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March 31, 2005

Mr. Bob Schultz
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, CA 94501-6577

Subject: Former Exxon RAS #7-3399, 2991 Hopyard Road, Pleasanton, California,
ACHCSA File No. RO-362

Dear Mr. Schultz:

Attached for your review and comment is a copy of the *Soil and Water Investigation Work Plan and Modified Corrective Action Plan* for the above-referenced site. The document was prepared by ETIC Engineering, Inc. of Pleasant Hill, California, in response to your letter dated December 29, 2004.

Upon information and belief, I declare, under penalty of perjury, that the information contained in the attached document is true and correct.

If you have any questions or comments, please contact me at 510.547.8196.

Sincerely,

Jennifer C. Sedlachek
Project Manager

Attachment: ETIC Soil and Water Investigation Work Plan and Modified Corrective Action Plan dated March 2005

c: w/ attachment:
Ms. Cherie McMaulou - California Regional Water Quality Control Board, San Francisco Bay Region
Mr. Matthew Katen - Zone 7 Water Agency
Mr. Stephen Cusenza - City of Pleasanton Public Works Department
Mr. Thomas Elson - Luhdorff and Scalmanini Consulting Engineers
Mr. Joseph A. Aldridge - Valero Energy Corporation

c: w/o attachment:
Ms. Christa Marting - ETIC Engineering, Inc.

ETIC ENGINEERING

# Soil and Water Investigation Work Plan and Modified Corrective Action Plan

## Former Exxon Retail Site 7-3399
## 2991 Hopyard Road
## Pleasanton, California

ACHCSA File No. RO-362

Prepared for

ExxonMobil Oil Corporation
4096 Piedmont Avenue #194
Oakland, California 94611

Prepared by

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2285 Morello Avenue
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3/31/05

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Date

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REGISTERED GEOLOGIST
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STATE OF CALIFORNIA

3/31/05

Date

March 2005

## SITE CONTACTS

| | |
|---|---|
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## INTRODUCTION

At the request of ExxonMobil Oil Corporation (ExxonMobil), ETIC Engineering, Inc. (ETIC) has prepared this Soil and Water Investigation Work Plan and Modified Corrective Action Plan for former Exxon Retail Site (RS) 7-3399, located at 2991 Hopyard Road, Pleasanton, California (Figure 1). This document outlines the proposed scope of work for a soil and groundwater investigation and addresses corrective action issues for the site. The soil and groundwater investigation is proposed to assess the potential impacts of petroleum hydrocarbons and methyl t-butyl ether (MTBE) in the first water bearing zone (designated as Zone 1) in the recent predominant downgradient direction of the current underground storage tanks (USTs). This document has been prepared in response to a letter from the Alameda County Health Care Services Agency (ACHCSA) dated 29 December 2004. Responses to other items listed in the letter from the ACHCSA are also included in this document. A copy of the ACHCSA letter is provided in Appendix A.

Responses to the enumerated items in the letter from the ACHCSA are presented below. These items address work plan and corrective action issues in addition to other issues presented in the letter.

1. The ACHCSA letter indicates that the recent groundwater gradient in Zone 1 is to the southwest and that no monitoring wells screened in Zone 1 are located downgradient of the current USTs. The letter also mentions the previous MTBE results for well OW2, which is located in the current UST backfill, and requests an investigation to characterize groundwater immediately downgradient of the current USTs. A soil and groundwater investigation to characterize groundwater immediately downgradient of the current USTs is outlined in the Proposed Scope of Work section of this document.

2. The ACHCSA letter requests that cleanup goals and cleanup levels be proposed for the site. The letter states that they should be consistent with the water quality objectives of the basin and be protective of human health and the environment including the potential use of groundwater from Pleasanton Well No. 7 as a drinking water source. The cleanup goals and cleanup levels for the site are evaluated in the Cleanup Goals and Site-Specific Levels section of this document.

3. The ACHCSA letter reiterates some of the groundwater extraction system (GES) information which was detailed in the Report of Groundwater Monitoring, Third Quarter 2004, dated November 2004 (ETIC 2004a). The letter states that current hydrocarbon and mass removal rates are very low and that no significant hydraulic control of shallow groundwater is anticipated due to low groundwater yields from the extraction wells. These general conclusions were previously outlined in the Proposed Shutdown of Groundwater Extraction System letter, dated 5 March 2004 (ETIC 2004b).

   The ACHCSA letter also states that ongoing extraction from the current extraction network may interfere with the collection of representative groundwater samples from these wells and that the temporary discontinuation of groundwater extraction be proposed while current site conditions are evaluated. Per a conversation with the ACHCSA on 21 October 2004, the GES was shut down on 27 October 2004 to monitor groundwater under non-pumping conditions. This

shutdown was not reported in the Report of Groundwater Monitoring, Third Quarter 2004, because the shutdown occurred after the reporting period (22 June 2004 to 21 September 2004) stated in the report. The shutdown was reported in the Report of Groundwater Monitoring, Fourth Quarter 2004 (ETIC 2005).

The ACHCSA letter requests a plan for groundwater monitoring with criteria that would trigger restart of the GES. This information is provided in the Monitoring Plan and Restart Criteria section of this document.

4. The ACHCSA letter reiterates the statement in the Proposed Shutdown of Groundwater Extraction System letter (ETIC 2004b) that the extent and concentrations of hydrocarbons and MTBE are stable or decreasing across the site. The letter further states that the inefficiency of the GES may be largely the result of decreasing groundwater levels and requests a series of isoconcentration maps showing current concentrations in each of the water-bearing zones.

   The groundwater extraction wells are screened within the perched zone (including tank backfill wells) and within Zone 1 at the site. Groundwater within the perched zone is only intermittently available for sampling and is currently inadequate for the operation of the system. Groundwater levels in Zone 1 have shown a significant decrease since 2001. Since static groundwater currently occurs at the site in Zone 1 at a depth of approximately 55 feet below ground surface (bgs) and the clay layer which constitutes the bottom of Zone 1 occurs at approximately 57 feet, there is only approximately 2 feet of water within Zone 1, which is inadequate for the operation of the system. To illustrate this point, a hydrograph of MW1, which is located within Zone 1, is provided as Figure 2.

   The current concentrations and maximum concentrations for the past four quarters of benzene, Total Petroleum Hydrocarbons as gasoline (TPH-g), and MTBE in micrograms per liter (µg/L) are shown below:

| | Current Maximum Concentration (20 December 2004) | | Maximum Concentration of the Past Four Quarters | |
|---|---|---|---|---|
| Benzene | <0.5 µg/L | All wells. | 2.20 µg/L | VR1 (22 June 2004) |
| TPH-g | 93.3 µg/L | VR1 | 988 µg/L | VR1 (22 June 2004) |
| MTBE | 6.60 µg/L | VR1 | 43.3 µg/L | VR1 (22 June 2004) |

   As shown in the table above, MTBE and hydrocarbon concentrations are low and appear to be decreasing at the site. The current MTBE and hydrocarbon concentrations for each zone are shown in Figure 1. Since benzene was not detected and since well VR1 is the only well with detectable concentrations of TPH-g and MTBE, isoconcentration maps were not prepared.

5. The ACHCSA letter requests groundwater gradients for each zone from 1988 to the present to evaluate the historical groundwater flow direction. The rose diagrams requested are presented on Figure 1 and the rose diagram data are included in Tables 1A, 1B, and 1C. Rose diagrams are included for the perched zone, Zone 1, and Zone 3. Since Zone 2 includes only two wells (MW5D and MW13) a gradient cannot be calculated for this zone. Rose diagrams for the

perched zone, Zone 1, and Zone 3 will be included in subsequent groundwater monitoring reports. The rose diagrams include the groundwater flow directions that were calculated for previous groundwater monitoring reports dating back to 1988.

6. The ACHCSA letter requests that groundwater samples be collected and analyzed from well MW9A for hydrocarbons and oxygenates. The Report of Groundwater Monitoring, Fourth Quarter 2004 (ETIC 2005) indicates that groundwater samples could not be collected from well MW9A on 20 December 2004. Table 2 of that report indicates that the groundwater level measured in the well is only for the water in the sump (a blank section casing at the bottom of the well), that it is below the screened interval, and that it is not considered representative of site conditions. Groundwater levels in well MW9A will continue to be monitored during the groundwater monitoring events for the site and groundwater samples will be collected from the well if the groundwater is representative of site conditions.

7. The ACHCSA letter requests a detailed plan for post-remedial monitoring. The groundwater monitoring plan for the site is included in the Report of Groundwater Monitoring, Fourth Quarter 2004 (ETIC 2005) as Table 4 and is included in this document as Table 2. After 1 year of post-remedial monitoring, the groundwater monitoring plan will be evaluated and a reduced monitoring schedule may be proposed. This proposal would be submitted to the ACHCSA for approval prior to implementation.

**Site Location, History, and Land Use**

Former Exxon RS 7-3399 is an active retail service station located at 2991 Hopyard Road, on the southeast corner of the intersection with Valley Avenue in Pleasanton, California (Figure 1). The site has six pump islands and two 10,000-gallon and one 12,000-gallon double-walled fiberglass USTs used for dispensing three grades of gasoline. Operation of the site was taken over by Valero Energy Corporation in June 2000. The surrounding land use is primarily commercial and residential.

**Summary of Investigations and Remedial Action Prior to 2000**

Former fuel USTs, originally installed in 1971, were removed from the site in 1988. The current fuel USTs have been in place since that time. The station underwent upgrades in 1997, at which time a 1,000-gallon used-oil tank was removed (Delta 1997). Former and current station features are shown in Figure 1.

Environmental assessment and remedial actions have been conducted at the site since 1988 and have included: soil and groundwater monitoring (1988-present), excavation to 31 feet bgs (39 feet bgs in one 8-by-8-foot area) in the area of the former fuel USTs (1988), liquid-phase hydrocarbon (LPH) removal (1988-1990), groundwater extraction (1988-1990), soil vapor extraction (1989-1993 and 1997-1998), and air sparging/bioventing (1997-2000). Investigations and remedial actions from 1988 to 1996 are summarized in a Problem Assessment Report/Remedial Action Plan (PAR/RAP) prepared by Delta Environmental Consultants, Inc. (Delta 1996). Remedial actions from 1997 to 1999 are additionally summarized in the second/third quarter 1999 monitoring report (Delta 1999).

Prior to 2000, remedial actions focused on the saturated clayey sand to gravel zone encountered from approximately 35 to 55 feet bgs, where water had been first encountered (referred to as Zone 1), and the silts and clays overlying this zone. Groundwater and soil vapor extraction influent concentrations had approached asymptotic levels before shutdown of the respective systems. With the exception of MW9, hydrocarbon concentrations in groundwater samples collected from wells screened in this zone had generally shown a stable or decreasing trend.

**Summary of Investigations and Remedial Action Since 2000**

Well MW9, which was damaged, was pressure grouted and replaced with newly installed well MW9A in November 2000 (ETIC 2001a).

MTBE was detected in several site wells in Zone 1 when quarterly MTBE analysis began in 1995. MTBE was also detected at higher concentrations in groundwater samples collected from a perched water bearing zone located approximately 10 feet beneath portions of the site. MTBE was detected at a maximum concentration of 177,000 µg/L in well OW2, located in the UST backfill, in September 1999. Because of the concentrations of MTBE detected in groundwater and the proximity of water supply wells to the site, additional work was agreed upon by the ACHCSA and other interested parties at a meeting held in May 2000. The work included installation of wells MW12A, MW13, and MW14 as sentry wells between the site and the nearest water supply wells (ETIC 2001b), and implementation of remedial measures to reduce mass and control potential migration of hydrocarbons and MTBE (ETIC 2000).

ETIC installed and began operation of a GES in March 2001. Groundwater was extracted from perched zone wells OW2 and VR1, and Zone 1 well MW9A. When the system is operated, extracted groundwater is pumped from the extraction wells to the existing treatment compound via underground double-contained pipes. Groundwater is filtered and treated by adsorption using granular activated carbon (GAC) to remove dissolved chemicals to meet discharge permit limits. A permit to discharge the treated groundwater from the Dublin-San Ramon Services District is in effect. The system is described in greater detail in a letter to the ACHCSA dated 13 December 2000 (ETIC 2000). Per a conversation with the ACHCSA on 21 October 2004, the GES was shut down on 27 October 2004 to monitor groundwater under non-pumping conditions.

Well construction details are provided in Table 3. Cumulative groundwater monitoring data and system operation data can be found in the Report of Groundwater Monitoring, Fourth Quarter 2005 (ETIC 2005).

**Regional Geology and Hydrogeology**

The site is located in the north-central portion of the Livermore Valley, within the Coast Range Geomorphic Province. The Livermore Valley slopes gently toward the west.

The Livermore Valley is underlain by non-water bearing rocks and water bearing rocks and sediments (DWR 1974). The non-water bearing rocks are marine sandstone, shale, and conglomerate, and sandstone of Eocene to Miocene age. These rocks are exposed in the hills

surrounding Livermore Valley and are found at depths greater than 1,000 feet beneath the valley floor.

The Plio-Pleistocene age Livermore Formation overlaps the Tassajara Formation beneath the north portion of the valley and is exposed over broad regions south of the valley. Sediments of this formation consist primarily of clayey gravel in a sandy clay matrix. Sedimentary units south of the valley dip gently north, are nearly level beneath the valley floor, and dip gently south beneath the north edge of the valley (DWR 1974).

Surficial valley-fill materials overlie both the Tassajara Foundation and the Livermore Formation and range in thickness from a few feet to approximately 400 feet. The Pleistocene to Holocene age sediments include unconsolidated sand, gravel, and clay which occur as terrace deposits, alluvial fan deposits with gravelly clayey facies, alluvium, basin deposits, or channel deposits of active streams (DWR 1974).

Groundwater beneath the area of investigation is located within the Livermore groundwater basin. The sediments and water bearing units comprising the basin include valley-fill materials, the Tassajara Formation, and the Livermore Formation (DWR 1974). The Livermore Valley groundwater basin is characterized by hydrologic discontinuities, and is segregated into sub-basins on the basis of localized faults. The Livermore Valley groundwater system is a multi-layered system with an unconfined aquifer overlying sequential partially confined aquifers. Groundwater in the basin generally flows to the west (DWR 1974). The principal streams in the area are Arroyo Valley Creek and Arroyo Mocho Creek, which flow toward the western end of the valley. Both creeks are greater than one half mile from the site.

**Local Geology and Hydrogeology**

Three water bearing zones, designated Zones 1, 2, and 3, and a perched zone have been identified within the total depth explored in borings advanced for the site. Although these zones were encountered at varying depths, a typical geologic section is described below:

- Perched Zone - A perched water table was discovered at an approximate depth of 10 feet bgs beneath portions of the site. In December 1999, six monitoring wells (PMW1-PMW6) were installed in this perched zone. UST backfill wells OW1 and OW2 are also considered to be part of this zone. Well VR1, screened from approximately 10-30 feet bgs in the former UST overexcavation area, appears to cross this zone; however, water levels in VR1 are generally deeper than those in wells PMW1-PMW6.

- Zone 1 - A clayey sand to gravel zone from approximately 35 to 55 feet bgs. Silts and clays from approximately 55 to 67 feet bgs underlying this zone are observed in the areas explored.

- Zone 2 - A silty sand to gravelly sand is present beneath the silts and clays from approximately 67 to 82 feet bgs. Beneath Zone 2 in the areas explored, a clay layer is present from approximately 82 to 120 feet bgs.

- Zone 3 (also called the deeper zone) - Beneath the clay layer underlying Zone 2 is a saturated zone which grades from silty sand to gravel to the total depth explored beneath the site vicinity (143 feet bgs). Similar lithology is observed in Pleasanton well No. 7. The uppermost screen in Pleasanton well No. 7 is located in this zone.

Geologic cross-sections representing subsurface conditions in the vicinity are included in Appendix B (ETIC 2001) and Appendix C (Delta 1996). Larger copies of Figures 3 and 4 in Appendix B and a discussion of these cross-sections are provided in the Well Installation Report (ETIC 2001).

Groundwater flow direction in the perched zone has been estimated to be to the southeast and northeast. Groundwater flow direction in Zone 1 has varied from northeast, northwest and southwest since 1998, but most recently (since 2002) has been predominantly to the southwest. More recently the groundwater flow direction has been estimated to the southwest. Groundwater gradient and flow direction in Zone 3 is relatively flat (a maximum gradient of 0.007) and variable, with recent estimates to the northwest, northeast, and southeast. Rose diagrams are presented on Figure 1.

Pump tests conducted in 1988 did not indicate any hydraulic communication between Pleasanton well 7 and Zone 1 beneath the site (Delta 1996). Pumping and injection tests at Zone 7 wells (Hop 4, 6, and 9) indicate that there may be some communication with MW8 (Delta 1996). The top of the shallowest screen in the Zone 7 wells is at approximately 215 feet bgs (Hop 6). MW8 is screened in Zone 3 from 118 to 133 feet bgs.

## PROPOSED SCOPE OF WORK

A soil and groundwater investigation will be performed to assess the potential impacts of petroleum hydrocarbons and MTBE in the Zone 1 water bearing zone downgradient of the current USTs. One soil boring is proposed onsite at the location shown on Figure 1. The location was chosen onsite downgradient of the current USTs in the direction of the recent groundwater flow in Zone 1.

ETIC proposes to conduct the following activities:

- The dual-tube direct-push method is proposed for the advancement of the boring (Figure 1). The location may need to be modified based on property access, utilities, vehicles, traffic requirements, or other obstacles encountered. Installation and sample collection methods are described in the field protocols in Appendix D.

- The boring will be continuously logged to total depth. The boring will be advanced until first groundwater in Zone 1 is encountered. Static groundwater currently occurs at the site in Zone 1 at a depth of approximately 54.9 feet below ground surface. The boring will not be advanced past the clay layer between Zone 1 and Zone 2, which begins at a depth of approximately 57 feet bgs. The actual depth of the boring will be dependent on conditions encountered in the field.

- Soil samples will be continuously collected for observation of soils. Selected soil samples will be submitted for laboratory analysis based on significant changes in the soil characteristics and/or field organic vapor analyzer measurements.

- One or more attempts will be made to collect a groundwater sample from the depth at which groundwater is likely to occur in Zone 1. If groundwater is not generated during the first day of sampling, the boring will be sealed at the surface and left to recharge overnight. If no groundwater is observed in the boring on the second day, the boring will be destroyed. Groundwater samples will be collected using a bailer, peristaltic pump, or inertial pump. Small-diameter well casing with 0.010-inch slotted well screen or equivalent may be installed in the boring to facilitate the collection of groundwater samples.

Soil and groundwater samples selected for analysis will be analyzed for:

- TPH-g by EPA Method 8015B.
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8021B.
- MTBE, ethyl t-butyl ether, t-amyl methyl ether, t-butyl alcohol, diisopropyl ether, 1,2-dibromoethane, 1,2-dichloroethane, and ethanol by EPA Method 8260B.

### Reporting and Schedule

Completion of the field work is contingent upon approval of the proposed work by the ACHCSA and on obtaining access to the site. A report for the investigation will be submitted to the ACHCSA once the field work is completed. The investigation results will be presented in a technical report. The report will include a summary of the investigation results, site map, detailed boring logs, and analytical results.

## CLEANUP GOALS AND SITE-SPECIFIC LEVELS

The ACHCSA letter requests that cleanup goals and cleanup levels be proposed for the site. The letter states that they should be consistent with the water quality objectives of the basin and be protective of human health and the environment including the potential use of groundwater from Pleasanton Well No. 7 as a drinking water source.

Pleasanton Well No. 7 has been identified as the closest municipal well to the site. The well is located approximately 225 feet northwest of the site and is screened from 120 to 440 feet bgs. The location of the well is shown in Figure 1.

As requested in the ACHCSA letter, the direct exposure pathway of dissolved-phase constituents in groundwater to this receptor was evaluated. No other exposure pathways to any other receptors were evaluated.

### Chemicals of Potential Concern

In order to evaluate the cleanup goals and the cleanup levels for the site a set of chemicals of potential concern (COPCs) must be selected. Since it is not practical to evaluate the risk associated with the potential exposure to every compound present in a petroleum product, risk management decisions are generally based on assessing the potential impacts from a select group of indicator

compounds (ASTM 1995). The COPCs for the site include TPH-g, BTEX, and MTBE. Based on the previously documented site usage, these chemicals are consistent with those handled at the site.

The San Francisco Bay Basin Water Quality Control Plan states that, at a minimum, groundwaters designated for use as domestic or municipal supply shall not contain concentrations of constituents in excess of the primary or secondary maximum contaminant levels (MCLs) specified in Title 22 of the California Code of Regulations (Title 22). The lower of the primary or secondary MCLs for COPCs are:

| | |
|---|---|
| Benzene | 1 µg/L |
| Toluene | 150 µg/L |
| Ethylbenzene | 700 µg/L 300 |
| Xylenes | 1,750 µg/L |
| MTBE | 5 µg/L 13 |

As discussed with the ACHCSA, these concentrations would constitute the "cleanup goals."

**Potential Exposure Pathways and Receptors**

As requested in the ACHCSA letter, the direct exposure pathway of dissolved-phase constituents in groundwater to Pleasanton Well No. 7 was evaluated. The well is located approximately 225 feet northwest of the site and is screened from 120 to 440 feet bgs, and the uppermost screen of the well is located within Zone 3. Impacted groundwater at the site is confined to the tank backfill, the perched zone, and Zone 1 at the site. Zones 2 and 3 are not impacted. Pump tests conducted in 1988 did not indicate any hydraulic communication between Pleasanton Well No. 7 and Zone 1 beneath the site (Delta 1996). In addition, two different confining layers separate Zone 1 from Zone 3: a layer of silts and clays from approximately 55 to 67 feet bgs and a layer of clay from approximately 82 to 120 feet bgs. Because Zones 2 and 3 are not impacted, as well as the lack of hydraulic communication between Zone 1 and Zone 3 and the existence of the confining layers, direct exposure pathways to groundwater may be considered incomplete.

**BIOSCREEN Fate and Transport Model**

Although the direct exposure pathways to groundwater may be considered incomplete, as requested by the ACHCSA, the direct exposure pathway to groundwater was analyzed as a hypothetical complete pathway as an exercise in determining preliminary site-specific cleanup levels. The COPCs benzene and MTBE were chosen for this evaluation as conservative representative constituents of gasoline due to their relative higher toxicity and mobility, respectively, in groundwater.

The top of Pleasanton Well No. 7 intersects Zone 3 and well MW8 is the only well at the site which is screened in Zone 3. As a hypothetical conservative scenario, well MW8 was evaluated as if it were a conduit for dissolved-phase benzene and MTBE in order to determine preliminary site-specific cleanup levels. However, it must be noted that this scenario is highly unlikely for the following reasons:

- Well MW8 was installed with a 10-inch-diameter steel conductor casing from the surface to a depth of 91 feet bgs.

- An annular grout column and bentonite exists from the surface to a depth of 114 feet bgs.

- Two different confining layers separate Zone 1 from Zone 3. A confining layer of silts and clays from approximately 55 to 67 feet bgs separates Zone 1 and Zone 2 and a more substantial confining layer composed of clay from approximately 82 to 120 feet bgs separates Zone 2 and Zone 3.

Estimations regarding the fate and transport of existing benzene and MTBE concentrations beneath the site were simulated using the EPA's BIOSCREEN Natural Attenuation Decision Support Model, Version 1.4 (Newell et al. 1996). This is a screening-level model which employs the Domenico analytical solute transport model and accounts for advection, dispersion, adsorption, and first-order biological decay of the constituents being modeled. Where site-specific data are not available, appropriate literature values have been used (SWRCB 2000, ASTM 1995, Freeze and Cherry 1979). Input data are summarized in Table E-1 in Appendix E.

The use of the BIOSCREEN model allows for estimates of travel times and attenuation of constituents dissolved in groundwater. Due to MTBE's potentially recalcitrant behavior in many subsurface environments, the effect of biological decay has been disregarded when presenting attenuation data for MTBE in the fate and transport modeling. A conservative estimate of the first-order biological decay rate for benzene of 0.69/year (half-life = 1 year) is used in the fate and transport modeling of benzene (ASTM 1995). As site-specific data are not available for all model input parameters, conservative estimates based on appropriate literature sources have been used where necessary. Appendix E provides detailed information regarding the input parameters used in the BIOSCREEN model and also provides the associated output data.

Additional assumptions were made including:

- The entire sand pack around well MW8 and the bentonite at the base of the boring would become the "source" of the dissolved-phase benzene and MTBE concentrations.

- The mass of the source is "infinite," making the source constant over the period simulated with the model.

The BIOSCREEN model was run with different "source zone concentrations" to the nearest 1 µg/L until the concentrations at the point of interest would nearly reach the respective MCLs for benzene and MTBE. Additionally, the model was run for the simulation times of 10, 100, and 1,000 years. These different simulation times appeared to have no effect on the final "source zone concentrations." Additional details related to this modeling effort, input values used, and predicted concentrations plots for 100 years into the future are presented in Appendix E.

The BIOSCREEN model predicts that, based on the scenario outlined above, dissolved-phase concentrations equal to or less than 83 µg/L benzene and 149 µg/L MTBE would not result in

concentrations of benzene and MTBE above MCLs at Pleasanton Well No. 7. These levels are highly conservative and are only to be used for evaluation as initial remediation cleanup levels for the site.

These initial remediation cleanup levels are well below the concentrations observed at the site during the last groundwater monitoring event and below the concentrations observed during the previous four quarters of groundwater monitoring (ETIC 2005). Therefore, current concentrations are protective of the target MCLs for offsite groundwater at Pleasanton Well No. 7 and discontinuation of active remediation is warranted.

## MONITORING PLAN AND RESTART CRITERIA

The ACHCSA letter requests a plan for groundwater monitoring with criteria that would trigger restart of the GES. The groundwater monitoring plan is included in the Report of Groundwater Monitoring, Fourth Quarter 2004 as Table 4 and is included in this document as Table 2. ExxonMobil no longer owns or operates the gasoline service station at the site and the activities of the current gasoline service station would be evaluated as the potential source of any increase in gasoline constituent concentrations in groundwater, including increases which would necessitate the restart of the GES.

Restart of the GES or implementation of other remedial measures could be triggered by any of the following:

- An increase in concentrations of benzene or MTBE in the groundwater samples from the wells above the cleanup levels specified in the Cleanup Goals and Site-Specific Levels section of this document for at least two consecutive quarters.

- The detection of ethanol in groundwater samples from the wells for at least two consecutive quarters.

Restart of the GES is dependent upon the existence of adequate water levels in the extraction wells, which is needed for the system to operate.

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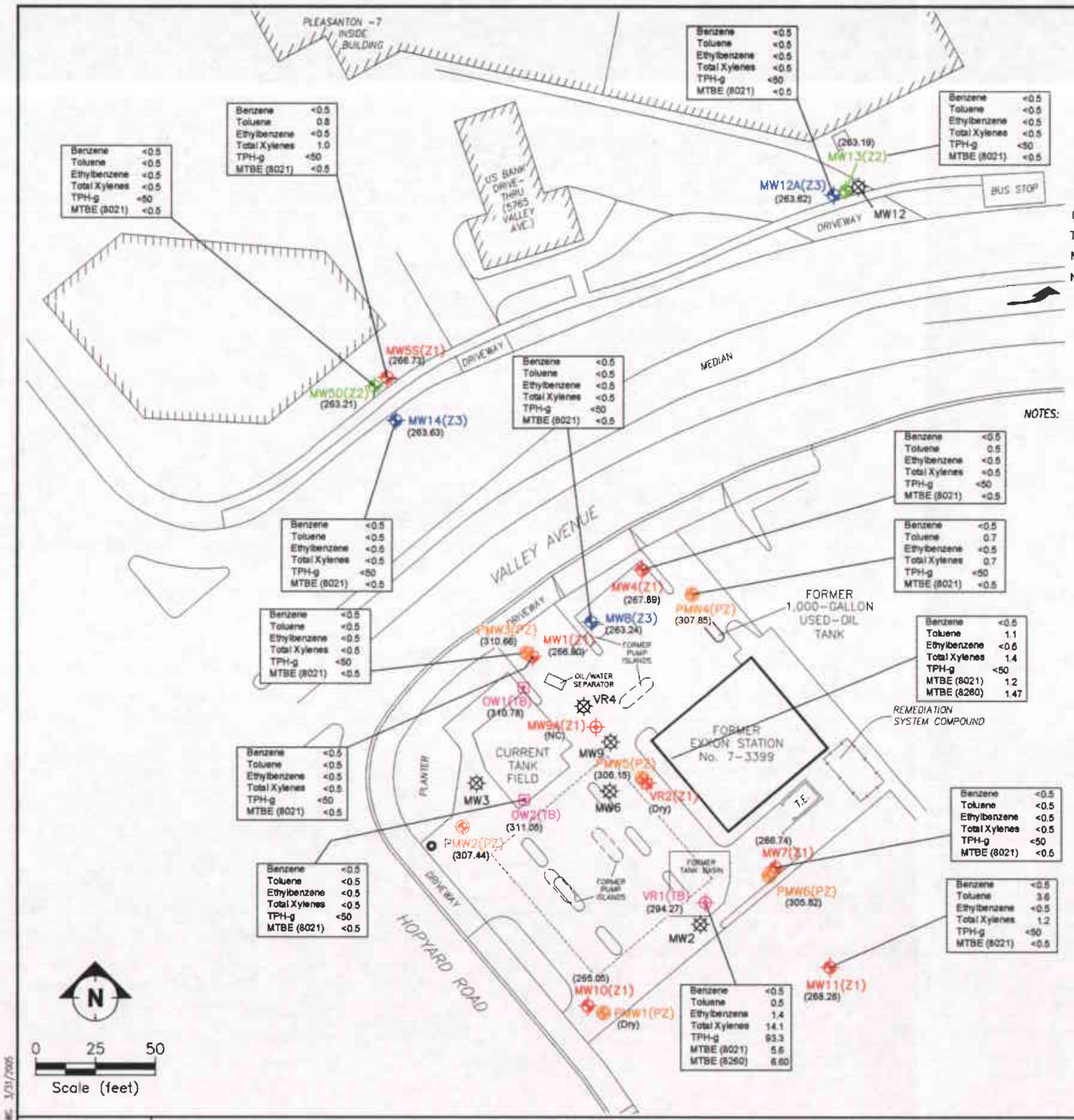



LEGEND:

- TANK BACKFILL WELL
- MONITORING WELL
- GROUNDWATER EXTRACTION WELL
- VAPOR EXTRACTION WELL
- PERCHED MONITORING WELL
- DESTROYED MONITORING WELL
- PROPOSED BORING

(263.19) GROUNDWATER ELEVATION (feet)
TPH-g TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
MTBE METHYL T-BUTYL ETHER
NC NOT CALCULATED

- (TB) TANK BACKFILL WELL
- (PZ) PERCHED ZONE WELL
- (Z1) ZONE 1 WELL
- (Z2) ZONE 2 WELL
- (Z3) ZONE 3 WELL (DEEPER ZONE)

NOTES:

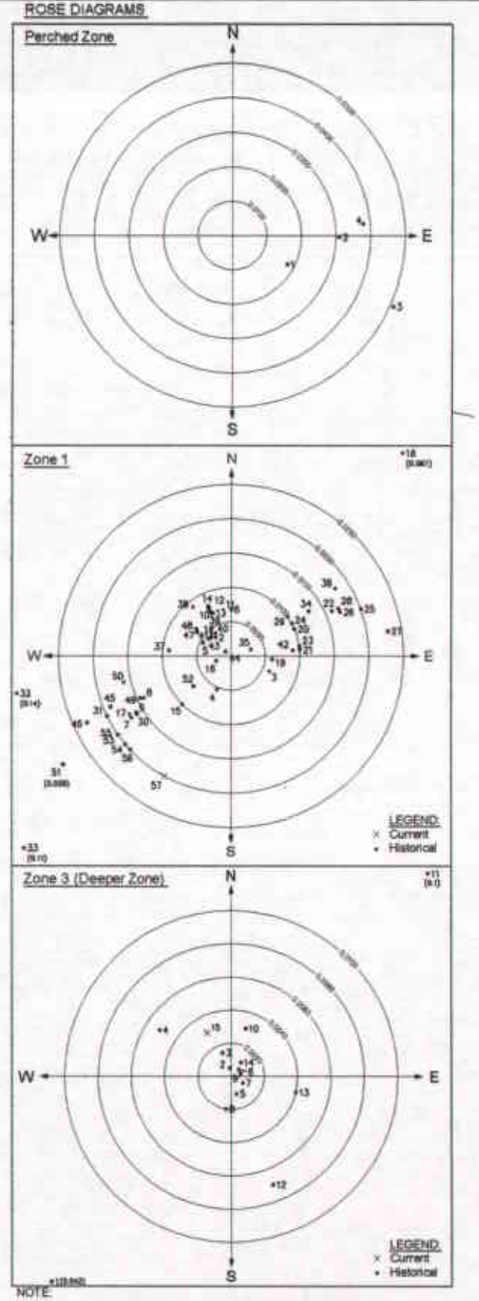
1. CONCENTRATIONS MEASURED IN MICROGRAMS PER LITER (ug/L).
2. WELLS OW1, OW2, AND PZ1 ARE TANK BACKFILL WELLS WHICH MAY INTERSECT THE PERCHED ZONE.
3. WELLS OW1, OW2, AND PMW1-PMW8 ARE CONSIDERED TO BE SCREENED IN A PERCHED WATER ZONE.
4. WELLS SCREENED IN ZONE 1 INCLUDE: MW1, MW4, MW5S, MW7, MW9A, MW10, MW11. WELLS MW5S, MW9A, MW10, AND MW11 WERE NOT USED TO CALCULATE GROUNDWATER GRADIENT FOR ZONE 1.

Groundwater Flow Directions

GW Zone 1 Gradient = 0.02

GW Deeper Zone Gradient = 0.003

ROSE DIAGRAMS




NOTE:
Numbers on Rose Diagram Represent Earliest to Latest Gauging Date.

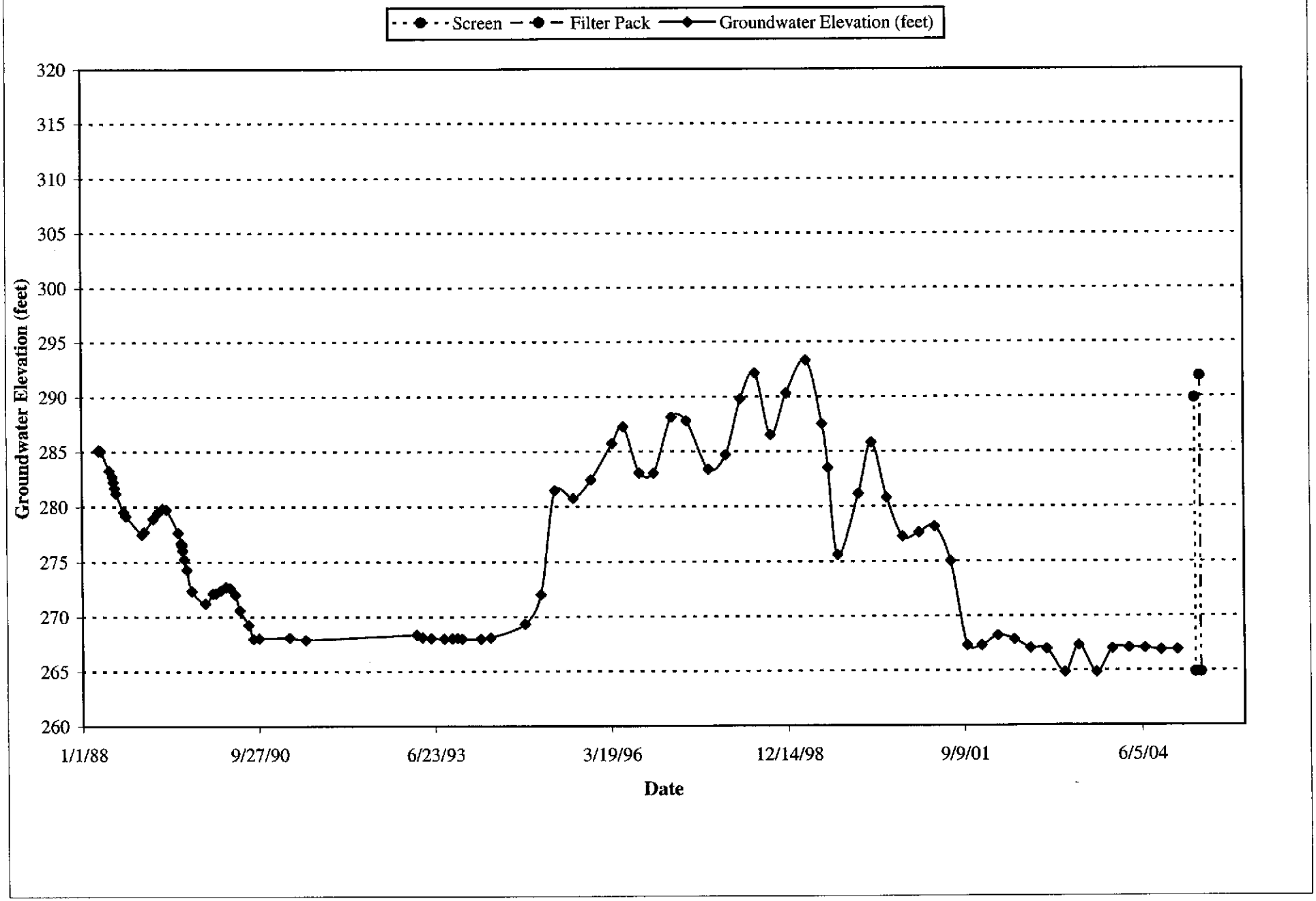
FILENAME: SITE03005.DWG 3/31/2005

ETIC ENGINEERING

SITE PLAN SHOWING GROUNDWATER ELEVATIONS, ANALYTICAL RESULTS, AND ROSE DIAGRAMS
FORMER EXXON RS 7-3399
2991 HOPYARD ROAD, PLEASANTON, CALIFORNIA
20 DECEMBER 2004

FIGURE: 1

**FIGURE 2: FORMER EXXON RETAIL SITE 7-3399**
**MW1: Groundwater Elevation with Analytical Concentration Trends**




G:\Projects\73399\Public\Hydrographs\7-3399 Hydrographs 4Q04.xls

TABLE 1A ROSE DIAGRAM DATA: PERCHED ZONE,
FORMER EXXON RS 7-3399, 2991 HOPYARD ROAD, PLEASANTON, CALIFORNIA

| ID | Date | Gradient | Direction | | |
|---|---|---|---|---|---|
| 1 | 04/04/00 | 0.0180 | S | 62 | E |
| 2 | 06/28/00 | 0.031 | S | 89 | E |
| 3 | 09/26/00 | 0.051 | S | 66 | E |
| 4 | 12/28/00 | 0.038 | N | 85 | E |
| -- | 03/28/01 | NC | -- | -- | -- |

NC Not calculated.

TABLE 1B ROSE DIAGRAM DATA: ZONE 1,
FORMER EXXON RS 7-3399, 2991 HOPYARD ROAD, PLEASANTON, CALIFORNIA

| ID | Date | Gradient | Direction | | |
|---|---|---|---|---|---|
| 1 | 06/23/88 | 0.0045 | N | 40 | W |
| 2 | 08/26/88 | 0.0035 | N | 40 | W |
| -- | 12/07/88 | NC | -- | -- | -- |
| 3 | 03/08/89 | 0.006 | S | 68 | E |
| 4 | 06/30/89 | 0.0053 | S | 23 | W |
| -- | 08/03/89 | NC | -- | -- | -- |
| 5 | 11/28/89 | 0.0045 | N | 65 | W |
| -- | 01/09/90 | NC | -- | -- | -- |
| 6 | 06/11/90 | 0.0068 | N | 0 | W |
| -- | 09/28/90 | NC | -- | -- | -- |
| 7 | 12/27/90 | 0.017 | S | 58 | W |
| 8 | 03/20/91 | 0.014 | S | 64 | W |
| 9 | 06/20/91 | 0.016 | S | 59 | W |
| 10 | 09/12/91 | 0.007 | N | 25 | W |
| -- | 12/30/91 | NC | -- | -- | -- |
| 11 | 03/02/92 | 0.0069 | N | 24 | W |
| 12 | 06/08/92 | 0.0076 | N | 25 | W |
| 13 | 09/16/92 | 0.0068 | N | 23 | W |
| 14 | 12/10/92 | 0.008 | N | 25 | W |
| 15 | 03/11/93 | 0.01 | S | 45 | W |
| 16 | 06/01/93 | 0.0023 | S | 71 | W |
| -- | 09/29/93 | NC | -- | -- | -- |
| -- | 11/23/93 | NC | -- | -- | -- |
| -- | 03/10/94 | NC | -- | -- | -- |
| 17 | 05/04/94 | 0.017 | S | 60 | W |
| -- | 09/01/94 | NC | -- | -- | -- |
| 18 | 11/16/94 | 0.067 | N | 40 | E |
| 19 | 02/15/95 | 0.006 | S | 85 | E |
| 20 | 05/09/95 | 0.01 | N | 67 | E |
| 21 | 08/21/95 | 0.01 | N | 85 | E |
| 22 | 11/30/95 | 0.016 | N | 66 | E |
| 23 | 03/28/96 | 0.01 | N | 82 | E |
| 24 | 05/31/96 | 0.01 | N | 62 | E |
| 25 | 08/28/96 | 0.02 | N | 70 | E |
| 26 | 11/18/96 | 0.017 | N | 68 | E |
| 27 | 02/28/97 | 0.023 | N | 81 | E |
| 28 | 05/23/97 | 0.017 | N | 66 | E |
| -- | 09/23/97 | NC | -- | -- | -- |
| 29 | 12/30/97 | 0.01 | N | 55 | E |
| 30 | 03/24/98 | 0.016 | S | 58 | W |
| 31 | 06/15/98 | 0.02 | S | 64 | W |

TABLE 1B ROSE DIAGRAM DATA: ZONE 1,
FORMER EXXON RS 7-3399, 2991 HOPYARD ROAD, PLEASANTON, CALIFORNIA

| ID | Date | Gradient | Direction | | |
|---|---|---|---|---|---|
| 32 | 09/11/98 | 0.14 | S | 80 | W |
| 33 | 12/09/98 | 0.11 | S | 47 | W |
| 34 | 03/31/99 | 0.013 | N | 60 | E |
| 35 | 06/30/99 | 0.003 | N | 72 | E |
| 36 | 08/03/99 | 0.018 | N | 57 | E |
| 37 | 09/24/99 | 0.009 | N | 85 | W |
| 38 | 12/22/99 | 0.009 | N | 38 | W |
| 39 | 04/04/00 | 0.005 | N | 35 | W |
| 40 | 06/28/00 | 0.004 | N | 35 | W |
| 41 | 09/26/00 | 0.004 | N | 46 | W |
| 42 | 12/28/00 | 0.009 | N | 85 | E |
| 43 | 03/28/01 | 0.004 | N | 52 | W |
| 44 | 06/25/01 | 0.001 | N | 52 | W |
| 45 | 09/26/01 | 0.019 | S | 67 | W |
| 46 | 12/17/01 | 0.023 | S | 65 | W |
| 47 | 03/18/02 | 0.006 | N | 55 | W |
| 48 | 6/17-18/02 | 0.0064 | N | 52 | W |
| 49 | 09/16/02 | 0.0145 | S | 65 | W |
| 50 | 12/17/02 | 0.016 | S | 76 | W |
| 51 | 03/28/03 | 0.029 | S | 57 | W |
| 52 | 6/16-17/03 | 0.007 | S | 51 | W |
| – | 09/22/03 | NC | -- | -- | -- |
| 53 | 12/22/03 | 0.02 | S | 55 | W |
| 54 | 03/23/04 | 0.02 | S | 50 | W |
| 55 | 6/21-22/04 | 0.02 | S | 55 | W |
| 56 | 9/20-21/04 | 0.02 | S | 47 | W |
| **57** | **12/20/04** | **0.02** | **S** | **29** | **W** |

NC Not calculated.

TABLE 1C ROSE DIAGRAM DATA: ZONE 3,
FORMER EXXON RS 7-3399, 2991 HOPYARD ROAD, PLEASANTON, CALIFORNIA

| ID | Date | Gradient | Direction | | |
|---|---|---|---|---|---|
| 1 | 06/25/01 | 0.042 | S | 41 | W |
| 2 | 09/26/01 | 0.0005 | N | 10 | W |
| 3 | 12/17/01 | 0.0015 | N | 20 | W |
| 4 | 03/18/02 | 0.0051 | N | 57 | W |
| 5 | 6/17-18/02 | 0.0011 | S | 17 | E |
| 6 | 09/16/02 | 0.0006 | N | 48 | E |
| 7 | 12/17/02 | 0.0008 | S | 70 | E |
| 8 | 03/28/03 | 0.002 | S | 9 | W |
| 9 | 6/16-17/03 | 0.0006 | N | 73 | E |
| 10 | 09/22/03 | 0.0030 | N | 17 | E |
| 11 | 12/22/03 | 0.1 | N | 44 | E |
| 12 | 03/23/04 | 0.007 | S | 21 | E |
| 13 | 6/21-22/04 | 0.004 | S | 76 | E |
| 14 | 9/20-21/04 | 0.001 | N | 35 | E |
| **15** | **12/20/04** | **0.003** | **N** | **29** | **W** |

TABLE 2 GROUNDWATER MONITORING PLAN,
FORMER EXXON RS 7-3399, 2991 HOPYARD ROAD, PLEASANTON, CALIFORNIA

| Well Number | Groundwater Gauging Frequency | Groundwater Sampling and Analysis Frequency | |
|---|---|---|---|
| | | BTEX and TPH-g | MTBE |
| MW1 | Q | Q | Q |
| MW4 | Q | Q | Q |
| MW5D | Q | Q | Q |
| MW5S | Q | Q | Q |
| MW7 | Q | Q | Q |
| MW8 | Q | Q | Q |
| MW9A | Q | Q | Q |
| MW10 | Q | Q | Q |
| MW11 | Q | Q | Q |
| MW12A | Q | Q | Q |
| MW13 | Q | Q | Q |
| MW14 | Q | Q | Q |
| OW1 | Q | Q | Q |
| OW2 | Q | Q | Q |
| PMW1 | Q | Q | Q |
| PMW2 | Q | Q | Q |
| PMW3 | Q | Q | Q |
| PMW4 | Q | Q | Q |
| PMW5 | Q | Q | Q |
| PMW6 | Q | Q | Q |
| VR1 | Q | Q | Q |
| VR2 | Q | Q | Q |

Q = Quarterly.

BTEX = Benzene, toluene, ethylbenzene, total xylenes.
TPH-g = Total Petroleum Hydrocarbons as gasoline.
MTBE = Methyl tertiary butyl ether.

TABLE 3 WELL CONSTRUCTION DETAILS, FORMER EXXON RS 7-3399, 2991 HOPYARD ROAD, PLEASANTON, CALIFORNIA

| Well Number | | Well Installation Date | Elevation TOC (feet) | Casing Material | Total Depth (feet) | Well Depth (feet) | Borehole Diameter (inches) | Casing Diameter (inches) | Screened Interval (feet) | Slot Size (inches) | Filter Pack Interval (feet) | Filter Pack Material | Water Bearing Zone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW1 | d | 04/01/88 | 320.52 | -- | 57 | 57 | -- | 4 | 32-57 | 0.020 | 30-57 | -- | Zone 1 |
| MW2 | a | 04/02/88 | | -- | 57 | 57 | -- | 4 | 37-57 | 0.020 | 34-57 | -- | -- |
| MW3 | a | 04/04/88 | | -- | 60 | 56 | -- | 4 | 36-56 | 0.020 | 35-60 | -- | -- |
| MW4 | d | 04/06/88 | 321.56 | -- | 60 | 57 | -- | 4 | 37-57 | 0.020 | 36-60 | -- | Zone 1 |
| MW5D | d | 05/10/88 | 321.79 | -- | 82.0 | 77.5 | -- | 4 | 67.5-77.5 | 0.020 | 64-77.5 | -- | Zone 2 |
| MW5S | d | 05/11/88 | 320.52 | -- | 58 | 55 | -- | 4 | 40-55 | 0.020 | 37.5-58 | -- | Zone 1 |
| MW6 | a | 05/11/88 | | -- | 59 | 55 | -- | 4 | 40-55 | 0.020 | 36-59 | -- | -- |
| MW7 | d | 07/12/88 | 321.27 | -- | 56.5 f | 53 | -- | 5 | 28-53 | 0.020 | 25-56.5 | -- | Zone 1 |
| MW8 | d | 09/30/89 | 321.86 | PVC | 140 | 133 | 14 | 4 | 118-133 | 0.020 | 114-133 | -- | Deeper Zone |
| MW9 | a | 10/04/89 | | PVC | 57.5 | 54.5 | 10 | 4 | 34.5-54.5 | 0.020 | 34-54.5 | -- | -- |
| MW9A | d | 11/03/00 | 321.27 | PVC | 59 | 58 | 12.25 | 6 | 35-55<br>55-58 c | 0.020 | 33-58 | #3 Sand | Zone 1 |
| MW10 | d | 10/06/89 | 322.99 | PVC | 60.5 | 60 | 10 | 4 | 40-60 | 0.020 | 38-60 | -- | Zone 1 |
| MW11 | d | 11/02/89 | 321.73 | PVC | 55.5 | 55 | 10 | 4 | 35-55 | 0.020 | 33-55 | -- | Zone 1 |
| MW12 | a | 08/17/00 | | PVC | 132 | 131.5 | 8.33 | 2 | 114.5-131.5 | 0.020 | 112.5-132 | #3 Sand | -- |
| MW12A | d | 08/30/00 | 322.62 | PVC | 136 | 130.5 | 8.33 | 2 | 115.5-130.5 | 0.020 | 113.5-130.5 | #3 Sand | Deeper Zone |
| MW13 | d, b | 08/23/00 | 322.71 | PVC and Steel | 73 | 72 | 8.33 | 2 | 61.5-72 | 0.020 | 57.5-73 | #3 Sand | Zone 2 |

TABLE 3 WELL CONSTRUCTION DETAILS, FORMER EXXON RS 7-3399, 2991 HOPYARD ROAD, PLEASANTON, CALIFORNIA

| Well Number | | Well Installation Date | Elevation TOC (feet) | Casing Material | Total Depth (feet) | Well Depth (feet) | Borehole Diameter (inches) | Casing Diameter (inches) | Screened Interval (feet) | Slot Size (inches) | Filter Pack Interval (feet) | Filter Pack Material | Water Bearing Zone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW14 | d | 08/29/00 | 321.24 | PVC | 143 | 136 | 8.33 | 2 | 121.5-136.5 | 0.020 | 119.5-143 | #3 Sand | Deeper Zone |
| OW1 | | tank backfill well | NM | -- | -- | -- | -- | 4 | e | -- | -- | -- | Perched Zone |
| OW2 | d | tank backfill well | 321.55 | -- | -- | -- | -- | 4 | e | -- | -- | -- | Perched Zone |
| PMW1 | d | 12/16/99 | 322.75 | PVC | 16 | 16 | 10 | 4 | 6-16 | 0.010 | 5.5-16 | #2/12 Sand | Perched Zone |
| PMW2 | d | 12/16/99 | 322.37 | PVC | 16 | 16 | 10 | 4 | 6-16 | 0.010 | 5.5-16 | #2/12 Sand | Perched Zone |
| PMW3 | d | 12/16/99 | 321.27 | PVC | 16 | 16 | 10 | 4 | 6-16 | 0.010 | 5.5-16 | #2/12 Sand | Perched Zone |
| PMW4 | d | 12/16/99 | 321.37 | PVC | 16 | 16 | 10 | 4 | 6-16 | 0.010 | 5.5-16 | #2/12 Sand | Perched Zone |
| PMW5 | d | 12/16/99 | 320.04 | PVC | 35.5 | 16 | 10 | 4 | 6-16 | 0.010 | 5.5-16 | #2/12 Sand | Perched Zone |
| PMW6 | d | 12/17/99 | 321.38 | PVC | 16 | 16 | 10 | 4 | 6-16 | 0.010 | 5.5-16 | #2/12 Sand | Perched Zone |
| VR1 | d | 10/24/88 | 321.00 | PVC | 30 | 30 | 10 | 4 | 10-30 | 0.020 | 10-30 | -- | -- |
| VR2 | | 11/20/89 | NM | PVC | 45.5 | 45 | 8 | 2 | 35-45 | 0.020 | 33-45.5 | -- | -- |
| VR3 | a | 11/20/89 | | PVC | 35.5 | 35 | 8 | 2 | 5-35 | 0.020 | 4-35.5 | -- | -- |
| VR4 | a | 11/24/89 | | PVC | 35.5 | 32.5 | 8 | 2 | 12.5-32.5 | 0.020 | 4-35.5 | -- | -- |

a Well destroyed.
b PVC screen from 61.5-72, stainless steel blank from 11.5-61.5, PVC blank from surface to 11.5.
c Depth of PVC sump at base of well.
d Well surveyed in October 2001. Elevation is based on City of Pleasanton Benchmark #C-972. Brass disc in concrete abutment, 15 feet north of the southeast corner of the south bound bridge over Mocho Canal. Elevation = 330.55 feet.
e Well screen is visible near surface and is assumed to extend to near total depth.

TABLE 3 WELL CONSTRUCTION DETAILS, FORMER EXXON RS 7-3399, 2991 HOPYARD ROAD, PLEASANTON, CALIFORNIA

| Well Number | Well Installation Date | Elevation TOC (feet) | Casing Material | Total Depth (feet) | Well Depth (feet) | Borehole Diameter (inches) | Casing Diameter (inches) | Screened Interval (feet) | Slot Size (inches) | Filter Pack Interval (feet) | Filter Pack Material | Water Bearing Zone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

f The total depth measured in well MW7 does not match the well completion log. On 16 September 2002, the total depth was measured as 59.83 feet below top of casing.

Perched Zone Gradient generally not calculated.
Zone 1 Gradient calculated quarterly.
Zone 2 Possible communication with Zone 1. Gradient generally not calculated.
Deeper Zone Gradient calculated quarterly.

NM Not measured.
PVC Polyvinyl chloride.
TOC Top of casing.

-- Information not available.

# Appendix A

# Regulatory Correspondence

ALAMEDA COUNTY
**HEALTH CARE SERVICES**
AGENCY
DAVID J. KEARS, Agency Director



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

December 29, 2004

Jennifer C. Sedlachek
ExxonMobil Refining and Supply Co.
7096 Piedmont Ave., #194
Oakland, CA 94611

Steve Asmann
Steve's Valero I
2991 Hopyard Rd.
Pleasanton, CA 94566

Bruce Morrison
Kirk D. Morrison Trust et al.
224 Woodward Ave.
Sausalito, CA 90623-1066

Subject: Fuel Leak Case No. RO0000362, Valero #3823, 2991 Hopyard Rd., Pleasanton, California – Request for SWI Workplan and Modified CAP

Dear Ms. Sedlachek and Mssrs. Asmann and Morrison:

Alameda County Environmental Health (ACEH) has reviewed your March 5, 2004, *Proposed Shutdown of Groundwater Extraction System* prepared by ETIC Engineering, Inc., and the case file for the above-referenced site. In addition, ACEH discussed the proposed shutdown and reporting requirements with ETIC on June 17, August 4, October 12, and October 21, 2004. During those conversations, ACEH requested additional information to justify ExxonMobil's request for system shutdown. As discussed, the following issues were to be addressed as part of the Third Quarter 2004 status report:

- Due to fluctuation of the groundwater gradient, groundwater quality within "Zone 1" does not appear to be monitored downgradient of the current UST field by the existing monitoring well network. This apparent data gap needs to be addressed.
- The current vertical and lateral extent of soil and groundwater contamination needs to be evaluated.
- Historical groundwater flow directions in each of the water-bearing zones need to be evaluated.
- The requirement for active remediation needs to be evaluated with respect to site conditions and risk, not the efficiency of the current remedial system.

ETIC's November 16, 2004 *Report of Groundwater Monitoring* does not address these concerns. In order for ACEH to consider your request for system shutdown, we request that you further evaluate current site conditions and collect additional data as necessary. Please revise your request for system shutdown and submit a workplan which addresses the technical comments below.

**TECHNICAL COMMENTS**

1. Downgradient Groundwater Sampling

Your recent groundwater monitoring reports show the groundwater gradient in Zone 1 to be toward the southwest. Based on the inferred flow direction, no monitoring wells screened in Zone 1 are currently located downgradient of the UST field. Well OW2 is located within the UST

field and screened within a shallow perched groundwater zone. Up to 45,400 ug/L MTBE was historically detected in this well during the June 2000 sampling event; however, during the most recent sampling event in March 2004 3.7 ug/L MTBE was detected in this well. Due to its shallow screening, well OW2 is insufficient to fully characterize groundwater in the UST field area. We request that you propose investigation tasks to characterize groundwater immediately downgradient of the current UST field in the workplan requested below.

2. Cleanup Goals and Site-Specific Levels

We request that you propose cleanup goals and cleanup levels for the site. Cleanup criteria do not appear to have been established for the site prior to initiation of groundwater extraction in March 2001. Your cleanup goals need to be consistent with water quality objectives for the basin. Soil and groundwater cleanup levels for the site need to be protective of human health and the environment, including potential use of groundwater from Pleasanton Well No. 7 as a drinking water source. Prior to discontinuation of active remediation, the appropriate cleanup levels will need to be achieved. Please propose cleanup goals and site-specific cleanup levels in the workplan requested below.

3. Monitoring Plan and Restart Criteria

Your November 16, 2004 *Remediation System Summary* (Table 5) indicates that the average operational flow rate of the groundwater extraction system has been less than 0.1 gpm since May 2003. Wells OW2 and VR1 are currently active, and wells MW9A, OW1, PMW2 and PMW5 are inactive. Current hydrocarbon and MTBE mass removal rates are very low, with cumulative mass removal having decreased to near asymptotic levels. No significant hydraulic control of shallow groundwater is anticipated due to low groundwater yields from the extraction wells. The maximum detected groundwater concentrations in the most recent sampling events for the six extraction wells were in well VR1 on June 22, 2004: 43.3 ug/l MTBE, 2.2 ug/L benzene, and 988 ug/l TPHg. We note, however, that well MW-9A has not been sampled since June 25, 2001 (see Comment #5, below). Ongoing extraction from the current extraction network may interfere with the collection of representative groundwater samples from these wells. Accordingly, we recommend you propose temporary discontinuation of groundwater extraction while current site conditions are evaluated. Prior to implementing temporary discontinuation of groundwater extraction, we request that you prepare and submit a plan for groundwater monitoring with criteria that would trigger restart of the extraction system. Please submit your monitoring plan and system restart criteria in the workplan requested below.

4. Evaluation of Post-Remedial Conditions

Your March 5, 2004 *Proposed Shutdown of Groundwater Extraction System* states that "the extent and concentration of hydrocarbons and MTBE are stable or decreasing across the site." While we concur that the groundwater extraction system in its current configuration is no longer effective at reducing hydrocarbon or MTBE mass in the site subsurface, we are concerned that the inefficiency of the system may be largely the result of decreased groundwater levels. We request that you further support your assertion regarding the extent and magnitude of contamination. As part of your evaluation, we require a series of isoconcentration maps showing current concentrations for each of the key contaminants of concern in each of the water-bearing zones. Please submit your evaluation of current site conditions in the workplan requested below.

5. Groundwater Flow Direction

To evaluate historical groundwater flow direction in each of the water bearing zones, we request that you prepare and submit a rose diagram of groundwater gradients for each zone. All site data, from 1988 to present, needs to be considered in your evaluation. Please submit your evaluation of historical groundwater flow direction in the workplan requested below.

6. Groundwater Monitoring

As part of your evaluation of current site conditions, we request that you collect and analyze samples from monitoring well MW-9A. We request that you analyze samples for TPHg, BTEX, MTBE, TBA, TAME, DIPE and ETBE. Please submit your results and subsequent evaluation and recommendations in the workplan requested below.

7. Verification Monitoring

As part of your proposal for system shutdown, we require that you submit a detailed plan for post-remedial monitoring. Your monitoring plan needs to identify wells to be included in the monitoring network, the monitoring frequency, and your proposed time period for post-remedial monitoring.

**REPORT REQUEST**

Please submit your *Soil and Water Investigation Workplan and Modified Corrective Action Plan* by **March 31, 2005**. ACEH makes this request pursuant to California Health & Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2778 outline the responsibilities of a responsible party for an unauthorized release from an UST system, and require your compliance with this request.

Professional Certification and Conclusions/Recommendations

The California Business and Professions Code (Sections 6735 and 7835.1) requires that workplans 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.

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.

**UNDERGROUND STORAGE TANK CLEANUP FUND**

Please note that delays in investigation, late reports or enforcement actions by ACEH may result in you becoming ineligible to receive cleanup cost reimbursement from the state's Underground Storage Tank Cleanup Fund (senate Bill 2004).

**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 County District Attorney or other appropriate agency, for enforcement. California Health and Safety Code, Section 25299.76 authorizes ACEH enforcement including administrative action or monetary penalties of up to $10,000 per day for each day of violation.

Please call me at (510) 567-6719 with any questions regarding this case.

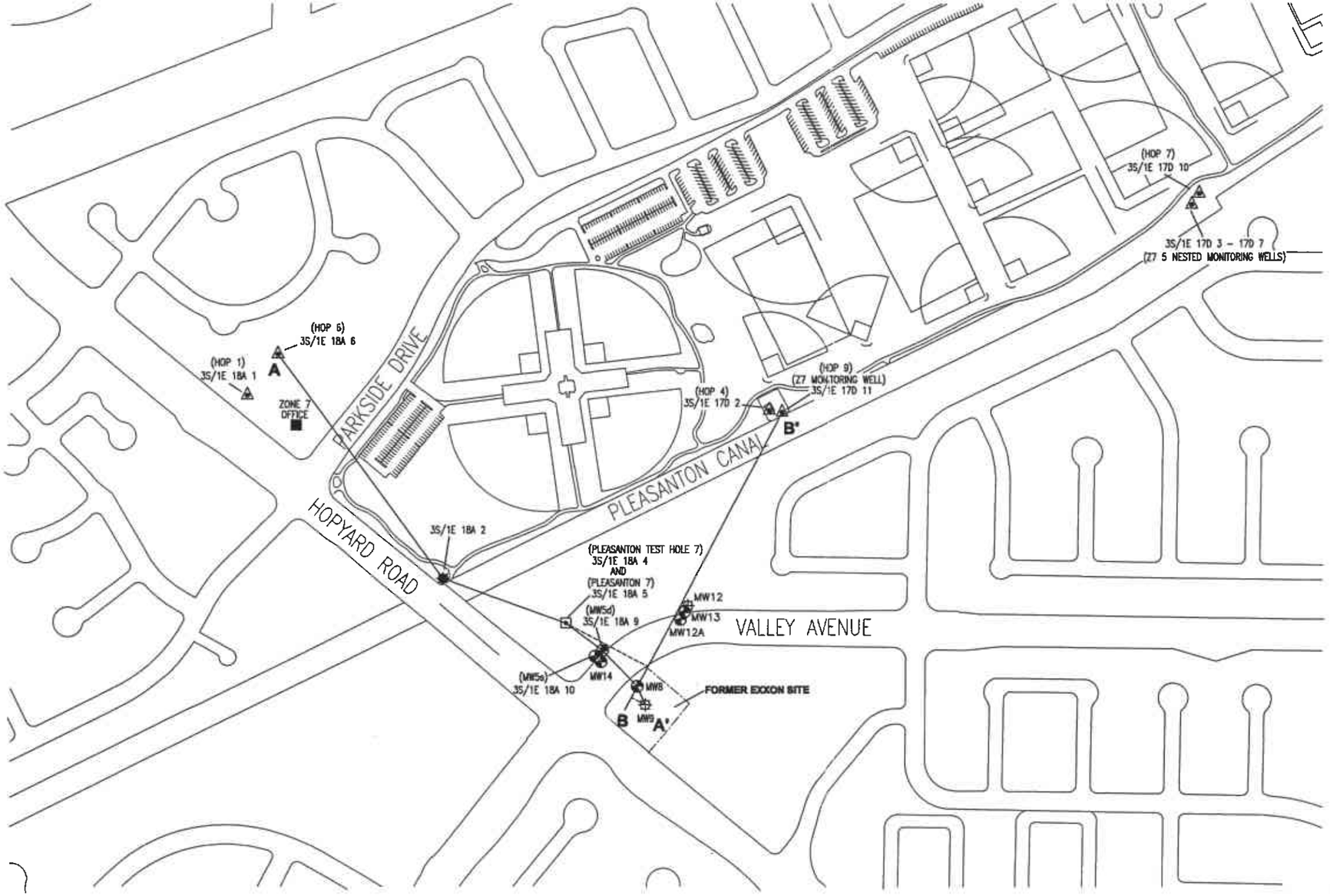
Sincerely,

Robert W. Schultz, R.G.
Hazardous Materials Specialist

cc: Steve Cusenza, City of Pleasanton, P.O. Box 520, Pleasanton, CA 94566-0802
Bryan Campbell, ETIC,2285 Morello Ave., Pleasant Hill, CA 94523
Matt Katen, Zone 7 Water District, QIC 80201
Donna Drogos, ACEH
Robert W. Schultz, ACEH

# Appendix B

# Geologic Cross-Sections (ETIC 2001)




*Adapted from Delta Environmental Consultants, Inc. drawings.*

FILENAME: FIG2.DWG 02/16/01

ETIC Engineering, Inc.

GEOLOGIC CROSS-SECTION TRACE LOCATION MAP
FORMER EXXON RS 7-3399
2991 HOPYARD ROAD, PLEASANTON, CALIFORNIA

FIGURE: 2

A
NORTHWEST

A'
SOUTHEAST

APPROXIMATE ELEVATION IN FEET

VERTICAL DEPTH IN FEET BELOW GROUND SURFACE

50 FT
0
VERTICAL SCALE

0 50 FT
HORIZONTAL SCALE

LEGEND

APPROXIMATE CONTACT BETWEEN SOIL TYPES

SCREENED INTERVAL

** THE LITHOLOGY NOTED FOR MW1 WAS USED TO FILL IN THE GAP IN LITHOLOGY IN MW8 FROM 0 FEET TO 30 FEET BELOW GROUND SURFACE.

* THE LITHOLOGY USED WAS FOR PLEASANTON TEST HOLE 7 (3S/1E 18A 4).

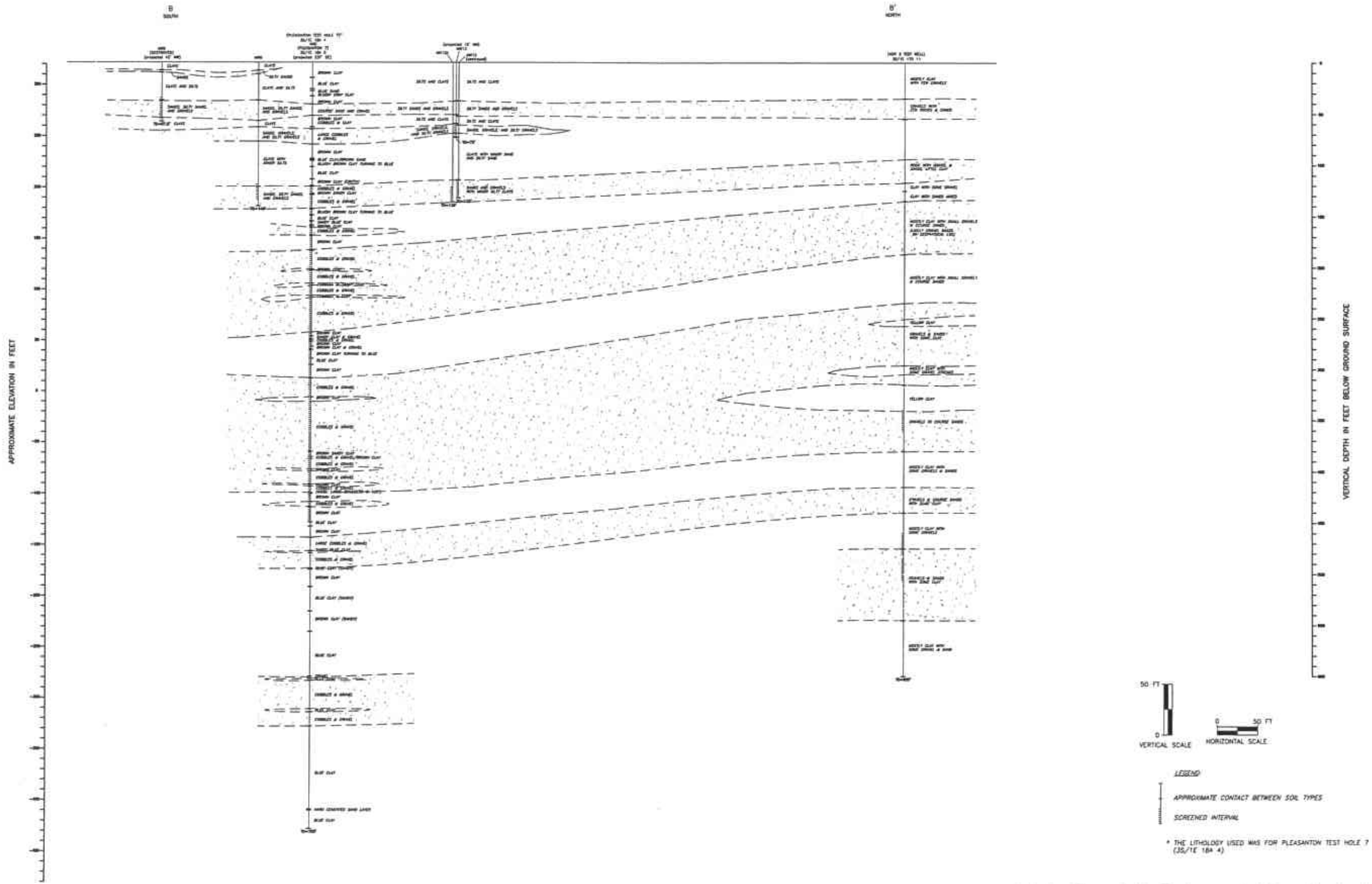
*Adapted from Delta Environmental Consultants, Inc. drawings.*

FILENAME: FIG3.DWG 02/16/01

ETIC Engineering, Inc.

GEOLOGIC CROSS-SECTION A-A'
FORMER EXXON RS 7-3399
2991 HOPYARD ROAD, PLEASANTON, CALIFORNIA

FIGURE:
3




*Adapted from Delta Environmental Consultants, Inc. drawings.*

FILENAME: FIG4.DWG 02/16/01

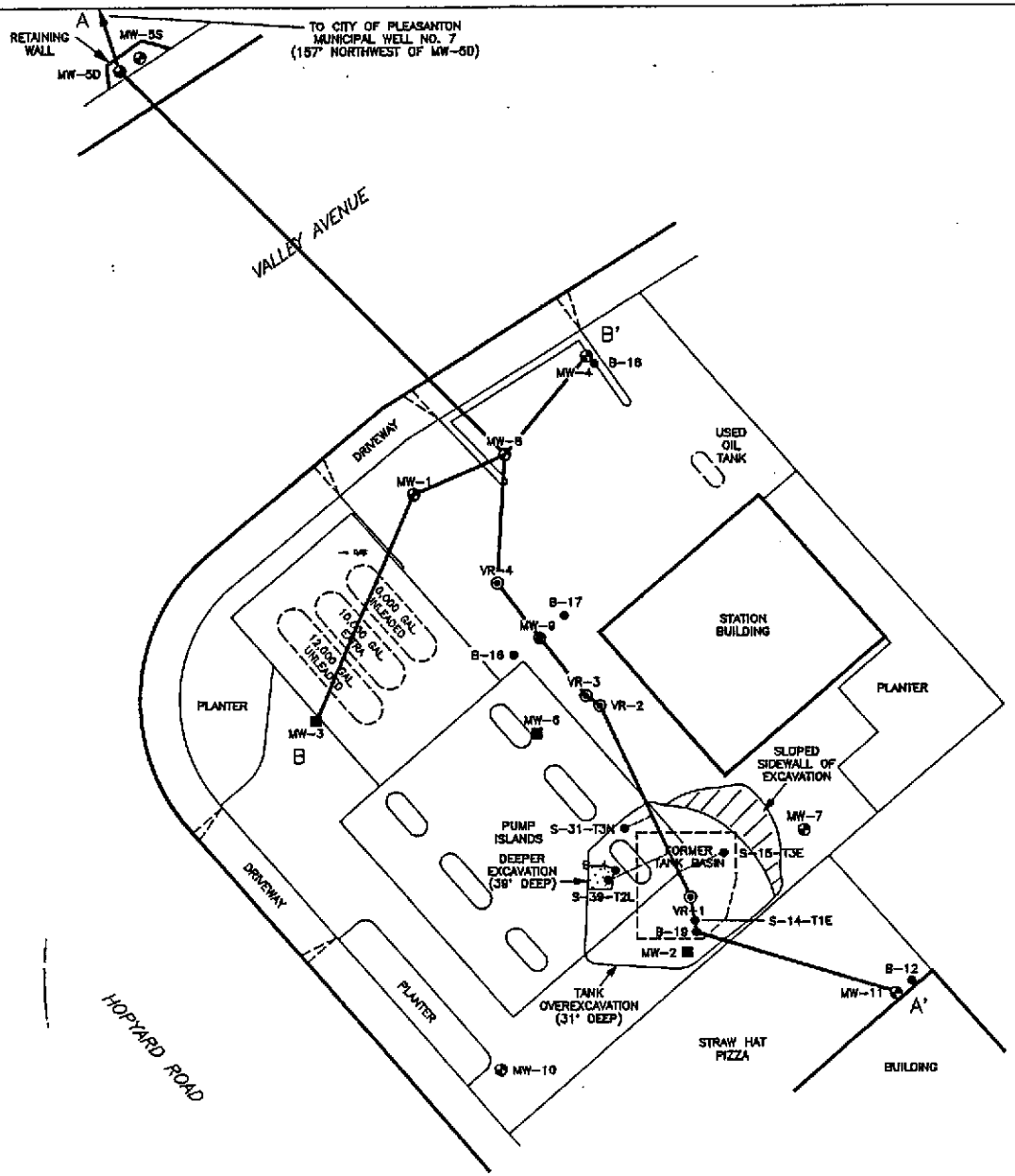
ETIC Engineering, Inc.

GEOLOGIC CROSS-SECTION B-B'
FORMER EXXON RS 7-3399
2991 HOPYARD ROAD, PLEASANTON, CALIFORNIA

FIGURE: **4**

# Appendix C

# Geologic Cross-Sections (Delta 1996)




North

LEGEND:

- B-12 SOIL BORING LOCATION
- VR-1 VAPOR EXTRACTION WELL LOCATION
- MW-2 DESTROYED MONITORING WELL
- MW-1 MONITORING WELL LOCATION
- S-15-T3E SOIL SAMPLE LOCATION

0 30 FT
SCALE

NOTE:
BASE MAP ADAPTED FROM RESNA FIGURE.SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

FIGURE 5
GEOLOGIC CROSS SECTION LOCATION MAP
EXXON STATION NO 7-3399
2991 HOPYARD ROAD
PLEASANTON, CA.

| | |
|---|---|
| PROJECT NO. 0084-838 | DRAWN BY LH 5/20/98 |
| FILE NO. 84-838-1 | PREPARED BY CKA |
| REVISION NO. 1 | REVIEWED BY |

Delta Environmental Consultants, Inc.

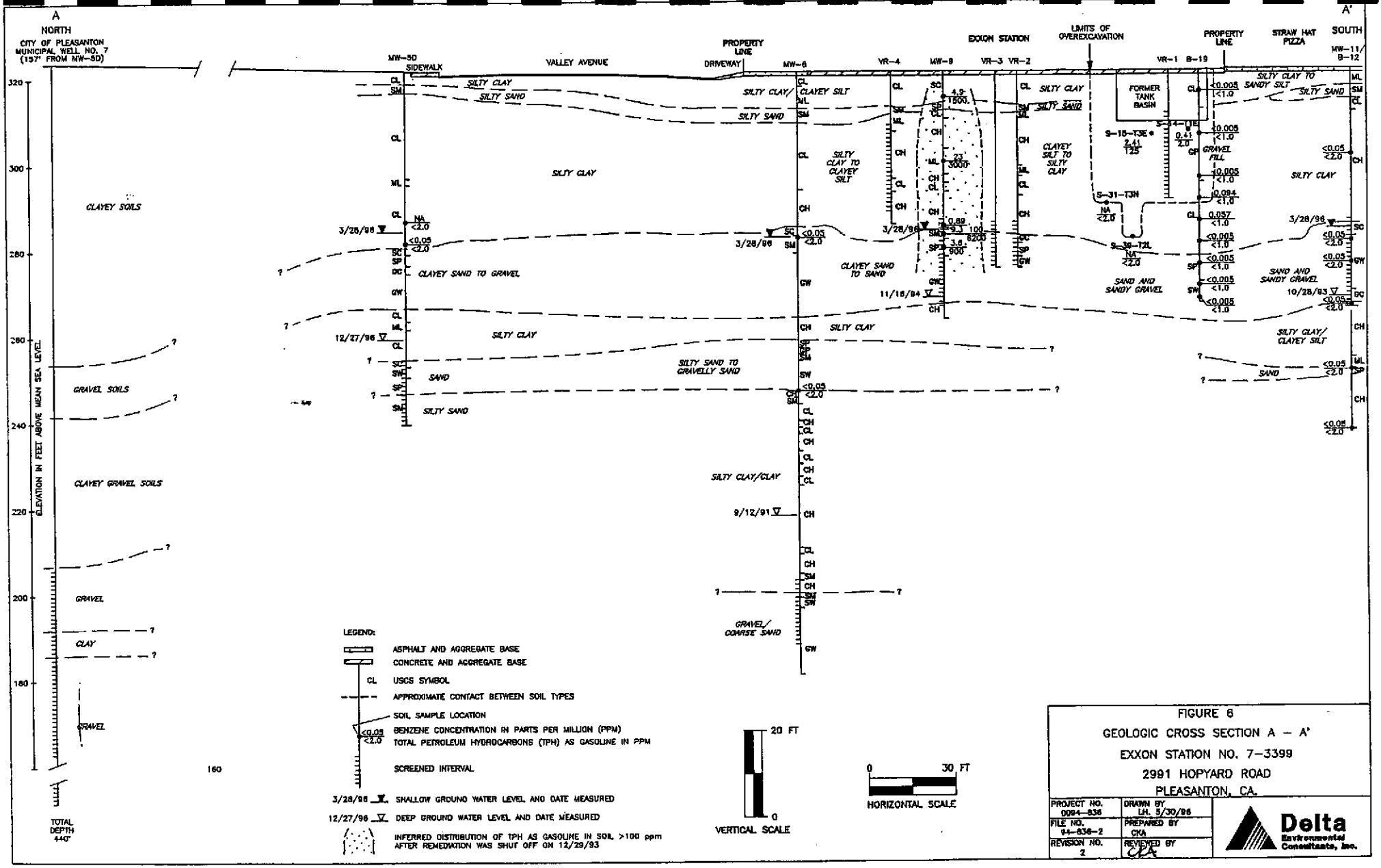



FIGURE 6

GEOLOGIC CROSS SECTION A – A'

EXXON STATION NO. 7-3399

2991 HOPYARD ROAD

PLEASANTON, CA.

| | |
|---|---|
| PROJECT NO. 0094-836 | DRAWN BY LH, 5/30/96 |
| FILE NO. 94-836-2 | PREPARED BY CKA |
| REVISION NO. 2 | REVIEWED BY |

Delta Environmental Consultants, Inc.

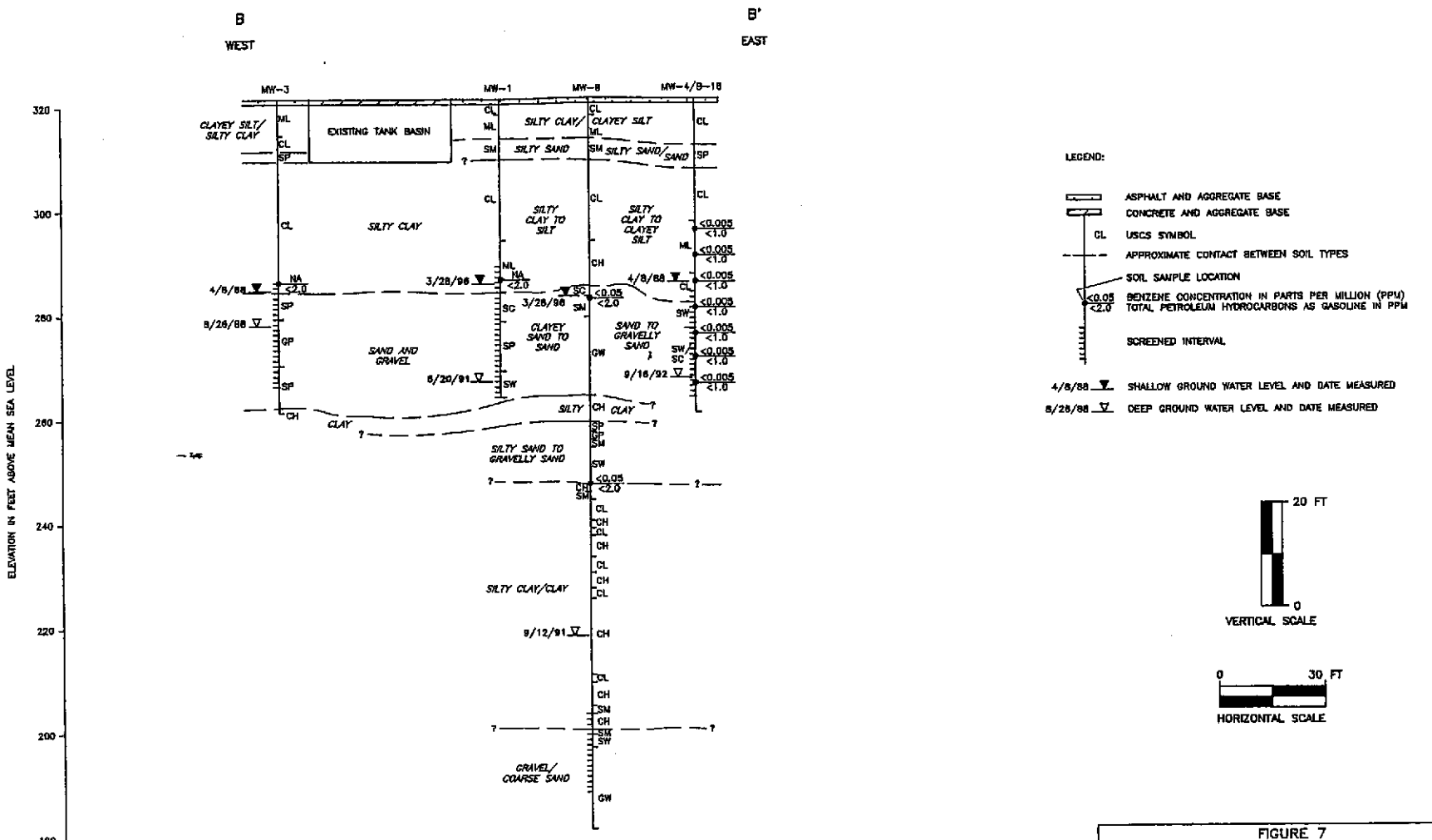



FIGURE 7

GEOLOGIC CROSS SECTION B – B'

EXXON STATION NO. 7-3399

2991 HOPYARD ROAD

PLEASANTON, CA.

| | |
|---|---|
| PROJECT NO. 0094-836 | DRAWN BY LH. 5/20/96 |
| FILE NO. 94-836-3 | PREPARED BY CKA |
| REVISION NO. 1 | REVIEWED BY |

Delta Environmental Consultants, Inc.

# Appendix D

# Field Protocols

# PROTOCOLS FOR INSTALLATION, SAMPLING, AND ABANDONMENT OF DUAL TUBE DIRECT PUSH BORINGS

## SUBSURFACE CLEARANCE SURVEY PROCEDURES

Prior to drilling, the proposed locations of borings will be marked with white paint. Underground Service Alert (USA) will be contacted prior to subsurface activities and a "ticket" will be issued for this investigation. USA members will mark underground utilities in the delineated areas using standard color code identifiers.

Once USA has marked the site, all proposed borehole locations will be investigated by subsurface clearance surveys to identify possible buried hazards (pipelines, drums, tanks). Subsurface clearance surveys use several geophysical methods to locate shallow buried man-made objects. The geophysical methods include electromagnetic induction (EMI) profiling, ground penetrating radar (GPR), and/or magnetic surveying. The choice of methods depends on the target object and potential interference from surrounding features.

Prior to drilling, all boreholes will be cleared of underground utilities to a depth of at least 4 feet below ground surface (bgs) in "non-critical zones" and to 8 feet bgs in "critical zones". Critical zones are defined as locations that are within 10 feet from the furthest edge of any underground storage tank (UST), within 10 feet of the product dispenser islands, the entire area between the UST field and the product dispenser islands, and within 10 feet of any suspected underground line. An 8- to 12-inch-diameter circle will be cut in the surface cover at each boring location.

## SOIL CORING PROCEDURES

Soil and groundwater samples are collected for lithologic and chemical analysis using a direct driven dual tube soil coring system. A hydraulic hammer drives sampling rods into the ground to collect continuous soil cores. Two nested sampling rods are driven simultaneously: small-diameter inner sampling rods are used to obtain and retrieve the soil cores; the larger diameter (approximately 2-inch OD) outer rods serve as temporary drive casing.

As the rods are advanced, soil is driven into an approximately 1.5-inch-diameter sample barrel that is attached to the end of the inner rods. Soil samples are collected in sleeves inside the sample barrel as both rods are advanced. The use of outer rods prevents sloughing of the formation while the inner rods are withdrawn from the hole. This ensures that the drive sampler will always be sampling soil from the desired interval, rather than potentially contaminated soil that has sloughed in from higher up in the hole.

After being driven 3 feet, the inner rods are removed from the borehole. The sleeves containing the soil samples are removed from the inner sample barrel, and can then be preserved for chemical analyses or used for lithologic identification. The soil-filled liner is labeled with the bore number, sample depth, site location, date, and time. The samples are placed in bags and stored in a cooler containing ice. This process is repeated until the desired depth is reached.

When the sampler is retrieved, either the lowermost or middle sample liner is removed and the ends of the tube are covered with aluminum foil or a Teflon liner and sealed with plastic caps. Soil from

one of the liners is placed in a plastic bag. The soil is scanned with a flame ionization detector (FID) or a photo-ionization detector (PID).

All drive casing, inner sample barrels, inner rods, and tools are cleaned with Alconox or equivalent detergent and deionized water. All rinsate from the cleaning is contained in 55-gallon drums at the project site.

## GROUNDWATER SAMPLING PROCEDURES

After the targeted water-bearing zone has been penetrated, the sample barrel and inner rods are removed from the borehole, and the drive casing is pulled up approximately 0.5 to 2 feet to allow groundwater to flow into the borehole. Small-diameter well casing with 0.010-inch slotted well screen or equivalent may be installed in the borehole to facilitate the collection of groundwater samples. Threaded sections of PVC are lowered into the borehole inside the drive casing. The drive casing is then pulled up to expose the slotted interval of the PVC. Groundwater samples may then be collected with a bailer, peristaltic pump, bladder pump or inertial pump until adequate sample volume is obtained.

Groundwater samples are preserved, stored in an ice-filled cooler, and are delivered, under chain-of-custody, to a laboratory certified by the California Department of Health Services (DHS) for hazardous materials analysis.

## BOREHOLE GROUTING

On completion of soil and water sampling, boreholes will be abandoned with a neat cement grout. The grout is pumped through a grouting tube positioned at the bottom of the boreholes prior to withdrawing the outer rods.

# Appendix E

# BIOSCREEN Model Data and Output

## TABLE E-1: BIOSCREEN PARAMETERS, VALUES, AND SOURCES OF DATA

| 1. Hydrogeology | | |
|---|---|---|
| **Parameter** | **Value** | **Source of Data** |
| Seepage Velocity | 138.9 ft/yr | Calculated from the other hydrogeology parameters in the program. |
| Hydraulic Conductivity | 1 x $10^{-2}$ cm/sec | Estimate based on soil classification of soil in Zone 3 and literature values. |
| Hydraulic Gradient | 0.0051 ft/ft | Estimate based on steepest historical Zone 3 northwest gradient. |
| Porosity | 0.38 | Estimate based on classification of soil in Zone 3 and literature values. |
| **2. Dispersion** | | |
| Longitudinal Dispersivity | 13.1 ft | Calculated from estimated plume length in the program. |
| Transverse Dispersivity | 1.3 ft | |
| Vertical Dispersivity | 0.0 ft | |
| Estimated Plume Length | 270 ft | Approximate distance between MW8 and Pleasanton Well No. 7. |
| **3. Adsorption** | | |
| Retardation Factor,<br>Benzene<br>MTBE | <br>1.36<br>1.07 | Calculated from the other adsorption parameters in the program. |
| Soil Bulk Density | 1.85 kg/L | Estimated literature values. |
| Partition Coefficient,<br>Benzene<br>MTBE | <br>58.9 L/kg<br>10.9 L/kg | Estimated literature values. |
| Fraction Organic Carbon | 0.1% | Estimated literature values. |
| **4. Biodegradation** | | |
| 1st Order Decay Coeff.<br>Benzene<br>MTBE | <br>0.690 / yr<br>Essentially 0 | Calculated from solute half-life in the program. |
| Solute Half-Life<br>Benzene<br>MTBE | <br>1 year<br>Essentially Infinite | Value for benzene from estimated literature values. Value for MTBE is essentially infinite due to its recalcitrant nature. |
| **5. General** | | |
| Modeled Area Length | 270 ft | Approximate distance between MW8 and Pleasanton Well No. 7. |
| Modeled Area Width | 135 ft | Estimated as ½ the modeled area length. |
| Simulation Time | 10, 100, 1000 yr | Simulation run for multiple years to check the effect on the results. |
| **6. Source Data** | | |
| Source Thickness in Sat. Zone | 23 feet | The length of the beginning of the filter pack in MW8 to the bottom of the boring (includes 7 feet of bentonite at the base of the boring). |
| Source Zone Width | 2 ft | Conservative estimate of the width of the borehole for MW8 (the actual width is 10 to 14 inches). |
| Source Zone Concentration,<br>Benzene<br>MTBE | <br>83 µg/L<br>149 µg/L | Concentrations at well MW8 at which the MCLs of 1 µg/L for benzene and 5 µg/L for MTBE could occur. |
| Soluble Mass | Infinite | Makes the source constant over the period of the simulation. |

# BIOSCREEN Natural Attenuation Decision Support System

*Air Force Center for Environmental Excellence* — *Version 1.4*

7-3399: BENZENE
Run Name

**Data Input Instructions:**

1. Enter value directly ...or
2. Calculate by filling in grey cells below. (To restore formulas, hit button below)

Variable* — Data used directly in model.
20 — Value calculated by model. (Don't enter any data)

## 1. HYDROGEOLOGY

| | | | |
|---|---|---|---|
| Seepage Velocity* | Vs | 138.9 | (ft/yr) |
| *or* | | ↑ or | |
| Hydraulic Conductivity | K | 1.0E-02 | (cm/sec) |
| Hydraulic Gradient | i | 0.0051 | (ft/ft) |
| Porosity | n | 0.38 | (-) |

## 2. DISPERSION

| | | | |
|---|---|---|---|
| Longitudinal Dispersivity | alpha x | 13.1 | (ft) |
| Transverse Dispersivity* | alpha y | 1.3 | (ft) |
| Vertical Dispersivity* | alpha z | 0.0 | (ft) |
| *or* | | ↑ or | |
| Estimated Plume Length | Lp | 270 | (ft) |

## 3. ADSORPTION

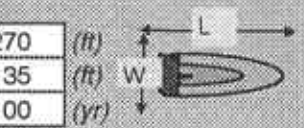
| | | | |
|---|---|---|---|
| Retardation Factor* | R | 1.3 | (-) |
| *or* | | ↑ or | |
| Soil Bulk Density | rho | 1.85 | (kg/l) |
| Partition Coefficient | Koc | 58.9 | (L/kg) |
| FractionOrganicCarbon | foc | 1.0E-3 | (-) |

## 4. BIODEGRADATION

| | | | |
|---|---|---|---|
| 1st Order Decay Coeff* | lambda | 6.9E-1 | (per yr) |
| *or* | | ↑ or | |
| Solute Half-Life | t-half | 1.00 | (year) |
| ***or Instantaneous Reaction Model*** | | | |
| Delta Oxygen* | DO | | (mg/L) |
| Delta Nitrate* | NO3 | | (mg/L) |
| Observed Ferrous Iron* | Fe2+ | | (mg/L) |
| Delta Sulfate* | SO4 | | (mg/L) |
| Observed Methane* | CH4 | | (mg/L) |

## 5. GENERAL

| | | |
|---|---|---|
| Modeled Area Length* | 270 | (ft) |
| Modeled Area Width* | 135 | (ft) |
| Simulation Time* | 100 | (yr) |




115
↑ or
0.02

## 6. SOURCE DATA

Source Thickness in Sat.Zone* 23 (ft)

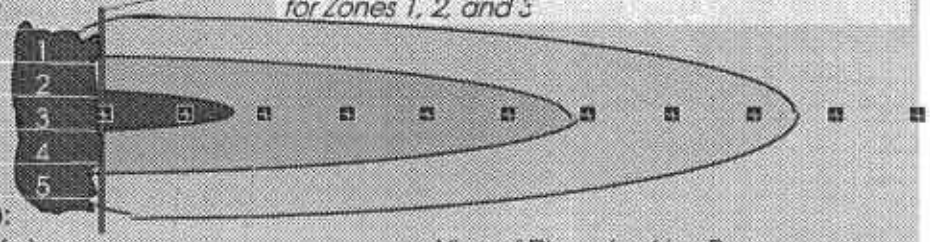
| Source Zones Width* (ft) | Conc. (mg/L)* |
|---|---|
| 0 | 0 |
| 0 | 0 |
| 2 | 0.083 |
| 0 | 0 |
| 0 | 0 |

Source Halflife (see Help):

| Inst. React. | 1st Order | |
|---|---|---|
| Infinite | Infinite | (yr) |

Soluble Mass In Source NAPL, Soil: Infinite (Kg)

*Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3*




*View of Plume Looking Down*

*Observed Centerline Concentrations at Monitoring Wells*
*If No Data Leave Blank or Enter '0'*

## 7. FIELD DATA FOR COMPARISON

| Dist. from Source (ft) | Concentration (mg/L) |
|---|---|
| 0 | |
| 27 | |
| 54 | |
| 81 | |
| 108 | |
| 135 | |
| 162 | |
| 189 | |
| 216 | |
| 243 | |
| 270 | |

## 8. CHOOSE TYPE OF OUTPUT TO SEE:

**RUN CENTERLINE** — **View Output**

**RUN ARRAY** — **View Output**

**Help**

Recalculate This Sheet

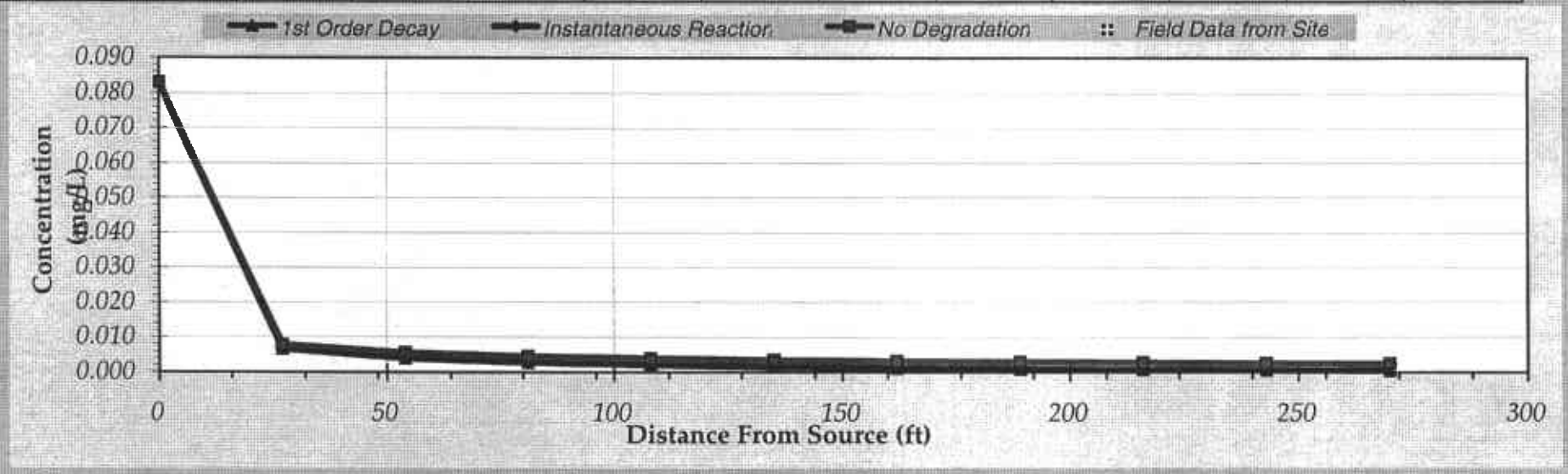
Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

## DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

*Distance from Source (ft)*

| TYPE OF MODEL | 0 | 27 | 54 | 81 | 108 | 135 | 162 | 189 | 216 | 243 | 270 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No Degradation | 0.083 | 0.008 | 0.006 | 0.005 | 0.004 | 0.004 | 0.003 | 0.003 | 0.003 | 0.003 | 0.002 |
| 1st Order Decay | 0.083 | 0.007 | 0.004 | 0.003 | 0.002 | 0.002 | 0.001 | 0.001 | 0.001 | 0.001 | 0.000 |
| Inst. Reaction | 0.083 | 0.008 | 0.006 | 0.005 | 0.004 | 0.004 | 0.003 | 0.003 | 0.003 | 0.003 | 0.002 |
| *Field Data from Site* | | | | | | | | | | | |




Calculate Animation

Time:

100 Years

Return to Input

Recalculate This Sheet

# BIOSCREEN Natural Attenuation Decision Support System

*Air Force Center for Environmental Excellence* — *Version 1.4*

7-3399: MTBE
Run Name

**Data Input Instructions:**

115
or
0.02

1. Enter value directly...or
2. Calculate by filling in grey cells below. (To restore formulas, hit button below)

Variable* — Data used directly in model.
20 — Value calculated by model. (Don't enter any data)

## 1. HYDROGEOLOGY

| | | | |
|---|---|---|---|
| Seepage Velocity* | Vs | 138.9 | (ft/yr) |
| or | | or | |
| Hydraulic Conductivity | K | 1.0E-02 | (cm/sec) |
| Hydraulic Gradient | i | 0.0051 | (ft/ft) |
| Porosity | n | 0.38 | (-) |

## 2. DISPERSION

| | | | |
|---|---|---|---|
| Longitudinal Dispersivity | alpha x | 13.1 | (ft) |
| Transverse Dispersivity* | alpha y | 1.3 | (ft) |
| Vertical Dispersivity* | alpha z | 0.0 | (ft) |
| or | | or | |
| Estimated Plume Length | Lp | 270 | (ft) |

## 3. ADSORPTION

| | | | |
|---|---|---|---|
| Retardation Factor* | R | 1.1 | (-) |
| or | | or | |
| Soil Bulk Density | rho | 1.85 | (kg/l) |
| Partition Coefficient | Koc | 10.9 | (L/kg) |
| FractionOrganicCarbon | foc | 1.0E-3 | (-) |

## 4. BIODEGRADATION

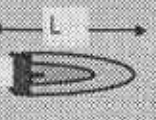
| | | | |
|---|---|---|---|
| 1st Order Decay Coeff* | lambda | 6.9E-7 | (per yr) |
| or | | or | |
| Solute Half-Life | t-half | ######## | (year) |

*or Instantaneous Reaction Model*

| | | | |
|---|---|---|---|
| Delta Oxygen* | DO | | (mg/L) |
| Delta Nitrate* | NO3 | | (mg/L) |
| Observed Ferrous Iron* | Fe2+ | | (mg/L) |
| Delta Sulfate* | SO4 | | (mg/L) |
| Observed Methane* | CH4 | | (mg/L) |

## 5. GENERAL

| | | |
|---|---|---|
| Modeled Area Length* | 270 | (ft) |
| Modeled Area Width* | 135 | (ft) |
| Simulation Time* | 100 | (yr) |




## 6. SOURCE DATA

Source Thickness in Sat.Zone* 23 (ft)

Source Zones

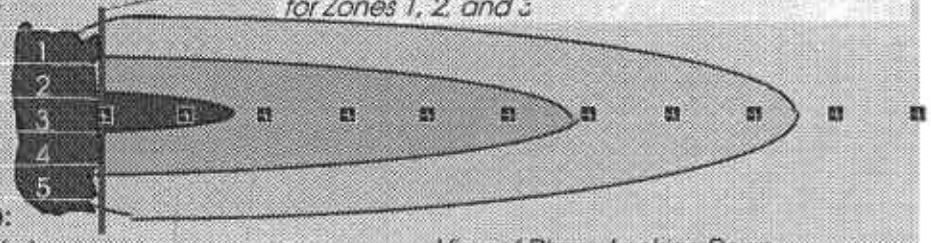
| Width* (ft) | Conc. (mg/L)* |
|---|---|
| 0 | 0 |
| 0 | 0 |
| 2 | 0.149 |
| 0 | 0 |
| 0 | 0 |

Source Halflife (see Help):

| | | |
|---|---|---|
| Infinite | Infinite | (yr) |
| Inst. React. | 1st Order | |
| Soluble Mass | Infinite | (Kg) |

In Source NAPL, Soil

*Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3*




*View of Plume Looking Down*

*Observed Centerline Concentrations at Monitoring Wells*
*If No Data Leave Blank or Enter '0'*

## 7. FIELD DATA FOR COMPARISON

| Dist. from Source (ft) | 0 | 27 | 54 | 81 | 108 | 135 | 162 | 189 | 216 | 243 | 270 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Concentration (mg/L) | | | | | | | | | | | |

## 8. CHOOSE TYPE OF OUTPUT TO SEE:

**RUN CENTERLINE** — View Output

**RUN ARRAY** — View Output

**Help**

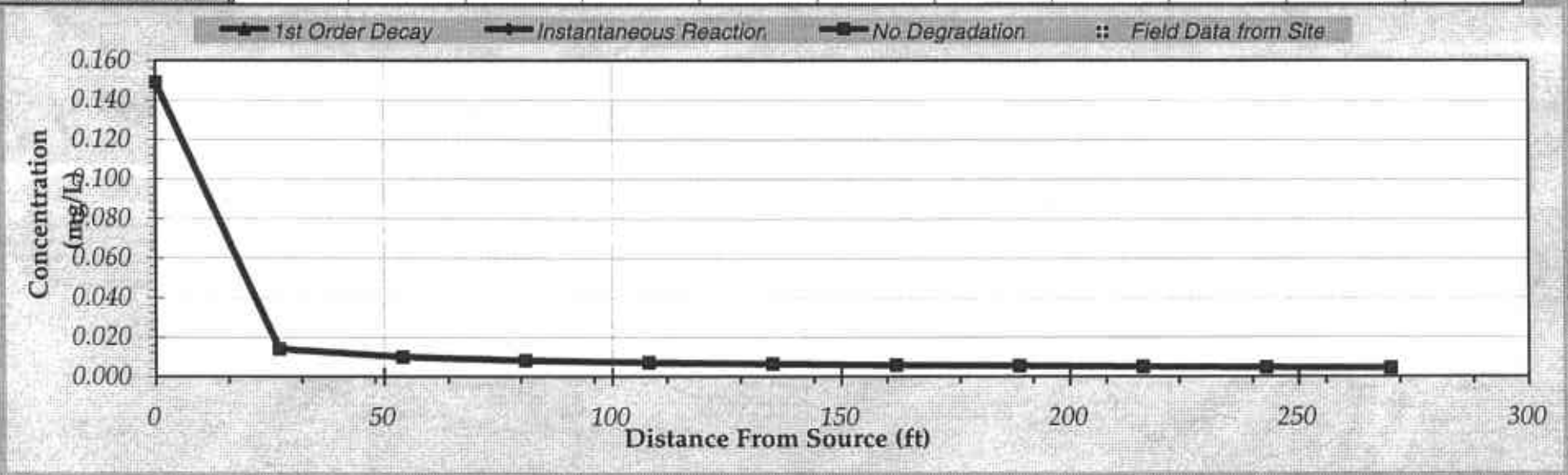
Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

## DISSOLVED HYDROCARBON CONCENTRATION ALONG PLUME CENTERLINE (mg/L at Z=0)

| TYPE OF MODEL | Distance from Source (ft) 0 | 27 | 54 | 81 | 108 | 135 | 162 | 189 | 216 | 243 | 270 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No Degradation | 0.149 | 0.014 | 0.010 | 0.008 | 0.007 | 0.006 | 0.006 | 0.005 | 0.005 | 0.005 | 0.004 |
| 1st Order Decay | 0.149 | 0.014 | 0.010 | 0.008 | 0.007 | 0.006 | 0.006 | 0.005 | 0.005 | 0.005 | 0.004 |
| Inst. Reaction | 0.149 | 0.014 | 0.010 | 0.008 | 0.007 | 0.006 | 0.006 | 0.005 | 0.005 | 0.005 | 0.004 |
| Field Data from Site | | | | | | | | | | | |




Calculate Animation

Time: 100 Years

Return to Input

Recalculate This Sheet