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1131 Harbor Bay Parkway, Suite 250
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RECEIVED

By Alameda County Environmental Health 9:21 am, Mar 27, 2017

Re: Former Signal Oil Station No. 206145
800 Center Street
Oakland, California
Case No. RO0000454

I have read and acknowledged the content, recommendations and/or conclusions contained in the attached *Updated Sensitive Receptor Survey and Site Conceptual Model and Low-Threat Closure Request* submitted on my behalf to ACDEH's FTP server and the SWRCB's Geotracker website.

This letter is submitted pursuant to the requirements of California Water Code Section 13267(b)(1) and the regulating implementation entitled Appendix A pertaining thereto.

Sincerely,

A handwritten signature in cursive script that reads "Carryl MacLeod".

Ms. Carryl MacLeod
Project Manager

Attachment: *Updated Sensitive Receptor Survey and Site Conceptual Model and Low-Threat Closure Request*



Transmittal

March 24, 2017

To: Mark Detterman
 Alameda County Department of Environmental
 Health
 1131 Harbor Bay Parkway, Suite 250
 Alameda, California 94502

Ref. No.: 312002

From: Kiersten Hoey

GHD Tel: (510) 420-3347

Subject: Case No. RO0000454 – Former Signal Oil Service Station 206145

No. of Copies	Description/Title	Drawing No./ Document Ref.	Issue
1	Updated Sensitive Receptor Survey and Site Conceptual Model and Low-Threat Closure Request	34	1

Issued for: Your information As requested Construction Quotation
 Your approval/comments Returned to you For re-submission

Sent by: Overnight courier Same day courier Other: Geotracker and ACEH ftp site

Remarks:

Copy to: Ms. Carryl MacLeod – Chevron EMC
(electronic only)

Completed by: Kiersten Hoey
[Please Print]

Signed: 

Filing: Correspondence File



Updated Sensitive Receptor Survey and Site Conceptual Model and Low-Threat Closure Request

Former Signal Oil Service Station 206145
800 Center Street
Oakland, California
Fuel Leak Case RO0454

Prepared for:

Mr. Mark Detterman
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Chevron Environmental Management Company

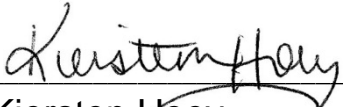
GHD | 5900 Hollis Street Suite A Emeryville CA 94506 United States


312002 | 2016.2 | 04.02 | Report No 34 | March 24, 2017

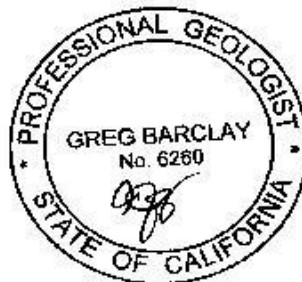


Updated Sensitive Receptor Survey and Site Conceptual Model and Low-Threat Closure Request

Former Signal Oil Service Station 206145
800 Center Street
Oakland, California
Fuel Leak Case RO0454


Kiersten Hoey


Greg Barclay, PG 6260



5900 Hollis Street Suite A Emeryville CA 94506 United States
312002 | 2016.2 | 04.02 | Report No 34| March 24, 2017



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1. Introduction

GHD on behalf of Chevron Environmental Management Company (CEMC) is submitting this *Updated Sensitive Receptor Survey and Site Conceptual Model (SCM) and Low-Threat Closure Request* for Former Signal Oil Service Station 206145, located at 800 Center Street in Oakland, California (Figure 1). Alameda County Department of Environmental Health (ACDEH) previously approved well destruction as a final step to site closure in their April 4, 2016 letter; however, upon further review of site data from January 2014, ACDEH indicated that additional site data was necessary prior to destruction of shallow site wells and site closure, as outlined in their letters dated May 26, 2016 and December 29, 2016 (Appendix A). This report provides additional site data, including groundwater monitoring and sampling data, and updates to previously submitted Sensitive Receptor Survey (SRS) and SCM in support of site closure per the State's *Low-Threat Underground Storage Tank Case Closure Policy* (LTCP).

Due to project delays associated with restarting groundwater monitoring and sampling at the site and updating the SRS involving compiling addresses and mailing out questionnaires to 350 addresses within the survey radius, the schedule for submittal of ACDEH technical report requests was delayed. Gettler-Ryan, Inc. (G-R) was unable to schedule the monitoring and sampling of the site during the second quarter 2016 resulting in the restart of monitoring and sampling during the third quarter 2016. Monitoring and sampling was also performed during the fourth quarter 2016 and first quarter 2017. Results of the sampling events were presented in GHD's *Third Quarter 2016 Groundwater Monitoring and Sampling Report* dated November 9, 2016, *Fourth Quarter 2016 Groundwater Monitoring and Sampling Report* dated January 13, 2017, and *First Quarter 2017 Groundwater Monitoring and Sampling Report* dated March 22, 2017. Site background information, an updated SRS, an updated SCM, and a low-threat closure request are presented below.

2. Site Background

2.1 Site Description

The site is a former Signal Oil gasoline service station located on the northeastern corner of 8th Street and Center Street in a mixed commercial and residential area of Oakland, California (Figures 1 and 2). A service station operated at the site from 1932 to 1973. Four 1,000-gallon fuel underground storage tanks (USTs) and one used oil UST were installed when the site was developed. These USTs were removed in 1973 when the station was closed. The site is currently undeveloped and surrounded by a temporary chain-link fence. The site is expected to remain vacant for the near future as no known plans exist for any type of redevelopment. The property is zoned as mixed commercial/residential.

Environmental investigation has been ongoing since 1989. To date, 17 monitoring wells, eight air sparge wells, 61 soil borings, and 11 soil vapor probes have been advanced/installed on- and offsite (Figure 2). A remedial excavation was completed in 2002, removing approximately 1,584 tons of soil. Groundwater is currently monitored by 17 on- and offsite monitoring wells. A summary of previous site investigation and remediation is presented in Appendix B.



2.2 Site Hydrology

Groundwater in the East Bay Plain basin is designated as a potential drinking water source; however, groundwater in the basin is not currently used as a municipal drinking water supply due to readily available imported surface water.¹ The shallow water-bearing zone beneath the site is monitored by wells installed at three different depth intervals. Shallow groundwater monitoring wells have been monitored since 1997 and the deeper screened wells were monitored from 2007 through 2012. Monitoring and sampling of the deeper screened wells was discontinued because no dissolved hydrocarbons were detected in the wells. Historical depth to groundwater in the shallow-screened wells ranges from approximately 3 to 13 feet below grade (fbg) and consistently flows toward the southwest.

3. Updated Sensitive Receptor Survey

GHD conducted an updated SRS and a door-to-door survey to determine the following:

1. Identify sensitive receptors within 1,000 feet of the groundwater plume extent.
2. Determine if there is any potential risk to the identified receptors.

Discussion of the door-to-door survey, well search, sensitive facilities search, surface water body review, and preferential pathways are presented in the following sections.

3.1 Neighborhood Survey

On October 13, 2016, GHD mailed a door-to-door survey to property owners and tenants to identify any wells, sumps, and basements at all properties located within 1,000 feet of the site perimeter. Using Parcel Quest, GHD identified 280 properties located within the survey area, mailed over 350 surveys to the identified property owners and tenants, and received 43 responses to the survey. Copies of the returned surveys are available upon request. Results of the survey responses are summarized in Table 1 and noted below:

- All respondents noted that the dwellings are currently connected to a municipal water supply.
- None of the responses indicated that a well exists on any of the surveyed properties.
- 1 of the responses indicated that the property “used to have a well”.
- 20 of the responses indicated that there is no basement or sump on the property.
- 10 of the responses indicated a building with slab on grade foundation.
- 8 of the responses indicated a building with perimeter foundation.
- 3 of the responses indicated a building with pier & post foundation.

¹ Table 2-2 Existing and Potential Beneficial Uses in Groundwater in Identified Basins; *Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin*; California Regional Water Quality Control Board- San Francisco Bay Region, January 18, 2007.



- 17 of the responses indicated that the building foundation construction was unknown or the survey question was unanswered.
- 3 of the responses indicated the property is a vacant lot.
- 14 of the responses indicated that there is a crawl space or basement but no sump.
- 3 of the responses indicated that the building has an active sump.

Of these sumps, respondents noted that one sump discharges pumped water into the sewer, one sump discharges into a garden on the property, and one sump discharges onto the street. The locations of the sumps in relation to the site are listed on Table 2 and illustrated on Figure 3. Two of the sumps are located downgradient, but are at least 200 feet beyond the edge of the plume and 300 feet from the source. Additionally, no dissolved hydrocarbons are detected in well MW-8 located between the sumps and the site. The third sump is located 131 feet to the north (upgradient); no dissolved hydrocarbons are detected in well MW-1A located between the dissolved plume and the sump. Therefore, dissolved hydrocarbons originating at the site entering the sumps is unlikely.

Given no active wells were reported on any of the nearby properties, proximity of the properties to the site plume, and all respondents indicating water is supplied by the municipal water supplier, risk of hydrocarbons originated at the site affecting drinking water is unlikely. Further, given all of the above properties are located beyond the extent of the dissolved hydrocarbon plume, there is likely no potential vapor risk to basements or crawl spaces at these properties and therefore no further investigation is warranted.

3.2 Water Supply Well Records

In 2009, Conestoga-Rovers & Associates (CRA) reviewed files provided by the Department of Water Resources (DWR) for water supply wells within a 2,000-foot radius of the site. In 2017, GHD reviewed files provided by Alameda County Public Works Agency (ACPWA). All files provided by the DWR and ACPWA are confidential in nature and are not provided within this report. Based on the information provided from the agencies, no domestic, irrigation, industrial, or municipal wells were identified within 2,000 feet of the site.

3.3 Sensitive Facilities

In 2012, CRA conducted a search for other potential receptors, including daycare centers, schools, hospitals, and elderly care homes. In their *Closure Request* report dated November 29, 2012, CRA concluded four schools were located within 2,000 feet of the site. GHD reviewed the sensitive facilities data and noted a discrepancy from 2012. The Candells College Preparatory School does not appear to exist at the 2012 noted address or any other address. The noted address appears to be an abandoned building destroyed by a fire. Of the remaining three schools identified, the nearest school is located approximately 900 feet northwest (crossgradient). No schools are located downgradient of the site. A list of the identified sensitive facilities is included in Table 2. Locations relative to the site are illustrated on Figure 3. GHD confirmed per the LTCP that there are no daycare centers, hospitals, and elderly care homes identified within a 1,000-foot radius of the site.



Based on distance (900 feet), groundwater flow direction to the southwest, and the limited size of the shrinking dissolved hydrocarbon plume, the identified school within the 1,000-foot radius of the site is unlikely to be affected by hydrocarbons originated at the site.

3.4 Surface Water Bodies

Based on USGS topographic map and aerial images from Google Earth, there are no surface waters within 1,000 feet of the site. The nearest surface water body identified is the Oakland Inner Harbor, located approximately 1 mile south (downgradient) of the site. Based on the distance to Oakland Inner Harbor, it is unlikely that Oakland Inner Harbor will be affected by hydrocarbons originated at the site.

3.5 Conduit Survey

In 2011, CRA completed a conduit study and submitted the results in their *Revised Corrective Action Plan and Preferential Pathway Analysis* dated November 20, 2011. CRA located sanitary sewer, electric, communication, water, and natural gas utilities offsite. Based on utility maps and data provided by utility company representatives, CRA concluded that these utilities are all suspected to be at depths less than 5 fbg. The deepest utilities are likely the sanitary sewers beneath Center Street and 8th Street. Since 1995, the shallowest groundwater depth in wells MW-4, MW-5, and MW-6 was 5.08 fbg in MW-4. Groundwater in offsite wells has been shallower than 6 fbg, six out of 56 monitoring events in MW-4, one out of 55 monitoring events in MW-5, and zero events in MW-6. Because groundwater is rarely shallower than 6 fbg, it is very unlikely the underground utilities surrounding the site are acting as preferential pathways for migration of dissolved hydrocarbons. Between 2011 and 2017, depth to groundwater in these three wells has been deeper than 5 fbg.

4. Updated Site Conceptual Model

LTCP General Criteria e, Site Conceptual Model (SCM) criteria was previously submitted in CRA's November 29, 2012 *Closure Request* and June 27, 2014 *Site Assessment Report and Site Conceptual Model*. These two referenced reports, together with the updated SCM for groundwater with recently collected groundwater data and updated SRS information presented below, make up a complete SCM.²

In their May 26, 2016 letter, ACDEH stated that they noted very atypical groundwater data from site wells during the January 2014 groundwater monitoring event which they suggested will delay destruction of shallow site wells and site closure. Specifically, ACDEH referred to a change in depth to groundwater and an increase of TPHd concentrations resulting in questionable TPHd plume stability and plume classification. As a result, ACDEH determined that the site fails to meet LTCP General Criteria e (Site Conceptual Model) and Media-Specific Criteria for Groundwater due to insufficient data collection and analysis to assess the nature, extent and mobility of the release.

² Per LTCP criteria, the supporting data and analysis used to develop the CSM are not required to be contained in a single report and may be contained in multiple reports submitted to the regulatory agency over a period of time.



ACDEH directed CEMC to resume groundwater monitoring and sampling, and to consider defining the site plume length by other means. GHD therefore resumed groundwater monitoring and sampling during the third and fourth quarters of 2016 and first quarter of 2017. It should be noted that LTCP focuses on dissolved benzene and methyl tertiary butyl ether (MTBE) in groundwater, which at this site meet the Media-Specific Criteria for Groundwater. Further discussion of this data as it relates to plume stability and LTCP Media-Specific Criteria for Groundwater is included below.

4.1 TPHd Plume Stability

In order to assess the stability of the dissolved hydrocarbon plume, GHD completed three additional groundwater monitoring and sampling events during the third and fourth quarters of 2016 and first quarter of 2017, and compiled TPHd concentration versus time graphs for wells MW-1A, MW-2, MW-3, and MW-4 (shallow wells downgradient of the source area). All 4 wells show an increase in TPHd concentrations during the lowest recorded recent groundwater elevation event in January 2014; however, these concentrations were within historical ranges and TPHd concentrations were reduced in all wells following slightly higher groundwater elevations during the August and November 2016 monitoring and sampling events. Groundwater elevations were a few feet higher during the February 2017 event, yet TPHd concentrations remained similar to those detected in August and November 2016. TPHd concentrations in wells MW-1A, MW-2, and MW-4 are currently less than the laboratory reporting limit; TPHd concentrations in well MW-3 are currently low but within the same magnitude of order as the water quality objective of 100 *micrograms* per liter ($\mu\text{g/L}$). Concentration versus time graphs indicate that dissolved TPHd concentrations were steadily decreasing in all four wells over time prior to the January 31, 2014 sampling event. Concentrations during the last three events have decreased to at least one order of magnitude less than those detected during the January 2014 event, indicating that the dissolved hydrocarbon plume is decreasing in extent under normal hydrologic conditions. Furthermore, the dissolved TPHd plume, centered on well MW-3 near the source area, is laterally and vertically defined to below laboratory reporting limits by the remaining site wells MW-1, MW-2, and MW-4 through MW-17. Chemical concentrations versus time graphs are presented in Appendix C.

4.2 Receptors and Dissolved Hydrocarbon Plume

The LTCP *Technical Justification for Groundwater Media Specific Criteria* (April 2012), Section 4.1 (*Technical Justification*), which is used to supplement and provide technical justification on possible dissolved-phase plume lengths. The document provides average, 90th percentile, and maximum dissolved-phase plume lengths for TPHg, benzene, and MTBE at any given site. These lengths are listed in Table 4.1 below. TPHd is not used to describe plume lengths largely because the TPHd carbon range is of low solubility. Possible dissolved TPHg and benzene plume lengths are compared to site-specific plume lengths using the most recent groundwater monitoring well data below.



Table 4.1 Plume Characteristics

Constituent	Average Plume Length (feet)	90% Plume Length (feet)	Maximum Plume Length (feet)	Site plume length (feet)
Benzene	198	350	554	111
MTBE	317	545	1,046	NA
TPHg	248	413	855	111
<i>SWRCB Technical Justification for Groundwater Media-Specific Criteria (Final 04-24-2012)</i>				

The door-to-door survey responses indicated that there are approximately 17 dwellings located less than 1,000 feet from the site, and approximately 9 dwellings less than 500 feet from the site that have a basement or crawl space. Additionally, the survey responses indicate the presence of 3 dwellings that have active sumps located approximately 130 to 380 feet from the site boundary. Of the remaining three schools identified, the nearest school is located approximately 900 feet northwest (crossgradient). No schools are located downgradient of the site. None of the identified potential receptors are located within the dissolved hydrocarbons plume; locations are summarized on Tables 1 and 2 and illustrated on Figure 3.

Site conditions cannot be considered protective of these receptors based on separation distance alone. However site-specific data indicate that the site hydrocarbon plumes are attenuating at a distance less than the separation distances outlined within the *Technical Justification*, and that current site conditions are likely protective of the identified offsite receptors. However, site-specific data indicates full dissolved hydrocarbon plume attenuation from the source area (MW-3) to the downgradient well (MW-8) at a distance of approximately 111 feet. Current site conditions show the residual dissolved TPHd, TPHg, and BTEX plumes are limited to the southwest corner of the site (MW-3) and beneath the Center Street and 8th Street intersection; MTBE is no longer detected in groundwater. The benzene detected in well MW-6 this quarter appears to be an anomaly, as no BTEX has been detected in well MW-6 since the year 2000 when benzene appeared once and then returned to previous non-detect concentrations. This anomaly does not appear to be related to groundwater depth because groundwater has historically been measured at similar depths with no benzene detected. No hydrocarbons are detected in the remaining wells located between the residual hydrocarbon plume and the identified potential receptors.

Based on the above evaluation of the most recent groundwater analytical data and the results of the updated SRS, GHD concludes the following:

- Concentration versus time graphs indicate that dissolved TPHd concentrations are decreasing in extent under typical site hydrologic conditions. All other COCs have met LTCP criteria or WQOs.
- Current site data indicate that the majority of dissolved hydrocarbon concentrations detected at the site are located within the site boundaries and full dissolved hydrocarbon plume attenuation is obtained at less than a distance of approximately 111 feet.
- No identified receptors are expected to be affected by the residual hydrocarbon plume.



5. Low-Threat Closure Request

In their May 26, 2016 letter, ACDEH stated that the site fails to meet the LTCP General Criteria e (Site Conceptual Model) and the Media Specific Criteria for Groundwater. Updated SRS and plume stability data provided in this and previous reports meet LTCP General Criteria e (Site Conceptual Model). Site conditions meeting all general and Media-Specific Criteria are outlined below.

5.1 General Criteria Requirements

The general criteria requirements that must be satisfied by candidate sites are listed as follows:

a. *The unauthorized release is located within the service area of a public water system.*

Satisfied: The site and surrounding properties are served by EBMUD, which imports surface water to supply to the public. Additionally, as discussed in Section 3.4.2, no water supply wells were identified within 2,000 feet of the site.

b. *The unauthorized release consists only of petroleum.*

Satisfied: The site's unauthorized release has been characterized as a release of petroleum-based products. The primary sources of hydrocarbons were the four former fuel USTs located on the western edge of the site and the former dispenser islands located on the southwestern corner of the site. The primary COCs are TPHd, TPHg, and benzene.

c. *The unauthorized ("primary") release from the UST system has been stopped.*

Satisfied: All petroleum storage and handling facilities have been removed from the site.

d. *Free product has been removed to the maximum extent practicable.*

Satisfied: No free product or light non-aqueous petroleum liquid (LNAPL) has been detected in any of the site monitoring wells.

e. *A conceptual site model has been developed.*

Satisfied: CRA's November 29, 2012 *Closure Request*, June 27, 2014 *Site Assessment Report and Site Conceptual Model* and this updated SCM constitute a comprehensive SCM.

f. *Secondary source removal has been addressed.*

Satisfied: In 2002, G-R removed 1,584 tons of hydrocarbon-bearing soil in the areas of the former fuel USTs, dispenser islands, hydraulic lift, and sumps, to depths of approximately 12 to 14 fbg. Prior to backfilling the excavation, approximately 900 pounds of ORC was placed at the base of the excavation. In 2011, a low-flow air sparge (LFAS) pilot test reduced dissolved hydrocarbons by at least one order of magnitude. The rate of natural attenuation is exceeding the rate of hydrocarbon mass flux from soil to groundwater, as demonstrated by the reduction in hydrocarbon concentrations over time in groundwater in wells MW-1 through MW-4.

g. *Soil or groundwater has been tested for MTBE and results reported in accordance with Health and Safety Code section 25296.15.*



Satisfied: MTBE has been evaluated in soil and groundwater, and reported in accordance with Health and Safety Code section 25296.15. According to soil and groundwater data and consistent with the period of station operation (ceased in 1973), MTBE is not a constituent of concern.

h. Nuisance as defined by Water Code section 13050 does not exist at the site.

Satisfied: Conditions satisfying the definition of a nuisance as defined in Water Code section 13050 do not exist at the site.

5.2 Media-Specific Criteria

Media-specific criteria are related to the most common exposure scenarios, which in the LTCP have been combined into three media-specific criteria:

1. Groundwater,
2. Vapor Intrusion to Indoor Air, and
3. Direct Contact and Outdoor Air Exposure.

5.2.1 Groundwater

The LTCP requires that water quality objectives (WQOs) will be attained through natural attenuation within a reasonable amount of time, the contaminant plume that exceeds WQOs is stable or decreasing in areal extent, and meets the additional characteristics of one of the five classes of sites listed in the LTCP.

The five classes of sites are stated in the LTCP as follows:

1. a. The contaminant plume that exceeds WQOs is less than 100 feet in length.
b. There is no free product.
c. The nearest existing water supply well and/or surface water body is greater than 250 feet from the defined plume boundary.
2. a. The contaminant plume that exceeds WQOs is less than 250 feet in length.
b. There is no free product.
c. The nearest existing water supply well and/or surface water body is greater than 1,000 feet from the defined plume boundary.
d. The dissolved concentration of benzene is less than 3,000 µg/l and the dissolved concentration of MTBE is less than 1,000 µg/l.
3. a. The contaminant plume that exceeds WQOs is less than 250 feet in length.
b. Free product may be present below the site but does not extend off-site.
c. The plume has been stable or decreasing for a minimum of 5 years.
d. The nearest existing water supply well and/or surface water body is greater than 1,000 feet from the defined plume boundary.



- e. The property owner is willing to accept a deed restriction if the regulatory agency requires a deed restriction as a condition of closure.
4.
 - a. The contaminant plume that exceeds WQOs is less than 1,000 feet in length.
 - b. There is no free product.
 - c. The nearest existing water supply well and/or surface water body is greater than 1,000 feet from the defined plume boundary.
 - d. The dissolved concentration of benzene is less than 1,000 µg/l and the dissolved concentration of MTBE is less than 1,000 µg/l.
5.
 - a. An analysis of site specific conditions determines that the site under current and reasonable anticipated near-term future scenarios poses a low threat to human health and safety and to the environment and water quality objectives will be achieved within a reasonable time frame.

Satisfied: The site satisfies Class 2 criteria as follows:

Groundwater in the East Bay Plain basin is designated as a potential drinking water source;³ however, no municipal wells were identified within a half mile radius, and the site is provided water by the EBMUD which relies solely on imported water to supply the region with drinking water.^{4,4} Therefore, non-drinking water WQOs are appropriate for this site.

- The dissolved hydrocarbon plume from the source area (MW-3) that exceeds WQOs is less than 250 feet in length in all directions (Figure 4). The distance between the downgradient well MW-8 and upgradient well MW-7 is 220 feet. No hydrocarbons are detected in either of the wells. Downgradient well MW-8, where no hydrocarbons are detected, is approximately 111 feet from the plume center (MW-3).
- No LNAPL has been observed in any monitoring wells.
- No drinking water wells were identified in DWR or ACPWA records or during the door-to-door survey.
- The nearest surface water body is the Oakland Inner Harbor, located over 1,000 feet from the plume boundary (approximately 1 mile to the south).
- Dissolved benzene and MTBE are two orders of magnitude lower than the criteria of 3,000 µg/L benzene and 1,000 µg/L MTBE.

Additionally,

- Groundwater in the East Bay Plain basin is designated as a potential drinking water source; however, and the site is provided water by the EBMUD which relies solely on imported water to supply the region with drinking water.^{4,}

³ <http://www.ebmud.com/our-water/water-supply>

⁴ California Regional Water Quality Control Board San Francisco Bay Region, East Bay Plain Groundwater Basin Beneficial Use Evaluation Report, Alameda and Contra Costa Counties, CA, June 1999.



- Dissolved hydrocarbon concentrations are decreasing in extent under typical site hydrologic conditions.

5.2.2 Vapor Intrusion to Indoor Air

The LTCP describes conditions, including bioattenuation zones (soil conditions that support biodegradation of hydrocarbon vapors), which, if met, will assure that exposure to petroleum vapors in indoor air will not pose unacceptable health risks. In many petroleum release cases, potential human exposures to vapors are mitigated by bioattenuation processes as vapors migrate toward the ground surface. The low-threat vapor-intrusion criteria described below apply to sites where the release originated and impacted or potentially impacted adjacent parcels when: (1) existing buildings are occupied or may be reasonably expected to be occupied in the future, or (2) buildings for human occupancy are reasonably expected to be constructed in the future. Petroleum release sites shall satisfy the media-specific criteria for petroleum vapor intrusion to indoor air and be considered low-threat for the vapor-intrusion-to-indoor-air pathway if:

- a. Site-specific conditions at the release site satisfy all of the characteristics and criteria of scenarios 1 through 3 as applicable, or all of the characteristics and criteria of scenario 4 as applicable; or
- b. A site-specific risk assessment for the vapor intrusion pathway is conducted and demonstrates that human health is protected to the satisfaction of the regulatory agency; or
- c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, the regulatory agency determines that petroleum vapors migrating from soil or groundwater will have no significant risk of adversely affecting human health.

Exception: Satisfaction of the media-specific criteria for petroleum vapor intrusion to indoor air is not required at active commercial petroleum fueling facilities.

Satisfied: This site meets all criteria of Scenario 4. Soil vapor samples were collected quarterly for over one year from six soil vapor probes (VP-1 through VP-6) at 5 fbg. Soil vapor concentrations spiked in May 2011 immediately following four months of LFAS system operation, but dropped to low and non-detectable levels the subsequent four consecutive quarterly events. Benzene, ethylbenzene, and naphthalene concentrations are below the residential soil gas criteria listed in the Scenario 4 table. Oxygen in all six probes on all five sampling events ranged from 6.5 to 21 percent, indicating a sufficient bioattenuation zone between the probe and the surface. This site is currently undeveloped and surrounded by residential buildings. Table 5.1 below list the LTCP soil gas criteria and maximum concentrations detected in the last four sampling events. Based on the soil vapor data, there is no significant risk from soil vapor in the vadose zone to the surrounding residences or any future site occupants under static equilibrium conditions.



Table 5.1 Soil Vapor Concentrations – Bioattenuation Zone (O₂ > 4%)

Constituent	Residential	Commercial	Maximum Detected Concentration 5/10/2011	Maximum Concentrations Subsequent 4 Quarterly Events 2011-2012
<i>Concentrations in µg/m³</i>				
Benzene	<85,000	<280,000	10,000	110
Ethylbenzene	<1,100,000	<3,600,000	4,200	9.1
Naphthalene	<93,000	<310,000	<18,000	<2,600
µg/m ³ = micrograms per cubic meter				

5.2.3 Direct Contact and Outdoor Air Exposure

The LTCP describes conditions where direct contact with contaminated soil or inhalation of contaminants volatilized to outdoor air poses an insignificant threat to human health. Release sites where human exposure may occur must satisfy the media-specific criteria for direct contact and outdoor air exposure and are considered low-threat if they meet any one of the following:

- a. Maximum concentrations of petroleum constituents in soil are less than or equal to those listed in the table below for the specified depth below ground surface. The limits from 0 to 5 fbg protect from ingestion, dermal contact, and outdoor inhalation of volatile and particulate emissions. The 5 to 10 fbg limits protect from inhalation of volatile emissions only; the ingestion and dermal contact pathways are not considered significant. In addition, if exposure to construction workers or utility trench workers is reasonably anticipated, the concentration limits for Utility Worker must also be satisfied.

Table 5.2 Concentrations of Petroleum Constituents in Soil That Will Have No Significant Risk of Adversely Affecting Human Health

Constituent	Residential		Commercial/ Industrial		Utility Worker	Maximum Concentration	Maximum Concentration
	0 – 5 fbg mg/kg	Volatilization to outdoor air 5 – 10 fbg mg/kg	0 – 5 fbg mg/kg	Volatilization to outdoor air 5 – 10 fbg mg/kg	0 – 10 fbg mg/kg	0 – 5 fbg mg/kg	>5-10 fbg mg/kg
Benzene	1.9	2.8	8.2	12	14	0.11	92
Ethylbenzene	21	32	89	134	314	0.76	480
Naphthalene	9.7	9.7	45	45	219	0.006	58
PAH*	0.063	NA	0.68	NA	4.5	<0.003	0.37

Notes:

mg/kg Milligrams per kilogram

NA Not Analyzed

* Based on the seven carcinogenic polynuclear aromatic hydrocarbons (PAHs) as benzo(a)pyrene toxicity equivalent [BaPe]. The PAH screening level is only applicable where soil is affected by either waste oil and/or Bunker C fuel.



- b. Maximum concentrations of petroleum constituents in soil are less than levels that a site-specific risk assessment demonstrates will have no significant risk of adversely affecting human health.
- c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, the regulatory agency determines that the concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health.

Satisfied: No benzene, ethylbenzene, naphthalene or PAH concentrations in soil exceed the direct contact exposure criteria for residential or commercial (0-5 fbg). Of the 124 soil samples collected between 5 and 10 fbg, 24 contain benzene and/or ethylbenzene concentrations above the residential outdoor air exposure criteria and 13 contain benzene and/or ethylbenzene concentrations above the commercial/industrial outdoor air exposure criteria. Additionally, 9 samples contain benzene and/or ethylbenzene concentrations above the utility worker exposure criteria. Six naphthalene concentrations detected between 5 and 10 fbg exceed the commercial and/or residential outdoor air exposure scenarios and no naphthalene concentrations exceed the utility worker outdoor air exposure scenario. Given site-specific vapor data, residential or commercial/industrial risk to outdoor air exposure is unlikely. Risk to a utility worker from direct contact with residual hydrocarbons in soil could be possible for excavations exceeding 5 fbg, but unlikely, and is addressed through the implementation of a soil and groundwater management plan that was submitted in 2015.

Therefore, on behalf of CEMC, GHD respectfully requests ACDEH grant case closure. As the dissolved hydrocarbons remaining in groundwater pose no significant threat to human health, safety, and the environment, CEMC shall cease groundwater monitoring and sampling activities pending a response to our low-threat closure request from ACDEH.

Figures



SOURCE: USGS QUADRANGLE MAP: OAKLAND WEST, CA.

Figure 1

VICINITY MAP
 FORMER SIGNAL OIL SERVICE STATION 206145
 800 CENTER STREET
 Oakland, California



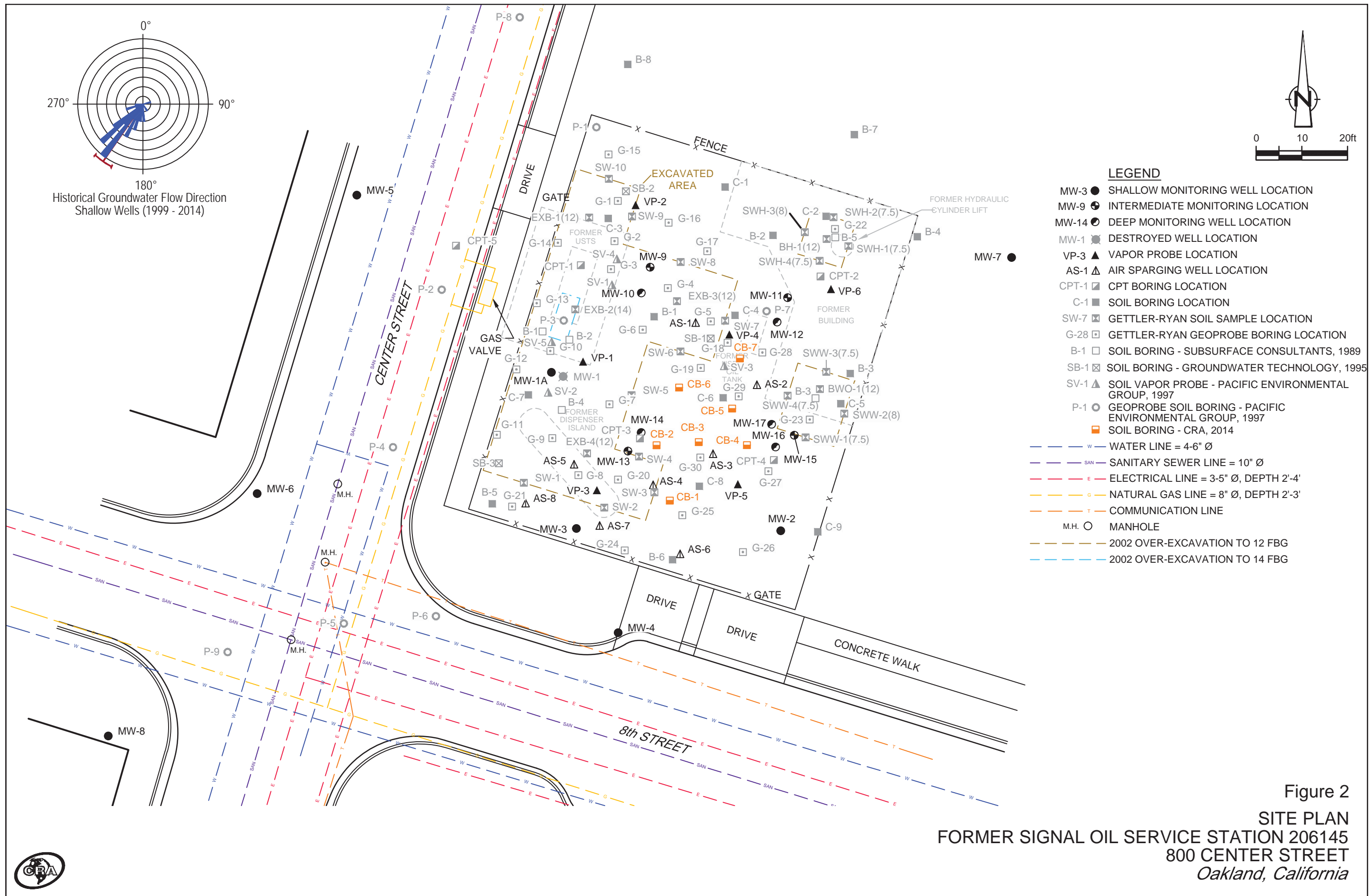
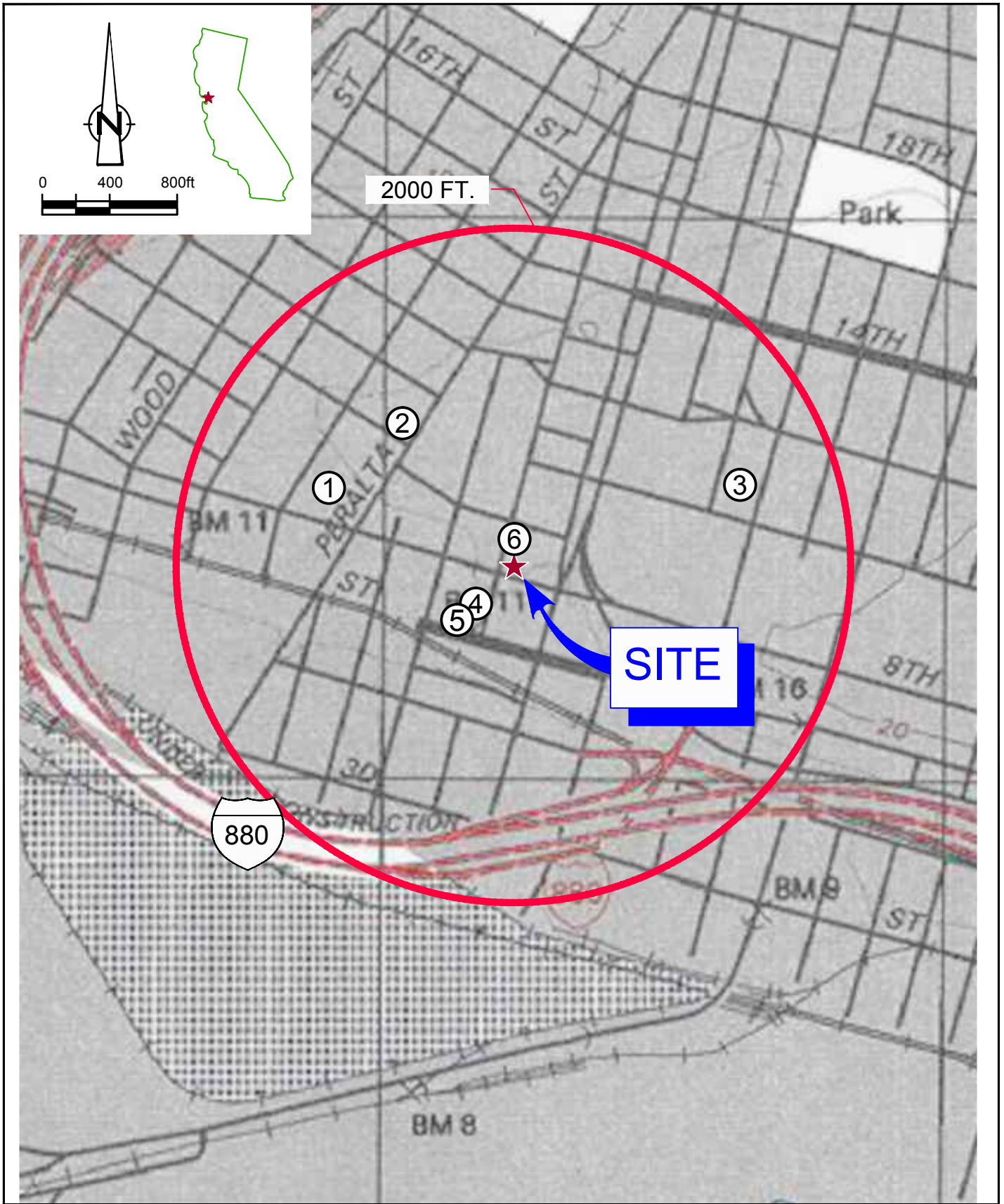


Figure 2
 SITE PLAN
 FORMER SIGNAL OIL SERVICE STATION 206145
 800 CENTER STREET
 Oakland, California





Source: TOPO! MAPS

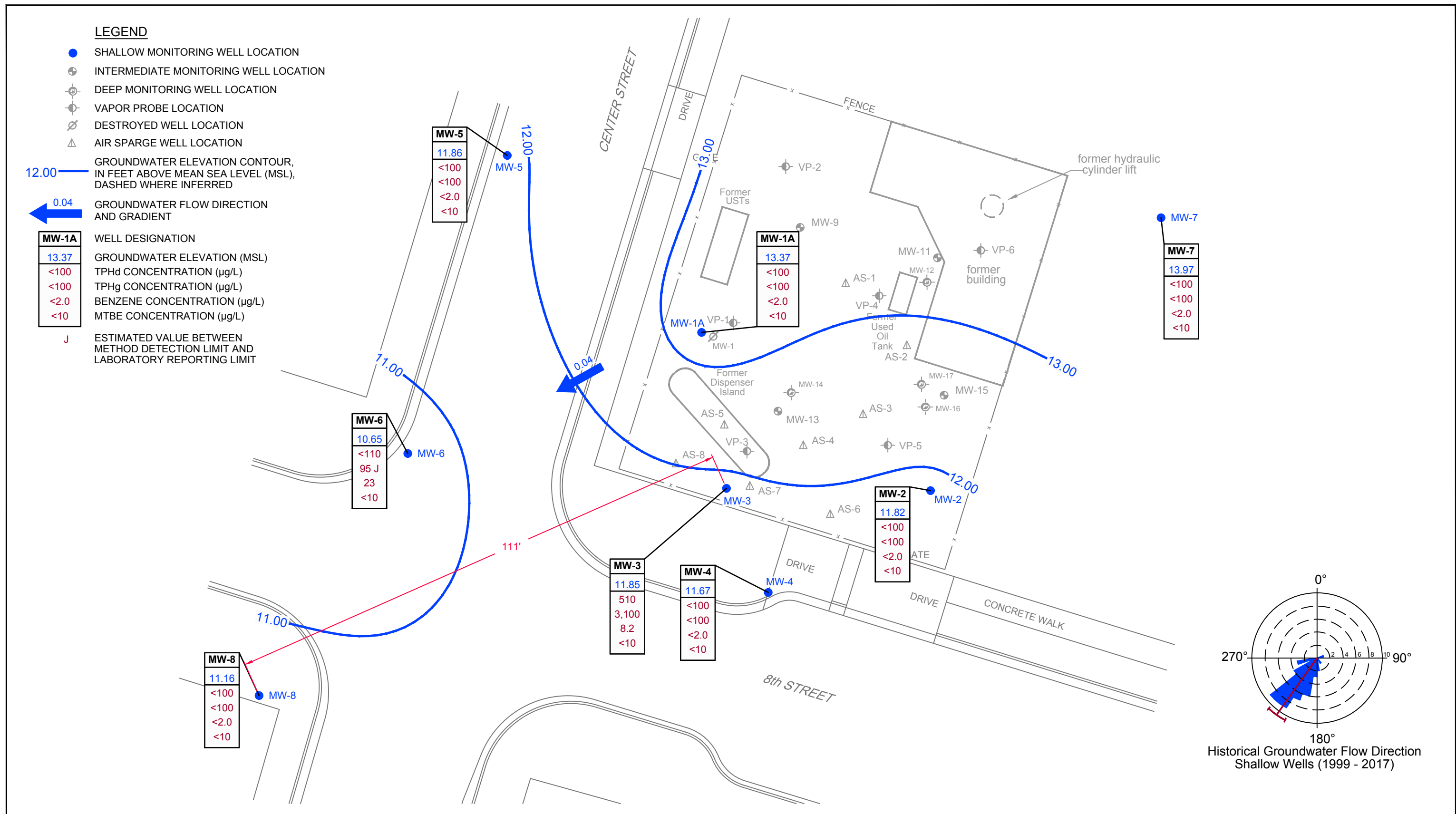


FORMER SIGNAL OIL SERVICE STATION 206145
 800 CENTER STREET
 OAKLAND, CALIFORNIA

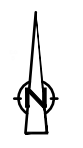
312002-95
 Mar 14, 2017

SENSITIVE RECEPTOR MAP

FIGURE 3



Source: SITE PLAN ADAPTED FROM MORROW SURVEYING LAND SURVEYORS AUGUST 17 2005 MONITORING WELL EXHIBIT.



FORMER SIGNAL OIL SERVICE STATION 206145
 800 CENTER STREET
 OAKLAND, CALIFORNIA
 GROUNDWATER ELEVATION CONTOUR AND HYDROCARBON
 CONCENTRATION MAP - FEBRUARY 7, 2017

312002-95
 Mar 8, 2017

FIGURE 4

Tables

Table 1
Door To Door Survey Responses
Former Signal Oil Station 206145
800 Center Street
Oakland, California

Door To Door Survey Responses

Distance and Direction From the Site	Well On Property?	Building Foundation Type	Basement / Crawl Space / Sump?
690 feet Northeast	No	Slab On Grade	No
251 feet Sothwest	No	Slab On Grade	No
427 feet Southwest	No	Perimeter	No
781 feet West-Northwest	No	Perimeter	No
887 feet Northwest	No	Unkown	Not marked
325 feet Southwest	No	Slab on Grade	Yes ¹
675 feet Southwest	No	Vacant lot	No
660 feet Southwest	No	Vacant lot	No
655 feet Southwest	No	Vacant lot	No
100 feet West	No	Slab On Grade	No
90 feet West	No	Slab On Grade	Yes ^{2, 3}
262 feet Northeast	No	Perimeter	No
784 feet North	No	Perimeter	Yes ²
690 feet Northwest	No	Perimeter	No
617 feet South	No	Not marked	No
725 feet Northwest	No	Not marked	Yes ²
419 feet North	No	Perimeter	Yes ²
906 feet Southwest	No	Perimeter	No
680 feet Northwest	No	Unkown	Yes ²
610 feet West	No	Not marked	Yes ²
329 feet North-Northwest	No	Pier & Post	Yes ²
335 feet North-Northwest	No	Not marked	Not marked
600 feet Northwest	No	Unkown	Yes ²
545 feet West	No	Not marked	Not marked
710 South-Southwest	No	Slab On Grade	Yes ^{2, 3}
446 feet North	No ⁴	Unkown	Yes ²
160 feet Southeast	No	Not marked	Not marked
165 feet North-Northwest	No	Slab On Grade	No
200 feet East	No	Perimeter	Yes ²
457 feet South-Southwest	No	Not marked	No
380 feet Southwest	No	Pier & Post	Yes ⁵
900 feet North	No	Perimeter	No
905 feet West	No	Pier & Post	Yes ²
625 feet Northwest	No	Unkown	Yes ²

Table 1
Door To Door Survey Responses
Former Signal Oil Station 206145
800 Center Street
Oakland, California

Door To Door Survey Responses

Distance and Direction From the Site	Well On Property?	Building Foundation Type	Basement / Crawl Space / Sump?
800 feet Southeast	No	Not marked	No
410 feet Southwest	No	Slab On Grade	No
175 feet West	No	Not marked	No
387 feet Southwest	No	Unkown/other	Yes ²
131 feet North	No	Slab On Grade	Yes ⁶
671 feet Northwest	No	Not marked	Not marked
880 feet Southwest	No	Slab On Grade	No
392 feet Northwest	No	Pier & Post	No
485 feet West	No	Not marked	Not marked

Notes:

¹ Survey response noted basement sump is set at a depth between 8-10 fbg and operates during big rain storms. Discharges into sewer.

² Survey response noted basement on property and no sump

³ Survey response specified that foundation was slab on grade but also indicated a basement.

⁴ Survey response noted that property "used to have a well"

⁵ Survey response noted basement and sump on property. Sump operates during rain storms; 50-100 gallons pumped during cycle; sump discharges into garden on property.

⁶ Survey response noted sump on property and no basement. Sump operates during rain storms and discharges onto the street; "The house next door to the south is currently renovating and are doing a subgrade living space".

Table 2
Sensitive Facility Search Table
Former Signal Oil Station 206145
800 Center Street
Oakland, California

Sensitive Facilities (schools, day cares, nursing homes and hospitals)

Map ID	Distance From Site	Direction	Facility	Address
1	900 feet Northwest	Crossgradient	Prepatory Literary Academy of Cultural Excellence	920 Campbell Street, Oakland
2	1,000 feet Northwest	Crossgradient	St. Martin De Porres Catholic School	1630 10 Street, Oakland
3	1,250 feet Northeast	Upgradient	Cole Elementary School	1011 Union Street, Oakland

Sumps

4	325 feet Southwest	Downgradient	Survey response noted basement sump is set at a depth between 8-10 fbg and operates during big rain storms. Discharges into sewer.	
5	380 feet Southwest	Downgradient	Survey response noted basement and sump on property. Sump operates during rain storms; 50-100 gallons pumped during cycle; sump discharges into garden on property.	
6	131 feet North	Upgradient	Survey response noted sump on property and no basement. Sump operates during rain storms and discharges onto the street; "The house next door to the south is currently renovating and are doing a subgrade living space".	

Appendix A

Regulatory Correspondence

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
REBECCA GEBHART, Acting Director



ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-670
FAX (510) 337-9335

May 26, 2016

Mr. Mark Horne
Chevron Environmental Management Co.
6101 Bollinger Canyon Road
San Ramon, CA 94583
(Sent via electronic mail to:
MarkHorne@chevron.com)

Mr. Rene Boisvert
800 Center LLC
c/o Boulevard Equity Group
484 Lake Park Ave #246
Oakland, CA 94610-2730

Mr. Terrilla Sadler
618 Brooklyn Avenue
Oakland, CA 94606

Subject: Request for Groundwater Monitoring, Fuel Leak Case RO0000454 (Global ID # T0600102230), Chevron #20-6145 / Signal SS, 800 Center Street, Oakland CA 94607

Messrs. Horne, Boisvert, and Sadler:

In our previous April 4, 2016 letter, Alameda County Department of Environmental Health (ACDEH) indicated that it was appropriate to proceed with well destruction as a final step toward moving the case to closure. In the process of revisiting site data in the intervening time period ACDEH noted very atypical groundwater data from all site wells from the January 31, 2014 groundwater monitoring event, including to a lesser extent upgradient well MW-7, than had been previously noted. Groundwater concentrations of Total Petroleum Hydrocarbons as diesel (TPHd) in all site wells rose significantly. For example, concentrations in well MW-1A rose from 950 micrograms per liter ($\mu\text{g/l}$) to 9,100 $\mu\text{g/l}$ TPHd, without Silica Gel (SG), and from 420 $\mu\text{g/l}$ to 4,400 $\mu\text{g/l}$ with SG. In each well, groundwater appears to have been at its deepest level in a number of years. This change effectively rendered the groundwater TPHd plume undefined in the downgradient direction. No additional groundwater monitoring events have occurred since that event at the site.

ACDEH has evaluated site data, in conjunction with the case files, to determine if the site is eligible for closure as a low risk site under the State Water Resources Control Board's LTCP. Based on ACDEH staff review, we have determined that the site fails to meet the LTCP General Criteria e (Site Conceptual Model), and the Media-Specific Criteria for Groundwater (see Geotracker for an updated checklist).

Thus it appears appropriate to delay well destruction and site closure and re-evaluate the site within the context of the Low Threat Closure Policy (LTCP); however, it also remains plausible to proceed with the destruction of all deeper wells while retaining all shallow site and vicinity wells. Thus, as an option, you may proceed with destruction of these deeper wells.

Based on the review of the case file ACDEH requests that you address the following technical comments and send us the documents requested below.

TECHNICAL COMMENTS

- 1. LTCP General Criteria e (Site Conceptual Model)** – According to the LTCP, the SCM is a fundamental element of a comprehensive site investigation. The SCM establishes the source and attributes of the unauthorized release, describes all affected media (including soil, groundwater, and soil vapor as appropriate), describes local geology, hydrogeology and other physical site characteristics that affect contaminant environmental transport and fate, and identifies all confirmed and potential contaminant receptors (including water supply wells, surface water bodies, structures and their inhabitants). The SCM is relied upon by practitioners as a guide for investigative design and data collection. All relevant site characteristics identified by the SCM shall be assessed and

supported by data so that the nature, extent, and mobility of the release have been established to determine conformance with applicable criteria in this policy.

Our review of the case files indicates that insufficient data collection or analysis has been presented to assess the nature, extent, and mobility of the release and to support compliance with Media Specific Criteria Groundwater as described below. Based on changes in the depth to groundwater, it appears that the depth of groundwater may influence these concentrations.

2. **LTCP Media Specific Criteria for Groundwater** – To satisfy the media-specific criteria for groundwater, the contaminant plume that exceeds water quality objectives must be stable or decreasing in areal extent, and meet all of the additional characteristics of one of the five classes of sites listed in the policy.

Our review of the case files indicates that insufficient data collection and analysis has been presented to support the requisite characteristics of plume stability or plume classification as follows:

- a. **Groundwater Plume Length** – The January 2014 groundwater monitoring event documented all site wells contained significantly higher TPHd concentrations than prior monitoring events. Conversely, TPHg and petroleum hydrocarbon volatiles, including benzene, ethylbenzene, toluene, and total xylenes (BTEX) did not change significantly. As a consequence, it may be appropriate to define the groundwater TPHd plume length by other means, such as use of maximum plume lengths as defined in the LTCP *Technical Justification for Groundwater Media-Specific Criteria*, (April 2012), and determine if sensitive receptors are located within the assumed maximum plume length. ACDEH defines sensitive receptors to include wells, and sensitive populations, as well as dewatering structures such as basements with sumps that remove groundwater from the subsurface and an exposure separation, and potentially discharge it to surface conveyance such as curbs with potential direct exposures to humans and the environment. Please be aware, that an updated well survey and sensitive population survey has more recently been conducted for the site.
- b. **Stability of Groundwater Concentrations** – It appears appropriate to resume groundwater monitoring of all on- and offsite shallow groundwater monitoring wells in an attempt to determine current groundwater depths and current concentrations in an effort to support an updated SCM.

TECHNICAL REPORT REQUEST

Please upload technical reports to the ACEH ftp site (Attention: Mark Detterman), and to the State Water Resources Control Board's Geotracker website, in accordance with the specified file naming convention below, according to the following schedule:

- **July 8, 2016** – Deep Well Destruction Report (including Waste Disposal Documentation; **as option**)
File to be named RO454_WELL_DCM_R_yyyy-mm-dd
- **August 19, 2016** – Sensitive Receptor Survey, Updated SCM, and Second Quarter 2016 Groundwater Monitoring Report; File to be named RO454_SCM_GWM_R_yyyy-mm-dd
- **November 18, 2016** – Third Quarter 2016 Groundwater Monitoring Report
File to be named RO454_GWM_R_yyyy-mm-dd

Online case files are available for review at the following website: <http://www.acgov.org/aceh/index.htm>.

Messrs. Horne, Boisvert, and Sadler
RO0000454
May 26, 2016, Page 3

Should you have any questions, please contact me at (510) 567--6876 or send me an electronic mail message at mark.detterman@acgov.org.

Sincerely,



Digitally signed by Mark Detterman
DN: cn=Mark Detterman, o=ACEH, ou=ACEH,
email=mark.detterman@acgov.org, c=US
Date: 2016.05.26 15:24:44 -07'00'

Mark E. Detterman, PG, CEG
Senior Hazardous Materials Specialist

Enclosures: Attachment 1 – Responsible Party (ies) Legal Requirements / Obligations
Electronic Report Upload (ftp) Instructions

cc: Morgan Hargrave, Conestoga-Rovers & Associates, 10969 Trade Center Drive, Suite 107,
Rancho Cordova, CA 95670; (Sent via electronic mail to mhargrave@croworld.com)

Dilan Roe, ACDEH, (sent via electronic mail to dilan.roe@acgov.org)
Mark Detterman, ACDEH, (sent via electronic mail to mark.detterman@acgov.org)
Electronic File, GeoTracker

Attachment 1

Responsible Party(ies) Legal Requirements / Obligations

REPORT REQUESTS

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of reports in electronic form. The electronic copy replaces paper copies and is expected to be used for all public information requests, regulatory review, and compliance/enforcement activities. Instructions for submission of electronic documents to the Alameda County Environmental Cleanup Oversight Program FTP site are provided on the attached "Electronic Report Upload Instructions." Submission of reports to the Alameda County FTP site is an addition to existing requirements for electronic submittal of information to the State Water Resources Control Board (SWRCB) GeoTracker website. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for all groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitoring wells, and [other](#) data to the GeoTracker database over the Internet. Beginning July 1, 2005, these same reporting requirements were added to Spills, Leaks, Investigations, and Cleanup (SLIC) sites. Beginning July 1, 2005, electronic submittal of a complete copy of all reports for all sites is required in GeoTracker (in PDF format). Please visit the SWRCB website for more information on these requirements (http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal/).

PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "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." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 6835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

Please note that delays in investigation, later reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to \$10,000 per day for each day of violation.

Alameda County Environmental Cleanup Oversight Programs (LOP and SLIC)	REVISION DATE: May 15, 2014
	ISSUE DATE: July 5, 2005
	PREVIOUS REVISIONS: October 31, 2005; December 16, 2005; March 27, 2009; July 8, 2010, July 25, 2010
SECTION: Miscellaneous Administrative Topics & Procedures	SUBJECT: Electronic Report Upload (ftp) Instructions

The Alameda County Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of all reports in electronic form to the county's ftp site. Paper copies of reports will no longer be accepted. The electronic copy replaces the paper copy and will be used for all public information requests, regulatory review, and compliance/enforcement activities.

REQUIREMENTS

- **Please do not submit reports as attachments to electronic mail.**
- Entire report including cover letter must be submitted to the ftp site as a **single portable document format (PDF) with no password protection.**
- It is **preferable** that reports be converted to PDF format from their original format, (e.g., Microsoft Word) rather than scanned.
- **Signature pages and perjury statements must be included and have either original or electronic signature.**
- **Do not password protect the document.** Once indexed and inserted into the correct electronic case file, the document will be secured in compliance with the County's current security standards and a password. **Documents with password protection will not be accepted.**
- Each page in the PDF document should be rotated in the direction that will make it easiest to read on a computer monitor.
- Reports must be named and saved using the following naming convention:

RO#_Report Name_Year-Month-Date (e.g., RO#5555_WorkPlan_2005-06-14)

Submission Instructions

- 1) Obtain User Name and Password
 - a) Contact the Alameda County Environmental Health Department to obtain a User Name and Password to upload files to the ftp site.
 - i) Send an e-mail to deh.loptoxic@acgov.org
 - b) In the subject line of your request, be sure to include **"ftp PASSWORD REQUEST"** and in the body of your request, include the **Contact Information, Site Addresses, and the Case Numbers (RO# available in Geotracker) you will be posting for.**
- 2) Upload Files to the ftp Site
 - a) Using Internet Explorer (IE4+), go to <ftp://alcoftp1.acgov.org>
 - (i) Note: Netscape, Safari, and Firefox browsers will not open the FTP site as they are NOT being supported at this time.
 - b) Click on Page located on the Command bar on upper right side of window, and then scroll down to Open FTP Site in Windows Explorer.
 - c) Enter your User Name and Password. (Note: Both are Case Sensitive.)
 - d) Open "My Computer" on your computer and navigate to the file(s) you wish to upload to the ftp site.
 - e) With both "My Computer" and the ftp site open in separate windows, drag and drop the file(s) from "My Computer" to the ftp window.
- 3) Send E-mail Notifications to the Environmental Cleanup Oversight Programs
 - a) Send email to deh.loptoxic@acgov.org notify us that you have placed a report on our ftp site.
 - b) Copy your Caseworker on the e-mail. Your Caseworker's e-mail address is the entire first name then a period and entire last name @acgov.org. (e.g., firstname.lastname@acgov.org)
 - c) The subject line of the e-mail must start with the RO# followed by **Report Upload.** (e.g., Subject: RO1234 Report Upload) If site is a new case without an RO#, use the street address instead.
 - d) If your document meets the above requirements and you follow the submission instructions, you will receive a notification by email indicating that your document was successfully uploaded to the ftp site.

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY

REBECCA GEBHART, Interim Director



DEPARTMENT OF ENVIRONMENTAL HEALTH
LOCAL OVERSIGHT PROGRAM (LOP)
For Hazardous Materials Releases
1131 HARBOR BAY PARKWAY, SUITE 250
ALAMEDA, CA 94502
(510) 567-6700
FAX (510) 337-9335

December 29, 2016

Mr. Mark Horne
Chevron Environmental Management Co.
6101 Bollinger Canyon Road
San Ramon, CA 94583
(Sent via electronic mail to:
MarkHorne@chevron.com)

Mr. Rene Boisvert
800 Center LLC
c/o Boulevard Equity Group
484 Lake Park Ave #246
Oakland, CA 94610-2730

Mr. Terrilla Sadler
618 Brooklyn Avenue
Oakland, CA 94606

NOTICE TO COMPLY

Subject: Request for Groundwater Monitoring, Updated Site Conceptual Model, Sensitive Receptor Survey, Fuel Leak Case RO0000454 (Global ID # T0600102230), Chevron #20-6145 / Signal SS, 800 Center Street, Oakland CA 94607

Messrs. Horne, Boisvert, and Sadler:

Alameda County Department of Environmental Health (ACDEH) has reviewed the case file, including the *Third Quarter 2016 Groundwater Monitoring and Sampling Report*, and dated November 9, 2016. The report was prepared and submitted on your behalf by GHD. Thank you for submitting the report. The report documented a groundwater monitoring event at the subject site on August 18, 2016.

A review of the case file for the above-referenced site indicates that your case is currently not in compliance with the ACDEH May 25, 2016 correspondence, which requested quarterly groundwater monitoring in addition to an updated Site Conceptual Model (SCM) and a sensitive receptor survey as detailed in that letter. Over four months have lapsed and the sensitive receptor survey and an updated SCM have not been received by ACDEH.

Completion of site characterization and/or cleanup at this site is necessary to ensure human health and the environment are protected, as well as to move this case towards closure under the State Water Boards (SWBs) Low Threat Closure Policy (LTCP). Please note that as Responsible Parties, you are required by California Code of Regulations, Title 23, Division 3, Chapter 16, Article 11, §2720 through §2728 to characterize the site and implement corrective action, as required.

In order to regain compliance, please conduct the requested actions, and submit a summary report, and electronically upload all documents to GeoTracker and ACDEH's FTP server by the dates specified below. Failure to conduct the work by the due dates specified below may result in an issuance of a Notice of Violation and possible enforcement action by the District Attorney and/or ineligibility for reimbursement of corrective action costs incurred at the site from the Underground Storage Tank Clean-up Fund. ACDEH can recommend removal of this site from the Underground Storage Tank Cleanup Fund. Pursuant to Chapter 6.7, California Health and Safety code, civil penalties up to \$10,000 for each UST for each day of violation may be imposed. Please note that once removed from the Clean-up Fund, the costs associated with site characterization/site cleanup work that is required will not be reimbursed. Please note that civil penalties for non-compliance are assessed from the original due date (August 19, 2016).

Based on the review of the case file ACDEH requests that you address the following technical comments and send us the documents requested below.

TECHNICAL COMMENTS

1. **LTCP General Criteria e (Site Conceptual Model) – (LATE)** Our review of the case files indicates that insufficient data collection or analysis has been presented to assess the nature, extent, and mobility of the release and to support compliance with Media Specific Criteria Groundwater as described below.

Based on changes in the depth to groundwater, it appears that depth to groundwater affects groundwater concentrations. During the January 2014 monitoring and sampling event, groundwater was at a historic low point for the preceding six years, and contaminant concentrations were at historic high concentrations for the preceding six years. The relationship appears to indicate historic low groundwater levels may cause historic plume concentration spikes that must be considered within the context of the LTCP.

2. **LTCP Media Specific Criteria for Groundwater – (LATE)** Our review of the case files indicates that insufficient data collection and analysis has been presented to support the requisite characteristics of plume stability or plume classification as follows:
 - a. **Groundwater Plume Length** – The January 2014 groundwater monitoring event documented all site wells contained significantly higher TPHd concentrations than prior monitoring events. Conversely, TPHg and petroleum hydrocarbon volatiles, including benzene, ethylbenzene, toluene, and total xylenes (BTEX) did not change significantly. As a consequence, it is appropriate to define the groundwater TPHd plume length by means contained in the LTCP, such as use of maximum plume lengths as defined in the LTCP *Technical Justification for Groundwater Media-Specific Criteria*, (April 2012), and determine if sensitive receptors are located within 1,000 feet of the assumed maximum plume length. ACDEH defines sensitive receptors to include wells, sensitive populations, and dewatering structures such as basements with sumps that remove groundwater from the subsurface, and discharge it to surface conveyance such as curbs with potential direct exposures to humans and the environment including storm water discharges. ACDEH is aware that an updated well survey and sensitive population survey has more recently been conducted for the site.
 - b. **Stability of Groundwater Concentrations** – It appears appropriate to resume groundwater monitoring of all on- and offsite shallow groundwater monitoring wells in an attempt to determine current groundwater depths and current concentrations in an effort to support an updated SCM.
3. **Quarterly Groundwater Monitoring** – In order to quickly determine groundwater plume concentration stability, please conduct quarterly groundwater monitoring and sampling at the site and submit reports by the dates identified below.

SUBMITTAL ACKNOWLEDGEMENT STATEMENT

Please note that ACDEH has updated Attachment 1 with regard to report submittals to ACDEH. ACDEH will now be requiring a Submittal Acknowledgement Statement, replacing the Perjury Statement, as a cover letter signed by the Responsible Party (RP). The language for the Submittal Acknowledgement Statement is as follows:

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

Please make this change to your submittals to ACDEH.

TECHNICAL REPORT REQUEST

Please upload technical reports to the ACEH ftp site (Attention: Mark Detterman), and to the State Water Resources Control Board's Geotracker website, in accordance with the specified file naming convention below, according to the following schedule:

- **February 24, 2017 (LATE)** – Sensitive Receptor Survey, Updated SCM
File to be named RO454_SCM_R_yyyy-mm-dd
- **April 7, 2017** – First Quarter 2017 Groundwater Monitoring Report
File to be named RO454_GWM_R_yyyy-mm-dd

Online case files are available for review at the following website: <http://www.acgov.org/aceh/index.htm>.

Should you have any questions, please contact me at (510) 567--6876 or send me an electronic mail message at mark.detterman@acgov.org.

Sincerely,



Digitally signed by Mark Detterman
DN: cn=Mark Detterman, o=ACEH,
ou=ACEH,
email=mark.detterman@acgov.org, c=US
Date: 2016.12.29 10:47:03 -08'00'

Mark E. Detterman, PG, CEG
Senior Hazardous Materials Specialist

Enclosures: Attachment 1 – Responsible Party (ies) Legal Requirements / Obligations
Electronic Report Upload (ftp) Instructions

cc: Morgan Hargrave, GHD, 10969 Trade Center Drive, Suite 107, Rancho Cordova, CA 95670;
(Sent via electronic mail to: morgan.hargrave@ghd.com)

Greg Barclay, GHD, 10969 Trade Center Drive, Suite 107, Rancho Cordova, CA 95670;
(Sent via electronic mail to: greg.barclay@ghd.com)

Dilan Roe, ACDEH, (Sent via electronic mail to: dilan.roe@acgov.org)
Paresh Khatri, ACDEH; (Sent via electronic mail to: paresh.khatri@acgov.org)
Mark Detterman, ACDEH, (Sent via electronic mail to: mark.detterman@acgov.org)
Electronic File; GeoTracker

Attachment 1

Responsible Party(ies) Legal Requirements / Obligations

REPORT REQUESTS

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

ELECTRONIC SUBMITTAL OF REPORTS

Alameda County Department of Environmental Health's (ACDEH) Environmental Cleanup Oversight Programs, Local Oversight Program (LOP) and Site Cleanup Program (SCP) require submission of reports in electronic form. The electronic copy replaces paper copies and is expected to be used for all public information requests, regulatory review, and compliance/enforcement activities. Instructions for submission of electronic documents to the Alameda County Environmental Cleanup Oversight Program File Transfer Protocol (FTP) site are provided on the attached "Electronic Report Upload Instructions." Submission of reports to the Alameda County FTP site is an addition to existing requirements for electronic submittal of information to the State Water Resources Control Board (SWRCB) GeoTracker website. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for all groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitoring wells, and other data to the GeoTracker database over the Internet. Beginning July 1, 2005, these same reporting requirements were added to SCP sites. Beginning July 1, 2005, electronic submittal of a complete copy of all reports for all sites is required in GeoTracker (in PDF format). Please visit the SWRCB website (http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal/) for more information on these requirements.

ACKNOWLEDGEMENT STATEMENT

All work plans, technical reports, or technical documents submitted to ACDEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to ACDEH's FTP server and the SWRCB's GeoTracker website." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6731, 6735, and 7835) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately licensed or certified professional. For your submittal to be considered a valid technical report, you are to present site-specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this case meet this requirement. Additional information is available on the Board of Professional Engineers, Land Surveyors, and Geologists website at: <http://www.bpelsq.ca.gov/laws/index.shtml>.

UNDERGROUND STORAGE TANK CLEANUP FUND

Please note that delays in investigation, late reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to \$10,000 per day for each day of violation.

Alameda County Environmental Cleanup Oversight Programs (LOP and SCP)	REVISION DATE: December 1, 2016
	ISSUE DATE: July 5, 2005
	PREVIOUS REVISIONS: October 31, 2005; December 16, 2005; March 27, 2009; July 8, 2010, July 25, 2010; May 15, 2014, November 29, 2016
SECTION: Miscellaneous Administrative Topics & Procedures	SUBJECT: Electronic Report Upload (ftp) Instructions

The Alameda County Environmental Cleanup Oversight Programs (LOP and SCP) require submission of all reports in electronic form to the county's ftp site. Paper copies of reports will no longer be accepted. The electronic copy replaces the paper copy and will be used for all public information requests, regulatory review, and compliance/enforcement activities.


REQUIREMENTS

- **Please do not submit reports as attachments to electronic mail.**
- Entire report including cover letter must be submitted to the ftp site as a **single portable document format (PDF) with no password protection.**
- It is **preferable** that reports be converted to PDF format from their original format, (e.g., Microsoft Word) rather than scanned.
- **Signature pages and perjury statements must be included and have either original or electronic signature.**
- **Do not password protect the document.** Once indexed and inserted into the correct electronic case file, the document will be secured in compliance with the County's current security standards and a password. **Documents with password protection will not be accepted.**
- Each page in the PDF document should be rotated in the direction that will make it easiest to read on a computer monitor.
- Reports must be named and saved using the following naming convention:

RO#_Report Name_Year-Month-Date (e.g., RO#5555_WorkPlan_2005-06-14)

Submission Instructions

- 1) Obtain User Name and Password
 - a) Contact the Alameda County Environmental Health Department to obtain a User Name and Password to upload files to the ftp site.
 - i) Send an e-mail to deh.loptoxic@acgov.org.
 - b) In the subject line of your request, be sure to include "**ftp PASSWORD REQUEST**" and in the body of your request, include the **Contact Information, Site Addresses,** and the **Case Numbers (RO# available in Geotracker) you will be posting for.**

- 2) Upload Files to the ftp Site
 - a) Open File Explorer using the Windows  key + E keyboard shortcut.
 - i) Note: Netscape, Safari, and Firefox browsers will not open the FTP site as they are NOT being supported at this time.
 - b) On the address bar, type in `ftp://alcoftp1.acgov.org`.
 - c) Enter your User Name and Password. (Note: Both are Case Sensitive)
 - d) Click Log On.
 - e) Open "My Computer" on your computer and navigate to the file(s) you wish to upload to the ftp site.
 - f) With both "My Computer" and the ftp site open in separate windows, drag and drop the file(s) from "My Computer" to the ftp window.

- 3) Send E-mail Notifications to the Environmental Cleanup Oversight Programs
 - a) Send email to deh.loptoxic@acgov.org notify us that you have placed a report on our ftp site.
 - b) Copy your Caseworker on the e-mail. Your Caseworker's e-mail address is the entire first name then a period and entire last name `@acgov.org`. (e.g., `firstname.lastname@acgov.org`)
 - c) The subject line of the e-mail must start with the RO# followed by **Report Upload**. (e.g., Subject: RO1234 Report Upload) If site is a new case without an RO#, use the street address instead.
 - d) If your document meets the above requirements and you follow the submission instructions, you will receive a notification by email indicating that your document was successfully uploaded to the ftp site.

Appendix B Site History

Appendix B Summary of Previous Environmental Investigation and Remediation

August 1989 Subsurface Investigation

Subsurface Consultants, Inc. (Subsurface) advanced soil borings B-1 through B-5 to depths ranging from 4.5 to 26 feet below grade (fbg) in the vicinity of the former underground storage tanks (USTs), dispenser island, and sumps along the eastern property boundary. Temporary wells were installed in borings B-1 and B-3. Subsurface noted in their report that the former USTs had been removed in 1973 when the station closed based on a permit search at the City of Oakland. Additional information is available in Subsurface's October 13, 1989 *Preliminary Hydrocarbon Contamination Assessment*.

October 1995 Subsurface Investigation

Groundwater Technology, Inc. (GTI) advanced borings SB-1 through SB-3 and installed groundwater monitoring wells MW-1 through MW-4. Additional information is available in GTI's November 14, 1995 *Additional Site Assessment Report*.

March 1996 Subsurface Investigation

Pacific Environmental Group (PEG) advanced soil borings P-1 through P-9 both on and offsite. Additional information is available in PEG's April 18, 1996 *Soil and Groundwater Investigation*.

December 1996 Well Installation

PEG installed offsite wells MW-5 through MW-7 and drilled a boring for MW-8. Well MW-8 was not installed because no evidence of petroleum hydrocarbons was observed. Additional information is available in PEG's January 24, 1997 *Soil and Groundwater Investigation*.

1997 Soil Vapor Sampling

PEG advanced soil vapor points SV-1 through SV-5 to depths up to 12 fbg. Hydrocarbon concentrations in soil vapor were highest between 6 and 10 fbg. Additional information is available in PEG's January 24, 1997 *Soil and Groundwater Investigation*.

1999/2001 Site Demolition

In 1999, Gettler-Ryan, Inc. (G-R) removed the dispenser island, sumps, the hydraulic hoist, building foundations, garbage enclosure, yard lights and asphalt. During station removal, an orphaned 1,000-gallon gasoline UST, an orphaned 550-gallon used-oil UST, and a buried 55-gallon drum (apparently a makeshift used-oil UST) were encountered. The removal of these encountered USTs was not completed until April 2001, while Chevron and the property owner determined UST ownership. On April 12, 2011, soil samples A-1 and A-2 were collected from beneath the 1,000-gallon gasoline UST, and

soil sample WOT was collected from beneath the 550-gallon used-oil UST. Additional information is available in Delta Environmental Consultants, Inc. (Delta) May 21, 2001 *Compliance Soil Sampling during Removal of Underground Storage Tanks*.

January 2002 Monitoring Well Installation

G-R installed offsite groundwater monitoring well MW-8. No TPHd, TPHg, benzene, or methyl tertiary butyl ether (MTBE) was detected in soil. Additional information is available in Delta's April 11, 2002 *Monitoring Well Installation Report*.

June 2002 Subsurface Investigation

G-R advanced onsite soil borings GP-1 through GP-23 to approximately 12 fbg. Soil samples were collected at 5 and 10 fbg in each boring to profile soil for disposal for the planned remedial excavation. Additional information is available in G-R's July 31, 2002 *Soil Borings*.

November 2002 Remedial Excavation

G-R excavated hydrocarbon-bearing soil in the areas of the former USTs, dispenser island, hydraulic lift, and sumps to a total depth of approximately 12 fbg, with a maximum depth of 14 fbg in one location. Approximately 1,584 tons of hydrocarbon-bearing soil were removed and transported to Allied Waste Landfill in Manteca, California. Thirty-four (SW-1 through SW-10 at 5 and 10 fbg, EXB-1 through SCB-4, SWH-1 through SWH-4, BH-1, SWW-1 through SWW-4, and BWO-1) confirmation soil samples were collected. Well MW-1 was destroyed by excavation during this event. Prior to backfilling, approximately 900 pounds of oxygen releasing compound was placed in the excavation bottoms, and Class II aggregate base was used for backfill. Additional information is available in Delta's January 23, 2003 *Well Destruction, Over-Excavation and Soil Sampling Report*.

January 2003 Soil Borings and Well installation

Delta advanced soil borings GP-24 through GP-30 to approximately 16 fbg and installed monitoring well MW-1A near former monitoring well MW-1. Additional information is available in Delta's May 15, 2003 *Soil Boring and Well Installation Report*.

October and November 2004 Geoprobe and CPT Investigation

Cambria Environmental Technology advanced cone penetration test (CPT) borings CPT-1 through CPT-5 and direct push borings C-1 through C-9 to further define the lateral and vertical extents of hydrocarbons in soil. All borings were advanced onsite except CPT-5, which was located offsite in Center Street. Vertical delineation of hydrocarbons in soil was achieved between 15 and 20 fbg, except for concentrations just above TPHg detection limits between 25 and 50 fbg. Anomalous hydrocarbon grab-groundwater analytical results were detected in deeper groundwater samples. It was surmised that these detections may result from cross contamination during drilling. Additional information is in Cambria's January 14, 2005 *Subsurface Investigation Report*.

2007 Well Installation and Subsequent Sampling

Conestoga-Rovers & Associates, Inc. (CRA) installed clustered monitoring wells MW-9 through MW-17 to further define the vertical extent of hydrocarbons in groundwater. Wells MW-9 through MW-16 were screened from 35 to 40 fbg or from 55 to 60 fbg to collect depth-discrete groundwater samples. Well MW-17 was screened from 70 to 75 fbg to vertically delineate dissolved-phase hydrocarbons. Dissolved-phase hydrocarbons were detected in all wells and were highest in well MW-14 screened from 55-60 fbg. Subsequent groundwater monitoring and sampling events indicated that hydrocarbon concentrations were decreasing in these wells. Additional information is available in CRA's May 14, 2007 *Well Installation Report* and October 1, 2007 *Third Multi-Level Groundwater Monitoring Report*.

October 2007 Soil Vapor Probe Installation

CRA installed permanent onsite soil vapor probes VP-1 through VP-6, and on November 6, 2007 collected soil vapor samples to evaluate the potential for vapor intrusion to proposed residential housing units. No benzene was detected in soil vapor. Additional information is available in CRA's January 23, 2008 *Feasibility Study/Corrective Action Plan Addendum*.

October 2008 Soil Vapor Investigation

CRA re-sampled vapor probes VP-1 and VP-3 through VP-6 to confirm initial results. VP-2 could not be sampled due to water in the tubing. No benzene was detected. Additional information is available in CRA's November 18, 2008 *Soil Vapor Investigation Results*.

January 2010 Surficial Sampling

CRA collected surficial soil samples at the surface and at depths of 0.5 and 2.5 fbg from 12 locations, the majority of which are designated as future landscaping areas where potential direct human contact may occur. The locations were designated SS-1 through SS-12. Soil samples were analyzed for lead, organochlorine pesticides, and polychlorinated biphenyls (PCB). The scope of work was based on California's Department of Toxic Substances Control (DTSC) 2006 *Interim Guidance Evaluation of School Sites with Potential Soil Contamination as a Result of Lead from Lead-Based Paint, Organochlorine Pesticides from Termiticides, and Polychlorinated Biphenyls from Electrical Transformers*. The highest lead concentrations were detected at SS-1, SS-2, SS-3, and SS-6, all located in the northern portion of the site, but not on the former Chevron owned parcel. This data was incorporated into Arcadis's August 17, 2010 health risk assessment report. In December 2009, CRA conducted a Department of Water Resources (DWR) file review and identified one irrigation well within 1/2-mile radius of the site, located approximately 2,100 feet upgradient of the site. The well was installed in 1915 and has a total depth of 55 fbg. Additional details are available in CRA's February 15, 2010 *Surficial Soil Lead Results*.

February 2010 Low Flow Air Sparge Well Installations

In February 2010, CRA installed low flow air-sparge wells AS-1 through AS-8 in accordance with CRA's November 1, 2007 *Feasibility Study and Corrective Action Plan* and April 27, 2009 *Work Plan for Low*

Flow Air Sparging Pilot Test and Additional Soil Vapor Sampling, which was approved with comments by Alameda County Environmental Health Services (ACEH) in their letter dated December 23, 2009. Additional details are available in CRA's July 6, 2011 *Low Flow Air Sparge Pilot Test report*.

September 2010 Low Flow Air Sparge Pilot Test

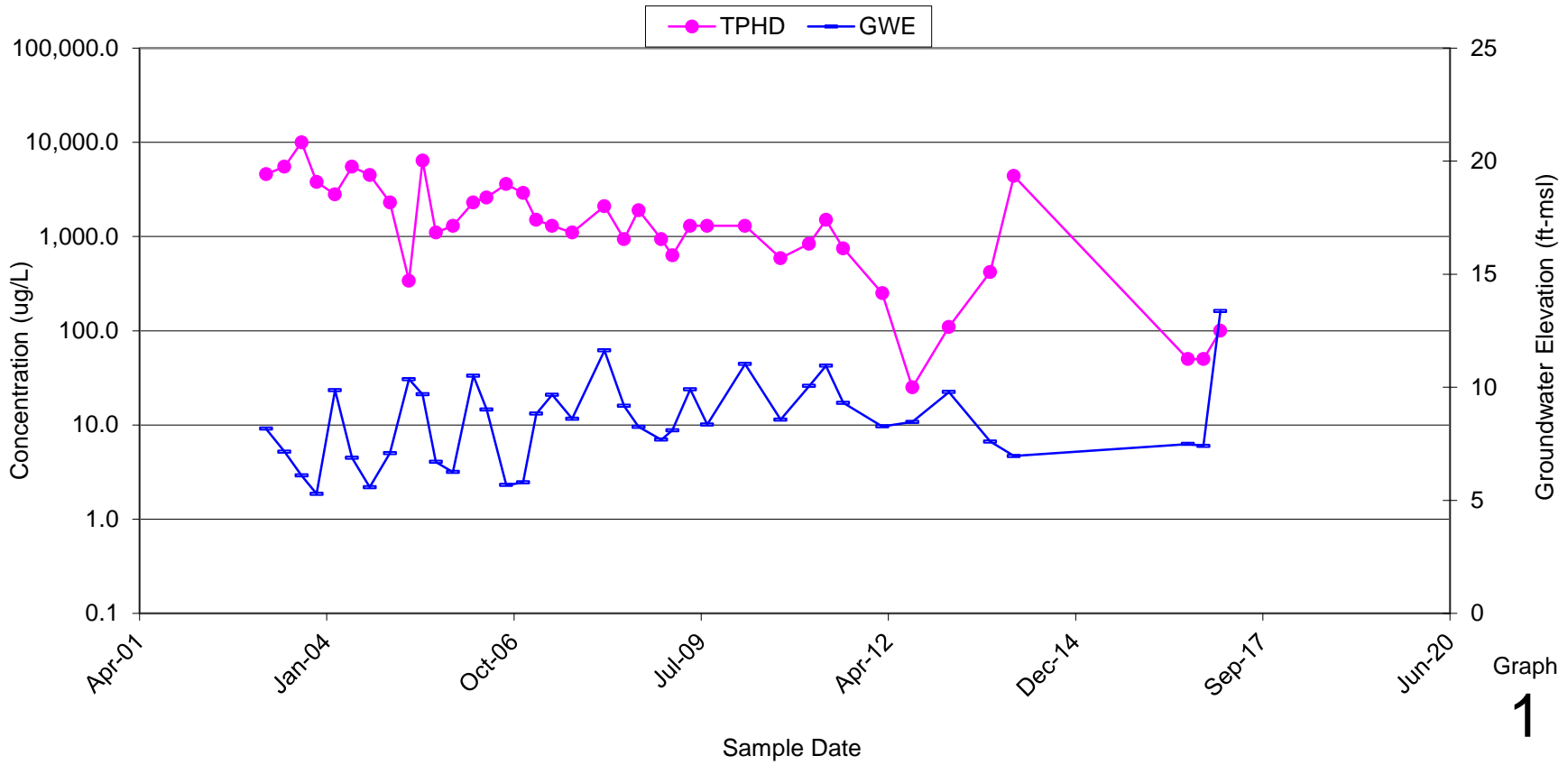
The low flow air sparge system (LFAS) began operation on January 5, 2011 and operated continuously until it was shutdown on April 8, 2011. Air was injected sequentially into each of the eight sparge wells, AS-1 through AS-8, for approximately 60 minutes per sparge cycle. Sparge cycle time was determined based on the observed time for the induced groundwater mound to dissipate to pre-injection elevation. Based on the LFAS pilot test results CRA concluded air sparging could be successful in reducing dissolved hydrocarbon concentrations in groundwater and recommended operating the LFAS with soil vapor extraction to minimize the potential vapor in the vadoze zone while the LFAS operated. Additional details are available in CRA's July 6, 2011 *Low Flow Air Sparge Pilot Test report*.

November 2011 Revised Corrective Action Plan

CRA submitted the November 30, 2011 *Revised Corrective Action Plan and Preferential Pathway Analysis* as requested by the ACEH in a letter dated August 17, 2011. Sanitary sewer, electric, communication, water, and natural gas utilities were identified offsite and likely not a potential pathways for migration of the dissolved-phase hydrocarbons from the site. CRA concluded active remediation was not warranted and recommended continued monitored natural attenuation of hydrocarbons in soil vapor and groundwater through May 2012. Soil vapor samples were proposed through the first and second quarters of 2012 and groundwater samples through the first quarter of 2012. CRA also referenced the State Water Resource Control Board's September 21, 2010 *Preliminary 5-Year Review Summary Report for USTCF Claim Number: 012265* letter which stated the site meets the Region 2 criteria for low risk groundwater site closure. Additional details are available in CRA's November 30, 2011 *Revised Corrective Action Plan and Preferential Pathway Analysis*.

Appendix C

Chemical Concentration Versus Time Graphs

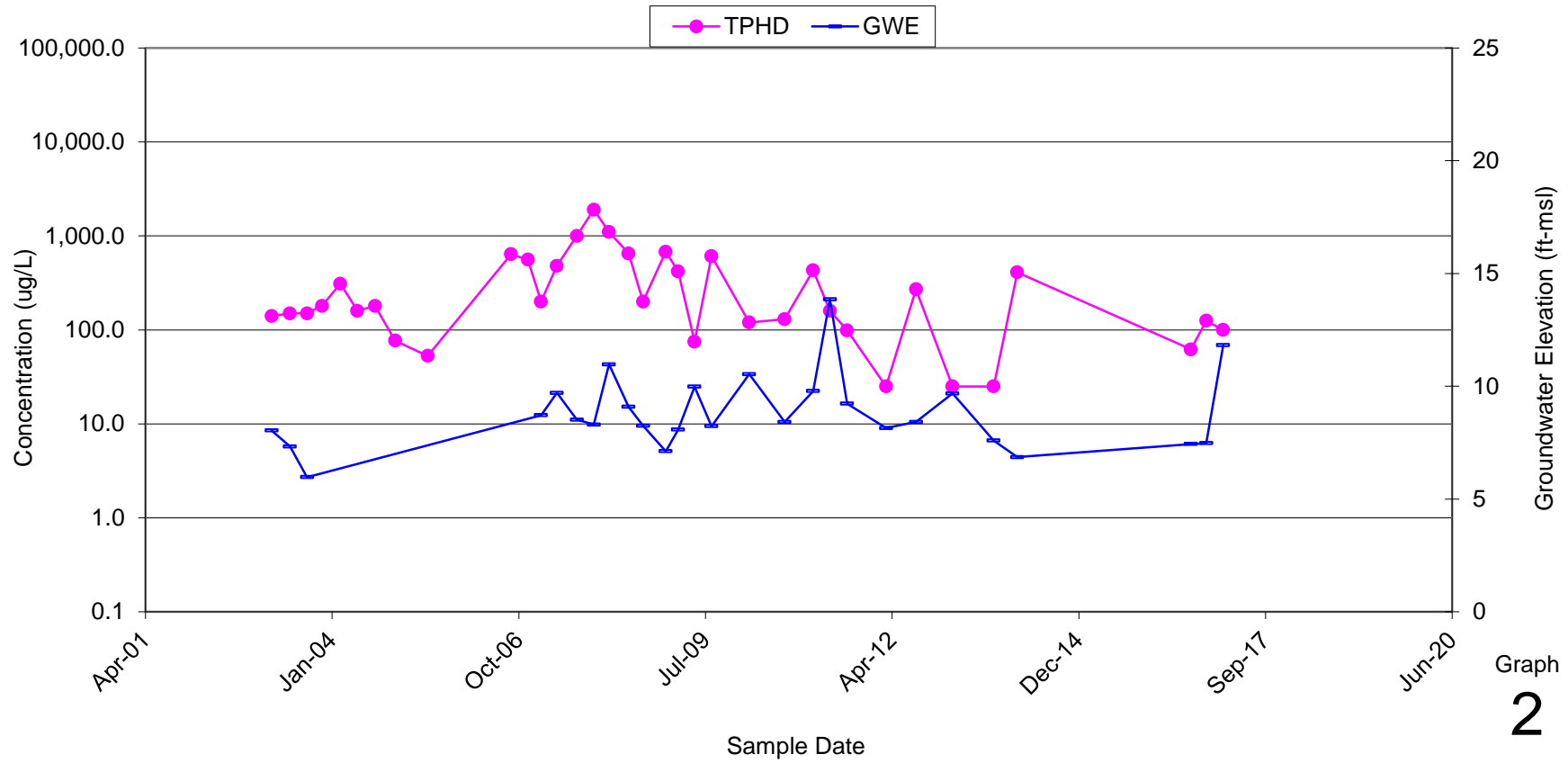


Graph
1

FORMER SIGNAL OIL STATION 206145
800 CENTER STREET
OAKLAND, CALIFORNIA



MW-1A: TPHd
CONCENTRATIONS AND
GROUNDWATER ELEVATION

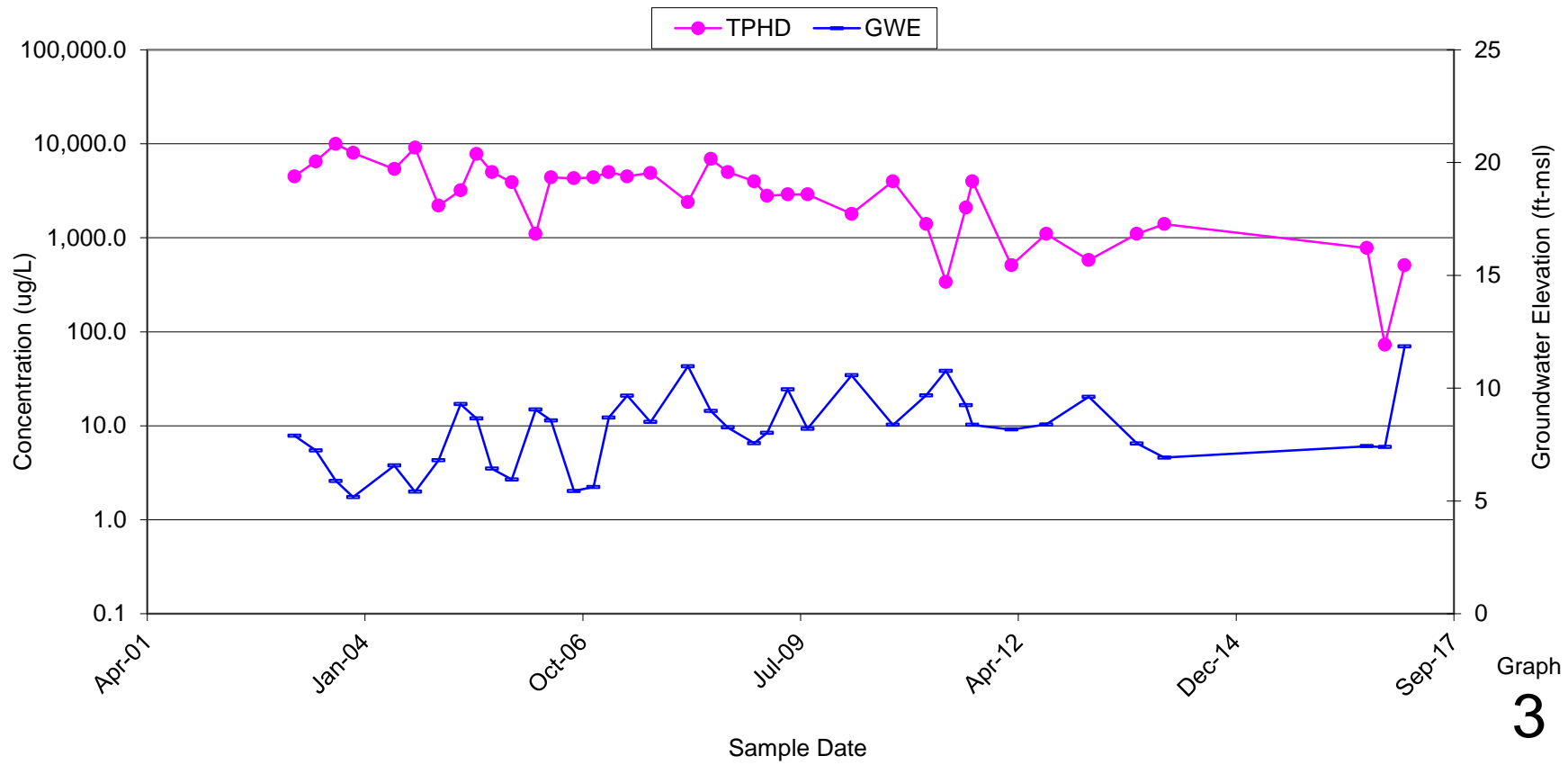


Graph
2

FORMER SIGNAL OIL STATION 206145
800 CENTER STREET
OAKLAND, CALIFORNIA



MW-2: TPHd
CONCENTRATIONS AND
GROUNDWATER ELEVATION

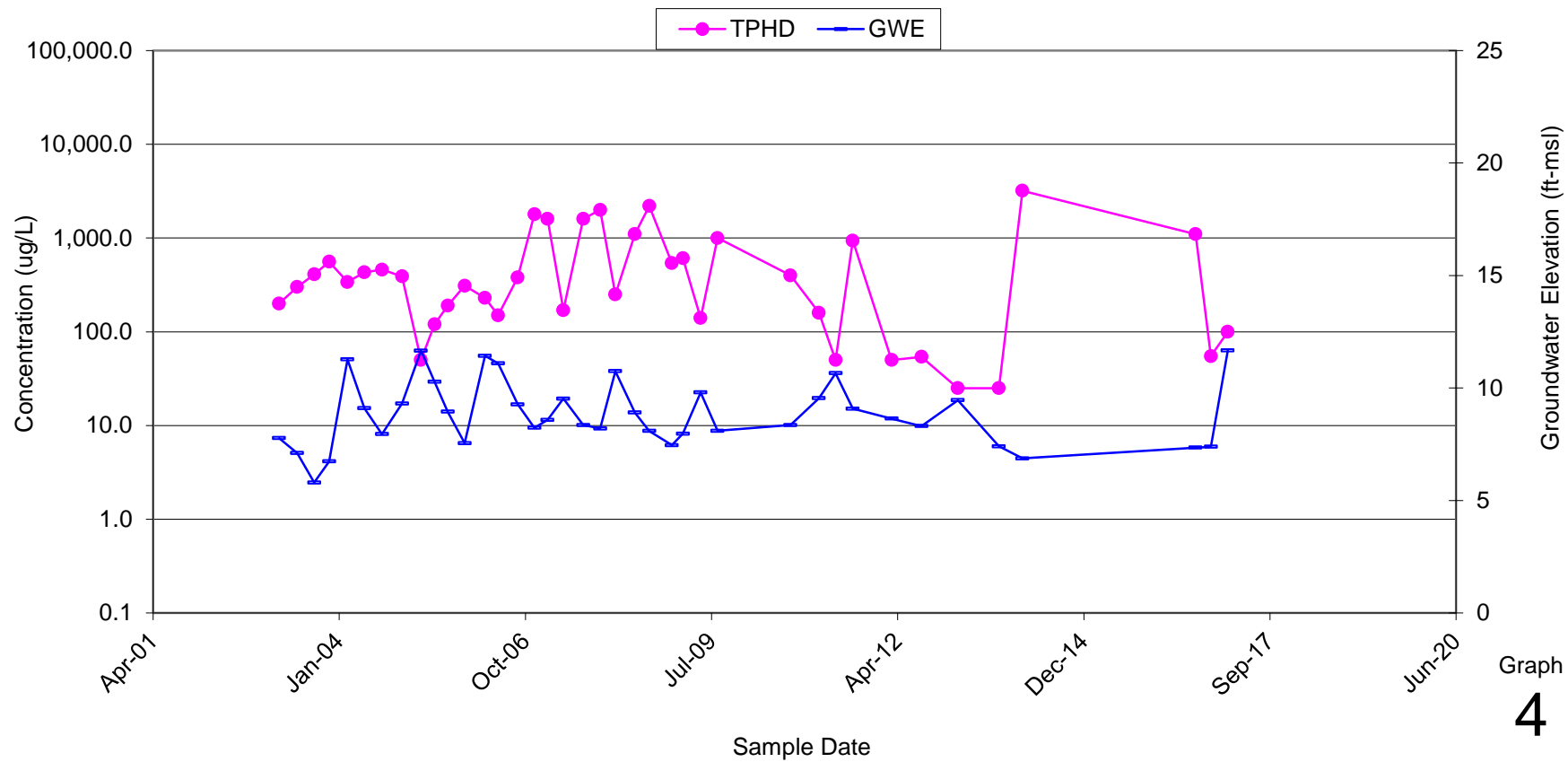


Graph
3

FORMER SIGNAL OIL STATION 206145
800 CENTER STREET
OAKLAND, CALIFORNIA



MW-3: TPHd
CONCENTRATIONS AND
GROUNDWATER ELEVATION



Graph
4

FORMER SIGNAL OIL STATION 206145
800 CENTER STREET
OAKLAND, CALIFORNIA



MW-4: TPHd
CONCENTRATIONS AND
GROUNDWATER ELEVATION