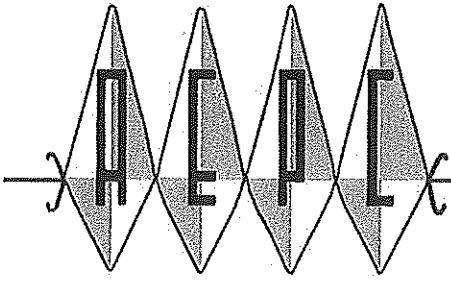


**RECEIVED**

By Alameda County Environmental Health at 4:55 pm, Dec 19, 2013



**ALLIED ENGINEERING & PRODUCTION CORP.**

2421 BLANDING AVE. (P.O. BOX 1230), ALAMEDA, CA 94501  
(510) 522-1500 • FAX (510) 522-2868 • [www.alliedeng.com](http://www.alliedeng.com)

December 11, 2013

In reference to Report of December 2013 Sampling, I declare under penalty of perjury that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge.

  
Cassandra Miller, Vice President

Allied Engineering & Production Corporation

**geo - logic**

1140 - 5th Avenue, Crockett, CA 94525

*geotechnical and environmental consulting services*

(510) 593-5382 - Fax (510) 787-1457

Dec.11, 2013

Ms. Karel Detterman  
Alameda County Environmental Health Services  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502-6577

**RE: Report of December 2013 Sampling  
Allied Engineering Co., 2421 Blanding Avenue, Alameda, CA  
Fuel Leak Case No. RO0002601**

Dear Ms. Detterman:

This report documents the recent sampling of three monitoring wells at the above-referenced site. The wells were installed in April, 2010, in accordance with Geo-Logic's work plan dated December 22, 2008, as requested in a letter from Alameda County Environmental Health (ACEH) dated November 13, 2008.

### **SITE DESCRIPTION**

The subject site is located on the northeastern side of Blanding Avenue, southeast of Park Street, on the eastern perimeter of Alameda, Alameda County, California. The site is located adjacent to the tidal canal of Alameda Harbor. At the site, a 2,000-gallon gasoline tank, dispenser and the related product piping were removed. A Site Plan (Figure 1) showing the location of these features is attached to this report.

### **PREVIOUS FIELD ACTIVITIES**

On January 7, 2004, one 2,000-gasoline tank was removed. Mr. Bill Oyas, Fire Inspector with the City of Alameda, and Mr. Rob Weston of Alameda County Environmental Health (ACEH) witnessed the tank removal. Mr. Weston also directed the soil and groundwater sampling.

The tank was constructed of single wall steel, and appeared to have been covered with a tar paper that was largely dissolved. The tank, which measured approximately six feet in diameter and ten feet in length, appeared to be in good condition and no holes were observed. The fill port for the tank was located on the eastern end of the tank, and had consisted of a "T" fitting that was plumbed to a remote fill location and a fill port directly over the tank. The tank was transported under manifest to ECI in Richmond, California.

Odors of hydrocarbons were detected in the excavated soils and sidewalls, and in the groundwater. Groundwater collected in the tank pit excavation at approximately nine feet below grade.

The tank pit backfill material appeared to be a silty fine-grained sand which was stained dark gray to black. The native material in the sidewalls, beneath about 1.5 feet of fill material, appeared to be clayey silt and silty clay, which was dark brown to about five feet below grade, where the color changed to olive green.

Following the tank removal, a "grab" groundwater sample was collected from the tank pit excavation. The sample was collected using a disposable teflon bailer. Some oily product appeared to have collected on the surface of the water, which may have been the result of the dissolving of the tar paper that was originally on the tank. The groundwater sample had a moderate odor of weathered fuel.

One soil sample, designated as TP-W (7.25'), was collected from the sidewall of the western end of the tank pit excavation at the depth indicated. The soil at this location consisted of dark gray to black silty sand backfill with a moderate odor of weathered fuel. A second sample, designated as TP-N (8'), was collected from the northern sidewall of the excavation. The soil at this location consisted of green clayey silt/silty clay, which also had a moderate odor of weathered fuel. The locations of the sample points are shown on Figure 1.

One soil sample, designated as P1 (3.5'), was collected at a 90 degree elbow location in the product piping trench, approximately 1.5 foot below the excavation bottom. No odors of hydrocarbons were observed at this location. Another soil sample, designated as Disp. (3.5'), was collected from beneath the former dispenser location. A moderate odor of weathered fuel was observed on this sample. The materials at these locations consisted of native dark gray clayey silt/silty clay. The locations of these sample points are shown on Figure 1.

The soil and groundwater samples were analyzed for TPH as gasoline, benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tertiary butyl ether (MTBE) by EPA method 8020, and for total lead. All of the soil and groundwater samples were also analyzed for the eight fuel oxygenates by EPA Method 8260. The groundwater sample was also analyzed for organic lead.

Elevated concentrations of TPH as gasoline and BTEX were detected in the soil and groundwater samples. MTBE and the eight fuel oxygenates were non-detectable. 8.4 parts per billion of 1,2-dichloroethane was detected in the grab groundwater sample. Total Lead was detected in the samples at what appears to be naturally-occurring background concentrations. Organic Lead was non-detectable in the grab ground water sample.

On March 8, 2007, one four-part composite sample was collected from approximately 100 cubic yards of soil that had remained on site since the tank removal. The soil was underlain by plastic tarps. The stockpile sample was analyzed for TPH as gasoline, BTEX, and MTBE by EPA method 8020, and for total lead and STLC lead. The soil was profiled for disposal and was later removed from the site and transported to the Altamont Landfill in Livermore, California.

Based on letters from the ACEH dated September 22, 2006 and March 28, 2005, Geo-Logic prepared a work plan dated March 16, 2007 for a soil and groundwater investigation. The work plan was reviewed by ACEH and revisions were requested in a letter dated April 10, 2007. The revisions to the work plan were prepared and submitted on April 23, 2007, and were conditionally approved by the ACEH in a letter dated May 24, 2007.

On June 27, 2007, six of the eight proposed borings were completed to groundwater, and other shallow borings were completed. Borings B1, B5, B6 and B8 were completed at the proposed locations. Due to access limitations (the presence of concrete near the bank and trees overhead), boring B2 was not completed at the proposed location and B3 was relocated midway between the originally proposed locations of B2 and B3. Boring B4 could not be completed with the drilling rig due to the presence of trees. Two attempts were made using a hand auger. The first attempt, designated as B4A, encountered sheet metal at about one foot, proximal to a sheet metal building. The second attempt, designated as B4B, encountered metal shavings at about one foot below grade, and the hole was terminated due to refusal.

Boring 7 was attempted three times at or near the original location with the drill rig but encountered concrete about one foot below grade. As it was observed that there was an active storm drain that outletted to the estuary underlying this area, the boring was relocated and completed to the northwest. This location was desirable to provide delineation both of the hydrocarbons in water, and possible metal debris near the bank.

The borings were completed using a geoprobe rig provided by Vironex of Pacheco, California, a state-licensed driller. The locations of the borings are shown on Figure 1. The borings were continuously cored and the subsurface soils were examined for evidence of contamination. A photo-ionization detector (PID) was also used to screen the soil for contamination. Samples were selected from about five feet below grade, at the capillary fringe (about 7.5 feet below grade), and at about 12.5 feet and 15 feet below grade. The 12.5 foot samples generally corresponded to the last part of a layer of low permeability soils that appeared to contain hydrocarbons in many of the holes. The sample at the total depth (about 15 feet below grade) was generally in higher permeability water-bearing sandy soils and no odor of hydrocarbons was apparent.

All of the soil and groundwater samples were analyzed for TPH as gasoline, BTEX, and MTBE by EPA Methods 8015 and 8020. The ground water samples were analyzed for the fuel oxygenates and lead scavengers by EPA Method 8260. Selected soil samples from B3, B7B and B7C from a depth of four to 4.5 feet below grade, and the groundwater samples from B3 and B7C, were analyzed for the CAM 17 metals. The soil from B7B and B7C at that interval had visible metal debris in it. Mr. Steven Plunkett of ACDEH witnessed most of the drilling and sampling.

The analytical results of the soil samples indicated predominantly non-detectable results for petroleum hydrocarbons, except at the capillary fringe (about 7.5 feet below grade). The samples from B3, which was about 1.5 foot higher in elevation than the tank pit borings, had an elevated TPH as gasoline concentration at 12.5 feet below grade and non-detectable results at 7.5 feet below grade. The sample from 4.5 feet below grade near the former dispenser location at B5 also had elevated concentrations of hydrocarbons.

The analytical results of the grab groundwater samples indicated dissolved concentrations of hydrocarbons in groundwater in all of the borings except B7C, which was non-detectable. The concentrations of benzene in groundwater attenuated to very low (2.4 ppb in B3) to non-detectable to the north and east. The concentrations were not defined below about 100 to 160 ppb to the west and south.

The analytical results for the CAM 17 metals in B3 at 4.5 feet below grade, which appeared to be native soil, did not indicate any metals above the ESLs. The sample from B7B at four feet below grade, which contained abundant metal debris, had concentrations of nine of the CAM 17 metals above the ESLs. This sample, which contained the highest concentration of chromium of the soil samples analyzed, was also analyzed for hexavalent chromium by method E218.6m, which indicated a concentration of hexavalent chromium of 500 ppm. Arsenic and chromium concentrations exceeded their respective ESLs in the soil sample from B7C at 4.5 feet below grade, which also appeared to be historical fill material similar to the sample from B7B.

The analytical results for the CAM 17 metals in groundwater indicated concentrations of 14 metals above their respective ESLs in B3, and eleven metals above their respective ESLs in B7C. Except for lead and molybdenum, the concentrations of metals in the groundwater sample from B7C are significantly lower than the concentrations in B3. The collection of the sample in B7C was difficult and the rods were retracted three times, making it possible that metal debris from shallower depth affected the water sample analyses.

This work is summarized in Geo-Logic's "Report of Soil and Groundwater Investigation" dated July 18, 2007.

On April 19, 2010, three monitoring wells, designated as MW1 through MW3 on the attached Figure 3, were installed at the site. Well MW1 was located in the vicinity of previous boring B1, on the northeast side of the former tank pit, within the warehouse. Well MW2 was located adjacent to previous boring B5, at the former dispenser location. Well MW3 was located adjacent to previous boring B3, near the top of the estuary bank. Due to the previous logging and sampling, soil samples were not collected from the borings for these wells, however, the drill cuttings were examined for lithology and evidence of contamination. Odors of hydrocarbons were encountered beginning at approximately 6 feet (capillary fringe) in MW1, and at approximately two feet in MW2, in the former dispenser area.

Well Construction: The well casings consisted of two-inch diameter schedule 40 PVC with flush threaded joints and 0.010 inch factory slots. Based on previous conditions encountered in exploratory borings, the wells were screened between approximately 5 and 20 feet below grade with 0.010 inch screen. #2/12 sand was used for the filter pack and was placed from approximately 4.5 to 20 feet below grade, starting approximately 1/2 foot above the perforated interval. A 0.5-foot thick bentonite seal was placed in the annular space on top of the sand pack. Neat cement grout was placed on top of the bentonite seal to the surface.

On May 4, 2010, samples were obtained from the three wells, and the wells were monitored and sampled. The groundwater samples were analyzed for TPH as gasoline, BTEX, and MTBE and the fuel oxygenates and lead scavengers by EPA Method 8260 B, and for the CAM 17 metals. The analytical results of the groundwater samples collected from the three monitoring wells indicated concentrations ranging from predominantly non-detectable in MW3 to up to 2,300 parts per billion (ppb) of TPH as gasoline and up to 210 ppb of benzene in MW2, at the former dispenser area. At MW3, the only detected analyte was MTBE, at a concentration of 1.6 ppb. Toluene and xylenes were also detected in MW2 at concentrations of 5.8 and 130 ppb, respectively. At MW1, adjacent to the former tank pit, TPH as gasoline, benzene, toluene, xylenes and t-Butyl Alcohol were detected at concentrations of 380, 22, 0.77, 1.2 and 2.4 ppb, respectively. The concentrations of TPH as gasoline (2,300 ppb), benzene (210 ppb), and xylenes (130 ppb) are in excess of their respective Environmental Screening Levels (Table F-1b).

For the CAM 17 metals, six metals (beryllium, chromium, mercury, selenium, silver, and thallium) were non-detectable. Of the other eleven metals, cadmium, cobalt, copper, lead and nickel were detected in excess of their respective ESLs. Nickel concentrations were particularly elevated (ranging up to 190 ppb in MW2, in excess of the ESL of 8.2 ppb).

The analytical data is summarized in Tables 2 and 3. The results of this work were summarized in Geo-Logic's "Report of Monitoring Well Installation and May 2010 Sampling", dated May 14, 2010.

On Nov. 5, 2010, samples were again obtained from the three wells, and the wells were monitored. That work is summarized in Geo-Logic's "Report of November 2010 Sampling" dated November 19, 2010.

On May 13, 2011, and December 5, 2011, samples were again obtained from the three wells, and the wells were monitored. Also, two samples were obtained from the inner harbor waters, which yielded entirely non-detectable results for metals. That work is summarized in Geo-Logic's "Report of May 2011 Sampling" dated May 24, 2011, and "Report of December 2011 Sampling", dated December 16, 2011.

On June 1 and December 3, 2012, samples were again obtained from the three wells, and the wells were monitored. That work is summarized in Geo-Logic's "Report of June 2012 Sampling" and "Report of December 2012 Sampling", dated June 12 and December 11, 2012, respectively.

On June 3, 2013, samples were again obtained from the three wells, and the wells were monitored. That work is summarized in Geo-Logic's "Report of June 2013 Sampling", dated June 17, 2013.

### **RECENT FIELD ACTIVITIES –GROUNDWATER SAMPLING**

On December 2, 2013, samples were again obtained from the three wells, and the wells were monitored. The groundwater samples were collected as follows: prior to sampling, the wells were checked for depth to water and the presence of free product and sheen. No free product or sheen was noted in the wells.

The wells were bailed until the volume of water withdrawn was equal to at least three casing volumes. To assure that a representative groundwater sample was collected, periodic measurements of the temperature, pH and specific conductance were made. The samples were collected only when the temperature, pH, and/or specific conductance reached relatively constant values.

Water samples were collected using disposable bailers. An effort was made to minimize exposure of the samples to air. The samples were decanted into clean VOA vials that were then sealed with Teflon-lined screw caps, labeled, and stored in a cooler, on ice, until delivery to the laboratory. The samples for metals analyses were filtered in the field due to hold time requirements. Excess water resulting from the purging and cleaning procedures was collected and contained in a drum.

### **HYDROLOGY**

On December 2, 2013, the measured depth to groundwater in wells MW1 through MW3 varied between approximately 4.50 to 7.23 feet below the tops of the well casings. As shown on Figure 2, the estimated hydraulic gradient was to the north at approximately 0.01 feet per foot. The direction of groundwater flow has been predominantly to the north in four in previous events, however, the site is under strong tidal influence. The elevations of groundwater fell between approximately 0.18 and 0.89 feet since the previous event on June 3, 2013.

The groundwater elevation data is summarized in Table 1 and on Figure 2. . Copies of the field data sheets are attached to this report.

### **ANALYTICAL RESULTS**

The groundwater samples were analyzed by McCampbell Analytical Laboratory in Pittsburg, California, a state-certified laboratory. The groundwater samples were analyzed for TPH as gasoline, BTEX, and MTBE and the fuel oxygenates and lead scavengers by EPA Method 8260 B, and for the CAM 17 metals.

The only detected hydrocarbons in the groundwater samples collected from the three monitoring wells consisted of 7.1 parts per billion (ppb) of benzene that was detected in MW2. This was relatively similar to the last two previous events, and is the third event showing very low to non-detectable results.

For the CAM 17 metals in the monitoring well samples, the analytical results were relatively similar to previous events. In MW-3, the sample could not be analyzed at the required quality control without a ten-fold dilution, resulting in some of the detection limits exceeding the ESLs. Since cadmium and copper have historically always exceeded the ESL in this well, it is assumed that this was probably the case for this event even though these metals were not above the (elevated) detection limit.

Nickel remains elevated above the ESL in all three wells. Vanadium and selenium were detected above their respective ESLs in MW-1 and MW-3, respectively (where groundwater is not considered a potential drinking water source, Table F-1b).

The analytical data is summarized in Tables 2 and 3 and Figure 3. Copies of the laboratory analyses data sheets and chain of custody are attached to this report.



This report will be uploaded to the Geotracker database in addition to the ACEH database. Should you have any questions regarding this report, please do not hesitate to call me at (510) 593-5382.

Sincerely,  
**Geo-Logic**



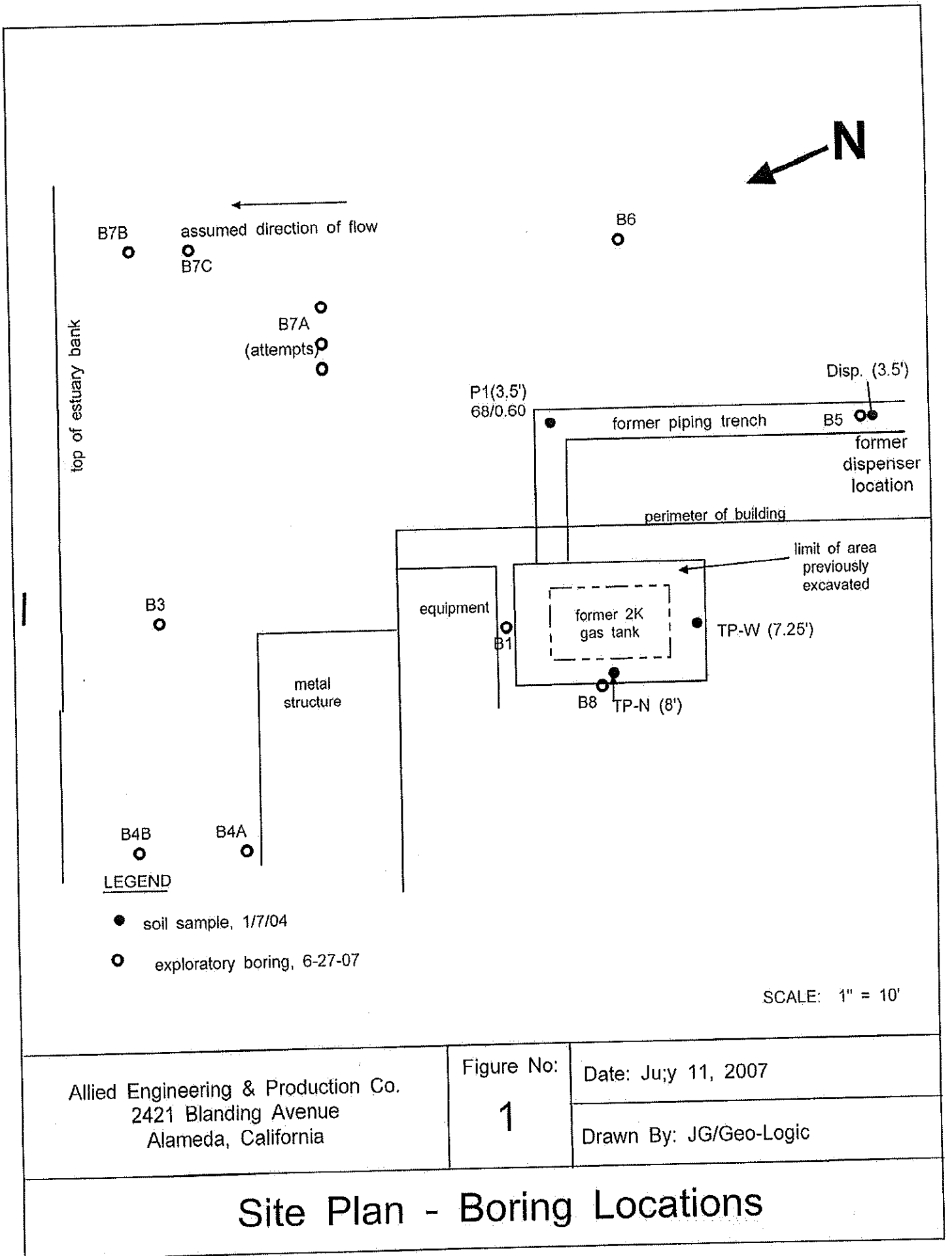
A handwritten signature in black ink, appearing to read "Joel G. Greger".

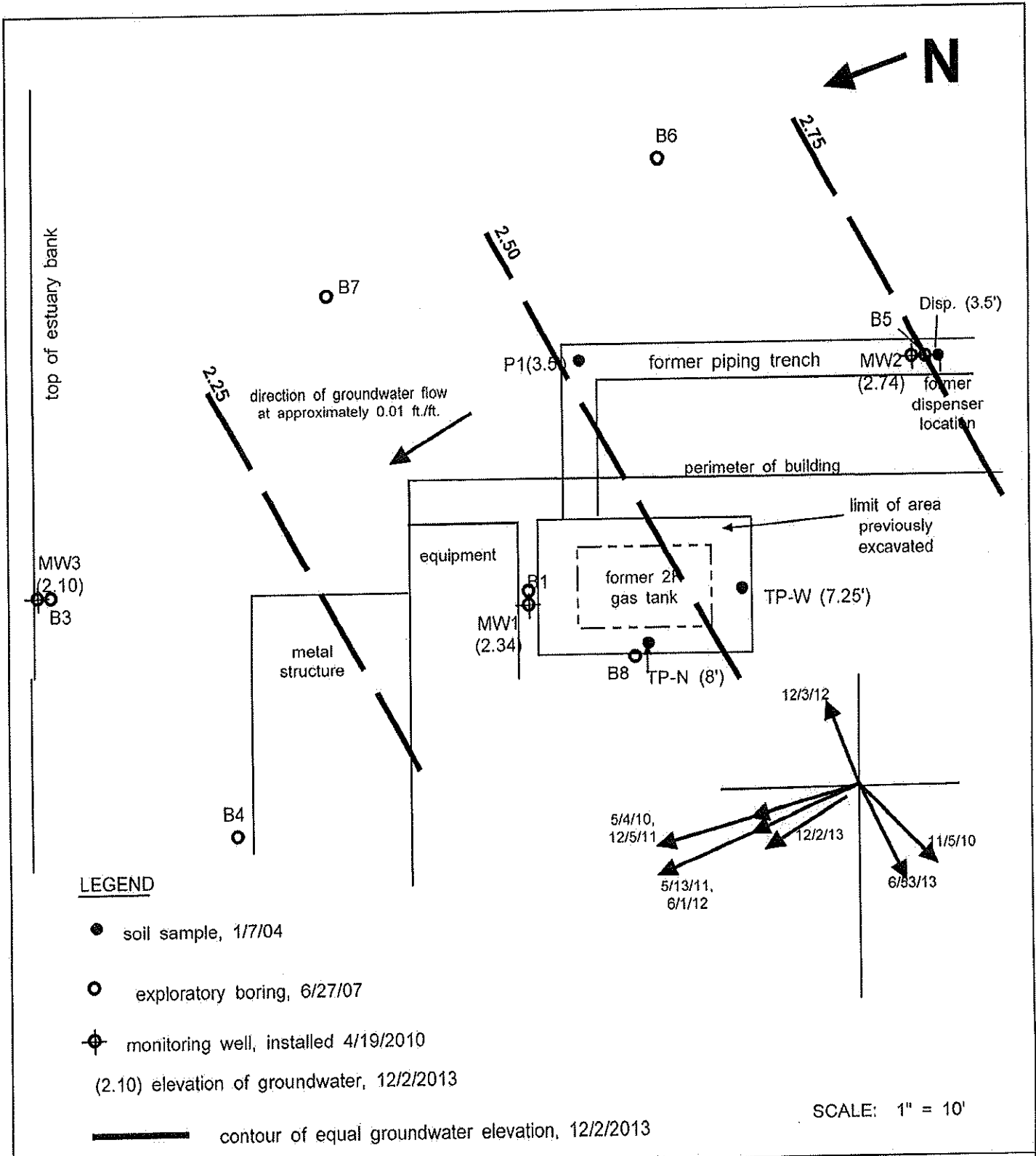
Joel G. Greger  
Certified Engineering Geologist  
Registered Environmental Assessor  
CEG # EG1633, REA # 07079

cc: Ms. Kassandra Miller, Allied Engineering

Attachments: Tables 1 through 3  
Figures 1 through 3  
Laboratory Analytical Data  
Field Data Sheets

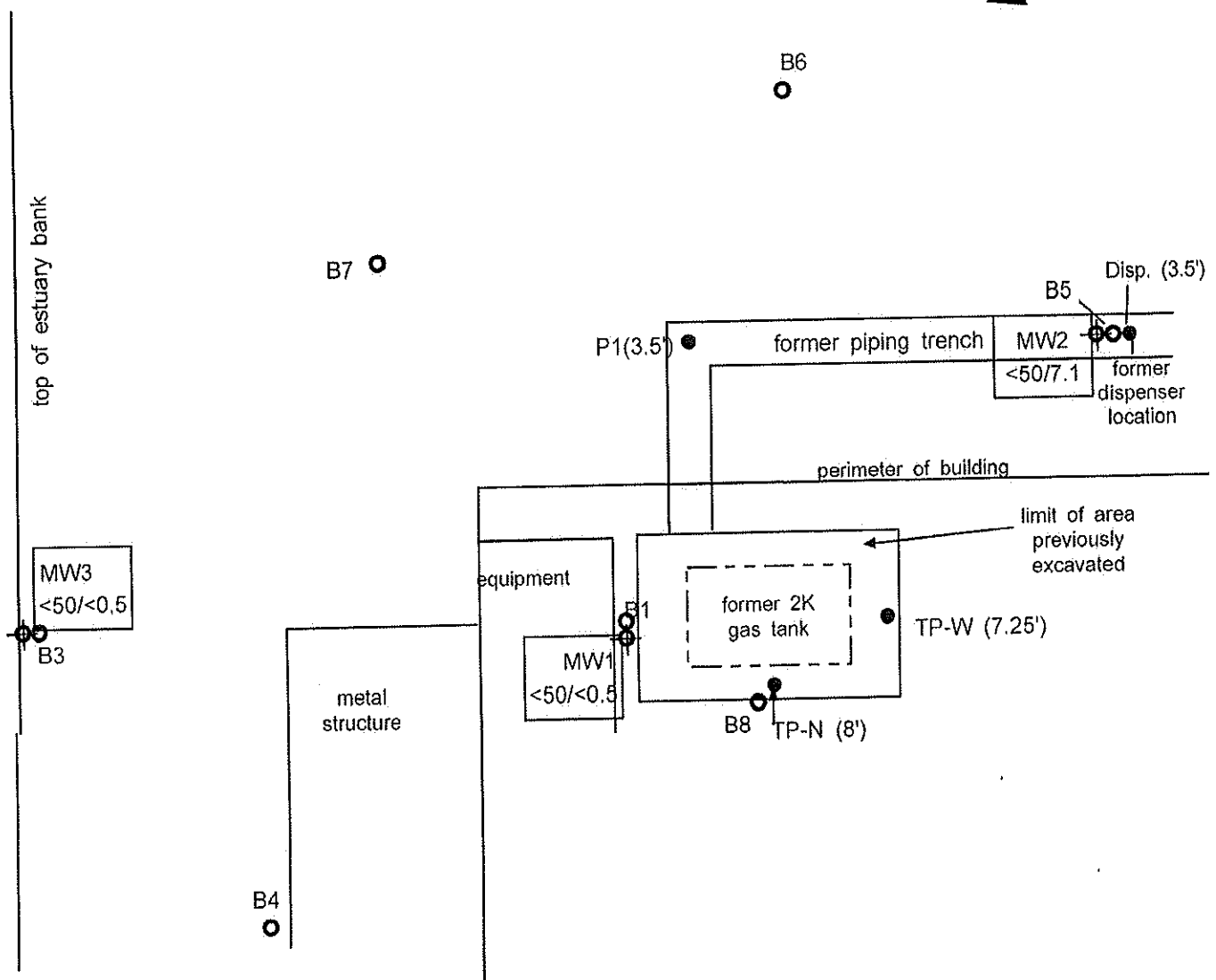
# **FIGURES**





Allied Engineering & Production Co. 2421 Blanding Avenue Alameda, California	Figure No:	Date: Dec. 11, 2013
	2	Drawn By: JG/Geo-Logic

# Potentiometric Surface Map



**LEGEND**

- soil sample, 1/7/04
- exploratory boring, 6/27/07
- ⊕ monitoring well, installed 4/19/2010

MW3 concentration of TPH-gas/benzene in ppb, 12/2/2013  
 <math><50/<0.5</math>

SCALE: 1" = 10'

Allied Engineering & Production Co. 2421 Blanding Avenue Alameda, California	Figure No: <b>3</b>	Date: Dec. 9, 2013
		Drawn By: JG/Geo-Logic

# Groundwater Contaminant Concentration Map

# **TABLES**

TABLE 1  
GROUNDWATER MONITORING DATA  
2421 Blanding Ave., Alameda, CA

Well No.	Date	Groundwater Elevation	Top of casing Elevation	Depth to Water	Well Depth	Product Thickness	Sheen	Water purged (gallons)	
MW1	4/26/2010	2.37	8.27	5.90	20.13	0	No	25	
	5/4/2010	-0.30		8.57	20.18	0	No	7	
	11/5/2010	2.24		6.03	20.16	0	No	9	
	5/13/2011	1.99		6.28	20.27	0	No	9	
	12/5/2011	1.94		6.33	20.15	0	No	8.5	
	6/1/2012	1.86		6.41	20.06	0	No	9.5	
	12/3/2012	2.47		5.80	20.15	0	No	9	
	6/3/2012	1.84		6.43	20.15	0	No	9.5	
	12/2/2013	2.34		5.93	20.15	0	No	9	
	MW2	4/27/2010		2.60	7.24	4.64	18.90	0	No
5/4/2010		0.48	6.76	19.18		0	No	8.5	
11/5/2010		1.91	5.33	19.14		0	No	8	
5/13/2011		2.15	5.09	19.09		0	No	9	
12/5/2011		2.15	5.09	19.14		0	No	8.5	
6/1/2012		1.89	5.35	19.16		0	No	9.5	
12/3/2012		2.69	4.55	19.17		0	No	9	
6/3/2012		1.85	5.39	19.17		0	No	8.5	
12/2/2013		2.74	2.74	4.50		19.20	0	No	9
MW3		4/26/2010	2.36	9.33		6.97	20.02	0	No
	5/4/2010	-1.16	10.49		20.04	0	No	5.75	
	11/5/2010	3.93	5.40		20.03	0	No	9	
	5/13/2011	1.84	7.49		20.03	0	No	8	
	12/5/2011	1.70	7.63		20.04	0	No	8	
	6/1/2012	1.83	7.50		20.07	0	No	9.5	
	12/3/2012	2.13	7.20		20.00	0	No	8	
	6/3/2012	1.92	7.41		20.00	0	No	8	
	12/2/2013	2.10	7.23		20.00	0	No	8	

TABLE 2  
GROUNDWATER ANALYTICAL RESULTS - HYDROCARBONS  
2421 Blanding Ave., Alameda, CA

Well No.	Date	TPH-g (ppb)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Xylenes (ppb)	MTBE (ppb)	TBA (ppb)
MW1	5/4/2010	380	22	0.77	<0.5	1.2	<0.5	2.4
	11/5/2010	120	4.5	<0.5	<0.5	<0.5	<0.5	<2.0
	5/13/2011	250	14	<0.5	<0.5	<0.5	<0.5	<2.0
	12/5/2011	200	8.9	<0.5	<0.5	<0.5	<0.5	<2.0
	6/1/2012	<50	2.1	<0.5	<0.5	<0.5	<0.5	<2.0
	12/3/2012	<50	1.0	<0.5	<0.5	<0.5	<0.5	<2.0
	6/3/2013	<50	1.5	<0.5	<0.5	<0.5	<0.5	<2.0
	12/2/2013	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0
MW2	5/4/2010	2,300	210	5.8	<5.0	130	<5.0	<20
	11/5/2010	110	28	<0.5	2.3	<0.5	0.55	<2.0
	5/13/2011	2,600	240	<5.0	57	25	<5.0	<2.0
	12/5/2011	990	140	<2.5	9.8	3.7	<2.5	<10
	6/1/2012	1,900	190	<5.0	34	15	<5.0	<20
	12/3/2012	<50	4.4	<0.5	<0.5	<0.5	<0.5	<2.0
	6/3/2013	<50	2.3	<0.5	<0.5	<0.5	<0.5	<2.0
	12/2/2013	<50	7.1	<0.5	<0.5	<0.5	<0.5	<2.0
MW3	5/4/2010	<50	<0.5	<0.5	<0.5	<0.5	1.6	<2.0
	11/5/2010	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0
	5/13/2011	<50	<0.5	<0.5	<0.5	<0.5	0.84	<2.0
	12/5/2011	<50	<0.5	<0.5	<0.5	<0.5	0.84	3.4
	6/1/2012	<50	<0.5	<0.5	<0.5	<0.5	0.70	<2.0
	12/3/2012	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0
	6/3/2013	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0
	12/2/2013	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0
ESL		100/500	1.0/46	40/130	30/290	13/13	5.0/1,800	12/18,000

**EXPLANATION:**

ppb = parts per billion

TPH = Total Petroleum Hydrocarbons as gasoline.

TBA = t-Butyl alcohol

ESL - Environmental Screening Level, Tables F-1a/F-1b (groundwater is/is not a potential drinking water source).



**TABLE 3**  
**GROUNDWATER ANALYTICAL RESULTS - CAM 17 METALS**  
**2421 Blanding Avenue, Alameda, CA**

Well No.	Date	Antimony (ppb)	Arsenic (ppb)	Barium (ppb)	Cadmium (ppb)	Chromium (ppb)	Cobalt (ppb)	Copper (ppb)	Lead (ppb)	Mercury (ppb)	Molybdenum (ppb)	Nickel (ppb)	Selenium (ppb)	Silver (ppb)	Vanadium (ppb)	Zinc (ppb)
MW1	5/4/2010	<0.5	17	130	<b>0.29</b>	<0.5	<b>6.2</b>	<0.5	2.1	<0.025	4.8	<b>120</b>	<0.5	<0.19	6.0	5.9
	11/5/2010	<0.5	15	93	<0.25	<0.5	1.4	0.83	<0.5	<0.025	2.0	<b>75</b>	<0.5	<0.19	2.7	<5.0
	5/13/2011	<0.5	18	100	<0.25	<0.5	0.92	<0.5	<0.5	<0.025	2.3	<b>85</b>	<0.5	<0.19	0.71	<5.0
	12/5/2011	<0.5	19	110	<0.25	<0.5	0.76	<0.5	<0.5	<0.025	1.8	<b>82</b>	<0.5	<0.19	1.7	<5.0
	6/1/2012	<0.5	11	99	<0.25	<1.0	0.70	<0.5	<0.5	<0.025	1.6	<b>59</b>	<0.5	<0.19	0.75	<5.0
	12/3/2012	<0.5	4.7	120	<0.25	<0.5	2.2	0.62	<0.5	<0.025	0.80	<b>54</b>	<0.5	<0.19	6.1	<5.0
	6/3/2013	<0.5	9.4	78	<0.25	<0.5	1.3	<0.5	<0.5	<0.025	1.1	<b>25</b>	<0.5	<0.19	<b>23</b>	<5.0
	12/2/2013	<0.5	8.0	110	<0.25	<0.5	<0.5	<0.5	<0.5	<0.025	1.0	<b>32</b>	<0.5	<0.19	<b>15</b>	<5.0
MW2	5/4/2010	<0.5	4.1	<b>84</b>	<b>1.0</b>	<0.5	<b>7.9</b>	1.7	<b>4.0</b>	<0.025	2.4	<b>190</b>	<0.5	<0.19	8.0	14
	11/5/2010	<0.5	5.3	61	<0.25	<0.5	1.9	<b>3.6</b>	1.7	<0.025	0.74	<b>110</b>	<0.5	<0.19	9.1	10
	5/13/2011	<0.5	5.7	62	<0.25	<0.5	1.6	<0.5	<0.5	<0.025	0.56	<b>170</b>	<0.5	<0.19	3.7	<5.0
	12/5/2011	<0.5	7.8	81	<0.25	<0.5	0.98	<0.5	0.81	<0.025	<0.5	<b>220</b>	<0.5	<0.19	5.1	<5.0
	6/1/2012	<0.5	5.4	89	<0.25	<1.0	1.1	<0.5	<0.5	<0.025	<0.5	<b>220</b>	<0.5	<0.19	5.6	<5.0
	12/3/2012	<0.5	5.3	83	<b>0.50</b>	<0.5	<b>3.2</b>	<b>3.7</b>	1.4	<0.025	<0.5	<b>120</b>	<0.5	<0.19	7.3	68
	6/3/2013	<0.5	5.9	86	<0.25	<0.5	2.2	<0.5	<0.5	<0.025	0.57	<b>83</b>	<0.5	<0.19	2.5	<5.0
	12/2/2013	<0.5	7.3	83	<0.25	<0.5	0.92	0.7	<0.5	<0.025	<0.5	<b>41</b>	<0.5	<0.19	5.5	6.6
MW3	5/4/2010	0.65	2.7	180	<b>2.1</b>	<0.5	<b>5.9</b>	<b>6.4</b>	<b>14</b>	<0.025	20	<b>85</b>	<0.5	<0.19	4.4	7.0
	11/5/2010	0.91	2.1	81	<b>6.2</b>	7.6	<b>3.6</b>	<b>7.7</b>	<b>4.9</b>	<b>0.055</b>	26	<b>15</b>	2.7	<b>3.0</b>	3.3	35
	5/13/2011	<0.5	2.7	63	<b>0.51</b>	<0.5	2.1	<b>4.9</b>	2.1	<0.025	6.0	<b>55</b>	0.70	<0.19	4.4	<5.0
	12/5/2011	<0.5	5.5	48	<b>0.91</b>	0.57	0.64	<b>4.9</b>	1.0	<0.025	14	<b>52</b>	2.1	<0.19	7.6	<5.0
	6/1/2012	<0.5	3.3	38	<b>0.37</b>	<1.0	3.8	<b>5.3</b>	1.1	<0.025	6.1	<b>91</b>	<0.5	<0.19	6.3	6.8
	12/3/2012	<0.5	3.4	63	<b>0.34</b>	2.7	2.3	<b>3.1</b>	<0.5	<0.025	11	<b>24</b>	<b>9.5</b>	<0.19	5.3	<5.0
	6/3/2013	<0.5	2.8	71	<b>0.38</b>	0.65	1.6	<b>3.3</b>	0.58	<0.025	7.6	<b>82</b>	1.2	<0.19	5.3	<5.0
	12/2/2013	<0.5	<5.0	110	<2.5	<5.0	<5.0	<5.0	<5.0	<0.25	18	<b>57</b>	<b>14</b>	<1.9	<5.0	<5.0
IHC-W	5/13/2011	<0.5	<0.5	<5.0	<0.25	<0.5	<0.5	<0.5	<0.5	<0.025	<0.5	<0.5	<0.5	<0.19	<0.5	<5.0
IHC-E	5/13/2011	<0.5	<0.5	<5.0	<0.25	<0.5	<0.5	<0.5	<0.5	<0.025	<0.5	<0.5	<0.5	<0.19	<0.5	<5.0
ESL -		6.0	36	1000	0.25	50	3.0	3.1	2.5	0.025	35	8.2	5.0	0.19	15	81
Table F-1a																
ESL -		30	36	1000	0.25	180	3.0	3.1	2.5	0.025	240	8.2	5.0	0.19	19	81
Table F-1b																

**EXPLANATION:**

ESL = Environmental Screening Level, RWQCB, May 2008. Table F-1a, groundwater is a potential drinking water source, Table F-1b, groundwater is not a potential drinking water source.

Beryllium and thallium were non-detectable.

IHC = Inner Harbor Channel

ppb = parts per billion

Allied Engineering  
2421 Blanding Avenue  
Alameda, California

December 2013 Sampling  
Report Attachments  
Lab Data and Field Data Sheets

**LABORATORY  
ANALYTICAL DATA**



**McC Campbell Analytical, Inc.**

*"When Quality Counts"*

## Analytical Report

**WorkOrder:** 1312068

**Report Created for:** Geo-Logic  
1140 5th Avenue  
Crockett, CA 94525

**Project Contact:** Joel Gregor

**Project P.O.:**

**Project Name:** #DEI-6607; Allied Engineering

**Project Received:** 12/03/2013

Analytical Report reviewed & approved for release on 12/09/2013 by:

*Question about  
your data?*

[Click here to email  
McC Campbell](#)

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:** Geo-Logic  
**Project:** #DEI-6607; Allied Engineering  
**WorkOrder:** 1312068

<u>Glossary Abbreviation</u>	<u>Description</u>
95% Interval	95% Confident Interval
DF	Dilution Factor
DUP	Duplicate
LCS	Laboratory Control Sample
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ND	Not detected at or above the indicated MDL or RL
NR	Analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix; or sample diluted due to high matrix or analyte content.
RD	Relative Difference
RL	Reporting Limit
RPD	Relative Percent Deviation
SPK Val	Spike Value
SPKRef Val	Spike Reference Value

### Analytical Qualifier

S spike recovery outside accepted recovery limits  
a1 sample diluted due to matrix interference



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http://www.mccampbell.com / E-mail: main@mccampbell.com

# Analytical Report

Client: Geo-Logic  
Project: #DEI-6607; Allied Engineering  
Date Received: 12/3/13 19:54  
Date Prepared: 12/3/13

WorkOrder: 1312068  
Extraction Method: E200.8  
Analytical Method: E200.8  
Unit: µg/L

## CAM / CCR 17 Metals

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MW-1	1312068-001A	Water/DISS.	12/02/2013 14:43	ICP-MS1	84689
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Antimony	ND		0.50	1	12/05/2013 15:28
Arsenic	8.0		0.50	1	12/05/2013 15:28
Barium	110		5.0	1	12/05/2013 15:28
Beryllium	ND		0.50	1	12/05/2013 15:28
Cadmium	ND		0.25	1	12/05/2013 15:28
Chromium	ND		0.50	1	12/05/2013 15:28
Cobalt	ND		0.50	1	12/05/2013 15:28
Copper	ND		0.50	1	12/05/2013 15:28
Lead	ND		0.50	1	12/05/2013 15:28
Mercury	ND		0.025	1	12/05/2013 15:28
Molybdenum	1.0		0.50	1	12/06/2013 01:10
Nickel	32		0.50	1	12/05/2013 15:28
Selenium	ND		0.50	1	12/05/2013 15:28
Silver	ND		0.19	1	12/05/2013 15:28
Thallium	ND		0.50	1	12/05/2013 15:28
Vanadium	15		0.50	1	12/05/2013 15:28
Zinc	ND		5.0	1	12/05/2013 15:28

(Cont.)

CDPH ELAP 1644 ♦ NELAP 12283CA

AR Analyst's Initial

 Angela Rydelius, Lab Manager



## Analytical Report

Client: Geo-Logic  
Project: #DEI-6607; Allied Engineering  
Date Received: 12/3/13 19:54  
Date Prepared: 12/3/13

WorkOrder: 1312068  
Extraction Method: E200.8  
Analytical Method: E200.8  
Unit: µg/L

### CAM / CCR 17 Metals

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MW-2	1312068-002A	Water/DISS.	12/02/2013 15:33	ICP-MS1	84689
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Antimony	ND		0.50	1	12/05/2013 15:34
Arsenic	7.3		0.50	1	12/05/2013 15:34
Barium	83		5.0	1	12/05/2013 15:34
Beryllium	ND		0.50	1	12/05/2013 15:34
Cadmium	ND		0.25	1	12/05/2013 15:34
Chromium	ND		0.50	1	12/05/2013 15:34
Cobalt	0.92		0.50	1	12/05/2013 15:34
Copper	0.70		0.50	1	12/05/2013 15:34
Lead	ND		0.50	1	12/06/2013 01:17
Mercury	ND		0.025	1	12/05/2013 15:34
Molybdenum	ND		0.50	1	12/06/2013 01:17
Nickel	41		0.50	1	12/05/2013 15:34
Selenium	ND		0.50	1	12/05/2013 15:34
Silver	ND		0.19	1	12/05/2013 15:34
Thallium	ND		0.50	1	12/05/2013 15:34
Vanadium	5.5		0.50	1	12/05/2013 15:34
Zinc	6.6		5.0	1	12/05/2013 15:34

(Cont.)



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http://www.mcccampbell.com / E-mail: main@mcccampbell.com

# Analytical Report

**Client:** Geo-Logic  
**Project:** #DEI-6607; Allied Engineering  
**Date Received:** 12/3/13 19:54  
**Date Prepared:** 12/3/13

**WorkOrder:** 1312068  
**Extraction Method:** E200.8  
**Analytical Method:** E200.8  
**Unit:** µg/L

## CAM / CCR 17 Metals

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MW-3	1312068-003A	Water/DISS.	12/02/2013 13:56	ICP-MS1	84689
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Antimony	ND		5.0	10	12/06/2013 01:04
Arsenic	ND		5.0	10	12/06/2013 01:04
Barium	110		50	10	12/06/2013 01:04
Beryllium	ND		5.0	10	12/06/2013 01:04
Cadmium	ND		2.5	10	12/06/2013 01:04
Chromium	ND		5.0	10	12/06/2013 01:04
Cobalt	ND		5.0	10	12/06/2013 01:04
Copper	ND		5.0	10	12/06/2013 01:04
Lead	ND		5.0	10	12/06/2013 01:04
Mercury	ND		0.25	10	12/06/2013 01:04
Molybdenum	18		5.0	10	12/06/2013 01:04
Nickel	57		5.0	10	12/06/2013 01:04
Selenium	14		5.0	10	12/06/2013 01:04
Silver	ND		1.9	10	12/06/2013 01:04
Thallium	ND		5.0	10	12/06/2013 01:04
Vanadium	ND		5.0	10	12/06/2013 01:04
Zinc	ND		50	10	12/06/2013 01:04

Analytical Comments: a1





## Analytical Report

**Client:** Geo-Logic  
**Project:** #DEI-6607; Allied Engineering  
**Date Received:** 12/3/13 19:54  
**Date Prepared:** 12/6/13

**WorkOrder:** 1312068  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L

### TPH(g) by Purge & Trap and GC/MS

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MW-1	1312068-001B	Water	12/02/2013 14:43	GC28	84849
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
TPH(g)	ND		50	1	12/06/2013 12:28
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>		
Toluene-d8	92		70-130		12/06/2013 12:28
MW-2	1312068-002B	Water	12/02/2013 15:33	GC28	84849
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
TPH(g)	ND		50	1	12/06/2013 13:06
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>		
Toluene-d8	93		70-130		12/06/2013 13:06
MW-3	1312068-003B	Water	12/02/2013 13:56	GC28	84849
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
TPH(g)	ND		50	1	12/06/2013 13:45
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>		
Toluene-d8	92		70-130		12/06/2013 13:45



## Analytical Report

**Client:** Geo-Logic  
**Project:** #DEI-6607; Allied Engineering  
**Date Received:** 12/3/13 19:54  
**Date Prepared:** 12/6/13

**WorkOrder:** 1312068  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L

### Oxygenates, MBTEX & Lead Scavengers by GC/MS

Client ID	Lab ID	Matrix/Ext/Type	Date Collected	Instrument	Batch ID
MW-1	1312068-001B	Water	12/02/2013 14:43	GC28	84849

Analytes	Result	RL	DF	Date Analyzed
tert-Amyl methyl ether (TAME)	ND	0.50	1	12/06/2013 12:28
Benzene	ND	0.50	1	12/06/2013 12:28
t-Butyl alcohol (TBA)	ND	2.0	1	12/06/2013 12:28
1,2-Dibromoethane (EDB)	ND	0.50	1	12/06/2013 12:28
1,2-Dichloroethane (1,2-DCA)	ND	0.50	1	12/06/2013 12:28
Diisopropyl ether (DIPE)	ND	0.50	1	12/06/2013 12:28
Ethylbenzene	ND	0.50	1	12/06/2013 12:28
Ethyl tert-butyl ether (ETBE)	ND	0.50	1	12/06/2013 12:28
Methyl-t-butyl ether (MTBE)	ND	0.50	1	12/06/2013 12:28
Toluene	ND	0.50	1	12/06/2013 12:28
Xylenes, Total	ND	0.50	1	12/06/2013 12:28

Surrogates	REC (%)	Limits	Date Analyzed
Dibromofluoromethane	107	70-130	12/06/2013 12:28
Toluene-d8	107	70-130	12/06/2013 12:28
4-BFB	127	70-130	12/06/2013 12:28

Client ID	Lab ID	Matrix/Ext/Type	Date Collected	Instrument	Batch ID
MW-2	1312068-002B	Water	12/02/2013 15:33	GC28	84849

Analytes	Result	RL	DF	Date Analyzed
tert-Amyl methyl ether (TAME)	ND	0.50	1	12/06/2013 13:06
Benzene	7.1	0.50	1	12/06/2013 13:06
t-Butyl alcohol (TBA)	ND	2.0	1	12/06/2013 13:06
1,2-Dibromoethane (EDB)	ND	0.50	1	12/06/2013 13:06
1,2-Dichloroethane (1,2-DCA)	ND	0.50	1	12/06/2013 13:06
Diisopropyl ether (DIPE)	ND	0.50	1	12/06/2013 13:06
Ethylbenzene	ND	0.50	1	12/06/2013 13:06
Ethyl tert-butyl ether (ETBE)	ND	0.50	1	12/06/2013 13:06
Methyl-t-butyl ether (MTBE)	ND	0.50	1	12/06/2013 13:06
Toluene	ND	0.50	1	12/06/2013 13:06
Xylenes, Total	ND	0.50	1	12/06/2013 13:06

Surrogates	REC (%)	Qualifiers	Limits	Date Analyzed
Dibromofluoromethane	106		70-130	12/06/2013 13:06
Toluene-d8	108		70-130	12/06/2013 13:06
4-BFB	133	S	70-130	12/06/2013 13:06

(Cont.)



## Analytical Report

**Client:** Geo-Logic  
**Project:** #DEI-6607; Allied Engineering  
**Date Received:** 12/3/13 19:54  
**Date Prepared:** 12/6/13

**WorkOrder:** 1312068  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/L

### Oxygenates, MBTEX & Lead Scavengers by GC/MS

Client ID	Lab ID	Matrix/Ext/Type	Date Collected	Instrument	Batch ID
MW-3	1312068-003B	Water	12/02/2013 13:56	GC28	84849
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
tert-Amyl methyl ether (TAME)	ND		0.50	1	12/06/2013 13:45
Benzene	ND		0.50	1	12/06/2013 13:45
t-Butyl alcohol (TBA)	ND		2.0	1	12/06/2013 13:45
1,2-Dibromoethane (EDB)	ND		0.50	1	12/06/2013 13:45
1,2-Dichloroethane (1,2-DCA)	ND		0.50	1	12/06/2013 13:45
Diisopropyl ether (DIPE)	ND		0.50	1	12/06/2013 13:45
Ethylbenzene	ND		0.50	1	12/06/2013 13:45
Ethyl tert-butyl ether (ETBE)	ND		0.50	1	12/06/2013 13:45
Methyl-t-butyl ether (MTBE)	ND		0.50	1	12/06/2013 13:45
Toluene	ND		0.50	1	12/06/2013 13:45
Xylenes, Total	ND		0.50	1	12/06/2013 13:45
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>		
Dibromofluoromethane	109		70-130		12/06/2013 13:45
Toluene-d8	107		70-130		12/06/2013 13:45
4-BFB	127		70-130		12/06/2013 13:45



# Quality Control Report

**Client:** Geo-Logic  
**Date Prepared:** 12/3/13  
**Date Analyzed:** 12/4/13  
**Instrument:** ICP-MS1  
**Matrix:** Water  
**Project:** #DEI-6607; Allied Engineering

**WorkOrder:** 1312068  
**BatchID:** 84689  
**Extraction Method:** E200.8  
**Analytical Method:** E200.8  
**Unit:** µg/L  
**Sample ID:** MB/LCS-84689  
1312064-001EMS/MSD

## QC Summary Report for E200.8

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Antimony	ND	49.13	0.50	50	-	98.3	85-115
Arsenic	ND	47.84	0.50	50	-	95.7	85-115
Barium	ND	474.4	5.0	500	-	94.9	85-115
Beryllium	ND	52.2	0.50	50	-	104	85-115
Cadmium	ND	49.92	0.25	50	-	99.8	85-115
Chromium	ND	49.44	0.50	50	-	98.9	85-115
Cobalt	ND	49.76	0.50	50	-	99.5	85-115
Copper	ND	49.98	0.50	50	-	100	85-115
Lead	ND	48.6	0.50	50	-	97.2	85-115
Mercury	ND	1.128	0.025	1.25	-	90.2	85-115
Molybdenum	ND	48.02	0.50	50	-	96	85-115
Nickel	ND	49.74	0.50	50	-	99.5	85-115
Selenium	ND	52.02	0.50	50	-	104	85-115
Silver	ND	50.35	0.19	50	-	101	85-115
Thallium	ND	48.04	0.50	50	-	96.1	85-115
Vanadium	ND	49.74	0.50	50	-	99.5	85-115
Zinc	ND	505.8	5.0	500	-	101	85-115

(Cont.)



# Quality Control Report

**Client:** Geo-Logic  
**Date Prepared:** 12/3/13  
**Date Analyzed:** 12/4/13  
**Instrument:** ICP-MS1  
**Matrix:** Water  
**Project:** #DEI-6607; Allied Engineering

**WorkOrder:** 1312068  
**BatchID:** 84689  
**Extraction Method:** E200.8  
**Analytical Method:** E200.8  
**Unit:** µg/L  
**Sample ID:** MB/LCS-84689  
1312064-001EMS/MSD

## QC Summary Report for E200.8

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Antimony	NR	NR	0	ND<5	NR	NR	-	NR	
Arsenic	NR	NR	0	67	NR	NR	-	NR	
Barium	NR	NR	0	95	NR	NR	-	NR	
Beryllium	NR	NR	0	ND<5	NR	NR	-	NR	
Cadmium	NR	NR	0	ND<2.5	NR	NR	-	NR	
Chromium	NR	NR	0	8.6	NR	NR	-	NR	
Cobalt	NR	NR	0	ND<5	NR	NR	-	NR	
Copper	NR	NR	0	81	NR	NR	-	NR	
Lead	NR	NR	0	5.1	NR	NR	-	NR	
Mercury	NR	NR	0	ND<0.25	NR	NR	-	NR	
Molybdenum	NR	NR	0	ND<5	NR	NR	-	NR	
Nickel	NR	NR	0	16	NR	NR	-	NR	
Selenium	NR	NR	0	ND<5	NR	NR	-	NR	
Silver	NR	NR	0	ND<1.9	NR	NR	-	NR	
Thallium	NR	NR	0	ND<5	NR	NR	-	NR	
Vanadium	NR	NR	0	53	NR	NR	-	NR	
Zinc	NR	NR	0	ND<50	NR	NR	-	NR	



## Quality Control Report

<b>Client:</b> Geo-Logic	<b>WorkOrder:</b> 1312068
<b>Date Prepared:</b> 12/6/13	<b>BatchID:</b> 84849
<b>Date Analyzed:</b> 12/6/13	<b>Extraction Method:</b> SW5030B
<b>Instrument:</b> GC28	<b>Analytical Method:</b> SW8260B
<b>Matrix:</b> Water	<b>Unit:</b> µg/L
<b>Project:</b> #DEI-6607; Allied Engineering	<b>Sample ID:</b> MB/LCS-84849 1312068-003BMS/MSD

### QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Acetone	ND	-	10	-	-	-	-
tert-Amyl methyl ether (TAME)	ND	20.73	0.50	20	-	104	70-130
Benzene	ND	17.86	0.50	20	-	89.3	70-130
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	79.62	2.0	80	-	99.5	70-130
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	23.17	0.50	20	-	116	70-130
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	21.73	0.50	20	-	109	70-130
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	-	-	-	-
trans-1,3-Dichloropropene	ND	-	0.50	-	-	-	-

(Cont.)



## Quality Control Report

<b>Client:</b> Geo-Logic	<b>WorkOrder:</b> 1312068
<b>Date Prepared:</b> 12/6/13	<b>BatchID:</b> 84849
<b>Date Analyzed:</b> 12/6/13	<b>Extraction Method:</b> SW5030B
<b>Instrument:</b> GC28	<b>Analytical Method:</b> SW8260B
<b>Matrix:</b> Water	<b>Unit:</b> µg/L
<b>Project:</b> #DEI-6607; Allied Engineering	<b>Sample ID:</b> MB/LCS-84849 1312068-003BMS/MSD

### QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Diisopropyl ether (DIPE)	ND	17.91	0.50	20	-	89.6	70-130
Ethylbenzene	ND	-	0.50	-	-	-	-
Ethyl tert-butyl ether (ETBE)	ND	19.25	0.50	20	-	96.3	70-130
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	19.19	0.50	20	-	96	70-130
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	-	-	-	-
1,1,1,2-Tetrachloroethane	ND	-	0.50	-	-	-	-
Tetrachloroethene	ND	-	0.50	-	-	-	-
Toluene	ND	19.77	0.50	20	-	98.8	70-130
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	-	-	-	-
<b>Surrogate Recovery</b>							
Dibromofluoromethane	26.7	45.47		45	107	101	70-130
Toluene-d8	27.4	45.28		45	110	101	70-130
4-BFB	3.149	5.722		4.5	126	127	70-130

(Cont.)



### Quality Control Report

Client: Geo-Logic  
Date Prepared: 12/6/13  
Date Analyzed: 12/6/13  
Instrument: GC28  
Matrix: Water  
Project: #DEI-6607; Allied Engineering

WorkOrder: 1312068  
BatchID: 84849  
Extraction Method: SW5030B  
Analytical Method: SW8260B  
Unit: µg/L  
Sample ID: MB/LCS-84849  
1312068-003BMS/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
tert-Amyl methyl ether (TAME)	20.52	21.15	20	ND	103	106	70-130	3.03	20
Benzene	16.53	17.08	20	ND	82.6	85.4	70-130	3.28	20
t-Butyl alcohol (TBA)	80.37	86.03	80	ND	100	108	70-130	6.81	20
1,2-Dibromoethane (EDB)	22.95	24.53	20	ND	115	123	70-130	6.68	20
1,2-Dichloroethane (1,2-DCA)	20.53	21.21	20	ND	103	106	70-130	3.25	20
Diisopropyl ether (DIPE)	16.36	17.06	20	ND	81.8	85.3	70-130	4.20	20
Ethyl tert-butyl ether (ETBE)	18.46	19.16	20	ND	92.3	95.8	70-130	3.75	20
Methyl-t-butyl ether (MTBE)	18.73	19.4	20	ND	93.7	97	70-130	3.54	20
Toluene	18.76	19.43	20	ND	93.8	97.2	70-130	3.54	20
<b>Surrogate Recovery</b>									
Dibromofluoromethane	44.44	44.81	45		99	100	70-130	0.823	20
Toluene-d8	42.81	43.69	45		95	97	70-130	2.04	20
4-BFB	5.243	5.287	4.5		117	117	70-130	0	20





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

WorkOrder: 1312068

ClientCode: GLC

WaterTrax   
  WriteOn   
  EDF   
  Excel   
  EQuIS   
  Email   
  HardCopy   
  ThirdParty   
  J-flag

<b>Report to:</b>		<b>Bill to:</b>	<b>Requested TAT:</b>
Joel Greger	Email: joelgreger2@gmail.com	Joel Greger	<b>5 days</b>
Geo-Logic	cc:	Geo-Logic	
1140 5th Avenue	PO:	1140 5th Avenue	<i>Date Received:</i> 12/03/2013
Crockett, CA 94525	ProjectNo: #DEI-6607; Allied Engineering	Crockett, CA 94525	<i>Date Printed:</i> 12/03/2013
(510) 787-6867    FAX: (510) 787-1457			

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	
1312068-001	MW-1	Water	12/2/2013 14:43	<input type="checkbox"/>	A	B	A										
1312068-002	MW-2	Water	12/2/2013 15:33	<input type="checkbox"/>	A	B											
1312068-003	MW-3	Water	12/2/2013 13:56	<input type="checkbox"/>	A	B											

**Test Legend:**

1	CAM17MS DISS	2	GAS8260_W	3	PREFD REPORT	4		5	
6		7		8		9		10	
11		12							

The following SampleIDs: 001B, 002B, 003B contain testgroup.

**Prepared by: Daniel Loa**

**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:** GEO-LOGIC  
**Project:** #DEI-6607; Allied Engineering  
**Comments:**

**QC Level:** LEVEL 2  
**Client Contact:** Joel Gregor  
**Contact's Email:** joelgreger2@gmail.com

**Work Order:** 1312068  
**Date Received:** 12/3/2013

WaterTrax     WriteOn     EDF     Excel     Fax     Email     HardCopy     ThirdParty     J-flag

Lab ID	Client ID	Matrix	Test Name	Number of Containers	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1312068-001A	MW-1	Water	E200.8 (CAM 17) (Dissolved)	1	250mL HDPE w/ HNO3	<input type="checkbox"/>	12/2/2013 14:43	5 days	None	<input type="checkbox"/>	
				1	1L HDPE, unprsv.	<input type="checkbox"/>					
1312068-001B	MW-1	Water	TPH(g) & BTEX & 5 Oxys+Lead Scav by 8260B	4	VOA w/ HCl	<input type="checkbox"/>	12/2/2013 14:43	5 days	None	<input type="checkbox"/>	
1312068-002A	MW-2	Water	E200.8 (CAM 17) (Dissolved)	1	250mL HDPE w/ HNO3	<input type="checkbox"/>	12/2/2013 15:33	5 days	None	<input type="checkbox"/>	
				1	1L HDPE, unprsv.	<input type="checkbox"/>					
1312068-002B	MW-2	Water	TPH(g) & BTEX & 5 Oxys+Lead Scav by 8260B	4	VOA w/ HCl	<input type="checkbox"/>	12/2/2013 15:33	5 days	None	<input type="checkbox"/>	
1312068-003A	MW-3	Water	E200.8 (CAM 17) (Dissolved)	1	250mL HDPE w/ HNO3	<input type="checkbox"/>	12/2/2013 13:56	5 days	None	<input type="checkbox"/>	
				1	1L HDPE, unprsv.	<input type="checkbox"/>					
1312068-003B	MW-3	Water	TPH(g) & BTEX & 5 Oxys+Lead Scav by 8260B	4	VOA w/ HCl	<input type="checkbox"/>	12/2/2013 13:56	5 days	None	<input type="checkbox"/>	

**\* NOTE: STLC and TCLP extractions require 48 hrs to complete; therefore, all TATs begin after the extraction is completed (i.e., 24hr TAT yields results in 72 hrs from sample submission).**

**Bottle Legend:**

1L HDPE, unprsv. = 1L HDPE Bottle, Unpreserved  
250mL HDPE w/ HNO3 = 250mL HDPE Bottle w/ HNO3  
VOA w/ HCl = 43mL VOA w/ HCl



**McCAMPBELL ANALYTICAL, INC.**

1534 WILLOW PASS ROAD  
 PITTSBURG, CA 94565-1701  
 Website: [www.mccampbell.com](http://www.mccampbell.com) Email: [main@mccampbell.com](mailto:main@mccampbell.com)  
 Telephone: (877) 252-9262 Fax: (925) 252-9269

**CHAIN OF CUSTODY RECORD**

TURN AROUND TIME

RUSH  24 HR  48 HR  72 HR  5 DAY

GeoTracker EDF  PDF  Excel  Write On (DW)

Check if sample is effluent and "J" flag is required

Report To: Joel Greger	Bill To: Geo-Logic
Company: Geo-Logic	
1140 5 <sup>th</sup> Ave	
Crockett CA 94525	
Tele: (510) 593-5382	E-Mail: <a href="mailto:joelgreger2@gmail.com">joelgreger2@gmail.com</a>
Project #: <u>DEL-6607</u>	Project Name: Allied Engineering
Project Location: 2421 Blanding Ave Alameda CA	
Sampler Signature: Kian Atkinson <i>[Signature]</i>	

SAMPLE ID	LOCATION/ Field Point Name	SAMPLING		# Containers	Type Containers	MATRIX					METHOD PRESERVED				Analysis Request	Other	Comments
		Date	Time			Water	Soil	Air	Sludge	Other	ICE	HCL	HNO <sub>3</sub>	Other			
✓ MW-1		12/2/13	1443	6	1/2 gal	X					X	X	X	X	X		**Indicate here if these samples are potentially dangerous to handle:
✓ MW-2		12/2/13	1533	6	1/2 gal	X					X	X	X	X	X		
✓ MW-3		12/2/13	1356	6	1/2 gal	X					X	X	X	X	X		

\*\*MAI clients MUST disclose any dangerous chemicals known to be present in their submitted samples in concentrations that may cause immediate harm or serious future health endangerment as a result of brief, gloved, open air, sample handling by MAI staff. Non-disclosure incurs an immediate \$250 surcharge and the client is subject to full legal liability for harm suffered. Thank you for your understanding and for allowing us to work safely.

Relinquished By: <i>[Signature]</i> KIAN ATKINSON	Date: 12/2/13	Time: 1615	Received By: <i>[Signature]</i> FL#01	ICE# <u>2-3</u>  GOOD CONDITION _____ HEAD SPACE ABSENT _____ DECHLORINATED IN LAB _____ APPROPRIATE CONTAINERS _____ PRESERVED IN LAB _____ VOAS O&G METALS OTHER _____ PRESERVATION pH<2	COMMENTS: <i>Sampled for Dissolved Cam 17 Filtered in Field with disposable 0.45 micron filter. Extra 1L Poly provided</i>
Relinquished By: <i>[Signature]</i> KIAN ATKINSON	Date: 12/3/13	Time: 104	Received By: <i>[Signature]</i> COMPTON		
Relinquished By: <i>[Signature]</i>	Date: 12/3	Time: 1820	Received By: <i>[Signature]</i>		

GLOBAL ID: T06019716048



### Sample Receipt Checklist

Client Name: **Geo-Logic** Date and Time Received: **12/3/2013 7:54:51 PM**  
 Project Name: **#DEI-6607; Allied Engineering** Login Reviewed by: **Daniel Loa**  
 WorkOrder N°: **1312068** Matrix: Water Carrier: Benjamin Yslas (MAI Courier)

**Chain of Custody (COC) Information**

Chain of custody present? Yes  No   
 Chain of custody signed when relinquished and received? Yes  No   
 Chain of custody agrees with sample labels? Yes  No   
 Sample IDs noted by Client on COC? Yes  No   
 Date and Time of collection noted by Client on COC? Yes  No   
 Sampler's name noted on COC? Yes  No

**Sample Receipt Information**

Custody seals intact on shipping container/cooler? Yes  No  NA   
 Shipping container/cooler in good condition? Yes  No   
 Samples in proper containers/bottles? Yes  No   
 Sample containers intact? Yes  No   
 Sufficient sample volume for indicated test? Yes  No

**Sample Preservation and Hold Time (HT) Information**

All samples received within holding time? Yes  No   
 Container/Temp Blank temperature Cooler Temp: 0.3°C NA   
 Water - VOA vials have zero headspace / no bubbles? Yes  No  NA   
 Sample labels checked for correct preservation? Yes  No   
 Metal - pH acceptable upon receipt (pH<2)? Yes  No  NA   
 Samples Received on Ice? Yes  No

(Ice Type: WET ICE )

\* NOTE: If the "No" box is checked, see comments below.

Comments:



# McCAMPBELL ANALYTICAL, INC.

1534 WILLOW PASS ROAD  
PITTSBURG, CA 94565-1701

Website: [www.mccampbell.com](http://www.mccampbell.com) Email: [main@mccampbell.com](mailto:main@mccampbell.com)  
Telephone: (877) 252-9262 Fax: (925) 252-9269

## CHAIN OF CUSTODY RECORD

TURN AROUND TIME

RUSH 24 HR 48 HR 72 HR 5 DAY

GeoTracker EDF  PDF  Excel  Write On (DW)

Check if sample is effluent and "J" flag is required

Report To: Joel Greger Bill To: Geo-Logic  
 Company: Geo-Logic  
 1140 5<sup>th</sup> Ave  
 Crockett CA 94525 E-Mail: [joelgreger2@gmail.com](mailto:joelgreger2@gmail.com)  
 Tele: (510) 593-5382 Fax: (510) 787-1457  
 Project #: DEL-6607 Project Name: Allied Engineering  
 Project Location: 2421 Blanding Ave Alameda CA  
 Sampler Signature: Kian Atkinson *[Signature]*

SAMPLE ID	LOCATION/ Field Point Name	SAMPLING		# Containers	Type Containers	MATRIX					METHOD PRESERVED				Dissolved Cam 17 (0.45 Micron Filtered in field) Gas/BTEX/Oxygens/f Lead Scavengers 8260	Analysis Request	Other	Comments
		Date	Time			Water	Soil	Air	Sludge	Other	ICE	HCL	HNO <sub>3</sub>	Other				
MW-1		12/2/13	1443	6	voa/ pl	X					X	X	X	X	X			**Indicate here if these samples are potentially dangerous to handle:
MW-2		12/2/13	1533	6	voa/ pl	X					X	X	X	X	X			
MW-3		12/2/13	1356	6	voa/ pl	X					X	X	X	X	X			

\*\*MAI clients MUST disclose any dangerous chemicals known to be present in their submitted samples in concentrations that may cause immediate harm or serious future health endangerment as a result of brief, gloved, open air, sample handling by MAI staff. Non-disclosure incurs an immediate \$250 surcharge and the client is subject to full legal liability for harm suffered. Thank you for your understanding and for allowing us to work safely.

Relinquished By: <i>[Signature]</i> KIAN ATKINSON	Date: 12/2/13	Time: 1615	Received By: FZ#01
Relinquished By: <i>[Signature]</i> KIAN ATKINSON	Date: 12/3/13	Time:	Received By: COU#152
Relinquished By:	Date:	Time:	Received By:

ICE/r° \_\_\_\_\_  
 COMMENTS: Sampled for Dissolved Cam 17 Filtered in Field with disposable 0.45 micron filter. Extra 1L Poly provided  
 GOOD CONDITION \_\_\_\_\_  
 HEAD SPACE ABSENT \_\_\_\_\_  
 DECHLORINATED IN LAB \_\_\_\_\_  
 APPROPRIATE CONTAINERS \_\_\_\_\_  
 PRESERVED IN LAB \_\_\_\_\_  
 VOAS O&G METALS OTHER \_\_\_\_\_  
 PRESERVATION pH<2 \_\_\_\_\_  
 GLOBAL ID: T06019716048

# **FIELD DATA SHEETS**

# FLUID-LEVEL MONITORING DATA

Project Number: \_\_\_\_\_ Date: 12/2/2013

Project/Site Location: 2421 Blanding Ave Alameda CA

Technician: Kian Atkinson Method: Electronic

Boring/Well	Depth to Water (feet)	Depth to Product (feet)	Product Thickness (feet)	Total Well Depth (feet)	Comments
MW-1	5.93	NONE DETECTED	NONE DETECTED	20.15	@ 1300
MW-2	4.50	↓	↓	19.20	@ 1305
MW-3	7.23	↓	↓	20.00	@ 1255

WELL NUMBER / FIELD POINT ID: MW-1

DATE: DECEMBER 2, 2013

PROJECT / GLOBAL ID: T06019716048

SITE LOCATION: 2421 Blanding ave

CITY: Alameda

STATE: CA

**PURGE DEVICE**

circle one submersible pump circle one peristaltic pump bladder pump disposable bailer

**SAMPLING DEVICE**

circle one submersible pump circle one peristaltic pump bladder pump disposable bailer

casing diameter (inches) circle one 0.75 circle one 2 4 6

casing volumes (gallons) circle one 0.02 circle one 0.2 0.7 1.52

**WELL DATA**

SAMPLER/S: Kian Atkinson

WELL NUMBER / FIELD POINT ID: MW-1

A. TOTAL WELL DEPTH: 20.15

B. DEPTH TO WATER: 5.93

C. WATER HEIGHT (A-B): 14.22

D. WELL CASING DIAMETER: 2

E. CASING VOLUME: 2

F. SINGLE CASE VOLUME (Cx E): 2.84

G. PURGE CASE VOLUME (3x E): 8.57

H: 80% RECHARGE LEVEL (F+B): 8.77

**PURGE DATA**

START TIME: 1400

TUBING DEPTH: 12'

FINISH TIME: 1443

TUBING DEPTH: 12'

**SAMPLE TIME**

DEPTH TO WATER: 7.98

TIME MEASURED: 1443

SAMPLE APPEARANCE / ODOR: SLIGHT ODOR (FUEL), CLEAR

TOTAL GALLONS PURGED: 9

**WELL FLUID PARAMETERS**

CASING VOL.	0	0.5	1	1.5	2	2.5	3
TIME	1400	1407	1414	1421	1428	1435	1442
pH	7.07	7.07	7.06	7.06	7.06	7.05	7.05
TEMP in °C	50.7	50.6	50.7	50.7	50.7	50.6	50.7
COND / SC us/cm	638	637	637	636	636	635	635
DTW	5.93	6.35	6.87	7.01	7.28	7.91	8.17
Tubing Depth	12'						→
Pump Rate ml/min	850 ML/MIN						→



WELL NUMBER / FIELD POINT ID: MW-2  
 DATE: DECEMBER 2, 2013  
 PROJECT / GLOBAL ID: T06019716048  
 SITE LOCATION: 2421 Blanding ave  
 CITY: Alameda STATE: CA

**PURGE DEVICE**  
 circle one submersible pump peristaltic pump bladder pump disposable bailer  
**SAMPLING DEVICE**  
 circle one submersible pump peristaltic pump bladder pump disposable bailer  
 casing diameter (inches) circle one 0.75 2 4 6  
 casing volumes (gallons) circle one 0.02 0.2 0.7 1.52

**WELL DATA**  
 SAMPLER/S: Kian Atkinson  
 WELL NUMBER / FIELD POINT ID: MW-2  
 A. TOTAL WELL DEPTH: 19.20  
 B. DEPTH TO WATER: 4.00  
 C. WATER HEIGHT (A-B): 14.70  
 D. WELL CASING DIAMETER: 2  
 E. CASING VOLUME: 2  
 F. SINGLE CASE VOLUME (Cx E): 14.70 x 2.94  
 G. PURGE CASE VOLUME (3x E): 8.82  
 H. 80% RECHARGE LEVEL (F+B): 7.44

**PURGE DATA**  
 START TIME: 1450  
 TUBING DEPTH: 12'  
 FINISH TIME: 1530  
 TUBING DEPTH: 12'

**SAMPLE TIME**  
 DEPTH TO WATER: TIME MEASURED:  
 SAMPLE APPEARANCE / ODOR:  
 TOTAL GALLONS PURGED:

**WELL FLUID PARAMETERS**

CASING VOL.	0	0.5	1	1.5	2	2.5	3
TIME	1450	1457	1503	1510	1517	1524	1530
pH	7.12	7.13	7.13	7.14	7.14	7.14	7.14
TEMP in °C	52.1	52.1	52.1	52.1	52.1	52.1	52.0
COND / SC us/cm	268	268	268	268	268	268	268
DTW	4.50	5.35	5.85	6.21	6.37	6.58	6.71
Tubing Depth	12'						>
Pump Rate ml/min	800 ml/min						>

WELL NUMBER / FIELD POINT ID: MW-3

DATE: DECEMBER 2, 2013

PROJECT / GLOBAL ID: T06019716048

SITE LOCATION: 2421 Blanding ave

CITY: Alameda

STATE: CA

PURGE DEVICE

circle one submersible pump peristaltic pump bladder pump disposable bailer

SAMPLING DEVICE

circle one submersible pump peristaltic pump bladder pump disposable bailer
casing diameter (inches) circle one 0.75 2 4 6
casing volumes (gallons) circle one 0.02 0.2 0.7 1.52

WELL DATA

SAMPLER/S: Klan Atkinson

WELL NUMBER / FIELD POINT ID: MW-3

A. TOTAL WELL DEPTH: 20.00

B. DEPTH TO WATER: 7.25

C. WATER HEIGHT (A-B): 12.77

D. WELL CASING DIAMETER: 2

E. CASING VOLUME: 2

F. SINGLE CASE VOLUME (CxE): 2.55

G. PURGE CASE VOLUME (3xE): 7.65

H: 80% RECHARGE LEVEL (F+B): 9.78

PURGE DATA

START TIME: 1315

TUBING DEPTH: 15'

FINISH TIME: 1356

TUBING DEPTH: 15'

SAMPLE TIME

DEPTH TO WATER: 8.07

TIME MEASURED: 1356

SAMPLE APPEARANCE / ODOR: CLEAR, NO ODOR

TOTAL GALLONS PURGED: 8

WELL FLUID PARAMETERS

Table with 8 columns (Casing Vol 0-3) and 8 rows (Time, pH, Temp, Cond, DTW, Tubing Depth, Pump Rate). Includes handwritten data points for each parameter across the casing volume range.