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By Alameda County Environmental Health 3:08 pm, Apr 26, 2017

April 6, 2017

Mr. Mark Detterman, PG, CEG
Senior Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502

Subject: Phase II Data Gap Investigation Work Plan
for City of Emeryville Former Fire Station UST Site

Reference: Alameda County Fuel Leak Case No. RO0000068
GeoTracker Global ID T0600101848

Dear Mr. Detterman:

The City of Emeryville is pleased to submit the attached *Phase II Data Gap Investigation Work Plan* for the City formerly owned fire station site. The work plan was prepared by OTG EnviroEngineering Solutions, Inc. (OTG) under a consultant service contract with the City of Emeryville.

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 contact Mr. Xinggang Tong at (510) 465-8982 or me at (510) 596-3728 if you have questions or comments.

Sincerely,
City of Emeryville

NHumphrey

Nancy Humphrey
Environmental Programs Analyst

OTG EnviroEngineering Solutions, Inc.

April 6, 2017

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Dear Mr. Detterman:

OTG EnviroEngineering Solutions, Inc. (OTG) is pleased to present this *Phase II Data Gap Investigation Work Plan* for the City of Emeryville formerly owned fire station UST site. The Work Plan is prepared in response to a 5th January 2017 directive letter from Alameda County Department of Environmental Health (ACDEH).

Certification

I certify under penalty of law that this document and all attachments are prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Please call Xinggang Tong at (510) 465-8982 or Nancy Humphrey at (510) 596-3728 if you have questions or comments.

Sincerely,
OTG EnviroEngineering Solutions, Inc.

Xinggang Tong, PhD, PE
Project Manager

Attachments

Table 1 – Phase II Data Gap Investigation Work Plan and Focused Site Conceptual Model
City of Emeryville Former Fire Station – GeoTracker ID T0600101848, ACEH Case RO#68

SITE DESCRIPTION

This City of Emeryville owned former fire station used to have the street address of 4331 San Pablo Avenue, Emeryville, CA (Figure 1), and occupied a rectangle area of 125 ft by 148 ft (Figure 2). However, the fire station does not exist today. As part of the "Emery village Center" redevelopment area in the early 2000, its parcel was combined with adjacent parcels and then subdivided into three parcels as existing today: Parcel #49-1027-39, Parcel #49-1027-38, and Parcel #49-1027-37-1, as shown on Figure 3. The former fire station parcel is now part of outdoor parking area of the Emery Village Center, as shown on Figure 2.

SITE HISTORY

The City of Emeryville operated a fire station at 4331 San Pablo Avenue from the early 1910s to around 1995 based on a Phase I ESA prepared by Lowney Associates (1999). A 500-gallon underground fuel storage tank (UST) provided fueling services to the station's fire engines. A sump pit also existed in the concrete-paved backyard that once collected waste engine and transmission oil from fire engine maintenance activities. Their locations are shown on Figure 4.

SITE ENVIRONMENTAL INVESTIGATION AND REMEDIATION HISTORY

The UST and associated equipment and underground piping were removed on July 26, 1994 under the supervision of ACEH (SEACOR, 1994a & 1994b). Approximately 20 cubic yards of petroleum hydrocarbon impacted soil was also removed from the excavation pit and disposed of offsite. A soil sample was collected from each of the four sidewalls of the UST excavation pit at the depth of seven (7) feet below ground surface (bgs). A fifth soil sample was collected from the base of the excavation pit at the fuel dispenser island at 3 feet bgs. The five soil samples were analyzed for TPH-gas, TPH-diesel, and BTEX. TPH gas ranged from 3 to 190 mg/kg, TPH-diesel from ND (10) to 260 mg/kg, and benzene from ND (0.005) to 0.38 mg/kg.

A 2"-diameter groundwater monitoring well (MW-1) was installed approximately 10 feet down gradient of the former UST to a depth of 23 feet bgs, with screen from 6 to 21 feet bgs, on February 21, 1995 (SEACOR, 1995). The well was monitored quarterly in 1995 for TPH-gas, TPH-diesel, and BTEX. At the fourth and the last documented monitoring event conducted on December 11, 1995, TPH-gas was measured at 8.7 mg/L, TPH-diesel at 98 mg/L, and benzene at 230 ug/L (SEACOR, 1996). Groundwater levels varied from approximately 5 feet to 12 feet below top of well casing. The well was destroyed during the site redevelopment in the early 2000. However, well destruction records could not be located. Also, documents related to remedial activities during the site redevelopment could not be found.

Table 1 – Phase II Data Gap Investigation Work Plan and Focused Site Conceptual Model
City of Emeryville Former Fire Station – GeoTracker ID T0600101848, ACEH Case RO#68

Task	Data Gap Item	Proposed Investigation	Rationale	Analyses
Task 1: LTCP General Criteria B – The unauthorized release consists only of petroleum				
1a	The existence of a sump pit that collected waste oil needs to be investigated.	Advance one boring (SB-3 on Figure 4) at the center of the former sump to approx 15 ft bgs. Soil samples from 0-5 ft, 5-10 ft bgs intervals, and additional based on field observations, will be collected for analyses.	Soil samples will be collected directly beneath the bottom of the former sump for analyses. No grab groundwater will be collected from the borehole as grab groundwater typically contains high suspended solids content and does not represent true groundwater quality. A groundwater monitoring well (MW-3) will be installed within 10 feet of downgradient of the former sump as detailed under Task 2a. Groundwater quality will be monitored quarterly from MW-3 under Task 2a.	Soil samples will be analyzed for TPH-g, TPH-d, & TPH-mo by EPA 8015; BTEX, MTBE, and naphthalene by EPA8260; PAH by EPA8270; and LUFT 5 metals (Cd, Cr, Pb, Ni, & Zn) by EPA6010.
Task 2: LTCP General Criteria D – Free product has been removed to the maximum extent practicable				
2a	Sheen was reported in the last monitoring event of the former well MW-1 on 12/11/95. No removal activities were reported.	Install two new monitoring wells (MW-2 & MW-3) as shown on Figure 4. The wells will be 2"-diameter Sch 40 PVC casing, to 20 ft deep; with 0.01" well screen from 5 ft to 20 ft below grade. Soil samples from MW-2	Well MW-1 was destroyed during the site redevelopment in the early 2000. The last groundwater monitoring data was over 20 years old. Limited free product may have attenuated itself since then. The two new wells are strategically located to assess potential free product existence and groundwater quality.	Soil and groundwater samples will be analyzed for TPH-g & TPH-d by EPA8015; BTEX, MTBE, and naphthalene by EPA8260. In addition, groundwater sample from MW-3 will also be analyzed for TPH-mo by

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		will be collected from 0 to 5 ft, 5 to 10 ft, & 10 to 20 ft intervals based on field observations. MW-3 will be at the same location of SB-2. No new soil samples will be collected during its installation. The two wells will be surveyed, developed, & monitored quarterly for one year.	MW-2 will be located within 10 ft downgradient of the former UST & dispenser excavation area. MW-2 will be located within approx. 5 ft downgradient of the former sump location and approx. 30 ft downgradient of the former UST.	EPA8015; PAH by EPA8270; and LUFT 5 metals (Cd, Cr, Pb, Ni, & Zn) by EPA6010. During each quarterly monitoring event, water levels (and LNAPL thickness if exists) from each well will be measured to the nearest 0.01 ft prior to purging.
Task 3: LTCP General Criteria F – Secondary source has been removed to the extent practicable				
3a	Insufficient data available to assess the extent of secondary source removal from the former sump and the former UST & dispenser area.	Advance two borings (SB-4 & SB-5) to approx. 15 ft bgs. Soil samples from 0-5 ft, 5-10 ft bgs intervals, and additional based on field observations, will be collected for analyses.	Over-excavation was performed during the UST removal in August 1994. Approx 20 cubic yards of impacted soil was disposed of off-site. Additional remediation may have been conducted during redevelopment in the early 2000, but documentation is not available. Soil Boring SB-3 as proposed under Task 1a will provide assessment of secondary soil source of the former sump. Soil Borings SB-4 & SB-5, together with MW-2 soil boring, will provide assessment of	Analyses for SB-3 soil samples are listed under Task 1a above. Soil samples from SB-4, SB-5 & MW-2 will be analyzed for TPH-g & TPH-d by EPA8015; BTEX, MTBE, and naphthalene by EPA8260. Groundwater sample analysis is listed under Task 2a above.

			secondary and residual soil source beneath & surrounding the former UST & dispenser. No grab groundwater will be collected from SB-4 & SB-5 as grab groundwater samples typically contain high suspended solids content and do not represent true groundwater quality. Monitoring well MW-2 & MW-3 will provide assessment of potential free product.	
Task 4: LTCP Media Specific Criteria for Groundwater				
4a	Plume length and lateral extent not defined, nor groundwater flow direction.	Installation of two groundwater monitoring wells are proposed under Task 2a above.	Since there are many contaminated sites surrounding this site, including one in immediate downgradient area (Pepsi Canning & Truck Maintenance facility), it is difficult to field define plume length attributable to this site. We will rely on case studies cited by the LTCP for plume length & lateral extent estimate. A review of groundwater elevation data from nearby sites (Berkeley Farms, RO#2452; OakWalk, RO#2733; & Celis, RO#453) indicates that the shallow groundwater flows in a southwesterly direction. No separate investigation will be performed for this site for groundwater flow direction.	

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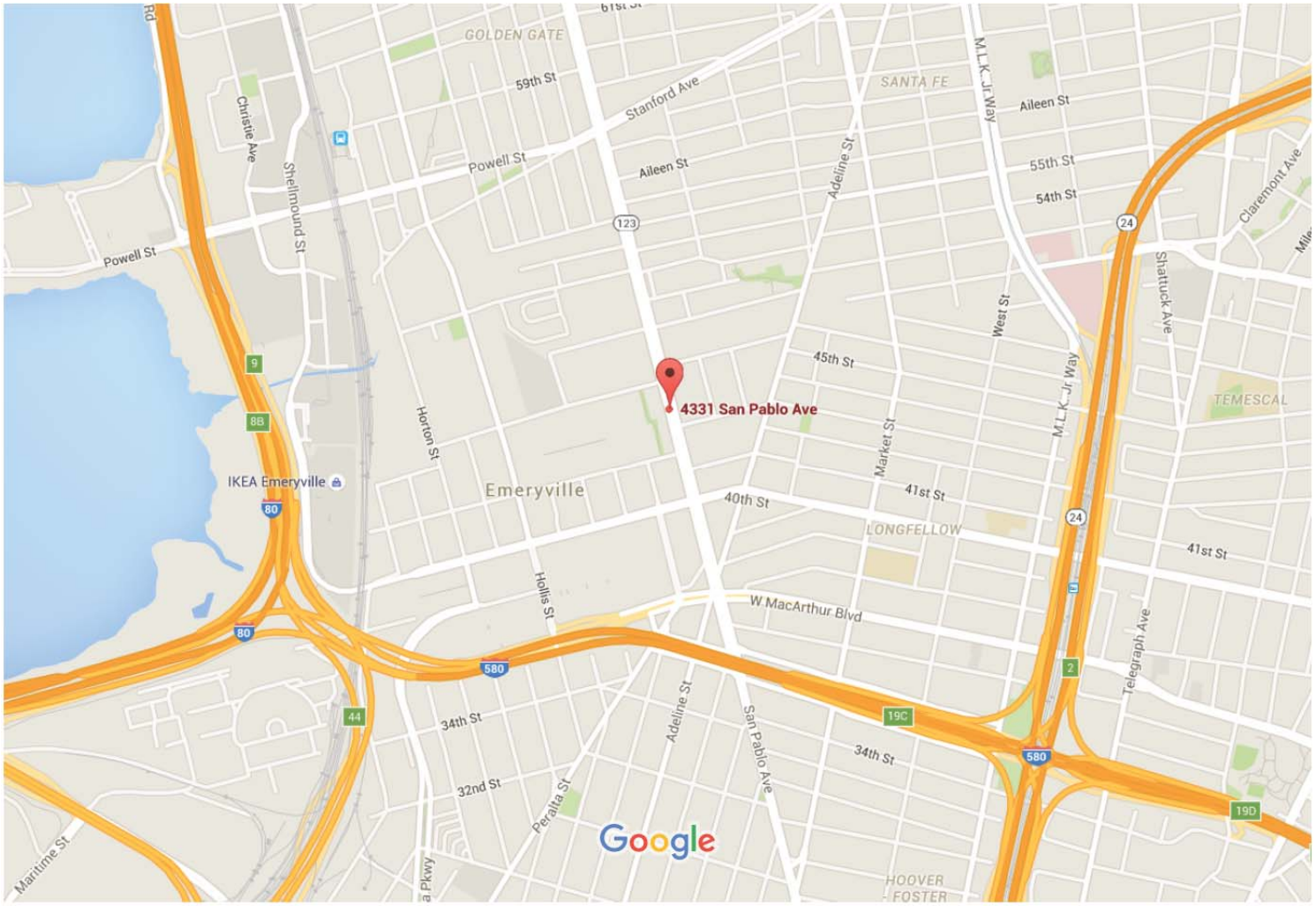
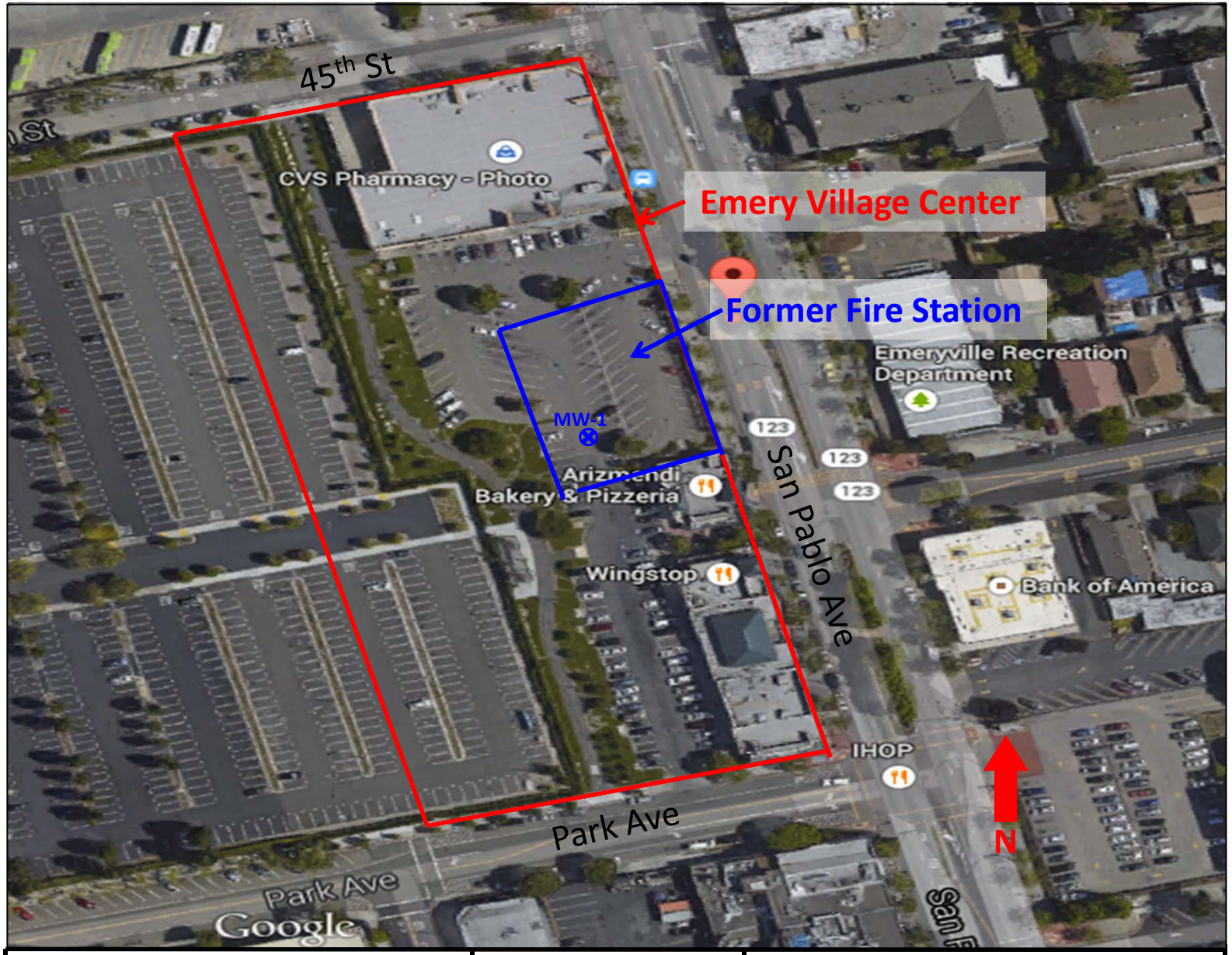
4b	The length of a potential LNAPL is undefined.	The potential existence of LNAPL will be monitored quarterly for one year as stated under Task 2a.	The installation of two monitoring wells under Task 2a will provide assessment of LNAPL. Additional investigation and potential removal alternatives will be evaluated if LNAPL is identified.	Quarterly measurement of LNAPL thickness for one year if identified.
4c	Limited data available to assess plume stability	Quarterly monitoring of the two new wells for one year.	Plume stability will be evaluated after one year of quarterly groundwater monitoring.	See Task 2a above.
4d	Distance to closest water supply well or surface water is undetermined	A well and surface water body survey will be conducted within ¼ radius of the site.		
Task 5: LTCP Media Specific Criteria for Vapor Intrusion to Indoor Air				
5a	Limited data available to allow assessment of vapor intrusion to indoor air	Two contingent vapor monitoring wells are proposed, as shown on Figure 4. The vapor wells will be 5 ft deep. Details are in Appendix A.	The need for soil vapor monitoring will be evaluated upon the completion of the additional soil and groundwater investigation proposed under Task 1a, 2a, & 3a above.	If the two contingent vapor wells are installed, soil vapor samples will be collected and analyzed by TO-15 for TPH-g, BTEX, & naphthalene.
Task 6: LTCP Media Specific Criteria for Direct Contact and Outdoor Air Exposure				
6a	Limited data available to allow assessment of direct contact and outdoor air exposure	See contingent vapor monitoring wells proposed under Task 5a.	See Task 5a above.	See Task 5a above.

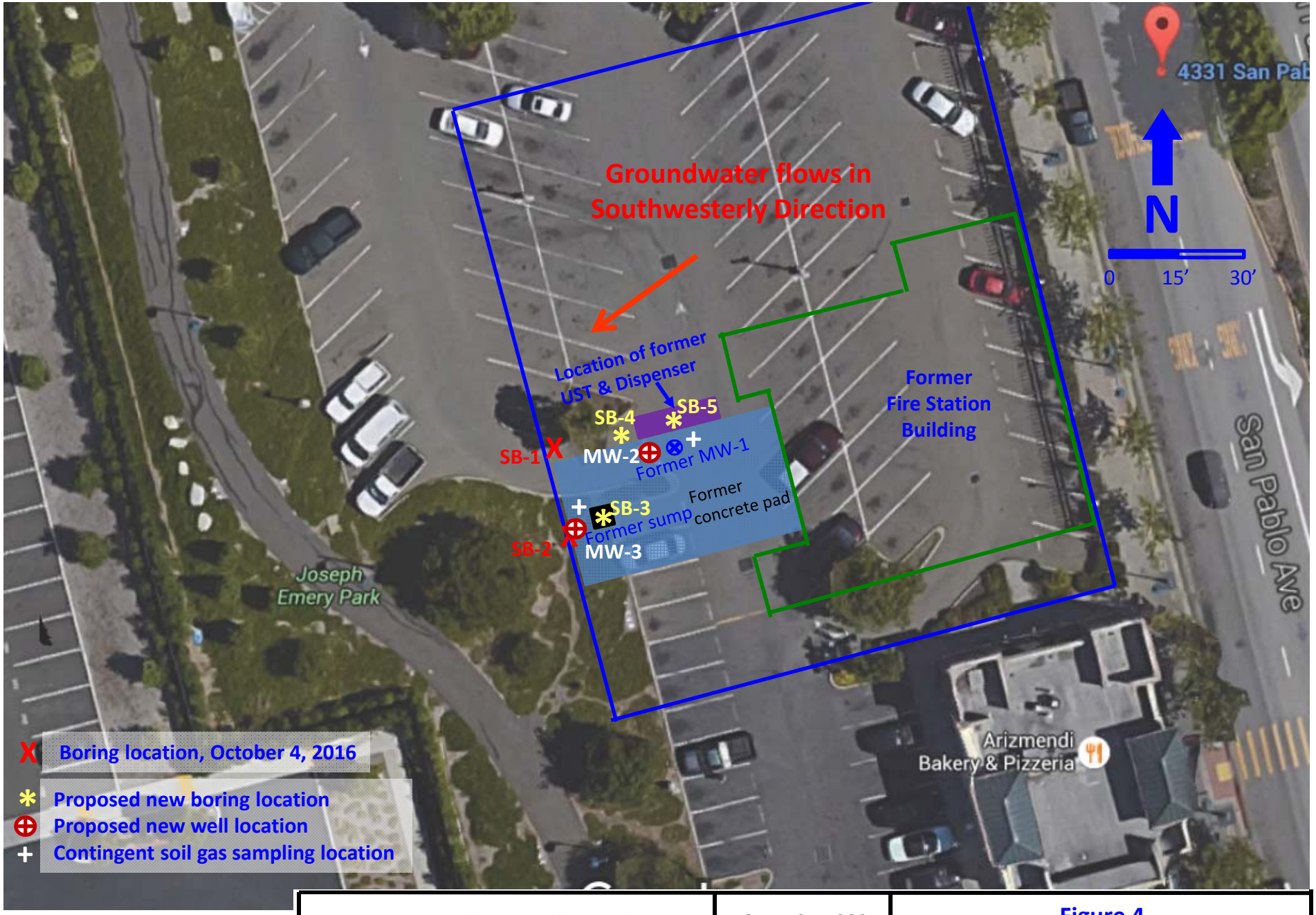


EnviroEngineering Solutions, Inc.	14EMV03.3000	Figure 1 - Location of City of Emeryville Former Fire Station 4331 San Pablo Avenue, Emeryville, CA
	January, 2016	



EnviroEngineering Solutions, Inc.	14EMV03.3000	Figure 2 - Location of City of Emeryville Former Fire Station
	January, 2016	4331 San Pablo Avenue, Emeryville, CA

OTG EnviroEngineering Solutions, Inc.	16EMV04.1000	Figure 3
	April 2017	Current Parcel Map, Emery Village Center



EnviroEngineering Solutions, Inc.	16EMV04.1000	**Figure 4** **Proposed Boring & Well Locations**
	April 2017	4331 San Pablo Avenue, Emeryville, CA