017 15:42
tert-Butyl benzene	ND	5.0	10	10/09/2017 15:42
Carbon Disulfide	ND	5.0	10	10/09/2017 15:42
Carbon Tetrachloride	ND	5.0	10	10/09/2017 15:42
Chlorobenzene	ND	5.0	10	10/09/2017 15:42
Chloroethane	ND	5.0	10	10/09/2017 15:42
Chloroform	ND	5.0	10	10/09/2017 15:42
Chloromethane	ND	5.0	10	10/09/2017 15:42
2-Chlorotoluene	ND	5.0	10	10/09/2017 15:42
4-Chlorotoluene	ND	5.0	10	10/09/2017 15:42
Dibromochloromethane	ND	5.0	10	10/09/2017 15:42
1,2-Dibromo-3-chloropropane	ND	2.0	10	10/09/2017 15:42
1,2-Dibromoethane (EDB)	ND	5.0	10	10/09/2017 15:42
Dibromomethane	ND	5.0	10	10/09/2017 15:42
1,2-Dichlorobenzene	ND	5.0	10	10/09/2017 15:42
1,3-Dichlorobenzene	ND	5.0	10	10/09/2017 15:42
1,4-Dichlorobenzene	ND	5.0	10	10/09/2017 15:42
Dichlorodifluoromethane	ND	5.0	10	10/09/2017 15:42
1,1-Dichloroethane	ND	5.0	10	10/09/2017 15:42
1,2-Dichloroethane (1,2-DCA)	ND	5.0	10	10/09/2017 15:42
1,1-Dichloroethene	ND	5.0	10	10/09/2017 15:42
cis-1,2-Dichloroethene	83	5.0	10	10/09/2017 15:42
trans-1,2-Dichloroethene	ND	5.0	10	10/09/2017 15:42
1,2-Dichloropropane	ND	5.0	10	10/09/2017 15:42
1,3-Dichloropropane	ND	5.0	10	10/09/2017 15:42
2,2-Dichloropropane	ND	5.0	10	10/09/2017 15:42

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Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-GW	1710036-011B	Water	09/29/2017 13:30	GC28 10091714.D	146723

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	5.0	10	10/09/2017 15:42
cis-1,3-Dichloropropene	ND	5.0	10	10/09/2017 15:42
trans-1,3-Dichloropropene	ND	5.0	10	10/09/2017 15:42
Diisopropyl ether (DIPE)	ND	5.0	10	10/09/2017 15:42
Ethylbenzene	ND	5.0	10	10/09/2017 15:42
Ethyl tert-butyl ether (ETBE)	ND	5.0	10	10/09/2017 15:42
Freon 113	ND	5.0	10	10/09/2017 15:42
Hexachlorobutadiene	ND	5.0	10	10/09/2017 15:42
Hexachloroethane	ND	5.0	10	10/09/2017 15:42
2-Hexanone	ND	5.0	10	10/09/2017 15:42
Isopropylbenzene	ND	5.0	10	10/09/2017 15:42
4-Isopropyl toluene	ND	5.0	10	10/09/2017 15:42
Methyl-t-butyl ether (MTBE)	ND	5.0	10	10/09/2017 15:42
Methylene chloride	ND	5.0	10	10/09/2017 15:42
4-Methyl-2-pentanone (MIBK)	ND	5.0	10	10/09/2017 15:42
Naphthalene	ND	5.0	10	10/09/2017 15:42
n-Propyl benzene	ND	5.0	10	10/09/2017 15:42
Styrene	ND	5.0	10	10/09/2017 15:42
1,1,1,2-Tetrachloroethane	ND	5.0	10	10/09/2017 15:42
1,1,2,2-Tetrachloroethane	ND	5.0	10	10/09/2017 15:42
Tetrachloroethene	ND	5.0	10	10/09/2017 15:42
Toluene	ND	5.0	10	10/09/2017 15:42
1,2,3-Trichlorobenzene	ND	5.0	10	10/09/2017 15:42
1,2,4-Trichlorobenzene	ND	5.0	10	10/09/2017 15:42
1,1,1-Trichloroethane	ND	5.0	10	10/09/2017 15:42
1,1,2-Trichloroethane	ND	5.0	10	10/09/2017 15:42
Trichloroethene	130	5.0	10	10/09/2017 15:42
Trichlorofluoromethane	ND	5.0	10	10/09/2017 15:42
1,2,3-Trichloropropane	ND	5.0	10	10/09/2017 15:42
1,2,4-Trimethylbenzene	ND	5.0	10	10/09/2017 15:42
1,3,5-Trimethylbenzene	ND	5.0	10	10/09/2017 15:42
Vinyl Chloride	ND	5.0	10	10/09/2017 15:42
Xylenes, Total	ND	5.0	10	10/09/2017 15:42

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Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-GW	1710036-011B	Water	09/29/2017 13:30	GC28 10091714.D	146723

Analytes	Result	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>	<u>Limits</u>		
Dibromofluoromethane	106	78-134		10/09/2017 15:42
Toluene-d8	108	82-120		10/09/2017 15:42
4-BFB	104	69-131		10/09/2017 15:42

Analyst(s): JEM



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-48-GW	1710036-012B	Water	09/29/2017 13:20	GC10 10071741.D	146723

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	10	1	10/08/2017 13:10
tert-Amyl methyl ether (TAME)	ND	0.50	1	10/08/2017 13:10
Benzene	ND	0.50	1	10/08/2017 13:10
Bromobenzene	ND	0.50	1	10/08/2017 13:10
Bromochloromethane	ND	0.50	1	10/08/2017 13:10
Bromodichloromethane	ND	0.50	1	10/08/2017 13:10
Bromoform	ND	0.50	1	10/08/2017 13:10
Bromomethane	ND	0.50	1	10/08/2017 13:10
2-Butanone (MEK)	ND	2.0	1	10/08/2017 13:10
t-Butyl alcohol (TBA)	ND	2.0	1	10/08/2017 13:10
n-Butyl benzene	ND	0.50	1	10/08/2017 13:10
sec-Butyl benzene	ND	0.50	1	10/08/2017 13:10
tert-Butyl benzene	ND	0.50	1	10/08/2017 13:10
Carbon Disulfide	ND	0.50	1	10/08/2017 13:10
Carbon Tetrachloride	ND	0.50	1	10/08/2017 13:10
Chlorobenzene	ND	0.50	1	10/08/2017 13:10
Chloroethane	ND	0.50	1	10/08/2017 13:10
Chloroform	2.1	0.50	1	10/08/2017 13:10
Chloromethane	ND	0.50	1	10/08/2017 13:10
2-Chlorotoluene	ND	0.50	1	10/08/2017 13:10
4-Chlorotoluene	ND	0.50	1	10/08/2017 13:10
Dibromochloromethane	ND	0.50	1	10/08/2017 13:10
1,2-Dibromo-3-chloropropane	ND	0.20	1	10/08/2017 13:10
1,2-Dibromoethane (EDB)	ND	0.50	1	10/08/2017 13:10
Dibromomethane	ND	0.50	1	10/08/2017 13:10
1,2-Dichlorobenzene	ND	0.50	1	10/08/2017 13:10
1,3-Dichlorobenzene	ND	0.50	1	10/08/2017 13:10
1,4-Dichlorobenzene	ND	0.50	1	10/08/2017 13:10
Dichlorodifluoromethane	ND	0.50	1	10/08/2017 13:10
1,1-Dichloroethane	ND	0.50	1	10/08/2017 13:10
1,2-Dichloroethane (1,2-DCA)	0.53	0.50	1	10/08/2017 13:10
1,1-Dichloroethene	ND	0.50	1	10/08/2017 13:10
cis-1,2-Dichloroethene	ND	0.50	1	10/08/2017 13:10
trans-1,2-Dichloroethene	ND	0.50	1	10/08/2017 13:10
1,2-Dichloropropane	ND	0.50	1	10/08/2017 13:10
1,3-Dichloropropane	ND	0.50	1	10/08/2017 13:10
2,2-Dichloropropane	ND	0.50	1	10/08/2017 13:10

(Cont.)



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-48-GW	1710036-012B	Water	09/29/2017 13:20	GC10 10071741.D	146723

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	0.50	1	10/08/2017 13:10
cis-1,3-Dichloropropene	ND	0.50	1	10/08/2017 13:10
trans-1,3-Dichloropropene	ND	0.50	1	10/08/2017 13:10
Diisopropyl ether (DIPE)	ND	0.50	1	10/08/2017 13:10
Ethylbenzene	ND	0.50	1	10/08/2017 13:10
Ethyl tert-butyl ether (ETBE)	ND	0.50	1	10/08/2017 13:10
Freon 113	ND	0.50	1	10/08/2017 13:10
Hexachlorobutadiene	ND	0.50	1	10/08/2017 13:10
Hexachloroethane	ND	0.50	1	10/08/2017 13:10
2-Hexanone	ND	0.50	1	10/08/2017 13:10
Isopropylbenzene	ND	0.50	1	10/08/2017 13:10
4-Isopropyl toluene	ND	0.50	1	10/08/2017 13:10
Methyl-t-butyl ether (MTBE)	ND	0.50	1	10/08/2017 13:10
Methylene chloride	ND	0.50	1	10/08/2017 13:10
4-Methyl-2-pentanone (MIBK)	ND	0.50	1	10/08/2017 13:10
Naphthalene	ND	0.50	1	10/08/2017 13:10
n-Propyl benzene	ND	0.50	1	10/08/2017 13:10
Styrene	ND	0.50	1	10/08/2017 13:10
1,1,1,2-Tetrachloroethane	ND	0.50	1	10/08/2017 13:10
1,1,2,2-Tetrachloroethane	ND	0.50	1	10/08/2017 13:10
Tetrachloroethene	1.7	0.50	1	10/08/2017 13:10
Toluene	ND	0.50	1	10/08/2017 13:10
1,2,3-Trichlorobenzene	ND	0.50	1	10/08/2017 13:10
1,2,4-Trichlorobenzene	ND	0.50	1	10/08/2017 13:10
1,1,1-Trichloroethane	ND	0.50	1	10/08/2017 13:10
1,1,2-Trichloroethane	ND	0.50	1	10/08/2017 13:10
Trichloroethene	0.72	0.50	1	10/08/2017 13:10
Trichlorofluoromethane	ND	0.50	1	10/08/2017 13:10
1,2,3-Trichloropropane	ND	0.50	1	10/08/2017 13:10
1,2,4-Trimethylbenzene	ND	0.50	1	10/08/2017 13:10
1,3,5-Trimethylbenzene	ND	0.50	1	10/08/2017 13:10
Vinyl Chloride	ND	0.50	1	10/08/2017 13:10
Xylenes, Total	ND	0.50	1	10/08/2017 13:10

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Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/8/17-10/9/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-48-GW	1710036-012B	Water	09/29/2017 13:20	GC10 10071741.D	146723

Analytes	Result	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>	
Dibromofluoromethane	108	78-134		10/08/2017 13:10
Toluene-d8	108	82-120		10/08/2017 13:10
4-BFB	93	69-131		10/08/2017 13:10

Analyst(s): AK



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/2/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8021B/8015Bm
Unit: mg/Kg

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-46-10.0	1710036-001A	Soil	09/29/2017 12:03	GC7 10041727.D	146363

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND	1.0	1	10/05/2017 01:09
MTBE	---	0.050	1	10/05/2017 01:09
Benzene	---	0.0050	1	10/05/2017 01:09
Toluene	---	0.0050	1	10/05/2017 01:09
Ethylbenzene	---	0.0050	1	10/05/2017 01:09
Xylenes	---	0.015	1	10/05/2017 01:09

Surrogates	REC (%)	Limits	Date Analyzed
2-Fluorotoluene	77	62-126	10/05/2017 01:09

Analyst(s): IA

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-14.0	1710036-004A	Soil	09/29/2017 10:22	GC7 10041728.D	146363

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND	1.0	1	10/05/2017 01:39
MTBE	---	0.050	1	10/05/2017 01:39
Benzene	---	0.0050	1	10/05/2017 01:39
Toluene	---	0.0050	1	10/05/2017 01:39
Ethylbenzene	---	0.0050	1	10/05/2017 01:39
Xylenes	---	0.015	1	10/05/2017 01:39

Surrogates	REC (%)	Limits	Date Analyzed
2-Fluorotoluene	74	62-126	10/05/2017 01:39

Analyst(s): IA



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/2/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8021B/8015Bm
Unit: mg/Kg

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-48-14.0	1710036-007A	Soil	09/29/2017 09:16	GC7 10041729.D	146363

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND	1.0	1	10/05/2017 02:09
MTBE	---	0.050	1	10/05/2017 02:09
Benzene	---	0.0050	1	10/05/2017 02:09
Toluene	---	0.0050	1	10/05/2017 02:09
Ethylbenzene	---	0.0050	1	10/05/2017 02:09
Xylenes	---	0.015	1	10/05/2017 02:09

Surrogates	REC (%)	Limits	Date Analyzed
2-Fluorotoluene	78	62-126	10/05/2017 02:09

Analyst(s): IA



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/4/17-10/6/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
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
B-46-GW	1710036-010A	Water	09/29/2017 14:00	GC7 10031729.D	146458

<u>Analytes</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
TPH(g) (C6-C12)	ND	50	1	10/04/2017 01:52
MTBE	---	5.0	1	10/04/2017 01:52
Benzene	---	0.50	1	10/04/2017 01:52
Toluene	---	0.50	1	10/04/2017 01:52
Ethylbenzene	---	0.50	1	10/04/2017 01:52
Xylenes	---	1.5	1	10/04/2017 01:52
<u>Surrogates</u>	<u>REC (%)</u>	<u>Limits</u>		
aaa-TFT	99	89-115		10/04/2017 01:52

Analyst(s): IA

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-GW	1710036-011A	Water	09/29/2017 13:30	GC3 10061717.D	146708

<u>Analytes</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
TPH(g) (C6-C12)	ND	50	1	10/06/2017 18:37
MTBE	---	5.0	1	10/06/2017 18:37
Benzene	---	0.50	1	10/06/2017 18:37
Toluene	---	0.50	1	10/06/2017 18:37
Ethylbenzene	---	0.50	1	10/06/2017 18:37
Xylenes	---	1.5	1	10/06/2017 18:37
<u>Surrogates</u>	<u>REC (%)</u>	<u>Qualifiers</u>	<u>Limits</u>	
aaa-TFT	695	S	89-115	10/06/2017 18:37

Analyst(s): IA

Analytical Comments: d6,c4



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/4/17-10/6/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
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
B-48-GW	1710036-012A	Water	09/29/2017 13:20	GC7 10031731.D	146458

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND	50	1	10/04/2017 02:52
MTBE	---	5.0	1	10/04/2017 02:52
Benzene	---	0.50	1	10/04/2017 02:52
Toluene	---	0.50	1	10/04/2017 02:52
Ethylbenzene	---	0.50	1	10/04/2017 02:52
Xylenes	---	1.5	1	10/04/2017 02:52

Surrogates	REC (%)	Limits	
aaa-TFT	105	89-115	10/04/2017 02:52

Analyst(s): IA



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/2/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW3550B
Analytical Method: SW8015B
Unit: mg/Kg

Total Extractable Petroleum Hydrocarbons w/out SG Clean-Up

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-46-10.0	1710036-001A	Soil	09/29/2017 12:03	GC9b 10091719.D	146416

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	3.9	1.0	1	10/09/2017 14:06
TPH-Motor Oil (C18-C36)	6.9	5.0	1	10/09/2017 14:06

Surrogates	REC (%)	Limits	Date Analyzed
C9	97	78-126	10/09/2017 14:06

Analyst(s): TK **Analytical Comments:** e2,e7

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-14.0	1710036-004A	Soil	09/29/2017 10:22	GC39B 10091709.D	146416

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	360	100	100	10/09/2017 16:24
TPH-Motor Oil (C18-C36)	1300	500	100	10/09/2017 16:24

Surrogates	REC (%)	Limits	Date Analyzed
C26	117	79-117	10/09/2017 16:24

Analyst(s): TK **Analytical Comments:** e7,e2

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-48-14.0	1710036-007A	Soil	09/29/2017 09:16	GC9b 10091721.D	146416

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	1.0	1	10/09/2017 14:44
TPH-Motor Oil (C18-C36)	ND	5.0	1	10/09/2017 14:44

Surrogates	REC (%)	Limits	Date Analyzed
C9	97	78-126	10/09/2017 14:44

Analyst(s): TK



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/2/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
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
B-46-GW	1710036-010A	Water	09/29/2017 14:00	GC11A 10061768.D	146368

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	120	50	1	10/07/2017 10:14
TPH-Motor Oil (C18-C36)	390	250	1	10/07/2017 10:14

Surrogates	REC (%)	Limits
C9	95	61-139

Analyst(s): TK **Analytical Comments:** e7,e2

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-GW	1710036-011A	Water	09/29/2017 13:30	GC9a 10091730.D	146368

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	78,000	25,000	500	10/09/2017 17:20
TPH-Motor Oil (C18-C36)	330,000	120,000	500	10/09/2017 17:20

Surrogates	REC (%)	Qualifiers	Limits
C9	1184	S	61-139

Analyst(s): TK **Analytical Comments:** e7,e2,c2

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-48-GW	1710036-012A	Water	09/29/2017 13:20	GC9b 10091725.D	146368

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	78	50	1	10/09/2017 16:02
TPH-Motor Oil (C18-C36)	ND	250	1	10/09/2017 16:02

Surrogates	REC (%)	Limits
C9	100	61-139

Analyst(s): TK **Analytical Comments:** e2



Quality Control Report

Client: Langan
Date Prepared: 10/2/17
Date Analyzed: 10/3/17
Instrument: GC18
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment


WorkOrder: 1710036
BatchID: 146413
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg
Sample ID: MB/LCS-146413
 1709375-011EMS/MSD

QC Summary Report for SW8260B

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
Acetone	ND	0.10	-	-	-
tert-Amyl methyl ether (TAME)	ND	0.0050	-	-	-
Benzene	ND	0.0050	-	-	-
Bromobenzene	ND	0.0050	-	-	-
Bromochloromethane	ND	0.0050	-	-	-
Bromodichloromethane	ND	0.0050	-	-	-
Bromoform	ND	0.0050	-	-	-
Bromomethane	ND	0.0050	-	-	-
2-Butanone (MEK)	ND	0.020	-	-	-
t-Butyl alcohol (TBA)	ND	0.050	-	-	-
n-Butyl benzene	ND	0.0050	-	-	-
sec-Butyl benzene	ND	0.0050	-	-	-
tert-Butyl benzene	ND	0.0050	-	-	-
Carbon Disulfide	ND	0.0050	-	-	-
Carbon Tetrachloride	ND	0.0050	-	-	-
Chlorobenzene	ND	0.0050	-	-	-
Chloroethane	ND	0.0050	-	-	-
Chloroform	ND	0.0050	-	-	-
Chloromethane	ND	0.0050	-	-	-
2-Chlorotoluene	ND	0.0050	-	-	-
4-Chlorotoluene	ND	0.0050	-	-	-
Dibromochloromethane	ND	0.0050	-	-	-
1,2-Dibromo-3-chloropropane	ND	0.0040	-	-	-
1,2-Dibromoethane (EDB)	ND	0.0040	-	-	-
Dibromomethane	ND	0.0050	-	-	-
1,2-Dichlorobenzene	ND	0.0050	-	-	-
1,3-Dichlorobenzene	ND	0.0050	-	-	-
1,4-Dichlorobenzene	ND	0.0050	-	-	-
Dichlorodifluoromethane	ND	0.0050	-	-	-
1,1-Dichloroethane	ND	0.0050	-	-	-
1,2-Dichloroethane (1,2-DCA)	ND	0.0040	-	-	-
1,1-Dichloroethene	ND	0.0050	-	-	-
cis-1,2-Dichloroethene	ND	0.0050	-	-	-
trans-1,2-Dichloroethene	ND	0.0050	-	-	-
1,2-Dichloropropane	ND	0.0050	-	-	-
1,3-Dichloropropane	ND	0.0050	-	-	-
2,2-Dichloropropane	ND	0.0050	-	-	-
1,1-Dichloropropene	ND	0.0050	-	-	-
cis-1,3-Dichloropropene	ND	0.0050	-	-	-

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CA ELAP 1644 • NELAP 4033ORELAP

 QA/QC Officer



Quality Control Report

Client: Langan
Date Prepared: 10/2/17
Date Analyzed: 10/3/17
Instrument: GC18
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146413
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg
Sample ID: MB/LCS-146413
 1709375-011EMS/MSD

QC Summary Report for SW8260B

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
trans-1,3-Dichloropropene	ND	0.0050	-	-	-
Diisopropyl ether (DIPE)	ND	0.0050	-	-	-
Ethylbenzene	ND	0.0050	-	-	-
Ethyl tert-butyl ether (ETBE)	ND	0.0050	-	-	-
Freon 113	ND	0.0050	-	-	-
Hexachlorobutadiene	ND	0.0050	-	-	-
Hexachloroethane	ND	0.0050	-	-	-
2-Hexanone	ND	0.0050	-	-	-
Isopropylbenzene	ND	0.0050	-	-	-
4-Isopropyl toluene	ND	0.0050	-	-	-
Methyl-t-butyl ether (MTBE)	ND	0.0050	-	-	-
Methylene chloride	ND	0.0050	-	-	-
4-Methyl-2-pentanone (MIBK)	ND	0.0050	-	-	-
Naphthalene	ND	0.0050	-	-	-
n-Propyl benzene	ND	0.0050	-	-	-
Styrene	ND	0.0050	-	-	-
1,1,1,2-Tetrachloroethane	ND	0.0050	-	-	-
1,1,2,2-Tetrachloroethane	ND	0.0050	-	-	-
Tetrachloroethene	ND	0.0050	-	-	-
Toluene	ND	0.0050	-	-	-
1,2,3-Trichlorobenzene	ND	0.0050	-	-	-
1,2,4-Trichlorobenzene	ND	0.0050	-	-	-
1,1,1-Trichloroethane	ND	0.0050	-	-	-
1,1,2-Trichloroethane	ND	0.0050	-	-	-
Trichloroethene	ND	0.0050	-	-	-
Trichlorofluoromethane	ND	0.0050	-	-	-
1,2,3-Trichloropropane	ND	0.0050	-	-	-
1,2,4-Trimethylbenzene	ND	0.0050	-	-	-
1,3,5-Trimethylbenzene	ND	0.0050	-	-	-
Vinyl Chloride	ND	0.0050	-	-	-
Xylenes, Total	ND	0.0050	-	-	-

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Quality Control Report

Client: Langan
Date Prepared: 10/2/17
Date Analyzed: 10/3/17
Instrument: GC18
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146413
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg
Sample ID: MB/LCS-146413
 1709375-011EMS/MSD

QC Summary Report for SW8260B

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
Surrogate Recovery					
Dibromofluoromethane	0.1425		0.12	114	87-127
Toluene-d8	0.1645		0.12	132	93-141
4-BFB	0.01479		0.012	118	84-137
Benzene-d6	0.1096		0.10	110	67-131
Ethylbenzene-d10	0.1268		0.10	127	78-153
1,2-DCB-d4	0.08013		0.10	80	63-109



Quality Control Report

Client: Langan
Date Prepared: 10/2/17
Date Analyzed: 10/3/17
Instrument: GC18
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146413
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg
Sample ID: MB/LCS-146413
 1709375-011EMS/MSD

QC Summary Report for SW8260B

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Acetone	0.944	-	1	94	-	48-156	-	-
tert-Amyl methyl ether (TAME)	0.0382	-	0.050	76	-	56-115	-	-
Benzene	0.0436	-	0.050	87	-	63-131	-	-
Bromobenzene	0.0471	-	0.050	94	-	66-127	-	-
Bromochloromethane	0.0439	-	0.050	88	-	64-124	-	-
Bromodichloromethane	0.0390	-	0.050	78	-	64-120	-	-
Bromoform	0.0334	-	0.050	67	-	48-92	-	-
Bromomethane	0.0661	-	0.050	132	-	25-163	-	-
2-Butanone (MEK)	0.176	-	0.20	88	-	51-133	-	-
t-Butyl alcohol (TBA)	0.175	-	0.20	88	-	52-129	-	-
n-Butyl benzene	0.0604	-	0.050	121	-	83-200	-	-
sec-Butyl benzene	0.0646	-	0.050	129	-	81-199	-	-
tert-Butyl benzene	0.0584	-	0.050	117	-	79-178	-	-
Carbon Disulfide	0.0490	-	0.050	98	-	64-136	-	-
Carbon Tetrachloride	0.0449	-	0.050	90	-	66-140	-	-
Chlorobenzene	0.0431	-	0.050	86	-	73-116	-	-
Chloroethane	0.0508	-	0.050	102	-	35-147	-	-
Chloroform	0.0415	-	0.050	83	-	65-130	-	-
Chloromethane	0.0363	-	0.050	73	-	30-137	-	-
2-Chlorotoluene	0.0548	-	0.050	110	-	75-152	-	-
4-Chlorotoluene	0.0531	-	0.050	106	-	71-148	-	-
Dibromochloromethane	0.0409	-	0.050	82	-	61-106	-	-
1,2-Dibromo-3-chloropropane	0.0180	-	0.020	90	-	36-120	-	-
1,2-Dibromoethane (EDB)	0.0436	-	0.050	87	-	67-118	-	-
Dibromomethane	0.0411	-	0.050	82	-	61-116	-	-
1,2-Dichlorobenzene	0.0388	-	0.050	78	-	59-106	-	-
1,3-Dichlorobenzene	0.0491	-	0.050	98	-	75-129	-	-
1,4-Dichlorobenzene	0.0448	-	0.050	90	-	66-127	-	-
Dichlorodifluoromethane	0.0225	-	0.050	45	-	13-74	-	-
1,1-Dichloroethane	0.0437	-	0.050	87	-	65-134	-	-
1,2-Dichloroethane (1,2-DCA)	0.0415	-	0.050	83	-	57-131	-	-
1,1-Dichloroethene	0.0470	-	0.050	94	-	62-127	-	-
cis-1,2-Dichloroethene	0.0439	-	0.050	88	-	66-130	-	-
trans-1,2-Dichloroethene	0.0462	-	0.050	92	-	60-131	-	-
1,2-Dichloropropane	0.0406	-	0.050	81	-	63-127	-	-
1,3-Dichloropropane	0.0438	-	0.050	88	-	68-124	-	-
2,2-Dichloropropane	0.0457	-	0.050	91	-	63-150	-	-
1,1-Dichloropropene	0.0453	-	0.050	91	-	67-134	-	-
cis-1,3-Dichloropropene	0.0450	-	0.050	90	-	65-138	-	-

(Cont.)



Quality Control Report

Client: Langan
Date Prepared: 10/2/17
Date Analyzed: 10/3/17
Instrument: GC18
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146413
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg
Sample ID: MB/LCS-146413
 1709375-011EMS/MSD

QC Summary Report for SW8260B

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
trans-1,3-Dichloropropene	0.0421	-	0.050	84	-	66-124	-	-
Diisopropyl ether (DIPE)	0.0369	-	0.050	74	-	58-129	-	-
Ethylbenzene	0.0484	-	0.050	97	-	73-145	-	-
Ethyl tert-butyl ether (ETBE)	0.0387	-	0.050	77	-	62-125	-	-
Freon 113	0.0415	-	0.050	83	-	55-116	-	-
Hexachlorobutadiene	0.0480	-	0.050	96	-	75-178	-	-
Hexachloroethane	0.0531	-	0.050	106	-	75-152	-	-
2-Hexanone	0.0352	-	0.050	70	-	41-113	-	-
Isopropylbenzene	0.0632	-	0.050	126	-	67-172	-	-
4-Isopropyl toluene	0.0609	-	0.050	122	-	88-171	-	-
Methyl-t-butyl ether (MTBE)	0.0416	-	0.050	83	-	58-122	-	-
Methylene chloride	0.0455	-	0.050	91	-	57-140	-	-
4-Methyl-2-pentanone (MIBK)	0.0353	-	0.050	71	-	42-117	-	-
Naphthalene	0.0244	-	0.050	49	-	29-65	-	-
n-Propyl benzene	0.0618	-	0.050	124	-	85-174	-	-
Styrene	0.0385	-	0.050	77	-	63-126	-	-
1,1,1,2-Tetrachloroethane	0.0426	-	0.050	85	-	68-131	-	-
1,1,2,2-Tetrachloroethane	0.0436	-	0.050	87	-	45-121	-	-
Tetrachloroethene	0.0477	-	0.050	95	-	65-150	-	-
Toluene	0.0456	-	0.050	91	-	72-135	-	-
1,2,3-Trichlorobenzene	0.0295	-	0.050	59	-	35-80	-	-
1,2,4-Trichlorobenzene	0.0341	-	0.050	68	-	45-103	-	-
1,1,1-Trichloroethane	0.0444	-	0.050	89	-	67-137	-	-
1,1,2-Trichloroethane	0.0428	-	0.050	85	-	67-117	-	-
Trichloroethene	0.0447	-	0.050	89	-	62-135	-	-
Trichlorofluoromethane	0.0435	-	0.050	87	-	56-124	-	-
1,2,3-Trichloropropane	0.0519	-	0.050	104	-	58-133	-	-
1,2,4-Trimethylbenzene	0.0557	-	0.050	111	-	78-161	-	-
1,3,5-Trimethylbenzene	0.0585	-	0.050	117	-	85-170	-	-
Vinyl Chloride	0.0444	-	0.050	89	-	32-142	-	-
Xylenes, Total	0.136	-	0.15	90	-	70-137	-	-

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Quality Control Report

Client: Langan
Date Prepared: 10/2/17
Date Analyzed: 10/3/17
Instrument: GC18
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146413
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg
Sample ID: MB/LCS-146413
 1709375-011EMS/MSD

QC Summary Report for SW8260B

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Surrogate Recovery								
Dibromofluoromethane	0.137	-	0.12	110	-	87-127	-	-
Toluene-d8	0.164	-	0.12	131	-	93-141	-	-
4-BFB	0.0153	-	0.012	122	-	84-137	-	-
Benzene-d6	0.106	-	0.10	106	-	67-131	-	-
Ethylbenzene-d10	0.124	-	0.10	124	-	78-153	-	-
1,2-DCB-d4	0.0874	-	0.10	87	-	63-109	-	-

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Acetone	0.744	0.724	1	ND	74	72	36-141	2.80	20
tert-Amyl methyl ether (TAME)	0.0309	0.0298	0.050	ND	62	60	46-105	3.40	20
Benzene	0.0342	0.0332	0.050	ND	69	66	46-124	3.20	20
Bromobenzene	0.0368	0.0354	0.050	ND	74	71	50-119	4.10	20
Bromochloromethane	0.0349	0.0331	0.050	ND	70	66	42-122	5.40	20
Bromodichloromethane	0.0316	0.0306	0.050	ND	63	61	48-112	3.38	20
Bromoform	0.0276	0.0272	0.050	ND	55	54	36-90	1.67	20
Bromomethane	0.0533	0.0482	0.050	ND	107	96	10-149	9.97	20
2-Butanone (MEK)	0.114	0.110	0.20	ND	49	47	43-114	3.67	20
t-Butyl alcohol (TBA)	0.142	0.144	0.20	ND	71	72	33-123	1.20	20
n-Butyl benzene	0.0323	0.0315	0.050	ND	65	63	40-185	2.58	20
sec-Butyl benzene	0.0365	0.0351	0.050	ND	73	70	40-183	3.99	20
tert-Butyl benzene	0.0349	0.0340	0.050	ND	70	68	44-168	2.39	20
Carbon Disulfide	0.0326	0.0309	0.050	ND	65	62	23-139	5.19	20
Carbon Tetrachloride	0.0339	0.0326	0.050	ND	68	65	43-133	3.79	20
Chlorobenzene	0.0328	0.0317	0.050	ND	66	63	51-115	3.31	20
Chloroethane	0.0410	0.0396	0.050	ND	82	79	16-138	3.47	20
Chloroform	0.0333	0.0322	0.050	ND	67	64	54-117	3.29	20
Chloromethane	0.0297	0.0281	0.050	ND	55	52	14-128	5.27	20
2-Chlorotoluene	0.0387	0.0372	0.050	ND	77	74	54-141	4.14	20
4-Chlorotoluene	0.0382	0.0370	0.050	ND	76	74	52-134	3.05	20
Dibromochloromethane	0.0328	0.0316	0.050	ND	66	63	46-102	3.93	20
1,2-Dibromo-3-chloropropane	0.0148	0.0144	0.020	ND	74	72	16-120	2.81	20
1,2-Dibromoethane (EDB)	0.0342	0.0327	0.050	ND	68	65	48-113	4.32	20
Dibromomethane	0.0335	0.0324	0.050	ND	67	65	44-110	3.17	20
1,2-Dichlorobenzene	0.0304	0.0294	0.050	ND	61	59	43-106	3.24	20
1,3-Dichlorobenzene	0.0337	0.0324	0.050	ND	67	65	49-128	3.90	20

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Quality Control Report

Client: Langan
Date Prepared: 10/2/17
Date Analyzed: 10/3/17
Instrument: GC18
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment


WorkOrder: 1710036
BatchID: 146413
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg
Sample ID: MB/LCS-146413
 1709375-011EMS/MSD

QC Summary Report for SW8260B

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
1,4-Dichlorobenzene	0.0333	0.0321	0.050	ND	67	64	48-120	3.66	20
Dichlorodifluoromethane	0.0171	0.0167	0.050	ND	28	27	8-63	2.51	20
1,1-Dichloroethane	0.0348	0.0338	0.050	ND	70	68	50-122	2.84	20
1,2-Dichloroethane (1,2-DCA)	0.0333	0.0322	0.050	ND	67	65	46-116	3.18	20
1,1-Dichloroethene	0.0362	0.0355	0.050	ND	72	71	37-124	1.93	20
cis-1,2-Dichloroethene	0.0350	0.0342	0.050	ND	70	68	47-123	2.43	20
trans-1,2-Dichloroethene	0.0350	0.0336	0.050	ND	70	67	31-131	4.04	20
1,2-Dichloropropane	0.0323	0.0312	0.050	ND	65	62	50-116	3.36	20
1,3-Dichloropropane	0.0347	0.0331	0.050	ND	69	66	52-115	4.55	20
2,2-Dichloropropane	0.0355	0.0345	0.050	ND	71	69	43-137	3.02	20
1,1-Dichloropropene	0.0344	0.0334	0.050	ND	69	67	43-126	3.05	20
cis-1,3-Dichloropropene	0.0344	0.0331	0.050	ND	69	66	35-134	3.74	20
trans-1,3-Dichloropropene	0.0324	0.0312	0.050	ND	65	62	35-124	3.92	20
Diisopropyl ether (DIPE)	0.0294	0.0284	0.050	ND	59	57	49-116	3.50	20
Ethylbenzene	0.0346	0.0336	0.050	ND	69	67	49-137	2.96	20
Ethyl tert-butyl ether (ETBE)	0.0309	0.0295	0.050	ND	62	59	50-113	4.53	20
Freon 113	0.0288	0.0283	0.050	ND	58	57	28-114	1.86	20
Hexachlorobutadiene	0.0245	0.0244	0.050	ND	49	49	22-180	0	20
Hexachloroethane	0.0327	0.0330	0.050	ND	65	66	28-158	0.889	20
2-Hexanone	0.0294	0.0286	0.050	ND	59	57	31-102	2.80	20
Isopropylbenzene	0.0417	0.0400	0.050	ND	83	80	50-153	4.09	20
4-Isopropyl toluene	0.0345	0.0335	0.050	ND	69	67	41-171	2.87	20
Methyl-t-butyl ether (MTBE)	0.0332	0.0318	0.050	ND	66	64	48-110	4.31	20
Methylene chloride	0.0366	0.0350	0.050	ND	73	70	42-127	4.32	20
4-Methyl-2-pentanone (MIBK)	0.0292	0.0288	0.050	ND	58	58	24-114	0	20
Naphthalene	0.0250	0.0272	0.050	ND	48	53	19-69	8.57	20
n-Propyl benzene	0.0389	0.0372	0.050	ND	78	74	46-168	4.57	20
Styrene	0.0291	0.0280	0.050	ND	58	56	42-122	4.01	20
1,1,1,2-Tetrachloroethane	0.0324	0.0309	0.050	ND	65	62	52-121	4.48	20
1,1,2,2-Tetrachloroethane	0.0376	0.0361	0.050	ND	75	72	27-116	4.12	20
Tetrachloroethene	0.0331	0.0323	0.050	ND	66	65	37-149	2.35	20
Toluene	0.0335	0.0323	0.050	ND	67	65	52-124	3.53	20
1,2,3-Trichlorobenzene	0.0243	0.0253	0.050	ND	49	51	20-86	4.07	20
1,2,4-Trichlorobenzene	0.0261	0.0253	0.050	ND	52	51	24-107	3.09	20
1,1,1-Trichloroethane	0.0342	0.0334	0.050	ND	68	67	48-128	2.46	20
1,1,2-Trichloroethane	0.0339	0.0328	0.050	ND	68	66	51-110	3.24	20
Trichloroethene	0.0348	0.0335	0.050	ND	70	67	42-128	3.70	20
Trichlorofluoromethane	0.0323	0.0319	0.050	ND	65	64	31-121	1.29	20
1,2,3-Trichloropropane	0.0419	0.0411	0.050	ND	84	82	50-115	1.95	20

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CA ELAP 1644 • NELAP 40330RELAP

 QA/QC Officer



Quality Control Report

Client: Langan
Date Prepared: 10/2/17
Date Analyzed: 10/3/17
Instrument: GC18
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146413
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg
Sample ID: MB/LCS-146413
 1709375-011EMS/MSD

QC Summary Report for SW8260B

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
1,2,4-Trimethylbenzene	0.0360	0.0350	0.050	ND	72	70	48-151	2.57	20
1,3,5-Trimethylbenzene	0.0374	0.0360	0.050	ND	75	72	51-159	3.59	20
Vinyl Chloride	0.0353	0.0337	0.050	ND	71	67	11-136	4.48	20
Xylenes, Total	0.0967	0.0930	0.15	ND	64	62	38-141	3.89	20
Surrogate Recovery									
Dibromofluoromethane	0.145	0.145	0.12		116	116	82-136	0	20
Toluene-d8	0.160	0.159	0.12		128	127	92-139	0.421	20
4-BFB	0.0149	0.0147	0.012		119	118	82-135	1.18	20
Benzene-d6	0.0816	0.0786	0.10		82	79	55-122	3.86	20
Ethylbenzene-d10	0.0876	0.0848	0.10		88	85	58-141	3.25	20
1,2-DCB-d4	0.0691	0.0669	0.10		69	67	51-107	3.19	20



Quality Control Report

Client: Langan
Date Prepared: 10/8/17
Date Analyzed: 10/8/17
Instrument: GC10
Matrix: Water
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146723
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L
Sample ID: MB/LCS/LCSD-146723

QC Summary Report for SW8260B

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
Acetone	ND	10	-	-	-
tert-Amyl methyl ether (TAME)	ND	0.50	-	-	-
Benzene	ND	0.50	-	-	-
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	2.0	-	-	-
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	0.50	-	-	-
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	0.50	-	-	-
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	0.50	-	-	-
1,1-Dichloroethene	ND	0.50	-	-	-
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	-	-	-
1,1-Dichloropropene	ND	0.50	-	-	-
cis-1,3-Dichloropropene	ND	0.50	-	-	-

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Quality Control Report

Client: Langan
Date Prepared: 10/8/17
Date Analyzed: 10/8/17
Instrument: GC10
Matrix: Water
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146723
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L
Sample ID: MB/LCS/LCSD-146723

QC Summary Report for SW8260B


Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
trans-1,3-Dichloropropene	ND	0.50	-	-	-
Diisopropyl ether (DIPE)	ND	0.50	-	-	-
Ethylbenzene	ND	0.50	-	-	-
Ethyl tert-butyl ether (ETBE)	ND	0.50	-	-	-
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	0.50	-	-	-
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	0.50	-	-	-
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	0.50	-	-	-
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	-	-	-

Surrogate Recovery

Dibromofluoromethane	27.48		25	110	91-133
Toluene-d8	27.01		25	108	87-127
4-BFB	2.502		2.5	100	66-140

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CA ELAP 1644 • NELAP 4033ORELAP

 QA/QC Officer



Quality Control Report

Client: Langan
Date Prepared: 10/8/17
Date Analyzed: 10/8/17
Instrument: GC10
Matrix: Water
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146723
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L
Sample ID: MB/LCS/LCSD-146723

QC Summary Report for SW8260B

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
Acetone	195	182	200	98	91	47-122	6.72	20
tert-Amyl methyl ether (TAME)	10.5	9.81	10	105	98	62-121	6.68	20
Benzene	10.3	9.84	10	103	98	74-121	4.61	20
Bromobenzene	10.8	10.0	10	108	100	63-127	7.55	20
Bromochloromethane	10.4	9.80	10	104	98	70-126	6.02	20
Bromodichloromethane	10.7	10.2	10	107	103	66-127	4.10	20
Bromoform	9.54	8.91	10	95	89	60-119	6.90	20
Bromomethane	9.41	8.95	10	94	90	32-155	4.92	20
2-Butanone (MEK)	40.8	38.4	40	102	96	51-117	5.97	20
t-Butyl alcohol (TBA)	39.0	37.2	40	97	93	41-122	4.74	20
n-Butyl benzene	11.1	10.6	10	111	106	73-137	4.67	20
sec-Butyl benzene	10.0	9.56	10	100	96	71-137	4.41	20
tert-Butyl benzene	10.5	10.1	10	105	101	61-136	3.96	20
Carbon Disulfide	10.5	10.0	10	105	100	61-139	4.49	20
Carbon Tetrachloride	10.2	9.91	10	102	99	69-137	3.26	20
Chlorobenzene	10.6	10.2	10	106	102	71-122	4.14	20
Chloroethane	9.35	8.82	10	93	88	54-132	5.86	20
Chloroform	10.3	9.88	10	103	99	73-122	4.54	20
Chloromethane	10.5	10.1	10	105	101	48-136	4.00	20
2-Chlorotoluene	11.2	10.4	10	111	105	65-134	6.44	20
4-Chlorotoluene	10.6	9.96	10	107	100	65-130	6.73	20
Dibromochloromethane	10.1	9.35	10	101	94	65-121	7.27	20
1,2-Dibromo-3-chloropropane	4.00	3.72	4	100	93	41-132	7.20	20
1,2-Dibromoethane (EDB)	10.8	10.1	10	108	101	67-125	6.85	20
Dibromomethane	10.5	9.71	10	105	97	68-121	7.71	20
1,2-Dichlorobenzene	10.2	9.70	10	102	97	69-128	5.44	20
1,3-Dichlorobenzene	11.1	10.6	10	111	106	71-131	5.08	20
1,4-Dichlorobenzene	10.3	9.77	10	103	98	70-128	5.45	20
Dichlorodifluoromethane	9.41	8.95	10	94	89	21-158	5.05	20
1,1-Dichloroethane	10.2	9.58	10	102	96	73-123	5.85	20
1,2-Dichloroethane (1,2-DCA)	10.3	9.72	10	103	97	61-127	5.75	20
1,1-Dichloroethene	10.1	9.71	10	101	97	68-130	3.51	20
cis-1,2-Dichloroethene	10.2	9.80	10	102	98	72-123	3.60	20
trans-1,2-Dichloroethene	10.2	9.89	10	102	99	64-138	3.55	20
1,2-Dichloropropane	10.0	9.55	10	101	95	71-121	5.14	20
1,3-Dichloropropane	10.5	9.89	10	105	99	69-120	6.01	20
2,2-Dichloropropane	11.3	10.9	10	113	109	64-142	3.77	20
1,1-Dichloropropene	10.3	10.0	10	103	100	70-130	3.04	20
cis-1,3-Dichloropropene	11.6	10.9	10	116	109	58-136	6.28	20

(Cont.)



Quality Control Report

Client: Langan
Date Prepared: 10/8/17
Date Analyzed: 10/8/17
Instrument: GC10
Matrix: Water
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146723
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L
Sample ID: MB/LCS/LCSD-146723

QC Summary Report for SW8260B

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
trans-1,3-Dichloropropene	10.6	10.0	10	106	100	66-119	5.55	20
Diisopropyl ether (DIPE)	10.2	9.68	10	102	97	66-123	5.03	20
Ethylbenzene	10.4	9.88	10	104	99	71-125	5.27	20
Ethyl tert-butyl ether (ETBE)	10.5	9.98	10	105	100	67-122	5.17	20
Freon 113	9.40	9.01	10	94	90	68-132	4.23	20
Hexachlorobutadiene	10.8	10.7	10	108	107	56-155	0.558	20
Hexachloroethane	11.2	10.7	10	112	107	61-129	3.93	20
2-Hexanone	9.89	9.32	10	99	93	51-115	5.95	20
Isopropylbenzene	11.0	10.3	10	110	103	66-134	6.62	20
4-Isopropyl toluene	10.7	10.3	10	107	103	70-136	3.76	20
Methyl-t-butyl ether (MTBE)	10.2	9.58	10	102	96	64-118	6.05	20
Methylene chloride	9.67	9.16	10	97	92	62-121	5.43	20
4-Methyl-2-pentanone (MIBK)	11.2	10.4	10	112	103	51-115	7.67	20
Naphthalene	11.4	11.0	10	114	110	55-137	4.41	20
n-Propyl benzene	11.0	10.5	10	110	105	63-140	4.87	20
Styrene	10.7	10.1	10	107	101	62-133	6.12	20
1,1,1,2-Tetrachloroethane	10.8	10.4	10	108	104	69-128	3.98	20
1,1,2,2-Tetrachloroethane	10.9	10.3	10	109	103	60-118	5.16	20
Tetrachloroethene	10.3	9.84	10	103	98	63-136	4.75	20
Toluene	10.5	10.1	10	105	101	67-124	4.32	20
1,2,3-Trichlorobenzene	11.3	10.8	10	113	108	57-145	4.77	20
1,2,4-Trichlorobenzene	12.0	11.6	10	120	116	60-144	3.34	20
1,1,1-Trichloroethane	10.3	10.0	10	103	100	70-133	2.92	20
1,1,2-Trichloroethane	10.6	9.95	10	106	100	65-125	6.63	20
Trichloroethene	10.1	9.59	10	101	96	67-133	5.22	20
Trichlorofluoromethane	9.84	9.45	10	98	95	59-145	4.03	20
1,2,3-Trichloropropane	11.1	10.2	10	111	102	65-115	8.50	20
1,2,4-Trimethylbenzene	10.8	10.3	10	108	103	67-136	4.39	20
1,3,5-Trimethylbenzene	10.7	10.3	10	107	103	68-135	4.05	20
Vinyl Chloride	11.5	10.7	10	115	107	53-146	6.91	20
Xylenes, Total	31.6	29.8	30	105	99	68-128	5.97	20
Surrogate Recovery								
Dibromofluoromethane	27.2	27.5	25	109	110	91-133	1.02	20
Toluene-d8	27.3	27.3	25	109	109	87-127	0	20
4-BFB	2.84	2.77	2.5	114	111	66-140	2.42	20



Quality Control Report

Client: Langan
Date Prepared: 10/2/17
Date Analyzed: 10/2/17 - 10/3/17
Instrument: GC19
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146363
Extraction Method: SW5030B
Analytical Method: SW8021B/8015Bm
Unit: mg/Kg
Sample ID: MB/LCS/LCSD-146363
 1710020-001AMS/MSD

QC Summary Report for SW8021B/8015Bm

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
TPH(g) (C6-C12)	ND	1.0	-	-	-
MTBE	ND	0.050	-	-	-
Benzene	ND	0.0050	-	-	-
Toluene	ND	0.0050	-	-	-
Ethylbenzene	ND	0.0050	-	-	-
Xylenes	ND	0.015	-	-	-
Surrogate Recovery					
2-Fluorotoluene	0.09357		0.10	94	75-134

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH(btex)	0.608	0.597	0.60	101	100	82-118	1.74	20
MTBE	0.101	0.109	0.10	101	109	61-119	7.57	20
Benzene	0.116	0.121	0.10	116	121	77-128	4.27	20
Toluene	0.119	0.124	0.10	119	123	74-132	3.74	20
Ethylbenzene	0.118	0.120	0.10	118	121	84-127	2.40	20
Xylenes	0.333	0.340	0.30	111	113	86-129	2.18	20
Surrogate Recovery								
2-Fluorotoluene	0.0935	0.0955	0.10	93	96	75-134	2.16	20

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
TPH(btex)	NR	NR		ND	NR	NR	-	NR	-
MTBE	NR	NR		ND	NR	NR	-	NR	-
Benzene	NR	NR		ND	NR	NR	-	NR	-
Toluene	NR	NR		ND	NR	NR	-	NR	-
Ethylbenzene	NR	NR		ND	NR	NR	-	NR	-
Xylenes	NR	NR		ND	NR	NR	-	NR	-
Surrogate Recovery									
2-Fluorotoluene	NR	NR			NR	NR	-	NR	-



Quality Control Report

Client: Langan
Date Prepared: 10/3/17
Date Analyzed: 10/3/17
Instrument: GC7
Matrix: Water
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146458
Extraction Method: SW5030B
Analytical Method: SW8021B/8015Bm
Unit: µg/L
Sample ID: MB/LCS-146458
 1710058-001AMS/MSD

QC Summary Report for SW8021B/8015Bm

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
TPH(g) (C6-C12)	ND	50	-	-	-
MTBE	ND	5.0	-	-	-
Benzene	ND	0.50	-	-	-
Toluene	ND	0.50	-	-	-
Ethylbenzene	ND	0.50	-	-	-
Xylenes	ND	1.5	-	-	-
Surrogate Recovery					
aaa-TFT	9.5		10	95	89-116

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH(btex)	49.7	-	60	83	-	78-116	-	-
MTBE	8.95	-	10	89	-	72-122	-	-
Benzene	10.3	-	10	103	-	81-123	-	-
Toluene	11.1	-	10	111	-	83-129	-	-
Ethylbenzene	10.5	-	10	105	-	88-126	-	-
Xylenes	31.4	-	30	105	-	87-131	-	-
Surrogate Recovery								
aaa-TFT	10.1	-	10	101	-	89-116	-	-

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
TPH(btex)	59.6	60.3	60	ND	99	101	63-133	1.11	20
MTBE	8.95	8.72	10	ND	89	87	69-122	2.57	20
Benzene	11.1	10.9	10	ND	111	109	84-125	1.99	20
Toluene	11.7	11.4	10	ND	117	114	87-131	2.58	20
Ethylbenzene	11.1	11.0	10	ND	111	110	92-126	1.26	20
Xylenes	32.2	32.9	30	ND	107	110	88-132	2.30	20
Surrogate Recovery									
aaa-TFT	10.8	10.4	10		108	104	90-117	3.45	20



Quality Control Report

Client: Langan
Date Prepared: 10/6/17
Date Analyzed: 10/6/17
Instrument: GC3
Matrix: Water
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146708
Extraction Method: SW5030B
Analytical Method: SW8021B/8015Bm
Unit: µg/L
Sample ID: MB/LCS-146708
 1710183-001BMS/MSD

QC Summary Report for SW8021B/8015Bm

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
TPH(g) (C6-C12)	ND	50	-	-	-
MTBE	ND	5.0	-	-	-
Benzene	ND	0.50	-	-	-
Toluene	ND	0.50	-	-	-
Ethylbenzene	ND	0.50	-	-	-
Xylenes	ND	1.5	-	-	-

Surrogate Recovery

aaa-TFT	10.29		10	103	89-116
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Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH(btex)	56.3	-	60	94	-	78-116	-	-
MTBE	8.63	-	10	86	-	72-122	-	-
Benzene	8.85	-	10	88	-	81-123	-	-
Toluene	9.34	-	10	93	-	83-129	-	-
Ethylbenzene	9.81	-	10	98	-	88-126	-	-
Xylenes	30.6	-	30	102	-	87-131	-	-

Surrogate Recovery

aaa-TFT	10.0	-	10	100	-	89-116	-	-
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Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
TPH(btex)	56.9	56.2	60	ND	95	94	63-133	1.34	20
MTBE	8.74	9.02	10	ND	87	90	69-122	3.23	20
Benzene	9.29	9.56	10	ND	93	96	84-125	2.81	20
Toluene	9.68	9.91	10	ND	97	99	87-131	2.39	20
Ethylbenzene	10.2	10.2	10	ND	102	102	92-126	0	20
Xylenes	31.7	31.7	30	ND	106	106	88-132	0	20

Surrogate Recovery

aaa-TFT	10.3	10.4	10		103	104	90-117	0.767	20
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Quality Control Report

Client: Langan
Date Prepared: 10/2/17
Date Analyzed: 10/3/17
Instrument: GC6A
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146416
Extraction Method: SW3550B
Analytical Method: SW8015B
Unit: mg/Kg
Sample ID: MB/LCS-146416
 1709732-006BMS/MSD

QC Report for SW8015B w/out SG Clean-Up

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
TPH-Diesel (C10-C23)	ND	43.2	1.0	40	-	108	75-128
TPH-Motor Oil (C18-C36)	ND	-	5.0	-	-	-	-
Surrogate Recovery							
C9	26.38	26.6		25	106	107	72-122

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
TPH-Diesel (C10-C23)	NR	NR		1100	NR	NR	-	NR	-
Surrogate Recovery									
C9	N/A	N/A			N/A	N/A	-	N/A	-



Quality Control Report

Client: Langan	WorkOrder: 1710036
Date Prepared: 10/2/17	BatchID: 146368
Date Analyzed: 10/2/17	Extraction Method: SW3510C
Instrument: GC6A	Analytical Method: SW8015B
Matrix: Water	Unit: µg/L
Project: 750635604; 3000 Broadway Redevelopment	Sample ID: MB/LCS/LCSD-146368

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	-	-	-
Surrogate Recovery					
C9	665.6		625	106	68-127

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH-Diesel (C10-C23)	1170	1140	1000	117	114	86-142	2.73	30
Surrogate Recovery								
C9	669	653	625	107	104	68-127	2.40	30



1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

CHAIN-OF-CUSTODY RECORD

WorkOrder: 1710036

ClientCode: TWRF

- WaterTrax
 WriteOn
 EDF
 Excel
 EQulS
 Email
 HardCopy
 ThirdParty
 J-flag
 Detection Summary
 Dry-Weight

Report to:

Josh Graber
Langan
555 Montgomery St., Suite 1300
San Francisco, CA 94111
(415) 955-9040 FAX: (415) 955-9041

Email: jgraber@langan.com
cc/3rd Party: kstaehlin@langan.com; alee@langan.com;
PO:
ProjectNo: 750635604; 3000 Broadway
Redevelopment

Bill to:

Accounts Payable
Langan
555 Montgomery St., Suite 1300
San Francisco, CA 94111
Langan_InvoiceCapture@concur.solutio

Requested TAT: 5 days;

Date Received: 10/02/2017

Date Logged: 10/02/2017

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
1710036-001	B-46-10.0	Soil	9/29/2017 12:03	<input type="checkbox"/>	A		A		A							
1710036-004	B-47-14.0	Soil	9/29/2017 10:22	<input type="checkbox"/>	A		A		A							
1710036-007	B-48-14.0	Soil	9/29/2017 09:16	<input type="checkbox"/>	A		A		A							
1710036-010	B-46-GW	Water	9/29/2017 14:00	<input type="checkbox"/>		B		A		A						
1710036-011	B-47-GW	Water	9/29/2017 13:30	<input type="checkbox"/>		B		A		A						
1710036-012	B-48-GW	Water	9/29/2017 13:20	<input type="checkbox"/>		B		A		A						

Test Legend:

1	8260B_S	2	8260B_W	3	G-MBTEX_S	4	G-MBTEX_W
5	TPH(DMO)_S	6	TPH(DMO)_W	7		8	
9		10		11		12	

Prepared by: Alexandra Iniguez

The following SampIDs: 001A, 004A, 007A contain testgroup Multi Range_S.; The following SampIDs: 010A, 011A, 012A 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: LANGAN
Client Contact: Josh Graber
Contact's Email: jgraber@langan.com

Project: 750635604; 3000 Broadway Redevelopment

Work Order: 1710036
QC Level: LEVEL 2
Date Logged: 10/2/2017

Comments:

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
1710036-001A	B-46-10.0	Soil	Multi-Range TPH(g,d.mo) by EPA 8015Bm SW8260B (VOCs)	1	Stainless Steel tube 2"x6"	<input type="checkbox"/>	9/29/2017 12:03	5 days		<input type="checkbox"/>	
1710036-002A	B-46-12.0	Soil		1	Stainless Steel tube 2"x6"	<input type="checkbox"/>	9/29/2017 12:08			<input checked="" type="checkbox"/>	
1710036-003A	B-46-14.0	Soil		1	Stainless Steel tube 2"x6"	<input type="checkbox"/>	9/29/2017 12:12			<input checked="" type="checkbox"/>	
1710036-004A	B-47-14.0	Soil	Multi-Range TPH(g,d.mo) by EPA 8015Bm SW8260B (VOCs)	1	Stainless Steel tube 2"x6"	<input type="checkbox"/>	9/29/2017 10:22	5 days		<input type="checkbox"/>	
1710036-005A	B-47-16.0	Soil		1	Stainless Steel tube 2"x6"	<input type="checkbox"/>	9/29/2017 10:26			<input checked="" type="checkbox"/>	
1710036-006A	B-47-20.0	Soil		1	Stainless Steel tube 2"x6"	<input type="checkbox"/>	9/29/2017 10:33			<input checked="" type="checkbox"/>	
1710036-007A	B-48-14.0	Soil	Multi-Range TPH(g,d.mo) by EPA 8015Bm SW8260B (VOCs)	1	Stainless Steel tube 2"x6"	<input type="checkbox"/>	9/29/2017 9:16	5 days		<input type="checkbox"/>	
1710036-008A	B-48-16.0	Soil		1	Stainless Steel tube 2"x6"	<input type="checkbox"/>	9/29/2017 9:20			<input checked="" type="checkbox"/>	
1710036-009A	B-48-20.0	Soil		1	Stainless Steel tube 2"x6"	<input type="checkbox"/>	9/29/2017 9:39			<input checked="" type="checkbox"/>	
1710036-010A	B-46-GW	Water	Multi-Range TPH(g,d.mo) by EPA 8015Bm	4	2 VOAs w/HCL + 2-aVOAs (multi-range)	<input type="checkbox"/>	9/29/2017 14:00	5 days	Trace	<input type="checkbox"/>	
1710036-010B	B-46-GW	Water	SW8260B (VOCs)	2	VOA w/ HCl	<input type="checkbox"/>	9/29/2017 14:00	5 days	Trace	<input type="checkbox"/>	
1710036-011A	B-47-GW	Water	Multi-Range TPH(g,d.mo) by EPA 8015Bm	4	2 VOAs w/HCL + 2-aVOAs (multi-range)	<input type="checkbox"/>	9/29/2017 13:30	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.



WORK ORDER SUMMARY

Client Name: LANGAN
Client Contact: Josh Graber
Contact's Email: jgraber@langan.com

Project: 750635604; 3000 Broadway Redevelopment

Work Order: 1710036
QC Level: LEVEL 2
Date Logged: 10/2/2017

Comments:

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
1710036-011B	B-47-GW	Water	SW8260B (VOCs)	2	VOA w/ HCl	<input type="checkbox"/>	9/29/2017 13:30	5 days	Trace	<input type="checkbox"/>	
1710036-012A	B-48-GW	Water	Multi-Range TPH(g,d,mo) by EPA 8015Bm	4	2 VOAs w/HCL + 2-aVOAs (multi-range)	<input type="checkbox"/>	9/29/2017 13:20	5 days	Trace	<input type="checkbox"/>	
1710036-012B	B-48-GW	Water	SW8260B (VOCs)	2	VOA w/ HCl	<input type="checkbox"/>	9/29/2017 13:20	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.



Sample Receipt Checklist

Client Name: **Langan**
 Project Name: **750635604; 3000 Broadway Redevelopment**
 WorkOrder No: **1710036** Matrix: Soil/Water
 Carrier: Basit Sheikh (MAI Courier)

Date and Time Received: **10/2/2017 16:55**
 Date Logged: **10/2/2017**
 Received by: **Alexandra Iniguez**
 Logged by: **Alexandra Iniguez**

Chain of Custody (COC) Information

Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample IDs noted by Client on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Date and Time of collection noted by Client on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sampler's name noted on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
COC agrees with Quote?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>
Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper containers/bottles?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>
Sample/Temp Blank temperature	Temp: 4.5°C		NA <input type="checkbox"/>
Water - VOA vials have zero headspace / no bubbles?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>
Sample labels checked for correct preservation?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
pH acceptable upon receipt (Metal: <2; 522: <4; 218.7: >8)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Samples Received on Ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

(Ice Type: WET ICE)

UCMR Samples:

Total Chlorine tested and acceptable upon receipt for EPA 522?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Free Chlorine tested and acceptable upon receipt for EPA 218.7, 300.1, 537, 539?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>

Comments:



McC Campbell Analytical, Inc.

"When Quality Counts"

Analytical Report

WorkOrder: 1710036 A

Report Created for: Langan

555 Montgomery St., Suite 1300
San Francisco, CA 94111

Project Contact: Josh Graber

Project P.O.:

Project Name: 750635604; 3000 Broadway Redevelopment

Project Received: 10/02/2017

Analytical Report reviewed & approved for release on 10/19/2017 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: Langan
Project: 750635604; 3000 Broadway Redevelopment
WorkOrder: 1710036 A

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
ERS	External reference sample. Second source calibration verification.
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)



Glossary of Terms & Qualifier Definitions

Client: Langan
Project: 750635604; 3000 Broadway Redevelopment
WorkOrder: 1710036 A

Analytical Qualifiers

H Samples were analyzed out of holding time
S Surrogate spike recovery outside accepted recovery limits
c2 Surrogate recovery outside of the control limits due to matrix interference.
e2 Diesel range compounds are significant; no recognizable pattern
e7 Oil range compounds are significant

Quality Control Qualifiers

F1 MS/MSD recovery and/or RPD is out of acceptance criteria; LCS validates the prep batch.



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/13/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-16.0	1710036-005A	Soil	09/29/2017 10:26	GC38 10171713.D	146997

Analytes	Result	Qualifiers	RL	DF	Date Analyzed
Acetone	ND	H	0.10	1	10/17/2017 15:52
tert-Amyl methyl ether (TAME)	ND	H	0.0050	1	10/17/2017 15:52
Benzene	ND	H	0.0050	1	10/17/2017 15:52
Bromobenzene	ND	H	0.0050	1	10/17/2017 15:52
Bromochloromethane	ND	H	0.0050	1	10/17/2017 15:52
Bromodichloromethane	ND	H	0.0050	1	10/17/2017 15:52
Bromoform	ND	H	0.0050	1	10/17/2017 15:52
Bromomethane	ND	H	0.0050	1	10/17/2017 15:52
2-Butanone (MEK)	ND	H	0.020	1	10/17/2017 15:52
t-Butyl alcohol (TBA)	ND	H	0.050	1	10/17/2017 15:52
n-Butyl benzene	ND	H	0.0050	1	10/17/2017 15:52
sec-Butyl benzene	ND	H	0.0050	1	10/17/2017 15:52
tert-Butyl benzene	ND	H	0.0050	1	10/17/2017 15:52
Carbon Disulfide	ND	H	0.0050	1	10/17/2017 15:52
Carbon Tetrachloride	ND	H	0.0050	1	10/17/2017 15:52
Chlorobenzene	ND	H	0.0050	1	10/17/2017 15:52
Chloroethane	ND	H	0.0050	1	10/17/2017 15:52
Chloroform	ND	H	0.0050	1	10/17/2017 15:52
Chloromethane	ND	H	0.0050	1	10/17/2017 15:52
2-Chlorotoluene	ND	H	0.0050	1	10/17/2017 15:52
4-Chlorotoluene	ND	H	0.0050	1	10/17/2017 15:52
Dibromochloromethane	ND	H	0.0050	1	10/17/2017 15:52
1,2-Dibromo-3-chloropropane	ND	H	0.0040	1	10/17/2017 15:52
1,2-Dibromoethane (EDB)	ND	H	0.0040	1	10/17/2017 15:52
Dibromomethane	ND	H	0.0050	1	10/17/2017 15:52
1,2-Dichlorobenzene	ND	H	0.0050	1	10/17/2017 15:52
1,3-Dichlorobenzene	ND	H	0.0050	1	10/17/2017 15:52
1,4-Dichlorobenzene	ND	H	0.0050	1	10/17/2017 15:52
Dichlorodifluoromethane	ND	H	0.0050	1	10/17/2017 15:52
1,1-Dichloroethane	ND	H	0.0050	1	10/17/2017 15:52
1,2-Dichloroethane (1,2-DCA)	ND	H	0.0040	1	10/17/2017 15:52
1,1-Dichloroethene	ND	H	0.0050	1	10/17/2017 15:52
cis-1,2-Dichloroethene	ND	H	0.0050	1	10/17/2017 15:52
trans-1,2-Dichloroethene	ND	H	0.0050	1	10/17/2017 15:52
1,2-Dichloropropane	ND	H	0.0050	1	10/17/2017 15:52
1,3-Dichloropropane	ND	H	0.0050	1	10/17/2017 15:52
2,2-Dichloropropane	ND	H	0.0050	1	10/17/2017 15:52

(Cont.)



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/13/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-16.0	1710036-005A	Soil	09/29/2017 10:26	GC38 10171713.D	146997
Analytes	Result	Qualifiers	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	H	0.0050	1	10/17/2017 15:52
cis-1,3-Dichloropropene	ND	H	0.0050	1	10/17/2017 15:52
trans-1,3-Dichloropropene	ND	H	0.0050	1	10/17/2017 15:52
Diisopropyl ether (DIPE)	ND	H	0.0050	1	10/17/2017 15:52
Ethylbenzene	ND	H	0.0050	1	10/17/2017 15:52
Ethyl tert-butyl ether (ETBE)	ND	H	0.0050	1	10/17/2017 15:52
Freon 113	ND	H	0.0050	1	10/17/2017 15:52
Hexachlorobutadiene	ND	H	0.0050	1	10/17/2017 15:52
Hexachloroethane	ND	H	0.0050	1	10/17/2017 15:52
2-Hexanone	ND	H	0.0050	1	10/17/2017 15:52
Isopropylbenzene	ND	H	0.0050	1	10/17/2017 15:52
4-Isopropyl toluene	ND	H	0.0050	1	10/17/2017 15:52
Methyl-t-butyl ether (MTBE)	ND	H	0.0050	1	10/17/2017 15:52
Methylene chloride	ND	H	0.0050	1	10/17/2017 15:52
4-Methyl-2-pentanone (MIBK)	ND	H	0.0050	1	10/17/2017 15:52
Naphthalene	ND	H	0.0050	1	10/17/2017 15:52
n-Propyl benzene	ND	H	0.0050	1	10/17/2017 15:52
Styrene	ND	H	0.0050	1	10/17/2017 15:52
1,1,1,2-Tetrachloroethane	ND	H	0.0050	1	10/17/2017 15:52
1,1,2,2-Tetrachloroethane	ND	H	0.0050	1	10/17/2017 15:52
Tetrachloroethene	ND	H	0.0050	1	10/17/2017 15:52
Toluene	ND	H	0.0050	1	10/17/2017 15:52
1,2,3-Trichlorobenzene	ND	H	0.0050	1	10/17/2017 15:52
1,2,4-Trichlorobenzene	ND	H	0.0050	1	10/17/2017 15:52
1,1,1-Trichloroethane	ND	H	0.0050	1	10/17/2017 15:52
1,1,2-Trichloroethane	ND	H	0.0050	1	10/17/2017 15:52
Trichloroethene	ND	H	0.0050	1	10/17/2017 15:52
Trichlorofluoromethane	ND	H	0.0050	1	10/17/2017 15:52
1,2,3-Trichloropropane	ND	H	0.0050	1	10/17/2017 15:52
1,2,4-Trimethylbenzene	ND	H	0.0050	1	10/17/2017 15:52
1,3,5-Trimethylbenzene	ND	H	0.0050	1	10/17/2017 15:52
Vinyl Chloride	ND	H	0.0050	1	10/17/2017 15:52
Xylenes, Total	ND	H	0.0050	1	10/17/2017 15:52

(Cont.)



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/13/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-16.0	1710036-005A	Soil	09/29/2017 10:26	GC38 10171713.D	146997

Analytes	Result	Qualifiers	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>	<u>Qualifiers</u>	<u>Limits</u>		
Dibromofluoromethane	109	H	82-136		10/17/2017 15:52
Toluene-d8	106	H	92-139		10/17/2017 15:52
4-BFB	115	H	82-135		10/17/2017 15:52
Benzene-d6	80	H	55-122		10/17/2017 15:52
Ethylbenzene-d10	88	H	58-141		10/17/2017 15:52
1,2-DCB-d4	73	H	51-107		10/17/2017 15:52

Analyst(s): JEM



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/13/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-20.0	1710036-006A	Soil	09/29/2017 10:33	GC16 10171730.D	146997

Analytes	Result	Qualifiers	RL	DF	Date Analyzed
Acetone	ND	H	0.10	1	10/18/2017 02:48
tert-Amyl methyl ether (TAME)	ND	H	0.0050	1	10/18/2017 02:48
Benzene	ND	H	0.0050	1	10/18/2017 02:48
Bromobenzene	ND	H	0.0050	1	10/18/2017 02:48
Bromochloromethane	ND	H	0.0050	1	10/18/2017 02:48
Bromodichloromethane	ND	H	0.0050	1	10/18/2017 02:48
Bromoform	ND	H	0.0050	1	10/18/2017 02:48
Bromomethane	ND	H	0.0050	1	10/18/2017 02:48
2-Butanone (MEK)	ND	H	0.020	1	10/18/2017 02:48
t-Butyl alcohol (TBA)	ND	H	0.050	1	10/18/2017 02:48
n-Butyl benzene	ND	H	0.0050	1	10/18/2017 02:48
sec-Butyl benzene	ND	H	0.0050	1	10/18/2017 02:48
tert-Butyl benzene	ND	H	0.0050	1	10/18/2017 02:48
Carbon Disulfide	ND	H	0.0050	1	10/18/2017 02:48
Carbon Tetrachloride	ND	H	0.0050	1	10/18/2017 02:48
Chlorobenzene	ND	H	0.0050	1	10/18/2017 02:48
Chloroethane	ND	H	0.0050	1	10/18/2017 02:48
Chloroform	ND	H	0.0050	1	10/18/2017 02:48
Chloromethane	ND	H	0.0050	1	10/18/2017 02:48
2-Chlorotoluene	ND	H	0.0050	1	10/18/2017 02:48
4-Chlorotoluene	ND	H	0.0050	1	10/18/2017 02:48
Dibromochloromethane	ND	H	0.0050	1	10/18/2017 02:48
1,2-Dibromo-3-chloropropane	ND	H	0.0040	1	10/18/2017 02:48
1,2-Dibromoethane (EDB)	ND	H	0.0040	1	10/18/2017 02:48
Dibromomethane	ND	H	0.0050	1	10/18/2017 02:48
1,2-Dichlorobenzene	ND	H	0.0050	1	10/18/2017 02:48
1,3-Dichlorobenzene	ND	H	0.0050	1	10/18/2017 02:48
1,4-Dichlorobenzene	ND	H	0.0050	1	10/18/2017 02:48
Dichlorodifluoromethane	ND	H	0.0050	1	10/18/2017 02:48
1,1-Dichloroethane	ND	H	0.0050	1	10/18/2017 02:48
1,2-Dichloroethane (1,2-DCA)	ND	H	0.0040	1	10/18/2017 02:48
1,1-Dichloroethene	ND	H	0.0050	1	10/18/2017 02:48
cis-1,2-Dichloroethene	ND	H	0.0050	1	10/18/2017 02:48
trans-1,2-Dichloroethene	ND	H	0.0050	1	10/18/2017 02:48
1,2-Dichloropropane	ND	H	0.0050	1	10/18/2017 02:48
1,3-Dichloropropane	ND	H	0.0050	1	10/18/2017 02:48
2,2-Dichloropropane	ND	H	0.0050	1	10/18/2017 02:48

(Cont.)



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/13/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-20.0	1710036-006A	Soil	09/29/2017 10:33	GC16 10171730.D	146997

Analytes	Result	Qualifiers	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	H	0.0050	1	10/18/2017 02:48
cis-1,3-Dichloropropene	ND	H	0.0050	1	10/18/2017 02:48
trans-1,3-Dichloropropene	ND	H	0.0050	1	10/18/2017 02:48
Diisopropyl ether (DIPE)	ND	H	0.0050	1	10/18/2017 02:48
Ethylbenzene	ND	H	0.0050	1	10/18/2017 02:48
Ethyl tert-butyl ether (ETBE)	ND	H	0.0050	1	10/18/2017 02:48
Freon 113	ND	H	0.0050	1	10/18/2017 02:48
Hexachlorobutadiene	ND	H	0.0050	1	10/18/2017 02:48
Hexachloroethane	ND	H	0.0050	1	10/18/2017 02:48
2-Hexanone	ND	H	0.0050	1	10/18/2017 02:48
Isopropylbenzene	ND	H	0.0050	1	10/18/2017 02:48
4-Isopropyl toluene	ND	H	0.0050	1	10/18/2017 02:48
Methyl-t-butyl ether (MTBE)	ND	H	0.0050	1	10/18/2017 02:48
Methylene chloride	ND	H	0.0050	1	10/18/2017 02:48
4-Methyl-2-pentanone (MIBK)	ND	H	0.0050	1	10/18/2017 02:48
Naphthalene	ND	H	0.0050	1	10/18/2017 02:48
n-Propyl benzene	ND	H	0.0050	1	10/18/2017 02:48
Styrene	ND	H	0.0050	1	10/18/2017 02:48
1,1,1,2-Tetrachloroethane	ND	H	0.0050	1	10/18/2017 02:48
1,1,2,2-Tetrachloroethane	ND	H	0.0050	1	10/18/2017 02:48
Tetrachloroethene	ND	H	0.0050	1	10/18/2017 02:48
Toluene	ND	H	0.0050	1	10/18/2017 02:48
1,2,3-Trichlorobenzene	ND	H	0.0050	1	10/18/2017 02:48
1,2,4-Trichlorobenzene	ND	H	0.0050	1	10/18/2017 02:48
1,1,1-Trichloroethane	ND	H	0.0050	1	10/18/2017 02:48
1,1,2-Trichloroethane	ND	H	0.0050	1	10/18/2017 02:48
Trichloroethene	ND	H	0.0050	1	10/18/2017 02:48
Trichlorofluoromethane	ND	H	0.0050	1	10/18/2017 02:48
1,2,3-Trichloropropane	ND	H	0.0050	1	10/18/2017 02:48
1,2,4-Trimethylbenzene	ND	H	0.0050	1	10/18/2017 02:48
1,3,5-Trimethylbenzene	ND	H	0.0050	1	10/18/2017 02:48
Vinyl Chloride	ND	H	0.0050	1	10/18/2017 02:48
Xylenes, Total	ND	H	0.0050	1	10/18/2017 02:48

(Cont.)



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/13/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-20.0	1710036-006A	Soil	09/29/2017 10:33	GC16 10171730.D	146997

Analytes	Result	Qualifiers	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>	<u>Qualifiers</u>	<u>Limits</u>		
Dibromofluoromethane	124	H	82-136		10/18/2017 02:48
Toluene-d8	116	H	92-139		10/18/2017 02:48
4-BFB	112	H	82-135		10/18/2017 02:48
Benzene-d6	82	H	55-122		10/18/2017 02:48
Ethylbenzene-d10	108	H	58-141		10/18/2017 02:48
1,2-DCB-d4	76	H	51-107		10/18/2017 02:48

Analyst(s): KF



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/13/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW5030B
Analytical Method: SW8021B/8015Bm
Unit: mg/Kg

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-16.0	1710036-005A	Soil	09/29/2017 10:26	GC19 10161712.D	147028

Analytes	Result	Qualifiers	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND	H	1.0	1	10/16/2017 17:20
MTBE	---		0.050	1	10/16/2017 17:20
Benzene	---		0.0050	1	10/16/2017 17:20
Toluene	---		0.0050	1	10/16/2017 17:20
Ethylbenzene	---		0.0050	1	10/16/2017 17:20
Xylenes	---		0.015	1	10/16/2017 17:20

Surrogates	REC (%)	Qualifiers	Limits	Date Analyzed
2-Fluorotoluene	74	H	62-126	10/16/2017 17:20

Analyst(s): IA

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-20.0	1710036-006A	Soil	09/29/2017 10:33	GC19 10131713.D	147028

Analytes	Result	Qualifiers	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND		1.0	1	10/13/2017 16:54
MTBE	---		0.050	1	10/13/2017 16:54
Benzene	---		0.0050	1	10/13/2017 16:54
Toluene	---		0.0050	1	10/13/2017 16:54
Ethylbenzene	---		0.0050	1	10/13/2017 16:54
Xylenes	---		0.015	1	10/13/2017 16:54

Surrogates	REC (%)	Qualifiers	Limits	Date Analyzed
2-Fluorotoluene	81		62-126	10/13/2017 16:54

Analyst(s): IA



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/10/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW3510C/3630C
Analytical Method: SW8015B
Unit: µg/L

Total Extractable Petroleum Hydrocarbons w/ Silica Gel Clean-Up

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-GW - RE	1710036-011C	Water	09/29/2017 13:30	GC39A 10131710.D	147040

Analytes	Result	Qualifiers	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	92,000	H	25,000	500	10/13/2017 14:04
TPH-Motor Oil (C18-C36)	280,000	H	120,000	500	10/13/2017 14:04

Surrogates	REC (%)	Qualifiers	Limits	
C9	287	SH	61-139	10/13/2017 14:04

Analyst(s): TK

Analytical Comments: e7,e2,c2



Analytical Report

Client: Langan
Date Received: 10/2/17 16:55
Date Prepared: 10/13/17
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
Extraction Method: SW3550B
Analytical Method: SW8015B
Unit: mg/Kg

Total Extractable Petroleum Hydrocarbons w/out SG Clean-Up

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-16.0	1710036-005A	Soil	09/29/2017 10:26	GC39A 10131724.D	147044

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	180	1.0	1	10/13/2017 18:36
TPH-Motor Oil (C18-C36)	410	5.0	1	10/13/2017 18:36

Surrogates	REC (%)	Limits	Date Analyzed
C9	89	78-126	10/13/2017 18:36

Analyst(s): TK **Analytical Comments:** e7,e2

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-47-20.0	1710036-006A	Soil	09/29/2017 10:33	GC39A 10131732.D	147044

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	1.0	1	10/13/2017 21:11
TPH-Motor Oil (C18-C36)	ND	5.0	1	10/13/2017 21:11

Surrogates	REC (%)	Limits	Date Analyzed
C9	89	78-126	10/13/2017 21:11

Analyst(s): TK



Quality Control Report

Client: Langan
Date Prepared: 10/12/17
Date Analyzed: 10/13/17 - 10/18/17
Instrument: GC16, GC28
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146997
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg
Sample ID: MB/LCS-146997
 1710495-001AMS/MSD

QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Acetone	ND	0.538	0.10	1	-	54	48-156
tert-Amyl methyl ether (TAME)	ND	0.0387	0.0050	0.050	-	77	56-115
Benzene	ND	0.0441	0.0050	0.050	-	88	63-131
Bromobenzene	ND	0.0487	0.0050	0.050	-	97	66-127
Bromochloromethane	ND	0.0424	0.0050	0.050	-	85	64-124
Bromodichloromethane	ND	0.0432	0.0050	0.050	-	86	64-120
Bromoform	ND	0.0318	0.0050	0.050	-	64	48-92
Bromomethane	ND	0.0372	0.0050	0.050	-	74	25-163
2-Butanone (MEK)	ND	0.136	0.020	0.20	-	68	51-133
t-Butyl alcohol (TBA)	ND	0.113	0.050	0.20	-	56	52-129
n-Butyl benzene	ND	0.0676	0.0050	0.050	-	135	83-200
sec-Butyl benzene	ND	0.0669	0.0050	0.050	-	134	81-199
tert-Butyl benzene	ND	0.0627	0.0050	0.050	-	125	79-178
Carbon Disulfide	ND	0.0443	0.0050	0.050	-	89	64-136
Carbon Tetrachloride	ND	0.0554	0.0050	0.050	-	111	66-140
Chlorobenzene	ND	0.0464	0.0050	0.050	-	93	73-116
Chloroethane	ND	0.0381	0.0050	0.050	-	76	35-147
Chloroform	ND	0.0446	0.0050	0.050	-	89	65-130
Chloromethane	ND	0.0361	0.0050	0.050	-	72	30-137
2-Chlorotoluene	ND	0.0543	0.0050	0.050	-	109	75-152
4-Chlorotoluene	ND	0.0538	0.0050	0.050	-	108	71-148
Dibromochloromethane	ND	0.0387	0.0050	0.050	-	77	61-106
1,2-Dibromo-3-chloropropane	ND	0.0146	0.0040	0.020	-	73	36-120
1,2-Dibromoethane (EDB)	ND	0.0415	0.0040	0.050	-	83	67-118
Dibromomethane	ND	0.0372	0.0050	0.050	-	74	61-116
1,2-Dichlorobenzene	ND	0.0385	0.0050	0.050	-	77	59-106
1,3-Dichlorobenzene	ND	0.0495	0.0050	0.050	-	99	75-129
1,4-Dichlorobenzene	ND	0.0478	0.0050	0.050	-	96	66-127
Dichlorodifluoromethane	ND	0.0159	0.0050	0.050	-	32	13-74
1,1-Dichloroethane	ND	0.0457	0.0050	0.050	-	91	65-134
1,2-Dichloroethane (1,2-DCA)	ND	0.0401	0.0040	0.050	-	80	57-131
1,1-Dichloroethene	ND	0.0405	0.0050	0.050	-	81	62-127
cis-1,2-Dichloroethene	ND	0.0453	0.0050	0.050	-	91	66-130
trans-1,2-Dichloroethene	ND	0.0490	0.0050	0.050	-	98	60-131
1,2-Dichloropropane	ND	0.0416	0.0050	0.050	-	83	63-127
1,3-Dichloropropane	ND	0.0406	0.0050	0.050	-	81	68-124
2,2-Dichloropropane	ND	0.0686	0.0050	0.050	-	137	63-150

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Quality Control Report

Client: Langan
Date Prepared: 10/12/17
Date Analyzed: 10/13/17 - 10/18/17
Instrument: GC16, GC28
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146997
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg
Sample ID: MB/LCS-146997
 1710495-001AMS/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	0.0499	0.0050	0.050	-	100	67-134
cis-1,3-Dichloropropene	ND	0.0481	0.0050	0.050	-	96	65-138
trans-1,3-Dichloropropene	ND	0.0452	0.0050	0.050	-	90	66-124
Diisopropyl ether (DIPE)	ND	0.0401	0.0050	0.050	-	80	58-129
Ethylbenzene	ND	0.0534	0.0050	0.050	-	107	73-145
Ethyl tert-butyl ether (ETBE)	ND	0.0405	0.0050	0.050	-	81	62-125
Freon 113	ND	0.0343	0.0050	0.050	-	69	55-116
Hexachlorobutadiene	ND	0.0684	0.0050	0.050	-	137	75-178
Hexachloroethane	ND	0.0658	0.0050	0.050	-	132	75-152
2-Hexanone	ND	0.0284	0.0050	0.050	-	57	41-113
Isopropylbenzene	ND	0.0636	0.0050	0.050	-	127	67-172
4-Isopropyl toluene	ND	0.0667	0.0050	0.050	-	133	88-171
Methyl-t-butyl ether (MTBE)	ND	0.0394	0.0050	0.050	-	79	58-122
Methylene chloride	ND	0.0381	0.0050	0.050	-	76	57-140
4-Methyl-2-pentanone (MIBK)	ND	0.0317	0.0050	0.050	-	63	42-117
Naphthalene	ND	0.0215	0.0050	0.050	-	43	29-65
n-Propyl benzene	ND	0.0645	0.0050	0.050	-	129	85-174
Styrene	ND	0.0472	0.0050	0.050	-	94	63-126
1,1,1,2-Tetrachloroethane	ND	0.0496	0.0050	0.050	-	99	68-131
1,1,2,2-Tetrachloroethane	ND	0.0348	0.0050	0.050	-	70	45-121
Tetrachloroethene	ND	0.0591	0.0050	0.050	-	118	65-150
Toluene	ND	0.0507	0.0050	0.050	-	101	72-135
1,2,3-Trichlorobenzene	ND	0.0282	0.0050	0.050	-	56	35-80
1,2,4-Trichlorobenzene	ND	0.0391	0.0050	0.050	-	78	45-103
1,1,1-Trichloroethane	ND	0.0523	0.0050	0.050	-	105	67-137
1,1,2-Trichloroethane	ND	0.0398	0.0050	0.050	-	80	67-117
Trichloroethene	ND	0.0488	0.0050	0.050	-	98	62-135
Trichlorofluoromethane	ND	0.0341	0.0050	0.050	-	68	56-124
1,2,3-Trichloropropane	ND	0.0381	0.0050	0.050	-	76	58-133
1,2,4-Trimethylbenzene	ND	0.0568	0.0050	0.050	-	113	78-161
1,3,5-Trimethylbenzene	ND	0.0599	0.0050	0.050	-	120	85-170
Vinyl Chloride	ND	0.0382	0.0050	0.050	-	76	32-142
Xylenes, Total	ND	0.149	0.0050	0.15	-	100	70-137

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Quality Control Report

Client: Langan
Date Prepared: 10/12/17
Date Analyzed: 10/13/17 - 10/18/17
Instrument: GC16, GC28
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146997
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg
Sample ID: MB/LCS-146997
 1710495-001AMS/MSD

QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Surrogate Recovery							
Dibromofluoromethane	0.126	0.126		0.12	101	101	87-127
Toluene-d8	0.1414	0.143		0.12	113	114	93-141
4-BFB	0.0129	0.0136		0.012	103	109	84-137
Benzene-d6	0.08463	0.0886		0.10	85	89	67-131
Ethylbenzene-d10	0.1025	0.109		0.10	102	109	78-153
1,2-DCB-d4	0.07812	0.0818		0.10	78	82	63-109



Quality Control Report

Client: Langan
Date Prepared: 10/12/17
Date Analyzed: 10/13/17 - 10/18/17
Instrument: GC16, GC28
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146997
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg
Sample ID: MB/LCS-146997
 1710495-001AMS/MSD

QC Summary Report for SW8260B

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Acetone	0.617	0.568	1	ND	62	57	36-141	8.19	20
tert-Amyl methyl ether (TAME)	0.0380	0.0387	0.050	ND	76	77	46-105	1.85	20
Benzene	0.0399	0.0408	0.050	ND	80	82	46-124	2.13	20
Bromobenzene	0.0426	0.0431	0.050	ND	85	86	50-119	1.29	20
Bromochloromethane	0.0396	0.0404	0.050	ND	79	81	42-122	1.95	20
Bromodichloromethane	0.0401	0.0406	0.050	ND	80	81	48-112	1.22	20
Bromoform	0.0308	0.0307	0.050	ND	62	61	36-90	0.341	20
Bromomethane	0.0274	0.0253	0.050	ND	55	51	10-149	8.12	20
2-Butanone (MEK)	0.138	0.136	0.20	ND	69	68	43-114	1.37	20
t-Butyl alcohol (TBA)	0.127	0.135	0.20	ND	63	68	33-123	6.57	20
n-Butyl benzene	0.0504	0.0508	0.050	ND	101	102	40-185	0.824	20
sec-Butyl benzene	0.0508	0.0522	0.050	ND	102	104	40-183	2.68	20
tert-Butyl benzene	0.0498	0.0506	0.050	ND	100	101	44-168	1.62	20
Carbon Disulfide	0.0261	0.0341	0.050	ND	52	68	23-139	26.3,F1	20
Carbon Tetrachloride	0.0490	0.0502	0.050	ND	98	100	43-133	2.30	20
Chlorobenzene	0.0415	0.0419	0.050	ND	83	84	51-115	0.977	20
Chloroethane	0.0356	0.0318	0.050	ND	67	59	16-138	11.5	20
Chloroform	0.0407	0.0417	0.050	ND	81	83	54-117	2.31	20
Chloromethane	0.0330	0.0330	0.050	ND	66	66	14-128	0	20
2-Chlorotoluene	0.0459	0.0469	0.050	ND	92	94	54-141	2.06	20
4-Chlorotoluene	0.0461	0.0466	0.050	ND	92	93	52-134	0.899	20
Dibromochloromethane	0.0364	0.0370	0.050	ND	73	74	46-102	1.57	20
1,2-Dibromo-3-chloropropane	0.0131	0.0137	0.020	ND	66	68	16-120	4.28	20
1,2-Dibromoethane (EDB)	0.0380	0.0381	0.050	ND	76	76	48-113	0	20
Dibromomethane	0.0351	0.0357	0.050	ND	70	71	44-110	1.84	20
1,2-Dichlorobenzene	0.0349	0.0356	0.050	ND	70	71	43-106	1.93	20
1,3-Dichlorobenzene	0.0431	0.0435	0.050	ND	86	87	49-128	0.994	20
1,4-Dichlorobenzene	0.0412	0.0420	0.050	ND	82	84	48-120	1.79	20
Dichlorodifluoromethane	0.0136	0.0136	0.050	ND	27	27	8-63	0	20
1,1-Dichloroethane	0.0416	0.0424	0.050	ND	83	85	50-122	1.88	20
1,2-Dichloroethane (1,2-DCA)	0.0371	0.0376	0.050	ND	74	75	46-116	1.47	20
1,1-Dichloroethene	0.0399	0.0402	0.050	ND	80	80	37-124	0	20
cis-1,2-Dichloroethene	0.0418	0.0425	0.050	ND	84	85	47-123	1.67	20
trans-1,2-Dichloroethene	0.0441	0.0345	0.050	ND	88	69	31-131	24.6,F1	20
1,2-Dichloropropane	0.0381	0.0387	0.050	ND	76	77	50-116	1.65	20
1,3-Dichloropropane	0.0371	0.0377	0.050	ND	74	75	52-115	1.64	20
2,2-Dichloropropane	0.0619	0.0626	0.050	ND	124	125	43-137	1.06	20

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Quality Control Report

Client: Langan
Date Prepared: 10/12/17
Date Analyzed: 10/13/17 - 10/18/17
Instrument: GC16, GC28
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146997
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg
Sample ID: MB/LCS-146997
 1710495-001AMS/MSD

QC Summary Report for SW8260B

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
1,1-Dichloropropene	0.0438	0.0447	0.050	ND	88	89	43-126	2.00	20
cis-1,3-Dichloropropene	0.0416	0.0413	0.050	ND	83	83	35-134	0	20
trans-1,3-Dichloropropene	0.0402	0.0402	0.050	ND	81	80	35-124	0.0866	20
Diisopropyl ether (DIPE)	0.0381	0.0383	0.050	ND	76	77	49-116	0.562	20
Ethylbenzene	0.0469	0.0465	0.050	ND	94	93	49-137	0.732	20
Ethyl tert-butyl ether (ETBE)	0.0389	0.0396	0.050	ND	78	79	50-113	1.60	20
Freon 113	0.0318	0.0341	0.050	ND	64	68	28-114	6.80	20
Hexachlorobutadiene	0.0474	0.0489	0.050	ND	95	98	22-180	3.19	20
Hexachloroethane	0.0531	0.0552	0.050	ND	106	110	28-158	3.78	20
2-Hexanone	0.0297	0.0285	0.050	ND	59	57	31-102	4.18	20
Isopropylbenzene	0.0519	0.0535	0.050	ND	104	107	50-153	3.03	20
4-Isopropyl toluene	0.0549	0.0562	0.050	ND	110	112	41-171	2.33	20
Methyl-t-butyl ether (MTBE)	0.0383	0.0351	0.050	ND	77	70	48-110	8.57	20
Methylene chloride	0.0306	0.0352	0.050	ND	61	70	42-127	14.1	20
4-Methyl-2-pentanone (MIBK)	0.0331	0.0319	0.050	ND	66	64	24-114	3.70	20
Naphthalene	0.0224	0.0223	0.050	ND	41	41	19-69	0	20
n-Propyl benzene	0.0518	0.0533	0.050	ND	104	107	46-168	2.79	20
Styrene	0.0426	0.0429	0.050	ND	85	86	42-122	0.675	20
1,1,1,2-Tetrachloroethane	0.0446	0.0454	0.050	ND	89	91	52-121	1.81	20
1,1,2,2-Tetrachloroethane	ND	ND	0.050	ND	0,F1	0,F1	27-116	0	20
Tetrachloroethene	0.0494	0.0501	0.050	ND	99	100	37-149	1.39	20
Toluene	0.0444	0.0448	0.050	ND	89	90	52-124	0.880	20
1,2,3-Trichlorobenzene	0.0253	0.0256	0.050	ND	51	51	20-86	0	20
1,2,4-Trichlorobenzene	0.0323	0.0331	0.050	ND	65	66	24-107	2.40	20
1,1,1-Trichloroethane	0.0469	0.0475	0.050	ND	94	95	48-128	1.17	20
1,1,2-Trichloroethane	0.0354	0.0366	0.050	ND	71	73	51-110	3.15	20
Trichloroethene	0.0772	0.0788	0.050	ND	154,F1	158,F1	42-128	2.03	20
Trichlorofluoromethane	0.0339	0.0324	0.050	ND	68	65	31-121	4.46	20
1,2,3-Trichloropropane	0.0361	0.0362	0.050	ND	72	72	50-115	0	20
1,2,4-Trimethylbenzene	0.0475	0.0486	0.050	ND	95	97	48-151	2.15	20
1,3,5-Trimethylbenzene	0.0496	0.0502	0.050	ND	99	100	51-159	1.30	20
Vinyl Chloride	0.0344	0.0333	0.050	ND	69	67	11-136	3.35	20
Xylenes, Total	0.130	0.132	0.15	ND	87	88	38-141	1.14	20

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Quality Control Report

Client: Langan
Date Prepared: 10/12/17
Date Analyzed: 10/13/17 - 10/18/17
Instrument: GC16, GC28
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 146997
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg
Sample ID: MB/LCS-146997
 1710495-001AMS/MSD

QC Summary Report for SW8260B

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Surrogate Recovery									
Dibromofluoromethane	0.128	0.129	0.12		102	103	82-136	0.537	20
Toluene-d8	0.140	0.140	0.12		112	112	92-139	0	20
4-BFB	0.0134	0.0135	0.012		107	108	82-135	0.894	20
Benzene-d6	0.0808	0.0828	0.10		81	83	55-122	2.42	20
Ethylbenzene-d10	0.0936	0.0950	0.10		94	95	58-141	1.55	20
1,2-DCB-d4	0.0744	0.0762	0.10		74	76	51-107	2.32	20



Quality Control Report

Client: Langan
Date Prepared: 10/13/17
Date Analyzed: 10/13/17
Instrument: GC3
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 147028
Extraction Method: SW5030B
Analytical Method: SW8021B/8015Bm
Unit: mg/Kg
Sample ID: MB/LCS-147028
 1710421-001AMS/MSD

QC Summary Report for SW8021B/8015Bm

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
TPH(g) (C6-C12)	ND	1.0	-	-	-
MTBE	ND	0.050	-	-	-
Benzene	ND	0.0050	-	-	-
Toluene	ND	0.0050	-	-	-
Ethylbenzene	ND	0.0050	-	-	-
Xylenes	ND	0.015	-	-	-

Surrogate Recovery

2-Fluorotoluene	0.1062		0.10	106	75-134
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Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH(btex)	0.582	-	0.60	97	-	82-118	-	-
MTBE	0.0942	-	0.10	94	-	61-119	-	-
Benzene	0.0970	-	0.10	97	-	77-128	-	-
Toluene	0.103	-	0.10	103	-	74-132	-	-
Ethylbenzene	0.104	-	0.10	104	-	84-127	-	-
Xylenes	0.322	-	0.30	107	-	86-129	-	-

Surrogate Recovery

2-Fluorotoluene	0.103	-	0.10	103	-	75-134	-	-
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Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
TPH(btex)	0.545	0.538	0.60	ND	91	90	58-129	1.37	20
MTBE	0.0934	0.0926	0.10	ND	93	93	47-118	0	20
Benzene	0.0935	0.0978	0.10	ND	93	98	55-129	4.54	20
Toluene	0.0991	0.104	0.10	ND	99	104	56-130	4.51	20
Ethylbenzene	0.101	0.106	0.10	ND	101	106	63-129	5.17	20
Xylenes	0.313	0.326	0.30	ND	104	109	64-131	4.08	20

Surrogate Recovery

2-Fluorotoluene	0.100	0.105	0.10		100	105	62-126	4.67	20
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Quality Control Report

Client: Langan
Date Prepared: 10/10/17
Date Analyzed: 10/13/17
Instrument: GC39B
Matrix: Water
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 147040
Extraction Method: SW3510C/3630C
Analytical Method: SW8015B
Unit: µg/L
Sample ID: MB/LCS/LCSD-147040

QC Report for SW8015B w/ Silica Gel 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	-	-	-
Surrogate Recovery					
C9	520.6		625	83	68-127

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH-Diesel (C10-C23)	879	898	1000	88	90	86-142	2.16	30
Surrogate Recovery								
C9	531	526	625	85	84	68-127	0.815	30



Quality Control Report

Client: Langan
Date Prepared: 10/13/17
Date Analyzed: 10/13/17
Instrument: GC39A
Matrix: Soil
Project: 750635604; 3000 Broadway Redevelopment

WorkOrder: 1710036
BatchID: 147044
Extraction Method: SW3550B
Analytical Method: SW8015B
Unit: mg/Kg
Sample ID: MB/LCS-147044
 1710036-005AMS/MSD

QC Report for SW8015B w/out SG Clean-Up

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
TPH-Diesel (C10-C23)	ND	32.5	1.0	40	-	81	75-128
TPH-Motor Oil (C18-C36)	ND	-	5.0	-	-	-	-
Surrogate Recovery							
C9	22.33	22.5		25	89	90	72-122

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
TPH-Diesel (C10-C23)	178	177	40	176.8	2,F1	0,F1	71-134	0.476	30
Surrogate Recovery									
C9	22.5	22.5	25		90	90	78-126	0	30

1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262



CHAIN-OF-CUSTODY RECORD

WorkOrder: 1710036 **A** ClientCode: TWRF

- WaterTrax WriteOn EDF Excel Fax Email HardCopy ThirdParty J-flag
 Detection Summary Dry-Weight

Report to:
Josh Graber
Langan
555 Montgomery St., Suite 1300
San Francisco, CA 94111
(415) 955-5244 FAX: (415) 955-9041

Email: jgraber@langan.com
cc/3rd Party: kstaehlin@langan.com; alee@langan.com;
PO:
ProjectNo: 750635604; 3000 Broadway
Redevelopment

Bill to:
Accounts Payable
Langan
555 Montgomery St., Suite 1300
San Francisco, CA 94111
Langan_InvoiceCapture@concur.solutio

Requested TATs: 1 day;
5 days;
Date Received: 10/02/2017
Date Logged: 10/02/2017
Date Add-On: 10/13/2017

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
1710036-005	B-47-16.0	Soil	9/29/2017 10:26	<input type="checkbox"/>	A	A	A									
1710036-006	B-47-20.0	Soil	9/29/2017 10:33	<input type="checkbox"/>	A	A	A									
1710036-011	B-47-GW - RE	Water	9/29/2017 13:30	<input type="checkbox"/>				C								

Test Legend:

1	8260B_S	2	G-MBTEX_S	3	TPH(DMO)_S	4	TPH(DMO)WSG_W
5		6		7		8	
9		10		11		12	

Prepared by: Alexandra Iniguez
Add-On Prepared By: Jena Alfaro

Comments: Two samples taken off hold for GDMO,8260 and DMOwsg RE added 10/13/17 STAT

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: LANGAN
Client Contact: Josh Graber
Contact's Email jgraber@langan.com

Project: 750635604; 3000 Broadway Redevelopment

Work Order: 1710036

QC Level: LEVEL 2

Comments: Two samples taken off hold for GDMO,8260 and DMOWsg RE added 10/13/17 STAT

Date Logged: 10/2/2017

Date Add-On: 10/13/2017

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1710036-005A	B-47-16.0	Soil	Multi-Range TPH(g,d,mo) by EPA 8015Bm SW8260B (VOCs)	1	Acetate Liner	9/29/2017 10:26	5 days		<input type="checkbox"/>	
							5 days		<input type="checkbox"/>	
1710036-006A	B-47-20.0	Soil	Multi-Range TPH(g,d,mo) by EPA 8015Bm SW8260B (VOCs)	1	Acetate Liner	9/29/2017 10:33	5 days		<input type="checkbox"/>	
							5 days		<input type="checkbox"/>	
1710036-011C	B-47-GW - RE	Water	SW8015B (TPH-d,mo w/ S.G. Clean-Up)	1	aVOA	9/29/2017 13:30	1 day	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.

