Chevron

Olivia Skance
Team Lead
Marketing Business Unit

Chevron Environmental Management Company
6111 Bollinger Canyon Road
San Ramon, CA 94583
Tel (925) 543-2366
Fax (925) 543-2324
olivia.skance@chevron.com

December 16, 2011

Mr. 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

Dear Mr. Detterman:

Attached for your review is the *Work Plan for Site Assessment and Preferential Pathway Survey* former Chevron Service Station No. 9-9708, located at 5910 MacArthur Boulevard, in Oakland, California. 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.

If you should have any further questions, please do not hesitate to contact me.

Sincerely,

Olivia Skance
Team Lead
Chevron Environmental Management Company

ARCADIS U.S., Inc.
950 Glenn Drive
Suite 125
Folsom
California 95630
Tel 916-985-2079
Fax 916-985-2093
www.arcadis-us.com

ENVIRONMENT

Mr. 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

Subject:
Work Plan for Site Assessment and Preferential Pathway Survey
Former Chevron Service Station No. 9-9708
5910 MacArthur Boulevard
Oakland, California
Fuel Leak Case No. RO0000124

Date:
December 16, 2011

Contact:
Thomas Potter

Phone:
916.985.2079 ext. 31

Email:
Thomas.Potter@
arcadis-us.com

Our ref:
B0060901.9708 00002

Dear Mr. Detterman:

ARCADIS has prepared this work plan for a site assessment and preferential pathway study associated with the former Chevron Environmental Management Company (Chevron) station No. 9-9708, located at 5910 MacArthur Boulevard in Oakland, California (Figure 1). This work plan was prepared in response to a letter from the Alameda County Environmental Health (ACEH) dated October 5, 2011, requesting further delineation around a former waste oil underground storage tank (UST) associated with the site.

ARCADIS proposes to advance seven direct push borings and collect soil and groundwater samples from the borings, to evaluate both soil and groundwater impacts in the vicinity of the former waste oil UST. The information obtained during the assessment will be used to identify the next appropriate steps. The proposed scope of work is outlined below.

Background

Former Chevron Service Station No. 9-9708 is currently an active Valero branded station located at the southeast corner of MacArthur Boulevard and Seminary Avenue, in Oakland, California. The site is bounded by the intersecting streets and a mixed commercial and residential building, with which it shares an open parking lot.

Current site structures include a convenience store, three gasoline USTs and two dispenser islands with associated canopies (Figure 2).

The surface of the site is predominantly covered in asphalt and is underlain by aggregate base to approximately 2 feet below ground surface (bgs). The soil beneath the aggregate base is dominated by clay, with a sandy clay layer extending to approximately 5 feet bgs and a clayey gravel with sand layer extending below that to approximately 16 feet bgs. A lean clay layer extends from approximately 16 feet bgs to between 27 and 36 feet bgs. Clayey gravels with sand and silty sands exist below the lean clay, to approximately 41 feet.[1]

Three groundwater monitoring wells were installed as part of the first site assessment, in 1997 (MW-1, MW-2 and MW-3). Petroleum hydrocarbon concentrations in the gasoline range organics (TPH-GRO) were detected in the soil and groundwater samples collected from MW-1 and MW-2 and heavy range petroleum hydrocarbons (oil and grease) were detected in the soil samples from MW-3, with the deepest impacts located at approximately 16 feet bgs. A fourth groundwater monitoring well (MW-4) was installed downgradient of MW-1 and MW-2 in 1999. Two more groundwater wells (MW-5 and MW-6) were installed in 2002. Petroleum hydrocarbons in the gasoline range organics have diminished in groundwater and the only remaining significant detections in groundwater are petroleum hydrocarbons in the diesel and motor oil range organics (TPH-DRO and TPH-MO), from the groundwater samples collected at MW-3. Historic groundwater elevations range from approximately 10 to 15 feet bgs. The site is underlain by a culverted portion of Lions Creek.

Proposed Assessment Activities

To evaluate and understand potential preferential pathways at the site, ARCADIS proposes to use a private utility locator to investigate the area around the former waster oil UST and explore, to the extent possible, on site utility lines, laterals and trenches. ARCADIS will explore near to the site utilities and trenches as warranted. In addition, ARCADIS proposes to perform a file review of the California Department

[1] Delta Environmental Consultants, Inc. 2000. *Interim Corrective Action Plan*. Prepared for Chevron Products Company, Former Chevron Service Station No. 9-9708, California (June 30, 2000).

of Water Resources and the Alameda County Public Works Agency well databases, to identify active, inactive, decommissioned and abandoned wells. ARCADIS also proposes to investigate the historical land uses of the site, and properties around the site, by performing a file review at the Alameda County Assessor's office and/or using a third party to perform a review of federal and state environmental databases.

To evaluate the lateral extent of petroleum hydrocarbon-impacted soil and groundwater in the vicinity of the former waste oil UST, ARCADIS proposes to advance seven direct push borings at the approximate locations shown on Figure 2. Activities associated with the proposed borings are outlined below.

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.

Direct Push Borings

Seven direct push boring locations are proposed to delineate the extent of TPH-DRO and TPH-MO impacts to soil and groundwater in the vicinity of the former onsite waste oil UST. The proposed drilling locations are shown on Figure 2. The horizontal groundwater flow direction has been historically to the northwest, with a component of flow to the west. The groundwater elevation contour and historic flow direction rose diagram from the first semiannual 2011 groundwater monitoring and sampling report are included in Attachment 1. The proposed boring locations are located downgradient and cross gradient of the former waste oil UST. The proposed soil borings will be installed on the opposite side of the station building from the former waste oil UST, due to access constraints.

Depth to water measurements have historically ranged between approximately 10 and 15 feet bgs and the deepest recorded soil concentrations in the vicinity of the former waste oil tank are at 16 feet bgs. The proposed borings will be advanced to approximately 23 feet bgs. 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. A geologic cross section of the site is presented in Attachment 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 and soil samples will be collected approximately every 2 feet. 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 a photo ionization detector (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 a seal zip-lock bag. The bag 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 PID readings are useful for indicating relative levels of contamination, but cannot be used to evaluate hydrocarbon levels with the confidence of laboratory results. 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 boring, a groundwater sample will be collected at each location. The groundwater sample will be collected using a disposable bailer or a temporary well and a disposable bailer, if necessary. The boring will be sealed with a grout to approximately 4 inches bgs and finished to match the existing surface.

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

- TPH-MO [C_{16} – C_{36}] by United States Environmental Protection Agency (USEPA) Method 8015B modified with and without silica gel clean up
- TPH-DRO [C_{10} – C_{28}] 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
- Cadmium, chromium, lead, nickel and zinc, by USEPA 6010B
- Polychlorinated biphenyls (PCBs) by USEPA 8082

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

A report will be prepared to document the results of the drilling and flow path survey activities. 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
- An aerial photograph base map showing the site and the property in vicinity of the site
- Documentation of the activities performed in connection with the subsurface assessment activities
- Results of the laboratory analyses performed on the soil and groundwater samples
- Conclusions and recommendations relevant to the assessment objectives

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.

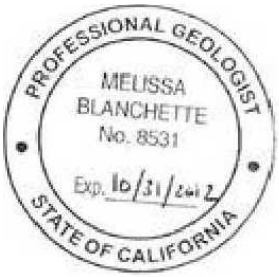
If you have any questions or comments regarding the contents of this work plan, please contact either Mr. Thomas Potter of ARCADIS at 916.985.2079 ext. 31 or by e-mail at Thomas.Potter@arcadis-us.com or Ms. Rebecca Andresen of ARCADIS at 206.726.4717 or by e-mail at Rebecca.Andresen@arcadis-us.com.

Sincerely,

ARCADIS U.S., Inc.

Thomas M. Potter
Associate Project Manager

Melissa Blanchette, PG (CA 8531)
Certified Project Manager I

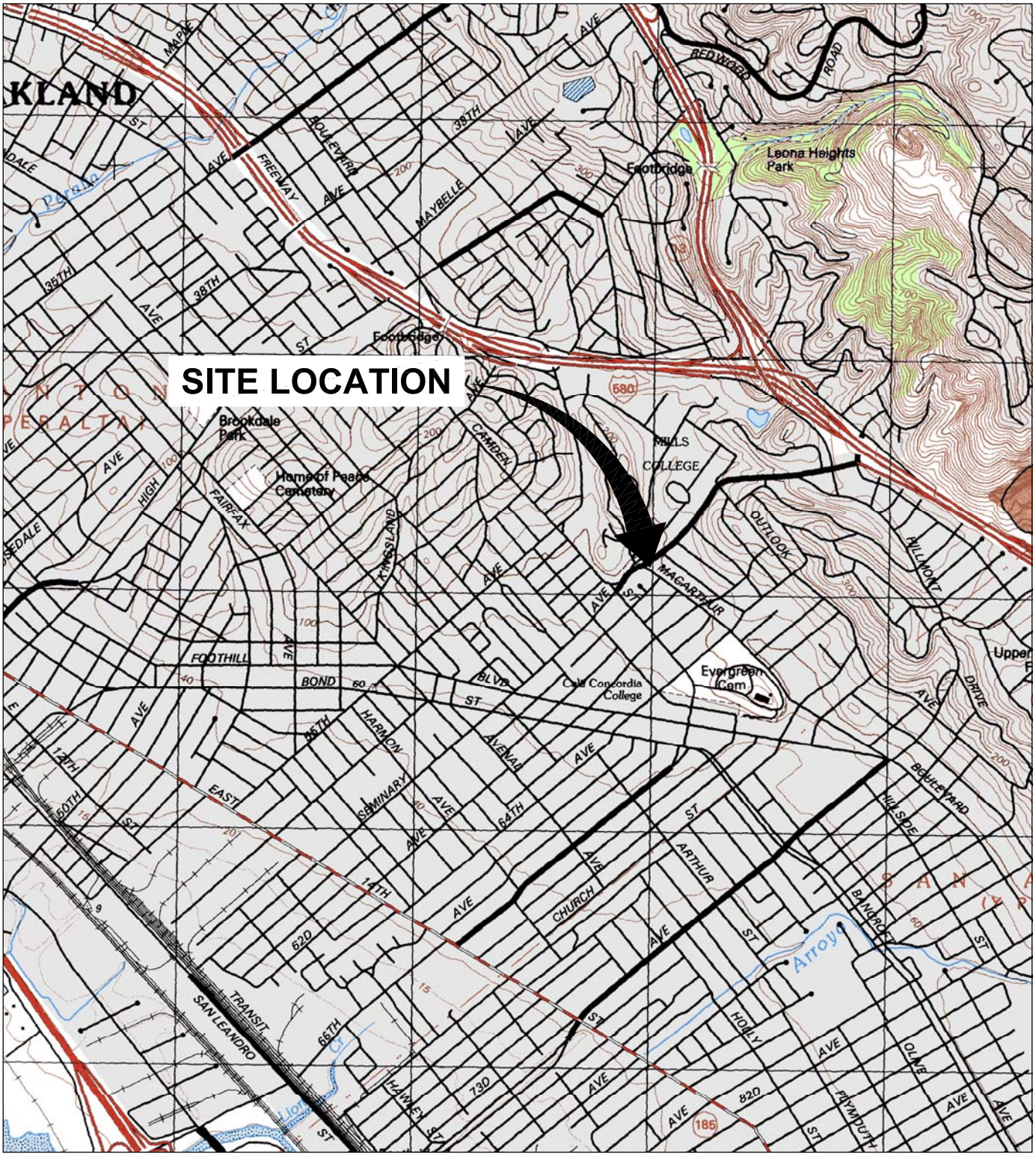


Enclosures:

Figure 1	Site Location Map
Figure 2	Site Plan with Boring Locations
Attachment 1	Groundwater Elevation Contour and Historic Flow Direction Rose Diagram Conestoga-Rovers & Associates, July 19, 2011
Attachment 2	Geologic Cross Sections Delta Environmental Consultants, Inc., June 29, 2000

Copies:

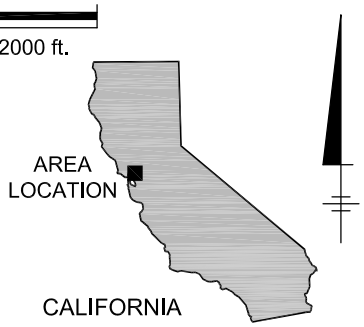
Mr. Robert Speer, Chevron (electronic only)
Mr. Nisson Saidon, Property Owner



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

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.



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

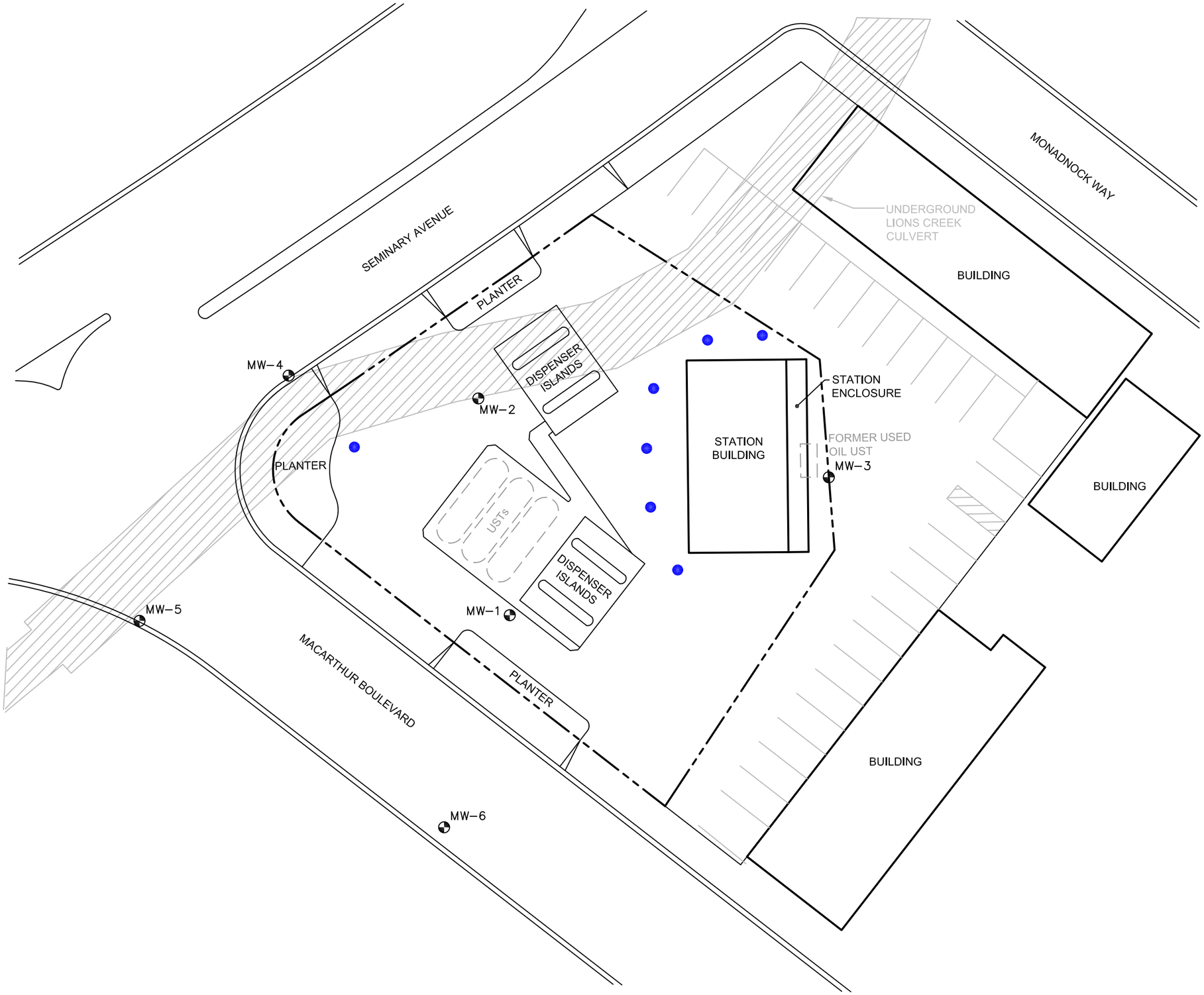
WORK PLAN FOR SITE ASSESSMENT AND PREFERENTIAL PATHWAY SURVEY

SITE LOCATION MAP

ARCADIS

FIGURE 1

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIVE\B006090197081\0002\DWG\60901N01.dwg LAYOUT: 1 SAVED: 12/7/2011 4:04 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 12/7/2011 4:05 PM BY: HOWES, DAVID
XREFS: IMAGES: PROJECTNAME: --
CA_Oakland_East.tif



LEGEND:

- PROPERTY LINE
- MONITORING WELL
- PROPOSED BORING
- UST — UNDERGROUND STORAGE TANK

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, @ A SCALE OF 1" = 30'.
2. ALL LOCATIONS ARE APPROXIMATE.

0 30' 60'

GRAPHIC SCALE

FORMER CHEVRON SERVICE STATION 9-9708
5910 MACARTHUR BOULEVARD, OAKLAND, CA

WORK PLAN FOR SITE ASSESSMENT AND PREFERENTIAL PATHWAY SURVEY

SITE MAP

ARCADIS

FIGURE **2**

CITY: SYRACUSE, NY DIV/GROUP: ENV/IM-DV DB: P. LISTER PM/TM: R. ANDRESEN TR: BJ. WALL LYR: ON="OFF=REF
G:\ENVCAD\SYRACUSE\ACTIVE\B006090197080000021DWG\60901B01.dwg LAYOUT: 2 SAVED: 12/12/2011 4:07 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---
XREFS: IMAGES: PROJECTNAME: ---
PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 12/12/2011 4:08 PM BY: LISTER, PAUL

ARCADIS

Attachment 1

Groundwater Elevation Contour Map and Historic Flow Direction Rose Diagram, Conestoga-Rovers & Associates, July 19, 2011

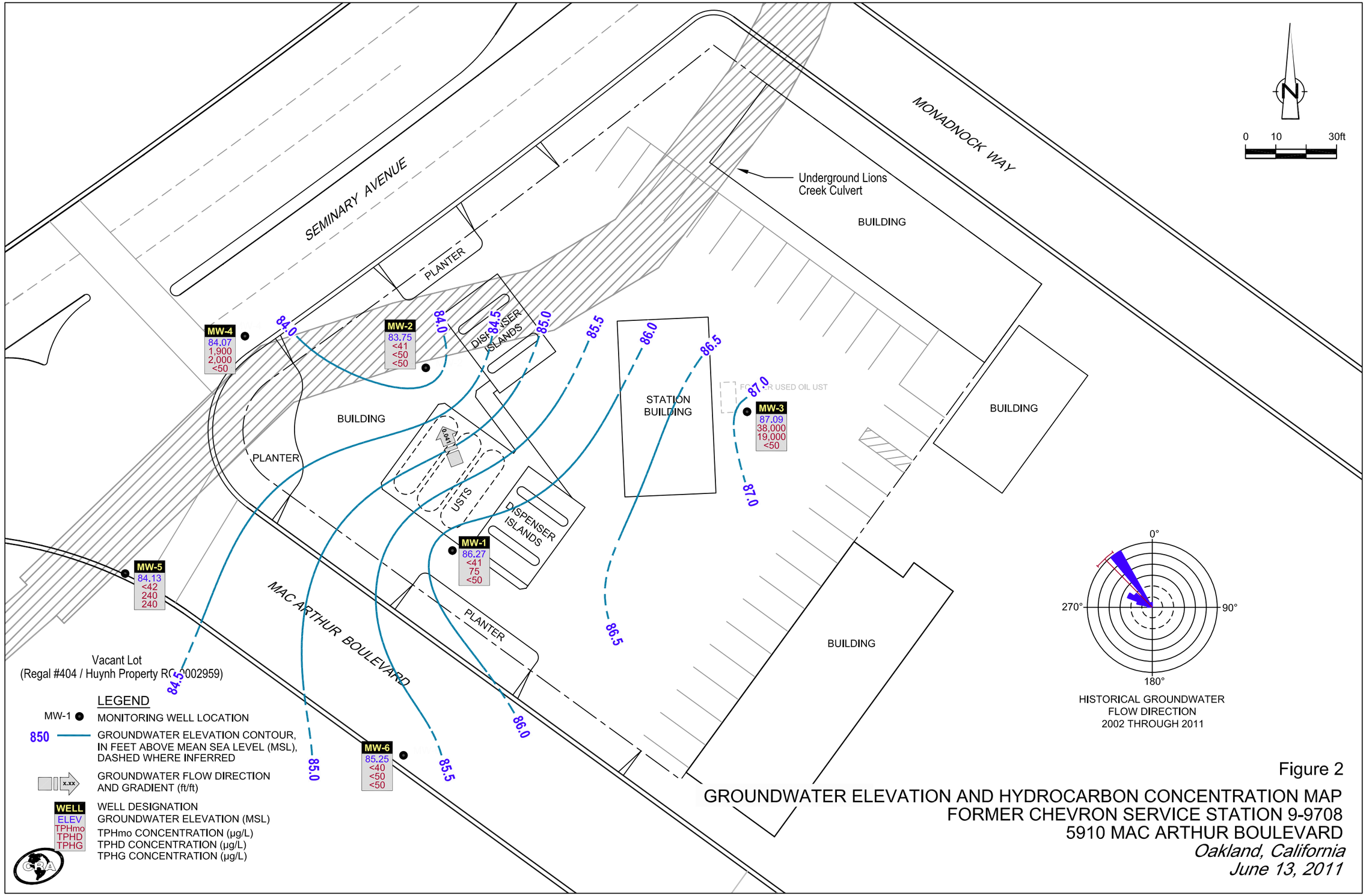


Figure 2

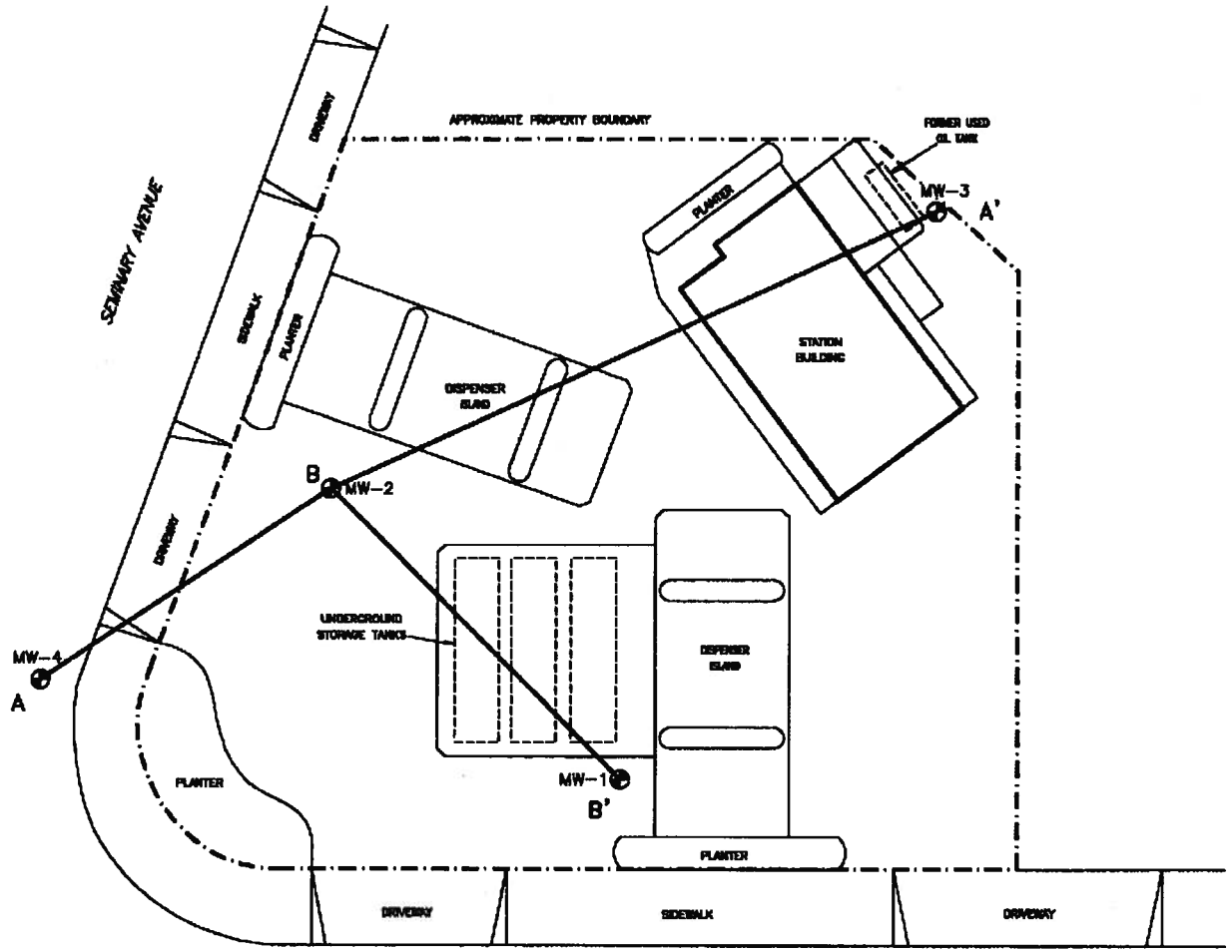
GROUNDWATER ELEVATION AND HYDROCARBON CONCENTRATION MAP
FORMER CHEVRON SERVICE STATION 9-9708
5910 MAC ARTHUR BOULEVARD
Oakland, California
June 13, 2011

311972-2010(008)GN-EM002 JUL 19/2011

ARCADIS

Attachment 2

Geologic Cross Sections, Delta Environmental Consultants, Inc., June 29, 2000



North

0 30 FT

SCALE

LEGEND:

MW-1 MONITORING WELL LOCATION

A——A' GEOLOGIC CROSS SECTION TRACE

FIGURE 4

GEOLOGIC CROSS SECTION LOCATION MAP

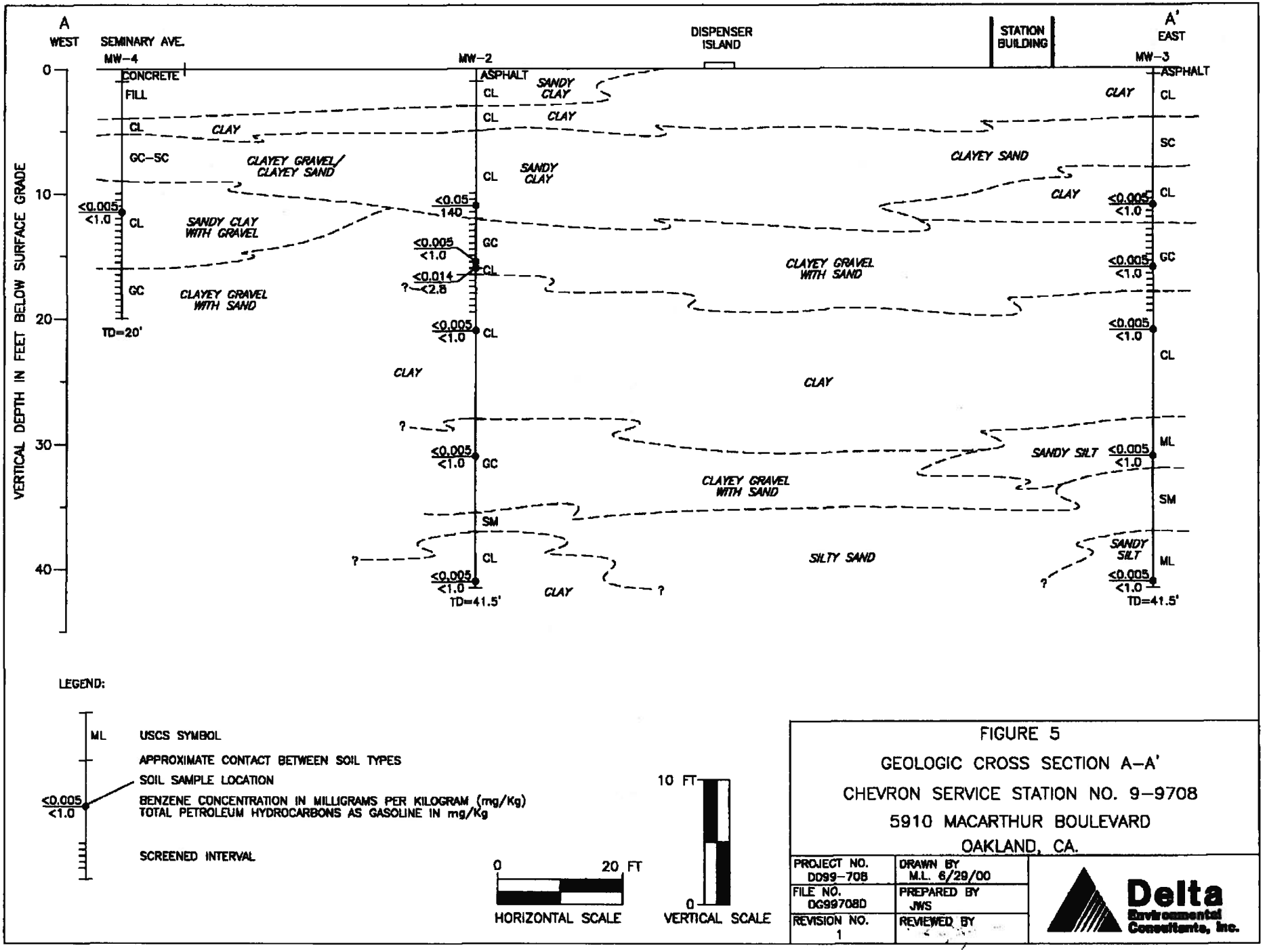
CHEVRON SERVICE STATION NO. 9-9708

5910 MACARTHUR BOULEVARD

OAKLAND, CA.

PROJECT NO. DG99-708	DRAWN BY M.L. 6/29/00
FILE NO. DG99708C	PREPARED BY JWS
REVISION NO. 2	REVIEWED BY

Delta Environmental Consultants, Inc.



LEGEND:

FIGURE 5

GEOLOGIC CROSS SECTION A–A'

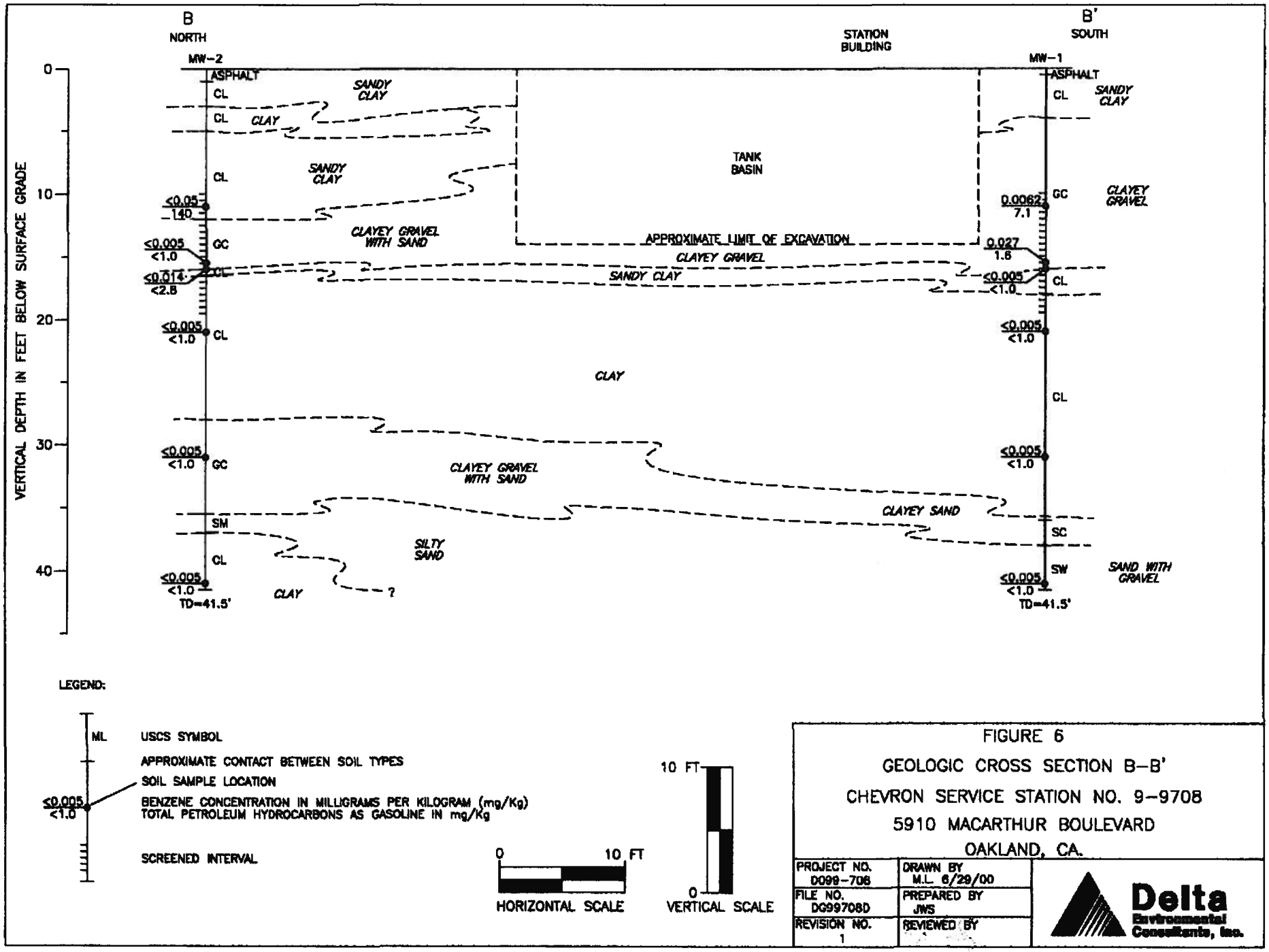
CHEVRON SERVICE STATION NO. 9–9708

5910 MACARTHUR BOULEVARD

OAKLAND, CA.

PROJECT NO. DD99–708	DRAWN BY M.L. 6/29/00
FILE NO. DG99708D	PREPARED BY JWS
REVISION NO. 1	REVIEWED BY

Delta Environmental Consultants, Inc.



LEGEND:

ML — USCS SYMBOL

APPROXIMATE CONTACT BETWEEN SOIL TYPES

SOIL SAMPLE LOCATION

≤0.005 / <1.0 — BENZENE CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/Kg)
TOTAL PETROLEUM HYDROCARBONS AS GASOLINE IN mg/Kg

SCREENED INTERVAL

0 — 10 FT
HORIZONTAL SCALE

10 FT
0
VERTICAL SCALE

FIGURE 6

GEOLOGIC CROSS SECTION B–B'

CHEVRON SERVICE STATION NO. 9-9708

5910 MACARTHUR BOULEVARD

OAKLAND, CA.

PROJECT NO. DO99-706	DRAWN BY M.L. 6/29/00
FILE NO. DG99708D	PREPARED BY JWS
REVISION NO. 1	REVIEWED BY

Delta Environmental Consultants, Inc.