

RD-36



Shaw™ Shaw Environmental, Inc.

4005 Port Chicago Hwy
Concord, California 94520

Alameda County
MAY 27 2005
Environmental Health Agency

May 23, 2005

Mr. Robert Schultz
Alameda County Health Agency
1131 Harbor Bay Parkway
Alameda, California 94502

Re: **Report Transmittal**
Work Plan – Site Assessment
76 Service Station #4186
1771 First Street
Livermore, CA

Dear Mr. Schultz:

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 me at (916) 558-7609.

Sincerely,

Shelby Suzanne Lathrop
Project Manager
Shaw Environmental, Inc.
Approved service provider of ConocoPhillips -Risk Management & Remediation
Cell: 707-592-1146

Client Contact Information:
ConocoPhillips
76 Broadway
Sacramento, California 95818
Client office: 916-558-7609
Client fax: 916-558-7639

Attachment
cc: Liz Sewell, ConocoPhillips



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Pleasanton, California 94588
www.atc-enviro.com
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May 23, 2005

Mr. Robert Schultz
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

Re: Work Plan – Site Assessment
ATC Project No. 75.75118.1237 / 75W02
76 Service Station No. 4186 / CoP No. WNO 1237
1771 First Street
Livermore, California

Alameda County
MAY 27 2005
Environmental Health

Dear Mr. Schultz:

ATC Associates Inc. (ATC) has prepared this Work Plan on behalf of ConocoPhillips Company for the above referenced property, Figure 1. Proposed scope of services presented herein includes the installation of one monitor well.

The purpose of the additional monitor well is to further define the extent of the dissolved MtBE hydrocarbon plume in the up-gradient direction, west of the UST pad. Historic groundwater collected from monitor well U-3 has contained MtBE concentration in excess of 6,200 ug/l. The elevated MtBE concentrations appear to be confined to the area surrounding the UST system (tank pad), but are currently not defined in the up-gradient direction. Refer to Figure 2 for the proposed well locations.

SITE DESCRIPTION

The subject site is an operating service station located on the southwest corner of the intersection of First Street (State Highway 84) and N Street in Livermore, California (Figure 2). The site is bounded on the north by First Street, on the east by N Street, and on the south and west by commercial buildings. Properties in the immediate site vicinity are used for a mix of commercial purposes that include restaurants, automobile repair shops, and shopping facilities. The site is located at an approximate elevation of 480 feet above mean sea level (MSL).

Current aboveground site facilities consist of four dispenser islands, a canopy and a station building/convenience store. Two 10,000-gallon gasoline USTs are located in a common pit on the east side of the site.

SITE BACKGROUND AND ACTIVITY

On June 6, 1996, six soil samples were collected from beneath the fuel dispensers and along the product delivery piping during dispenser and piping replacement activities. Analytical results were reported as not detected (ND) for Total Petroleum Hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene and total xylenes (BTEX) for all samples collected beneath the dispenser islands and product delivery piping.

On September 10, 1997, a soil gas survey was conducted as part of a baseline site evaluation associated with the property transfer from Unocal Corporation to Tosco. Six soil gas probes were advanced and samples collected at 3 or 15 feet bgs in the vicinity of the UST complex, dispenser islands, and product lines. Analytical results ranged from 41 to 4,500 parts per billion by volume (ppb-v) of TPHg, ND to 110 ppb-v of benzene and ND to 8,000 ppb-v of MtBE. The area of highest soil vapor concentration was reported to be localized around the UST complex.

On April 8, 1998, the Alameda County Zone 7 Water Agency files were reviewed to identify water supply wells located within a one half mile radius from the site. Two municipal wells were identified approximately 1,500 and 1,800 feet northwest of the site, and two domestic wells were located approximately 1,900 and 2,800 feet southwest and west of the site.

On June 16, 1998, three 2-inch diameter groundwater monitor wells (U-1 through U-3) were installed. The wells were installed to a depth of approximately 34 feet bgs. Soil samples collected from the three wells were reported as ND for TPHg, benzene, and MtBE.

In May of 2000, a site conceptual model (SCM) was completed for the site. In the SCM, a groundwater flow velocity was calculated to determine the plume travel time to the nearest receptor. Ground water velocity was calculated at 46 feet per year. The SCM concluded that hydrocarbon impact to groundwater appears to fluctuate with the historical rise and fall of the groundwater surface beneath the site.

On February 21, 2001, two 2-inch diameter offsite groundwater monitor wells (U-4 and U-5) were installed at the locations shown on Figure 2. The wells were installed to a depth of approximately 47 feet bgs. TPHg, BTEX or MtBE were not detected in any of the soil samples analyzed. TPHg and benzene were non-detectable in the groundwater samples analyzed from wells U-4 and U-5. Other than MtBE, fuel oxygenates were also non-detectable. MtBE was detected in groundwater samples from both wells U-4 and U-5 at concentrations of 38.2 and 55.4 ug/l, respectively. Groundwater monitoring and sampling of the wells was initiated in July of 1998, and has continued on a quarterly basis to the present time. Historically, groundwater flow directions have varied from north to southwest. Depth to groundwater has varied from approximately 23 to 46 feet below top of casing.

On December 5 – 7, 2001, two monitor wells (U-6 and U-7) and eight ozone microsparge points (SP-1 through SP-8) were installed. The monitor wells were installed to 46 feet bgs using 8-inch diameter hollow stem augers. Borings SP-1 through SP-8 were completed as sparge points with the installation of 2-inch diameter KVA sparge points attached to ¾-inch diameter blank schedule 80 PVC casing through the hollow-stem augers. The sparge points are composed of 30-inch long microporous plastic. Sparge points SP-1 through SP-4 were installed to a depth of 45 feet bgs. Sparge points SP-6S and SP-7S were installed to a depth of 25 feet bgs. The remaining two sparge locations contained nested sparge points (SP-5, SP-5S, SP-8 and SP-8S) installed to 25 and 45 feet bgs in each boring, respectively. Upon completion of the sparge point installation, an interim remedial measure system was installed consisting of a K-V Associates, Inc. (KVA) "C-Sparge" ozone microsparge system.

SITE GEOLOGY AND HYDROGEOLOGY

The subject site is located in the Livermore Valley in the north-central Coast ranges and is underlain by interfingering Holocene age alluvial fan and gravel facies. These deposits are composed of semi-consolidated deposit of sand and gravel in a matrix of clayey sand. The Livermore Valley contains several northwest trending faults. The site is approximately 1.0 mile southwest of the Mocho Fault and approximately 1 1/2-mile miles northeast of the Livermore Fault. Previous field investigations have determined that the unsaturated (vadose) zone is comprised predominantly of gravel with varying amounts of clay, silt, and sand. The saturated zone is comprised predominantly of clay with varying amounts of silt, sand, and gravel.

Groundwater was initially encountered at depths ranging from 24 to 25 feet bgs. Historical monitoring data indicate that the static depth to water varies from 23 to 31 feet bgs. Historical groundwater flow direction has also varied from the north to the southwest at an average gradient of 0.02 ft/ft. The nearest surface water to the site is the Arroyo Mocho Creek, located approximately 2,900 feet south of the site.

PROPOSED SCOPE OF WORK

The proposed scope of work includes the following activities:

- Conduct utility clearance and obtain drilling permit from the Zone 7 Water Agency and Alameda County Public Works Agency;
- Install one monitor well to approximately 45 feet bgs with the initial 5 feet completed with “air-knife” technology as shown on Figure 3;
- Collect soil and groundwater samples for laboratory analysis from the monitor well borehole location;
- Contract a licensed land surveyor to generate a site map and survey the new monitor well;
- Upload monitor well x, y, z coordinates and analytical laboratory data into the State of California Geotracker System per requirements of AB 2886; and
- Prepare a report of findings.

Pre-Field Investigation Activities

ATC will conduct a utility survey prior to conducting the field investigation. Underground Services Alert (USA) will be notified at least 48 hours prior to installing the proposed monitor well, and the services of a private utility locating company will be utilized to reduce the risk of damage to any utilities beneath the property. Additionally, prior to installing the monitor well, the first 5-feet of each borehole will be cleared using an air knife or hydrovak rig.

ATC will prepare a site-specific Health and Safety (H&S) plan in accordance Title 8, Section 5192 of the California Code of Regulations. The H&S plan will contain a list of emergency contacts, as well as a hospital route map to the nearest emergency facility.

A drilling permit will be obtained from the Zone 7 Water Agency and Alameda County Public Works Agency prior to scheduling the field work.

Monitor Well Installation and Soil Sampling Procedures

The monitor well (refer to Figure 2) will be installed by a C-57 licensed contractor using a drill rig equipped with 8-inch diameter hollow-stem augers. A sufficient number of clean augers will be brought on site by the drilling contractor each day of the field work. All decontamination of the auger flights will occur at the drilling contractor's off site facility.

Soil samples will be collected and logged continuously using a California-modified split-spoon sampler. Soil samples will be collected using 6-inch long by 2-inch diameter brass sample tubes. The middle sample tube from each interval will be sealed with Teflon tape and plastic end caps and placed in a chest cooled with ice for delivery to the analytical laboratory for chemical analysis. The remaining soil collected from the sample tubes will be used for field screening and lithologic description purposes. Soil samples from each sample interval will be field screened for the presence of volatile organic compounds (VOCs) using a photoionization detector (PID). It is anticipated that two soil samples per boring will be collected for laboratory analysis. The PID readings will be recorded on the soil boring log by the field geologist. All soil samples will be logged using the Unified Soil Classification System (USCS).

The monitor well will be constructed using 2-inch diameter polyvinyl chloride (PVC) well casing and screen (0.020-slot) and will be designed based upon field conditions observed while drilling. The well construction details will consist of well screen from approximately 25 to 35 feet bgs and well casing from 0 to 25 feet bgs. The exact intervals will be dependent upon observed aquifer and hydrocarbon impact conditions. The sand pack will consist of #2/12 Monterey sand, the well will be sealed with hydrated bentonite chips and Portland cement. The well will be set to grade and the well head covered with a traffic-rated vault box. Figure 3 depicts a typical monitor well construction diagram.

Monitor Well Development and Sampling Procedures

After a minimum of 48 hours has elapsed following the completion of the well it will be developed using a surge block and centrifugal pump equipped with disposable polyethylene tubing. A minimum of 10 well casing volumes will be removed from each well during the development process.

After the well has been developed and a minimum of 24 hours have elapsed, groundwater samples will be collected for laboratory analysis. The well will be purged using a centrifugal pump equipped with 3/8-inch disposable polyethylene tubing. A minimum of three well casing volumes will be purged from the well prior to collecting groundwater samples for laboratory analysis. Water temperature, conductivity, pH, and dissolved oxygen will be monitored during the purging of each well to ensure that groundwater from the surrounding formation has entered the well casing prior to sample collection. These environmental parameter readings will be noted on field sampling data sheets, copies of which will be provided in the report of findings.

Groundwater samples will be collected from the tubing once the environmental parameters have stabilized. New polyethylene tubing and bailers will be used to purge and sample each well. After groundwater samples have been collected, the sample containers (40 milliliter glass vials) will be placed in a chest cooled with ice and transported to a state-certified laboratory for chemical analysis.

Laboratory Analysis

All soil and groundwater samples will be submitted under chain of custody protocol to Severn Trent Laboratories, Inc., a California-certified laboratory located in Pleasanton, California. The soil and

groundwater samples will be analyzed for TPPH using United States Environmental Protection Agency (US EPA) Method 8015 and BTEX, MtBE, DIPE, ETBA, TAME, and ethanol using EPA Method 8260B. Groundwater samples collected from each well will also be analyzed for total dissolved solids (TDS) using US EPA Method 160.1. In addition, for waste profiling purposes, one soil sample will be analyzed for total lead and TCLP lead using EPA Method 6010. Proper chain-of-custody procedures will be followed for sample shipment.

Site Survey and Electronic Deliverable Format (EDF) Upload

ATC will contract with a licensed land surveyor to generate an accurate site map, as well as to provide top of casing elevation and horizontal coordinates for each monitoring well location. The information will be used to produce an accurate site map for the report, as well as to upload analytical data to the State's Geotracker System.

Waste Disposal

All soil cuttings, rinsate fluids and purge water generated during this investigation will be temporarily stored onsite in appropriately labeled 55-gallon Department of Transportation (DOT)-approved drums pending disposal arrangements. The fluids and solids will be transported offsite by a licensed waste hauler once an approved destination for the waste is found.

Report

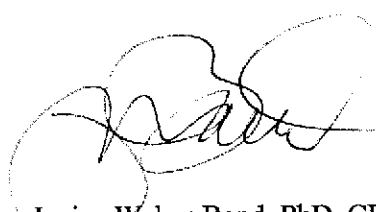
The findings of the field investigation will be presented in a Subsurface Investigation Report. The contents of the report will include a sample location map, copies of the analytical laboratory data sheets, soil boring/monitor well construction logs, a cross section, and conclusions and recommendations for additional investigation and/or monitoring, if appropriate.

If you have any questions regarding the contents of this work plan, please give me a call at (925) 225-7817. Ms. Shelby Lathrop, the ConocoPhillips Site Manager, may also be contacted at (916) 558-7609 for additional questions.

Sincerely,
ATC ASSOCIATES INC.



David A. Evans
Senior Project Manager

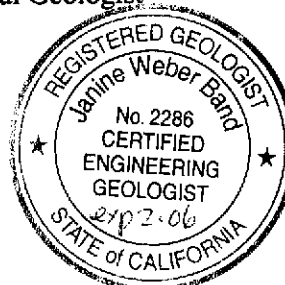


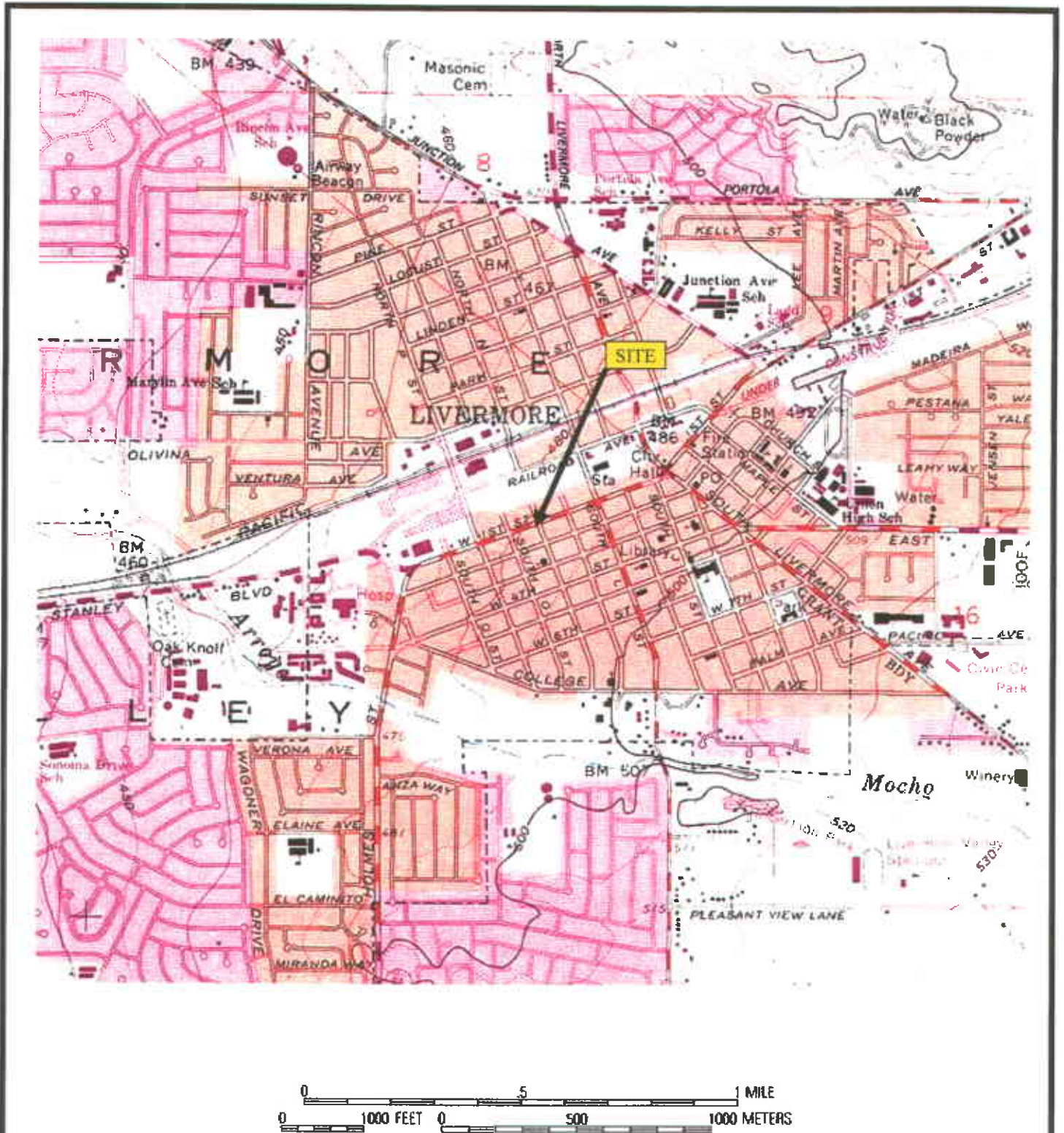
Janine Weber-Band, PhD, CEG #2286
Principal Geologist

Cc: Shelby Lathrop – ConocoPhillips (electronic copy)

Attachments:

- Figure 1 – Site Vicinity Map
- Figure 2 – Site Map with Proposed Well Locations
- Figure 3 – Well Construction Diagram





SOURCE: USGS LIVERMORE QUADRANGLE, CALIFORNIA (7.5 MINUTE SERIES) TOPOGRAPHIC MAP. OBTAINED FROM THE 2000 NATIONAL GEOGRAPHIC TOPO! SOFTWARE.


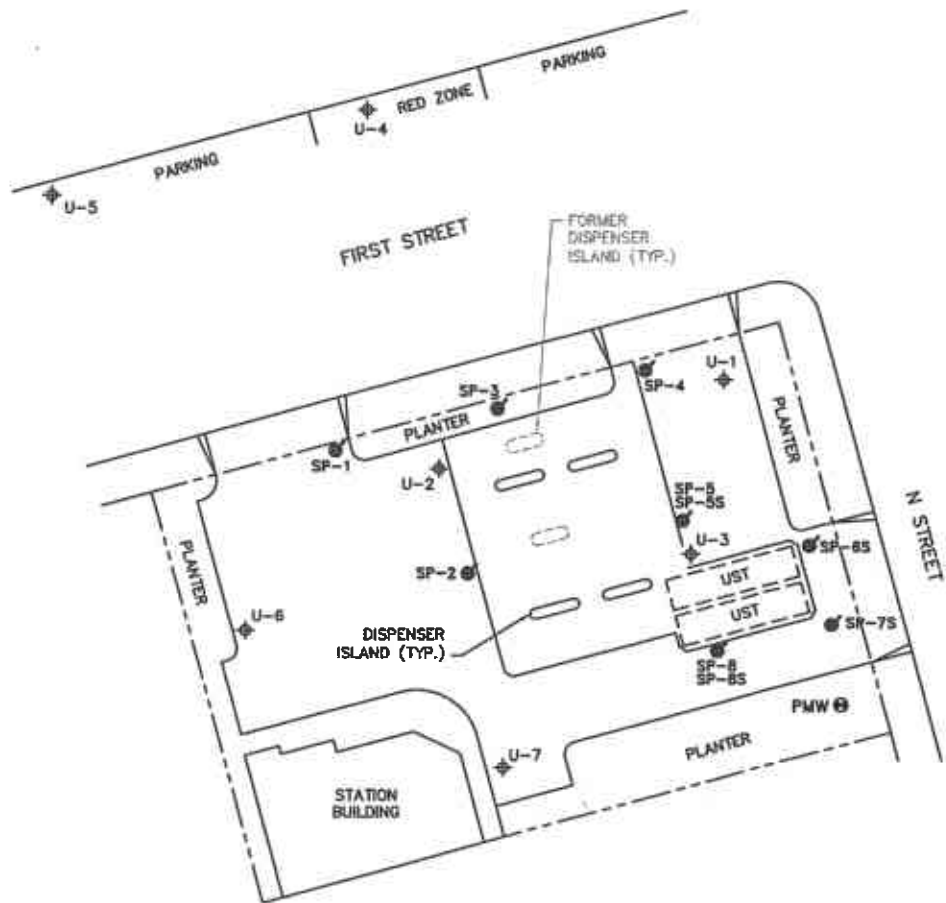
		
6602 Owens Drive, Suite 100 Pleasanton, CA 94588 (925) 460-5300		
PROJECT NO: 75.75118.1237		
DESIGNED BY: DE	SCALE: N/A	REVIEWED BY: DE
DRAWN BY: EC	DATE: 04/05	FILE: 4186 SITE VIC

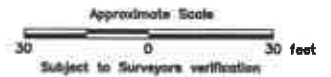
FIGURE 1
SITE VICINITY MAP

76 STATION 4186
 1771 FIRST STREET
 LIVERMORE, CALIFORNIA



LEGEND

- APPROXIMATE PROPERTY LINE
- U-7 ◊ GROUNDWATER MONITOR WELL
- PMW ⊕ PROPOSED GROUNDWATER MONITOR WELL
- SP-1 ⊕ OZONE SPARGE POINT



BASE MAP REFERENCE:
 MODIFIED FROM SITE PLAN SUPPLIED BY
 MILLER BROOKS, ENVIRONMENTAL, INC.

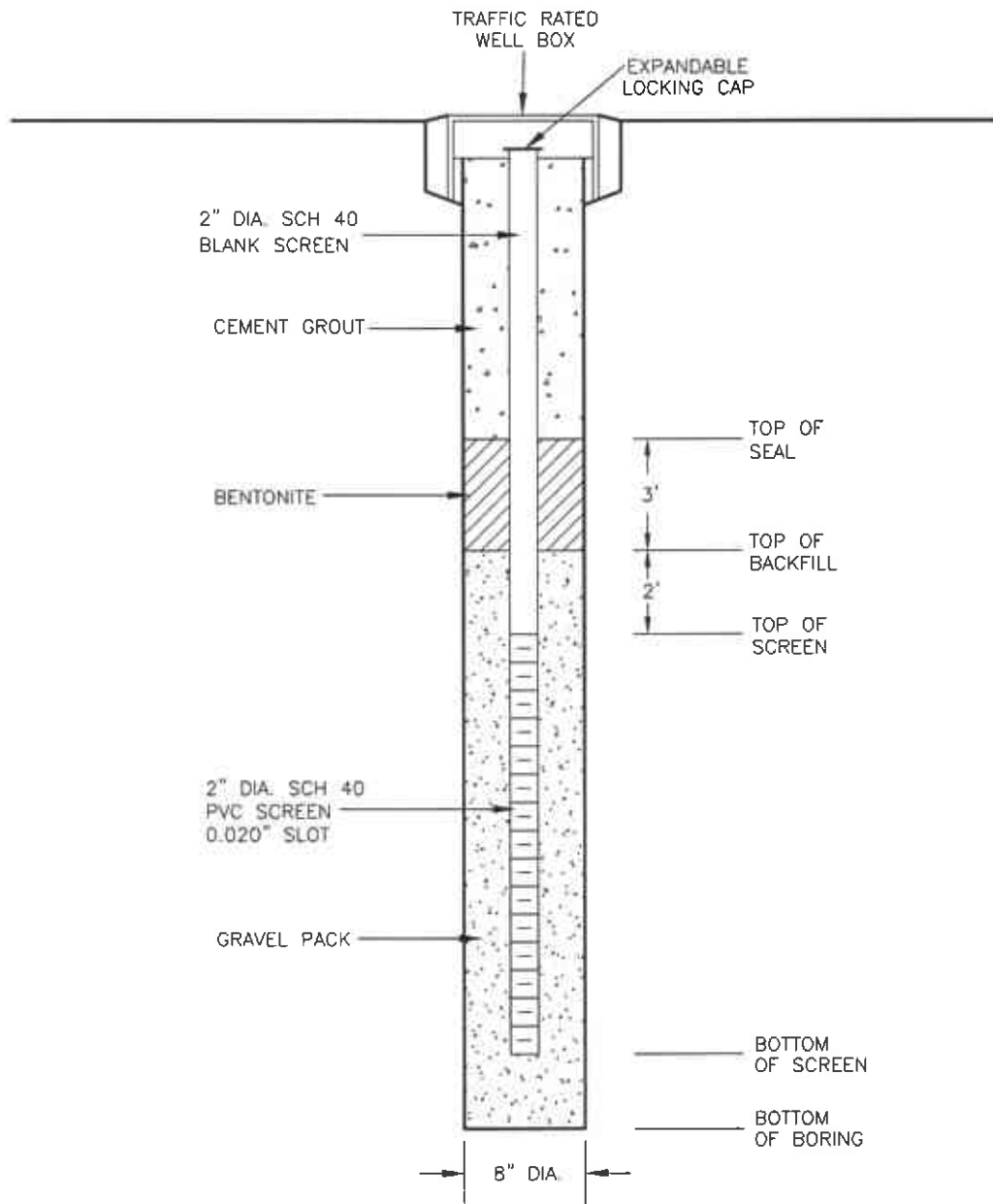


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SCALE AS SHOWN	DRAWING DATE 04/19/05	ACAD FILE 4186-stla plan
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**PROPOSED MONITOR WELL
 LOCATION MAP**

CLIENT CONOCOPHILLIPS	PI DAE		
LOCATION 76 STATION 4186 1771 FIRST STREET LIVERMORE, CALIFORNIA	PE DA		
DESIGNED	DRAWN BY: EC	PROJECT NO. 75.75118.1237	FIGURE 2



NOTES:

1. NOT DRAWN TO SCALE
2. DEPTH MESUREMENTS AND INTERVALS ARE APPROXIMATE. ACTUAL WELL DESIGN WILL BE BASED ON EXPLORATORY BORING AND SITE CONDITIONS



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TYPICAL MONITOR WELL DIAGRAM

FIGURE
 3