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By Alameda County Environmental Health 1:02 pm, Dec 15, 2016

December 5, 2016

Mr. DeLong Liu  
DeLong Petroleum, Inc.  
2501 North Main Street  
Walnut Creek, California 94597

RE: Additional Site & Off-Site Investigation Work Plan

76 Gas Station/Circle K  
1716 Webster Street  
Alameda, California  
ACEH Case # RO0003140

“I declare, that to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached report are true and correct.

Submitted by;

DeLong Liu  
President





November 30, 2016

Alameda County Environmental Health Services  
Environmental Protection  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502-6577

Attention: Mr. Mark Detterman

RE: Additional Site & Off-Site Investigation Work Plan  
Delong Oil, Inc.  
1716 Webster Street, Alameda, California 94501  
Fuel Leak Case No. RO0003140; (Global ID No. T10000005974)  
(CCI Project No. 12214-3)

Dear Mr. Detterman:

Compliance & Closure, Inc. (CCI) is pleased to present this Additional Site & Off-Site Investigation Work Plan for the Delong Oil site located at 1716 Webster Street, Alameda, California. The Work Plan was requested from the Alameda County Environmental Health (ACEH) in its letter dated October 19, 2016.

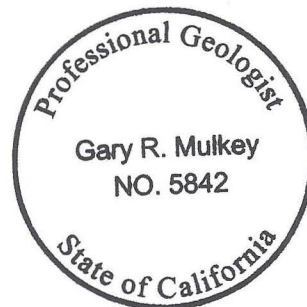
CCI appreciates your comments and if you have any questions, please contact our office at 925-648-2008 or e-mail [gary@cci-envr.com](mailto:gary@cci-envr.com).

Sincerely,  
Compliance & Closure, Inc.

A handwritten signature in blue ink that reads "Gary R. Mulkey".

Gary R. Mulkey, P.G. 5842

Cc: Mr. Delong Liu, Delong Oil, Inc.



# **Additional Site & Off-Site Investigation Work Plan**

**For**

**Delong Oil, Inc.  
1716 Webster Street, Alameda County, California**

## **Introduction**

Compliance & Closure, Inc. (CCI) has prepared this Additional Site & Off-site Investigation Work Plan on behalf of Delong Oil, Inc., owner of the property located at 1716 Webster, Alameda, California (Figure 1). The work plan was requested by the Alameda County Environmental Health (ACEH) in its letter dated October 19, 2016. The ACEH has requested that CCI's May 23, 2016 Work Plan for Additional Soil and Groundwater Investigation which included soil borings be put on hold and requested a new work plan that addresses the residential foundations of the homes to the east of the site, on site soil vapor sampling and further delineation of the groundwater diesel plume to the northwest of the site.

The purpose of the additional investigation is to investigate the nature of the residential foundations to the east of the site (along the south side of Buena Vista Avenue extending to Concordia Street. The ACEH is also requesting a methane soil vapor investigation be conducted along the east side of the gas station site to determine if methane is being generated from the biodegradation of the residual petroleum contamination found in the vicinity of the former waste oil tank. Further delineation of the diesel groundwater plume to the northwest of the subject site also needs to be conducted to determine the extent of contamination.

The ACEH has also requested that quarterly groundwater monitoring be continued at the site. In previous correspondence CCI had informed the ACEH that monitoring wells MW-4 and MW-5 appear to have been destroyed. Monitoring well MW-4 was filled with cement and there is a "new" asphalt patch in the area of MW-5. CCI will contact the Alameda County Public Works Department (ACDEH) to determine if the wells were destroyed under permit with the ACDEH.

## **Site Setting**

The site is currently an operating 76 gas station with a Circle K convenience store located on the southeast corner of Webster Street and Buena Vista Avenue in the City and County of Alameda, California. Adjacent to the property on the east side are residences, across Buena Vista Avenue

to the north is an operating Chevron gas station and commercial properties are located south and west of the site.

### **Background Information**

In 1983, three single-walled, fiberglass gasoline fuel tanks (12,000-gallon, 10,000-gallon and 6,000-gallon) and one waste oil tank were installed underground (USTs) at the site. In 1987, Mobil Oil Corporation replaced the waste oil tank with a 1,000-gallon tank. The site was later sold to British Petroleum, which operated the site until 1994. In 1994, the site was sold to ConocoPhillips, which operated the site until 2009. Between 1990 and 2009, several environmental site investigations and monitoring activities were conducted by several environmental consulting firms including Kaprealian Engineering, Inc., Hydro-Environmental Technologies, Inc., Fugro West and TRC Alton Geoscience.

In 2009, ConocoPhillips sold the site to United Brothers Enterprises, Inc., also doing business as Delong Oil, Inc., the current owner of the property. In early November 2009, Delong Oil converted the 6,000-gallon gasoline tank to a diesel tank. In July 2011, free-phase product was discovered in well RW-1, located adjacent to the converted diesel tank. Fingerprint analysis later identified the liquid as diesel fuel. Since Delong Oil was the only operator to sell diesel fuel at the site, the ACEH named it as a responsible party for the unauthorized release of the fuel. On September 6, 2013, the 1,000-gallon waste oil tank was removed from the site. Two soil samples and one grab water sample were collected from the excavation. The laboratory reported the soil samples contained detectable total petroleum hydrocarbons as diesel (TPHd) at 30.9 milligrams per kilogram (mg/kg) and total petroleum hydrocarbons as motor oil (TPHmo) at 231 mg/kg. The groundwater sample was also reported to contain detectable TPHd at 18,200 micrograms per liter (ug/L) and TPHmo at 46,200 ug/L. Based on these results, Delong Oil was again named a responsible party for an unauthorized release of product in the vicinity of the former waste oil tank.

On June 10, 2014, ACEH issued a letter directing Delong Oil to prepare a scope of work to characterize the downgradient and lateral extent of the free-phase product and groundwater contamination associated with the waste oil tank. ACEH also directed Delong Oil to evaluate potential impacts from the waste oil tank release to adjacent down-gradient residential buildings.

On January 25, 2016, CCI conducted a soil and groundwater investigation in the vicinity of the former waste oil and hydraulic lift area of the former gas station building. CCI was following the scope of work in the approved work plan from June 2014.

Results from the investigation showed that the soil and groundwater samples collected from the area just north and west of the former waste oil tank and the area of the former hydraulic lifts were

reported by the laboratory to contain detectable concentrations of TPHd. Soil sample SB-6-5, collected from a depth of 5 feet was reported by the laboratory to contain the highest TPHd concentration, at 32.1 mg/kg. This soil sample was also reported to contain TPHmo at 178 mg/kg and total petroleum hydrocarbons as hydraulic oil (THPho) at 34.7 mg/kg. The concentration of TPHd in the other 11 soil samples were much lower. No other compounds were detected in the soil samples.

Six groundwater samples collected from the borings were reported to contain relatively low concentrations of TPHd. All the TPHd samples were below the ESLs for groundwater where groundwater is a current or potential drinking water source. Four of the water samples, however, were reported to contain TPHmo ranging from 0.221 mg/L at SB-5-W to 0.493 mg/L at SB-6-W. All four of these water samples (SB-1-W, SB-2-W, SB-5-W and SB-6-W) exceeded the 100 ug/L ESLs for TPHmo where groundwater is a current or potential drinking water resource. The extent of the TPHmo in the groundwater to the east was not defined. The current and past groundwater gradient at the site indicates the groundwater flow direction is generally toward the north.

PID readings recorded during the investigation generally ranged from 15 to 1440 ppm in several of the soil borings. These PID readings did not correlate with results from the laboratory analysis.

On October 19, 2016, The ACEH has requested a new work plan that addresses the residential foundations of the homes to the east of the site, on site soil vapor sampling and further delineation of the groundwater diesel plume to the northwest of the site.

### **Scope of Work**

In response to the ACEH directive, CCI proposes to do the following;

- 1) Send letter to the property owners on the south side of Buena Vista Avenue, between Webster Street and Concordia Street to request access to the property to investigate building foundations for any sign of petroleum vapors;
- 2) Use a GeoProbe rig to install temporary soil vapor wells and collect soil vapor samples from three locations along the east side of the gasoline station;
- 3) The soil vapor samples will be analyzed for methane using ASTM D-1946;
- 4) CCI will further delineate the diesel groundwater plume on the northwest side of the subject site. CCI proposes to use a CPT rig to collect off-site lithology and groundwater samples to determine the extent of contamination;
- 5) CCI will contact the Alameda County Public Works Department (ACDEH) to determine if monitoring wells MW-4 and MW-5 were destroyed under permit with the ACDEH.

- 6) Presented the results of the investigation in a report.

### **Residential Foundation Investigation**

On September 6, 2013, the 1,000-gallon waste oil tank was removed from the southwest side of the site. Two soil samples and one grab water sample were collected from the excavation. The laboratory reported the soil samples contained detectable total petroleum hydrocarbons as diesel (TPHd) at 30.9 milligrams per kilogram (mg/kg) and total petroleum hydrocarbons as motor oil (TPHmo) at 231 mg/kg. The groundwater sample was also reported to contain detectable TPHd at 18,200 micrograms per liter (ug/L) and TPHmo at 46,200 ug/L. Due to the soil and groundwater contamination detected from the waste oil tank removal, the ACEH has requested that the residential homes to the east of the Delong Oil site have their foundations investigated for the presence of any petroleum vapors.

CCI will send letters to the property owners on the south side of Buena Vista Avenue, between Webster Street and Concordia Street to request access to the property to investigate building foundations for any sign of petroleum vapors. Assuming that access is granted, CCI will attempt to determine if any of the residential structures have basements or sump pumps to remove water from underneath the homes. CCI will use a PID meter to determine if any measurable vapors are present under the homes.

### **Soil Vapor Sampling**

CCI proposes to collect soil gas samples from three sample locations along the east side of the gas station site, Figure 2. Due to the shallow groundwater table, the soil vapor samples will be collected from depths of approximately 3 feet. The subsurface vapor sampling will be performed using a Direct-Push Technology (DPT) system provided by Gregg Drilling and Testing of Martinez, California under the supervision of a California Professional Geologist. Soil gas analysis will be performed by Eurofins/Air Toxics of Folsom, California. The soil gas samples collected during the investigation will be analyzed for methane using ASTM D-1946. CCI will compare the methane results to the San Francisco Bay, Regional Water Quality Control Boards, Environmental Screening Levels (ESLs) for soil vapor gas to determine if any methane soil gas will be an issue at the subject site.

### **Temporary Soil Gas Sampling Probe Installation**

Prior to commencing field work, CCI will notify Underground Service Alert (USA) and a private line location firm to clear the proposed boring locations of any underground utilities. CCI will install the three temporary sampling points by “direct-pushing” small diameter rods into the subsurface with a Geoprobe® System. The rods will be pushed to a depth of approximately 3 feet. Once the probe reaches the designated sampling depth, ¼-inch outside diameter (O.D.) Teflon tubing with a vapor implant will be inserted through the direct push probe, (Figure 3).

The vapor implant will be placed at the vertical midpoint of the sand pack having a thickness of 6-inches to 1 foot. A minimum of 6 inches of dry granular bentonite will be placed on the sand pack. Hydrated granular bentonite will then be placed on top of the 6-inches of the dry granular bentonite and brought to the surface. After construction of each temporary soil gas probe, samples will not be collected for at least 2 hours in order to allow subsurface conditions to equilibrate.

### **Shut in Test**

The shut in test will be used to determine whether there are any leaks in the sample train between the Summa canister and the vapor tight valve atop the sample probe. This test is performed prior to connecting the sample train to the ¼-inch Teflon tubing on the vapor sample probe. The sample train consists of a Summa canister, a flow regulator (150-milliliters/minute), vacuum gauges, purge port, sample port and micro-filter (Figure 4). The Summa canister will be attached to the sample manifold; the sample port valve will then be closed. A vacuum pump will then be attached to the purge port and a vacuum of at least -20 inches of mercury (hg) will be applied. Once the vacuum is applied, the purge port valve will be closed. The vacuum in the manifold will be monitored for at least 5 minutes using an attached vacuum gauge. The vacuum reading should be constant. If it is not, there is a leak and the manifold needs to be sealed.

### **Leak Test**

A leak test will be used to determine whether ambient air is leaking into the soil gas sample during collection of the sample. The test will be conducted at every soil gas probe sample location. Difluoroethalyne will be used as a liquid tracer compound to evaluate sample integrity. A leak test shroud will be used and placed over the sample train at the surface to create background atmosphere with the tracer gas. The shroud is designed to contain the entire sampling train and the soil gas well annulus (Figure 5). The seal integrity of the sample train and soil sampling probe will be confirmed by analyzing the soil gas sample for the tracer compound (difluoroethalyne).

### **Vapor Probe Purge Volume**

To ensure stagnant or ambient air is removed from the sampling point and to assure samples collected are representative of subsurface conditions, the air in the sample probe will be purged. CCI will use a default of three (3) purge volumes at each sample location and will calculate the purge volume based on purge volume tables (Appendix A). Three sampling tube volumes will be purged using a 6-liter SUMMA<sup>®</sup> canister. Purge time will be based on the pressure drop on the purge canister, approximately 3 to 5 psi.

### **Subsurface Vapor Sampling**

Once the Shut in Test, Leak Test and Vapor Probe Purge are completed, the probe is then pulled up approximately 6-inches to expose the screen to the open borehole. Soil vapor samples will then be collected in a 1-liter Summa canister equipped with a pressure gauge. For each sample canister, initial and final pressure readings and sampling times will be recorded. Following soil vapor sample collection, the Summa canister valve will be closed, labeled, recorded on a chain of custody form and placed into a cooler for transport to the laboratory. The probe boreholes will then backfilled with Portland cement.

### **Off-Site CPT Groundwater Investigation**

The ACEH has requested that further investigation of the diesel groundwater plume on the northwest side of the site be conducted in an attempt to defining the extent of groundwater contamination at the site. CCI proposes to conduct this investigation using a CPT rig as a reconnaissance tool to collect grab water samples from various locations at cross-gradient and down-gradient locations. CCI proposes to direct push five CPT borings to the west, northwest, and northeast of the site on Buena Vista Avenue.

### **CPT Data Collection**

Subsurface data gather from the 1716 Webster Street site indicate the primary water bearing zone is found at approximately 10 to 15 feet below the ground surface. In order to obtain lithological data and grab water samples from various depths, CCI proposes to use a CPT rig to collect sounding data and grab water samples from selected depths from a total of 6 CPT boring locations (Figure 2). It is anticipated these borings will extend to approximately 30 to 35 feet. The final depth will depend on the lithology provided in the sounding logs.

Prior to starting the field work, CCI will obtain the proper permits from the Alameda County Public Works Department (ACDEH). Encroachment permits will also be obtained from the City of Alameda for the boring locations on Webster Street and Buena Vista Avenue. CCI will retain Traffic Management, Inc. to provide traffic control while working in the street. Prior to starting field work, Underground Service Alert (USA) will be notified of the drilling operation and the boring locations will be marked with white paint so that this area can be "cleared" for utility lines.

At the location of the CPT borings, a two-step process will be used, which includes "sounding" the hole to collect lithology information and pore pressure data, followed by "direct-pushing" to a targeted sand lens and using a hydropunch sampling device to collect a "grab" groundwater sample from the zone of interest.



During the sounding phase, a cone-tipped, pressure-sensitive probe will be attached to a string of steel rods and advanced into the ground with heavy hydraulic rams. The rams, as well as the rest of the CPT equipment, will be contained in a 30-ton truck. The weight of the truck will provide the reactive force. As the rods and probe are pushed into the ground, two strain-gauge load cells contained within the probe will measure the bearing and shear resistance at the tip and sides of the probe, respectively, from the soil encountered. Analog signals generated by the cells in the probe will be transmitted via cable to an on-board computer, where conversion into digital data will occur. As the probe is advanced, the data generated by the probe will be simultaneously displayed on a monitor and printed as a hard copy inside the CPT rig. These logs will then be used to select zones of interest to collect groundwater samples.

### **CPT Groundwater Sampling**

After a second "direct-push" boring is extended to the target depth, a groundwater sample will be collected using a push-in PVC Piezometer, which is similar to a "Hydropunch" sampling device. The PVC Piezometer sampling system consists of two principal components: steel, outer protective casing with a 2-inch outside diameter (O.D.), and an inner 1-inch O.D. PVC slotted screen. The PVC Piezometer will be attached to a string of steel rods and advanced with the CPT rig to the desired sampling depth. An expendable stainless steel tip will be attached to the end of the outer casing to prevent soil or groundwater from entering the PVC Piezometer as it is being advanced into the ground. After reaching the desired sampling depth, the steel protective casing will be retracted and the PVC casing will be exposed.

Groundwater samples will then be collected using a pre-cleaned, stainless steel bailer, which will be lowered through the center of the steel rods and into the open screen. Upon retrieval of the bailer, the water sample will be transferred to the appropriate laboratory-supplied bottles, labeled, logged on chain-of-custody forms and stored in a chilled chest containing water ice for preservation in the field and during transport to the analytical laboratory.

Upon completion of the groundwater sampling at each location, the hole will be sealed with bentonite grout in accordance with procedures approved by the County. The CPT bore hole will be sealed by pumping grout from an auto-grout system as the A-rod is removed from the hole. The top six inches of the hole will be filled with compacted asphalt to seal the road surface.

### **Laboratory Analysis**

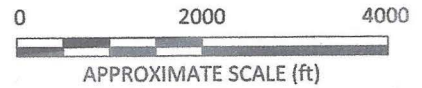
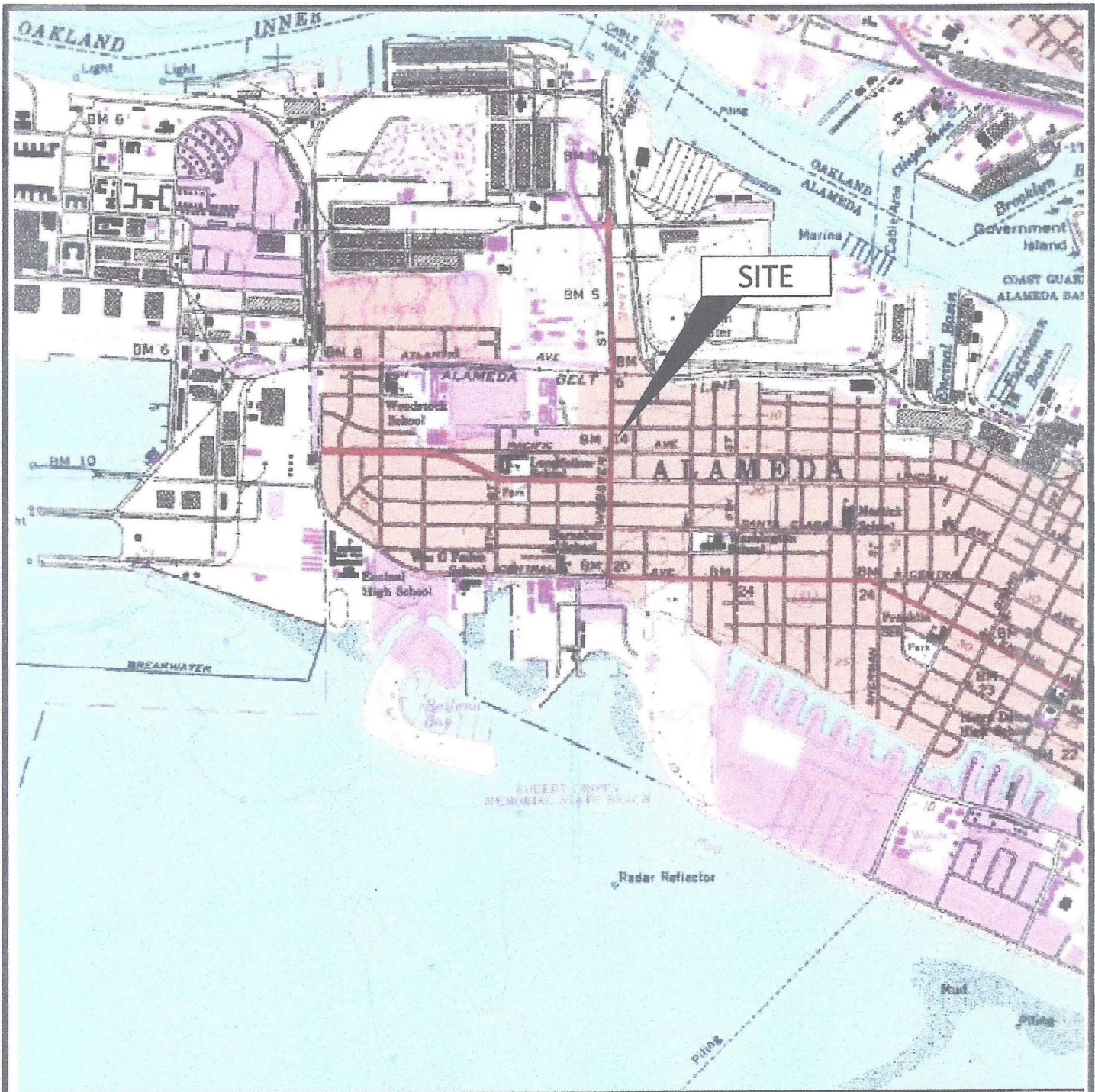
It is estimated that a total of 6 to 12 water samples will be collected during the investigation. The samples will be submitted to SGS Accutest Laboratories (Accutest), a state-certified laboratory located in San Jose, California, for chemical analysis. Accutest will employ methods approved by the California Regional Water Quality Control Board (CRWQCB) and the EPA. The samples will be analyzed for the presence of total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene,

ethylbenzene, and total xylenes (BTEX), naphthalene and fuel oxygenates using EPA Test Method 8260B and total petroleum hydrocarbons as diesel (TPHd) using EPA Test Method 8015B. All the water samples analyzed for TPHd and will be analyzed with silica gel cleanup.

### **Report**

At the conclusion of all field activity, a report of the findings of the investigation will be prepared. The report will include a summary of the investigation activities, including the soil vapor sample results and results from the CPT groundwater investigation, a description of the nature and extent of groundwater contamination and CCI's conclusion and recommendations for any further work.

## **FIGURES**



Base Map USGS

Reviewed By:  
GM

Approved By:  
GM

**Vicinity Map**

**Delong Petroleum  
1716 Webster Street  
Alameda, California**

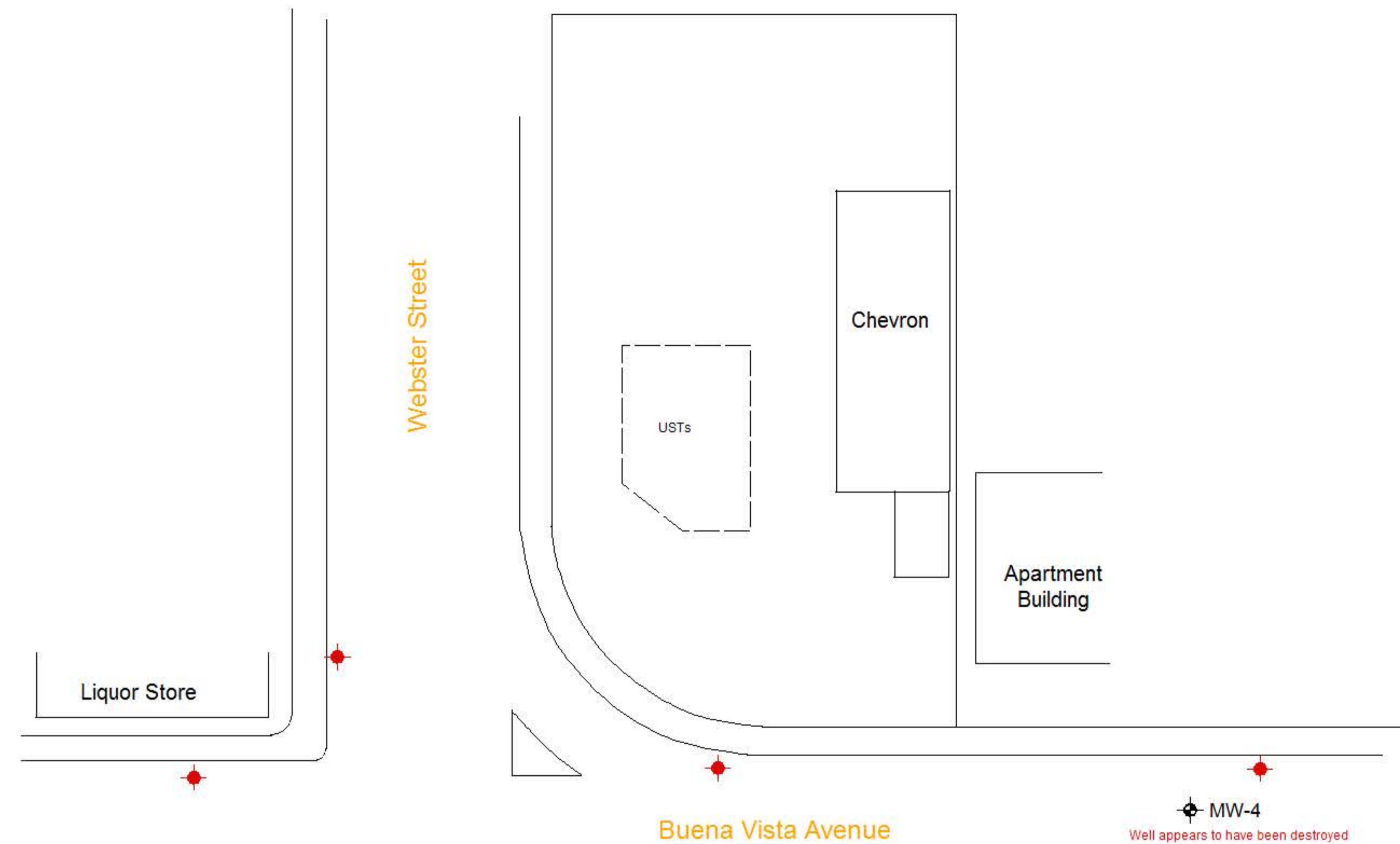
**Compliance & Closure, Inc.**

Job No.:  
12214-1

Date:  
2/3/2016

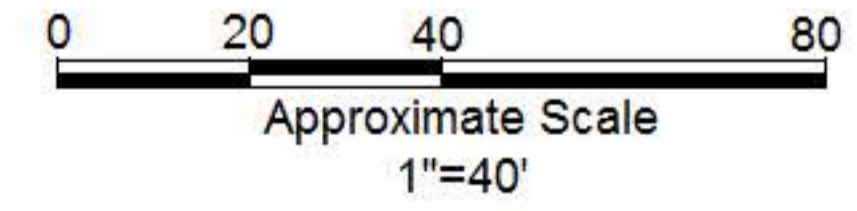
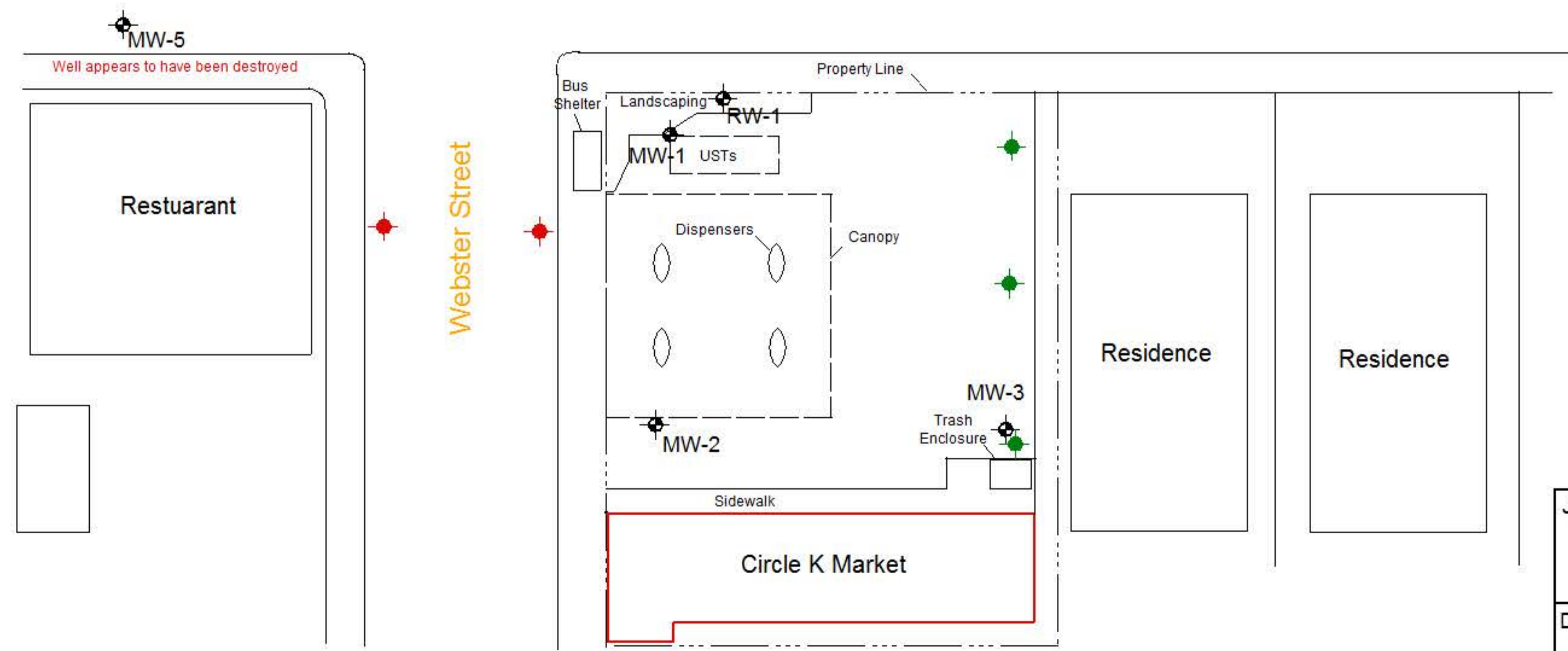
Drawn By:  
GM

Fig. No.:  
1

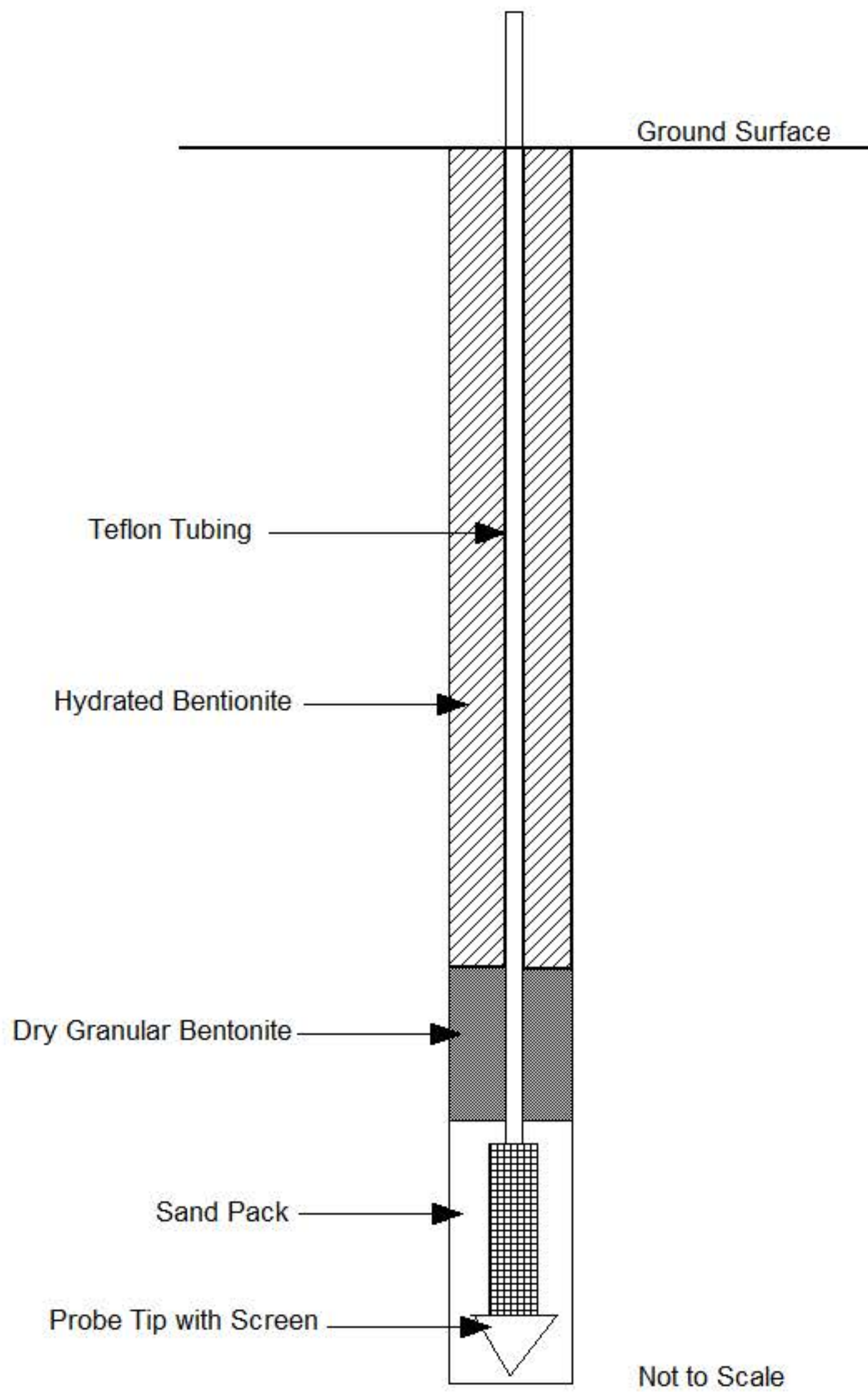


Legend

- MW-1 Monitoring Well
- RW-1 Recovery Well
- Proposed CPT Boring
- Proposed Soil Vapor Sample



Job No.: 12214-3	Site Plan Delong Oil 1716 Webster Street Alameda, California	Compliance & Closure, Inc.	
Date: 11/26/2016		Drawn by: NLN	Figure No.: 2



Reviewed By:

GM

**SCHEMATIC DIAGRAM OF SAMPLING PROBE**

**Compliance & Closure, Inc.**

Approved By:

GM

**Delong Oil, Inc.  
1716 Webster Street  
Alameda, California**

Job No.:

12214-3

Drawn By:

GM

Date:

11/17/2016

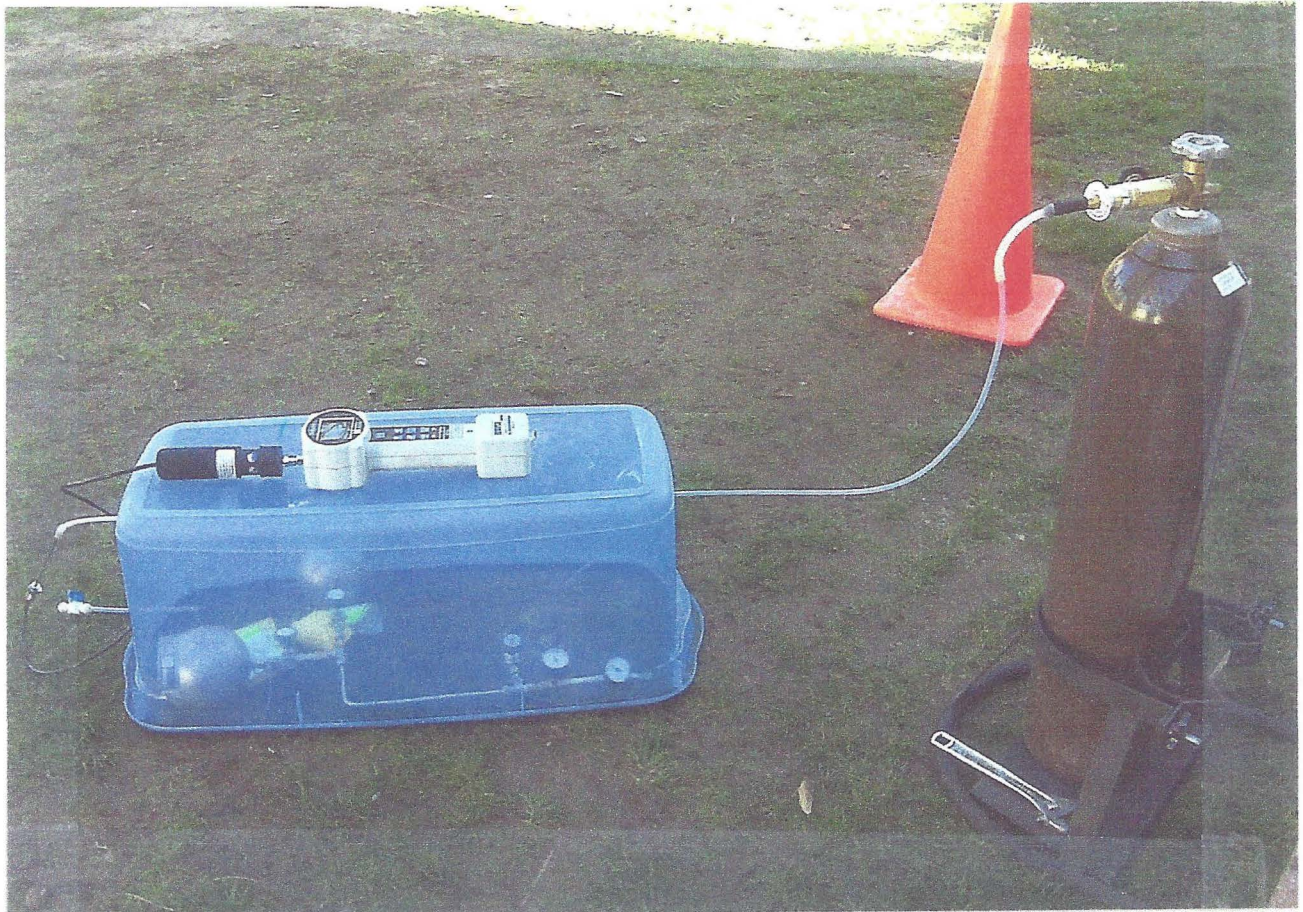
Fig. No.:

3

Additional Site & Off-Site Investigation Work Plan  
Delong Oil, Alameda California



Figure 4, Sampling Manifold Set-up.



Reviewed By:  
GM

Approved By:  
GM

**SOIL VAPOR SAMPLE SHROUD**

**Delong Oil, Inc.**  
**1716 Webster Street**  
**Alameda, California**

**Compliance & Closure, Inc.**

Job No.: 12214-3	Drawn By: GM
Date: 11/17/2016	Fig. No.: 5



# **APPENDIX A**

## **Purge Volume Tables**

## Soil Vapor Sample Purge Volume Table

Purge Volumes for Temporary Sampling Points (PRT System)

	5 feet Sample Depth	10 feet Sample Depth	15 feet Sample Depth	20 feet Sample Depth	25 feet Sample Depth	30 feet Sample Depth	35 feet Sample Depth	40 feet Sample Depth	45 feet Sample Depth	50 feet Sample Depth
One Purge Volume	28.3 ml 0 min 8.4 sec	50.6 ml 0 min 15.1 sec	72.9 ml 0 min 21.8 sec	95.2 ml 0 min 28.5 sec	117.5 ml 0 min 35.2 sec	139.8 ml 0 min 41.94 sec	162.1 ml 0 min 48.6 sec	184.4 ml 0 min 55.3 sec	206.7 ml 1 min 2.0 sec	229.0 ml 1 min 8.7 sec
Three Purge Volume	84.9 ml 0 min 25.2 sec	151.8 ml 0 min 45.3 sec	218.7 ml 1 min 5.4 sec	285.6 ml 1 min 25.5 sec	352. ml 1 min 45.6 sec	419.4 ml 2 min 5.82 sec	486.3 ml 2 min 25.8 sec	553.2 ml 2 min 45.9 sec	620.1 ml 3 min 6.0 sec	687.0 ml 3 min 26.1 sec
Seven Purge Volume	198.1 ml 0 min 58.8 sec	354.2 ml 1 min 45.7 sec	510.3 ml 2 min 32.6 sec	666.4 ml 3 min 19.5 sec	822.5 ml 4 min 6.4 sec	978.6 ml 4 min 53.8 sec	1,134.4 ml 5 min 40.2 sec	1,290.8 ml 6 min 27.1 sec	1,446.9 ml 7 min 14.0 sec	1,603.0 ml 8 min 0.9 sec

### Purge calculation Factors

1. Tubing (0.25 in OD, 0.17 in ID)
  - a. Volume = 4.46 ml per foot internal volume
2. Vapor Point Holder and Post Run Tubing Adapter
  - a. Volume = 6 ml internal volume
3. Calculations assume a 4-foot section of tubing is being used to extend from the boring surface to the pump

**volume Formula**       $A ((B \times C) + D) = E$

**Time Formula**                       $(F + E) \times G = H$

A = Number of purge volumes  
B = 1 foot of tubing, 4.46 ml  
C = Depth  
D = Point Holder Volume, 6 ml  
E = Volume to be purged

E = Volume to be purged  
P = Purge Rate, 200 ml (cc) per min  
G = 60 Seconds  
H = Purg Time in seconds at 200 ml (cc) per min