LOW-THREAT UST CASE CLOSURE REQUEST

Former San Marcos Forest Fire Station
236 Pico Avenue
San Marcos, California

August 28, 2014

AVOCET
ENVIRONMENTAL, INC.

LOW-THREAT UST CASE CLOSURE REQUEST

Former San Marcos Forest Fire Station
236 Pico Avenue
San Marcos, California

August 28, 2014

PREPARED FOR

State of California
Department of Forestry and Fire Protection
P.O. Box 944246
Sacramento, California 94244-2460

PREPARED BY

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Project No. 1336.003

AVOCET
ENVIRONMENTAL, INC.

August 28, 2014 Project No. 1336.003

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Low-Threat UST Case Closure Request
Former San Marcos Forest Fire Station
236 Pico Avenue
San Marcos, California

Dear Mr. Carlisle:

On behalf of The State of California, Department of Forestry and Fire Protection (CAL FIRE), transmitted herewith is a formal request for case closure for the former San Marcos Forest Fire Station at 236 Pico Avenue in San Marcos, California. The subject case closure request has been prepared pursuant to California's State Water Resources Control Board Low-Threat Underground Storage Tank Case Closure policy. If you have any questions about the closure request or require additional information, please do not hesitate to contact the undersigned at (949) 206-0977 Ext. 111 or at dsiren@avocetenv.com.

Respectfully submitted,

AVOCET ENVIRONMENTAL, INC.

Deke C. Siren, P.G.
Project Manager

DCS/DAB:sh
Enclosure
cc: Mr. A.K. Jain – CAL FIRE (PDF only)
Mr. Mike Duggan – CAL FIRE (PDF only)
Mr. Dan O'Brien – State of California, Real Estate Services Division (PDF only)

P:\1336 San Marcos Forest Fire Stn_CAL FIRE\08_Site Status and Closure Request\Report\Low-Threat Case Closure Request_2014-08-28.docx

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LIST OF ABBREVIATIONS AND ACRONYMS

bgs	below ground surface
BTEX	benzene, toluene, ethyl benzene, and xylenes
CAL FIRE	State of California, Department of Forestry and Fire Protection
CSM	conceptual site model
DEH	San Diego County Department of Environmental Health
EGI	England Geosystem, Inc.
HHRA	human health risk assessment
LNAPL	light nonaqueous-phase liquid
MCL	Maximum Contaminant Level
mg/kg	milligram per kilogram
LTCP	Low-Threat Closure Policy
MTBE	methyl *tert*-butyl ether
msl	mean sea level
SDRWQCB	California Regional Water Quality Control Board, San Diego Region
TPH-g	total petroleum hydrocarbons as gasoline
µg/L	microgram per liter
UST	underground storage tank

1.0 INTRODUCTION

This document requests case closure for the former California Department of Forestry and Fire Protection (CAL FIRE) station located at 236 Pico Avenue in San Marcos, California (the site) pursuant to California's Low-Threat Underground Storage Tank Case Closure Policy (LTCP). Avocet Environmental, Inc. (Avocet) prepared this request under contract to the California Department of General Services, Real Estate Services Division. The site location is shown in Figure 1 and a plan of the site is provided as Figure 2.

1.1 OVERVIEW

The San Marcos Forest Fire Station was constructed in 1957 and featured a garage for firefighting equipment and a barracks building for CAL FIRE personnel. Support facilities included a 550-gallon underground storage tank (UST) for gasoline at the location shown in Figure 2. The UST was permanently closed by removal in May 1997. Gasoline-impacted soil around the former UST was removed by over-excavation in July 1997 and a series of subsurface investigations followed under the direction of the San Diego County Department of Environmental Health (DEH). As of March 2013, the investigations have included the collection and analysis of soil matrix, soil vapor, and/or groundwater samples from 21 onsite and offsite borings, probes, and monitoring wells. The various phases of investigation are summarized in Section 2.3 and investigation locations are shown in Figure 2.

In June 2013, oversight of the site was transferred from the DEH to the California Regional Water Quality Control Board, San Diego Region (SDRWQCB). Avocet understands that prior to the transfer of the case, DEH evaluated the site for closure pursuant to the LTCP and concluded that it met most, but not all, of the required closure criteria. Although DEH did not issue any closure-related correspondence, an "LTCP Checklist" (Appendix A) posted to the GeoTracker web site indicates that DEH agreed that removal of the UST had stopped the release, that the secondary source (i.e., impacted soil) had been removed to the extent practical, the possible presence of methyl *tert*-butyl ether (MTBE) and other fuel oxygenates had been adequately addressed, and that vapor intrusion, if it is occurring at all, does not result in unacceptable human health risks. However, it appears that DEH felt the available data did not adequately define the extent of residual fuel hydrocarbons in soil and groundwater and, hence, the Conceptual Site Model (CSM) was deficient and the length of the groundwater plume could not be estimated with confidence (GeoTracker, August 14, 2013).

Avocet believes that DEH's evaluation of the available data was overly conservative and that the available data do in fact delineate the extent of fuel hydrocarbons in soil and groundwater and closure pursuant to the LTCP is appropriate.

1.2 REQUEST ORGANIZATION

Including the introduction, this report consists of five sections. Section 2.0 presents background information, including brief summaries of the principal phases of site assessment and an updated

CSM. Section 3.0 presents a conceptual site model. Section 4.0 addresses the unmet LTCP criteria identified by the DEH. Closing remarks and a request for case closure under the LTCP are provided in Section 5.0.

References, tables, and figures follow the text of the report, with additional supporting information in four appendices. The LTCP Checklist prepared by DEH is presented in Appendix A. Appendices B, C, and D contain historical analytical results for hydrocarbons in soil, groundwater, and soil vapor, respectively. Plots of benzene and MTBE concentrations in groundwater over time are presented in Appendix E.

2.0 BACKGROUND INFORMATION

This section presents background information considered relevant to the request for LTCP closure, including summaries of the various phases of site investigation, particularly the most recent investigations in March 2013, culminating with an updated CSM.

2.1 SITE LOCATION AND DESCRIPTION

The site is located on the west side of Pico Avenue, north of the intersection with East San Marcos Boulevard (Figure 1), in downtown San Marcos. The site is located on the floor of the San Marcos Creek drainage at an elevation of approximately 580 feet above mean sea level (msl). Hills define the drainage to the north, south, and east, with the hills to the north eventually rising to the San Marcos and Merriam Mountains at elevations over 1,600 feet above msl.

The site measures approximately 125 by 130 feet and occupies an area of approximately 0.37 acres. It is currently unoccupied but still features the fire engine/maintenance and barracks buildings, which are accessed from Pico Avenue via a paved, horseshoe-shaped drive. The former UST and fuel dispenser area is paved with concrete and the remainder of the site is landscaped with a combination of lawns, trees, concrete walkways, and other hardscape. A site plan showing the locations of these features is presented in Figure 2.

2.2 GEOLOGY AND HYDROGEOLOGY

The geology of the area consists of an igneous and metamorphic basement complex and a superjacent sedimentary succession of strata (Kennedy, 1977). The basement complex is composed of the Upper Jurassic Santiago Peak Volcanics, a structurally complex, mildly metamorphosed unit composed of andesitic volcanic rocks and volcaniclastic rocks and mid-Cretaceous rocks of the southern California batholith. Metamorphism of the Santiago Peak Volcanics, emplacement of the batholitic rocks, uplift, and carving of an erosion surface with relief in excess of 1,600 feet was completed by the Late Cretaceous time (Kennedy, 1977).

The post-batholitic superjacent sedimentary succession deposited on the erosional surface is very thin in the vicinity of the site. In the San Marcos region, the sedimentary succession are Pleistocene nonmarine dissected alluvial fan deposits and Recent alluvium consisting of unconsolidated stream, river channel, and alluvial fan deposits (Rogers, 1965). In the site area, tonalites (Cretaceous granitic rocks), residuum (decomposed granite), and rocks from the Santiago Peak Volcanics (Jura-Triassic metavolcanics and metasediments) are exposed (Rogers, 1965; CDWR, 1967).

Per SDRWQCB's classification, the site is in Richland Hydrologic Subarea 4.52 of the San Marcos Hydrologic Area 4.50 of the Carlsbad Hydrologic Unit 4.00 (SDRWQCB, 1994). The Carlsbad Hydrologic Unit is a triangular-shaped area of approximately 210 square miles, extending from Lake Wolford on the east to the Pacific Ocean on the west, and from Vista on the north to Cardiff-by-the-Sea on the south. Groundwater in Richland Hydrologic Subarea 4.52 has

been designated as beneficial for municipal, agricultural, and industrial use (SDRWQCB, 1994). The nearest groundwater production well to the site is approximately 450 feet west of the former UST area of the site (E2 Environmental, Inc. [E2], July 2006); approximately 400 feet west of the leading edge of the dissolved hydrocarbon plume in groundwater.

2.3 SUBSURFACE INVESTIGATIONS

Several phases of site investigation have been conducted since the gasoline UST was removed in 1997. The principal phases of investigation are outlined below and the investigation locations are shown in Figure 2. The results of soil matrix, groundwater, and soil vapor sample analyses are summarized in Appendices B, C, and D, respectively, and plots of benzene and MTBE concentrations in groundwater over time are presented in Appendix E.

- In September 2000, Ninyo & Moore collected soil samples from seven borings, Borings NM-B1 through NM-B7, drilled up to 31 feet below ground surface (bgs). Three of the borings (Borings NM-B1, NM-B6, and NM-B7) were completed as groundwater monitoring wells (Wells MW-1, MW-2, and MW-3, respectively). Groundwater samples were collected from these wells approximately ten days after installation. The Ninyo & Moore investigation indicated that soil and groundwater beneath the site had been impacted by petroleum hydrocarbons, with elevated concentrations of total petroleum hydrocarbons as gasoline (TPH-g), benzene, toluene, ethyl benzene, and total xylenes (BTEX) reported in soil samples collected between 15 and 25 feet bgs from Borings NM-B2 and NM-B3, located adjacent to the former UST (Ninyo & Moore, September 29, 2000). Soil matrix samples collected from the remainder of the borings also contained TPH-g and BTEX, albeit at lower levels than those found in Borings NM-B2 and NM-B3. Groundwater samples collected from Wells MW-1 through MW-3 contained low to moderate concentrations of TPH-g, BTEX, and MTBE.

- In September 2002, England Geosystem, Inc. (EGI) collected soil and groundwater grab samples from four offsite borings, Borings B-8 through B-11, drilled up to 35 feet bgs. Two of the borings (Borings B-8 and B-10) were completed as groundwater monitoring wells (Wells MW-4 and MW-5, respectively). No petroleum hydrocarbons were detected in these soil and groundwater samples.

- EGI and E2 monitored Wells MW-1 through MW-5 quarterly or semiannually for ten years between 2002 through 2012. The monitoring data showed decreasing benzene and MTBE concentrations in the three onsite wells, while petroleum hydrocarbons were not detected in the two offsite wells, indicating that offsite migration was not occurring..

- In 2011, E2 collected soil vapor samples at 5 feet bgs from five borings, Borings SG-1 through SG-5, located adjacent to the two buildings at the site to

assess potential vapor intrusion risks and complete a human health risk assessment (HHRA). However, none of the soil vapor samples contained detectable concentrations of any analytes. As such, vapor intrusion into existing structures at the site was judged not to be a concern and the HHRA was not conducted.

- In March 2013, Avocet collected soil matrix samples from five borings, Borings B-8[1] through B-12, drilled up to 35 feet bgs, and collected groundwater grab samples from Borings B-10, B-11, and B-12. These borings were drilled at and hydraulically downgradient of the former UST. Petroleum hydrocarbons were detected in only 3 of the 15 soil matrix samples analyzed, specifically the 18-foot sample from Boring B-9 and the 20-foot samples from Borings B-9 and B-11. Boring B-11 was drilled adjacent to Boring B-3, drilled in 2002, and the reported hydrocarbon concentrations compared. In brief, TPH-g and BTEX concentrations decreased by approximately 97 percent between 2002 and 2013. BTEX and naphthalene were detected in the groundwater grab samples from Borings B-10, B-11, and, to a much lesser extent, in Boring B-12. Borings B-10 and B-11 are located near the former UST and Boring B-12 is located hydraulically downgradient.

In brief, the data from these investigations indicate that soil at around 20 feet bgs and groundwater in the immediate vicinity of the former UST contains residual petroleum hydrocarbons. The data also indicate that offsite, downgradient groundwater west and northwest of the former UST has not been impacted by hydrocarbons, and downgradient groundwater to the southwest is minimally impacted by hydrocarbons. Additionally, the data indicate that shallow onsite soil vapor has not been impacted by hydrocarbons.

[1] Boring identifiers "B-8" through "B-11" were accidentally reused in the 2013 investigation and are different borings than the 2002 borings completed by EGI.

3.0 CONCEPTUAL SITE MODEL

The former UST, which was observed to have been corroded upon being removed, is believed to have been the principal if not the sole source of the gasoline release at the former San Marcos Forest Fire Station. Releases could have occurred from the associated dispenser and subsurface piping; however, Avocet understands that the dispenser was located in close proximity to the former UST so, regardless, the release was highly localized. Gasoline released from the former UST appears to have migrated vertically downward to the water table, which was at approximately 23 feet bgs in 2000 and which has since fluctuated between 19 and 24 feet bgs. There appears to have been little lateral spreading as the release migrated through the vadose zone and, as such, the over-excavation to remove gasoline-impacted soil in July 1997 is believed to have been highly effective.

On reaching the water table, gasoline began to dissolve in groundwater and disperse rather than accumulating as light nonaqueous-phase liquid (LNAPL). LNAPL has not been observed in any of the borings that penetrated the water table; including Boring B-11 drilled within the former UST footprint. Moreover, the maximum TPH-g concentrations reported in soil are less than would be indicative of gasoline-saturated soil.

Consistent with the site's physiographic setting on the floor of the San Marcos Creek drainage, groundwater flow is generally to the west, although the gradient is relatively flat. The interpreted lateral distribution of dissolved hydrocarbons in groundwater over the years has been consistent with the relatively flat gradient, reflecting advection in the direction of groundwater flow superimposed over diffusion in all directions. More specifically, the lateral distribution of dissolved hydrocarbons in groundwater has consistently been interpreted as roughly elliptical, with the long axis parallel to the prevailing groundwater flow direction. As of March 2013, the dissolved hydrocarbon plume, defined by benzene at concentrations over 1 microgram per liter (µg/L), the drinking water Maximum Contaminant Level (MCL), is approximately 90 feet long and 75 feet wide. DEH has acknowledged that geochemical data collected during routine groundwater monitoring indicate that intrinsic natural attenuation is in progress. Given the above, the dissolved gasoline plume is believed to be stable, if not decreasing, and offsite migration, if any, is not expected to be significant. Rather, Avocet expects the residual dissolved gasoline plume to shrink as intrinsic natural attenuation continues in the absence of an ongoing source.

4.0 LTCP CLOSURE CRITERIA

For a site to qualify for LTCP closure, it must meet eight "general criteria" and media-specific criteria for groundwater, vapor intrusion into indoor air, and direct contact and outdoor air exposure. This section evaluates the site in the context of these criteria with emphasis on those criteria DEH considered unmet in its August 14, 2013 evaluation (Appendix E).

4.1 GENERAL CRITERIA

For a site to be eligible for closure pursuant to the LTCP, it must meet the eight general criteria summarized below.

General Criteria		Compliance per DEH(1)	Comments
a	The unauthorized release is located within the service area of a public water system.	Yes	Vallecitos Water District.
b	The unauthorized release consists only of petroleum.	Yes	
c	The unauthorized ("primary") release from the UST system has been stopped.	Yes	UST, dispenser, and piping removed in May 1997.
d	Free product has been removed to the maximum extent practical.	Yes	No free product ever observed.
e	A CSM that assesses the nature, extent, and mobility of the release has been developed.	No(2)	Updated CSM discussed in Section 3.0
f	The secondary source has been removed to the extent practical.	Yes	Over-excavation of gasoline-impacted soil in July 1997
g	Soil or groundwater has been tested for MTBE and the results reported in accordance with Health and Safety Code Section 25296.15.	Yes	
h	Nuisance as defined by Water Code Section 13050 does not exist at the site.	Yes	

Notes: (1) Compliance as evaluated by DEH in LTCP Checklist dated August 14, 2013.
(2) DEH contends that areal extent of hydrocarbons in soil and groundwater not defined.

As indicated above, DEH concluded that the site met seven of the eight general criteria but felt that the areal extent of fuel hydrocarbons in soil and groundwater had not been adequately defined and, as such, the CSM was deficient. The areal extent of fuel hydrocarbons in soil and groundwater is addressed in Section 3.0 along with the updated CSM. In brief, however:

- Soil containing residual TPH-g, the most widely distributed residual contaminant in soil, at concentrations greater than 100 milligrams per kilogram (mg/kg) is limited to an approximately 30- by 40-foot area centered on the former UST and between 10 and 25 feet bgs (Avocet, April 12, 2013). Consistent with the CSM, there are few, if any, residual hydrocarbons in vadose zone soil above the invert of the former UST.

- Groundwater containing residual benzene, the most widely distributed residual contaminant in groundwater, at concentrations greater than 1 µg/L is limited to a

roughly elliptical plume measuring an estimated 90 feet along the long axis, parallel to the direction of groundwater flow.

4.2 MEDIA-SPECIFIC CRITERIA

In addition to meeting the eight general criteria summarized above, a site must meet media-specific criteria pertaining to groundwater, vapor intrusion into indoor air, and direct contact and exposure in outdoor air. For groundwater, LTCP closure may be appropriate for sites that meet the criteria for five "classes" of site defined, in part, by the distance to the nearest water supply well. As the nearest water supply well is 450 feet away, the subject San Marcos site is restricted to either Class 1 or 5, as discussed in more detail below. For vapor intrusion into indoor air, LTCP closure may be appropriate for certain scenarios, and for direct exposure and exposure in outdoor air, the LTCP policy provides maximum contaminant concentrations in near-surface soil under different land use scenarios. DEH's evaluation of the subject site in terms of the media-specific criteria is summarized below.

Media-Specific Criteria	Compliance per DEH (1)	Comments
Groundwater		
The contaminant plume that exceeds water quality objectives is stable or decreasing in areal extent and meets all of the additional characteristics of one of the five classes of LTCP site (Classes 1 through 5)	No	Site could be Class 1 or 5
Vapor Intrusion into Indoor Air		
The site is considered low-threat for the vapor-intrusion-to-air pathway in one of three LTCP scenarios (2a, 2b, or 2c).	Yes	Considered low-threat under Scenario 2b - site-specific vapor intrusion assessment indicates human health protected.
Direct Contact and Outdoor Air Exposure		
The site is considered low-threat for direct contact and outdoor air exposure in one of three LTCP scenarios (3a, 3b, or 3c).	Yes	Considered low-threat under Scenario 3.a – max. concentrations in soil less than allowable, depth-specific limits.

Notes: (1) Compliance as evaluated by DEH in LTCP Checklist dated August 14, 2013.

As indicated above, DEH concluded that vapor intrusion into indoor air and direct contact and exposure in outdoor air were not an issue but was unable to conclude that the contaminant plume is stable or decreasing. More specifically, DEH concluded that the areal extent of fuel hydrocarbons in groundwater had not been delineated and, hence, the length of the contaminant plume is "unknown." The media-specific criteria for groundwater are discussed further below.

4.3 MEDIA-SPECIFIC CRITERIA: 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 groundwater-specific site scenarios. In its evaluation, DEH concluded that the site does not meet any of the five scenarios; however, Avocet contends that the site meets the Scenario 1 criteria, which are as follows:

a. *The contaminant plume that exceeds water quality objectives is less than 100 feet in length.*

b. *There is no free product.*

c. *The nearest existing water supply well or surface water body is greater than 250 feet from the defined plume boundary.*

Avocet also contends that the site is eligible for closure under Scenario 5, which reads as follows:

> *The regulatory agency determines, based on an analysis of site specific conditions that under current and reasonably anticipated near-term future scenarios, the contaminant plume 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.*

5.0 SUMMARY AND REQUEST FOR CASE CLOSURE

LTCP closure is being requested based on the following:

- The UST system was excavated and removed from the site in May 1997, thereby eliminating the source of the hydrocarbons.
- Free product has never been observed in any of the borings or groundwater monitoring wells installed at the site.
- The areal extent of site contaminants in groundwater has been defined, with benzene being the only constituent that exceeds its MCL for drinking water. However, the benzene plume, as defined by its MCL, is less than 100 feet in length.
- The areal extent of soil exceeding 100 mg/kg for TPH in soil has been delineated and appears to be limited to an approximately 40- by 27-foot area centered on the former UST and between approximately 10 and 25 feet bgs.
- Soil vapor samples collected at 5 feet bgs did not contain detectable concentrations of BTEX, fuel oxygenates, or any other volatile organic compounds. As such, vapor intrusion into existing structures at the site was not considered a human health risk (E2, February 7, 2012).
- Absent VOCs in soil vapor in the upper 5 feet of the vadose zone and with only *di minimus* hydrocarbon concentrations in the upper 10 feet, there is no apparent risk to future site occupants and no apparent limitations to future site development.
- The nearest groundwater production well to the site is approximately 450 feet west of the former UST area.
- The general criterion for a CSM has been met with the additional information provided in Section 2.0 of this report.
- The media-specific criteria for groundwater meets Scenario 1 of the LTCP, as the groundwater plume appears to be stable or decreasing, there is no free product at the site, the benzene plume in groundwater is less than 100 feet long, and there are no water supply wells within 250 feet of the defined plume boundary.

Given that the source has been removed and considering that the site appears to meet the general and media-specific criteria for case closure under the LTCP, on behalf of the State of California, Department of Forestry and Fire Protection, Avocet requests LTCP closure for the subject site.

Respectfully submitted,

AVOCET ENVIRONMENTAL, INC

Deke C. Siren, P.G.
Project Manager

REFERENCES

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Figures

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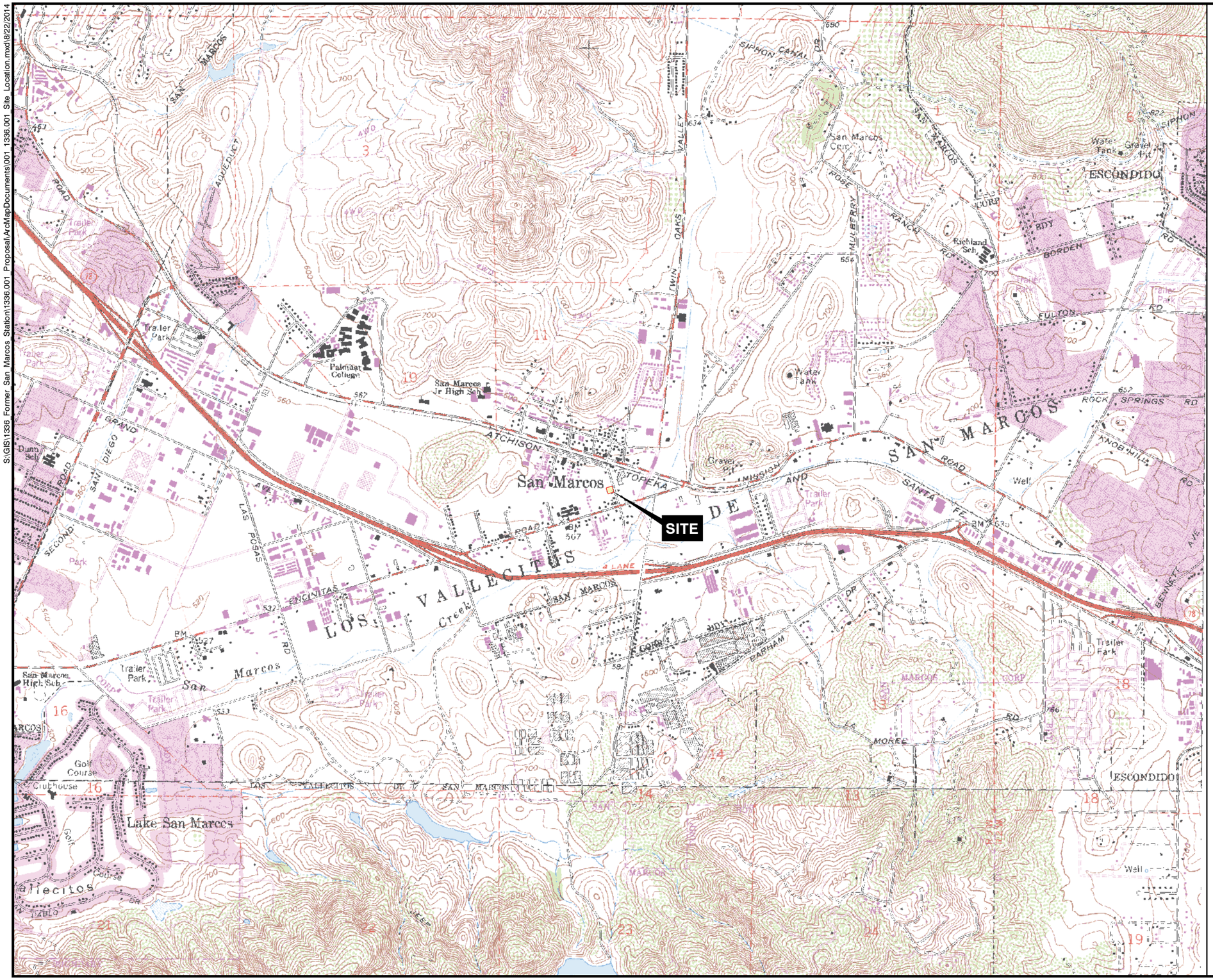

REFERENCE:
7.5 MINUTE U.S.G.S. TOPOGRAPHIC MAPS OF
RANCHO SANTA FE AND SAN MARCOS, CALIFORNIA

0 2,000 4,000 FEET

SCALE

FIGURE 1

SITE LOCATION MAP

FORMER SAN MARCOS FOREST FIRE STATION
SAN MARCOS, CALIFORNIA

PREPARED FOR

STATE OF CALIFORNIA
REAL ESTATE SERVICES DIVISION

AVOCET ENVIRONMENTAL, INC.

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N

LEGEND

- SOIL BORING LOCATION
- SOIL BORING AND HYDROPUNCH LOCATION
- HYDROPUNCH LOCATION
- SHALLOW (5 FEET) SOIL GAS SAMPLE
- GROUNDWATER MONITORING WELL
- UNDERGROUND STORAGE TANK EXCAVATION (APPROX.)
- FORMER UNDERGROUND STORAGE TANK (APPROX.)

0 30 60 FEET

SCALE

FIGURE 2

SITE PLAN

FORMER SAN MARCOS STATION
SAN MARCOS, CALIFORNIA

PREPARED FOR

STATE OF CALIFORNIA
REAL ESTATE SERVICES DIVISION

AVOCET ENVIRONMENTAL, INC.

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N

LEGEND

- SOIL BORING AND HYDROPUNCH LOCATION
- HYDROPUNCH LOCATION
- GROUNDWATER MONITORING WELL
- 710 BENZENE CONCENTRATION IN μg/L
- 10 BENZENE CONCENTRATION CONTOUR IN μg/L DASHED WHERE INFERRED
- FORMER UNDERGROUND STORAGE TANK (APPROX.)
- UNDERGROUND STORAGE TANK EXCAVATION (APPROX.)

NOTE:
1. FOUR OFF-SITE BORINGS WERE IDENTIFIED AS B-8 THROUGH B-11 IN 2002. RECENT SOIL BORINGS DRILLED IN 2013 WERE IDENTIFIED AS B-8 THROUGH B-12.

2. BENZENE CONCENTRATIONS IN WELLS MW-1 THROUGH MW-5 FROM NOVEMBER 26, 2012 (E2, JANUARY 14, 2013). BENZENE CONCENTRATIONS IN BORINGS B-11 THROUGH B-12 FROM MARCH 22, 2013 (AVOCET, APRIL 12, 2013).

0 25 50 FEET

SCALE

FIGURE 3

BENZENE ISOCONCENTRATIONS IN GROUNDWATER

FORMER SAN MARCOS STATION
SAN MARCOS, CALIFORNIA

PREPARED FOR

STATE OF CALIFORNIA
REAL ESTATE SERVICES DIVISION

AVOCET ENVIRONMENTAL, INC.

Appendix A

LTCP Checklist
(DEH, August 13, 2013)

AVOCET
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STATE WATER RESOURCES CONTROL BOARD
GEOTRACKER

CDF-FORMER SAN MARCOS FOREST FIRE STATION (T0607302261) - (MAP)

236 PICO AV
SAN MARCOS, CA 920692702
SAN DIEGO COUNTY
LUST CLEANUP SITE

CLEANUP OVERSIGHT AGENCIES
SAN DIEGO RWQCB (REGION 9) *(LEAD)* - *CASE #: 9UT3495*
CASEWORKER: *CRAIG L. CARLISLE*
SAN DIEGO COUNTY LOP - *CASE #: H20792-001*

LTCP CHECKLIST AS OF 8/13/2013

General Criteria - *The site satisfies the policy general criteria*	**NO**
a. Is the unauthorized release located within the service area of a public water system? **Name of Water System : Vallecitos Water District**	**YES**
b. The unauthorized release consists only of petroleum (info).	**YES**
c. The unauthorized ("primary") release from the UST system has been stopped.	**YES**
d. Free product has been removed to the maximum extent practicable (info).	**FP Not Encountered**
e. A conceptual site model that assesses the nature, extent, and mobility of the release has been developed (info). **Description:** **- Groundwater Assessment Incomplete - Areal Extent of Contamination Not Defined** **- Soil Assessment Incomplete - Areal Extent Not Defined**	**NO**
f. Secondary source has been removed to the extent practicable (info).	**YES**
g. Soil or groundwater has been tested for MTBE and results reported in accordance with Health and Safety Code Section 25296.15.	**YES**
h. Does a nuisance exist, as defined by Water Code section 13050.	**NO**

1. Media-Specific Criteria: Groundwater - *The contaminant plume that exceeds water quality objectives is stable or decreasing in areal extent, and meets all of the additional characteristics of one of the five classes of sites listed below.*	**NO**
EXEMPTION - Soil Only Case (Release has not Affected Groundwater - Info)	**NO**
Does the site meet any of the Groundwater specific criteria scenarios?	**NO**

ADDITIONAL QUESTIONS - The following conditions exist that do not meet the policy criteria:

Plume Length (That Exceeds Water Quality Objectives) :
- Unknown

Nearest Supply Well (From Plume Boundary) :
- > 250 Feet and ≤ 1,000 Feet

2. Media Specific Criteria: Petroleum Vapor Intrusion to Indoor Air - *The site is considered low-threat for the vapor-intrusion-to-air pathway if site-specific conditions satisfy items 2a, 2b, or 2c*	**YES**
EXEMPTION - Active Commercial Petroleum Fueling Facility	**NO**
Does the site meet any of the Petroleum Vapor Intrusion to Indoor Air specific criteria scenarios?	**YES**
2b - Petroleum Vapor Intrusion to Indoor Air - A site-specific risk assessment for the vapor intrusion pathway	YES

has been prepared that demonstrates human health is protected to the satisfaction of the regulatory agency.

3. Media Specific Criteria: Direct Contact and Outdoor Air Exposure - *The site is considered low-threat for direct contact and outdoor air exposure if it meets 1, 2, or 3 below.*	**YES**
EXEMPTION - The upper 10 feet of soil is free of petroleum contamination	**NO**
Does the site meet any of the Direct Contact and Outdoor Air Exposure criteria scenarios?	**YES**
3.1 - Maximum concentrations of petroleum constituents in soil are less than or equal to those listed in the following table (LINK) for the specified depth below ground surface.	YES

Additional Information	
Should this case be closed in spite of NOT meeting policy criteria?	NO

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0.1171875 seconds

Appendix B

Petroleum Hydrocarbons in Soil

AVOCET
ENVIRONMENTAL, INC.

TABLE 1

HISTORICAL SOIL ANALYTICAL RESULTS

San Marcos Forest Fire Station No. 14
San Marcos, California

Boring ID	Sample Depth	Date Drilled	Laboratory Analyses[1]					
			TPHg[2] (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	MTBE[3] (mg/kg)
NM-B1/MW-1	6	9/6/2000	<0.050	<0.003	<0.003	<0.003	<0.003	<0.050
	11	9/6/2000	<0.050	<0.003	<0.003	<0.003	<0.003	<0.050
	16	9/6/2000	**0.17**	**0.023**	<0.003	<0.003	**0.0068**	<0.050
	21	9/6/2000	**0.052**	**0.0047**	**0.0031**	<0.003	<0.003	<0.050
	26	9/6/2000	<0.050	<0.003	<0.003	<0.003	<0.003	<0.050
	31	9/6/2000	<0.050	<0.003	<0.003	<0.003	<0.003	<0.050
NM-B2	6	9/6/2000	<0.050	<0.003	<0.003	<0.003	<0.003	<0.050
	11	9/6/2000	**850**	**0.65**	**12**	**4.8**	**69**	<2.5
	16	9/6/2000	**11,000**	**88**	**750**	**220**	**1200**	<12.5
	21	9/6/2000	**3,300**	**50**	**260**	**48**	**370**	<12.5
	23.5	9/6/2000	**8,300**	**110**	**570**	**150**	**900**	<12.5
	25	9/6/2000	**14**	**0.5**	**0.31**	**0.16**	**1.1**	<0.25
NM-B3	11	9/6/2000	**0.29**	**0.004**	<0.003	<0.003	<0.003	**0.0056**
	16	9/6/2000	**2,900**	**9.5**	**160**	**60**	**330**	<2.5
	21	9/6/2000	**8,400**	**110**	**640**	**170**	**960**	<12.5
	23.5	9/6/2000	**4,200**	**47**	**290**	**84**	**490**	<5
	25	9/6/2000	**610**	**10**	**41**	**11**	**61**	<2.5
NM-B4	6	9/6/2000	<0.050	<0.003	<0.003	<0.003	<0.003	<0.050
	11	9/6/2000	<0.050	<0.003	<0.003	<0.003	<0.003	<0.050
	16	9/6/2000	**0.083**	0.0053	<0.003	<0.003	<0.003	<0.050
	21	9/6/2000	**38**	**0.6**	**0.16**	**0.15**	**1.6**	**0.35**
	23.5	09/06/00	**250**	**0.5**	**1.6**	**1.8**	**8.8**	<.25
	25	09/06/00	**0.39**	<0.003	<0.003	<0.003	**0.03**	<0.050
NM-B5	6	09/07/00	**4.2**	<0.003	<0.003	<0.003	**0.0053**	<0.050
	11	09/07/00	<0.050	<0.003	<0.003	<0.003	<0.003	<0.050
	16	09/07/00	<0.050	<0.003	<0.003	<0.003	<0.003	**0.023**
	21	09/07/00	**150**	**1.6**	**6.7**	**2.9**	**16**	**0.5**
	23.5	09/07/00	**560**	**6.2**	**29**	**11**	**67**	<2.5
	25	09/07/00	**120**	**0.6**	**1.6**	**1.1**	**7.1**	<.25
NM-B6/MW-2	6	09/07/00	<0.050	<0.003	<0.003	<0.003	<0.003	<0.050
	11	09/07/00	<0.050	<0.003	<0.003	<0.003	<0.003	<0.050
	16	09/07/00	**0.14**	**0.0073**	<0.003	<0.003	**0.0045**	<0.050
	21	09/07/00	<0.050	<0.003	<0.003	<0.003	<0.003	<0.050
	23.5	09/07/00	<0.050	<0.003	<0.003	<0.003	<0.003	<0.050
	25	09/07/00	<0.050	<0.003	<0.003	<0.003	<0.003	<0.050
NM-B7/MW-3	6	09/07/00	<0.050	<0.003	<0.003	<0.003	<0.003	<0.050
	11	09/07/00	<0.050	<0.003	<0.003	<0.003	<0.003	<0.050
	16	09/07/00	<0.050	<0.003	<0.003	<0.003	<0.003	<0.050
	21	09/07/00	**990**	**1.1**	**27**	**22**	**120**	<2.5
	24	09/07/00	**14**	**0.065**	**0.3**	**<0.003**	**0.58**	<.25
	25	09/07/00	**0.065**	<0.003	<0.003	<0.003	**0.0046**	<0.050
B-8/MW-4	25	09/03/02	<0.10	<0.002	<0.002	<0.002	<0.004	<0.005
B-9	25	09/03/02	<0.10	<0.002	<0.002	<0.002	<0.004	<0.005
B-10/MW-5	25	09/03/02	<0.10	<0.002	<0.002	<0.002	<0.004	<0.005
B-11	25	09/03/02	<0.10	<0.002	<0.002	<0.002	<0.004	<0.005

(1) Samples from 09/07/00 were analyzed by EPA Method 8015M for TPHg and EPA Method 8021B for Benzene, Toluene, Ethylbenzene, Total Xylenes, and MTBE; Samples from 09/03/04 were analyzed using EPA Method 8260B

(2) TPHg denotes total petroleum hydrocarbons as gasoline.

(3) MTBE denotes methyl tertiary-butyl ether

Table 1
March 2013 Soil Matrix Analytical Results
Former San Marcos Forest Fire Station
San Marcos, California

Sample I.D.	Sample Date	Sample Depth (feet bgs)	EPA Method 8015B	EPA Method 8260B										
			TPHg	Benzene	Toluene	Ethyl benzene	m,p-Xylenes	o-Xylenes	NPTH	MTBE	TBA	DIPE	ETBE	TAME
B-8;14'	03/22/13	14	<0.50	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.05	<0.01	<0.01	<0.01
B-8;16'	03/22/13	16	<0.50	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.05	<0.01	<0.01	<0.01
B-8;18'	03/22/13	18	<0.50	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.05	<0.01	<0.01	<0.01
B-8;20'	03/22/13	20	<0.50	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.05	<0.01	<0.01	<0.01
B-9;14'	03/22/13	14	<0.50	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.05	<0.01	<0.01	<0.01
B-9;16'	03/22/13	16	<0.50	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.05	<0.01	<0.01	<0.01
B-9;18'	03/22/13	18	**1.1**	<0.005	<0.005	<0.005	**0.006**	<0.005	<0.05	<0.005	<0.05	<0.01	<0.01	<0.01
B-9;20'	03/22/13	20	**110**	<0.5	<0.5	<0.5	**1.1**	<0.5	<5	<0.5	<5	<1	<1	<1
B-10;14'	03/22/13	14	<0.50	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.05	<0.01	<0.01	<0.01
B-10;16'	03/22/13	16	<0.50	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.05	<0.01	<0.01	<0.01
B-10;18'	03/22/13	18	<0.50	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.05	<0.01	<0.01	<0.01
B-10;20'	03/22/13	20	<0.50	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.05	<0.01	<0.01	<0.01
B-11;5'	03/22/13	5	<0.50	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.05	<0.01	<0.01	<0.01
B-11;10'	03/22/13	10	<0.50	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.05	<0.01	<0.01	<0.01
B-11;20'	03/22/13	20	**440**	**0.75**	**2.3**	**5.1**	**11**	**4.5**	**5.7**	<0.5	<5	<1	<1	<1

Notes:

Concentrations are in milligrams per kilogram (mg/kg)
"<" Denotes concentration not reported above indicated laboratory reporting limit
Bold indicates detected concentration
bgs = below ground surface
DIPE = diisopropyl ether
ETBE = ethyl tert-butyl ether
MTBE = methyl tert-butyl ether
NPTH = naphthalene
TAME = tert-amyl-methyl ether
TBA = tert-butyl alcohol
TPH-g = total petroleum hydrocarbons as gasoline

AVOCET ENVIRONMENTAL, INC.

Appendix C

Petroleum Hydrocarbons in Groundwater

AVOCET
ENVIRONMENTAL, INC.

TABLE 3
HISTORICAL GROUND WATER ANALYTICAL RESULTS
Former San Marcos Forest Fire Station
San Marcos, California

Well No.	Sample Date	EPA Method 8015M	EPA Method 8260B								
		TPHg (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-Benzene (µg/l)	Total Xylenes (µg/l)	MTBE (µg/l)	DIPE (µg/l)	TAME (µg/l)	ETBE (µg/l)	TBA (µg/l)
MW-1	9/18/2000	**310**	**9.3**	**1.0**	<0.50	**2.9**	**12**	<5.0	<5.0	<5.0	<5.0
	4/27/2001	<500	**35**	<1.0	**1.0**	**4.3**	**13**	<2.0	<2.0	<2.0	<12
	7/13/2001	**130**	**22**	<1.0	**1.1**	**4.3**	**9.4**	<2.0	<2.0	<2.0	<50
	10/24/2001	<100	**7.4**	<1.0	<1.0	<2.0	**5.5**	<2.0	<2.0	<2.0	<50
	1/9/2002	<100	**19**	<1.0	**1.0**	**2.5**	**11**	<2.0	<2.0	<2.0	<50
	4/4/2002	<100	**3.6**	<1.0	<1.0	**1.1**	**12**	<2.0	<2.0	<2.0	<10
	9/9/2002	<50	**2.6**	<0.50	<0.50	<1.0	**4.6**	<0.50	<0.50	<0.50	<50
	4/22/2004	<100	**25**	<1.0	**1.5**	**1.2**	**8.2**	<2.0	<2.0	<2.0	<10
	9/21/2004	<100	**0.8**	<1.0	<1.0	<2.0	**5.5**	<2.0	<2.0	<2.0	<10
	3/18/2005	**2,800**	**690**	**10**	**210**	**194**	**89**	<2.0	<2.0	<2.0	**20**
	5/9/2006	**240**	**35**	<0.50	**16**	<1.5	**4.6**	<5.0	<5.0	<5.0	<25
	9/28/2006	**75**	**14**	<0.50	**1.9**	<1.5	**3.5**	<5.0	<5.0	<5.0	<25
	12/21/2006	<50	**2.7**	<0.50	**0.75**	<1.5	**1.7**	<5.0	<5.0	<5.0	<25
	3/14/2007	**84**	**36**	<0.50	**5.8**	<1.5	**5.9**	<5.0	<5.0	<5.0	<25
	1/15/2009	**85**	**30**	<0.50	**0.61**	<0.50	**2.0**	<2.0	<2.0	<2.0	<20
	4/22/2009	<50 HT	<0.50	<0.50	<0.50	<0.50	**1.8**	<2.0	<2.0	<2.0	<20
	7/23/2009	<0.50	<0.50	<0.50	<0.50	<0.50	**1.0**	<2.0	<2.0	<2.0	<20
	4/6/2010	<0.50	**7.5**	<0.50	<0.50	<1.5	**1.7**	<2.0	<2.0	<2.0	<10
	3/16/2011	**110**	**9.6**	<0.50	**3.2**	<0.50	**4.9**	<2.0	<2.0	<2.0	<20
	9/12/2011	<50	<0.50	<0.50	<0.50	<0.5	**2.2**	<2.0	<2.0	<2.0	<20
	9/11/2012	<50	<0.50	<0.50	<0.50	<1.0	**<1.0**	<2.0	<2.0	<2.0	<10
	11/26/2012	**66**	**1.1**	<0.50	**0.60**	<2.0	**13**	<0.50	<1.0	<1.0	<20
MW-2	9/18/2000	**250**	<0.50	**0.89**	<0.50	**1.6**	**7.3**	<5.0	<5.0	<5.0	<5.0
	4/27/2001	<500	**41**	<1.0	**1.4**	**1.8**	**4.1**	<2.0	<2.0	<2.0	<12
	7/13/2001	<100	**18**	<1.0	**1.2**	<2.0	**2.7**	<2.0	<2.0	<2.0	<50
	10/24/2001	<100	**1.7**	<1.0	<1.0	<2.0	<1.0	<2.0	<2.0	<2.0	<50
	1/9/2002	<100	**0.87**	<1.0	<1.0	<2.0	<1.0	<2.0	<2.0	<2.0	<50
	4/4/2002	<100	**0.66**	<1.0	<1.0	<2.0	<1.0	<2.0	<2.0	<2.0	<10
	9/9/2002	<50	**1.2**	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<50
	4/22/2004	<100	**1.3**	<1.0	<1.0	<2.0	<1.0	<2.0	<2.0	<2.0	<10
	9/21/2004	<100	**0.83**	<1.0	<1.0	<2.0	<1.0	<2.0	<2.0	<2.0	<10
	3/18/2005	**230**	**57**	<1.0	**7.0**	**2.7**	**25**	<2.0	<2.0	<2.0	<10
	5/9/2006	<50	<0.50	<0.50	<0.50	<1.5	<1.0	<5.0	<5.0	<5.0	<25
	9/28/2006	<50	<0.50	<0.50	<0.50	<1.5	<1.0	<5.0	<5.0	<5.0	<25
	12/21/2006	<50	<0.50	<0.50	<0.50	<1.5	<1.0	<5.0	<5.0	<5.0	<25
	3/14/2007	<50	<0.50	<0.50	<0.50	<1.5	<1.0	<5.0	<5.0	<5.0	<25
	1/15/2009	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	<2.0	<2.0	<20
	4/22/2009	<50 HT	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	<2.0	<2.0	<20
	7/23/2009	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	<2.0	<2.0	<20
	4/6/2010	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	<2.0	<2.0	<20
	3/16/2011	<50	**1.1**	<0.50	<0.50	<0.5	<1.0	<2.0	<2.0	<2.0	<20
	9/12/2011	<50	<0.50	<0.50	<0.50	<0.5	<1.0	<2.0	<2.0	<2.0	<20
	9/11/2012	<50	<0.50	<0.50	<0.50	<1.0	<1.0	<2.0	<2.0	<2.0	<10
	11/26/2012	<50	**3.1**	<0.50	**1.3**	<2.0	**8.9**	<0.50	<1.0	<1.0	<20
MW-3	9/18/2000	**2,000**	**28**	**7.5**	<0.50	**310**	**9.0**	<5.0	<5.0	<5.0	<5.0
	4/27/2001	**9,200**	**940**	**2,400**	**460**	**2,600**	<10	<20	<20	<20	<120
	7/13/2001	**15,000**	**570**	**1,400**	**400**	**2,210**	<50	<100	<100	<100	<2500
	10/24/2001	**440**	**77**	**47**	**31**	**88**	**5.2**	<2.0	<2.0	<2.0	<10
	1/9/2002	**610**	**55**	**79**	**36**	**141**	**5.5**	<2.0	<2.0	<2.0	<50
	4/4/2002	**370**	**44**	**37**	**27**	**69**	**7.1**	<2.0	<2.0	<2.0	<10
	9/9/2002	**550**	**42**	**35**	**26**	**50**	**3.8**	<0.50	<0.50	<0.50	<50
	4/22/2004	**1,600**	**170**	**170**	**120**	**251**	**5.2**	<2.0	<2.0	<2.0	<10
	9/21/2004	**1,000**	**62**	**47**	**33**	**104**	**5.0**	<2.0	<2.0	<2.0	<10
	3/18/2005	**48,000**	**3,300**	**6,700**	**3,700**	**21,200**	**640**	<50	<50	<50	<250
	5/9/2006	**19,000**	**570**	**1,300**	**930**	**4,900**	**11**	<50	<50	<50	<250
	9/28/2006	**14,000**	**420**	**550**	**630**	**2,600**	<20	<20	<20	<20	<20
	12/21/2006	**8,700**	**300**	**520**	**530**	**1700**	<10	<50	<50	<50	<250
	12/21/2006[D]	**7,200**	**360**	**560**	**530**	**1800**	**4.4**	<20	<20	<20	<100
	3/14/2007	**3,700**	**250**	**280**	**300**	**790**	<5.0	<25	<25	<25	<120
	3/14/2007[D]	**3,000**	**270**	**320**	**340**	**860**	<10	<50	<50	<50	<250
	1/15/2009	**4,400**	**160**	**130**	**280**	**700**	**5.5**	<2.0	<2.0	<2.0	<20
	4/22/2009	**4,900 HT**	**200**	**120**	**290**	**700**	**3.7**	<2.0	<2.0	<2.0	<20
	7/23/2009	**1,700**	**120**	**25**	**210**	**190**	**4.6**	<4.0	<4.0	<4.0	<40
`	4/6/2010	**1,100**	**94**	**19**	**82**	**164**	**2.8**	<2.0	<2.0	<2.0	<10

e2 environmental

TABLE 3
HISTORICAL GROUND WATER ANALYTICAL RESULTS
Former San Marcos Forest Fire Station
San Marcos, California

Well No.	Sample Date	EPA Method 8015M	EPA Method 8260B								
		TPHg (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-Benzene (µg/l)	Total Xylenes (µg/l)	MTBE (µg/l)	DIPE (µg/l)	TAME (µg/l)	ETBE (µg/l)	TBA (µg/l)
MW-3 cont.	3/16/2011	**51,000**	**1200**	**1300**	**2100**	**12000**	**130**	<100	<100	<100	<1,000
	9/12/2011	**10,000**	**420**	**370**	**770**	**2540**	**10**	<2.0	<2.0	<2.0	<20
	9/11/2012	**2,400**	**76**	**56**	**120**	**173**	**3.0**	<2.0	<2.0	<2.0	<10
	11/26/2012	**88**	**10**	**3.9**	**11**	**6.5**	**3.4**	<0.50	<1.0	<1.0	<20
DUP (MW-3)	11/26/2012	**95**	**7.4**	**2.7**	**8.5**	**5.0**	**3.4**	<0.50	<1.0	<1.0	<20
MW-4	9/9/2002	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<50
	4/22/2004	<100	<0.50	<1.0	<1.0	<2.0	<1.0	<2.0	<2.0	<2.0	<10
	9/21/2004	<100	<0.50	<1.0	<1.0	<2.0	<1.0	<2.0	<2.0	<2.0	<10
	3/18/2005				Not sampled because well inaccessible						
	5/9/2006				Not sampled because well inaccessible						
	9/28/2006				Not sampled because well inaccessible						
	12/21/2006	<50	<0.50	<0.50	<0.50	<1.5	<1.0	<5.0	<5.0	<5.0	<25
	3/14/2007	<50	<0.50	<0.50	<0.50	<1.5	<1.0	<5.0	<5.0	<5.0	<25
	1/15/2009(3)	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	<2.0	<2.0	<20
	4/22/2009	<50 HT	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	<2.0	<2.0	<20
	7/23/2009	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	<2.0	<2.0	<20
	4/6/2010	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	<2.0	<2.0	<10
	3/16/2011	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	<2.0	<2.0	<20
	9/12/2011	<50	<0.50	<0.50	<0.50	<0.5	<1.0	<2.0	<2.0	<2.0	<20
	9/11/2012	<50	<0.50	<0.50	<0.50	<1.0	<1.0	<2.0	<2.0	<2.0	<10
AA DUP (MW-4)	9/11/2012	<50	<0.50	<0.50	<0.50	<1.0	<1.0	<2.0	<2.0	<2.0	<10
	11/26/2012	<50	<0.50	<0.50	<0.50	<2.0	<1.0	<0.50	<1.0	<1.0	<20
MW-5	9/9/2002	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<50
	4/22/2004	<100	<0.50	<1.0	<1.0	<2.0	<1.0	<2.0	<2.0	<2.0	<10
	9/21/2004	<100	<0.50	<1.0	<1.0	<2.0	<1.0	<2.0	<2.0	<2.0	<10
	3/18/2005	<100	<0.50	<1.0	<1.0	<2.0	<1.0	<2.0	<2.0	<2.0	<10
	5/9/2006	<50	<0.50	<0.50	<0.50	<1.5	<1.0	<5.0	<5.0	<5.0	<25
	9/28/2006	<50	<0.50	<0.50	<0.50	<1.5	<1.0	<5.0	<5.0	<5.0	<25
	12/21/2006	<50	<0.50	<0.50	<0.50	<1.5	<1.0	<5.0	<5.0	<5.0	<25
	3/14/2007	<50	<0.50	<0.50	<0.50	<1.5	<1.0	<5.0	<5.0	<5.0	<25
	1/15/2009(3)	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	<2.0	<2.0	<20
	4/22/2009	<50 HT	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	<2.0	<2.0	<20
	7/23/2009	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<2.0	<2.0	<2.0	<20
	4/6/2010	<50	<0.50	<0.50	<0.50	<1.5	<1.0	<2.0	<2.0	<2.0	<10
	3/16/2011	<50	<0.50	<0.50	<0.50	<0.5	<1.0	<2.0	<2.0	<2.0	<20
	9/12/2011	<50	<0.50	<0.50	<0.50	<0.5	<1.0	<2.0	<2.0	<2.0	<20
	9/11/2012	<50	<0.50	<0.50	<0.50	<1.0	<1.0	<2.0	<2.0	<2.0	<10
	11/26/2012	<50	<0.50	<0.50	<0.50	<2.0	<1.0	<0.50	<1.0	<1.0	<20
QCEB	4/6/2010	<50	<0.50	<0.50	<0.50	<1.5	<1.0	<2.0	<2.0	<2.0	<10
QCEB	3/16/2011	<50	<0.50	<0.50	<0.50	<0.5	<1.0	<2.0	<2.0	<2.0	<20
QCEB	9/12/2011	<50	<0.50	<0.50	<0.50	<0.5	<1.0	<2.0	<2.0	<2.0	<20
QCEB	9/11/2012	<50	<0.50	<0.50	<0.50	<1.0	<1.0	<2.0	<2.0	<2.0	<10
QCEB	11/26/2012	<50	<0.50	<0.50	<0.50	<2.0	<1.0	<0.50	<1.0	<1.0	<20
QCTB	4/6/2010	--	<0.50	<0.50	<0.50	<1.5	<1.0	<2.0	<2.0	<2.0	<10
QCTB	3/16/2011	--	<0.50	<0.50	<0.50	<0.5	<1.0	<2.0	<2.0	<2.0	<20
QCTB	9/12/2011	--	<0.50	<0.50	<0.50	<0.5	<1.0	<2.0	<2.0	<2.0	<20
QCTB	9/11/2012	<50	<0.50	<0.50	<0.50	<1.0	<1.0	<2.0	<2.0	<2.0	<10
QCTB	11/26/2012		<0.50	<0.50	<0.50	<2.0	<1.0	<0.50	<1.0	<1.0	<20
Drinking Water Standards											
State MCL(1)		--	1	150	300	1750	13	--	--	--	--
State Notification Level(2)		--	--	--	--	--	--	--	--	--	12

NOTES:
TPH-g = total petroleum hydrocarbons as gasoline.
MTBE = methyl tertiary-butyl ether
DIPE = diisopropyl ether
TAME = tertiary-amyl methyl ether
ETBE = ethyl tertiary-butyl alcohol
TBA = tertiary-butyl alcohol
µg/l = micrograms per liter
D = Results of a duplicate sample
HT = This result was analyzed outside of the EPA recommended holding time
QCEB = Equipment blank QA/QC sample
QCTB = Trip blank QA/QC sample
NA = Not Analyzed
-- = Not Established

(1) State Maximum Contaminant Level, Title 22 of California Code of Regulations.
(2) Drinking Water Notification Levels recommended by the California Department of Health Services, June 28, 2006.
(3) Wells MW-1, MW-2, and MW-3 historically reported with "NM-" prefix

e2 environmental

Table 2
March 2013 Groundwater Grab Sample Analytical Results
Former San Marcos Forest Fire Station
San Marcos, California

Boring I.D.	Sample Date	EPA Method 8260B										
		Benzene	Toluene	Ethyl benzene	p/m-Xylenes	o-Xylene	NPTH	MTBE	TBA	DIPE	ETBE	TAME
B-10	03/22/13	**710**	**3,400**	**1,700**	**7,100**	**3,000**	**430**	<20	<200	<40	<40	<40
B-11	03/22/13	**3,100**	**11,000**	**3,200**	**14,000**	**5,600**	**1,100**	<100	<1,000	<200	<200	<200
B-12	03/22/13	**2.8**	**6.9**	**84**	**30**	**29**	**30**	<1	<10	<2	<2	<2

Notes:
Concentrations are in micrograms per liter (µg/L)
"<" Denotes concentration not reported above indicated laboratory reporting limit
Bold indicates detected concentration
DIPE = diisopropyl ether
ETBE = ethyl tert-butyl ether
MTBE = methyl tert-butyl ether
NPTH = naphthalene
TAME = tert-amyl-methyl ether
TBA = tert-butyl alcohol

AVOCET ENVIRONMENTAL, INC.

Appendix D

Petroleum Hydrocarbons in Soil Vapor

AVOCET
ENVIRONMENTAL, INC.

H&P Mobile Geochemistry Inc.

03 January 2012

Mr. Tom Faludy
E2 Environmental
15375 Barranca Pkwy, Suite F-106
Irvine, CA 92618

H&P Project: EE122211-L4
Client Project: 1004.200.009 / 236 Pico Ave.

Dear Mr. Tom Faludy:

Enclosed is the analytical report for the above referenced project. The data herein applies to samples as received by H&P Mobile Geochemistry, Inc. on 22-Dec-11 which were analyzed in accordance with the attached Chain of Custody record(s).

The results for all sample analyses and required QA/QC analyses are presented in the following sections and summarized in the documents:

- Sample Summary
- Case Narrative (if applicable)
- Sample Results
- Quality Control Summary
- Notes and Definitions / Appendix
- Chain of Custody

Unless otherwise noted, all analyses were performed and reviewed in compliance with our Quality Systems Manual and Standard Operating Procedures. This report shall not be reproduced, except in full, without the written approval of H&P Mobile Geochemistry, Inc.

We at H&P Mobile Geochemistry, Inc. sincerely appreciate the opportunity to provide analytical services to you on this project. If you have any questions or concerns regarding this analytical report, please contact me at your convenience at 760-804-9678.

Sincerely,

J Villarreal

Janis Villarreal
Laboratory Director

H&P Mobile Geochemistry, Inc. operates under CA Environmental Lab Accreditation Program Numbers 2579, 2740, 2741, 2742, 2743, 2745 and 2754. National Environmental Laboratory Accreditation Conference (NELAC) Standards Lab #11845

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E2 Environmental 15375 Barranca Pkwy, Suite F-106 Irvine, CA 92618	Project: EE122211-L4 Project Number: 1004.200.009 / 236 Pico Ave. Project Manager: Mr. Tom Faludy	Reported: 03-Jan-12 10:30

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SG-1-5', 1PV, P111cc	E112096-01	Vapor	22-Dec-11	22-Dec-11
SG-1-5', 3PV, P333cc	E112096-02	Vapor	22-Dec-11	22-Dec-11
SG-1-5', 7PV, P777cc	E112096-03	Vapor	22-Dec-11	22-Dec-11
SG-2-5', P333cc	E112096-04	Vapor	22-Dec-11	22-Dec-11
SG-2-5' Dup, P383cc	E112096-05	Vapor	22-Dec-11	22-Dec-11
SG-3-5', P333cc	E112096-06	Vapor	22-Dec-11	22-Dec-11
SG-4-5', P99cc	E112096-07	Vapor	22-Dec-11	22-Dec-11
SG-5-5', P99cc	E112096-08	Vapor	22-Dec-11	22-Dec-11

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E2 Environmental 15375 Barranca Pkwy, Suite F-106 Irvine, CA 92618	Project: EE122211-L4 Project Number: 1004.200.009 / 236 Pico Ave. Project Manager: Mr. Tom Faludy	Reported: 03-Jan-12 10:30

Volatile Organic Compounds by EPA Method 8260B Modified

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SG-1-5', 1PV, P111cc (E112096-01) Vapor Sampled: 22-Dec-11 Received: 22-Dec-11									
1,1-Difluoroethane (LCC)	ND	10	ug/l	0.05	EL12202	22-Dec-11	22-Dec-11	EPA 8260B	
Methyl tertiary-butyl ether (MTBE)	ND	0.50	"	"	"	"	"	"	
Diisopropyl ether (DIPE)	ND	1.0	"	"	"	"	"	"	
Ethyl tert-butyl ether (ETBE)	ND	1.0	"	"	"	"	"	"	
Tertiary-amyl methyl ether (TAME)	ND	1.0	"	"	"	"	"	"	
Tertiary-butyl alcohol (TBA)	ND	5.0	"	"	"	"	"	"	
Benzene	ND	0.10	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
m,p-Xylene	ND	0.50	"	"	"	"	"	"	
o-Xylene	ND	0.50	"	"	"	"	"	"	
Naphthalene	ND	0.10	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*107 %*	*75-125*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*96.5 %*	*75-125*		"	"	"	"	
Surrogate: Toluene-d8		*104 %*	*75-125*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*121 %*	*75-125*		"	"	"	"	
SG-1-5', 3PV, P333cc (E112096-02) Vapor Sampled: 22-Dec-11 Received: 22-Dec-11									
1,1-Difluoroethane (LCC)	ND	10	ug/l	0.05	EL12202	22-Dec-11	22-Dec-11	EPA 8260B	
Methyl tertiary-butyl ether (MTBE)	ND	0.50	"	"	"	"	"	"	
Diisopropyl ether (DIPE)	ND	1.0	"	"	"	"	"	"	
Ethyl tert-butyl ether (ETBE)	ND	1.0	"	"	"	"	"	"	
Tertiary-amyl methyl ether (TAME)	ND	1.0	"	"	"	"	"	"	
Tertiary-butyl alcohol (TBA)	ND	5.0	"	"	"	"	"	"	
Benzene	ND	0.10	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
m,p-Xylene	ND	0.50	"	"	"	"	"	"	
o-Xylene	ND	0.50	"	"	"	"	"	"	
Naphthalene	ND	0.10	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*110 %*	*75-125*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*97.2 %*	*75-125*		"	"	"	"	
Surrogate: Toluene-d8		*102 %*	*75-125*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*118 %*	*75-125*		"	"	"	"	

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E2 Environmental 15375 Barranca Pkwy, Suite F-106 Irvine, CA 92618	Project: EE122211-L4 Project Number: 1004.200.009 / 236 Pico Ave. Project Manager: Mr. Tom Faludy	Reported: 03-Jan-12 10:30

Volatile Organic Compounds by EPA Method 8260B Modified

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SG-1-5', 7PV, P777cc (E112096-03) Vapor Sampled: 22-Dec-11 Received: 22-Dec-11									
1,1-Difluoroethane (LCC)	ND	10	ug/l	0.05	EL12202	22-Dec-11	22-Dec-11	EPA 8260B	
Methyl tertiary-butyl ether (MTBE)	ND	0.50	"	"	"	"	"	"	
Diisopropyl ether (DIPE)	ND	1.0	"	"	"	"	"	"	
Ethyl tert-butyl ether (ETBE)	ND	1.0	"	"	"	"	"	"	
Tertiary-amyl methyl ether (TAME)	ND	1.0	"	"	"	"	"	"	
Tertiary-butyl alcohol (TBA)	ND	5.0	"	"	"	"	"	"	
Benzene	ND	0.10	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
m,p-Xylene	ND	0.50	"	"	"	"	"	"	
o-Xylene	ND	0.50	"	"	"	"	"	"	
Naphthalene	ND	0.10	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*109 %*		*75-125*	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*98.8 %*		*75-125*	"	"	"	"	
Surrogate: Toluene-d8		*104 %*		*75-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*119 %*		*75-125*	"	"	"	"	
SG-2-5', P333cc (E112096-04) Vapor Sampled: 22-Dec-11 Received: 22-Dec-11									
1,1-Difluoroethane (LCC)	ND	10	ug/l	0.05	EL12202	22-Dec-11	22-Dec-11	EPA 8260B	
Methyl tertiary-butyl ether (MTBE)	ND	0.50	"	"	"	"	"	"	
Diisopropyl ether (DIPE)	ND	1.0	"	"	"	"	"	"	
Ethyl tert-butyl ether (ETBE)	ND	1.0	"	"	"	"	"	"	
Tertiary-amyl methyl ether (TAME)	ND	1.0	"	"	"	"	"	"	
Tertiary-butyl alcohol (TBA)	ND	5.0	"	"	"	"	"	"	
Benzene	ND	0.10	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
m,p-Xylene	ND	0.50	"	"	"	"	"	"	
o-Xylene	ND	0.50	"	"	"	"	"	"	
Naphthalene	ND	0.10	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*108 %*		*75-125*	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*99.9 %*		*75-125*	"	"	"	"	
Surrogate: Toluene-d8		*104 %*		*75-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*118 %*		*75-125*	"	"	"	"	

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Volatile Organic Compounds by EPA Method 8260B Modified

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SG-2-5' Dup, P383cc (E112096-05) Vapor Sampled: 22-Dec-11 Received: 22-Dec-11									
1,1-Difluoroethane (LCC)	ND	10	ug/l	0.05	EL12202	22-Dec-11	22-Dec-11	EPA 8260B	
Methyl tertiary-butyl ether (MTBE)	ND	0.50	"	"	"	"	"	"	
Diisopropyl ether (DIPE)	ND	1.0	"	"	"	"	"	"	
Ethyl tert-butyl ether (ETBE)	ND	1.0	"	"	"	"	"	"	
Tertiary-amyl methyl ether (TAME)	ND	1.0	"	"	"	"	"	"	
Tertiary-butyl alcohol (TBA)	ND	5.0	"	"	"	"	"	"	
Benzene	ND	0.10	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
m,p-Xylene	ND	0.50	"	"	"	"	"	"	
o-Xylene	ND	0.50	"	"	"	"	"	"	
Naphthalene	ND	0.10	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*112 %*	*75-125*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*105 %*	*75-125*		"	"	"	"	
Surrogate: Toluene-d8		*105 %*	*75-125*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*121 %*	*75-125*		"	"	"	"	
SG-3-5', P333cc (E112096-06) Vapor Sampled: 22-Dec-11 Received: 22-Dec-11									
1,1-Difluoroethane (LCC)	ND	10	ug/l	0.05	EL12202	22-Dec-11	22-Dec-11	EPA 8260B	
Methyl tertiary-butyl ether (MTBE)	ND	0.50	"	"	"	"	"	"	
Diisopropyl ether (DIPE)	ND	1.0	"	"	"	"	"	"	
Ethyl tert-butyl ether (ETBE)	ND	1.0	"	"	"	"	"	"	
Tertiary-amyl methyl ether (TAME)	ND	1.0	"	"	"	"	"	"	
Tertiary-butyl alcohol (TBA)	ND	5.0	"	"	"	"	"	"	
Benzene	ND	0.10	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
m,p-Xylene	ND	0.50	"	"	"	"	"	"	
o-Xylene	ND	0.50	"	"	"	"	"	"	
Naphthalene	ND	0.10	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*107 %*	*75-125*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*98.6 %*	*75-125*		"	"	"	"	
Surrogate: Toluene-d8		*102 %*	*75-125*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*124 %*	*75-125*		"	"	"	"	

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Volatile Organic Compounds by EPA Method 8260B Modified

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SG-4-5', P99cc (E112096-07) Vapor Sampled: 22-Dec-11 Received: 22-Dec-11									
1,1-Difluoroethane (LCC)	ND	10	ug/l	0.05	EL12202	22-Dec-11	22-Dec-11	EPA 8260B	
Methyl tertiary-butyl ether (MTBE)	ND	0.50	"	"	"	"	"	"	
Diisopropyl ether (DIPE)	ND	1.0	"	"	"	"	"	"	
Ethyl tert-butyl ether (ETBE)	ND	1.0	"	"	"	"	"	"	
Tertiary-amyl methyl ether (TAME)	ND	1.0	"	"	"	"	"	"	
Tertiary-butyl alcohol (TBA)	ND	5.0	"	"	"	"	"	"	
Benzene	ND	0.10	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
m,p-Xylene	ND	0.50	"	"	"	"	"	"	
o-Xylene	ND	0.50	"	"	"	"	"	"	
Naphthalene	ND	0.10	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*111 %*		*75-125*	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*99.0 %*		*75-125*	"	"	"	"	
Surrogate: Toluene-d8		*103 %*		*75-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*120 %*		*75-125*	"	"	"	"	
SG-5-5', P99cc (E112096-08) Vapor Sampled: 22-Dec-11 Received: 22-Dec-11									
1,1-Difluoroethane (LCC)	ND	10	ug/l	0.05	EL12202	22-Dec-11	22-Dec-11	EPA 8260B	
Methyl tertiary-butyl ether (MTBE)	ND	0.50	"	"	"	"	"	"	
Diisopropyl ether (DIPE)	ND	1.0	"	"	"	"	"	"	
Ethyl tert-butyl ether (ETBE)	ND	1.0	"	"	"	"	"	"	
Tertiary-amyl methyl ether (TAME)	ND	1.0	"	"	"	"	"	"	
Tertiary-butyl alcohol (TBA)	ND	5.0	"	"	"	"	"	"	
Benzene	ND	0.10	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
m,p-Xylene	ND	0.50	"	"	"	"	"	"	
o-Xylene	ND	0.50	"	"	"	"	"	"	
Naphthalene	ND	0.10	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*109 %*		*75-125*	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*96.5 %*		*75-125*	"	"	"	"	
Surrogate: Toluene-d8		*104 %*		*75-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*114 %*		*75-125*	"	"	"	"	

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E2 Environmental 15375 Barranca Pkwy, Suite F-106 Irvine, CA 92618	Project: EE122211-L4 Project Number: 1004.200.009 / 236 Pico Ave. Project Manager: Mr. Tom Faludy	Reported: 03-Jan-12 10:30

Volatile Organic Compounds by EPA Method 8260B Modified - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EL12202 - EPA 5030										
Blank (EL12202-BLK1)				Prepared & Analyzed: 22-Dec-11						
1,1-Difluoroethane (LCC)	ND	10	ug/l							
Methyl tertiary-butyl ether (MTBE)	ND	0.50	"							
Diisopropyl ether (DIPE)	ND	1.0	"							
Ethyl tert-butyl ether (ETBE)	ND	1.0	"							
Tertiary-amyl methyl ether (TAME)	ND	1.0	"							
Tertiary-butyl alcohol (TBA)	ND	5.0	"							
Benzene	ND	0.10	"							
Toluene	ND	1.0	"							
Ethylbenzene	ND	0.50	"							
m,p-Xylene	ND	0.50	"							
o-Xylene	ND	0.50	"							
Naphthalene	ND	0.10	"							
Surrogate: Dibromofluoromethane	*2.65*		*"*	*2.50*		*106*	*75-125*			
Surrogate: 1,2-Dichloroethane-d4	*2.32*		*"*	*2.50*		*92.8*	*75-125*			
Surrogate: Toluene-d8	*2.56*		*"*	*2.50*		*102*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*2.92*		*"*	*2.50*		*117*	*75-125*			
LCS (EL12202-BS1)				Prepared & Analyzed: 22-Dec-11						
Benzene	2.45	0.10	ug/l	2.50		98.2	70-130			
Toluene	2.43	1.0	"	2.50		97.2	70-130			
Ethylbenzene	2.62	0.50	"	2.50		105	70-130			
m,p-Xylene	4.80	0.50	"	5.00		96.0	70-130			
o-Xylene	2.38	0.50	"	2.50		95.3	70-130			
Surrogate: Dibromofluoromethane	*2.66*		*"*	*2.50*		*106*	*75-130*			
Surrogate: 1,2-Dichloroethane-d4	*2.46*		*"*	*2.50*		*98.4*	*75-125*			
Surrogate: Toluene-d8	*2.58*		*"*	*2.50*		*103*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*2.96*		*"*	*2.50*		*119*	*75-125*			

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E2 Environmental 15375 Barranca Pkwy, Suite F-106 Irvine, CA 92618	Project: EE122211-L4 Project Number: 1004.200.009 / 236 Pico Ave. Project Manager: Mr. Tom Faludy	Reported: 03-Jan-12 10:30

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Appendix

H&P Mobile Geochemistry, Inc. is approved as an Environmental Laboratory in conformance with the Environmental Laboratory Accreditation Program (CA) for the category of Volatile and Semi-Volatile Organic Chemistry of Hazardous Waste for the following methods:

Certificate# 2741, 2743, 2579, 2754 & 2740 approved for EPA 8260 and LUFT GC/MS
Certificate# 2742, 2745, & 2741 approved for LUFT
Certificate# 2745 & 2742 approved for EPA 418.1

H&P Mobile Geochemistry, Inc. is approved as an Environmental Laboratory in conformance with the National Environmental Accreditation Conference Standards for the category Environmental Analysis Air and Emissions for the following analytes and methods:

1,2,4-Trichlorobenzene by EPA TO-15 & TO-14A
Hexachlorobutadiene by EPA TO-15 & TO-14A
1,2,4-Trimethylbenzene by EPA TO -14A
1,2-Dichlorobenzene by EPA TO-15 & TO-14A
1,3,5-Trimethylbenzene by EPA TO -14A
1,4-Dichlorobenzene by EPA TO-15 & TO-14A
Benzene by EPA TO-15 & TO-14A
Chlorobenzene by EPA TO-15 & TO-14A
Ethyl benzene by EPA TO-15 & TO-14A
Styrene by EPA TO-15 & TO-14A
Toluene by EPA TO-15 & TO-14A
Total Xylenes by EPA TO-15 & TO-14A
1,1,1-Trichloroethane by EPA TO-15 & TO-14A
1,1,2,2-Tetrachloroethane by EPA TO-15 & TO-14A
1,1,2-Trichloroethane by EPA TO-15 & TO-14A
1,1-Dichloroethane by EPA TO-15 & TO-14A
1,1-Dichloroethene by EPA TO-15 & TO-14A
1,2-Dichloroethane by EPA TO-15 & TO-14A
1,2-Dichloropropane by EPA TO-15 & TO-14A
Bromoform by EPA TO-15
Bromomethane by EPA TO-15 & TO-14A
Carbon tetrachloride by EPA TO-15 & TO-14A
Chloroethane by EPA TO-15
Chloroform by EPA TO-15 & TO-14A
Chloromethane by EPA TO-15 & TO-14A
cis-1,2-Dichloroethene by EPA TO-15
cis-1,2-Dichloropropene by EPA TO-15 & TO-14A
Methylene chloride by EPA TO -15 & TO-14A
Tetrachloroethane by EPA TO-15 & TO-14A
trans-1,2-Dichloroethene by EPA TO-15
trans-1,2-Dichloropropene by EPA TO-15 & TO-14A
Trichloroethene by EPA TO-15 & TO-14A
Vinyl chloride by EPA TO -15 & TO-14A
2-Butanone by EPA TO-15
4-Methyl-2-Pentanone by EPA TO-15
Hexane by EPA TO-15
Methyl tert-butyl ether by EPA TO-15
Vinyl acetate by EPA TO-15

This certification applies to samples analyzed in summa canisters.

Chain of Custody Record

H&P Mobile Geochemistry Inc.

☒ 2470 Impala Dr., Carlsbad, CA 92010 • ph 760.804.9678 • fax 760.804.9159
☐ 1855 Coronado Ave., Signal Hill, CA 90755 • ph 800.834.9888

Date: 12/22/11
H&P Project # EE122211-L4
Outside Lab:

Client: E2 Environmental
Address: 15375 Barranca Pkwy, Ste F-106, Irvine, CA 92618
Email: tfaludy@e2env.com; geologist@prodigy.net
Collector: Dave Pride
Client Project # 1004.200.009
Location: 236 Pico Ave. San Marcos, CA
Phone: 949-453-8085
Fax:
Page: 1 of 1
Project Contact: Tom Faludy
Turn around time: on site

Geotracker EDF: Yes ☒ No ☐
Global ID:
Excel EDD: Yes ☒ No ☐

Sample Receipt
Intact: ☒ Yes ☐ No
Seal Intact: ☐ Yes ☐ No ☒ N/A
Cold: ☐ Yes ☐ No ☒ N/A
Temperature: 20°C

Special Instructions: No Analytes of interest detected from PVT. Will use default of 3 PV for remaining locations.

Lab Work Order # EL12096 EL12202

Sample Name	Field Point Name	Purge Vol	Time	Date	Sample Type	Container Type	Total # of containers	8260B Full List ☐	8260B ☐ BTEX/OXY ☐ TPH gas	8015M TPH ☐ g ☐ d ☐ ext	418.1 TRPH	VOC's: Full List ☐ 8260B ☐ TO-15	VOC's: Short List/DTSC ☐ 8260B ☐ TO-15	VOC's: SAM, 8260B ☐ SAM A ☒ SAM B	Naphthalene ☐ 8260B ☐ TO-15	Oxygenates ☐ 8260B ☐ TO-15	TPHv gas ☐ 8260B ☐ TO-15	Ketones ☐ 8260B ☐ TO-15	Other ☐ 8260B ☐ TO-15	Leak Check Compound ☐ 1,1 DFA ☐ OTHER	Methane	Fixed Gases ☐ CO_2 ☐ O_2 ☐ N_2
								SOIL/GW				SOIL VAPOR/AIR ANALYSIS										
SG-1-5' 1PV	SG-1	111cc	0923	12/22/11	Vapor	Glass Syringe	1							X								
SG-1-5' 3PV	SG-1	333cc	0924	↓	↓	↓	1							↓								
SG-1-5' 7PV	SG-1	777cc	0926				1															
SG-2-5'	SG-2	333cc	1056				1															
SG-2-5' Dup	SG-2	383cc	1057				1															
SG-3-5'	SG-3	333cc	1116				1															
SG-4-5'	SG-4	99cc	1141				1															
SG-5-5'	SG-5	99cc	1214	↓	↓	↓	1							↓								

Relinquished by: (Signature)	(company)	Received by: (Signature)	(company)	Date:	Time:
[signature]	E2 Env.	Daniel Pride	H&P	12/22/11	1225
Relinquished by: (Signature)	(company)	Received by: (Signature)	(company)	Date:	Time:
Relinquished by: (Signature)	(company)	Received by: (Signature)	(company)	Date:	Time:

*Signature constitutes authorization to proceed with analysis and acceptance of condition on back.

Sample disposal instruction: ☐ Disposal ☐ Return to client ☐ Pickup

H&P Mobile Geochemistry Inc.

Vapor Collection Log Sheet

Project Name / Location: **EE122211-L4 / 236 Pico Ave. San Marcos, CA**

Date: **12/22/2010**

Client: **E2 Environmental** Field Rep: Youssef

Arrival Time: 0740

H&P Representative: Dave Pride, Keith Fenore

Departure Time: 1230

Overtime: N/A Approved By: N/A

	Sample ID	Sample Collection Time	Sample Container SV0033	Probe Depth (ft)	Boring Diam (in) *if applicable*	Sandpack Depth (inches)	Tubing Length (ft)	Tubing Diam. (in.)	Sample Volume collected	Purge Volume (mL)	Flow Rate (mL/min)	Probe Vac Pressure Notes	Leak Check Type: 1,1-DFA	Shut In Test
1	SG-1-5' 1PV	0923	Glass Syring	5	~~2.25~~ 1.5	12	7	1/8	50cc	111	~200	ND	1,1-DFA	✓
2	SG-1-5' 3PV	0924	SV0034	5	~~2.25~~ 1.5	12	7	1/8	50cc	333	~200	ND		✓
3	SG-1-5' 7PV	0926	SV0035	5	~~2.25~~ 1.5	12	7	1/8	50cc	777	~200	ND		✓
4	SG-2-5'	1056	SV0038	5	1.5	12	7	1/8	50cc	333	~200	ND		✓
5	SG-2-5' Dup	1057	SV0033	5	1.5	12	7	1/8	50cc	383	~200	ND		✓
6	SG-3-5'	1116	SV0034	5	1.5	12	7	1/8	50cc	333	~200	ND		✓
7	SG-4-5'	1141	SV0035	5	1.0	12	7	1/8	50cc	99	~200	ND		✓
8	SG-5-5'	1214	SV0038	5	1.0	12	7	1/8	50cc	99	~200	ND		✓
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														

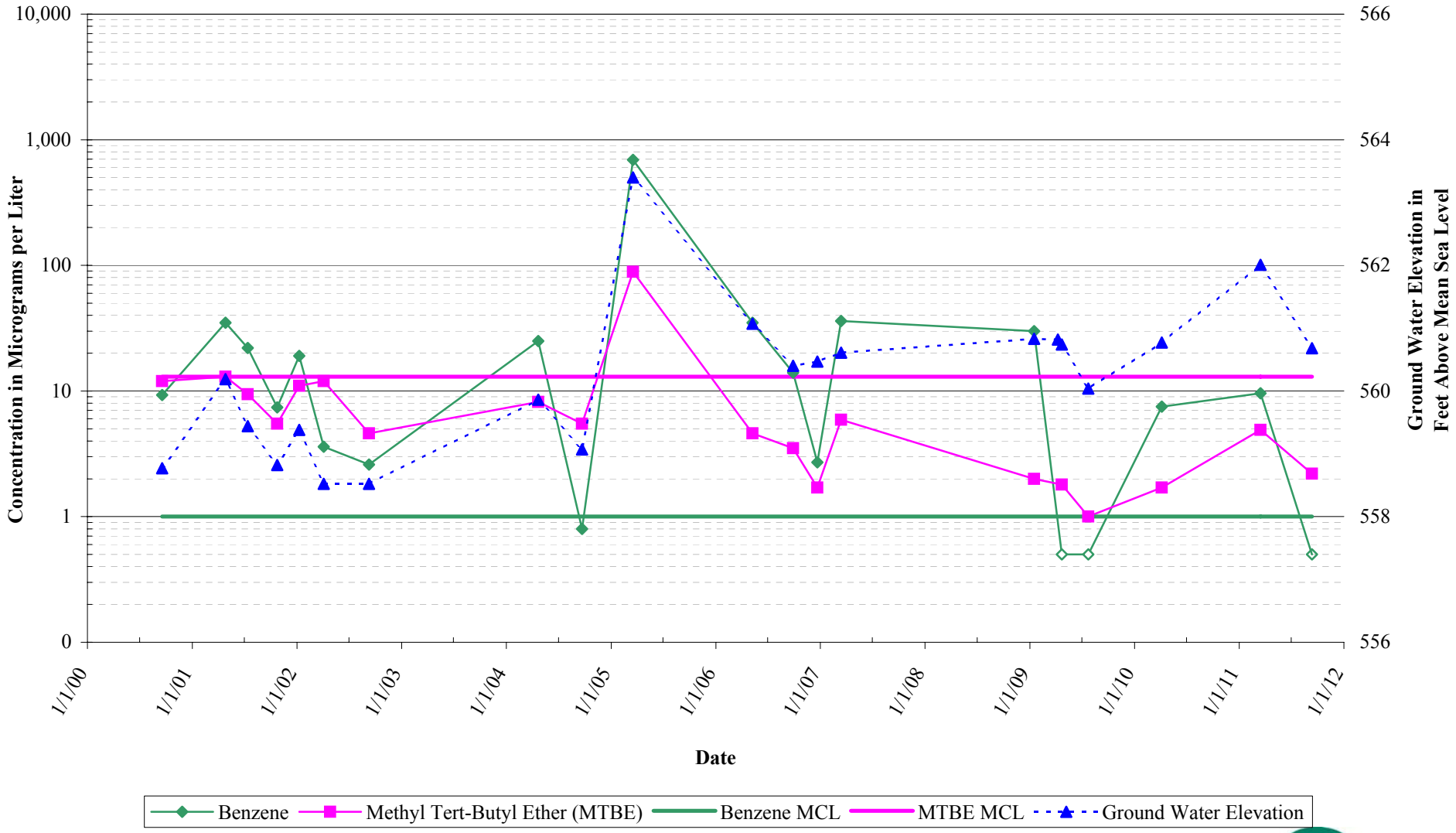
Field Notes:

Appendix E

Benzene and MTBE Concentrations in Groundwater

AVOCET
ENVIRONMENTAL, INC.

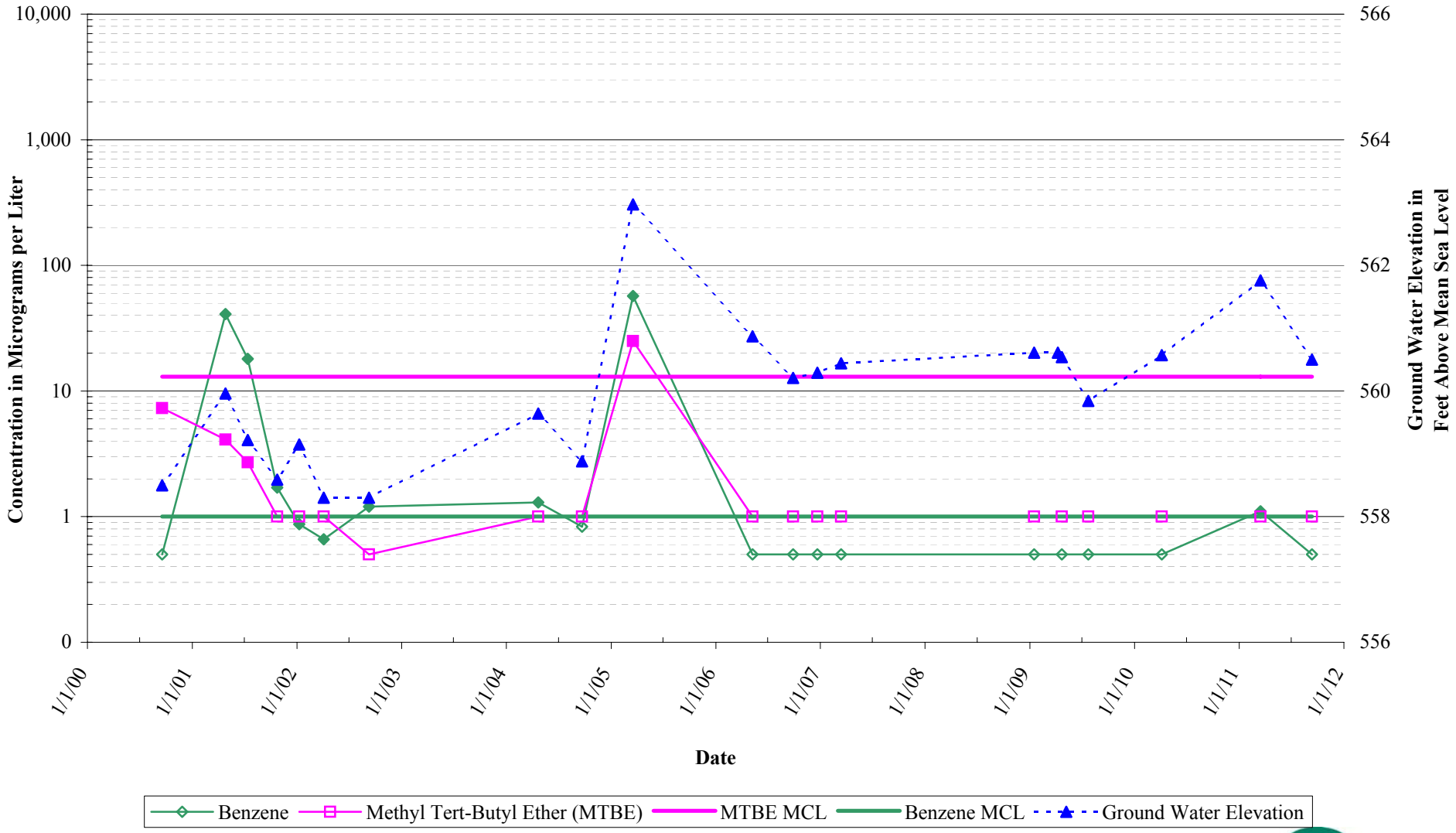
Graph 1
Well MW-1 Hydrograph with Historic Dissolved Benzene and MTBE Concentrations in Ground Water
Former San Marcos Forest Fire Station, San Marcos, California



Notes:
Maximum Contaminant Level (MCL) in Drinking Water
Open symbols indicate non-detects at the report laboratory limit.

e2 environmental

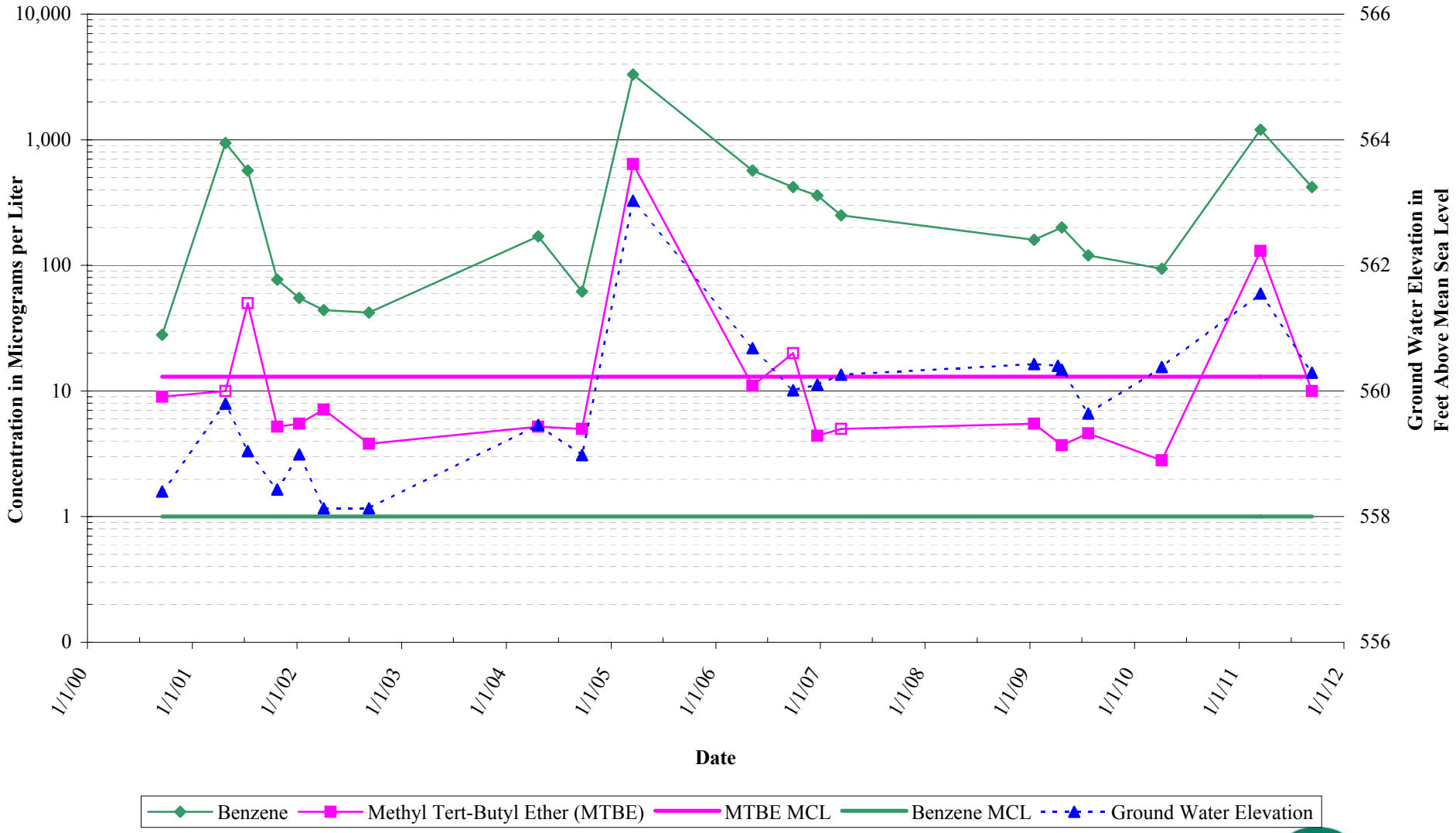
Graph 2
Well MW-2 Hydrograph with Historic Dissolved Benzene and MTBE Concentrations in Ground Water
Former San Marcos Forest Fire Station, San Marcos, California



Notes:
Maximum Contaminant Level (MCL) in Drinking Water
Open symbols indicate non-detects at the report laboratory limit.

e2 environmental

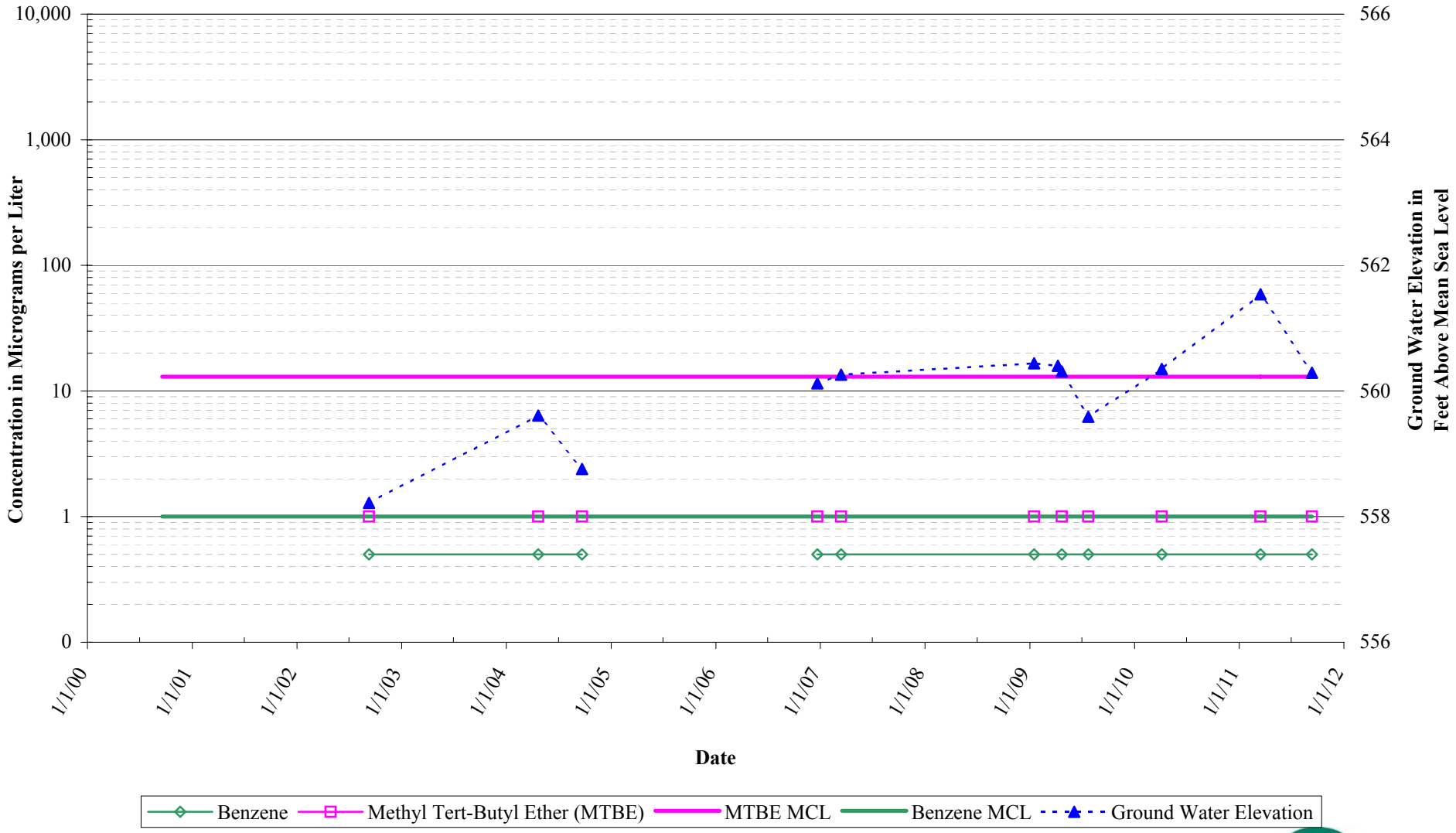
Graph 3
Well MW-3 Hydrograph with Historic Dissolved Benzene and MTBE Concentrations in Ground Water
Former San Marcos Forest Fire Station, San Marcos, California



Notes:
Maximum Contaminant Level (MCL) in Drinking Water
Open symbols indicate non-detects at the report laboratory limit.

e2 environmental

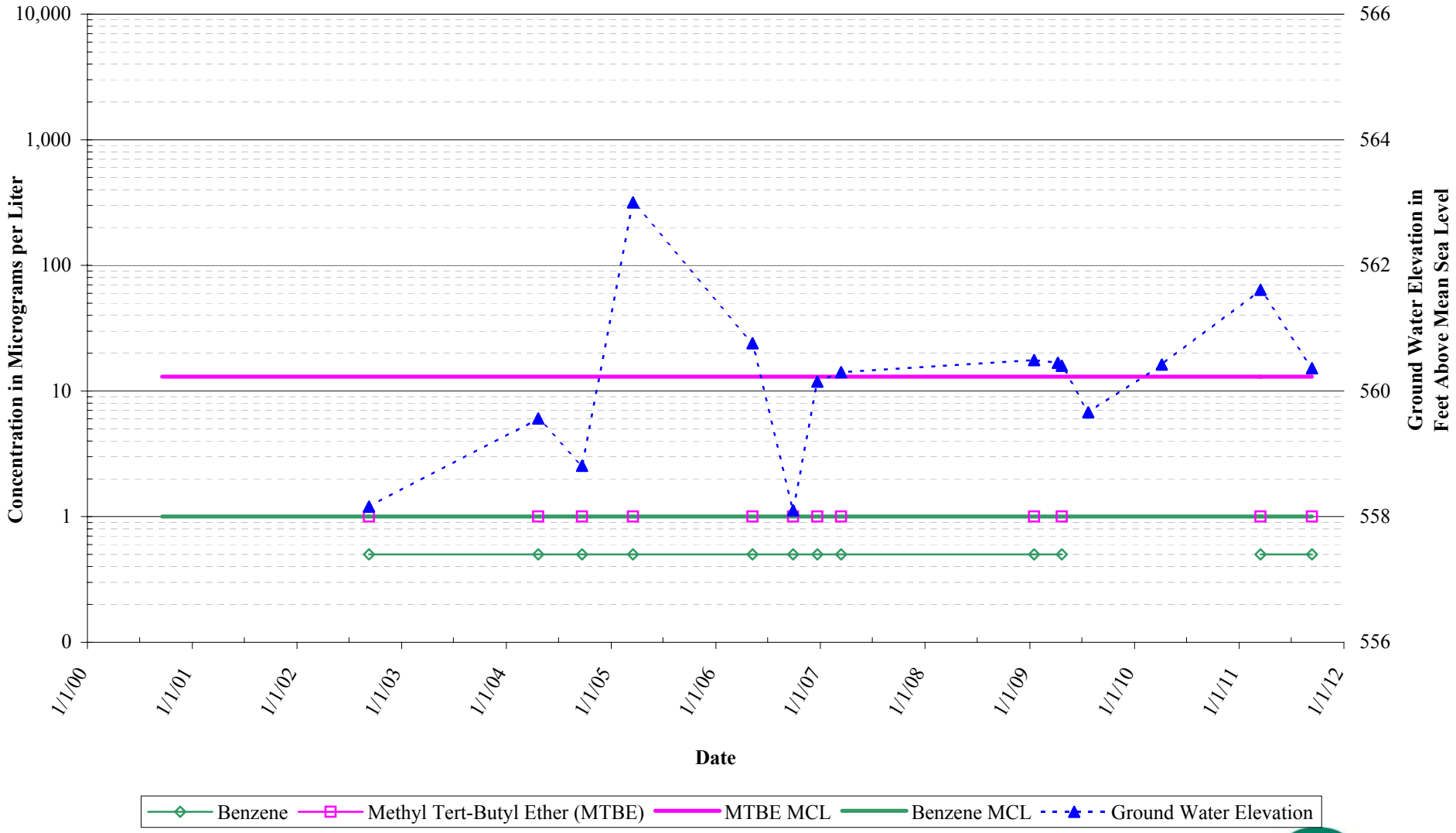
Graph 4
Well MW-4 Hydrograph with Historic Dissolved Benzene and MTBE Concentrations in Ground Water
Former San Marcos Forest Fire Station, San Marcos, California



Notes:
Maximum Contaminant Level (MCL) in Drinking Water
Open symbols indicate non-detects at the report laboratory limit.

e2 environmental

Graph 5
Well MW-5 Hydrograph with Historic Dissolved Benzene and MTBE Concentrations in Ground Water
Former San Marcos Forest Fire Station, San Marcos, California



Notes:
Maximum Contaminant Level (MCL) in Drinking Water
Open symbols indicate non-detects at the report laboratory limit.

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