ConocoPhillips
76 Broadway
Sacramento, California 95818

February 9, 2011

Mr. Jerry Wickham
Alameda County Health Agency
1131 Harbor Bay Parkway
Alameda, California 94502-6577

Re: **Supplemental Monitoring and Sampling Work Plan Transmittal**
76 Service Station #4186
1771 First Street
Livermore, California
Fuel leak Case No. RO0000436

Dear Mr. Wickham:

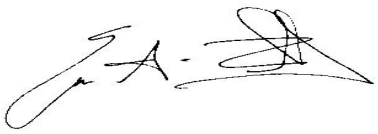
I declare under penalty of perjury that to the best of my knowledge the information and/or recommendations contained in the attached report is/are true and correct.

If you have any questions or need additional information, please call:

Ted Moise (Contractor)
ConocoPhillips
Risk Management & Remediation
76 Broadway
Sacramento, CA 95818

Phone: (510) 245-5162
Fax: (918) 662-4480
Ted.Moise@contractor.conocophillips.com

Sincerely,



Eric G. Hetrick
Site Manager
Risk Management & Remediation

Attachment

SUPPLEMENTAL MONITORING AND SAMPLING WORKPLAN

76 Station 4186
1771 First St
Livermore, CA

Antea Group Project No. C1Q4186010

February 9, 2011

Prepared for:
ConocoPhillips
76 Broadway
Sacramento, CA 95818

Prepared by:
Antea™Group
11050 White Rock Road
Suite 110
Rancho Cordova, CA
95670

Inogen Environmental Alliance

Antea USA, Inc.

Antea Group
11050 White Rock Road, Suite 110
Rancho Cordova, California 95670
www.anteagroup.com

February 9, 2011

Ms. Barbara Jakub
Alameda County Health Care Service Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Re: **SUPPLEMENTAL MONITORING AND SAMPLING WORKPLAN**
76 Service Station No. 4186
1771 First Street
Livermore, California
Fuel Leak case No. RO0000436

Dear Ms. Jakub:

Due to global rebranding, as of January 5, 2011 Delta Consultants has become Antea Group. Any reports submitted prior to this date will still be referenced as Delta reports.

On behalf of ConocoPhillips Company (COP), Antea Group (Antea) has prepared this *Supplemental Monitoring and Sampling Work Plan* in response to Alameda County Healthcare Services Letter to COP dated October 25, 2010 (**Appendix A**).

Please contact Jim Barnard at (916) 503-1279 if you have any questions

Sincerely,

ANTEA GROUP

James B. Barnard
Project Manager

Cc: Mr. Ted Moise, ConocoPhillips (electronic copy only)

Inogen

SUPPLEMENTAL MONITORING AND SAMPLING WORK PLAN
76 Service Station No. 4186
1771 First Street
Livermore, California

February 9, 2010

Prepared for:

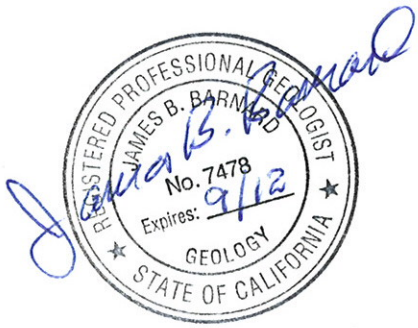
ConocoPhillips Company
76 Broadway
Sacramento, California

The material and data in this report were prepared under the supervision and direction of the undersigned

ANTEA GROUP

Alan Buehler
Staff Geologist

James B. Barnard
Project Manager
California Registered Professional Geologist No. 7478



1.0 INTRODUCTION

On behalf of ConocoPhillips, Delta has prepared this work plan for 76 Service Station No. 4186 located at 1771 First Street, Livermore, California (**Figure 1**). The purpose of this work plan is to outline the proposed installation of four magnesium sulfate application wells.

2.0 SITE BACKGROUND

The site is located on the southwest corner of the intersection of First Street and N Street (**Figure 1**), and is an active 76 service station. Two 10,000 gallon gasoline underground storage tanks (USTs), four dispenser islands, and a station building are present at the site (**Figure 2**). The site is located in a generally commercial area.

2.1 PREVIOUS ASSESSMENT

June 1996: During dispenser piping replacement activities, six soil samples were collected beneath the dispensers and product piping. Total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene, and total xylenes (BTEX) were below the laboratory's indicated reporting limits in all of the samples.

September 1997: A soil gas survey was conducted at the site. Six soil gas probes were advanced and samples were collected at 3 and 15 feet below ground surface (bgs) in the vicinity of the USTs, dispenser islands, and product lines. TPHg was reported in the samples at concentrations ranging from 41 to 4,500 parts per billion (ppb), benzene was reported at concentrations up to 110 ppb, and methyl tert butyl ether (MTBE) was reported at concentrations up to 8,000 ppb. The highest concentrations were reported in the area of the USTs.

June 1998: Three groundwater monitoring wells (U-1 through U-3) were installed at the site to depth of 34 feet bgs. TPHg, benzene, and MTBE were below laboratory reporting limits in soil samples collected from the well borings. The approximate well locations are shown in **Figure 2**.

May 2000: A site conceptual model (SCM) was completed for the site. The groundwater flow velocity was calculated to estimate plume travel time to the nearest down-gradient receptor. Groundwater velocity was calculated to be 46 feet per year. It was concluded that hydrocarbon impact to groundwater appears to fluctuate with the rise and fall of the groundwater surface beneath the site.

February 2001: Two additional monitoring wells (U-4 and (U-5) were installed. The monitoring wells were installed to depths of 45 feet bgs (U-4) and 47 feet bgs (U-5). TPHg, BTEX, and MTBE were below laboratory reporting limits in soil samples collected from the well boring. TPHg and benzene were below laboratory reporting limits in the initial groundwater samples collected from wells U-4 and U-5; however, MTBE was reported at concentrations of 38.2 and 55.4 micrograms per liter (ug/L) respectively. The approximate well locations are shown in **Figure 2**.

December 2001: Two additional monitoring wells (U-6 and U-7) and eight ozone injection sparge wells (SP-1 through SP-4, SP-5/5S, SP-6S, SP-7S, and SP-8/8S) were installed at the site. The monitoring wells were installed to 45 feet bgs. The sparge points in wells SP-1 through SP-4 were installed to a depth of 45 feet bgs. The sparge points in wells SP-6S and SP-7S were installed to a shallower depth of 25 feet bgs. The remaining two sparge wells each contained dual-nested sparge points installed to 25 feet bgs (SP-5S and SP-8S) and 45 feet bgs (SP-5 and SP-8). An ozone microsparge system was then installed and began operation in December 2001. The system injected ozone into the 10 sparge points. Approximate locations are shown in **Figure 2**.

April 2006: Seven borings (B-1 through B-7) were advanced at the site. Three boreholes were advanced at each location. The initial borehole was advanced to record a Cone Penetrometer Test (CPT) log of subsurface lithology. The second borehole was advanced for the purpose of collecting soil samples for observation and laboratory analysis, and to collect discrete groundwater samples at depths of approximately 38 feet to 44 feet bgs. The third borehole was advanced to

collect discrete groundwater samples at approximately 57 to 65 feet bgs. Three general stratigraphic zones were identified: an upper zone from 36 to 43 feet bgs, a middle clay zone from 43 to 55 feet bgs, and a lower zone from 55 to the maximum depth of 65.5 feet bgs explored. Soil samples from various depths were submitted for laboratory analysis. TPHg was reported in five upper zone, six clay zone, and three lower zone soil samples at concentrations of 700 milligrams per kilogram (mg/kg). MTBE was reported in three upper zone, three clay zone, and two lower zone samples at concentrations up to 0.29 mg/kg. Benzene was reported in three clay zone soil samples at concentrations up to 1.3 mg/kg. TPHg was reported in all of the 14 groundwater samples collected at concentrations up to 26,000 ug/L. Benzene was reported in five upper zone, and six lower zone groundwater samples at concentration up to 510 ug/L. MTBE was reported in four upper zone and six lower zone groundwater samples at concentrations up to 1,100 ug/L.

March 2007: Two additional on-site borings (B8 and B-9) and one off-site boring (B-10) were advanced using a CPT rig. The borings were advanced to further evaluate the vertical extent of impacted groundwater to the base of the lowermost sand and gravel unit, to evaluate groundwater quality in the lowermost sand and gravel unit down-gradient of the site, and to evaluate the presence of a clay layer underlying the lowermost coarse-grained soils which may represent a regional aquitard. Four soil samples were collected for laboratory analysis from off-site boring B-10. MTBE was reported in two of the samples at concentrations up to 0.016 mg/kg; TPHg and benzene were below laboratory reporting limits in all of the soil samples collected for analysis. TPHg (200 ug/L), benzene (0.94 ug/L), and MTBE (7.1 ug/L) were reported in the groundwater samples collected at 79 to 83 feet bgs from boring B-8. TPHg, BTEX, and fuel oxygenates were below laboratory reporting limits in the groundwater samples collected at 78 to 88 feet bgs from boring B-9. A low concentration of MTBE (0.73 ug/L) was reported in groundwater samples collected at 66 to 70 feet bgs from boring B-10, and a low concentration of toluene (1.4 ug/L) was reported in the groundwater sample collected between 83 to 87 feet bgs from boring B-10. Based on the results of the investigation, soil and groundwater in the area of off-site boring B-10 did not appear to be significantly impacted, groundwater within the lowermost sand and gravel unit in the area of boring B-8 was slightly impacted, and groundwater within the lowermost sand and gravel unit in the area of B-9 was not impacted.

March 2007: Oxygen injection testing was performed in the sparge wells to evaluate radius of influence and to evaluate the effectiveness of the existing system. As described in our Additional Subsurface Assessment Report, dated April 26, 2007, the testing suggested a ROI of between 10 to 15 feet around the wells on average, but perhaps greater in some area. This system has been inactive for the past year due to concerns about the injection of ozone causing oxidation of trivalent chromium [Cr(III)] into hexavalent chromium [Cr(VI)].

September and October of 2008: Delta installed eight more groundwater monitoring wells. Wells U-8 through U-11 were deemed Middle Zone Monitoring Wells, and installed to depths ranging from 45 to 50 feet bgs. The middle zone wells were constructed as 2 inch diameter wells with 10 foot screen intervals. Wells U-12 through U-15 were deemed Lower Zone Monitoring Wells, and installed to depths ranging from 71.5 to 75 feet bgs. The lower zone wells were constructed as 4 inch diameter wells with 10 foot screened intervals, and with 12 inch diameter steel conductor casing from surface to between 52 to 57 feet bgs.

Quarterly monitoring of the site wells has been performed since July 1998. Historically, the groundwater flow direction has varied from north to southwest. The depth to groundwater has varied from 21.62 to 46.31 feet bgs.

2.2 SUBSURFACE CONDITIONS

The site is underlain by sand and gravel to a depth of approximately 20 feet bgs. This is underlain by a clay layer from approximately 20 to 35 feet bgs with a sandy layer from approximately 35 to 45 feet bgs. There is another clay layer from approximately 40 feet bgs to a maximum explored depth of 50 feet bgs.

3.0 SUPPLEMENTAL MONITORING AND SAMPLING

As requested in the ACEH letter dated October 25, 2010, the purpose of this workplan is to propose a supplemental monitoring and sampling (M&S) program to amend the current M&S program for this site.

In the ACEH letter dated October 25, 2010, the agency wants to address whether Tertiary-Butyl Alcohol (TBA) is degrading under current conditions in the aquifer and has suggested using a method called Compound Specific Isotope Analysis (CSIA). Antea Group proposes the CSIA analysis of TBA to gain an indirect understanding of TBA degradation within an aquifer. Additionally, samples will be tested for TBA's daughter product(s) such as Tertiary Butyl Format (TBF).

Therefore, Antea Group recommends that the one-time, one well (U-10) analysis of TPHg, BTEX, MTBE and TBA be analyzed by CSIA, as well as quantifying the concentration of TBF.

4.0 LIMITATONS

The recommendations contained in this report represent Antea's professional opinions based upon the currently available information and are arrived at in accordance with currently acceptable professional standards. This report is based upon a specific scope of work requested by the client. The Contract between Antea and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of Antea's Client and anyone else specifically listed on this report. Antea will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, Antea makes no express or implied warranty as to the contents of this report.

CONSULTANT: Antea Group

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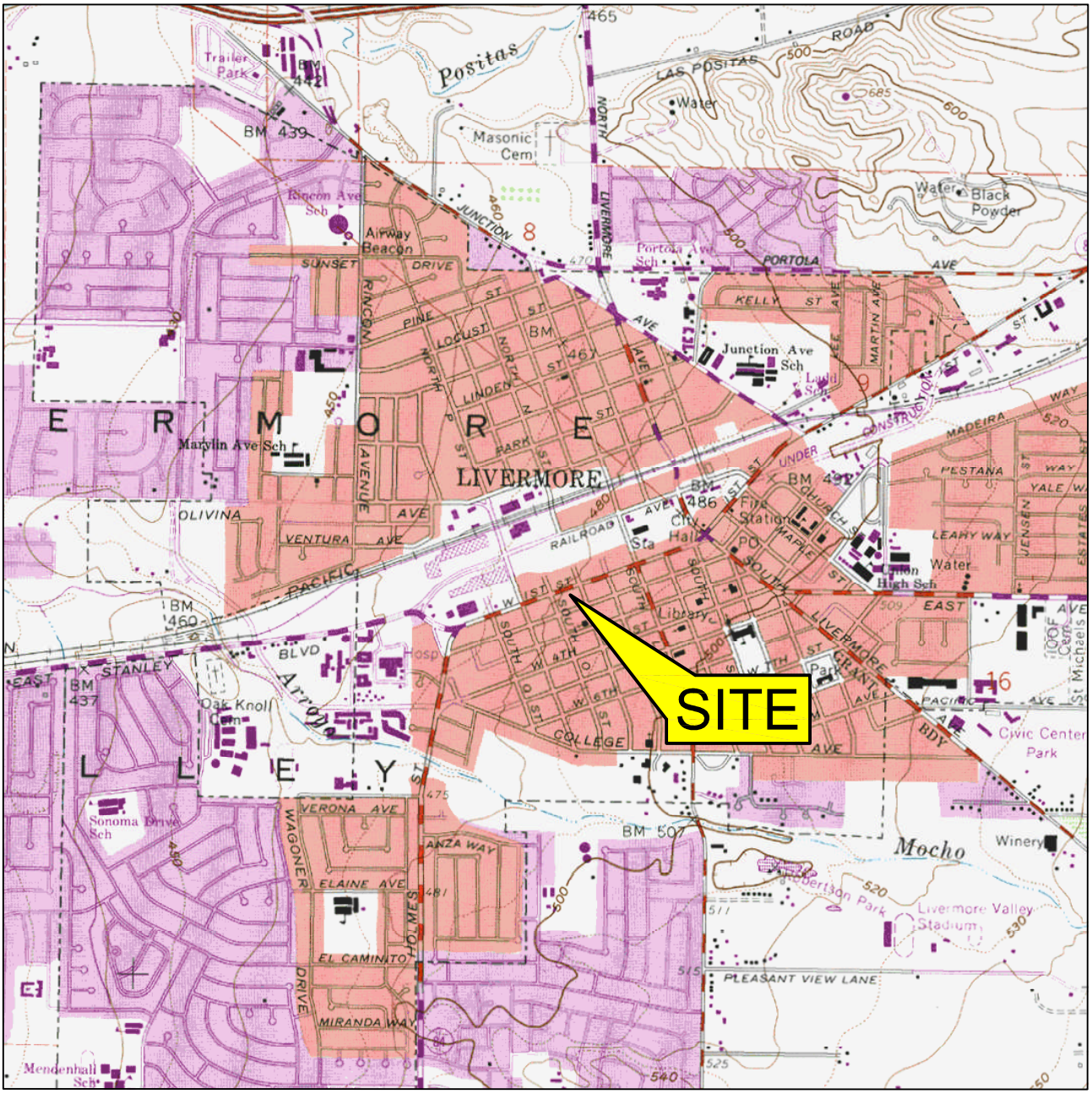
FIGURES

Figure 1 – Site Locator Map
Figure 2 – Site Map with Current Monitoring and Sparge Wells

APPENDICES

Appendix A – ACEH Letter dated October 25, 2010

FIGURES



0 1000 FT 2000 FT

SCALE: 1 : 24,000

North

FIGURE 1

SITE LOCATION MAP

76 STATION NO. 4186
1771 FIRST STREET
LIVERMORE, CA

PROJECT NO. C104-186	DRAWN BY MC 12/28/05
FILE NO. Site Locator 4186	PREPARED BY MC
REVISION NO. 1	REVIEWED BY

antea group

SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP, CALABASAS QUADRANGLE, 1967

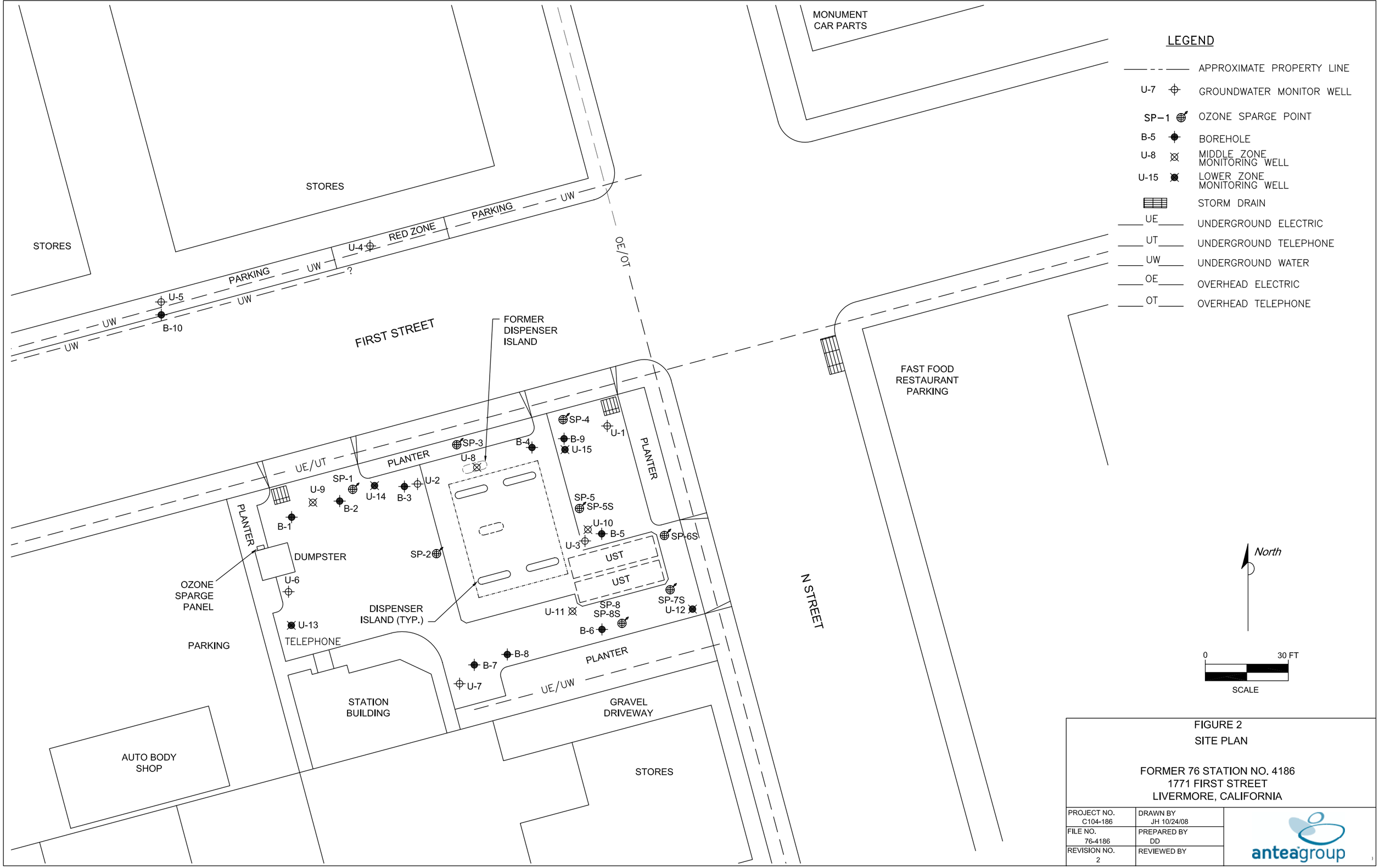


FIGURE 2
SITE PLAN

FORMER 76 STATION NO. 4186
1771 FIRST STREET
LIVERMORE, CALIFORNIA

PROJECT NO. C104-186	DRAWN BY JH 10/24/08
FILE NO. 76-4186	PREPARED BY DD
REVISION NO. 2	REVIEWED BY

antea group

APPENDIX A
ACEH Letter dated October 25, 2010

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
ALEX BRISCOE, Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

October 25, 2010

Bill Borgh (*Sent via E-mail to: Bill.Borgh@conocophillips.com*)
ConocoPhillips
76 Broadway
Sacramento, CA 95818

Thomas and Celine Vadakkekunnel
4481 Peacock Court
Dublin, CA 94568

Subject: Review of Technical Report for Fuel Leak Case No. RO0000436 and Geotracker Global ID T0600101777, Unocal #4186, 1771 First Street, Livermore, CA 94550

Dear Mr. Borgh and Mr. and Ms. Vadakkekunnel:

Alameda County Environmental Health (ACEH) staff has reviewed the fuel leak case file for the above-referenced site including the recently submitted document entitled, "*Magnesium Sulfate Pilot Test Report*," dated September 15, 2010 (Report). The Report, which was prepared on your behalf by Delta Consultants, presents results from a pilot test of magnesium sulfate injection using existing monitoring well U-11.

We request that you address the following technical comment, perform the proposed work, and send us the reports described below.

TECHNICAL COMMENTS

1. **Laboratory Analyses.** In our conditional work plan approval letter dated May 4, 2010, we requested that you include analysis for TBA using EPA Method 8260B in addition to the proposed laboratory analyses of groundwater samples collected prior to and following the introduction of magnesium sulfate in well U-11. Our request was based on a review of historical groundwater monitoring data, which indicates that although some decreases in concentrations have been observed over time for TPHg, BTEX, and MTBE, TBA concentrations have remained elevated. The recalcitrance of TBA is a concern for this site. Unfortunately, TBA was not included as an analyte for the groundwater samples collected prior to and following the introduction of magnesium sulfate. Therefore, potential effects of the magnesium sulfate injection upon TBA concentrations during the pilot test are not known. This represents a data gap for the pilot test.

2. **Conclusions and Recommendations.** The Report concludes that the applied sulfate is being adequately utilized as opposed to dispersed based on decreases in sulfate concentrations in the injection well and the lack of significant sulfate concentrations in the observation wells. Although sulfate is likely being used as a terminal electron acceptor to some extent, it is not clear whether the observed decreases in sulfate concentrations are due primarily to utilization or dispersion. MTBE and TPHg concentrations have increased in the application well and most observation wells. The Report recommends continued monitoring of biodegradation parameters on a semi-annual basis. We generally have no objection to this recommendation. However, in order to address the issue of whether TBA is degrading under current conditions in the aquifer, we request that you supplement the proposed groundwater monitoring with more specific and precise analyses such as compound-specific isotope analysis (CSIA). CSIA can be used to definitively demonstrate whether TBA or other fuel hydrocarbons or oxygenates are undergoing biodegradation. Please submit a brief work plan to supplement groundwater monitoring to more definitively demonstrate biodegradation.

TECHNICAL REPORT REQUEST

Please submit technical reports to Alameda County Environmental Health (Attention: Jerry Wickham), according to the following schedule:

- **December 10, 2010** – Work Plan to Supplement Groundwater Monitoring
- **February 10, 2011** – Semi-Annual Monitoring Report – Fourth Quarter 2010
- **August 10, 2011** – Semi-Annual Monitoring Report – Second Quarter 2011

If you have any questions, please call me at 510-567-6791 or send me an electronic mail message at jerry.wickham@acgov.org.

Sincerely,

Jerry Wickham, California PG 3766, CEG 1177, and CHG 297
Senior Hazardous Materials Specialist

Attachment: Responsible Party(ies) Legal Requirements/Obligations

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Danielle Stefani, Livermore Pleasanton Fire Department, 3560 Nevada St, Pleasanton, CA 94566 (*Sent via E-mail to: dstefani@lpfire.org*)

Cheryl Dizon (QIC 8021), Zone 7 Water Agency, 100 North Canyons Pkwy, Livermore, CA 94551 (*Sent via E-mail to: cdizon@zone7water.com*)

James Barnard, Delta Environmental, 11050 White Rock Road, Suite 110, Rancho Cordova, CA 95670 (*Sent via E-mail to: JBarnard@deltaenv.com*)

Donna Drogos, ACEH (*Sent via E-mail to: donna.drogos@acgov.org*)
Jerry Wickham, ACEH (*Sent via E-mail to: jerry.wickham@acgov.org*)

GeoTracker, File

Attachment 1

Responsible Party(ies) Legal Requirements/Obligations

REPORT REQUESTS

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

ELECTRONIC SUBMITTAL OF REPORTS

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

PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

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

UNDERGROUND STORAGE TANK CLEANUP FUND

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

AGENCY OVERSIGHT

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

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

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

REQUIREMENTS

- Entire report including cover letter must be submitted to the ftp site as **a single portable document format (PDF) with no password protection**. (Please do not submit reports as attachments to electronic mail.)
- It is **preferable** that reports be converted to PDF format from their original format, (e.g., Microsoft Word) rather than scanned.
- Signature pages and perjury statements **must** be included and have either original or electronic signature.
- **Do not password protect the document**. Once indexed and inserted into the correct electronic case file, the document will be secured in compliance with the County's current security standards and a password. **Documents with password protection will not be accepted**.
- Each page in the PDF document should be rotated in the direction that will make it easiest to read on a computer monitor.
- Reports must be named and saved using the following naming convention:
  RO#_Report Name_Year-Month-Date (e.g., RO#5555_WorkPlan_2005-06-14)

Additional Recommendations

- A separate copy of the tables in the document should be submitted by e-mail to your Caseworker in **Excel** format. These are for use by assigned Caseworker only.

Submission Instructions

1) Obtain User Name and Password:
   a) Contact the Alameda County Environmental Health Department to obtain a User Name and Password to upload files to the ftp site.
      i) Send an e-mail to dehloptoxic@acgov.org
         Or
      ii) Send a fax on company letterhead to (510) 337-9335, to the attention of Teena Le Khan.
   b) In the subject line of your request, be sure to include **"ftp PASSWORD REQUEST"** and in the body of your request, include the **Contact Information, Site Addresses**, and the **Case Numbers (RO# available in Geotracker) you will be posting for**.

2) Upload Files to the ftp Site
   a) Using Internet Explorer (IE4+), go to ftp://alcoftp1.acgov.org
      (i) Note: Netscape and Firefox browsers will not open the FTP site.
   b) Click on Page on upper right side of browser, and then scroll down to Open FTP Site in Windows Explorer.
   c) Enter your User Name and Password. (Note: Both are Case Sensitive.)
   d) Open "My Computer" on your computer and navigate to the file(s) you wish to upload to the ftp site.
   e) With both "My Computer" and the ftp site open in separate windows, drag and drop the file(s) from "My Computer" to the ftp window.

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