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By Alameda County Environmental Health at 3:33 pm, Sep 26, 2013



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September 25, 2013

Mark E. Detterman, PG, CEG  
Senior Hazardous Materials Specialist  
Alameda County Health Care Services Agency  
Environmental Health Department  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502-6577

Re: Facility No. 9-9708  
5910 MacArthur Boulevard, Oakland, CA

Dear Mr. Detterman:

Attached for your review is the *Data Gap Investigation Workplan* for the above-referenced site. This report was prepared by ARCADIS, upon whose assistance and advice I have relied. I declare under penalty of perjury that the information and/or recommendations contained in the attached report are true and correct to the best of my knowledge. Should you have any further questions, please do not hesitate to contact me.

Very truly yours,

A handwritten signature in blue ink that reads "Kelly C. Esters".

Kelly C. Esters  
Property Specialist

KCE:st  
Encl.



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Mr. Mark E. Detterman, PG, CEG  
Senior Hazardous Materials Specialist  
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1131 Harbor Bay Parkway, Suite 250  
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ENVIRONMENT

Subject:  
Data Gap Investigation Workplan  
Former Chevron Service Station No. 9-9708  
5910 MacArthur Boulevard  
Oakland, California  
*Fuel Leak Case No. RO0000124*

Date:  
September 25, 2013

Contact:  
Toni DeMayo

Phone:  
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Our ref:  
B0060901.9708.00002

Dear Mr. Detterman:

On behalf of Chevron Environmental Management Company (CEMC), ARCADIS U.S., Inc. (ARCADIS) has prepared this *Data Gap Investigation Workplan* for the former Chevron Service Station located at 5910 MacArthur Boulevard in Oakland, California (the Site, Figure 1). This work plan was prepared in response to the May 23, 2013 *Closure Request Response* from the Alameda County Environmental Health (ACEH). The ACEH letter denied site closure as requested in ARCADIS March 29, 2013 *Conceptual Site Model and Closure Request*. In the ACEH's May 23 letter, the agency requested a Data Investigation Workplan to support site closure under Low Threat Closure Policy (LTCP) and an updated conceptual site model (CSM) to support case closure under the media-specific criteria for groundwater and direct contact in accordance with the LTCP.

ARCADIS proposes to advance three direct push borings and three permanent groundwater monitoring wells. Soil and groundwater samples will be collected from all six locations. Soil borings and monitoring wells will be advanced to evaluate both for soil and groundwater impacts in the vicinity of the underground Lion Creek Stream Channel. The information obtained during the site assessment will be used to address the ACEH's technical comments as outlined in their May 23, 2013 letter.

Imagine the result

Once the data has been collected and analyzed, ARCADIS will submit an updated CSM and request for closure along with a path to closure project schedule. The proposed scope of work is outlined below.

### **Proposed Assessment Activities**

To evaluate and understand the potential groundwater pathway at the site, ARCADIS proposes to use a private utility locator to investigate the location and lateral extent of the underground Lion Creek Stream Channel, to the extent possible. In addition, ARCADIS proposes to perform a file review at the Alameda County Public Works Agency and the City of Oakland to help identify the precise location and characteristics of the underground Lion Creek Stream Channel.

To evaluate the lateral extent of impacted soil and groundwater in the vicinity of the fuel hydrocarbon underground storage tanks (UST), and to understand how the on-site presence of the underground Lion Creek Stream Channel effects groundwater flow, ARCADIS proposes to advance three direct push borings (B-10, B-11 and B-12) and to install three permanent monitoring wells (B-MW-7, B-MW-8 and B-MW-9). Proposed soil boring and monitoring well locations are shown on Figure 2. As requested by the ACEH, justifications for the additional soil boring locations are tabulated in Table 1 and clarify which scenario within each Media-Specific Criteria the investigation boring will address. The following scope of work has been outlined in accordance with the ACEH's May 23, 2013 letter.

- 1. General Criteria e – SCM Deficiencies – The March 2013 Site Conceptual Model (CSM) submitted for the subject site appears to be deficient in a number of aspects that directly affect site hydrology and plume length at the site. Our review of the case fields indicates that insufficient data and analysis has been presented to support the SCM. This analysis considered the following site specific data.*

**ARCADIS Response:** ARCADIS will evaluate on and off-site groundwater data to determine if groundwater flow is effected by the former Lion Creek Stream Channel. A file review with the City of Oakland and Alameda County will be conducted to obtain information on the re-location of the channel and to obtain the physical characteristics of the channel including depth below the ground surface in relation to the Site.

To evaluate and understand potential preferential pathways at the site, ARCADIS also proposes to use a private utility locator to locate site utilities throughout the site and to investigate the area around the underground Lion Creek Stream Channel, to the extent possible.

One soil boring (B-12) and three monitoring wells (B-MW-7, B-MW-8 and B-MW-9) will be advanced to characterize the underground Lion Creek Stream Channel, complete delineation of groundwater and to assess how the channel affects groundwater flow on and off-site. Boring B-12 is located in the area where the channel is presumed to be. The boring will be advanced using an air-knife to attempt to locate the top of the stream channel culvert. Soil samples will be collected at this boring. Proposed boring and well locations can be found on Figure 2.

Updated cross-sections to include the location of the stream channel will be included in the updated CSM report. Results of the data evaluation will be presented in an updated CSM report.

2. *General Criteria f – Secondary Source Has Been Removed to the Extent Practicable – Removal of the waste oil UST is reported to have occurred at an unknown date prior to 1997. A report on the removal has apparently not been found or submitted. Soil and groundwater characterization in the vicinity around the former UST location has been undertaken; however, the former tank hold is uncharacterized and may contain residual contamination at concentrations of concern.*

**ARCADIS Response:** ARCADIS performed a historical document review of ARCADIS's files and conducted a file review with the ACEH, however, the UST report was not found as detailed in the closure request submitted in March 2013 (ARCADIS, 2013). ARCADIS evaluated the soil and groundwater data collected from former soil borings (B-1 and B-8) that were advanced to evaluate the impacts of the waste oil UST in the CSM submitted in March 2013 (ARCADIS, 2013).

The ACEH states in their May 23, 2013 letter that the ACEH is in general agreement that sufficient soil sampling has occurred in the requisite two-depth zones to characterize the waste oil release under the Direct Contact and Outdoor Air Exposure Media-Specific Criteria. Therefore, no additional data collection is planned.

3. *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.*

**ARCADIS Response:** Three soil borings (B-10, B-11 and B-12) and three monitoring wells (MW-7 , MW-8 and MW-9) will be advanced to define the downgradient extent or flow path of the contaminant plume. Temporary monitoring wells will be installed in borings B-10 and B-11. Water levels will be measured in both temporary and permanent wells. Groundwater levels measure in the permanent monitoring wells will help assess how the channel may affect groundwater flow on and off-site. Groundwater and soil borings will also be collected at these locations. Proposed boring and monitoring well locations can be found on Figure 2.

4. *LTCP Media Specific Criteria for Direct Contact and Outdoor Air Exposure – To satisfy the media-specific criteria for direct contact and outdoor air exposure sufficient soil samples are required to have been collected and analyzed to determine if residual soil contamination meets the concentrations listed in Table 1 of the policy. Alternatively a site specific risk assessment can be conducted to demonstrate that the maximum concentrations in soil will have no significant risk to adversely affect human health, or the regulatory agency can determine the concentrations will have no significant risk or adversely affect human health.*

**ARCADIS Response:** Soil data collected from borings B-10, B-11 and B-MW-7 through B-MW-9 will be evaluated to determine if residual soil impacts meet the concentrations listed in Table 1 of the LTCP. Results of the data evaluation will be presented in an updated CSM report and the site-specific site assessment.

#### **Pre-Field Activities**

Prior to conducting field activities associated with the proposed scope, the pre-field tasks described below will be completed.

#### Health and Safety

ARCADIS will prepare a site-specific *Health and Safety Plan* for the scope of work as required by the Occupational Health and Safety Administration (OSHA) Standard "Hazardous Waste Operations and Emergency Response" guidelines (29 CFR

1910.120). The document will be reviewed and signed by ARCADIS personnel and subcontractors performing work at the site.

#### Permitting

ARCADIS will obtain drilling permits from the Alameda County Public Works Agency (ACPWA) prior to commencing intrusive field activities. ARCADIS will coordinate field activities with the ACPWA and the ACEH, and schedule an ACPWA inspector, if necessary, to document compliance with the permit requirements.

#### Field Activities

##### Utility Clearance

Prior to conducting subsurface work at the site, the soil boring locations will be cleared for underground utilities by a private utility locator. In addition, Underground Services Alert (USA) will be notified at least 48 hours prior to intrusive field activities.

##### Soil Borings and Monitoring Wells

All boring and monitoring well locations will be advanced with a hollow stem auger rig to a total depth of approximately 20 feet below ground surface (bgs) to delineate the extent of soil and groundwater impacts in the vicinity of the hydrocarbon USTs, and to assess how the underground Lion Creeks Stream Channel affects groundwater flow on and off-site. Borings will be drilled into the top of the clay layer, but will not be advanced through it, to minimize the potential for vertical migration below this potential impermeable barrier. The proposed drilling locations are shown on Figure 2.

Prior to advancement, each boring will be cleared to a minimum depth of 8 feet 1 inch bgs, using an air knife or a hand auger. Soil will be logged continuously for lithology and samples will be retained for chemical analysis approximately every 2 feet. Additional samples will be retained for analytical analysis at intervals with a high photo ionization detector PID field reading, discoloration and odor. Soil samples will be collected using 1-1/4 inch diameter stainless steel sleeves. Two sleeves will be retained for each sample, one sleeve for soil screening using PID, and one sleeve for possible chemical analysis. Sleeves retained for possible chemical analysis will be capped with Teflon squares and plastic end caps, and then sealed in zip-lock bags. Sleeves retained for screening will have approximately 30 grams of undisturbed soil scooped from their casing and placed in glass jars. The jar will be warmed in the sun

for approximately 20 minutes, after which the head space within the bag will be tested for total organic vapor, using a PID. The PID results will be noted on the field boring logs. The depth and number of the soil samples retained from each borehole for chemical analysis will therefore be based on PID screening, soil staining and soil discoloration. At a minimum, two soil samples from each borehole will be submitted for laboratory analysis.

Following advancement to depth of the soil borings B-10 and B-11, a groundwater sample will be collected at each location. A temporary monitoring well will be installed at each boring location. The groundwater sample will be collected, after purging, using a disposable bailer. The boring will be sealed with a grout to approximately 4 inches bgs and finished to match the existing surface.

Soil boring locations, B-MW-7, B- MW-8 and B- MW-9 will be converted to permanent groundwater monitoring wells (MW-7 through MW-9). All wells will be constructed of 2-inch diameter, schedule 40 polyvinyl chloride (PVC) casing and 10 feet 0.020-inch slotted screen. Screen intervals and exact construction details will be based on lithology observed during drilling. After the casing and screen has been lowered through the augers, the annular space will be filled with No. 2 1/2 Monterey sand to two feet above the top of the well screen. Five feet of bentonite pellets will be placed above the sand and hydrated, and cement-bentonite slurry will then be placed above the hydrated bentonite to approximately one foot below the ground surface. The well casing will be cut at approximately three to six inches bgs and a locking well cap will be placed on the well. A flush-mounted, traffic-rated, well box will be set in concrete at the surface and will be completed to match surrounding grade.

The new monitoring wells will be developed using the surge and bail method or another comparable technique. Development will not occur until at least 48-hours after installation, to enhance the hydraulic connection with the surrounding water-bearing formation. At least seven to ten well volumes will be removed during the development process to remove fine-grained sediment from the sand pack. All existing and newly installed monitoring wells will be surveyed.

Groundwater samples will be analyzed for the following analytes, per the parameters listed below:

- TPH-DRO [C<sub>10</sub> – C<sub>28</sub>] by USEPA Method 8015B with and without silica gel clean up
- Benzene, toluene, ethylbenzene, total xylenes, methyl tertiary butyl ether (MTBE), and ethanol by USEPA 8260B
- Halogenated volatile organic compounds (HVOCs) by USEPA 8260B
- Semi-volatile organic compounds (SVOCs) including naphthalene and polycyclic aromatic hydrocarbons (PAHs) by USEPA 8270.

Soil samples will be analyzed for the following analytes, per the parameters listed below:

- TPH-MO [C<sub>16</sub> – C<sub>36</sub>] by United States Environmental Protection Agency (USEPA) Method 8015B modified with and without silica gel clean up
- PH-DRO [C<sub>10</sub> – C<sub>28</sub>] by USEPA Method 8015B with and without silica gel clean up
- Benzene, toluene, ethylbenzene, total xylenes, methyl tertiary butyl ether (MTBE), and ethanol by USEPA 8260B
- Halogenated volatile organic compounds (HVOCs) by USEPA 8260B
- Semi-volatile organic compounds (SVOCs) including naphthalene and polycyclic aromatic hydrocarbons (PAHs) by USEPA 8270.

#### Investigation Derived Waste Disposal

Investigation derived waste (IDW) generated during drilling operations will be containerized in 55-gallon drums and temporarily stored on site pending characterization for off-site disposal. A composite sample of IDW will be collected for waste profiling purposes. Following the receipt of waste characterization sampling results, the IDW will be transported to an appropriate disposal facility.



## Reporting

An updated CSM will be prepared to document the results of the drilling and flow path survey activities. In addition the site will be evaluated against the LTCP criteria. The report will include the following:

- Site conditions, background information and historical site use, as well as historical use of the properties surrounding the site
- A site plan illustrating drilling locations, utility locations, trench locations and other relevant site features
- Cross sections showing subsurface features below the site; and
- Documentation of the activities performed in connection with the subsurface assessment activities
- Results of the laboratory analyses performed on the soil and groundwater samples, and
- Conclusions and recommendations.

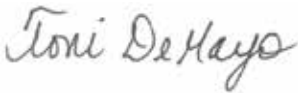
## Schedule

ARCADIS is prepared to initiate field work after receipt of the necessary approvals and permits. A summary report will be submitted to the ACEH within 60 days of our receipt of the final analytical results.

If you have any questions or comments regarding the contents of this work plan, please contact either Ms. Toni DeMayo of ARCADIS at 714.508.2657 or by e-mail at [Toni.DeMayo@arcadis-us.com](mailto:Toni.DeMayo@arcadis-us.com) or Ms. Melissa Blanchette of ARCADIS at 503.220.8201 x1113 or by e-mail at [Melisa.Blanchette@arcadis-us.com](mailto:Melisa.Blanchette@arcadis-us.com).

Sincerely,

ARCADIS U.S., Inc.



Toni F. DeMayo  
Project Manager



Melissa Blanchette, PG (CA 8531)  
Principal Geologist



Enclosures:

Figure 1  
Figure 2

Site Location Map  
Site Plan with Proposed Boring Locations

Table 1

Justification for Additional Soil Boring Locations

Copies:

Ms. Kelly Esters, CEMC (STRATA)  
Mr. Nisson Saidon, Property Owner

References:

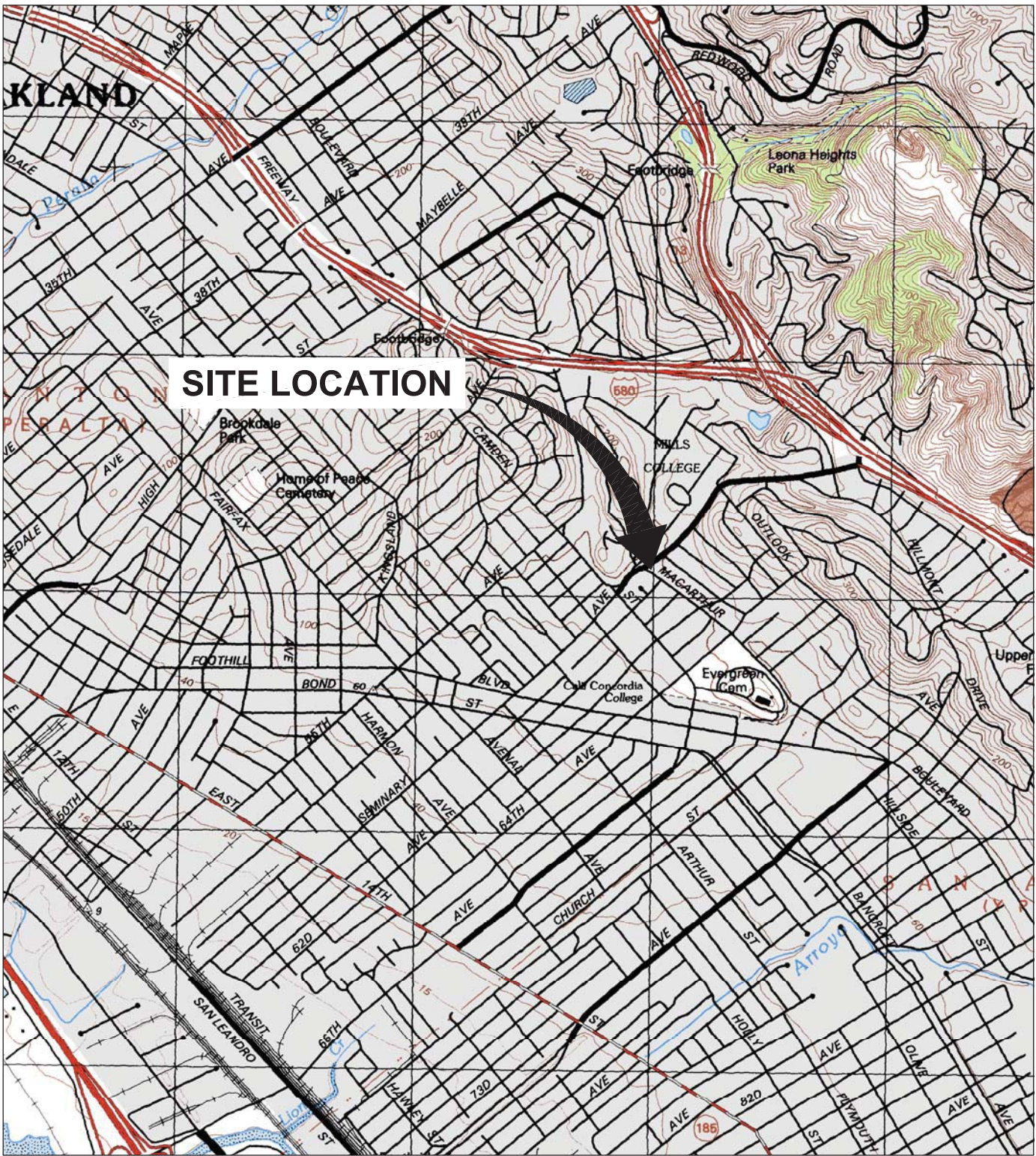
ARCADIS 2013. Conceptual Site Model and Closure Request. Chevron Station # 9-9708, 5910 MacArthur Boulevard, Oakland, California. ACEH Case No. RO0000124. March 29.



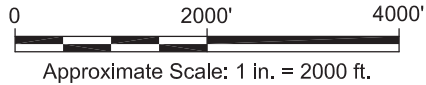
**Figures**



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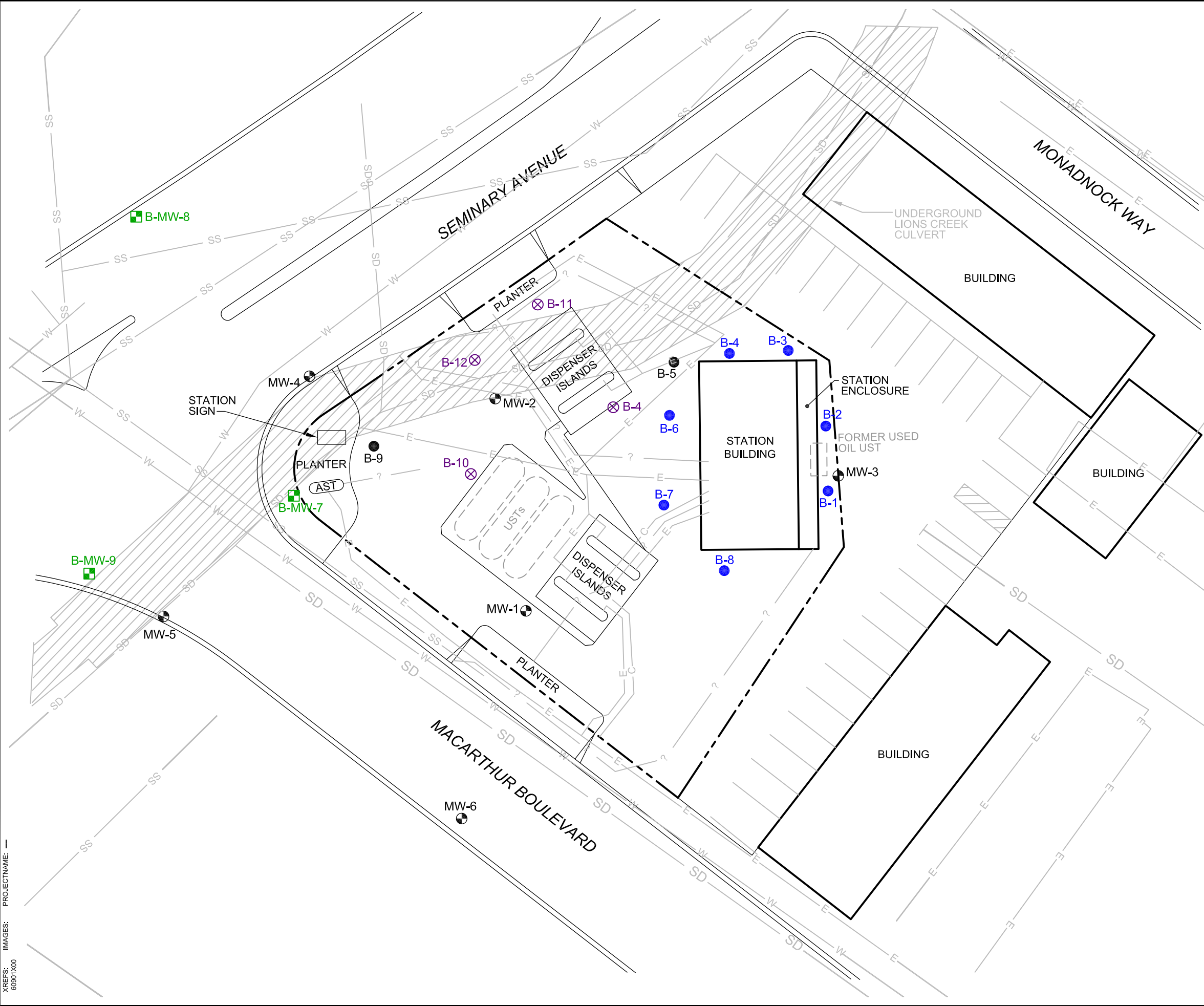
REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., OAKLAND EAST, CA, 1997.



FORMER CHEVRON SERVICE STATION NO. 9-9708 5910 MACARTHUR BOULEVARD, OAKLAND, CA	
<b>SITE LOCATION MAP</b>	
	FIGURE <b>1</b>

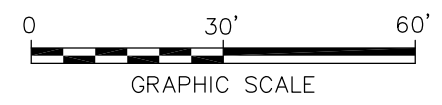


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 IMAGES: PROJECTNAME: --



- LEGEND:**
- PROPERTY LINE
  - MW-1 ● MONITORING WELL
  - B-1 ● BORING LOCATION (APPROXIMATE)
  - B-8 ⊗ PROPOSED SOIL BORING LOCATIONS
  - B-13 ■ PROPOSED MONITORING WELL LOCATIONS
  - UST UNDERGROUND STORAGE TANK
  - AST ABOVEGROUND STORAGE TANK
  - W WATER LINE
  - SS SANITARY SEWER LINE
  - SD STORM DRAIN LINE
  - E ELECTRICAL LINE
  - C COMMUNICATIONS LINE
  - ? UNIDENTIFIED LINE
  - WQO WATER QUALITY OBJECTIVE EQUAL TO 100 MICROGRAMS PER LITER FOR TPH-GRO, TPH-DRO AND TPH-MO
  - WQO WATER QUALITY OBJECTIVE EQUAL TO 1.0 MICROGRAMS PER LITER FOR BENZENE AND 12 MICROGRAMS PER LITER FOR MTBE

- NOTES:**
1. BASE MAP DIGITIZED FROM A PHOTOCOPY OF A DRAWING BY CONESTOGA-ROVER ASSOCIATES (CRA) TITLED "GROUNDWATER ELEVATION AND HYDROCARBON CONCENTRATION MAP", DATED JUNE 13, 2011, AT A SCALE OF 1" = 30'.
  2. ALL LOCATIONS ARE APPROXIMATE.



FORMER CHEVRON SERVICE STATION NO. 9-9708  
 5910 MACARTHUR BOULEVARD, OAKLAND, CA

**SITE PLAN WITH PROPOSED SOIL BORING AND MONITORING WELL LOCATIONS**

FIGURE 2



**Table**

**Table 1. Justification for Additional Soil Boring Locations**  
**Chevron Environmental Management Company**  
**Fromer Chevron Service Station No. 9-9708**  
**5910 MacArthur Boulevard, Oakland, CA**

Boring ID	Media Specific Criteria - General Criteria	Objective	Proposed Total Depth	Proposed Sampling
B-10	Media Specific Criteria for Groundwater, Direct contact and Outdoor Air Exposure	Characterize fuel UST area	20	Soil, grab GW and temporary MW
B-11	Media Specific Criteria for Groundwater, Direct contact and Outdoor Air Exposure	Characterize dispenser island	20	Soil, grab GW and temporary MW
B-12	CSM	Characterize former Lion Creek Channel	top of stream channel or refusal	Clear soil with airknife to find the top of the stream channel
B-MW-7	CSM and Media Specific Criteria for Groundwater, Direct contact and Outdoor Air Exposure	Characterize former Lion Creek Channel	20	Soil, grab GW and permanent MW
B-MW-8	CSM and Media Specific Criteria for Groundwater, Direct contact and Outdoor Air Exposure	Delenate GW, understand GW flow and effects of former Lion Creek Channel	20	Soil, grab GW and permanent MW
B-MW-9	CSM and Media Specific Criteria for Groundwater, Direct contact and Outdoor Air Exposure	Delenate GW, understand GW flow and effects of former Lion Creek Channel	20	Soil, grab GW and permanent MW

Notes:

feet MSL	- feet above mean sea level
feet bgs	- feet below ground surface
PVC	- polyvinyl chloride
UST	- underground storage tank
CSM	- conceptual site model