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

7

January 20, 2006

Shelby Lathrop (Contractor)
ConocoPhillips
Risk Management & Remediation
76 Broadway
Sacramento, CA 95818

Dear Ms. Lathrop:

Subject: Fuel Leak Case No. [redacted] Unocal Service Station No. 5325, 3220 Lakeshore Avenue, Oakland, CA

Alameda County Environmental Health (ACEH) staff has reviewed "Ozone Sparge Pilot Test Work Plan" dated November 17, 2005, prepared by TRC. We request that you perform the proposed work and send us the technical reports requested below.

OTHER COMMENTS

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. Submission of reports to the Geotracker website does not fulfill the requirement to submit documents to the Alameda County ftp site. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for 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 monitor wells, and other data to the Geotracker database over the Internet. Beginning July 1, 2005, electronic submittal of a complete copy of all necessary reports was required in Geotracker (in PDF format). Please visit the SWRCB website for more information on these requirements (http://www.swrcb.ca.gov/ust/cleanup/electronic_reporting).

TECHNICAL REPORT REQUEST

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

- January 31, 2006 - 4th Quarter 2005 Groundwater Monitoring Report
- March 17, 2006 - Soil and Groundwater Investigation Report

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.

If you have any questions, I may be reached at (510) 567-6746.

Sincerely,

Don Hwang
Hazardous Materials Specialist
Local Oversight Program

C: Keith Woodburne, TRC, 1590 Solano Way, Suite A, Concord, CA 94520
Donna Drogos
File

Hwang, Don, Env. Health

From: Woodburne, Keith [kwoodburne@TRCSOLUTIONS.com]

Sent: Wednesday, January 18, 2006 12:06 PM

To: Hwang, Don, Env. Health

Cc: Drogos, Donna, Env. Health; Shelby.S.Lathrop@conocophillips.com

Subject: FW: Response to ACHCS comments on Ozone Pilot Test Work Plan for 76 Station No. 5325

Attachments: 5290 CAP Approval ltr_111605.pdf; 5130 RCAP Public Comment ltr_011006.pdf; 2452 Ozone Pilot Study Approval ltr_010906.pdf

Don,

At the request of the ACEH during our August 2005 conference call, TRC submitted an Ozone Pilot Test Work Plan on November 17, 2005 to evaluate ozone sparging effectiveness in a limited test area prior to any full-scale implementation of the technology. To address your concerns regarding ozone sparging effectiveness and site applicability, TRC sent you extensive supporting documentation regarding ozone sparging technology and the equipment that will be used during the pilot test. To address your additional concerns regarding ozone sparging effectiveness and your desire to see other examples where this technology has bee successfully applied, I recently sent you reports for various ConocoPhillips sites (discussed below) where ozone sparging systems have been installed and pilot tests have been conducted.

The ozone pilot test conducted at 76 Station No. 5290 in Santa Clara showed ozone sparging to be effective in remediation of site hydrocarbons and it was subsequently recommended as the selected remedial alternative in the Corrective Action Plan (CAP) submitted for that site (you should already have a copy of the CAP). Attached is an approval letter from the Santa Clara County Department of Environmental Health (SCCDEH) approving the CAP for 76 Station No. 5290.

A similar pilot study was conducted at 76 Station No. 5130 in Milpitas, and ozone sparging was recommended as the selected remedial alternative in the Revised CAP submitted for that site (you should already have a copy of the RCAP). The attached letter from the SCCDEH indicates the CAP has been sent out for a 30-day public comment period, without any modifications requested by the SCCDEH. Approval of that Revised CAP should be received within 30 days.

TRC also submitted an Ozone Pilot Test Work Plan (identical to the one we sent you for site 5325 Oakland) to the Regional Water Quality Control Board (RWQCB) for 76 Station No. 2452 in Santa Cruz. Attached is a copy of the approval letter from the RWQCB. The RWQCB approved the work plan without any objections.

I hope we have addressed your concerns regarding the effectiveness of ozone sparging. Obviously, there are no guarantees that a particular remedial approach will be 100% effective at a particular site. However, past successes at other sites with similar site conditions, and the acceptance of this technology by a number of regulatory agencies, should convince you that application of ozone sparging at site 5325 has a reasonable chance of success. However, we won't know for sure how effective the technology will be until we complete the requested pilot study.

Recent groundwater analytical data from site wells show the hydrocarbon plume is on the move, with apparent migration of the MtBE plume of up to 60 feet over the past six months. Therefore, it is critical that we implement the pilot study as quickly as possible. If the pilot study shows ozone sparging to be an effective remedial approach, and we believe it will, a full scale system will need to be installed quickly to prevent further plume migration and potential impact to offsite receptors.

Please let me know if you have any additional questions or concerns regarding the proposed pilot study.

Regards,

Keith Woodburne, R.G.
Senior Project Geologist

TRC
1590 Solano Way, Suite A
Concord, CA 94520
T: 925-688-2488
F: 925-688-0388
C: 925-260-1373

From: Woodburne, Keith
Sent: Tuesday, January 03, 2006 1:31 PM
To: 'Hwang, Don, Env. Health'
Cc: Shelby Lathrop (Shelby.S.Lathrop@conocophillips.com)
Subject: RE: Response to ACHCS comments on Ozone Pilot Test Work Plan for 76 Station No. 5325

Don,

To hopefully address your concerns regarding the potential effectiveness of ozone sparging at 76 Station No. 5325, I am sending you reports for other ConocoPhillips sites where ozone sparging has proven to be effective.

Here is the Ozone Sparging System Installation Report, the Ozone Sparging Pilot Test & Monitored Natural Attenuation Progress Report, and the subsequent Corrective Action Plan for a ConocoPhillips site in Milpitas. In the CAP, continued ozone sparging was recommended and approved by the Santa Clara County Department of Environmental Health (SCCDEH). The site has variable soil types into which sparge points were installed, ranging from sandy silts to silty gravels. The boring logs for the sparge point installations are shown in Appendix C of the Ozone Sparging System Installation Report.

I will forward more examples in a separate email.

Let me know if you have trouble opening any of the attachments.

Keith Woodburne, R.G.
Senior Project Geologist
TRC
1590 Solano Way, Suite A
Concord, CA 94520
T: 925-688-2488
F: 925-688-0388
C: 925-260-1373

From: Hwang, Don, Env. Health [mailto:don.hwang@acgov.org]
Sent: Friday, December 30, 2005 10:14 AM
To: Woodburne, Keith
Subject: RE: Response to ACHCS comments on Ozone Pilot Test Work Plan for 76 Station No. 5325

Keith,

My main concern is that what is proposed has a reasonable chance to work.

You indicate that "This technology has been applied successfully at several other sites with similar site conditions (i.e., lithologies, depth to groundwater, constituents of concern and their concentrations, etc.),". Can you provide SWI for these sites & show similarities?

Don 510-567-6746

From: Woodburne, Keith [mailto:kwoodburne@TRCSOLUTIONS.com]
Sent: Wednesday, December 28, 2005 10:08 AM

To: Hwang, Don, Env. Health
Cc: Drogos, Donna, Env. Health; Shelby.S.Lathrop@conocophillips.com
Subject: Response to ACHCS comments on Ozone Pilot Test Work Plan for 76 Station No. 5325

Don,

Last week we talked briefly about the Ozone Pilot Test Work Plan submitted on behalf of ConocoPhillips for 76 Station No. 5325 located at 3220 Lakeshore Avenue in Oakland. You had reviewed the work plan and had some questions regarding the location and depth of the proposed sparge points and on the overall applicability of the ozone technology. I believe our conversation may not have addressed all of your questions so I thought I'd follow up via email to summarize some of the major points, as I understood them, of our discussion.

As you recall, TRC had originally proposed to install a permanent ozone treatment system at the site. During a phone call on August 31, 2005 with ConocoPhillips and myself, you expressed concern on the applicability of this technology and requested a short-term pilot study to evaluate the feasibility of this technology before planning a full-scale system.

A work plan was recently submitted outlining a short-term (3-month) ozone injection pilot study near well U-2. TRC believes the work plan outlines appropriately the scope of work needed to properly evaluate ozone injection as a potential remedial alternative. This technology has been applied successfully at several other sites with similar site conditions (i.e., lithologies, depth to groundwater, constituents of concern and their concentrations, etc.), and TRC has provided equipment specifications for the mobile treatment system that will be used during the test. If the test is not successful, alternative technologies will be proposed.

Please advise which specific issues need to be addressed in order to move forward with this scope of work. For example, if your concern is that 3 months constitutes a long test, the test duration could be shortened to 30 days or less. Of course, more data would be obtained from a longer test, and we would not expect significant contaminant response from a short test. We could, however, evaluate oxygen migration patterns based on dissolved oxygen changes which should be observable during such a test, and that data could be used to predict the radius of influence of the injection process. If you have specific questions on well construction and placement, I suggest a conference call to clarify. If you would prefer additional analyses during the test to evaluate the effect of ozone on the subsurface, we've had some similar requests from other regulators and can add that to the scope of work.

As we discussed during our November 30, 2005 meeting, we want to develop an acceptable template for ozone pilot testing that may be proposed at other ConocoPhillips sites you're managing within the County. I'll follow up with you shortly to discuss, clarify, and hopefully resolve outstanding issues so that the field work can be scheduled for early 2006.

Thank you for taking the time to conduct a detailed review of the Ozone Pilot Test Work Plan. We appreciate the opportunity to meet the County's and ConocoPhillips' goals for this location.

Regards,

Keith Woodburne, R.G.
Senior Project Geologist
TRC
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Concord, CA 94520
T: 925-688-2488
F: 925-688-0388
C: 925-260-1373

R-229

Hwang, Don, Env. Health

From: Woodburne, Keith [kwoodburne@TRCSOLUTIONS.com]
Sent: Tuesday, January 03, 2006 2:07 PM
To: Hwang, Don, Env. Health
Cc: Shelby.S.Lathrop@conocophillips.com
Subject: RE: Response to ACHCS comments on Ozone Pilot Test Work Plan for 76 Station No. 5325
Attachments: 5290 Feasibility Study.pdf; OzoneSpargingSystemStartupReport.pdf; OzoneSpargingSystemStatusReport_.pdf; Corrective Action Plan.pdf

Don,

Here's another ConocoPhillips site where ozone sparging has been shown to be effective. As with the previous site, continued ozone sparging was recommended and approved by the SCCDEH as the appropriate remedial alternative. The lithologies at this site are mostly silty sands. Copes of the boring logs are included in Appendix C of the System Startup Report.

The soils at this site are slightly more permeable than those observed at 76 Station No. 5325, which simply allows for slightly larger sparge point spacing. The permeable soils beneath 76 Station No. 5325 are silty sands and silt with sand which overlie a clay unit. The proposed spage points for the pilot study at 76 Station No. 5325 will be installed above the clay unit, into the silt with sand unit. According to the historical boring logs for the site, this contact between the silt with sand and the underlying clay is still 5 feet below the current depth to water. Furthermore, the evidence of hydrocarbon impact to soils noted in these historical boring logs is localized in the more permeable soils above the underlying clay. This observation is supported by the soil analytical data from those well installations. Let me know if you don't have a copy of the December 19, 1990 Well Installation Report prepared by Gettler-Ryan and I'll forward you a pdf copy.

Let me know if you have any additional questions or if you cannot open the attachments.

Regards,

Keith Woodburne, R.G.
Senior Project Geologist
TRC
1590 Solano Way, Suite A
Concord, CA 94520
T: 925-688-2488
F: 925-688-0388
C: 925-260-1373

From: Hwang, Don, Env. Health [mailto:don.hwang@acgov.org]
Sent: Friday, December 30, 2005 10:14 AM
To: Woodburne, Keith
Subject: RE: Response to ACHCS comments on Ozone Pilot Test Work Plan for 76 Station No. 5325

Keith,

My main concern is that what is proposed has a reasonable chance to work.

You indicate that "This technology has been applied successfully at several other sites with similar site conditions (i.e., lithologies, depth to groundwater, constituents of concern and their concentrations, etc.),". Can you provide SWI for these sites & show similarities?

Don 510-567-6746

From: Woodburne, Keith [mailto:kwoodburne@TRCSOLUTIONS.com]
Sent: Wednesday, December 28, 2005 10:08 AM
To: Hwang, Don, Env. Health
Cc: Drogos, Donna, Env. Health; Shelby.S.Lathrop@conocophillips.com
Subject: Response to ACHCS comments on Ozone Pilot Test Work Plan for 76 Station No. 5325

Don,

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A work plan was recently submitted outlining a short-term (3-month) ozone injection pilot study near well U-2. TRC believes the work plan outlines appropriately the scope of work needed to properly evaluate ozone injection as a potential remedial alternative. This technology has been applied successfully at several other sites with similar site conditions (i.e., lithologies, depth to groundwater, constituents of concern and their concentrations, etc.), and TRC has provided equipment specifications for the mobile treatment system that will be used during the test. If the test is not successful, alternative technologies will be proposed.

Please advise which specific issues need to be addressed in order to move forward with this scope of work. For example, if your concern is that 3 months constitutes a long test, the test duration could be shortened to 30 days or less. Of course, more data would be obtained from a longer test, and we would not expect significant contaminant response from a short test. We could, however, evaluate oxygen migration patterns based on dissolved oxygen changes which should be observable during such a test, and that data could be used to predict the radius of influence of the injection process. If you have specific questions on well construction and placement, I suggest a conference call to clarify. If you would prefer additional analyses during the test to evaluate the effect of ozone on the subsurface, we've had some similar requests from other regulators and can add that to the scope of work.

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Thank you for taking the time to conduct a detailed review of the Ozone Pilot Test Work Plan. We appreciate the opportunity to meet the County's and ConocoPhillips' goals for this location.

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Hwang, Don, Env. Health

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Cc: Drogos, Donna, Env. Health; Shelby.S.Lathrop@conocophillips.com
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Regards,

Keith Woodburne, R.G.
Senior Project Geologist
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1590 Solano Way, Suite A
Concord, CA 94520
T: 925-688-2488
F: 925-688-0388
C: 925-260-1373

Hwang, Don, Env. Health

From: Kosel, Thomas H [Thomas.H.Kosel@conocophillips.com]
Sent: Tuesday, August 30, 2005 2:00 PM
To: Hwang, Don, Env. Health; Drogos, Donna, Env. Health
Cc: Lathrop, Shelby Suzanne; Woodburne, Keith
Subject: RE: Conference call, 10:00 am, Wed., Aug. 31

I would like to propose a conference call for tomorrow's meeting to discuss the work plans that TRC has submitted on ConocoPhillips' behalf. I propose to start the call at 10:00 am (Wed., 8/31/05). The two ConocoPhillips sites that TRC has submitted work plans are:

76 Station No. 7376, 4191 First Street, Pleasanton, CA.

76 Station No. 5325, 3220 Lakeshore Avenue, Oakland, CA.

The access numbers for the conference call are:

Toll Number 1-210-814-1161

Toll Free Number 1- 866-623-8735

Pass code: 2435219 (followed by the # sign).

Shelby and I are available to talk about other sites/issues should Alameda County wish to do so.

Thomas H. Kosel
Site Manager, Risk Management and Remediation
ConocoPhillips
76 Broadway, Sacramento, CA 95818
916-558-7666, fax 916-558-7639, cell 916-622-2028

-----Original Message-----
From: Hwang, Don, Env. Health [mailto:don.hwang@acgov.org]
Sent: Wednesday, August 24, 2005 10:36 AM
To: Kosel, Thomas H; Drogos, Donna, Env. Health
Cc: Lathrop, Shelby Suzanne; Batra, Roger; evans60@atcassociates.com; Thomas Potter; jwagoner@deltaenv.com; RSC:MTBE
Subject: RE: Alameda County Work Plans for ConocoPhillips

Hi Thomas & Shelby, I'm in agreement with you to consider these as priority cases. We have a few others that we consider priority cases. Would you be able to meet to discuss priority cases 8/30 3PM+, or 8/31 9AM - noon, or 3PM+, or 9/1 10AM+? Sorry for the short notice. If these dates aren't good for you, please propose alternate dates. Don 510-567-6746

From: Kosel, Thomas H [mailto:Thomas.H.Kosel@conocophillips.com]
Sent: Tuesday, July 26, 2005 5:50 PM
To: Hwang, Don, Env. Health; Drogos, Donna, Env. Health
Cc: Lathrop, Shelby Suzanne; Batra, Roger; evans60@atcassociates.com; Thomas Potter; jwagoner@deltaenv.com; RSC:MTBE
Subject: Alameda County Work Plans for ConocoPhillips

Ms. Drogos and Mr. Hwang
Alameda County Health Agency

Attached is a list of six work plans for ConocoPhillips sites that are currently pending review by the

Alameda County Health Agency. We have listed the work plans in the order that COP would like to have them reviewed. We (and our consultants) are available to discuss these projects to assist Alameda County in the review of these work plans. We are also available to meet with the County should you wish to do so.

We declare, under penalty of perjury, that to the best of our knowledge the information and/or recommendations contained in the attached proposal or reports are true and correct.

1. 76 Station No. 7373, 4191 First Street, Pleasanton, California. Additional Soil and Groundwater Investigation Work Plan, submitted to Alameda County Health Services on May 20, 2005. Work plan to characterize vertical and lateral distribution of dissolved-phase hydrocarbons, including MTBE, in offsite soil and groundwater. Consultant: TRC, Roger Batra.

2. 76 Station No. 1156, 4276 MacArthur, Oakland: WP for additional site investigation submitted 5-24-05. Consultant: ATC, Dave Evans.

3. 76 Station No. 5325, 3220 Lakeshore Avenue, Oakland, California. Work Plan for Interim Remedial Measure/ Feasibility Study, submitted to ACHS on August 30, 2004. Consultant: TRC, Roger Batra.

4. 76 Station No. 0843, 1629 Webster, Alameda: WP for additional site investigation submitted 5-17-05. Consultant: ATC, Dave Evans.

5. 76 Station No. 6129, 3420 35 Ave, Oakland: WP for additional site investigation submitted 6-13-05. Consultant: ATC, Dave Evans.

6. 76 Station No. 6049, 898 A Street, Hayward: Closure submitted 4-20-03. Consultant: ATC, Dave Evans.

Shelby Lathrop
Shaw Environmental
Service Provider for ConocoPhillips
76 Broadway, Sacramento, CA 95818
916-558-7609, fax 916-558-7639, cell 707-592-1146

Thomas H. Kosel
Site Manager, Risk Management and Remediation
ConocoPhillips
76 Broadway, Sacramento, CA 95818
916-558-7666, fax 916-558-7639, cell 916-622-2028

Hwang, Don, Env. Health

From: Kosel, Thomas H [Thomas.H.Kosel@conocophillips.com]
Sent: Tuesday, July 26, 2005 5:50 PM
To: Hwang, Don, Env. Health; Drogos, Donna, Env. Health
Cc: Lathrop, Shelby Suzanne; Batra, Roger; evans60@atcassociates.com; Thomas Potter; jwagoner@deltaenv.com; RSC:MTBE
Subject: Alameda County Work Plans for ConocoPhillips

Ms. Drogos and Mr. Hwang
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Attached is a list of six work plans for ConocoPhillips sites that are currently pending review by the Alameda County Health Agency. We have listed the work plans in the order that COP would like to have them reviewed. We (and our consultants) are available to discuss these projects to assist Alameda County in the review of these work plans. We are also available to meet with the County should you wish to do so.

We declare, under penalty of perjury, that to the best of our knowledge the information and/or recommendations contained in the attached proposal or reports are true and correct.

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Site Manager, Risk Management and Remediation
ConocoPhillips
76 Broadway, Sacramento, CA 95818
916-558-7666, fax 916-558-7639, cell 916-622-2028

Hwang, Don, Env. Health

From: Batra, Roger [rbatra@TRCSOLUTIONS.com]
Sent: Wednesday, May 11, 2005 11:38 AM
To: Hwang, Don, Env. Health
Cc: Thomas.H.Kosel@conocophillips.com
Subject: RE: 76 Service Station # 5325, 3220 Lakeshore Avenue, Oakland, California

Attachments: Fig2_Proposed Sparge Points.pdf; 5325 1st Qtr 2005_20050421171224.pdf


Fig2_Proposed Sparge Points.pd...


5325 1st Qtr)05_200504211712.

Don,

The ozone-microsparge system will use low-flow air sparging and perforated points to introduce microbubbles of encapsulated ozone into the water table to oxidize contaminants. As the microbubbles rise within the column of water, the dissolved-phase hydrocarbons are rapidly oxidized. Ozone rapidly decomposes to oxygen. No waste is generated in the process. As was proposed in the Work Plan for Interim Remedial Measure/Feasibility Study dated August 30, 2004, the installation of the eleven onsite ozone sparge wells are based on the distribution of hydrocarbons in the water-bearing zone (QMR for Q1 2005 is attached). The ozone sparge well layout (Figure 2 in the Work Plan)is designed to decrease concentrations of existing hydrocarbons and act as a barrier to hydrocarbon migration. In addition, field data would be collected for evaluation of the effectiveness of the system. The samples will be collected at wells U-1, U-2, and U-6 to monitor ozone sparge system performance. All samples will be analyzed for dissolved oxygen (DO), oxygen-reduction potential (ORP), pH, electroconductivity, temperature, total petroleum hydrocarbons as gasoline, bezene, ethylbenzene, toluene, xylenes, and methyl tertiary butyl ether (MTBE). Quarterly sampling of all site wells will also continue during this period.

A system performance report will be submitted after six months of operation. Based on the changes in contaminant concentrations and dissolved oxygen levels at the monitoring wells, operation parameters (i.e. will be adjusted to optimize system performance. A final report will be prepared and submitted after twelve months of operation. At that time, the contaminant concentrations, DO level, and other monitored parameters measured will be compared to the initial condition from the monitoring wells.

Attached is Figure 2 showing the location of the proposed sparge points and the First Quarter 2005 QMR for the subject site.

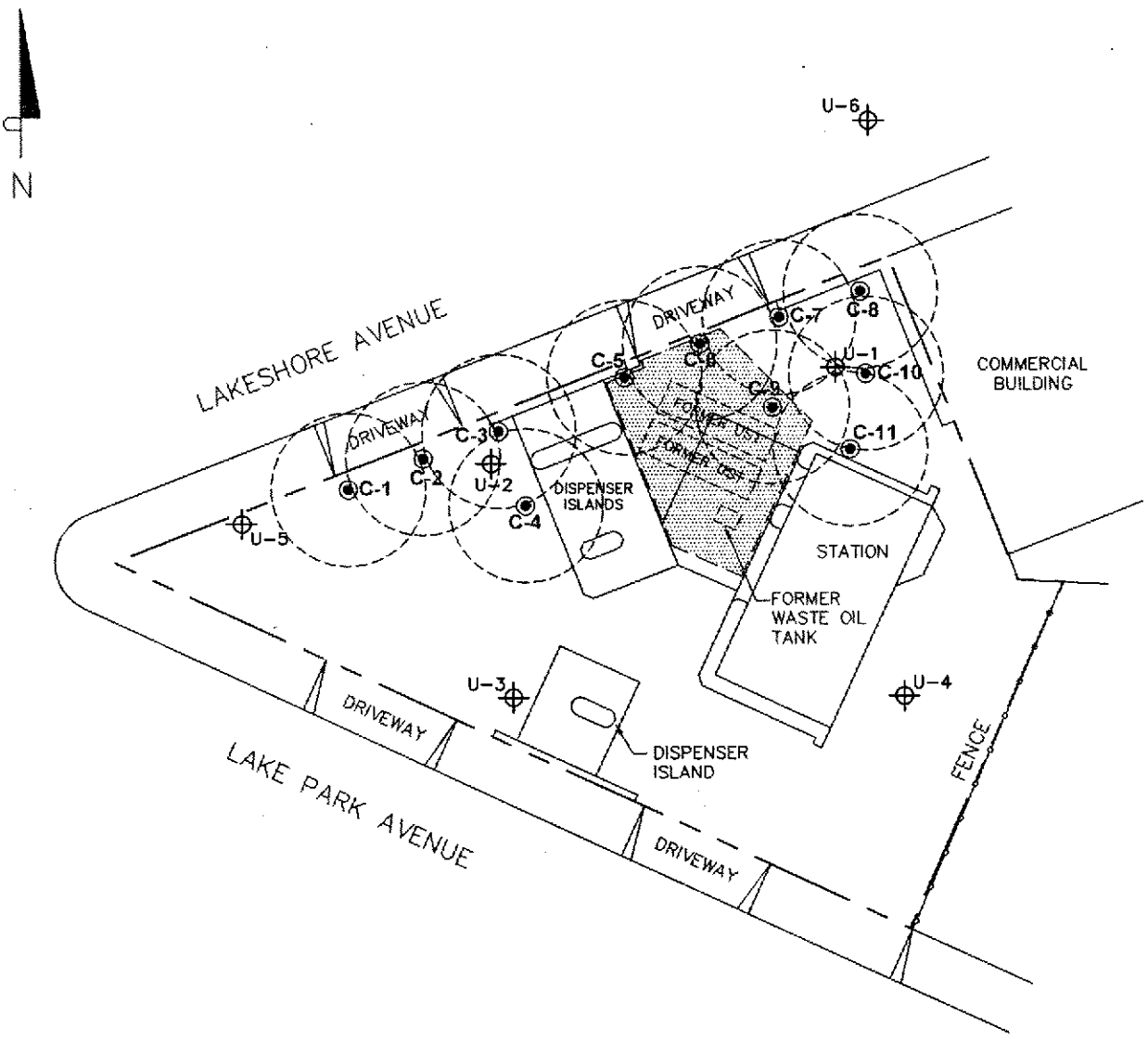
Thanks,

Roger Batra
Senior Project Manager
TRC
1590 Solano Way, Suite A
Concord, California 94520
925-688-2466 (Direct)
925-260-6403 (Cell)

-----Original Message-----
From: Hwang, Don, Env. Health [mailto:don.hwang@acgov.org]
Sent: Wednesday, May 04, 2005 10:35 AM
To: Batra, Roger
Subject: RE: 76 Service Station # 5325, 3220 Lakeshore Avenue, Oakland, California

Roger,

I've reviewed "Work Plan for Interim Remedial Measure/Feasibility Study"



LEGEND

- Property boundary
- Fence
- Approximate location of 1990 UST excavation
- U-6 — Monitoring well
- C-11 — Proposed sparge point with 18' radius of influence

APPROXIMATE SCALE (FEET)

0 40 80

PROPOSED SPARGE POINTS

76 Service Station #5325
3200 Lakeshore Avenue
Oakland, California

SOURCE: Site plan by Gettler-Ryan, November 2000.

TRC

FIGURE 2

Hwang, Don, Env. Health

From: Batra, Roger [rbatra@TRCSOLUTIONS.com]
Sent: Tuesday, May 03, 2005 10:56 AM
To: Hwang, Don, Env. Health
Subject: 76 Service Station # 5325, 3220 Lakeshore Avenue, Oakland, California

Attachments: ozone.pdf

ozone.pdf (71 KB)

Don,

Per your request, I am sending additional information on the Ozone Sparging Technology. I hope this helps in your approval of our work plan for the subject site (submitted on August 30, 2005).

Please call me should you have any questions or concerns.

Thanks,

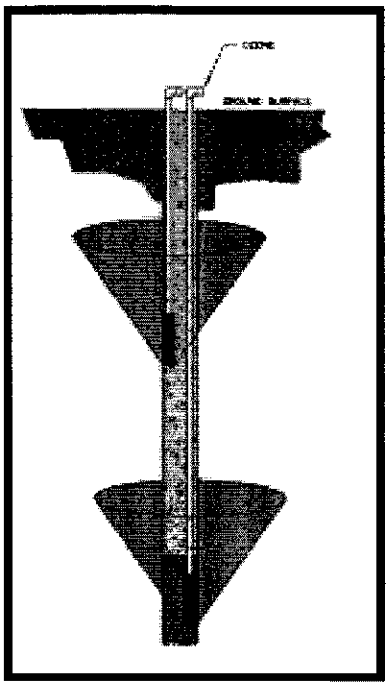
Roger Batra
Senior Project Manager
TRC
1590 Solano Way, Suite A
Concord, California 94520
925-688-2466 (Direct)
925-260-6403 (Cell)

http://www.kva-equipment.com/doc.php?12,0,58187p,ker56833,,,Index

http://www.kva-equipment.com/product.php?14,2,58187p,ker56833,,,Doc,page.html

<<ozone.pdf>>

Introduction to
Ozone Injection Technology



Ozone is a highly reactive chemical that has proven to be effective in destroying a wide variety of organic chemicals, including MtBE and chlorinated VOCs. Ozone destroys organic chemicals through the process of chemical oxidation, which breaks the targeted organic chemical down into carbon dioxide and water. Ozone is commonly used in aboveground treatment systems for treatment of wastewater and is widely used to treat extracted groundwater generated from pump-and-treat remediation systems.

An affordable and flexible alternative to large pump and treat systems, LFR uses the KVA C-Sparge™ System, a self-contained ozone-air sparging panel. The 110V panel operates as follows:

- Generated ozone is injected through tubing to a microporous sparge point designed to generate very small (i.e. approximately 50 micrometers in diameter) bubbles.
- Ozone micro bubbles are forced out into the surrounding water-bearing formation.
- A control panel regulates the frequency/duration of ozone injections.
- Ozone injected into the formation comes into contact with impacted groundwater, where contaminants in groundwater volatilize into the ozone bubble and are oxidized (destroyed).

This technology has the following advantages over other remedial approaches:

- Low capital equipment costs.
- Minimal site disturbance.
- Equipment is self-contained and compact (2' x 3').
- Technology has the potential to substantially decrease the mass and concentration of contaminants in a short time period (i.e., weeks).
- Does not require vapor control since the contaminants are destroyed rather than transferred from one phase to another.

LFR Levine·Fricke has been remediating contaminated sites throughout the country since our inception in 1969. Our vast experience with innovative, as well as conventional, remedial technologies allows us to bring cost-effective site closure to environmentally challenged properties.

LFR LEVINE • FRICKE
5 Johnson Drive, PO Box 130, Raritan, NJ 08869-0130 • (908) 526-1000 • (908) 526-7886 Fax • www.lfr.com

A Success Story: Ozone-Air Sparging Pilot Test at an MtBE Site in Long Island, New York

Background

LFR Levine·Fricke conducted a pilot study to evaluate the efficacy of an ozone and air-sparging system for *in-situ* treatment of methyl tertiary-butyl ether (MtBE) and benzene, toluene, ethylbenzene and xylenes (BTEX) impacted groundwater at a gasoline spill site on Long Island, New York. Two ozone-air sparge points were installed at different depths in a single borehole to maximize the conical diffusion of the gasses in the medium- to coarse-grain sand aquifer. Monitoring wells were installed at twelve and twenty-eight feet downgradient of the sparge points to measure the magnitude of hydraulic effect and to monitor changes in groundwater quality resulting from addition of ozone and air.

Results

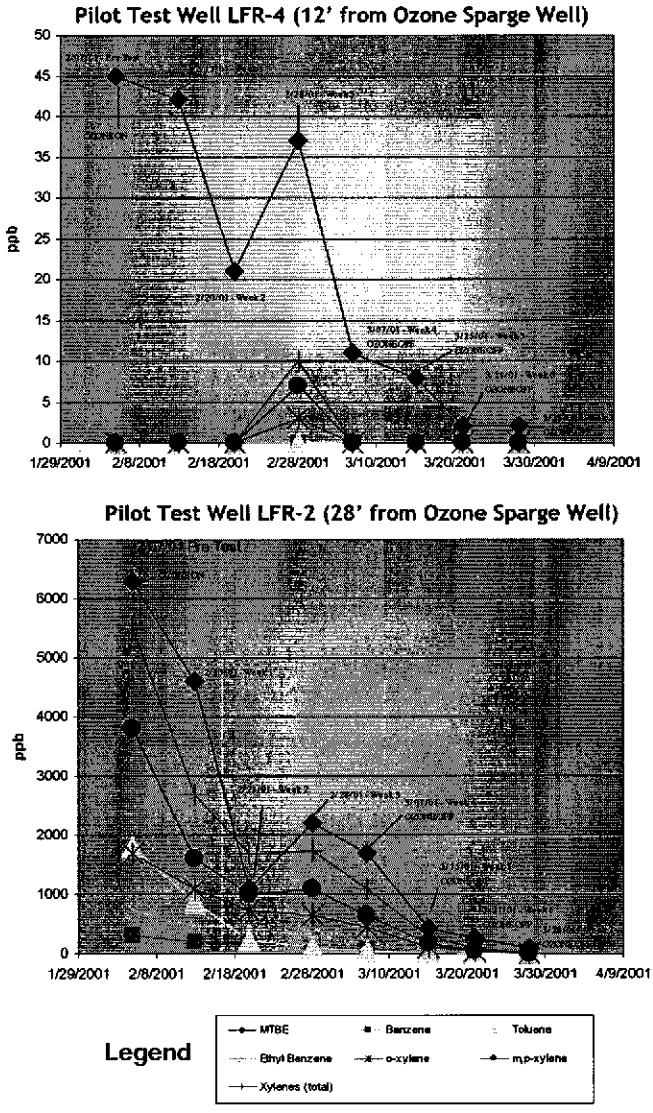
Pressure data from down-hole transducers and measurements of dissolved oxygen in groundwater were used to evaluate the area of influence of the sparging system. These data confirmed that the ozone-air sparge system had a down-gradient radius of influence of at least 28 feet.

Changes in MtBE concentration in groundwater were monitored and destruction rates estimated using analytical results from weekly samples collected from the monitoring points. The graphs at right plot MtBE concentration versus time for LFR-4 (12 feet down-gradient of the sparge well) and LFR-2 (28 feet downgradient of the sparge well).

After four weeks of ozone-air sparging, MtBE concentrations in LFR-2 decreased from 6,300 parts per billion (ppb) to 1,700 ppb, a 73% destruction rate. MtBE concentrations continued to decrease for three weeks after the four-week ozone-air sparging period to 79 ppb, *a 99% destruction rate*, at week 7. BTEX concentrations in LFR-2 realized similar decreases.

LFR-4 MtBE concentrations decreased from 45 ppb to 11 ppb in the four week ozone-air sparge period, a 76% destruction rate. MtBE concentrations continued to decrease for three weeks after the four-week ozone-air sparging period to 2 ppb, *a 96% destruction rate*, at week 7. BTEX was not initially detected in this well, however a spike in BTEX concentrations occurred after two weeks of ozone sparging.

MTBE and BTEX Concentrations vs. Time



Conclusions

LFR has performed a successful pilot clearly demonstrating the efficacy of the ozone and air sparging technology for remediation of MtBE and BTEX impacted groundwater. This innovative remedial technology is a cost-effective and timely alternative for the conventional pump and treat remedial technologies.

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

October 1, 2001
StID 1059/ RO0000229

Mr. Dave DeWitt
Tosco Marketing Company
2000 Crow Canyon Place, Suite 400
San Ramon, CA 94583

Re: Tosco Service Station #5325, 3220 Lakeshore Ave., Oakland CA 94610

Dear Mr. DeWitt:

Upon review of the Second Quarter 2001 Monitoring Report for the referenced site, I have the following observations:

- MTBE concentrations remain elevated in wells U-1 and U-2
- No information regarding recent past quarter or future proposed actions at the site is provided
- No information regarding the advancement of the proposed off-site boring nor the extraction of groundwater from monitoring or back-fill wells is given

Please provide a summary of actions, both past and future proposed actions, along with your monitoring reports. Please give a summary of the amounts of groundwater and estimated mass of TPHg and MTBE removed from the site. Please continue groundwater extraction from monitoring and tank back-fill wells on a regular basis until TPH concentrations remain consistently below 8000 ppb, the RWQCB interim Criterion for Continuous Concentration.

You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M. Chan
Hazardous Materials Specialist

C: B. Chan, files
H. Kevork, Gettler-Ryan Inc., 6747 Sierra Court, Suite J, Dublin, CA 94568
01-3220LakeshoreAve

RO 229

QUARTERLY SUMMARY REPORT

4th QUARTER - 2001
(October-December)

Tosco (76) Service Station No. 5325
3220 Lakeshore Avenue
Oakland, California

1059

COUNTY: Alameda **RWQCB Office:** San Francisco Bay Region

BACKGROUND: The site is currently an operating Tosco 76 service station. The underground storage tanks were replaced in June 1990. Approximately 850 cubic yards of soil was excavated during UST replacement activities. Three groundwater monitoring wells were installed on-site in September 1990. Two additional on-site monitoring wells and one offsite monitoring well were installed in June 1994. Quarterly sampling of wells began in October 1990. Conducted groundwater study which indicated no influence from Lake Merritt. Product skimmer was installed in Well U-1 during the First Quarter 1996 and is currently maintained. Waste oil UST and product lines were removed in November 1996. Approximately 147 tons of soil was excavated from the product lines. One UST backfill observation well was installed and a Limited Subsurface Investigation was performed on June 23, 1997. Soil samples were collected for specific analysis for future use in a RBCA preparation. Approximately 13,000 gallons of groundwater was extracted from the UST complex for remedial purposes. Fourth Quarter 1997 investigation reported free phase product in wells MW-1 and MW-2. A subsequent investigation indicated that no free phase product was observed and that the initial (quarterly) investigation was incorrect. Alton Geosciences performed vapor extraction on site wells in April 1999, utilizing a mobile dual phase extraction system. Approximately 20,000 gallons of groundwater was purged during dual phase extraction system operation. Installed an additional UST backfill conductor casing and commenced purging of groundwater in third quarter 2000.

RECENT QUARTER ACTIVITIES: Prepared and submitted the quarterly summary report. Monitored and sampled the groundwater monitoring wells. Continued groundwater purging of the UST pit.

NEXT QUARTER ACTIVITIES:. Perform quarterly groundwater monitoring and sampling. Continue groundwater purging of the UST pit, collect water sample from UST pit, and evaluate the effectiveness of purging.

CHARACTERIZATION/REMEDIAL STATUS:

Soil contamination delineated?	Yes
Dissolved ground water delineated?	No
Free product delineated?	Yes
Amount of impacted GW recovered this quarter?	13,100 (gal)
Amount of impacted GW recovered historically?	115,384 (gal)
Soil remediation in progress?	No - USTs replaced in June 1990, lines replaced November 1996.
- anticipated start/completion?	N/A
Dissolved/free product remediation in progress?	Yes (groundwater purging)
- anticipated start?	1/01
- anticipated completion?	unknown
CONSULTANT/CONTRACTOR:	Gettler-Ryan Inc.

Still have on-going MTBE problem. In the gw purging mode to date.

R0229

QUARTERLY SUMMARY REPORT

2nd QUARTER - 2001
(April - June)

Tosco (76) Service Station No. 5325
3220 Lakeshore Avenue
Oakland, California

COUNTY: Alameda **RWQCB Office:** San Francisco Bay Region

BACKGROUND: The site is currently an operating Tosco 76 service station. The underground storage tanks were replaced in June 1990. Approximately 850 cubic yards of soil was excavated during UST replacement activities. Three groundwater monitoring wells were installed on-site in September 1990. Two additional on-site monitoring wells and one offsite monitoring well were installed in June 1994. Quarterly sampling of wells began in October 1990. Conducted groundwater study which indicated no influence from Lake Merritt. Product skimmer was installed in Well U-1 during the First Quarter 1996 and is currently maintained. Waste oil UST and product lines were removed in November 1996. Approximately 147 tons of soil was excavated from the product lines. One UST backfill observation well was installed and a Limited Subsurface Investigation was performed on June 23, 1997. Soil samples were collected for specific analysis for future use in a RBCA preparation. Approximately 13,000 gallons of groundwater was extracted from the UST complex for remedial purposes. Fourth Quarter 1997 investigation reported free phase product in wells MW-1 and MW-2. A subsequent investigation indicated that no free phase product was observed and that the initial (quarterly) investigation was incorrect. Alton Geosciences performed vapor extraction on site wells in April 1999, utilizing a mobile dual phase extraction system. Approximately 20,000 gallons of groundwater was purged during dual phase extraction system operation. Installed an additional UST backfill conductor casing and commenced purging of groundwater in third quarter 2000.

RECENT QUARTER ACTIVITIES: Prepared and submitted the quarterly summary report. Monitored and sampled the groundwater monitoring wells. Continued groundwater purging of the UST pit.

NEXT QUARTER ACTIVITIES:. Prepare and submit the quarterly summary report. Perform quarterly groundwater monitoring and sampling. Continue groundwater purging of the UST pit and evaluate the effectiveness of purging.

CHARACTERIZATION/REMEDIAL STATUS:

Soil contamination delineated?	Yes
Dissolved ground water delineated?	No
Free product delineated?	Yes
Amount of impacted GW recovered this quarter?	9,300 (gal)
Amount of impacted GW recovered historically?	92,784 (gal)
Soil remediation in progress?	No - USTs replaced in June 1990, lines replaced November 1996.
- anticipated start/completion?	N/A
Dissolved/free product remediation in progress?	Yes (groundwater purging)
- anticipated start?	1/01
- anticipated completion?	unknown
CONSULTANT/CONTRACTOR:	Gettler-Ryan Inc.

RO229

QUARTERLY SUMMARY REPORT

1st QUARTER - 2001
(January - March)

Tosco (76) Service Station No. 5325
3220 Lakeshore Avenue
Oakland, California

COUNTY: Alameda **RWQCB Office:** San Francisco Bay Region

BACKGROUND: The site is currently an operating Tosco 76 service station. The underground storage tanks were replaced in June 1990. Approximately 850 cubic yards of soil was excavated during UST replacement activities. Three groundwater monitoring wells were installed on-site in September 1990. Two additional on-site monitoring wells and one offsite monitoring well were installed in June 1994. Quarterly sampling of wells began in October 1990. Conducted groundwater study which indicated no influence from Lake Merritt. Product skimmer was installed in Well U-1 during the First Quarter 1996 and is currently maintained. Waste oil UST and product lines were removed in November 1996. Approximately 147 tons of soil was excavated from the product lines. One UST backfill observation well was installed and a Limited Subsurface Investigation was performed on June 23, 1997. Soil samples were collected for specific analysis for future use in a RBCA preparation. Approximately 13,000 gallons of groundwater was extracted from the UST complex for remedial purposes. Fourth Quarter 1997 investigation reported free phase product in wells MW-1 and MW-2. A subsequent investigation indicated that no free phase product was observed and that the initial (quarterly) investigation was incorrect. Alton Geosciences performed vapor extraction on site wells in April 1999, utilizing a mobile dual phase extraction system. Approximately 20,000 gallons of groundwater was purged during dual phase extraction system operation. Installed an additional UST backfill conductor casing and commenced purging of groundwater in third quarter 2000.

RECENT QUARTER ACTIVITIES: Prepared and submitted quarterly summary reporting. Monitored and sampled groundwater monitoring wells. Continued groundwater purging of the UST pit.

NEXT QUARTER ACTIVITIES:. Prepare and submit the quarter summary report. Perform quarterly groundwater monitoring and sampling. Continue groundwater purging of the UST pit and evaluate the effectiveness of purging.

CHARACTERIZATION/REMEDIAL STATUS:

Soil contamination delineated?	Yes
Dissolved ground water delineated?	No
Free product delineated?	Yes
Amount of impacted GW recovered this quarter?	18,000 (gal)
Amount of impacted GW recovered historically?	83,484 (gal)
Soil remediation in progress?	No - USTs replaced in June 1990, lines replaced November 1996.
- anticipated start/completion?	N/A
Dissolved/free product remediation in progress?	Free Product (skimmer)
- anticipated start?	1/96
- anticipated completion?	4Q97
CONSULTANT/CONTRACTOR:	Gettler-Ryan Inc.

TOSCO
Marketing
Company

2000 Crow Canyon Place
Suite 400
San Ramon, CA 94583
925.277.2305
fax: 925.277.2361

**Environmental
Compliance
Department**

#1059

00 NOV -2 PM 4:54
ENVIRONMENTAL PROTECTION

November 1, 2000

Mr. Barney Chan
Alameda County Health Care Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Site activities
Tosco/76 Products Service Station #5325
3220 Lakeshore Avenue
Oakland, CA

Dear Mr. Chan:

Please find attached a letter report which details the installation of the tank pit extraction well at the site. The well was installed by TRC on September 28, 2000.

Any questions please call me at 925-277-2384.

Sincerely,

David B. De Witt
Environmental Project Manager

Cc: Dave Vossler, Gettler-Ryan, Inc.

TRC

October 26, 2000 Project No. 41-0302

Mr. Dave Dewitt
Tosco Distribution Company
2000 Crow Canyon Place, Suite 400
San Ramon, California 94583

SITE: TOSCO FACILITY NO. 5325
3220 LAKESHORE AVENUE
OAKLAND, CALIFORNIA

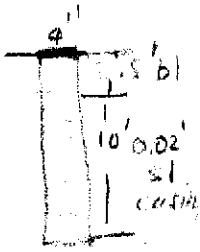
RE: TANK CAVITY WELL INSTALLATION REPORT

Dear Mr. DeWitt:

TRC submits this report for activities conducted on September 28, 2000 at Tosco Facility No. 5325, located at 3220 Lakeshore Avenue, Oakland, California (Figure 1).

The tank cavity well installation began with the saw-cutting of a 2.5 foot x 2.5 foot concrete area where the tank cavity well (TW-1) was to be installed. Following the removal of the concrete debris, a 2-foot diameter conductor casing was advanced down into the pea gravel approximately 3 feet below grade (fbg).

Following the conductor casing advancement, 10 feet of 4-inch diameter schedule 40 polyvinyl chloride (PVC) slotted casing (0.020-inch slots) was advanced into the pea gravel inside of the conductor casing. This was accomplished by removing pea gravel by suction hose from the interior of the casing as it was advanced down into the tank cavity. A 4-inch diameter schedule 40 PVC blank was then attached, and the casing was advanced to a total depth of 13.5 fbg. A locking casing cap was used to seal the top of the tank cavity well casing. The 2-foot diameter conductor casing was then removed, and the small void remaining was filled with pea gravel. The tank cavity well was then completed to grade using a 12-inch traffic-rated well box set with concrete. Following installation, approximately 3,000 gallons of water was removed. The purge water was then transported to the Tosco Rodeo Refinery for disposal. Approximately one-eighth of a yard of pea gravel was generated from the tank cavity well installation. A tank cavity well installation diagram is presented in Figure 2.



If you have any questions regarding this report, please contact Tracy Walker at (925) 688-2476.

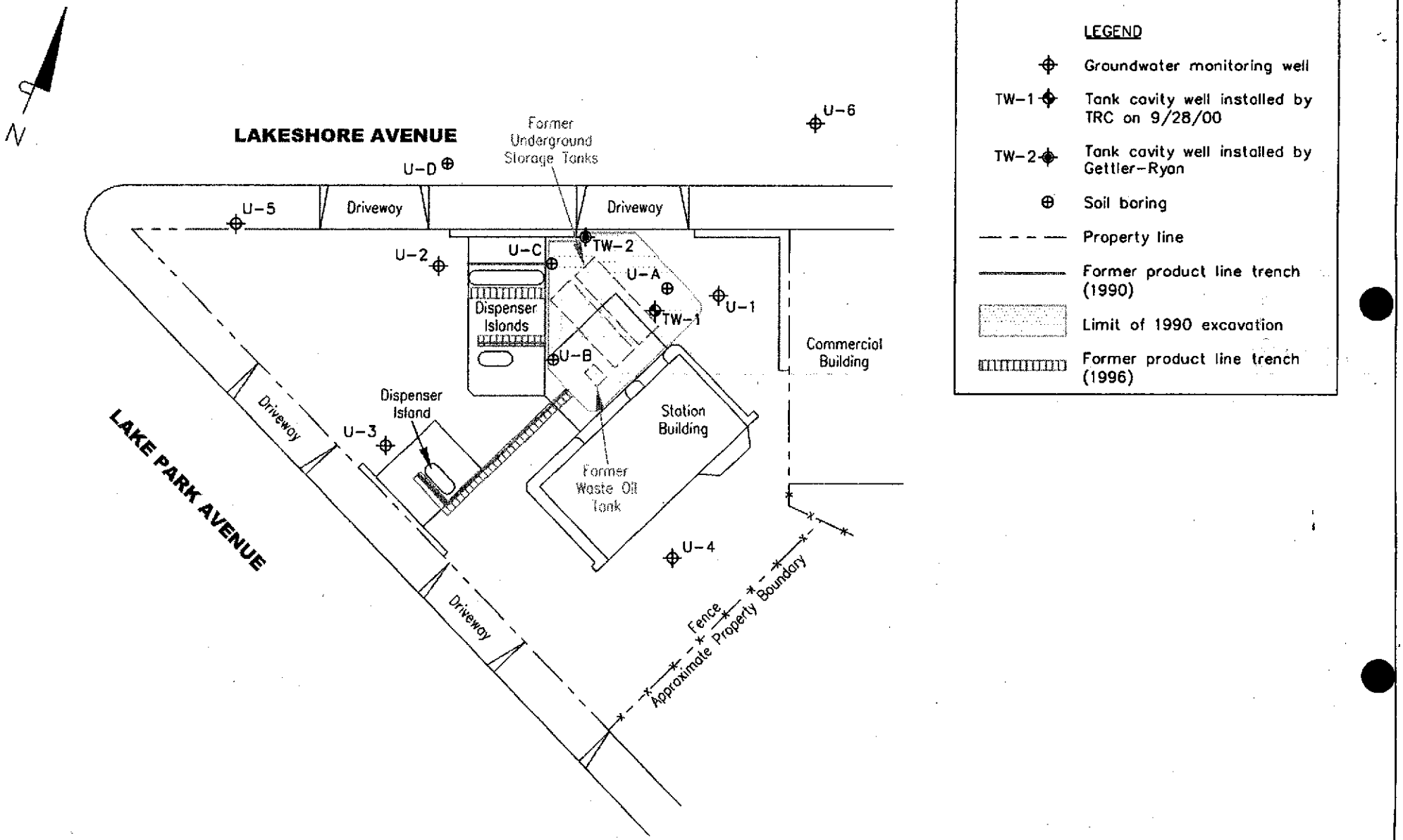
Sincerely,

Jeffrey S. Hunter
Staff Geologist

Tracy L. Walker, RG
Associate

Attachments

5052 Commercial Circle • Concord, California 94520
Telephone 925-688-1200 • Fax 925-688-0388



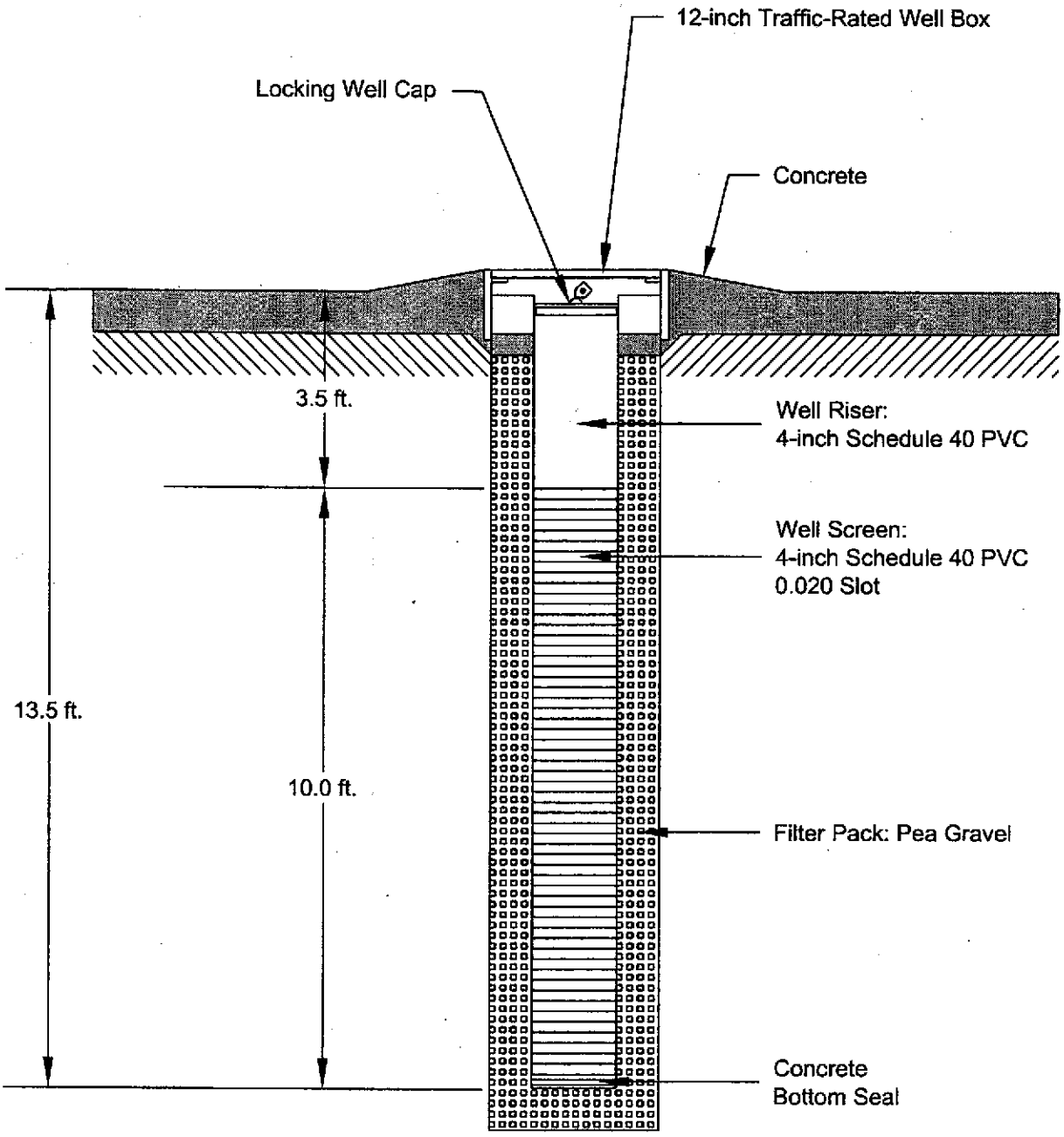
SOURCE: Gettler-Ryan Inc. Site Plan

SITE PLAN

Tosco (Unocal) Service Station 5325
3220 Lakeshore Avenue
Oakland, California

TRC

FIGURE 1



SCALE: NOT TO SCALE

TANK CAVITY WELL TW-1
COMPLETION DIAGRAM

Tosco (Unocal) Service Station 5325
3220 Lakeshore Avenue
Oakland, California

TRC | **FIGURE 2**

TOSCO
Marketing
Company

2000 Crow Canyon Place
Suite 400
San Ramon, CA 94583
925.277.2305
fax: 925.277.2361

**Environmental
Compliance
Department**

1059

October 25, 2000

Mr. Barney Chan
Alameda County Health Care Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Site activities
Tosco/76 Products Service Station #5325
3220 Lakeshore Avenue
Oakland, CA

Dear Mr. Chan:

This letter is written in response to a request for a site update made to Jed Douglas of Gentler-Ryan, our consultant. It is my understanding that you were concerned about the lack of information regarding the installation of the tank pit extraction well, proposed in the final version of the Site Conceptual Model (June 19, 2000). The extraction well was installed on September 28, 2000 by TRC/Alton Geosciences in conjunction with Gettler-Ryan and Onyx Industrial Services. At that time, 3000 gallons of contaminated water were removed from the tank pit and transported to the Tosco – Rodeo Refinery for processing. It is intended that weekly purging of the tank pit will occur on a weekly basis, unless there is insufficient recharge to the tank pit.

Prior to the well installation, a thorough inspection was made to verify the condition of the various fittings and components on the tanks and lines. There were some suspect fill-sump components which will be replaced in the near future. It is possible these components may have allowed MtBE vapors to encounter the groundwater. Should this be the case, it would explain the high concentrations of MtBE in the immediate vicinity of the tank pit.

Due to the configuration of the site, it was determined to move the location of the well to the north so as not to interfere with business traffic. Due to the configuration of the site, we only will be able to use a 3000-gallon tank truck for the purging. A previous well installed for similar purposes had less than satisfactory performance, but it is believed this was the result of the placement of the well immediately adjacent to the pit wall, resulting in restricted flow into the wellbore.

To date (10-21-00), we have extracted 11,500 gallons from the well. In about a month, we will take a tank pit water sample for analysis to determine if the technique is useful. If you have any questions on the project, please feel free to call me at 925-277-2384.

Sincerely,

David B. De Witt

David B. De Witt
Environmental Project Manager

Cc: Dave Vossler, Gettler-Ryan, Inc.

- Aren't they sampling @ each extraction event to calculate removal?

GETTLER-RYAN INC.

TRANSMITTAL

TO: Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

DATE: October 19, 2000
PROJ. #: Various
SUBJECT: Quarterly Summary Reports
Various Tosco (Unocal) Sites
Alameda County

FROM:
David J. Vossler
Project Manager
Gettler-Ryan Inc.
1364 N. McDowell Blvd., Suite B2
Petaluma, California 94954

WE ARE SENDING YOU:

COPIES	DATED	DESCRIPTION
1	3rd Quarter 2000	Quarterly Summary Report

THESE ARE TRANSMITTED as checked below:

[X] For review and comment [ ] Approved as submitted [ ] Resubmit _ copies for approval

[X] As requested [ ] Approved as noted [ ] Submit _ copies for distribution

[ ] For approval [ ] Return for corrections [ ] Return _ corrected prints

COMMENTS:

At the request of Tosco Marketing Company, we are forwarding you a corrected copy of the above listed documents for you files. If you have any questions, please call me at (707) 789-3251.

cc: Mr. David De Witt, Tosco Marketing Company
Mr. Barney Chan, Alameda County Health Care Services Agency (SS No. 5325)

QUARTERLY SUMMARY REPORT
3RD QUARTER - 2000
(JULY-SEPTEMBER)

1059

TOSCO (UNOCAL) SERVICE STATION No. 5325
3220 Lakeshore Avenue
Oakland, California

COUNTY: Alameda **RWQCB Office:** San Francisco Bay Region

BACKGROUND: The site is currently an operating Tosco 76 service station. The underground storage tanks were replaced in June 1990. Approximately 850 cubic yards of soil was excavated during UST replacement activities. Three groundwater monitoring wells were installed on-site in September 1990. Two additional on-site monitoring wells and one offsite monitoring well were installed in June 1994. Quarterly sampling of wells began in October 1990. Conducted groundwater study which indicated no influence from Lake Merritt. Product skimmer was installed in Well U-1 during the First Quarter 1996 and is currently maintained. Waste oil UST and product lines were removed in November 1996. Approximately 147 tons of soil was excavated from the product lines. One UST backfill observation well was installed and a Limited Subsurface Investigation was performed on June 23, 1997. Soil samples were collected for specific analysis for future use in a RBCA preparation. Approximately 13,000 gallons of groundwater was extracted from the UST complex for remedial purposes. Fourth Quarter 1997 investigation reported free phase product in wells MW-1 and MW-2. A subsequent investigation indicated that no free phase product was observed and that the initial (quarterly) investigation was incorrect. Alton Geosciences performed vapor extraction on site wells in April 1999, utilizing a mobile dual phase extraction system. Approximately 20,000 gallons of groundwater was purged during dual phase extraction system operation.

RECENT QUARTER ACTIVITIES: Prepared quarterly summary reporting. Monitored and sampled groundwater monitoring wells. Installed an additional UST backfill conductor casing and purged 3,000 gallons of groundwater.

NEXT QUARTER ACTIVITIES:. Prepare and submit the quarter summary report. Perform quarterly groundwater monitoring and sampling. Resume groundwater purging of the UST pit. ; Should plan to GW sample off site boring in street for MTBE.

CHARACTERIZATION/REMEDIAL STATUS:

Soil contamination delineated?	Yes
Dissolved ground water delineated?	No
Free product delineated?	Yes
Amount of impacted GW recovered this quarter?	3,000 (gal)
Amount of impacted GW recovered historically?	36,659 (gal)
Soil remediation in progress?	No - USTs replaced in June 1990, lines replaced November 1996.
- anticipated start/completion?	N/A
Dissolved/free product remediation in progress?	Free Product (skimmer)
- anticipated start?	1/96
- anticipated completion?	4Q97
CONSULTANT/CONTRACTOR:	Gettler-Ryan Inc.

GETTLER-RYAN INC.

TRANSMITTAL

00 JUL 21 PM 2:17

TO: Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

DATE: July 19, 2000
PROJ. #: Various
SUBJECT: Quarterly Summary Reports
Various Tosco (Unocal) Sites
Alameda County

FROM:
David J. Vossler
Project Manager
Gettler-Ryan Inc.
1364 N. McDowell Blvd., Suite B2
Petaluma, California 94954

WE ARE SENDING YOU:

COPIES	DATED	DESCRIPTION
1	2nd Quarter 2000	Quarterly Summary Report

THESE ARE TRANSMITTED as checked below:

[X] For review and comment [ ] Approved as submitted [ ] Resubmit _ copies for approval
[X] As requested [ ] Approved as noted [ ] Submit _ copies for distribution
[ ] For approval [ ] Return for corrections [ ] Return _ corrected prints

COMMENTS:

At the request of Tosco Marketing Company, we are forwarding you a corrected copy of the above listed documents for you files. If you have any questions, please call me at (707) 789-3251.

cc: Mr. David De Witt, Tosco Marketing Company
Mr. Barney Chan, Alameda County Health Care Services Agency (SS No. 5325)

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

June 30, 2000
StID # 1059

Mr. David DeWitt
Tosco Marketing Co.
2000 Crow Canyon Place, Suite 400
San Ramon, CA 94583

Re: Site Conceptual Model for Tosco Service Station, 3220 Lakeshore Ave., Oakland CA 94610

Dear Mr. DeWitt:

Our office has received and reviewed the June 19, 2000 Site Conceptual Model (SCM) for the above referenced site as prepared by Gettler-Ryan Inc. (GR). Based upon this evaluation, it was determined that this site is a Class D priority as defined in the SWRCB Final Draft of Guidelines for Investigation and Cleanup of MTBE and Other Ether-Based Oxygenates. This is because the site is not in an area that is most vulnerable to contamination and has concentrations of MTBE in groundwater over 5 ppb. In addition, using ecological protection levels from the Water Board, no eco-risk is likely to the nearest surface water body, Lake Merritt.

Though this site is considered a Class D, sites with high concentration of MTBE should have those concentrations and mass reduced before the plume can spread as stated in the SWRCB's final draft. To address this concern, the SCM proposes to perform purging of the tank pit every two weeks of an estimated 5000 gallon volume of impacted water. This is proposed for a period of three months for a total removal volume of 30,000 gallons. In addition, to further characterize the extent of the petroleum plume, GR proposes to advance a boring near former boring U-D and sample soil and groundwater for both chemical and geo-technical analysis. These items were discussed in our February 1, 2000 meeting and were verbally agreed upon at that time.

Our office approves this work proposal, however, please perform the additional items:

- Please include the removal of groundwater from wells U-1 and U-2 during the groundwater extraction event since it is uncertain whether pumping from the tank pit will influence these known impacted areas.
- Please include information regarding the groundwater removal in your groundwater monitoring reports. Please include such items as an estimate of the mass of each analyte removed, total mass removed, etc.
- Please continue groundwater removal until the concentrations in on-site wells equilibrates to low levels of MTBE.

Please initiate this work as soon as possible. You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M Chan

Barney M. Chan
Hazardous Materials Specialist

C: B. Chan, files
Mr. J. Douglas, Gettler-Ryan, 1364 North McDowell Blvd. Suite B2, Petaluma CA 94954-1116

SCMap3220Lakeshore

QUARTERLY SUMMARY REPORT
1ST QUARTER - 2000
(JANUARY-MARCH)

RO229

TOSCO (UNOCAL) SERVICE STATION No. 5325
3220 Lakeshore Avenue
Oakland, California

COUNTY: Alameda

RWQCB Office: San Francisco Bay Region

BACKGROUND: The site is currently an operating Tosco service station. The underground storage tanks were replaced in June 1990. Approximately 850 cubic yards of soil was excavated during UST replacement activities. Three groundwater monitoring wells were installed on-site in September 1990. Two additional on-site monitoring wells and one offsite monitoring well were installed in June 1994. Quarterly sampling of wells began in October 1990. Conducted groundwater study which indicated no influence from Lake Merritt. Product skimmer was installed in Well U-1 during the First Quarter 1996 and is currently maintained. Waste oil UST and product lines were removed in November 1996. Approximately 147 tons of soil was excavated from the product lines. One UST backfill observation well was installed and a Limited Subsurface Investigation was performed on June 23, 1997. Soil samples were collected for specific analysis for future use in a RBCA preparation. Approximately 13,000 gallons of groundwater was extracted from the UST complex for remedial purposes. Fourth Quarter 1997 investigation reported free phase product in wells MW-1 and MW-2. A subsequent investigation indicated that no free phase product was observed and that the initial (quarterly) investigation was incorrect. Alton performed vapor extraction on site wells in April 1999, utilizing a mobile "high vac" extraction system. Approximately 20,000 gallons of groundwater was purged during "high vac" extraction system operation.

RECENT QUARTER ACTIVITIES: Prepared quarterly summary reporting. Monitored and sampled groundwater monitoring wells.

NEXT QUARTER ACTIVITIES:. Prepare and submit the quarter summary report. Perform quarterly groundwater monitoring and sampling. Install an additional UST backfill conductor casing. Initiate groundwater purging of the UST pit. Submit final site conceptual model.

CHARACTERIZATION/REMEDIAL STATUS:

Soil contamination delineated?	Yes
Dissolved ground water delineated?	No
Free product delineated?	Yes
Amount of impacted GW recovered this quarter?	0 (gal)
Amount of impacted GW recovered historically?	33,659 (gal)
Soil remediation in progress?	No - USTs replaced in June 1990, lines replaced November 1996.
- anticipated start?	N/A
- anticipated completion?	N/A
Dissolved/free product remediation in progress?	Free Product (skimmer)
- anticipated start?	1/96
- anticipated completion?	4Q97
CONSULTANT/CONTRACTOR:	Gettler-Ryan Inc.

140123.01.frm

GETTLER-RYAN INC.

March 13, 2000

#1059

Mr. Barney Chan
Alameda County Environmental Health Services
1131 Harbor Bay Parkway
Alameda, CA 94502

Subject: **Response to Alameda County Environmental Health Services Letter Dated February 16, 2000, concerning Tosco (76) Service Station No. 5325, located at 3220 Lakeshore Avenue, Oakland, California, and Tosco (76) Service Station No. 3135, located at 845 66th Avenue, Oakland, California.**

Mr. Chan:

Gettler-Ryan Inc. (GR) on behalf of Tosco Marketing Company (Tosco) has prepared this letter detailing responses to observations posed in the Alameda County Environmental Health Services (ACEHS) letter dated February 16, 2000. The letter pertained to Tosco (76) Service Station No. 5325, located at 3220 Lakeshore Avenue, Oakland, California, and to Tosco (76) Service Station No. 3135, located at 845 66th Avenue, Oakland, California. The observations raised in the 2/16/00 letter are shown below in italics with our responses listed after the question.

1) Observations pertaining to Tosco Station No. 5325

"...provide an estimate of the amount of residual petroleum at the site, and also estimate the amount of petroleum removed in the groundwater extracted during this treatment."

Total Petroleum Hydrocarbons as gasoline (TPHg) mass remaining in soil at the site has been calculated at approximately 381 pounds. TPHg mass remaining in groundwater at the site has been calculated at approximately 146 pounds. Methyl tertiary-Butyl Ether (MtBE) mass remaining in groundwater at the site has been calculated at approximately 47 pounds. (See attached calculation sheets)

The amount of TPHg mass in the 13,580 gallons of groundwater extracted from the site during the April 1999 event has been calculated at approximately 4.65 pounds. ≈3%

"...you believed a boring, U-D, had already been taken in this area and that you would provide me any soil or groundwater data."

Soil boring U-D was completed at the site on June 23, 1997. As presented in GeoStrategies, Inc. *Soil Boring and Well Installation Report*, dated August 4, 1997, boring U-D was advanced by hand-auger to a total depth of 6 feet below ground surface (bgs) at the location shown on the attached Figure 2. Groundwater was encountered at a depth of approximately 6 feet bgs and a soil sample was collected in the capillary fringe at a depth of 5.5 feet bgs (U-D-5.5). No groundwater sample was collected from the boring. **Analytical results from the soil sample are presented on the attached Table 1.** TPHg was detected at a concentration of 450 parts per million (ppm) and MtBE was detected at a concentration of 1.1 ppm. Benzene was not detected in the soil sample.

2) Observations pertaining to Tosco Station No. 3135

"...submit a workplan for the installation of an off-site well."

GR has prepared a Work Plan for the installation of one off-site groundwater monitoring well. The well is proposed to be located on the south side of 66th Avenue, as shown on Figure 2 in the attached Work Plan.

If you have any questions or comments please feel free to call either of us.

Sincerely
Gettler-Ryan Inc.,

Jed A. Douglas
Project Geologist

Stephen J. Carter
Senior Geologist
R.G. 5577

REGISTERED GEOLOGIST
STEPHEN J. CARTER
No. 5577
STATE OF CALIFORNIA

Attachments: Mass Calculations
Figure 2 – Site Plan
Table 1 – Soil Chemical Analytical Data
Work Plan for Monitoring Well Installation

cc: Mr. David De Witt, Tosco Marketing Company, San Ramon, California

don't get the cale.

Hydrocarbon Mass Calculations for Tosco (76) Service Station No. 5325

A) TPHg Mass Calculation in Soil

Assumptions:

1. Concentration estimate does not include non-detectable points, therefore results may be artificially high because of this assumption.
2. Mass of soil impacted by TPHg is separated into two areas as shown on Figure 2. Area 1 equals a rectangular area covering the UST and dispenser areas of the site to a depth of 8 feet (average groundwater depth), equal to approximately 80 ft x 60 ft x 8 ft, less approximately 500 cubic yards overexcavated above groundwater during tank replacement in 1990. Area 2 equals a pentagon shaped area surrounding the UST and dispenser area including U-5, U-D and U-E, less Area 1, equal to approximately 70 ft x 50 ft x 8 ft.
3. Concentration of TPHg for individual locations is an average over the 8 foot depth assuming the upper 0 to 7.5 feet of soil is non detect, using soil sample analyses from monitoring wells and borings. The TPHg concentration used in the final calculation is an arithmetic mean of the averaged concentrations for each area.

Area 2

T
8 3-7.5 ND

Area 1

Volume (V) = 80' x 60' x 8' = 38400 cubic feet = 1422 cubic yards, - 500 yds^3 = 922 yds^3 soil

Converted to cubic centimeters = 922 yds^3 x 27 ft^3/yds^3 x 28316.85 cm^3/ft^3 = 7.05 x 10^8 cm^3

Soil Density = 1.7 g/cm^3 based on RBCA default value

3.2
8 dtw 8

(5/8)

TPHg concentration = (110 x 62.5%)+(12 x 62.5%)+(480 x 62.5%)+(270 x 40%)+(450 x 40%)+(220 x 40%)/6 = 125 mg/kg = 125.4 ug/g (mg/kg = ug/g)

Mass = Volume x Density x Concentration

Mass = 7.05 x 10^8 cm^3 x 1.7 g/cm^3 x 125.4 ug/g = 1.50 x 10^{11} ug = 150 Kg = **330 lbs TPHg in soil**

Area 2

Volume (V) = 70' x 50' x 8' = 28000 cubic feet = 1037 yds^3 soil

Converted to cubic centimeters = 1037 yds^3 x 27 ft^3/yds^3 x 28316.85 cm^3/ft^3 = 7.93 x 10^8 cm^3

Soil Density = 1.7 g/cm^3 based on RBCA default value

(1/2/8)

TPHg concentration = (450 x 6.25%)+(400 x 6.25%)+(29 x 6.25%)/3 = 18.3 mg/kg = 18.3 ug/g (mg/kg = ug/g)

Mass = Volume x Density x Concentration

Mass = 7.93×10^8 cm^3 x 1.7 g/cm^3 x 18.3 ug/g = 2.467×10^{10} ug = 24.6 Kg = **51.4 lbs TPHg in soil**

Total pounds of TPHg in soil for Areas 1 and 2 combined = 381.4

B) Hydrocarbon Mass Calculations in Groundwater

Assumptions:

1. Mass of impacted groundwater is equal to the mass of soil times the porosity of the soil. For TPHg and MTBE, an area approximately equal to the lowest iso-concentration contour is used, times the thickness of impacted groundwater equal to 18 feet (depth to water (~ 8') to bottom of deepest well (~26')).
2. Porosity of soil in saturated zone is approximately 40%.

TPHg

Volume (V) = 200' x 60' x 18' = 216,000 ft^3 x 0.40 x 62.4 lbs/ft^3 = 5.39×10^6 lbs water

Average TPHg concentration = (55000+23300+2620)/3 = 26,973 ppb = 27 ppm

Mass = Volume x Density x Concentration

Mass of TPHg = (5.39×10^6 lbs x 27 lbs TPHg)/1x 10^6 lbs H_2O = **146 lbs TPHg in water**

MTBE

Volume = 200' x 90' x 18' = 324,000 ft^3 x 0.40 x 62.4 lbs/ft^3 = 8.087×10^6 lbs water

Average MtBE concentration = (15300+6690+1040+239)/4 = 5817 ppb = 5.8 ppm

Mass = Volume x Density x Concentration

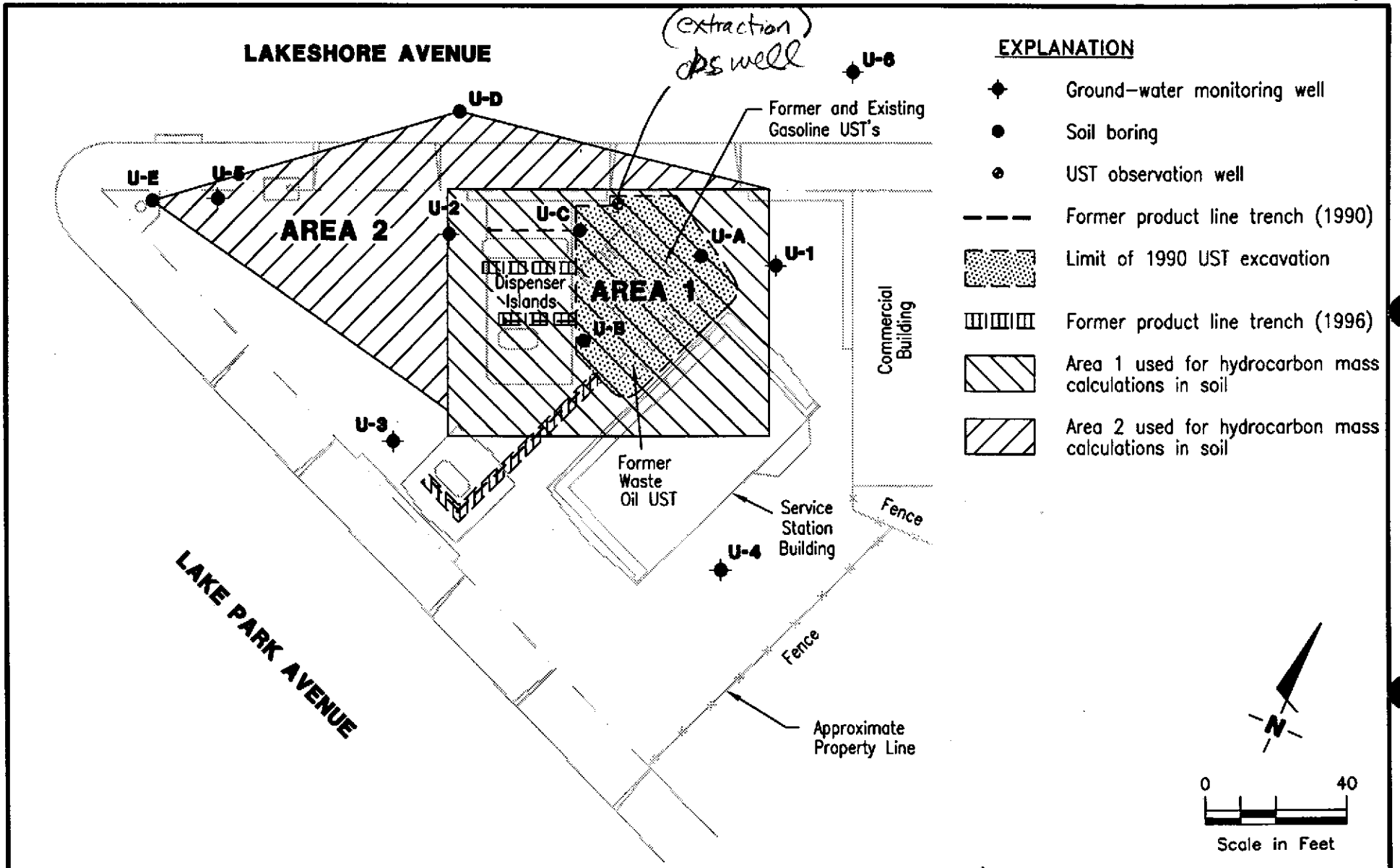
Mass of MtBE = (8.087×10^6 lbs x 5.8 lbs MTBE)/1x 10^6 lbs H_2O = **47 lbs MTBE in water**

TPHg in 13,580 gallons of water purged from site

Volume = 13,580 gallons x 8.34 lbs/gallon = 1.13×10^5 lbs water

Average TPHg concentration = (91000+15000+28000+29000)/4 = 40750 ppb = 41 ppm

Mass of TPHg = (1.13×10^5 lbs x 41 lbs TPHg)/1x 10^6 lbs H_2O = **4.65 lbs TPHg in water**



Gettler - Ryan Inc.
6747 Sierra Ct., Suite J (925) 551-7555
Dublin, CA 94568

SITE PLAN
Tosco (76) Service Station No. 5325
3220 Lakeshore Avenue
Oakland, California

FIGURE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
140123.04		3/00	

TABLE 1 - SOIL CHEMICAL ANALYTICAL DATA

Unocal Service Station No. 5325
3220 Lakeshore Avenue
Oakland, California

Sample No.	Sample Depth (ft.)	Sample Date	TPHg (ppm)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylenes (ppm)	MtBE (ppm)	Total Lead (ppm)
Boring U-D									
U-D-5.5	5.5	6/23/97	450	ND	1.2	9.8	35	1.1	NA
Boring U-E									
U-E-6.5	6.5	6/23/97	29	0.16	0.034	ND	0.050	ND	NA
Stockpile									
US-1A-D	--	6/23/97	7.6	0.042	ND	0.0086	0.067	NA	6.4

EXPLANATION:

ft. = feet
ppm = parts per million
-- = not applicable
NA = not analyzed for this constituent
ND = Not detected. See laboratory analytical data for detection limits.

ANALYTICAL LABORATORY:

Sequoia Analytical (ELAP #1210)

ANALYTICAL DATA:

TPHg = Total Petroleum Hydrocarbons as gasoline according to EPA Method 8015 Modified
MtBE = Methyl tertiary butyl ether according to EPA Method 8020

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

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway
Alameda, CA 94502-6577
(510) 567-6700
(510) 337-9432

February 16, 2000

Mr. David DeWitt
Tosco Marketing Co.
2000 Crow Canyon Place, Suite 400
San Ramon, CA 94583

Re: Tosco/76 Service Stations #5325, 3220 Lakeshore Ave., Oakland CA 94610 and # 3135, 845 66th Ave., Oakland CA 94621

Dear Mr. DeWitt:

This letter serves to summarize items discussed during our recent 2/1/00 meeting at the County office regarding the above referenced sites. These sites were primarily concerned about their MTBE concentration in groundwater and understanding its fate and remediation requirements relative to the Site Conceptual Model.

In regards to 3220 Lakeshore Ave., items mentioned in my November 12, 1999 letter were discussed. The efficacy of the mobile treatment system used in April 1999 was questioned. You stated that you could provide an estimate of the amount of residual petroleum at the site and also estimate the amount of petroleum removed in the groundwater extracted during this treatment. We also discussed whether the extent of MTBE contamination had been determined, particularly in the down-gradient direction. You stated that you believed a boring, U-D, had already been taken in this area and that you would provide me any soil or groundwater data. Lastly, the need for active remediation was discussed. You proposed to initiate three month, biweekly purging from the tank cavity well with an estimated removal of 5000 gallons per each vacuuming event. We would evaluate the effectiveness of this action through the groundwater monitoring events.

In regards to 845 66th Ave., we discussed the January 31, 2000 Gettler-Ryan response to my December 22, 1999 letter at the meeting. The historic groundwater gradient was indicated to vary from northeast, southeast, west-southwest and north-northwest. This information was used to show that an off-site source of MTBE was not apparent and that further site characterization is necessary in the southerly direction. You agreed to submit a work plan for the installation of an off-site well. You provided a map showing the location of two well fields. The Fitchburg Well Field was identified as being approximately 1200 feet southeast of the site. We then discussed the significance of this. Although existing conditions are not technically with those items stated in the SWRCB guidelines, I conferred with Mr. Chuck Headlee of the RWQCB for his opinion. He stated that the existence of potential conduits to the deep aquifer constitutes a risk, therefore, the extent (lateral and vertical) of MTBE contamination in the direction of the former well field must be determined. Please account for this need in your monitoring well work plan.

Please respond to these observations in writing within 30 days or no later than March 17, 2000. Should my observations meet with your concurrence, please include a schedule for your future actions.

You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M. Chan
Hazardous Materials Specialist

C: B. Chan, files
Mr. D. Vossler, Gettler-Ryan Inc., 6747 Sierra Ct., Suite J, Dublin, CA 94568
Mr. S. Carter, Gettler-Ryan, 3164 Gold Camp Drive, Suite 240, Rancho Cordova, CA 95670
MTBE-Toscosites

GETTLER-RYAN INC.

November 15, 1999

Mr. Barney Chan
Alameda County Environmental Health Services
1131 Harbor Bay Parkway
Alameda, CA 94502

Subject: **Bio-Attenuation Parameters at Tosco (76) Service Station No. 5325, located at 3220 Lakeshore Avenue, Oakland, California.**

Mr. Chan:

This letter details the review and comparison of bio-attenuation parameters collected by Gettler-Ryan Inc. (GR) from the Tosco Marketing Company (Tosco) Service Station No. 5325, located at 3220 Lakeshore Avenue in Oakland, California (Figure 1). The parameters were collected on September 8, 1999, during the quarterly monitoring and sampling event[1].

GR evaluated the bio-parameters collected during the September 1999 event. This evaluation was based on protocols outlined in Buscheck and others (1993)[2], Buscheck and O'Reilly (1995)[3], and Borden and others (1995)[4]. The evaluation consisted of comparing chemical indicators from the September 1999 sampling event across the dissolved hydrocarbon plume in a roughly east-west transect (A-A' on Figure 2), and along a roughly north-south transect (B-B' on Figure 2). Bio-parameters and chemical concentrations in groundwater from the September 1999 sampling event are summarized in the attached Table 1.

The attached graphs show the relationship between Total Petroleum Hydrocarbons as gasoline (TPHg) and Methyl tertiary-Butyl Ether (MtBE) concentrations in the wells during the most recent sampling event, and the bio-attenuation parameters oxidation-reduction potential (ORP), Dissolved Oxygen (DO), ferrous iron, and nitrate. DO was

---

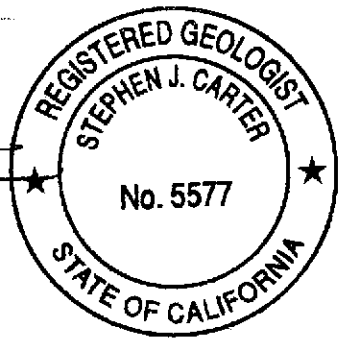
[1] Gettler-Ryan Inc., 1999, Groundwater Monitoring and Sampling Report Third Quarter 1999 – Event of September 8, 1999, dated October 18, 1999.
[2] Buscheck, T. E., K. T. O'Reilly, and N. N. Sheldon, 1993, Evaluation of Intrinsic Bioremediation at Field Sites, in Proceedings of the Conference on Petroleum Hydrocarbons and Organic Chemicals in Groundwater: National Groundwater Association/API, Houston, Texas, November 10-12, 1993.
[3] Buscheck, Tim, and Kirk O'Reilly, 1995, Protocol for Monitoring Intrinsic Bioremediation in Groundwater: Chevron Research and Technology Company, Health, Environment and Safety Group, dated March 1995.
[4] Borden, R. C., C. A. Gomez, and M. T. Becker, 1995, Geochemical Indicators of Intrinsic Bioremediation: Groundwater, volume 33, No. 2, dated 1995.

measured in three of the five wells used in the transects but not in a fashion which allows a complete plot along either transect. Additional DO readings will be added to the suite of analytes during the next sampling event. The expected indications of bio-attenuation across the plume would be a relative decrease in ORP, DO, and nitrate concentrations with an increase in TPHg concentration. Conversely, ferrous iron concentrations would be expected to increase with an increase in TPHg concentration. As shown on the attached graphs, ORP and nitrate concentrations decrease with an increase in TPHg concentrations, while iron concentrations increase or remain constant with an increase in TPHg concentration. These trends suggest ongoing bio-attenuation of petroleum hydrocarbons at the site. MtBE trends appear to follow a similar pattern, although literature referenced did not include studies of MtBE.

If you have any questions or comments please feel free to call either of us.

Sincerely
Gettler-Ryan Inc.,

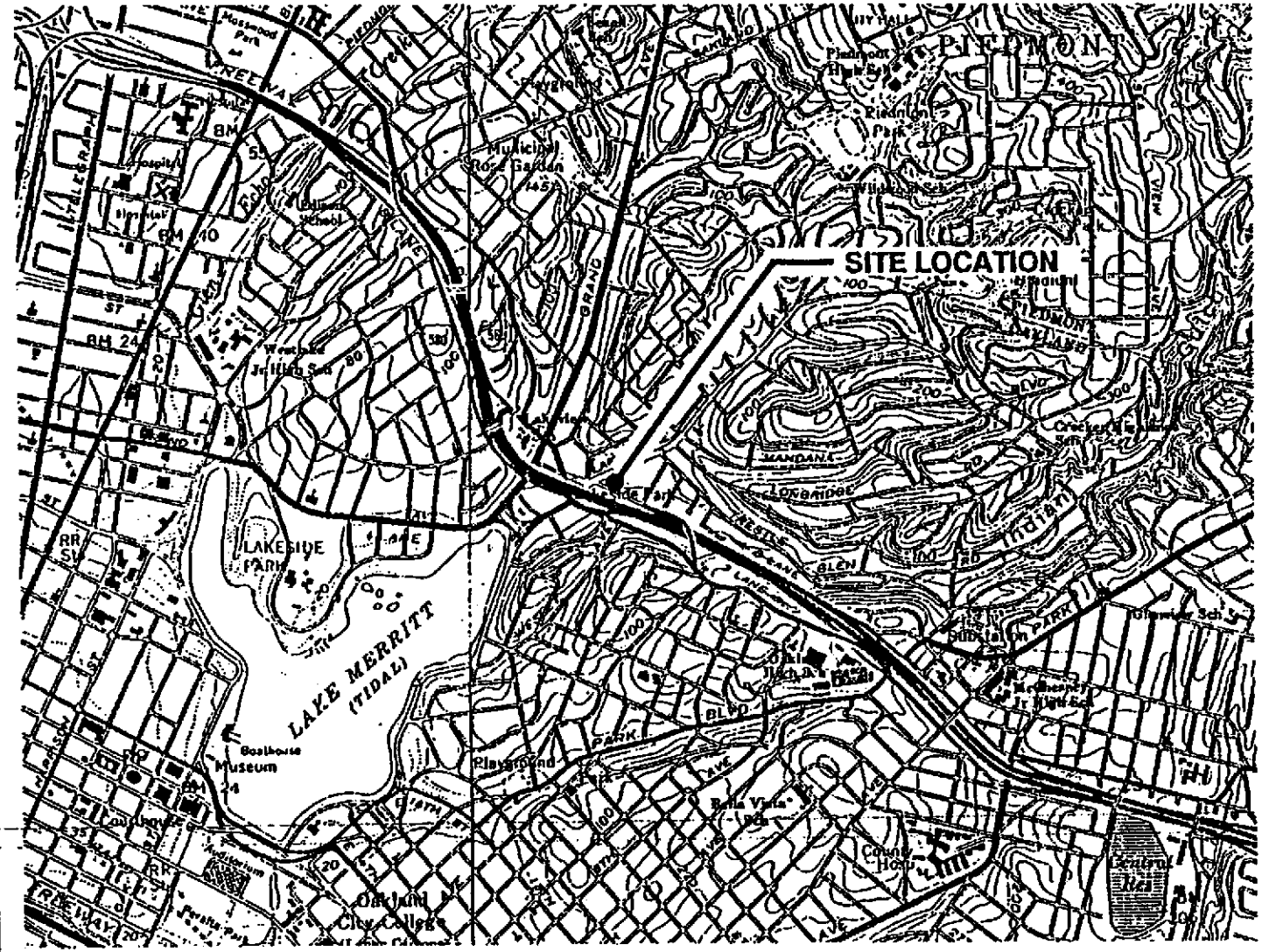
Jed A. Douglas
Project Geologist



Stephen J. Carter
Senior Geologist
R.G. 5577

Attachments: Figure 1 – Vicinity Map
Figure 2 – Concentration Map
Table 1 – Groundwater Chemical Analytical Data
Cross Section A-A'
Cross Section B-B'

cc: Mr. David De Witt, Tosco Marketing Company, San Ramon, California



Base Map: USGS Topographic Map

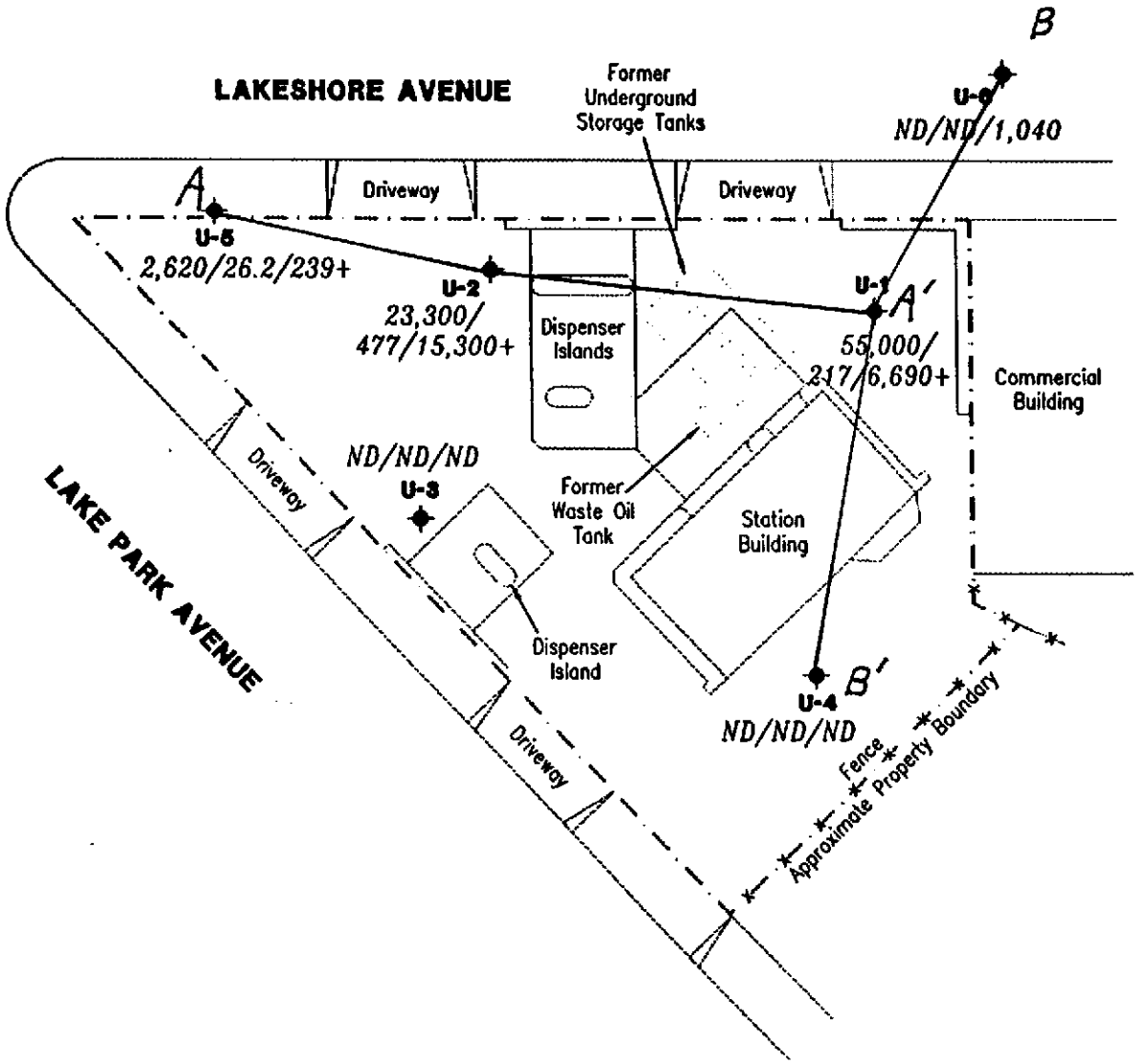
Approximate Scale: 1" = 2000'

GeoStrategies Inc.

Vicinity Map
UNOCAL Service Station #5325
3220 Lakeshore Avenue
Oakland, California

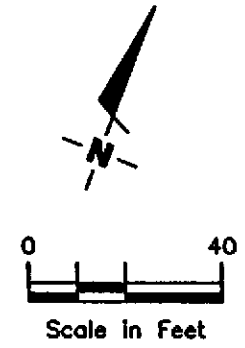
PLATE
1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE
7814		6/90	



EXPLANATION

✦	Groundwater monitoring well
A/B/C	TPH(G) (Total Petroleum Hydrocarbons as Gasoline)/Benzene/MTBE concentrations in ppb
ND	Not Detected
+	MTBE by EPA Method 8260



Source: Figure Modified From Drawing Provided By MPDS Services, Inc.

Gettler - Ryan Inc.
6747 Sierra Ct., Suite J (925) 551-7555
Dublin, CA 94568

CONCENTRATION MAP
Tosco (Unocal) Service Station No. 5325
3220 Lakeshore Avenue
Oakland, California

FIGURE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
180061		September 8, 1999	

TABLE 1 - GROUNDWATER CHEMICAL ANALYTICAL DATA

Tosco (76) Service Station No.5325
3220 Lakeshore Avenue
Oakland, California

Well No.	Distance[1] A-A' (feet)	Distance[2] B-B' (feet)	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	MTBE[3] (ppb)	MTBE[4] (ppb)	Iron (ppm)	Nitrate NO_3 (ppm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mg/L^3)
U-1	85	0	55,000	217	202	745	14,300	6,890	6,690	1.80	ND	NA	85.0
U-2	0	---	23,300	477	138	286	4,110	16,400	15,300	1.90	ND	NA	235
U-4	---	80	ND	ND	ND	ND	ND	ND	ND	ND	24.0	3.75	391
U-5	-62	---	2,620	26.2	ND	32.2	157	280	239	2.10	ND	2.21	335
U-6	---	-60	ND	ND	ND	ND	ND	851	1,040	0.14	5.59	3.12	305

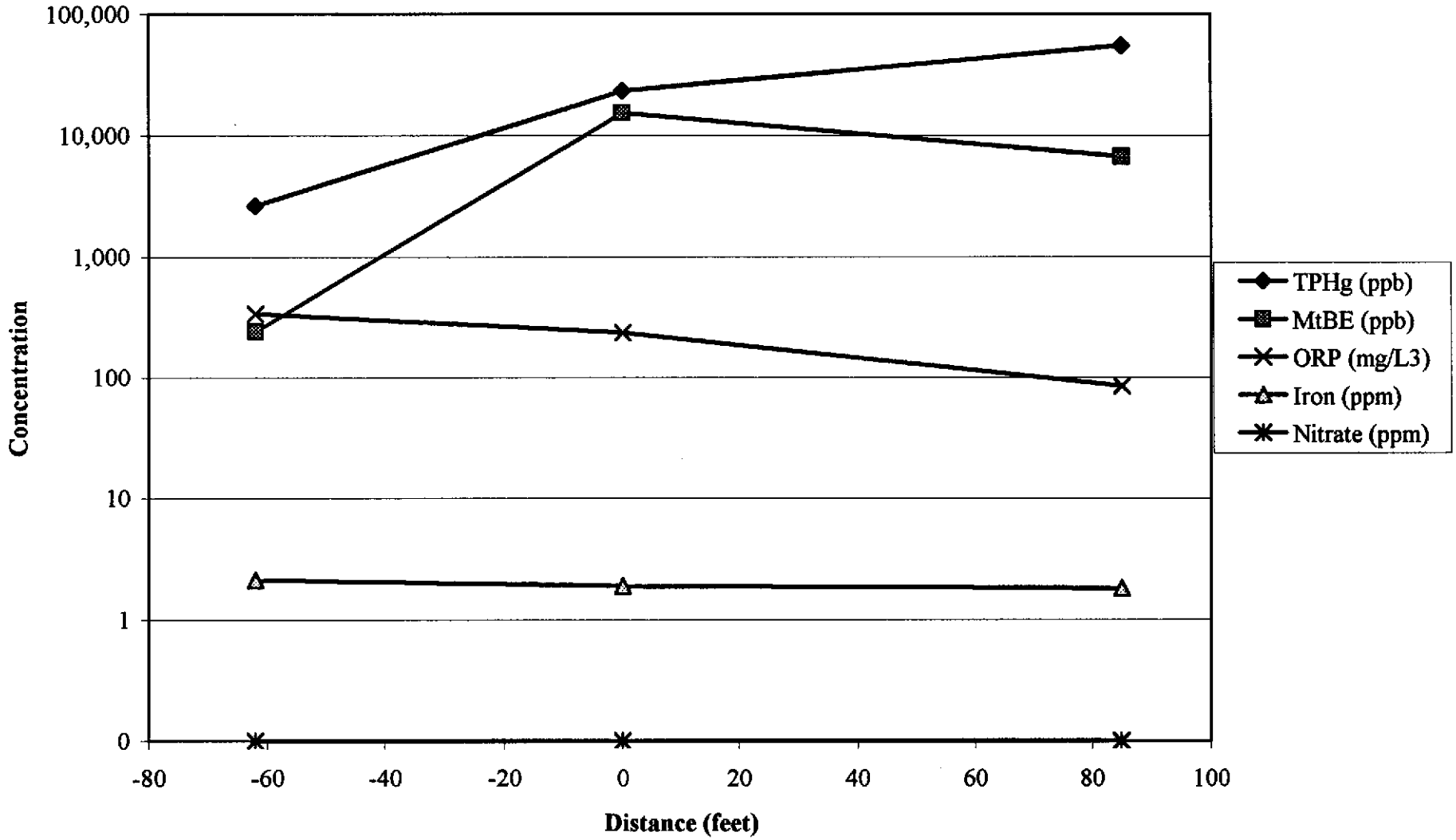
EXPLANATION:

ft. = feet
ppb = parts per billion
ppm = parts per million
mg/L = milligrams per liter
mg/L^3 = milligrams per cubic liter
ND = not detected
--- = not applicable
NA = not analyzed
[1] = Distance from Well U-2
[2] = Distance from Well U-1
[3] = MTBE by Method 8020
[4] = MTBE by Method 8260

ANALYTICAL METHODS:

TPHg = Total Petroleum Hydrocarbons as gasoline according to EPA Method 8015 Modified
Benzene, Toluene, Ethylbenzene, and Total Xylenes according to EPA Method 8020
MTBE = Methyl tertiary butyl ether according to EPA Method 8020/8260

Tosco (76) Service Station No. 5325
Cross-Section A-A'



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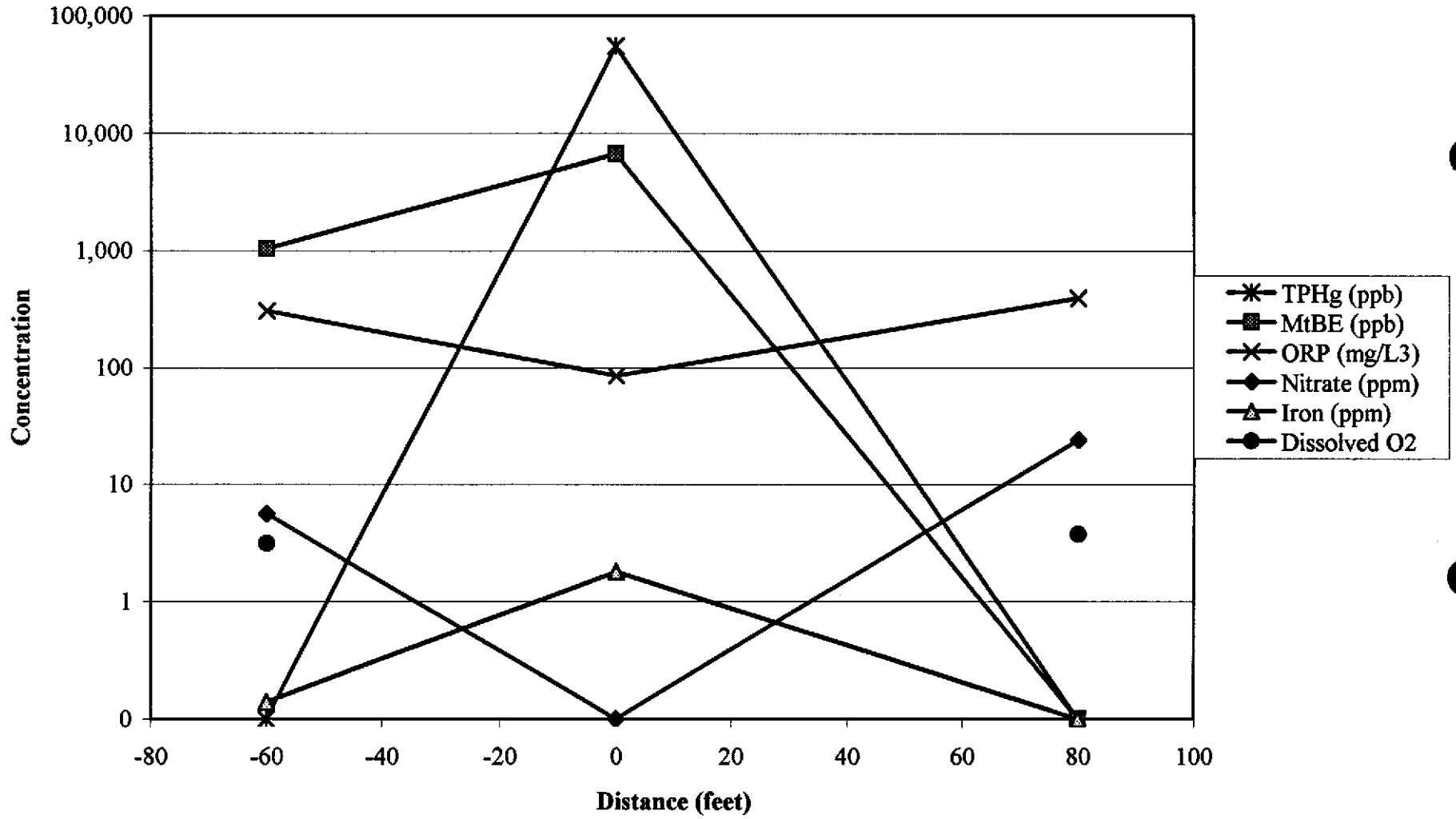
Tosco (76) Service Station No. 5325
Cross-Section B-B'



140123.04

QUARTERLY SUMMARY REPORT
4TH QUARTER - 1999
(OCTOBER-DECEMBER)

TOSCO (UNOCAL) SERVICE STATION No. 5325 RO 229
3220 Lakeshore Avenue
Oakland, California

COUNTY: Alameda

RWQCB Office: San Francisco Bay Region

BACKGROUND: The site is currently an operating Tosco service station. The underground storage tanks were replaced in June 1990. Approximately 850 cubic yards of soil was excavated during UST replacement activities. Three groundwater monitoring wells were installed on-site in September 1990. Two additional on-site monitoring wells and one offsite monitoring well were installed in June 1994. Quarterly sampling of wells began in October 1990. Conducted groundwater study which indicated no influence from Lake Merritt. Product skimmer was installed in Well U-1 during the First Quarter 1996 and is currently maintained. Waste oil UST and product lines were removed in November 1996. Approximately 147 tons of soil was excavated from the product lines. One UST backfill observation well was installed and a Limited Subsurface Investigation was performed on June 23, 1997. Soil samples were collected for specific analysis for future in a RBCA preparation. Approximately 13,000 gallons of groundwater was extracted from the UST complex for remedial purposes. Fourth Quarter 1997 investigation reported free phase product in wells MW-1 and MW-2. A subsequent investigation indicated that no free phase product was observed and that the initial (quarterly) investigation was incorrect. Alton performed vapor extraction on site wells in April 1999, utilizing a mobile "high vac" extraction system. Approximately 20,000 gallons of groundwater was purged during "high vac" extraction system operation.

RECENT QUARTER ACTIVITIES: Prepared quarterly summary reporting. Monitored and sampled groundwater monitoring wells.

NEXT QUARTER ACTIVITIES:. Prepare and submit the quarter summary report. Perform quarterly groundwater monitoring and sampling. Initiate groundwater purging of the UST pit (periodically).

CHARACTERIZATION/REMEDIAL STATUS:

Soil contamination delineated?	Yes
Dissolved ground water delineated?	No
Free product delineated?	Yes
Amount of impacted GW recovered this quarter?	0 (gal)
Amount of impacted GW recovered historically?	33,659 (gal)
Soil remediation in progress?	No - USTs replaced in June 1990, lines replaced November 1996.
- anticipated start?	N/A
- anticipated completion?	N/A
Dissolved/free product remediation in progress?	Free Product (skimmer)
- anticipated start?	1/96
- anticipated completion?	4Q97
CONSULTANT/CONTRACTOR:	Gettler-Ryan Inc.

GETTLER-RYAN INC. 7100 Redwood Blvd., Suite 104, Novato, CA 94945
Phone (415) 893-1515, Fax (415) 893-1517

FAX

Date: 11/30/99

Number of pages including cover sheet: 3

To: Barney Chan
Alameda County
Environmental Health

Phone:

Fax phone: 510-337-9432

CC:

From: Jed Douglas

Phone: (415) 893-1515

Fax phone: (415) 893-1517

Subject: Tosco 3135 + 5325
Well Search

REMARKS: ☐ Urgent ☒ For your review ☐ Reply ASAP ☐ Please comment

Hi Barney, In order to complete the site conceptual models for Tosco (76) station 3135, and Tosco (76) station 5325, GR intends to perform a 2000 foot radius well search in each site vicinity. Please complete the DWR release forms as sson as possible and fax back to me so we can access state records. Thank you for your attention to this matter.

Sincerely,

Jed

Public Works Water Resources
FAX # 670-5262
951 Turner Ct Hayward

State of California
Department of Water Resources
Central District
3251 S Street
Sacramento, CA 95816-7017

WELL DRILLER'S REPORTS
INSPECTION REQUEST AND AGREEMENT

Project: Tosco Service Station # 5325

Location: 3220 Lakeshore Ave. Oakland

County: Alameda Contract Number: 140123-04

Request is made pursuant to Section 13751 of the California Water Code for permission to inspect or copy Water Well Driller's Reports which are on file in your office.

In accordance with the requirements of Section 13752 of the Water Code, it is stipulated and agreed that such reports, or any copy or copies made thereof, will not be made available for inspection by the public but will be used solely by this governmental agency for making studies. If copies are made or taken, each copy will be stamped "CONFIDENTIAL" or "FOR OFFICIAL USE ONLY" and will be kept in a restricted file, access to which is limited to the staff of this governmental agency or to its contracted agents. Any copies furnished to contracted agents must be returned to the Department of Water Resources, Central District upon completion of work by the contracted agent.

No information contained in these reports can be disseminated or published without the written permission of the owner of the well.

Gettler-Ryan Inc. Contracted Agent	Alameda County Environmental Health Governmental Agency
7100 Redwood Blvd., Suite 104 Address	1131 Harbor Bay Parkway, 2nd Floor Address
Novato, CA 94945 City, State, & Zip Code	Alameda CA 94502 City, State, & Zip Code
By Jed Douglas Officer	By Barney Chan Officer
Project Geologist Title	Hazardous Materials Specialist Title
(415) 893-1515 Telephone	(510) 567-6765 Telephone
11-30-99 Date	11-30-99 Date

(For Departmental Information: _____ copies sent _____)

State of California
Department of Water Resources
Central District
3251 S Street
Sacramento, CA 95816-7017

WELL DRILLER'S REPORTS
INSPECTION REQUEST AND AGREEMENT

Project: Tosco (76) Service Station # 3135

Location: 845 66th Avenue, Oakland

County: Alameda Contract Number: 140070.03

Request is made pursuant to Section 13751 of the California Water Code for permission to inspect or copy Water Well Driller's Reports which are on file in your office.

In accordance with the requirements of Section 13752 of the Water Code, it is stipulated and agreed that such reports, or any copy or copies made thereof, will not be made available for inspection by the public but will be used solely by this governmental agency for making studies. If copies are made or taken, each copy will be stamped "CONFIDENTIAL" or "FOR OFFICIAL USE ONLY" and will be kept in a restricted file, access to which is limited to the staff of this governmental agency or to its contracted agents. Any copies furnished to contracted agents must be returned to the Department of Water Resources, Central District upon completion of work by the contracted agent.

No information contained in these reports can be disseminated or published without the written permission of the owner of the well.

Gettler-Ryan Inc. Contracted Agent	Alameda County Environmental Health Governmental Agency
7100 Redwood Blvd., Suite 104 Address	1131 Harbor Bay Parkway, 2nd Floor Address
Novato, CA 94945 City, State, & Zip Code	Alameda CA 94502 City, State, & Zip Code
By Jed Douglas Officer	By Barney Chan Officer
Project Geologist Title	Hazardous Materials Specialist Title
(415) 893-1515 Telephone	(510) 567-6765 Telephone
11-30-99 Date	11-30-99 Date

(For Departmental Information: _____ copies sent _____)

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

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway
Alameda, CA 94502-6577
(510) 567-6700
(510) 337-9432

November 12, 1999
StID # 1059

Mr. David De Witt
Tosco Marketing Co.
2000 Crow Canyon Place, Suite 400
San Ramon, CA 94583

Re: Tosco/76 Products Service Station # 5325, 3220 Lakeshore Ave., Oakland CA 94610

Dear Mr. De Witt:

Our office has received and reviewed the following documents; May 12, 1999 Dual-Phase Vacuum Extraction Event Report by Alton Geoscience and the October 18, 1999 Third Quarter 1999 Groundwater Monitoring & Sampling report from Gettler-Ryan. The Dual-Phase Extraction (DPE) report gives the results of the April 5-10, 1999 extraction via the mobile treatment system (MTS) as applied to wells U-1, U-2 and the tank cavity well (TCW). Your letter attachment points out the apparent significant reduction of TPHg noticed in the recent monitoring event, however, there has been a rebound in MTBE concentrations.

I have discussed some of my concerns with Mr. Tom Seeliger of Alton Geoscience and would like to share them with you.

- Before we can determine the effectiveness of the DPE event, please provide an estimate of the amount of hydrocarbons at the site, in all media. The 165 pounds of TPH estimated removed should be measured against the total amount of residual product. In addition, please estimate the equivalent pounds of TPHg removed in the 13,580 gallons of water removed. This may help determine the most cost effective remediation approach. If groundwater removal is not as effective as vapor extraction, pumping of the tank cavity may not be a cost-effective approach.
- The MTBE concentration in the groundwater sample from TCW increased significantly from the initial to the final sampling date. What do you think accounts for this?

It appears that the presence of MTBE is a significant problem at this site. The Water Board is working on a guidance document for the handling of MTBE impacted sites. They have been providing training and will soon be issuing formal guidance. A critical element of their policy will be the requirement of a site conceptual model (SCM). This must provide a good understanding of the hydrogeology, receptors and contaminant concentration trends, all of which, should be used for decision making at the site. Some of the items of the SCM already exist for this site, while others do not. The SCM should be presented in form of a comprehensive report, which ultimately will be part of your closure request package.

At this time, our office requests the following required elements of your SCM:

- Provide a map indicating the source(s) of contamination. How can you verify that there are no on-going sources?
- Please identify the receptor(s) and their locations. You should include a well survey.
- Please verify that no preferential pathways exist. Was the conclusion of your utility survey, no man made conduits exist?
- Please prepare plots of well chemical concentration vs. time and chemical concentration vs distance from source.
- Please provide a work plan to determine the lateral and vertical extent of MTBE contamination.
- Please state how the source areas will be remediated. Those wells with elevated MTBE must be addressed as well as other identified source areas. In the interim, do you plan to have the MTS routinely on-site?

Please provide your written response to this **letter within 45 days or no later than December 23, 1999.** You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M Chan

Barney M. Chan
Hazardous Materials Specialist

C: B. Chan, files
1mtbe3220

TOSCO
Marketing
Company

2000 Crow Canyon Place
Suite 400
San Ramon, CA 94583
925.277.2305
fax: 925.277.2361

**Environmental
Compliance
Department**

October 13, 1999

Mr. Barney Chan
Alameda County Health Care Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Remediation Results
Tosco/76 Products Service Station #5325
3220 Lakeshore Avenue
Oakland, CA

Dear Mr. Chan:

This letter is written to update you on remediation efforts at the subject site as requested in your August 31, 1999 letter. I apologize for not responding within the initial time frame. In general, I will attempt to answer your comments in the order in which they were presented.

- You will find attached a copy of the report from Alton Geosciences, which summarizes the results of the test. Briefly, nearly 165 lbs. (27 gallons) of petroleum hydrocarbons were recovered, as well as 13,580 gallons of water over the five day test period. Inspection of the cumulative recovered hydrocarbon data shows several spikes over the period of the test. It is believed these are the result of changing the extraction point or adding an additional well to the extraction process.

  40 mg/L Are acc.

  It is also clear this was an effective means of recovering hydrocarbons, primarily in the vapor or vadose zone. The ability to lower the water table in the vicinity of the recovery wells was also demonstrated by increased recovery rates. It is not clear if there was significant recovery of hydrocarbons from the liquid (groundwater) phase.

) This can be calc.

  Examination of the most recent groundwater monitoring data suggests the levels of contamination have been reduced (significantly) by perhaps 50%. While not clean by any means, this clearly demonstrates that the Mobile Treatment System (MTS) is an effective means of remediation. We are also investigating the feasibility of periodic purging of the tank pit groundwater via vacuum truck (water to go to the Rodeo Refinery).

) This assures GW removal is significant.

- The measurements for Eh were performed in the laboratory as we had indicated in our February 8, 1999 letter to you. It had been determined there may have been potential inconsistencies in the field measurements; therefore, we decided to have the measurements done at the laboratory. The next monitoring event has been scheduled to have the measurements made in the field.

- Dissolved oxygen data was not done on monitor wells U-1 and U-2 because of passive skimmers installed in those wells. Activity related to the removal of the skimmers disturbs the water column and gives an erroneous value.

- The interpretation of the historical bioremediation parameters will be submitted under separate cover by Gettler-Ryan, Inc. and will become part of the Quarterly Summary Report (QSR).

Sincerely,

David B. De Witt
Environmental Project Manager

Cc: Dave Vossler, Gettler-Ryan, Inc.

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

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

August 31, 1999
StID # 1059

Mr. David De Witt
Tosco Marketing Co.
2000 Crow Canyon Rd., Suite 400
San Ramon, CA 94583

Re: Tosco (Unocal) Station # 5325, 3220 Lakeshore Ave., Oakland CA 94610

Dear Mr. De Witt:

Our office has received and reviewed the Second Quarter 1999 groundwater monitoring and sampling report for the above site prepared by Gettler-Ryan. Our office has the following observations and comments:

- This is the first monitoring event after the dual-phase extraction test at this site in April 1999. Groundwater concentrations have decreased slightly,however, they remain high. Please submit a report on the vapor extraction test and your opinion as to whether this remediation approach would be recommended for additional future treatment of this site.
- It appears that the oxidation-reduction potential (ORP) readings were done in the laboratory. Please have these measurements performed in the field.
- It appears that dissolved oxygen was not run on wells U-1 and U-2, why was this?
- Please have your consultant provide an interpretation and recommendation section. This should include an evaluation of the historical bio-remediation parameters and the concentration trends observed in groundwater.

Please comment on these observations in writing **within 30 days or by October 1, 1999**.

You may contact me at (510) 567-6765 if you have any comments or questions.

Sincerely,

Barney M. Chan
Hazardous Materials Specialist

C: **B. Chan, files**
Ms. B. Sieminski, Gettler-Ryan, 6747 Sierra Ct., Suite J, Dublin, CA 94568
Comments3220

GETTLER-RYAN INC.

TRANSMITTAL

TO: Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

DATE: July 15, 1999
PROJ. #: Various
SUBJECT: Quarterly Summary Reports
Various Tosco (Unocal) Sites
Alameda County

FROM:
David J. Vossler
Project Manager
Gettler-Ryan Inc.
6747 Sierra Court, Suite J
Dublin, California 94568

WE ARE SENDING YOU:

COPIES	DATED	DESCRIPTION
1	2nd Quarter 1999	Quarterly Summary Report

THESE ARE TRANSMITTED as checked below:

[X] For review and comment	[ ] Approved as submitted	[ ] Resubmit __ copies for approval
[X] As requested	[ ] Approved as noted	[ ] Submit __ copies for distribution
[ ] For approval	[ ] Return for corrections	[ ] Return __ corrected prints

COMMENTS:

At the request of Tosco Marketing Company, we are forwarding you a corrected copy of the above listed documents for you files. If you have any questions, please call me at (925) 551-7555.

cc: Mr. David De Witt, Tosco Marketing Company
Mr. Barney Chan, Alameda County Health Care Services Agency (SS No. 5325)

QUARTERLY SUMMARY REPORT
2ND QUARTER - 1999
(APRIL-JUNE)

TOSCO (UNOCAL) SERVICE STATION No. 5325
3220 Lakeshore Avenue
Oakland, California

COUNTY: Alameda

RWQCB Office: San Francisco Bay Region

BACKGROUND: The site is currently an operating Tosco service station. The underground storage tanks were replaced in June 1990. Approximately 850 cubic yards of soil was excavated during UST replacement activities. Three groundwater monitoring wells were installed on-site in September 1990. Two additional on-site monitoring wells and one offsite monitoring well were installed in June 1994. Quarterly sampling of wells began in October 1990. Conducted groundwater study which indicated no influence from Lake Merritt. Product skimmer was installed in Well U-1 during the First Quarter 1996 and is currently maintained. Waste oil UST and product lines were removed in November 1996. Approximately 147 tons of soil was excavated from the product lines. One UST backfill observation well was installed and a Limited Subsurface Investigation was performed on June 23, 1997. Soil samples were collected for specific analysis for future in a RBCA preparation. Approximately 13,000 gallons of groundwater was extracted from the UST complex for remedial purposes. Fourth Quarter 1997 investigation reported free phase product in wells MW-1 and MW-2. A subsequent investigation indicated that no free phase product was observed and that the initial (quarterly) investigation was incorrect.

RECENT QUARTER ACTIVITIES: Prepared quarterly summary reporting. Monitored and sampled groundwater monitoring wells. Performed vapor extraction on site wells utilizing a mobile "high vac" extraction system. In addition, approximately 20,000 gallons of groundwater was purged during "high vac" extraction system operation.

NEXT QUARTER ACTIVITIES:. Prepare and submit the quarter summary report. Perform quarterly groundwater monitoring and sampling. Issue results from vapor extraction activities. Initiate groundwater purging of the UST pit (periodically).

CHARACTERIZATION/REMEDIAL STATUS:

Soil contamination delineated?	Yes
Dissolved ground water delineated?	No
Free product delineated?	Yes
Amount of impacted GW recovered this quarter?	20,000 (gal)
Amount of impacted GW recovered historically?	33,659 (gal)
Soil remediation in progress?	No - USTs replaced in June 1990, lines replaced November 1996.
- anticipated start?	N/A
- anticipated completion?	N/A
Dissolved/free product remediation in progress?	Free Product (skimmer)
- anticipated start?	1/96
- anticipated completion?	4Q97
CONSULTANT/CONTRACTOR:	Gettler-Ryan Inc.

GETTLER-RYAN INC.

TRANSMITTAL

TO: Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

DATE: April 19, 1999
PROJ. #: Various
SUBJECT: Quarterly Summary Reports
Various Tosco (Unocal) Sites
Alameda County

FROM:
David J. Vossler
Project Manager
Gettler-Ryan Inc.
6747 Sierra Court, Suite J
Dublin, California 94568

WE ARE SENDING YOU:

COPIES	DATED	DESCRIPTION
1	1st Quarter 1999	Quarterly Summary Report

THESE ARE TRANSMITTED as checked below:

[X] For review and comment	[ ] Approved as submitted	[ ] Resubmit _ copies for approval
[X] As requested	[ ] Approved as noted	[ ] Submit _ copies for distribution
[ ] For approval	[ ] Return for corrections	[ ] Return __ corrected prints

COMMENTS:

At the request of Tosco Marketing Company, we are forwarding you a corrected copy of the above listed documents for you files. If you have any questions, please call me at (925) 551-7555.

cc: Mr. David De Witt, Tosco Marketing Company
Mr. Barney Chan, Alameda County Health Care Services Agency (SS No. 5325)

QUARTERLY SUMMARY REPORT
1ST QUARTER - 1999
(JANUARY-MARCH)

TOSCO (UNOCAL) SERVICE STATION No. 5325
3220 Lakeshore Avenue
Oakland, California

CITY/COUNTY ID #: Oakland

COUNTY: Alameda

BACKGROUND: The site is currently an operating Tosco service station. The underground storage tanks were replaced in June 1990. Approximately 850 cubic yards of soil was excavated during UST replacement activities. Three groundwater monitoring wells were installed on-site in September 1990. Two additional on-site monitoring wells and one offsite monitoring well were installed in June 1994. Quarterly sampling of wells began in October 1990. Conducted groundwater study which indicated no influence from Lake Merritt. Product skimmer was installed in Well U-1 during the First Quarter 1996 and is currently maintained. Waste oil UST and product lines were removed in November 1996. Approximately 147 tons of soil was excavated from the product lines. One UST backfill observation well was installed and a Limited Subsurface Investigation was performed on June 23, 1997. Soil samples were collected for specific analysis for future in a RBCA preparation. Approximately 13,000 gallons of groundwater was extracted from the UST complex for remedial purposes. Fourth Quarter 1997 investigation reported free phase product in wells MW-1 and MW-2. A subsequent investigation indicated that no free phase product was observed and that the initial (quarterly) investigation was incorrect.

RECENT QUARTER ACTIVITIES: Prepared quarterly summary reporting. Monitored and sampled groundwater monitoring wells. Collect groundwater samples for purge water disposal profiling.

NEXT QUARTER ACTIVITIES:. Prepare and submit the quarter summary report. Perform quarterly groundwater monitoring and sampling. Initiate groundwater purging of the UST pit (periodically). Perform vapor extraction on site wells utilizing a mobile "high vac" extraction system.

CHARACTERIZATION/REMEDIAL STATUS:

Soil contamination delineated?	Yes
Dissolved ground water delineated?	No
Free product delineated?	Yes
Amount of impacted GW recovered this quarter?	100 (gal)
Amount of impacted GW recovered historically?	13,659 (gal)
Soil remediation in progress?	No - USTs replaced in June 1990, lines replaced November 1996.
- anticipated start?	NA
- anticipated completion?	NA
Dissolved/free product remediation in progress?	Free Product (skimmer)
- anticipated start?	1/96
- anticipated completion?	4Q97
CONSULTANT/CONTRACTOR:	Gettler-Ryan Inc.

140123.01.frm

ALTON GEOSCIENCE

ENVIRONMENTAL PROTECTION

99 MAR 19 PM 3:15

March 18, 1999

Alameda County Health Care Services
1131 Harbor Bay Parkway
Alameda, CA 94502

Tosco Facility No. 5325

ATTN: MR. BARNEY CHAN

SITE: TOSCO #5325
3220 LAKESHORE AVENUE
OAKLAND, CALIFORNIA

RE: DUAL-PHASE VAPOR EXTRACTION TEST AT TOSCO #5325

Dear Mr. Chan:

On behalf of Tosco Marketing Company, Alton Geoscience would like to notify you of an upcoming site activity which is scheduled for Tosco's UNOCAL service station #5325, located at 3220 Lakeshore Avenue in Oakland, California. A dual-phase vapor extraction test/interm remedial event, will be performed on April 5, 1999, and is scheduled to run continuously for up to five, 24 hour periods.

The dual-phase mobile treatment system (MTS) removes vapor-phase and liquid-phase hydrocarbons from the subsurface at air flow rates of up to 100 cubic feet per minute (cfm) and groundwater/free product flow rates up to 20 gallons per minute (gpm). Utilizing a high vacuum pump (> 300 inches of water), vapor-phase and liquid-phase hydrocarbons are removed from individual monitoring wells and separated at the MTS. Liquids are automatically transferred into an aboveground storage tank and hydrocarbon vapors are abated using a catalytic/thermal oxidizer.

If you have any questions regarding these activities, please call me at (925) 606-9150 x111.

Sincerely,

ALTON GEOSCIENCE

George Montross
Staff Geologist

cc: Dave DeWitt - Tosco Marketing Company

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GETTLER-RYAN INC.

February 8, 1999

Mr. Barney M. Chan
Alameda County Health Care Services Agency
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Subject: Response to Notice of Violation dated January 5, 1999
Tosco (76 branded) Service Station No. 5325
3220 Lakeshore Avenue, Oakland, California

Mr. Chan:

Gettler-Ryan Inc. (GR) on behalf of Tosco Marketing Company (Tosco) has prepared the following responses to your Notice of Violation (NOV) dated January 5, 1999 and your comments in a letter dated May 8, 1998.

May 8, 1998 ACHCS letter:

Report contents described under Title 23, Division 3, Chapter 16, Section 2652d

RESPONSE: The quarterly monitoring and sampling events performed at each site are performed by an independent contractor which does not allow for the expanded data requests to be included with the routine reports. The information that you have requested is included in the Quarterly Summary Reports (QSRs) that are prepared and submitted to the Regional Water Quality Control Board (RWQCB). Attached is a copy of the Fourth Quarter 1998 QSR for your review and files. I have also corrected the distribution list for these reports so that you will be receiving them in the future.

Remedial Activity Performed to Date

To date remedial efforts have included the excavation of impacted soils during the underground storage tank (UST) replacement (850 tons) and facility 1998 up-grades (147 tons), installation of passive product skimmer in U-1 and U-2 , installation of a conductor casing to facilitate the removal of water from the tank pit, purging approximately 13,000-gallons of water from the UST pit, and performed an extensive conduit study and

associated groundwater with reference to the potential migration to Lake Merit (findings indicated no influence). A Risk Based Corrective Action evaluation was initiated, however, was put on hold until the free product issue was resolved. The conduit study also indicated that off-site drilling (in the intersection of Lakeshore and Lake Park Avenue's) is not feasible due to the numerous underground utilities and high volume of street traffic (safety issue). Accessible well locations do not improve the understanding of site.

Current remedial plans are to implement the removal of groundwater from the site via the tank pit conductor casing. Groundwater samples have been collected to initiate this procedure. Additional free product removal will be implemented with down-well skimmers if measurable free product is observed (currently, no free product is present). Groundwater monitoring and sampling will continue quarterly.

September 3, 1998 ACHCS letter:

What conclusion was made regarding the potential of off-site utilities acting as preferential pathways for groundwater movement? If the utilities do not act as a preferential pathway, how will the extent of the groundwater contamination plume be determined.

RESPONSE: The conduit study identified many underground utility trenches and services. The elevation of the utility piping were surveyed and compared to the measured depth to water at the site and concluded that the groundwater occurs below most of the utilities. Some utility services, such as the sewer and storm drain piping, do extent into groundwater. The trenches associated with the sewer piping are backfilled with native sands and silts. Impacted groundwater could enter these trenches (slowly because of the limited permeability of the native soil), but these trenches can also act as a groundwater barrier to restrict the migration of impacted groundwater to the north (across Lakeshore Avenue). Other up-gradient and cross-gradient sources do exist and could also enter the sewer systems backfill. To investigate the groundwater travelling through the backfill of the sanitary and storm sewers is not practical based on the location of the site, Highway 580 overpass, other possible source areas and very limited off-site access.

Please confirm the presence of MtBE in monitoring wells U-2, U-5, and U-6 using EPA Method 8240 or 8260 as recommended by the water board.

RESPONSE: Detectable concentrations of MtBE will be confirmed by EPA Method 8260 during the first quarterly monitoring and sampling event scheduled for March 1999.

What is your explanation as how it can be that monitoring well U-1 reported 52,000 ppb total petroleum hydrocarbons as gasoline and ND for MtBE?

RESPONSE: Well U-1 had a reported TPHg concentration of 52,000 ppb and was ND for MtBE. This can be explained by several mechanisms. First, if the release associated with the "52,000 ppb TPHg" occurred prior to the addition of MtBE in the fuels, MtBE would not be present. Secondly, the location of U-1 may not be in proximity to a source or release area where the groundwater flow direction and subsurface lithology could prevent/reduce the migration of MtBE. Lastly, if the detection limit were raised because of the TPHg concentration, low concentrations of MtBE (< 2500 ppb) would be missed. Confirmation by EPA 8260 would be beneficial in this case. Since your letter of September 3, 1998, well U-1 has been reported to contain MtBE concentrations.

Please check with your sampler to verify the reported oxidation-reduction values. The attached data sheets appear to report 100 times the values presented in Table 2 of this report. If the Table 2 values are correct, it appears that conditions are not conducive for natural attenuation.

RESPONSE: After reviewing the historical data regarding the Redox Potential for the site, only the September 1997 groundwater data was analyzed in the laboratory by ASTM DI 49876. The other and current readings are recorded in the field using field testing equipment. This could account for the discrepancy in the data consistency. Starting with the First Quarter 1999 sampling and monitoring event, the Redox Potential will be analyzed by the laboratory by the appropriate ASTM method. These results will then be compared to the historical results and evaluated.

Please have the well samples analyzed for iron +2 (ferrous ion). The relative concentration of iron+2 can indicate the tendency for anaerobic biodegradation to occur. I believe total iron was analyzed in this monitoring event.

RESPONSE: The requested iron analysis will be correctly analyzed and reported as iron +2 (ferrous ion). These data will be included in the First Quarter 1999 Monitoring and Sampling Report.

The continual presence of free product or sheen in U-1 and U-2 is a concern. Please describe what can be done to reduce this source.

Well U-1 previously had a passive free product skimmer installed because of the reported product thickness, however, no product has ever been recovered. Well U-2 has also been reported to contain free product (<0.01 or a sheen) and a passive product skimmer was installed in attempt to recover the reported product, however, no free product was recovered. The product skimmers have been removed until conditions warrant their re-installation. Free product measurements prior to 1998 were recorded by MPDS and were not verified. Since 1998, GR has investigated reported measurable free product in wells U-1 and U-2, and determined that there was no free product in U-1 and the sheen in U-2 was more "biologic" than petroleum. This "biologic" sheen is common in areas of organic clays and silts. Groundwater analytical results from U-1 indicate the TPHg and BTEX concentrations are much too low to support any free product.

(3) FP or no FP? 1000 ppb is high enough for FP (1000ppm) ∴ need to run wells w/ "sheen".

I trust this letter has addressed your concerns outlined in your letter dated January 5, 1999. The next scheduled groundwater monitoring and sampling event will be conducted in March 1999, and at that time the required MtBE confirmation by 8260 will be implemented along with laboratory measured Redox Potential and ferrous iron (iron+2) analysis. Additional removal of groundwater from the conductor casing is currently in the implementation stage.

If you have any questions regarding the contents of this letter, or require additional information, please call me at (415) 893-1515.

Gettler-Ryan Inc.

David J. Vossler
Project Manager

Attachments: Fourth Quarterly Summary Report for 1998

Cc: Mr. David B. DeWitt, Tosco Marketing Company, San Ramon, California
140123 files

QUARTERLY SUMMARY REPORT
4TH QUARTER - 1998
(OCTOBER DECEMBER)

TOSCO (UNOCAL) SERVICE STATION No. 5325
3220 Lakeshore Avenue
Oakland, California

CITY/COUNTY ID #: Oakland

COUNTY: Alameda

BACKGROUND: The site is currently an operating Tosco service station. The underground storage tanks were replaced in June 1990. Approximately 850 cubic yards of soil was excavated during UST replacement activities. Three groundwater monitoring wells were installed on-site in September 1990. Two additional on-site monitoring wells and one offsite monitoring well were installed in June 1994. Quarterly sampling of wells began in October 1990. Conducted groundwater study which indicated no influence from Lake Merritt. Product skimmer was installed in Well U-1 during the First Quarter 1996 and is currently maintained. Waste oil UST and product lines were removed in November 1996. Approximately 147 tons of soil was excavated from the product lines. One UST backfill observation well was installed and a Limited Subsurface Investigation was performed on June 23, 1997. Soil samples were collected for specific analysis for future in a RBCA preparation. Approximately 13,000 gallons of groundwater was extracted from the UST complex for remedial purposes. Fourth Quarter 1997 investigation reported free phase product in wells MW-1 and MW-2. A subsequent investigation indicated that no free phase product was observed and that the initial (quarterly) investigation was incorrect.

RECENT QUARTER ACTIVITIES: Prepared quarterly summary reporting. Monitored and sampled groundwater monitoring wells.

NEXT QUARTER ACTIVITIES:. Prepare and submit the quarter summary report. Perform quarterly groundwater monitoring and sampling. Respond to an Alameda County Health Care Services Agency letter. Initiate groundwater purging of the UST pit (periodically).

CHARACTERIZATION/REMEDIAL STATUS:

Soil contamination delineated?	Yes
Dissolved ground water delineated?	No
Free product delineated?	Yes
Amount of impacted GW recovered this quarter?	87 (gal)
Amount of impacted GW recovered historically?	13,559 (gal)
Soil remediation in progress?	No - USTs replaced in June 1990, lines replaced November 1996.
- anticipated start?	NA
- anticipated completion?	NA
Dissolved/free product remediation in progress?	Free Product (skimmer)
- anticipated start?	1/96
- anticipated completion?	4Q2000
CONSULTANT/CONTRACTOR:	Gettler-Ryan Inc.

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

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

September 3, 1998
StID # 1059

Ms. Tina Berry
Tosco Marketing Co.
2000 Crow Canyon Place, Suite 200
San Ramon, CA 94583

Re: Unocal Service Station # 5325, 3220 Lakeshore Ave., Oakland CA 94610

Dear Ms. Berry:

Our office has received and reviewed the August 13, 1998 Second Quarter 1998 Monitoring and Sampling Report for the above site prepared by Gettler-Ryan. My initial reaction to this report is the noticeable absence of any interpretation and recommendation section in this report as requested in my May 8, 1998 letter. Please be aware, in accordance to Title 23, Division 3, Chapter 16, Section 2652d your quarterly report should include, among others, the following items:

- A description of the corrective and remedial actions the past quarter and the plans of action for the next.
- The method(s) of cleanup implemented to date, proposed cleanup actions, and a time schedule for implementing the proposed actions and
- An interpretation of results.

Please comment on the following observations of our office regarding this site:

- What conclusion was made regarding the potential of off-site utilities acting as preferential pathways for groundwater movement ? If the utilities do not act as a preferential pathway, how will the extent of the groundwater contamination plume be determined?
- Please confirm the presence of MTBE in monitoring wells U-2, U-5 and U-6 using EPA Method 8240 or 8260 as recommended by the Water Board.
- What is your explanation as to how it can be that monitoring well U-1 reported 52,000 ppb total petroleum hydrocarbons as gasoline and ND for MTBE ?
- Please check with your sampler to verify the reported oxidation-reduction values. The attached data sheets appear to report 100 times the values presented in Table 2 of this report. If the Table 2 values are correct, it appears that conditions are not conducive for natural attenuation.
- Please have the well samples analyzed for iron +2 (ferrous ion). The relative concentration of iron+2 can indicate the tendency for anaerobic biodegradation to occur. I believe total iron was analyzed in this monitoring event.
- The continual presence of free product or sheen in U-1 and U-2 is a concern. Please describe what can be done to reduce this source.

Please provide your written comment to these items **within 30 days or by October 5, 1998.**

You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M. Chan

Barney M. Chan
Hazardous Materials Specialist

C: B. Chan, files
Mr. Greg Gurss, Gettler-Ryan, 3164 Gold Camp Drive, Rancho Cordova, CA 95670
2-3220Lake

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

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

May 8, 1998
StID # 1059

Ms. Tina Berry
Tosco Marketing Co.
2000 Crow Canyon Place, Suite 200
San Ramon, Ca 94583

Re: Unocal Service Station # 5325, 3220 Lakeshore Ave., Oakland CA 94610

Dear Ms. Berry:

After reviewing the recent February 20, 1998 Fourth Quarter 1997 Groundwater Monitoring and Sampling Report for the above site, it occurred to me that I was not aware of the any recent remediation which may have taken place at this site. This may be a result of a lost technical report, however, I would like to suggest that your quarterly monitoring reports consist of a brief historical summary of subsurface investigations and remedial actions. Your reports should also make any recommendations for future action.

Our office's most recent data of this type is the report of the advancement of 2 borings and the installation of an observation well within the underground tank pit in June of 1997. During this time, approximately 13,000 gallons of water was purged from the tank pit. This observation well was to be used to observe the presence of free product, to allow for additional purging or the addition of oxygen or other supplements to enhance natural biodegradation.

The continued presence of free product requires some additional remedial measures besides that of a skimmer within these wells. It appears that the tank pit and the north dispenser island are the likely sources of free product. Please consider using the tank pit for either active or enhanced bio remediation. The oxygen levels, though adequate for bioremediation, could be increased with oxygen supplements. Please contact me at (510) 567-6765 on your suggestions to eliminate free product from this site. You are reminded that your human health risk assessment should be on hold until the free product is eliminated.

Sincerely,

Barney M. Chan, Hazardous Materials Specialist

C: **B. Chan,** files
Mr. Greg Gurss, Gettler-Ryan, 3164 Gold Camp Drive, Rancho Cordova, CA 95670

3220Lake

TOSCO

Tosco Marketing Company
2000 Crow Canyon Place, Ste. 400
San Ramon, California 94583
Telephone: 510-277-2305
Facsimile: 510-277-2361

Environmental Compliance Department

December 9, 1997

Mr. Barney Chan
Alameda County Health Care
Services Agency
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

UNOCAL Service Station #5325
3220 Lakeshore Avenue
Oakland, California

Dear Mr. Chan:

Thank you for your letter of November 17, 1997 concerning the subject location. In response to your comments, please note the following actions we propose to undertake:

- Site wells with sheen will be purged monthly for a period of three months. Historically, free product or sheens have been observed in site wells U-1 and U-2. Up to 500 gallons from each well will be removed (as necessary) in efforts to minimize free product measurements in the wells. We will also consider similar purging from the new well installed in the tank complex area.

- After the three month purging program, Tosco will consider the use of ORC socks in wells with the highest hydrocarbon concentrations to increase dissolved oxygen levels and thereby stimulate biodegradation of hydrocarbon compounds.

- We will continue to monitor the sheen in wells U-1 and U-2 and will evaluate the need to install or swap free product skimmers between the wells to maximize the removal of product from these wells.

- Depending on future monitoring and sampling results for this site, we will consider the need for further remedial actions and/or Risk Based Corrective Actions relevant to this case. We anticipate proposing additional activities during the second half of 1998.

The monthly purging program will begin during the first quarter 1998. Additionally, I would like to ask what your agency's position is with respect to no-purge options for groundwater monitoring wells in Alameda County? Do you have a policy regarding no-purge options for sites in general?

Please be advised that a site inspection was performed on December 2, 1997. Wells U-1 and U-2 were monitored and no floating product, sheen or film was observed in well U-2. Well U-1 contains a passive bailer to remove any product that may be present in it (the second quarter 1997 monitoring and sampling report noted 0.02 ft. of product in this well).

Should you have any questions, please feel free to contact me at the address provided. I can also be reached by telephone at 510-277-2321. Thanks again for your letter. I look forward to working with you on this case.

Sincerely,

Tina Berry

Tina Berry
Project Manager

cc: David Vossler, Gettler-Ryan
File (5325:3)

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

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

June 2, 1997
StID # 1059

Mr. David De Witt
Tosco Marketing Company
2000 Crow Canyon Place, Suite 400
P.O. Box 5155
San Ramon, CA 94583

Re: Unocal Service Station #5325, 3220 Lakeshore Ave., Oakland CA 94610

Dear Mr. De Witt:

Our office has received and reviewed GeoStrategies' May 5, 1997 **Work Plan for Limited Subsurface Investigation.** The work plan addresses items previously discussed during our March 26, 1997 meeting and include the comments in my April 7, 1997 letter. The work plan calls for the following:

1. Advancement of one offsite boring to delineate soil and groundwater contamination to the northwest of the existing tank complex and dispenser island;

2. The installation of a recovery well within the tank complex;

3. The advancement of one onsite boring for testing of physical parameters to use in a Tier 2 RBCA; and the addition of intrinsic bio parameters for the existing wells.

This work plan is accepted with the following conditions;

* Please consider the removal of contaminated water along with free product from the proposed recovery well

* Please consider the introduction of oxygen releasing compounds into the tank pit

* Please continue to run the intrinsic bio parameters along with the petroleum contaminants in future monitoring events and in all wells. Future monitoring reports can then compare trends in these parameters over time as well as an anticipated decrease in contaminant concentration.

Please contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M Chan

Barney M. Chan
Hazardous Materials Specialist

c: B. Chan, files
Mr. D. Vossler, GeoStrategies, 6747 Sierra Court, Suite G, Dublin, CA 94568
Ms. T. Berry, Tosco Marketing Co.

wpap3220

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

April 7, 1997
StID # 1059

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

Mr. David De Witt
Unocal Corporation
2000 Crow Canyon Place, Suite 400
P.O. Box 5155
San Ramon, CA 94583

Re: Unocal Service Station #5325, 3220 Lakeshore Ave., Oakland CA 94610

Dear Mr. De Witt:

Our office has received GeoStrategies' March 31, 1997 letter summarizing our March 26, 1997 meeting regarding the above referenced site. This letter provides written approval for your 45 day extension for submisssion of a work plan. Your work plan is thus due by **May 21, 1997.**

I have the following comments regarding the contents of the letter:

1. In regards to the hydrocarbon concentration used in the initial RBCA on February 6, 1997, one preferred method for determing groundwater contamination is using the average concentration for the past year of the most contaminated well. For soil contamination concentration, the highest residual concentration is conservatively used.

2. Cursory review of the maps of the utility trenches and conduits and historic groundwater elevations supports your belief that the conduits are not serving as a preferential pathway for contaminant migration.

3. Soil delineation should be performed to determine accurate contaminant concentration for the viable exposure pathways.

4. In regards to site specific indicator parameter for intrinsic bioremediation, please add Fe (iron) +3 to your listed parameters.

5. Separate phase hydrocarbon must be remediated and the use of ORC was mentioned as one passive method to do this.

Please contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M Chan

Barney M. Chan
Hazardous Materials Specialist

c: B. Chan, files
Mr. D. Vossler, GeoStrategies, 6747 Sierra Court, Suite G, Dublin, CA 94568

wpext3220

GeoStrategies

ENVIRONMENTAL PROTECTION

97 APR -2 PM 2:17

March 31, 1997

Mr. Barney Chan
Hazardous Materials Specialist
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Subject: Summary of Meeting of March 26, 1997 regarding the Unocal Service Station No. 5325, located at 3220 Lakeshore Avenue, Oakland, California

Mr. Chan:

This letter was prepared to summarize our meeting of March 26, 1997, between 76 Products Company (76 Products), GeoStrategies (GSI) and yourself. The meeting was initially arranged to discuss 76 Products intentions for additional environmental assessment and proposed site specific parameters for use in a Risk-Based Corrective Action (RBCA) evaluation. The method used to calculate the proposed average hydrocarbon concentrations were discussed with Alameda County Environmental Health Services (ACEHS). Also discussed was the ACEHS request of the to delineate the soil in the northwest direction (Lakeshore Avenue). Based on the discussions in our meeting ACEHS verbally granted 76 Products an extension for the submittal of a Work Plan originally required by April 8, 1997. The length of the extension was not confirmed, however, based on the information required to complete the Work Plan, 76 Products requests 45 days for the submittal of the requested Work Plan. The requested Work Plan will be submitted to the ACEHS by May 21, 1997. A brief summary of our meeting of March 26, 1997 is presented below.

Hydrocarbon Concentration

In the proposed site parameters for use in a RBCA evaluation submitted to the ACEHS by Mr. David B. DeWitt on February 6, 1997, contained average hydrocarbon concentrations for the site. These estimates for soil and groundwater were calculated by straight averaging all of the reported concentrations for each chemical constituent for each medium.

Isn't there a "preferred" way? ie
GW - Ave conc over last year
Soil - Looking conservatively at highest Residual conc.

6747 Sierra Court, Suite G • Dublin, CA 94568 • (510) 551-8777 • Fax (510) 551-7888

Off-site Groundwater Migration Through Utility Conduits

76 Products has initially addressed the potential for groundwater migration through the numerous utility trenches and conduits located adjacent to the site in Lakeshore Avenue. A licensed surveyor was retained to conduct a monitoring well head and sewer "fall line" elevation survey. The results of this survey along with the a review of the historical groundwater elevation indicate that the intersection of groundwater and the bottom of the utilities do not coincide until a point well off and down-gradient of the Unocal site. At that point, other potential responsible parties may be contributors. The utility trenches located adjacent to the site in Lakeshore Avenue are most likely not acting as a conduit to facilitate the off-site migration of impacted groundwater from the Unocal site.

Soil Delineation

ACEHS requested 76 Products to complete the soil delineation to the northwest, in Lakeshore Avenue. Besides easement problems from the City of Oakland, Lakeshore Avenue has many underground utilities, structures and traffic problems that limit the possible installation of exploratory borings in Lakeshore Avenue. 76 Products and GSI will assess possible locations for lateral definition of the soils in the northwest area of the site.

Site Specific Parameters

76 Products and GSI will include in the forthcoming Work Plan, provisions for the collection of soil samples for site specific physical parameters, such as, bulk density, water content, soil porosity, permeability, soil pH, total organic content (TOC), and particle size analysis. These parameters will be used in the RBCA evaluation for the site. Also, the next groundwater monitoring event will include intrinsic bio- parameters such as dissolved oxygen (DO), nitrate, sulfate phosphate and Redox potential.

Groundwater Attenuation Enhancement

Technologies, such as oxygen releasing compounds that can enhance to natural attenuation of petroleum hydrocarbons in groundwater will be reviewed for possible use at this site.

Separate Phase Recovery

76 Products and GSI will address the detected separate phase product found in U-1 and sheen in U-2, and propose remedial measures. It is currently thought that the separate phase product is primarily contained in the pea gravel filled underground storage tank (UST) complex that includes the area over excavated and backfilled in 1990.

During our meeting we also discussed the possible impact that the former Shell Oil and operating Chevron service stations may have down-gradient. An investigation beyond the Lakeshore and Lakepark intersection would not necessarily pertain to the operation of the Unocal service station. We tentatively agreed that any off-site investigation would not be required other than for the delineation of the soils in the area of the northern dispenser island. A RBCA evaluation will eventually be performed to assess the potential impact of groundwater on the nearest receptor, Lake Merritt.

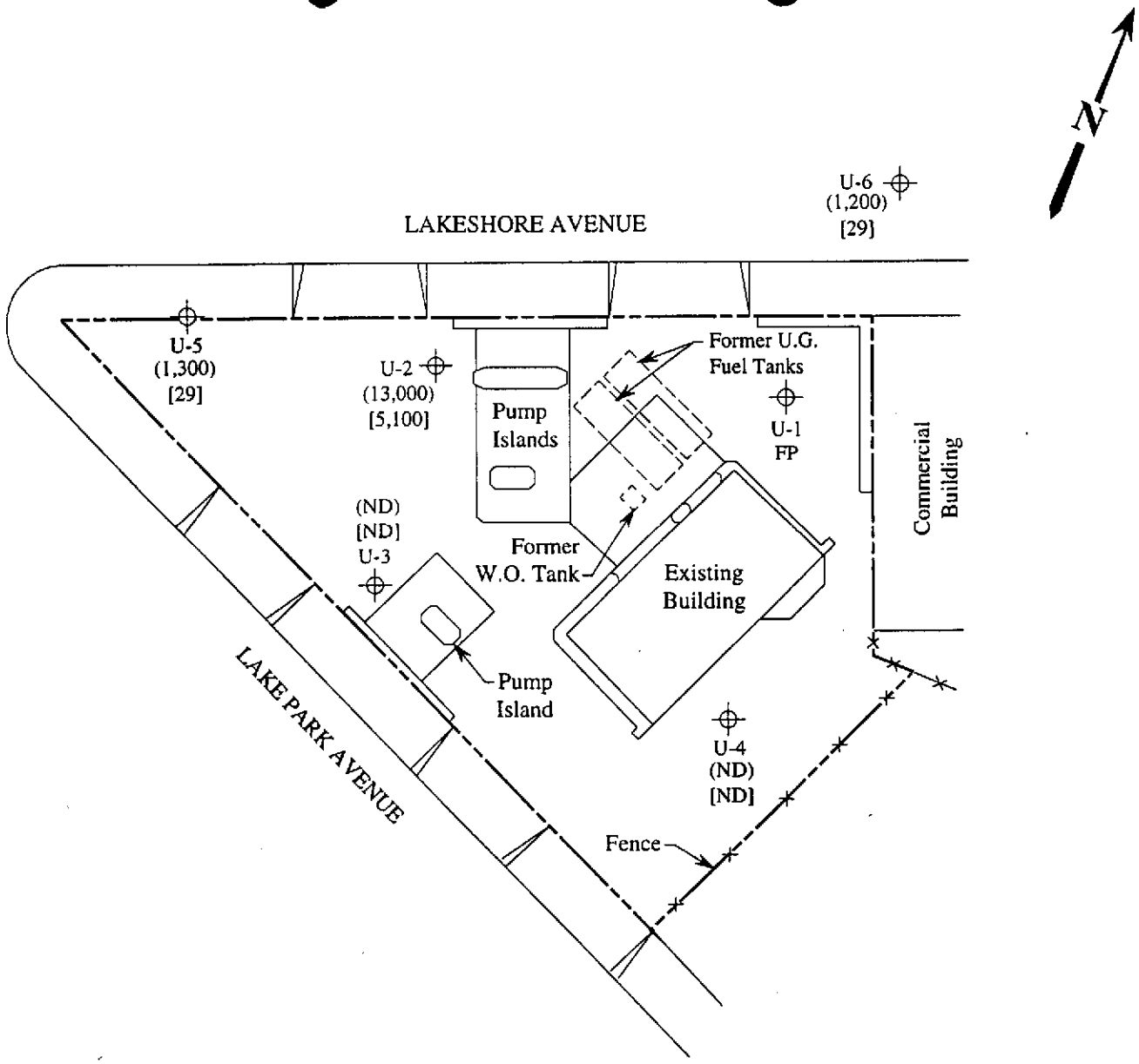
A work plan will be prepared and submitted to the ACEHS by May 21, 1997. If additions or deletions to this summary are required, please call me at (415) 893-1515 to discuss.

Sincerely,
GeoStrategies

David J. Vossler
Project Manager

Attachment: Site Map (MPDS Figure 2, Quarterly Monitoring Report dated January 22, 1997)

cc: David B. DeWitt, 76 Products Company



LEGEND

- ⊕ Monitoring well
- ( ) Concentration of TPH as gasoline in µg/L
- [ ] Concentration of benzene in µg/L
- ND Non-detectable, FP Free product

0 40 80

Approx. scale feet

PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUND WATER ON DECEMBER 9, 1996

mpds SERVICES, INCORPORATED

UNOCAL SERVICE STATION #5325
3220 LAKESHORE AVENUE
OAKLAND, CALIFORNIA

FIGURE
2

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

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

March 7, 1997
StID # 1059

Mr. David De Witt
Unocal Corporation
2000 Crow Canyon Place, Suite 400
P.O. Box 5155
San Ramon, CA 94583

Re: Unocal Service Station #5325, 3220 Lakeshore Ave., Oakland CA 94610

Dear Mr. De Witt:

Our office has received your 2/25/97 fax providing site specific data proposed for use in a Tier 2 RBCA. I have also discussed this site with Ms. Madhulla Logan of our office. Please explain how the average hydrocarbon concentrations in soil and groundwater were calculated in items number 4 & 5 of this letter.

It is premature to perform your risk assessment since the extent of the groundwater contamination has not been determined. When determined, you can then identify the complete exposure pathways and determine risk based upon site specific data. Offsite exposure to commercial workers and/or to a surface water body (Lake Merritt) are the most likely scenarios. Onsite soil and groundwater contamination is mainly downgradient to the onsite buildings.

Therefore, prior to performing a RBCA, please provide a workplan to determine the extent of offsite contamination. Because migration is likely through groundwater transport, grab groundwater samples should be taken along potential utility conduits and across Lakeshore Ave. where the commercial buildings are located.

Please submit your workplan **within 30 days or by April 8, 1997.** You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M Chan

Barney M. Chan
Hazardous Materials Specialist

c: B. Chan, files
Mr. G. Gurss, GeoStrategies, 3164 Gold Camp Dr., Suite 240, Rancho Cordova, CA 95670

wpre3220

76 PRODUCTS COMPANY

February 25, 1997

Mr. Barney M. Chan
Hazardous Materials Specialist
Alameda County Health Services - LOP
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Unocal Service Station #5325
3220 Lakeshore Avenue
Oakland, CA

Dear Mr. Chan:

Please find attached the list of physical parameters from the site which we feel are appropriate for use in a RBCA approach for this site. It will be noted that some of the parameter values are the same as default values; however, each parameter value is based upon our evaluation of actual site conditions.

We are continuing our investigation into the conditions of the sewer trenches, and since these trenches are apparently the deepest, they would be the most likely to be affected by hydrocarbon contaminated groundwater. During the installation of monitor well U-6, the sewer line was inadvertently penetrated. Inspection of the sewer during the repair showed the line is backfilled with native materials (silty sand) and we are using physical parameters appropriate for that type of soil.

As has been discussed before, groundwater flow directions and gradients are highly variable; therefore, we are re-surveying our wells to make sure that groundwater conditions are accurate.

The following special conditions existing at the site will be incorporated in the modeling:

1. The site is completely covered with either asphalt or concrete and the infiltration of surface waters would be significantly reduced.
2. The area of soil contamination is considered to be 60' x 80', centered around the dispenser islands.
3. The area of groundwater contamination is considered to be 150' x 100', extending from the tank pit and dispensers westward out to the center of the street.
4. Average hydrocarbon concentration of soil is 2 ppm benzene, 13 ppm toluene, 7 ppm ethylbenzene and 40 ppm xylenes.
5. Average hydrocarbon contamination of groundwater (over time) of 280 ppb benzene, 1170 ppb toluene, 421 ppb ethylbenzene and 3425 ppb of xylenes.

2000 Crow Canyon Place, Suite 400 San Ramon, California 94583
Telephone (510) 277-2414
A Unocal Company

6. The site is being modeled as a silty sand, but it should be noted that most of the monitor wells do not recharge from purging from monitoring and sampling. This is suggestive of very reduced groundwater flow velocities.
7. The current tank pit is backfilled with pea gravel and the tank pit is now acting as a collection sump.

Please review this data and give me a call when you are ready to discuss the next phase. I can be reached at 510-277-2384.

Sincerely yours,

David B. De Witt
Project Manager

Attachments
cc: Greg Gurss, GSI

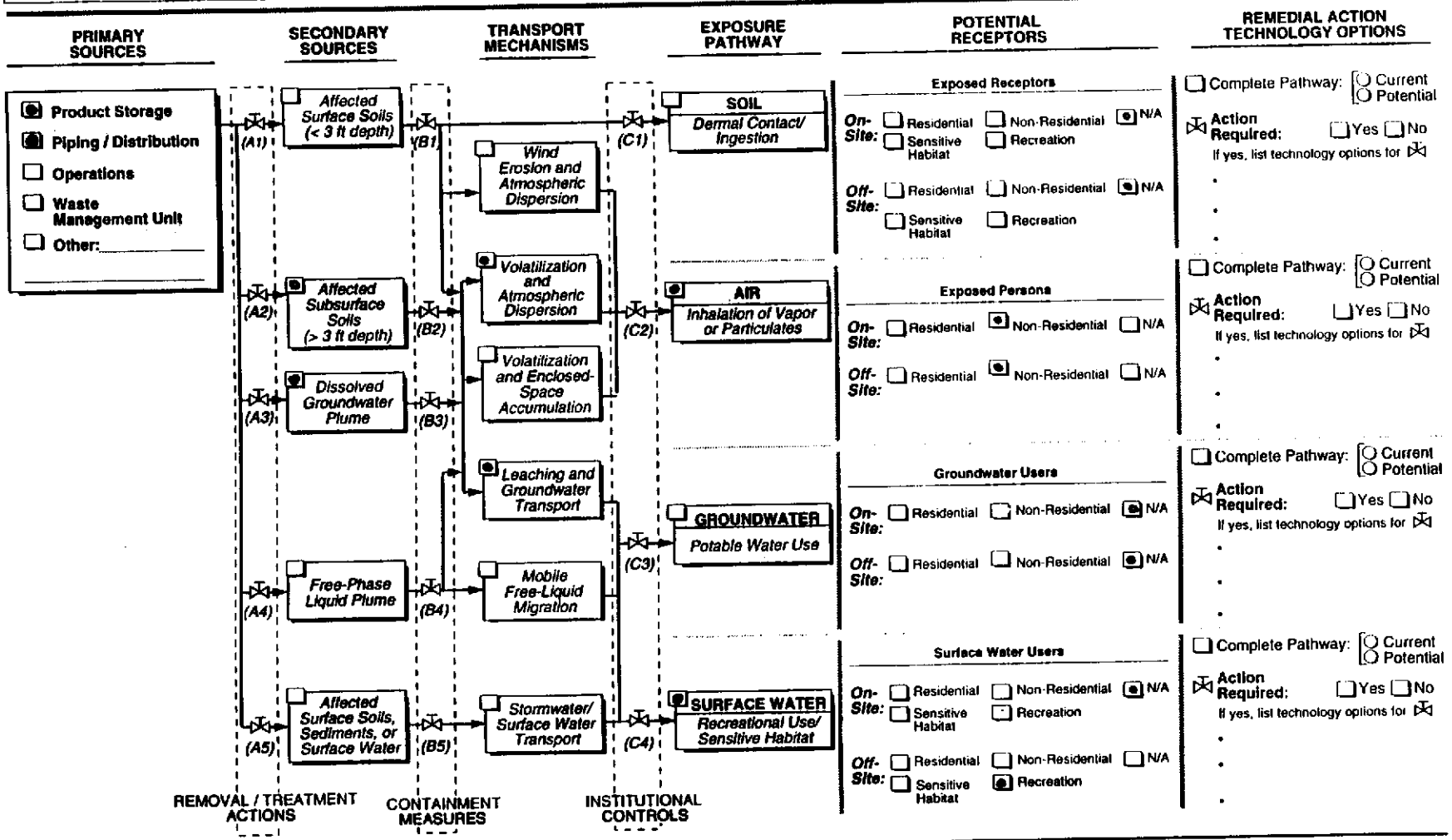
Site Name: Unocal SS No. 5325 Date Completed: 2/24/97

Site Location: 3220 Lakeshore Ave, Oakland Completed By:

EXPOSURE CONTROL FLOWCHART

Instructions: *Identify remedial measures to be implemented to prevent exposure, as follows:*

- *Step 1- Baseline Exposure: Identify applicable sources, transport mechanisms, and receptors as shown on Worksheet 4.2 (■ = applicable to site).*
- *Step 2- Remedial Measures: Fill in shut-off valves (⋈) to indicate removal / treatment action, containment measure, or institutional controls to be used to "shut off" exposure pathway.*
- *Step 3- Remedial Technology Options: For each complete pathway, identify category of corrective measure to be applied and list possible technology options in space provided (see options list in RBCA Guidance Manual).*



Site Name: Unocal SS No. 5325 Date Completed: 2/24/98

Site Location: 3220 Lakeshore Ave, Oakland Completed By:

SITE PARAMETER CHECKLIST FOR RISK-BASED SCREENING LEVELS

Instructions: For Tier 1 evaluation (generic screening levels), review specified default parameters (*) to ensure values are conservative for site. For Tier 2 Option 1 SSTL calculation (site-specific screening levels), provide site-specific values for sensitive parameters (§). Indicate parameter value used in evaluation by completing check box (■).

Note: * Confirm conservatism of these values for Tier 1 evaluation.
§ Provide site-specific measurement or estimate for Tier 2 evaluation.

		Default Value Used	Site-Specific Value Used	
Soil Parameters				
	soil type	☐ sandy soil	☐ Silty Sand	*§
Θ_T	Soil porosity	☐ 0.38 (dim)	■ 42 est.	§
Θ_{ws}	water content - vadose zone	☐ 0.12 (dim)	■ 25 est.	§
Θ_{as}	air content - vadose zone (= Θ_T - Θ_{ws})	■ 0.26 (dim)	☐	
Θ_{wcap}	water content - capillary fringe	■ 0.342 (dim)	☐	
Θ_{acap}	air content - capillary fringe (= Θ_T - Θ_{wcap})	■ 0.038 (dim)	☐	
ρ_s	Soil density	☐ 1.7 g/cm^3	■ 1.7	§
foc	mass fraction of organic carbon in soil	☐ 0.01 (dim)	■ 0.01	§
Ls	Depth to contaminated soil	☐ 100 cm	■ 160	§
Lgw	Depth to groundwater	☐ 300 cm	■ 185	§
h_{cap}	capillary zone thickness	■ 5 cm	☐	
hv	vadose zone thickness (= Lgw - hc)	☐ 295 cm	■ 160	
pH	Soil/water pH	☐ 6.5	■ 7.5	
Groundwater Parameters				
I	Water infiltration rate	☐ 30 cm/yr	■ 7.1	§
V_{gw}	groundwater velocity	☐ 82.0 ft/yr	■ 1.16	*§
δ_{gw}	groundwater mixing zone depth	☐ 200 cm	■ 200	*§
DF	aquifer dilution factor (= I + V_{gw} δ_{gw}/(IW))	■ 12.1	☐	
Surface Parameters				
U_{air}	Amb. air velocity in mixing zone	☐ 225 cm/s	☐	*§
δ_{air}	Mixing zone height	☐ 200 cm	☐	*§
A	Contaminated Area	☐ 2250000 cm^2	☐	
W	Width of Contaminated Area	☐ 1500 cm	☐	§
d	Thickness of Surficial Soils	☐ 100 cm	☐	§
Pe	Particulate areal emission rate	☐ 2.17E-10 g/cm^2-s	☐	§
Building Parameters				
L_{crack}	Foundation crack thickness	☐ 15 cm	☐	
η	Foundation crack fraction	☐ 0.01 (dim)	☐	
Lb_r	Building Volume/Foundation Area Ratio (res.)	☐ 200 cm	☐	
Lb_c	Building Volume/Foundation Area Ratio (com./ind.)	☐ 300 cm	☐	
ER_r	Building vapor volume exchange rate (res.)	☐ 12 dy^{-1}	☐	
ER_c	Building vapor volume exchange rate (com./ind.)	☐ 20 dy^{-1}	☐	

Discussion: *Provide rationale for default parameter revision; discuss additional site-specific features of note; etc.*

(continue on next page if needed)

Site Name: Unocal SS No. 5325 Date Completed: 2/24/97

Site Location: 3220 Lakeshore Ave, Oakland Completed By:

SUMMARY OF SOURCE ZONE CHARACTERISTICS

Instructions: ***Provide information regarding presence and dimensions of affected soil and groundwater zones. For each affected medium, list constituents of concern (COCs) and representative concentration data on Worksheets 5.4 - 5.6. Describe source area histories on Worksheets 2.2 and 2.3 and show locations on Figures 3 through 7. (Under RBCA, the affected soil or groundwater zone is defined as the area or volume containing COC concentrations in excess of Tier 1 screening levels.)***

AFFECTED SURFACE SOILS (≤ 3 ft BGS)

- ☐ Present
- ■ Not Present
- ☐ Not Measured

If present, complete the following:

- Maximum areal extent (ft^2):
- Width of affected zone (ft):
- Length of affected zone (ft):
- Depth interval (ft,BGS):

(Provide COC data on Worksheet 5.4)

AFFECTED SUBSURFACE SOILS (> 3 ft BGS)

- ■ Present
- ☐ Not Present
- ☐ Not Measured

If present, complete the following:

- Depth to top of affected soil (ft) (min. 3 ft, BGS): 5 ft
- Depth to base of affected soil (ft, BGS): 6 ft
- Maximum areal extent (ft^2): 4,800

(Provide COC data on Worksheet 5.5)

AFFECTED GROUNDWATER

- ■ Present
- ☐ Not Present
- ☐ Not Measured

If present, complete the following:

- Maximum areal extent (ft^2): 15,000 ft^2
- Length of plume (ft): 150 ft
- Width of plume (ft): 100 ft
- Depth to top of affected water-bearing unit (ft, BGS): 6 ft
- Depth to base of plume (ft, BGS):

(Provide COC data on Worksheet 5.6)

OTHER SOURCE MEDIUM

- ☐ Present
- ■ Not Present

If present, describe nature of material and dimensions:

(Provide COC data on separate table)

FAX #1059

Date 2-25-97

Number of pages including cover sheet 6

TO: MR. BARNEY CHAN

Phone

Fax Phone

FROM: DAVID DEWITT

76 Products
2000 Crow Canyon Place, Ste. 400
San Ramon, CA 94583

Phone

Fax Phone (510)277-2309

CC:

REMARKS: ☐ Urgent ☒ For your review ☐ Reply ASAP ☐ Please Comment

- ☐ Pursuant to our discussion
- ☐ Review and call to discuss
- ☐ Review and comment in writing
- ☐ Review and edit for accuracy
- ☐ For your information
- ☐ For discussion in meeting
- ☐ Please sign and return
- ☒ Hardcopy to follow in mail

76 PRODUCTS COMPANY

February 25, 1997

Mr. Barney M. Chan
Hazardous Materials Specialist
Alameda County Health Services - LOP
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Unocal Service Station #5325
3220 Lakeshore Avenue
Oakland, CA

Dear Mr. Chan:

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4. Average hydrocarbon concentration of soil is 2 ppm benzene, 13 ppm toluene, 7 ppm ethylbenzene and 40 ppm xylenes.
5. Average hydrocarbon contamination of groundwater (over time) of 280 ppb benzene, 1170 ppb toluene, 421 ppb ethylbenzene and 3425 ppb of xylenes.

Reasonable?

how was this derived

what about offsite from U-1 & U-2

2000 Crow Canyon Place Suite 400 San Ramon California 94583
Telephone (510) 277-2414

6. The site is being modeled as a silty sand, but it should be noted that most of the monitor wells do not recharge from purging from monitoring and sampling. This is suggestive of very reduced groundwater flow velocities.
7. The current tank pit is backfilled with pea gravel and the tank pit is now acting as a collection sump.

Please review this data and give me a call when you are ready to discuss the next phase. I can be reached at 510-277-2384.

Sincerely yours,

David B. De Witt
Project Manager

Attachments
cc: Greg Gurss, GSI

Site Name: Unocal SS No. 5325 Date Completed: 2/24/97

Site Location: 3220 Lakeshore Ave, Oakland Completed By:

EXPOSURE CONTROL FLOWCHART

Instructions: *Identify remedial measures to be implemented to prevent exposure, as follows:*

- *Step 1- Baseline Exposure: Identify applicable sources, transport mechanisms, and receptors as shown on Worksheet 4.2 (■ = applicable to site).*
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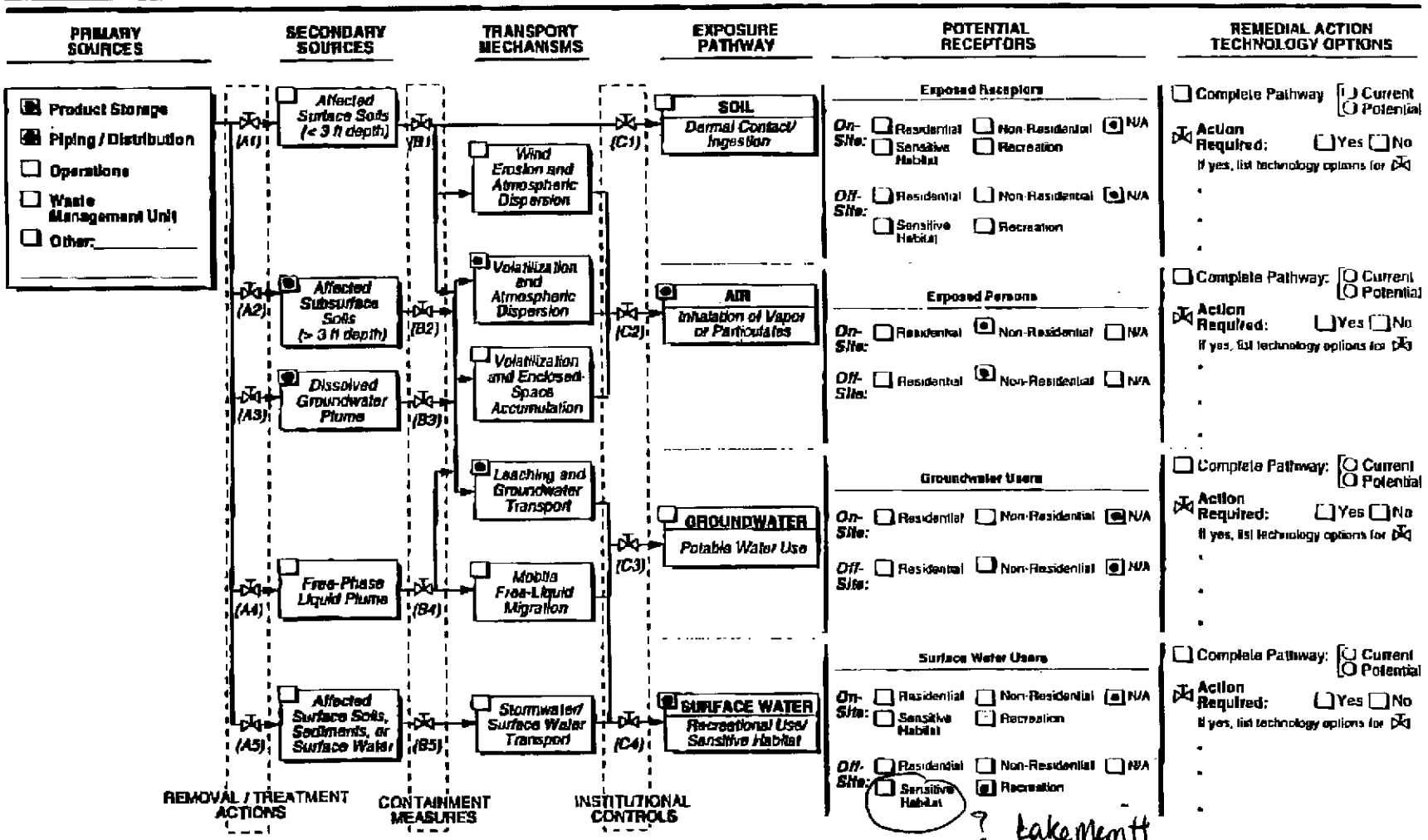

RBCA SUMMARY REPORT | Worksheet 5.1

Site Name: Unocal SS No. 5325 Date Completed: 2/24/98

Site Location: 8220 Lakeshore Ave, Oakland Completed By:

SITE PARAMETER CHECKLIST FOR RISK-BASED SCREENING LEVELS

Instructions: For Tier 1 evaluation (generic screening levels), review specified default parameters (*) to ensure values are conservative for site. For Tier 2 Option 1 SSTL calculation (site-specific screening levels), provide site-specific values for sensitive parameters (§). Indicate parameter value used in evaluation by completing check box (■).

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θ_T	Soil porosity	☐ 0.38 (dim)	■ 42 est.	§
θ_{ws}	water content - vadose zone	☐ 0.12 (dim)	■ 25 est.	§
θ_{as}	air content - vadose zone (= θ_T - θ_{ws})	■ 0.26 (dim)	☐	
θ_{wcap}	water content - capillary fringe	■ 0.342 (dim)	☐	
θ_{acap}	air content - capillary fringe (= θ_T - θ_{wcap})	■ 0.038 (dim)	☐	
ρ_s	Soil density	☐ 1.7 g/cm^3	■ 1.7	§
foc	mass fraction of organic carbon in soil	☐ 0.01 (dim)	■ 0.01	§
Ls	Depth to contaminated soil	☐ 100 cm	■ 160	§
Lgw	Depth to groundwater	☐ 300 cm	■ 185	§
hcap	capillary zone thickness	■ 5 cm	☐	
hv	vadose zone thickness (= Lgw - hc)	☐ 295 cm	■ 160	
pH	Soil/water pH	☐ 6.5	■ 7.5	
Groundwater Parameters				
I	Water infiltration rate	☐ 30 cm/yr	■ 7.1	§
V_{gw}	groundwater velocity	☐ 82.0 ft/yr	■ 1.16	*§
δ_{gw}	groundwater mixing zone depth	☐ 200 cm	■ 200.	*§
DF	aquifer dilution factor (= 1 + V_{gw} δ_{gw} / (IW))	■ 12.1	☐	
Surface Parameters				
U_{air}	Amb. air velocity in mixing zone	☐ 225 cm/s	☐	*§
δ_{air}	Mixing zone height	☐ 200 cm	☐	*§
A	Contaminated Area	☐ 2250000 cm^2	☐	
W	Width of Contaminated Area	☐ 1500 cm	☐	§
d	Thickness of Surficial Soils	☐ 100 cm	☐	§
Pe	Particulate areal emission rate	☐ 2.17E-10 g/cm^2-s	☐	§
Building Parameters				
L_{crack}	Foundation crack thickness	☐ 15 cm	☐	
η	Foundation crack fraction	☐ 0.01 (dim)	☐	
Lb_r	Building Volume/Foundation Area Ratio (res.)	☐ 200 cm	☐	
Lb_c	Building Volume/Foundation Area Ratio (com./ind.)	☐ 300 cm	☐	
ER_r	Building vapor volume exchange rate (res.)	☐ 12 dy^{-1}	☐	
ER_c	Building vapor volume exchange rate (com./ind.)	☐ 20 dy^{-1}	☐	

Discussion: *Provide rationale for default parameter revision; discuss additional site-specific features of note; etc.*

Lower soil porosity to account for soil moisture same as default

refer to SSTL from 0.38

-6'

(continue on next page if needed)

RBCA SUMMARY REPORT | Worksheet 5.3

Site Name: Unocal SS No. 5325 Date Completed: 2/24/97

Site Location: 3220 Lakeshore Ave, Oakland Completed By:

SUMMARY OF SOURCE ZONE CHARACTERISTICS

Instructions: *Provide information regarding presence and dimensions of affected soil and groundwater zones. For each affected medium, list constituents of concern (COCs) and representative concentration data on Worksheets 5.4 - 5.6. Describe source area histories on Worksheets 2.2 and 2.3 and show locations on Figures 3 through 7. (Under RBCA, the affected soil or groundwater zone is defined as the area or volume containing COC concentrations in excess of Tier 1 screening levels.)*

AFFECTED SURFACE SOILS (≤ 3 ft BGS)

- ☐ Present
- ■ Not Present
- ☐ Not Measured

If present, complete the following:

- Maximum areal extent (ft^2):
- Width of affected zone (ft):
- Length of affected zone (ft):
- Depth interval (ft,BGS):

(Provide COC data on Worksheet 5.4)

AFFECTED SUBSURFACE SOILS (> 3 ft BGS)

- ■ Present
- ☐ Not Present
- ☐ Not Measured

If present, complete the following:

- Depth to top of affected soil (ft) (min. 3 ft, BGS): 5 ft
- Depth to base of affected soil (ft, BGS): 6 ft
- Maximum areal extent (ft^2): 4,800

(Provide COC data on Worksheet 5.5)

AFFECTED GROUNDWATER

- ■ Present
- ☐ Not Present
- ☐ Not Measured

If present, complete the following:

- Maximum areal extent (ft^2): 15,000 ft^2
- Length of plume (ft): 150 ft
- Width of plume (ft): 100 ft
- Depth to top of affected water-bearing unit (ft, BGS): 6 ft
- Depth to base of plume (ft, BGS):

(Provide COC data on Worksheet 5.6)

OTHER SOURCE MEDIUM

- ☐ Present
- ■ Not Present

If present, describe nature of material and dimensions:

(Provide COC data on separate table)

76 PRODUCTS COMPANY

February 6, 1997

Mr. Barney M. Chan
Hazardous Materials Specialist
Alameda County Health Services - LOP
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Unocal Service Station #5325
3220 Lakeshore Avenue
Oakland, CA

Dear Mr. Chan:

This letter is my attempt to summarize this morning's meeting and to make sure that Alameda County Health Services - LOP agrees with the approach that 76 Products Company (Unocal) will utilize in our assessment of this service station site. 76 Products Company, through our consultants, will:

1. Present to Alameda County Health Services - LOP within the next two weeks (February 24) the proposed physical data (porosities, groundwater flow velocities, contamination levels, etc.) to be used in the evaluation so there is agreement on the data sets to be used in the RBCA assessment.
2. Perform a Risk Based Corrective Action (RBCA) study of our site and how it could potentially impact Lake Merritt through underground utility trenches.
    - It is understood that a complete exposure pathway for potential drinking water does not exist; however, potential exposure routes from surface water to the general public may exist (through air or dermal contact).
3. Determine what Site Specific Target Levels (SSTL) would be appropriate for the site and determine if the site meets those criteria.

If I have not correctly summarized our meeting, please call me at 510-277-2384 so that we may discuss any differences.

Sincerely yours,

David B. De Witt
Project Manager

cc: Greg Gurss, GSI

2000 Crow Canyon Place, Suite 400, San Ramon, California 94583
Telephone (510) 277-2414
A Unocal Company

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

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

January 2, 1997
StID # 1059

Mr. David De Witt
Unocal Corporation
2000 Crow Canyon Place, Suite 400
P.O. Box 5155
San Ramon, CA 94583

Re: Unocal Service Station #5325, 3220 Lakeshore Ave., Oakland CA 94610

Dear Mr. De Witt:

This letter provides written confirmation for the extension from December 19, 1996 to January 31, 1997 in responding to the questions posed in my November 18, 1996 letter.

As mentioned in this letter, you may modify the current monitoring schedule to omit chemical analysis for monitoring wells U-3 and U-4. Please continue, however, to take groundwater elevation readings for gradient contouring purposes. Please also remember to analyze the well containing the highest prior MTBE concentration by Method 8240 or 8260.

You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M. Chan
Hazardous Materials Specialist

c: B. Chan, files
Mr. G. Gurss, GeoStrategies, 3164 Gold Camp Dr., Suite 240, Rancho Cordova, CA 95670
Mr. J. Greger, MPDS Services Inc., 2401 Stanwell Dr., Suite 400, Concord CA 94520
ext3220

GeoStrategies

1059

ENVIRONMENTAL PROTECTION

96 DEC 20 PM 4: 13

December 18, 1996

Mr. Barney M. Chan
Alameda County Health Care Services
1131 Harbor Bay Parkway
Suite 250
Alameda, California 94502-6577

Subject: Request for Deadline Extension to Alameda County Health Care Services Letter for Unocal Service Station No. 5325, 3220 Lakeshore Avenue, Oakland, California.

Mr. Chan:

At the request of Unocal Corporation (Unocal), GeoStrategies (GSI) is requesting an extension from December 19, 1996 to January 31, 1997 for submittal of a response to the items discussed in Alameda County Health Care Services letter dated November 18, 1996. Per our discussion on December 17, 1996, verbal approval was granted for the extension.

As discussed, the report with the analytical results from the replacement of the product piping is in preparation and should be submitted to your office by January 11, 1996. If you should have any questions, please call our Sacramento office at (916) 631-1300.

Sincerely,
GeoStrategies

Greg A. Gurss
Project Manager

c: Dave DeWitt, Unocal Corporation

UN5325BC.LT1

3164 Gold Camp Drive, Suite 240 • Rancho Cordova, CA 95670 • (916) 631-1314 • Fax (916) 631-1317

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

November 18, 1996
StID # 1059

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

Mr. David De Witt
Unocal Corporation
2000 Crow Canyon Place, Suite 400
P.O. Box 5155
San Ramon, CA 94583

Re: Unocal Service Station #5325, 3220 Lakeshore Ave., Oakland CA 94610

Dear Mr. De Witt:

Our office has received and reviewed the July 24, 1996 MPDS groundwater monitoring report for the above site. I also was present along with yourself during the November 15, 1996 waste oil tank and underground piping removal. During this removal, it appeared that the dispenser areas on the northern portion of this site had been impacted by a gasoline release. The other samples, beneath the waste oil tank and along the rest of the fuel line did not appear impacted. Additional overexcavation was planned within the dispenser area down to five (5) feet bgs along with resampling. Please send a copy of the analytical results for the samples from the tank and piping removal as soon as possible. It is possible that the observed soil contamination in the area of the dispensers is the source of the elevated petroleum contamination being found in monitoring well U-2.

In regards to the overall site investigation, I spoke with Mr. Haig Tejirian about this. A number of items were discussed which I would like brought to your attention:

1. Based on the elevated levels of petroleum contaminants in groundwater, please investigate the underground utilities as a potential preferential pathway for contamination migration. Please identify how the extent of the petroleum hydrocarbon plume will be determined.

2. Should some type of remediation be done to prevent offsite migration of contamination or to attenuate the elevated levels being detected in wells U-1, U-2 and U-5 ?

3. Based on historical monitoring data, it seem appropriate to either decrease or halt groundwater monitoring in wells U-3 and U-4.

4. Please run the monitoring well with the highest reported MTBE result via Method 8240 or 8260 as recommended to the LOP managers by SWRCB UST Section manager.

Please respond to the above items in writing **within 30 days or by December 19, 1996.**

You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M Chan

Barney M. Chan
Hazardous Materials Specialist

c: B. Chan, files
Mr. J. Greger, MPDS Services Inc., 2401 Stanwell Dr., Suite 400, Concord CA 94520

ssi.3220

white -env.health
yellow -facility
pink -files

ALAMEDA COUNTY, DEPARTMENT OF
ENVIRONMENTAL HEALTH

Hazardous Materials Inspection Form

①

1131 Harbor Bay Pkwy
Alameda CA 94502
510/567-6700

II, III

Site ID # _____ Site Name Unocal #5325 Today's Date 11/15/96

Site Address 3220 Lakeshore Ave

City Oak Zip 94610 Phone ____________

_____ MAX AMT stored > 500 lbs, 55 gal., 200 cft.?

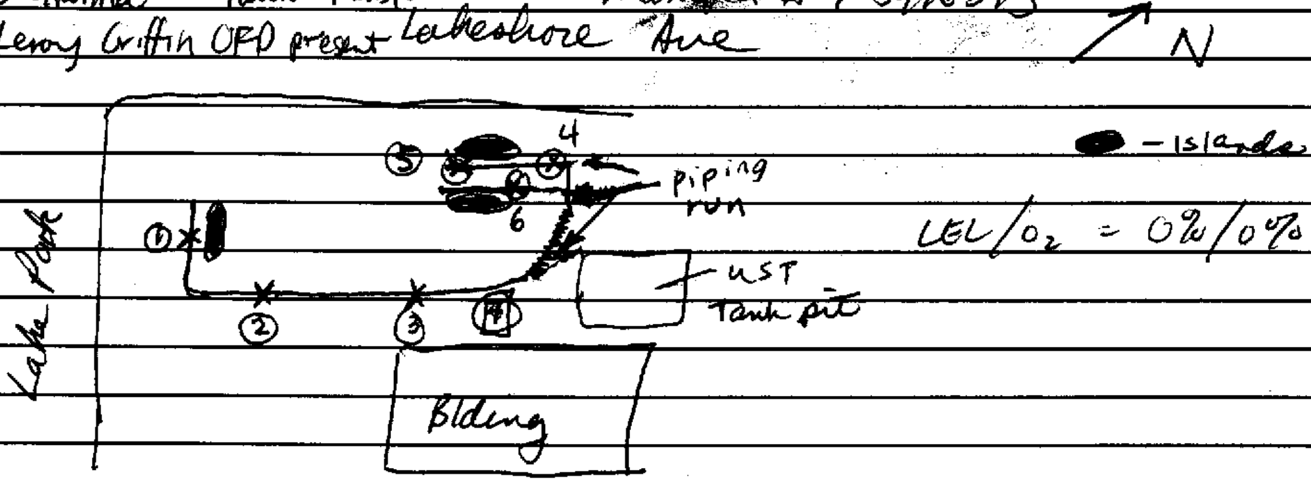
Inspection Categories:

____ I. Haz. Mat/Waste GENERATOR/TRANSPORTER
____ II. Hazardous Materials Business Plan, Acutely Hazardous Materials
_Y_ III. Underground Storage Tanks Removal

* Calif. Administration Code (CAC) or the Health & Safety Code (HS&C)

Comments:

Present to witness the removal of 1-500 gallon waste oil tank
& all associated piping to fuel tanks
Contractor: Balch Petroleum - Tom Emberton
Unocal rep: D. DeWitt, Greg Gurss
Sampler: B. Sienienski of Geostrategies - Gettler Ryan
Dexanna - Tank transporter Manifest # 95996515
Leroy Griffin OFD present



Piping Soil sples ① brown clay no odor, ② brown gravely clay no odor ③ blue gray gravelly clay no odor
④ blue gray clay - mod gas odor ⑤ black moist clay mild gas odor ⑥ blue gray clay - mild gas odor
Sple (T) taken @ ~8' bgs into brown silt, no odor, below W/O tank

II, III

Contact ____________

Title ____________

Signature ____________

Inspector B. CHAN

Signature B Chan

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yellow -facility
pink -files

ALAMEDA COUNTY, DEPARTMENT OF ENVIRONMENTAL HEALTH

Hazardous Materials Inspection Form

1131 Harbor Bay Pkwy
Alameda CA 94502
510/567-6700

II, III

Site ID # _____ Site Name _____ Today's Date___/___/___

Site Address _____

City _____ Zip 94___ Phone _____

_____ MAX AMT stored > 500 lbs, 55 gal., 200 cft.?

Inspection Categories:

____ I. Haz. Mat/Waste GENERATOR/TRANSPORTER
____ II. Hazardous Materials Business Plan, Acutely Hazardous Materials
____ III. Underground Storage Tanks

* Calif. Administration Code (CAC) or the Health & Safety Code (HS&C)

Comments:

II, III

Contact _____

Title _____ Inspector _____

Signature _____ Signature _____

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yellow -facility
pink -files

ALAMEDA COUNTY, DEPARTMENT OF ENVIRONMENTAL HEALTH

1131 Harbor Bay Pkwy
Alameda CA 94502
510/567-6700

Hazardous Materials Inspection Form

II, III

Site ID # _____ Site Name Unocal #5325 Today's Date 11/15/96

Site Address 3220 Lakeshore

City Oak Zip 94610 Phone ______

_____ MAX AMT stored > 500 lbs, 55 gal., 200 cft.?

Inspection Categories:

____ I. Haz. Mat/Waste GENERATOR/TRANSPORTER
____ II. Hazardous Materials Business Plan, Acutely Hazardous Materials
✓ III. Underground Storage Tanks R.

* Calif. Administration Code (CAC) or the Health & Safety Code (HS&C)

Comments:

Based on the OVA + qualitative odors detected in sples #4, 5+6, these two areas were excavated further to approx 5' BGS + resampled.

Piping sples: Run for TPHg, BTEX & MTBE
Waste oil sple: TPHg, d, BTEX, MTBEX, TOG, Chlorinated HC (8010) metals Cd, Cr, Pb, Ni + Zn
If any hydrocarbons detected in waste oil sple then sample for 8270 semivolatiles

II, III

Contact ______

Title ______

Signature [signature]

Inspector R CHAN

Signature [signature]

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yellow -facility
pink -files

ALAMEDA COUNTY, DEPARTMENT OF ENVIRONMENTAL HEALTH

Hazardous Materials Inspection Form

1131 Harbor Bay Pkwy
Alameda CA 94502
510/567-6700

II, III

Site ID # _____ Site Name _____ Today's Date___/___/___

Site Address _____

City _____ Zip 94___ Phone _____

_____ MAX AMT stored > 500 lbs, 55 gal., 200 cft.?

Inspection Categories:

____ I. Haz. Mat/Waste GENERATOR/TRANSPORTER
____ II. Hazardous Materials Business Plan, Acutely Hazardous Materials
____ III. Underground Storage Tanks

* Calif. Administration Code (CAC) or the Health & Safety Code (HS&C)

Comments:

II, III

Contact _____

Title _____ Inspector _____

Signature _____ Signature _____

Barney Chan
Project Specialist
11/14/96
Note: Additional requirements & changes
Per confirm w/ Fire Inspector prior removal

ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY
DEPARTMENT OF ENVIRONMENTAL HEALTH
ENVIRONMENTAL PROTECTION DIVISION
1131 HARBOR BAY PARKWAY, RM 250
ALAMEDA, CA 94502-6577
PHONE # 510/567-6700
FAX # 510/337-9335

ACCEPTED
Underground Storage Tank Closure Permit Application
Alameda County Division of Hazardous Materials
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

These closure/removal plans have been received and found to be acceptable and essentially meet the requirements of State and Local Health Laws. Changes to your closure plans indicated by this Department are to assure compliance with State and local laws. The project proposed herein is now released for issuance of any required building permits for construction/destruction.
One copy of the accepted plans must be on the job and available to all contractors and craftsmen involved with the removal.
Any changes or alterations of these plans and specifications must be submitted to this this Department and to the Fire and Building Inspections Department to determine if such changes meet the requirements of State and local laws.
Notify this Department at least 72 hours prior to the following required inspections:

✓ Removal of Tank(s) and Piping
____ Sampling
____ Final Inspection

Issuance of a) permit to operate, b) permanent site closure, is dependent on compliance with accepted plans and all applicable laws and regulations.

"THERE IS A FINANCIAL PENALTY FOR NOT OBTAINING THESE INSPECTIONS"

Contact Specialist:

UNDERGROUND TANK CLOSURE PLAN
*** * * Complete according to attached instructions * * ***

1. Name of Business Lakeshore UNOCAL #5325
   Business Owner or Contact Person **(PRINT)** Ron Sorenson c/o R.H. Lee & Assoc.
2. Site Address 3220 Lakeshore Avenue
   City Oakland Zip 94610 Phone (510)893-1675
3. Mailing Address 3220 Lakeshore Avenue
   City Oakland Zip 94610 Phone (510)893-1675
4. Property Owner UNOCAL Corporation
   Business Name (if applicable) _____
   Address 2000 Crow Canyon Place Suite 400
   City, State San Ramon, CA Zip 94583
5. Generator name under which tank will be manifested
   UNOCAL 76 Products Company
   EPA ID# under which tank will be manifested CAL000000576

6. Contractor ~~Gettler-Ryan Inc.~~ Balch Petroleum

Address ~~6747 Sierra Court Suite J~~ 939 Ames Ave

City ~~Dublin~~ Milpitas 94035 Phone ~~(510) 551-7555~~ 408 942-8686

License Type* A B HAZ C61 D40 ID# ~~220793~~

***Effective January 1, 1992, Business and Professional Code Section 7058.7 requires prime contractors to also hold Hazardous Waste Certification issued by the State Contractors License Board.**

7. Consultant (if applicable) Robert H. Lee & Assoc.

Address 650 Howe Avenue Suite 504

City, State Sacramento CA 95825 Phone (916) 646-4003

8. Main Contact Person for Investigation (if applicable)

Name Ron Sorenson Title Job Captain

Company Robert H. Lee & Assoc.

Phone (916) 646-4003

9. Number of underground tanks being closed with this plan 1 (waste oil)

Length of piping being removed under this plan 650/3 ≈ 220' ~ 10 spls

Total number of underground tanks at this facility (**confirmed with owner or operator) 3

10. State Registered Hazardous Waste Transporters/Facilities (see instructions).

**** Underground storage tanks must be handled as hazardous waste ****

a) Product/Residual Sludge/Rinsate Transporter

Name Erickson, Inc. EPA I.D. No. CAD009466392

Hauler License No. 0019 License Exp. Date 5-31-97

Address 255 Parr Blvd.

City Richmond State CA Zip 94801

b) Product/Residual Sludge/Rinsate Disposal Site

Name Erickson, Inc EPA ID# CAD009466392

Address 255 Parr Blvd.

City Richmond State CA Zip 94801

c) Tank and Piping Transporter

Name ~~Erickson, Inc.~~ EPA I.D. No. ~~CAD009466e392~~

Hauler License No. ~~0019~~ License Exp. Date ~~5-31-97~~

Address ~~255 Parr Blvd.~~

City ~~Richmond~~ State ~~CA~~ Zip ~~94801~~

d) Tank and Piping Disposal Site

Name ~~Erickson, Inc.~~ EPA I.D. No. ~~CAD009466e392~~

Address ~~255 Parr Blvd.~~

City ~~Richmond~~ State ~~CA~~ Zip ~~94801~~

11. Sample Collector

Name ~~Tim Ross~~ Greg Grish

Company ~~Kaprealian Engineering~~ GeoStrategies - GetterRyan

Address ~~P.O. Box 913~~

City ~~Benecia~~ Sacramento State ~~CA~~ Zip ~~94510~~ Phone ~~(510) 602-5100~~ 916-631-1300

12. Laboratory

Name Sequoia Analytical Labs

Address 680 Chesapeake Drive

City Redwood City State CA Zip 94063

State Certification No. 1210

13. Have tanks or pipes leaked in the past? Yes[ ] No[X] Unknown[ ]

If yes, describe. _____

14. Describe methods to be used for rendering tank(s) inert:

10-20 pounds of CO_2 in the form of dry ice will be placed in the tank.

Before tanks are pumped out and inerted, all associated piping must be flushed out into the tanks. All accessible associated piping must then be removed. Inaccessible piping must be permanently plugged.

The Bay Area Air Quality Management District, 415/771-6000, along with local Fire and Building Departments, must also be contacted for tank removal permits. Fire departments typically require the use of a combustible gas indicator to verify tank inertness. **It is the contractor's responsibility to bring a working combustible gas indicator on-site to verify that the tank is inert.**

15. Tank History and Sampling Information ***** (see instructions) *****

Tank		Material to be sampled (tank contents, soil, groundwater)	Location and Depth of Samples
Capacity	Use History include date last used (estimated)		
520 gal.	Waste oil	soil, water if applicable	(2) confiritory samples will be taken from beneath the tank - two feet below native soil / backfill interface. One sample at each end of tank

One soil sample must be collected for every 20 linear feet of piping that is removed. A ground water sample must be collected if any ground water is present in the excavation.

Excavated/Stockpiled Soil	
Stockpiled Soil Volume (estimated) 1000 cubic yards soil from fuel piping Soil from waste oil tank ← TOG and analytes detected in soils beneath tank	**Sampling Plan** One composite sample, consisting of four individual brass sampling cylinders will be analyzed for every 50 cubic yards of soil. Samples will be analyzed for TPHG and BTXE. If detectable amounts of petroleum hydrocarbons are found, samples will be tested for lead.

Stockpiled soil must be placed on bermed plastic and must be completely covered by plastic sheeting.

Will the excavated soil be returned to the excavation immediately after tank removal? [ ] yes [X] no [ ] unknown

If yes, explain reasoning _____

If unknown at this point in time, please be aware that **excavated soil may not be returned to the excavation without prior approval from Alameda County. This means that the contractor, consultant, or responsible party must communicate with the Specialist IN ADVANCE of backfilling operations.**

16. Chemical methods and associated detection limits to be used for analyzing samples:
The Tri-Regional Board recommended minimum verification analyses and practical quantitation reporting limits should be followed.
See attached Table 2.

17. Submit Site Health and Safety Plan (See Instructions)

Contaminant Sought	EPA or Other Sample Preparation Method Number	EPA or Other Analysis Method Number	Method Detection Limit	
			SOIL	WATER
TPH G & BTX&E +MTBE	GCFID 5030, WATER GCFID 5030, 3810, SOIL	MOD. 8015, 8020, OR 8240, SOIL 602 OR 624, WATER	1.0 0.0005	50.0 0.5
W.O. TANK ABOVE PLUS:				
TPH D	GCFID 5030, WATER GCFID 5030, 3810, SOIL	GCFID 3550, SOIL GCFID 3510, WATER	1.0	50.0
TOG	413.1	SM 5520 D&E, SOIL SM 5520 A&E, WATER	50.0	5,000.0
CL HC		8010, 8240, SOIL 601 OR 624, WATER		
TESTS WILL BE RUN FOR THE FOLLOWING:				
Cd, Cr, Pb, Ni, Zn	7130, 7197, 7421, 7950	ICAP OR AA		
PCP, PCB, PNA&CREOSITE	~~8080~~	8270		

18. Submit Worker's Compensation Certificate copy

Name of Insurer WCP805709116 Transamerican Insurance

19. Submit Plot Plan ***(See Instructions)***

20. Enclose Deposit (See Instructions)

21. **Report any leaks or contamination to this office within 5 days of discovery.**
The written report shall be made on an Underground Storage Tank Unauthorized Leak/Contamination Site Report (ULR) form.

22. **Submit a closure report to this office within 60 days of the tank removal. The report must contain all information listed in item 22 of the instructions.**

23. Submit State (Underground Storage Tank Permit Application) Forms A and B (one B form for each UST to be removed) (mark box 8 for "tank removed" in the upper right hand corner)

I declare that to the best of my knowledge and belief that the statements and information provided above are correct and true.

I understand that information, in addition to that provided above, may be needed in order to obtain approval from the Environmental Protection Division and that no work is to begin on this project until this plan is approved.

I understand that any changes in design, materials or equipment will void this plan if prior approval is not obtained.

I understand that all work performed during this project will be done in compliance with all applicable OSHA (Occupational Safety and Health Administration) requirements concerning personnel health and safety. I understand that site and worker safety are solely the responsibility of the property owner or his agent and that this responsibility is not shared nor assumed by the County of Alameda.

Once I have received my stamped, accepted closure plan, I will contact the project Hazardous Materials Specialist at least three working days in advance of site work to schedule the required inspections.

CONTRACTOR INFORMATION

Name of Business Gaetlen-Ryan, Inc.

Name of Individual _____

Signature _____ Date _____

PROPERTY OWNER OR MOST RECENT TANK OPERATOR (Circle one)

Name of Business UNOCAL Corporation

Name of Individual Ron Sorenson for UNOCAL

Signature Ron Sorenson Date 4/25/96

General Instructions

* Three (3) copies of this plan plus attachments and a deposit must be submitted to this Department.

* Any cutting into tanks requires local fire department approval.

* One complete copy of your approved plan must be at the construction site at all times; a copy of your approved plan must also be sent to the landowner.

* State of California Permit Application Forms A and B are to be submitted to this office. One Form A per site, one Form B for each removed tank.

Line Item Specific Instructions

2. SITE ADDRESS
   Address at which closure is taking place.

5. EPA I.D. NO. under which the tanks will be manifested
   EPA I.D. numbers may be obtained from the State Department of Toxic Substances Control, 916/324-1781.

6. CONTRACTOR
   Prime contractor for the project.

10. STATE REGISTERED HAZARDOUS WASTE TRANSPORTERS/FACILITIES

    a) All residual liquids and sludges are to be removed from tanks before tanks are inerted.

    c) Tanks must be hauled as hazardous waste.

    d) This is the place where tanks will be taken for cleaning.

15. TANK HISTORY AND SAMPLING INFORMATION
    Use History - This information is essential and must be accurate. Include tank installation date, products stored in the tank, **and the date when the tank was last used.**

    Material to be sampled - e.g. water, oil, sludge, soil, etc.

    Location and depth of samples - e.g. beneath the tank a maximum of two feet below the native soil/backfill interface, side wall at the high water mark, etc.

16. CHEMICAL METHODS AND ASSOCIATED DETECTION LIMITS
See attached Table 2.

17. SITE HEALTH AND SAFETY PLAN
A site specific Health and Safety plan must be submitted. We advocate the site health and safety plan include the following items, at a minimum:

a) The name and responsibilities of the site health and safety officer;

b) An outline of briefings to be held before work each day to appraise employees of site health and safety hazards;

c) Identification of health and safety hazards of each work task. Include potential fire, explosion, physical, and chemical hazards;

d) For each hazard, identify the action levels (contaminant concentrations in air) or physical conditions which will trigger changes in work habits to ensure workers are not exposed to unsafe chemical levels or physical conditions;

e) Description of the work habit changes triggered by the above action levels or physical conditions;

f) Frequency and types of air and personnel monitoring - along with the environmental sampling techniques and instrumentation - to be used to detect the above action levels. Include instrumentation maintenance and calibration methods and frequencies;

g) Confined space entry procedures (if applicable);

h) Decontamination procedures;

i) Measures to be taken to secure the site, excavation and stockpiled soil during and after work hours (e.g. barricades, caution tape, fencing, trench plates, plastic sheeting, security guards, etc.);

j) Spill containment/emergency/contingency plan. Be sure to include emergency phone numbers, the location of the phone nearest the site, and directions to the hospital nearest the site;

k) Documentation that all site workers have received the appropriate OSHA approved trainings and participate in appropriate medical surveillance per 29 CFR 1910.120; and

l) A page for employees to sign acknowledging that they have read and will comply with the site health and safety plan.

The safety plan must be distributed to all employees and contractors working in hazardous waste operations on site. **A complete copy of the site health and safety plan along with any standard operating procedures shall be on site and accessible at all times.**

NOTE: These requirements are excerpts from 29 CFR Part 1910.120(b)(4), Hazardous Waste Operations and Emergency Response, Final Rule, March 6, 1989. Safety plans of certain underground tank sites may need to meet the complete requirements of this Rule.

19. PLOT PLAN
The plan should consist of a scaled view of the facility at which the tank(s) are located and should include the following information:

a) Scale;

b) North Arrow;

c) Property Lines;

d) Location of all Structures;

e) Location of all relevant existing equipment including tanks and piping to be removed and dispensers;

f) Streets;

g) Underground conduits, sewers, water lines, utilities;

h) Existing wells (drinking, monitoring, etc.);

i) Depth to ground water; and

j) All existing tank(s) and piping in addition to the tank(s) being removed.

20. DEPOSIT
A deposit, payable to "County of Alameda" for the amount indicated on the Alameda County Underground Storage Tank Fee Schedule, must accompany the plans.

21. Blank Unauthorized Leak/Contamination Site Report forms may be obtained in limited quantities from this office or from the San Francisco Bay Regional Water Quality Control Board (510/286-1255). Larger quantities may be obtained directly from the State Water Resources Control Board at (916) 739-2421.

22. TANK CLOSURE REPORT
The tank closure report should contain the following information:

a) General description of the closure activities;

b) Description of tank, fittings and piping conditions. Indicate tank size and former contents; note any corrosion, pitting, holes, etc.;

c) Description of the excavation itself. Include the tank and excavation depth, a log of the stratigraphic units encountered within the excavation, a description of root holes or other potential contaminant pathways, the depth to any observed ground water, descriptions and locations of stained or odor-bearing soil, and descriptions of any observed free product or sheen;

d) Detailed description of sampling methods; i.e. backhoe bucket, drive sampler, bailer, bottle(s), sleeves

e) Description of any remedial measures conducted at the time of tank removal;

f) To-scale figures showing the excavation size and depth, nearby buildings, sample locations and depths, and tank and piping locations. Include a copy of the plot plan prepared for the Tank Closure Plan under item 19;

g) Chain of custody records;

h) Copies of signed laboratory reports;

i) Copies of "TSDF to Generator" Manifests for all hazardous wastes hauled offsite (sludge, rinsate, tanks and piping, contaminated soil, etc.); and

j) Documentation of the disposal of/and volume and final destination of all non-manifested contaminated soil disposed offsite.

TABLE #2
RECOMMENDED MINIMUM VERIFICATION ANALYSES FOR UNDERGROUND TANK LEAKS

HYDROCARBON LEAK	SOIL ANALYSIS	WATER ANALYSIS
Unknown Fuel	TPH G GCFID(5030) TPH D GCFID(3550) BTX&E 8020 or 8240 TPH AND BTX&E 8260	TPH G GCFID(5030) TPH D GCFID(3510) BTX&E 602, 624 or 8260
Leaded Gas	TPH G GCFID(5030) BTX&E 8020 OR 8240 TPH AND BTX&E 8260 TOTAL LEAD AA ------Optional------- TEL DHS-LUFT EDB DHS-AB1803	TPH G GCFID(5030) BTX&E 602 or 624 TOTAL LEAD AA TEL DHS-LUFT EDB DHS-AB1803
Unleaded Gas	TPH G GCFID(5030) BTX&E 8020 or 8240 TPH AND BTX&E 8260	TPH G GCFID(5030) BTX&E 602, 624 or 8260
Diesel, Jet Fuel and Kerosene	TPH D GCFID(3550) BTX&E 8020 or 8240 TPH AND BTX&E 8260	TPH D GCFID(3510) BTX&E 602, 624 or 8260
Fuel/Heating Oil	TPH D GCFID(3550) BTX&E 8020 or 8240 TPH AND BTX&E 8260	TPH D GCFID(3510) BTX&E 602, 624 or 8260
Chlorinated Solvents	CL HC 8010 or 8240 BTX&E 8020 or 8240 CL HC AND BTX&E 8260	CL HC 601 or 624 BTX&E 602 or 624 CL HC AND BTX&E 8260
Non-chlorinated Solvents	TPH D GCFID(3550) BTX&E 8020 or 8240 TPH AND BTX&E 8260	TPH D GCFID(3510) BTX&E 602 or 624 TPH and BTX&E 8260
Waste and Used Oil or Unknown (All analyses must be completed and submitted)	TPH G GCFID(5030) TPH D GCFID(3550) TPH AND BTX&E 8260 O & G 5520 D & F BTX&E 8020 or 8240 CL HC 8010 or 8240 ICAP or AA TO DETECT METALS: Cd, Cr, Pb, Zn, Ni METHOD 8270 FOR SOIL OR WATER TO DETECT: PCB* PCP* PNA CREOSOTE	TPH G GCFID(5030) TPH D GCFID(3510 O & G 5520 B & F BTX&E 602, 624 or 8260 CL HC 601 or 624 PCB PCP PNA CREOSOTE

* If found, analyze for dibenzofurans (PCBs) or dioxins (PCP)

Reference: Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites, 10 August 1990

EXPLANATION FOR TABLE #2: MINIMUM VERIFICATION ANALYSIS

1. OTHER METHODOLOGIES are continually being developed and as methods are accepted by EPA or DHS, they also can be used.

2. For DRINKING WATER SOURCES, EPA recommends that the 500 series for volatile organics be used in preference to the 600 series because the detection limits are lower and the QA/QC is better.

3. APPROPRIATE STANDARDS for the materials stored in the tank are to be used for all analyses on Table #2. For instance, seasonally, there may be five different jet fuel mixtures to be considered.

4. To AVOID FALSE POSITIVE detection of benzene, benzene-free solvents are to be used.

5. TOTAL PETROLEUM HYDROCARBONS (TPH) as gasoline (G) and diesel (D) ranges (volatile and extractible, respectively) are to be analyzed and characterized by GCFID with a fused capillary column and prepared by EPA method 5030 (purge and trap) for volatile hydro- carbons, or extracted by sonication using 3550 methodology for extractable hydrocarbons. Fused capillary columns are preferred to packed columns; a packed column may be used as a "first cut" with "dirty" samples or once the hydrocarbons have been characterized and proper QA/QC is followed.

6. TETRAETHYL LEAD (TEL) analysis may be required if total lead is detected unless the determination is made that the total lead concentration is geogenic (naturally occurring).

7. CHLORINATED HYDROCARBONS (CL HC) AND BENZENE, TOLUENE, XYLENE AND ETHYLBENZENE (BTX&E) are analyzed in soil by EPA methods 8010 and 8020 respectively, (or 8240) and in water, 601 and 602, respectively (or 624).

8. OIL AND GREASE (O & G) may be used when heavy, straight chain hydrocarbons may be present. Infrared analysis by method 418.1 may also be acceptable for O & G if proper standards are used. **Standard Methods" 17th Edition, 1989, has changed the 503 series to 5520.**

9. **PRACTICAL QUANTITATION REPORTING LIMITS are influenced by matrix problems and laboratory QA/QC procedures. Following are the Practical Quantitation Reporting Limits:**

	SOIL PPM	WATER PPB
TPH G	**1.0**	**50.0**
TPH D	**1.0**	**50.0**
BTX&E	**0.005**	**0.5**
O & G	**50.0**	**5,000.0**

Based upon a Regional Board survey of Department of Health Services Certified Laboratories, the Practical Quantitation Reporting Limits are attainable by a majority of laboratories with the exception of diesel fuel in soils. The Diesel Practical Quantitation Reporting Limits, shown by the survey, are:

ROUTINE	MODIFIED PROTOCOL
≤ 10 ppm (42%)	≤ 10 ppm (10%)
≤ 5 ppm (19%)	≤ 5 ppm (21%)
≤ 1 ppm (35%)	≤ 1 ppm (60%)

When the Practical Quantitation Reporting Limits are not achievable, an explanation of the problem is to be submitted on the laboratory data sheets.

10. LABORATORY DATA SHEETS are to be signed and submitted and include the laboratory's assessment of the condition of the samples on receipt including temperature, suitable container type, air bubbles present/absent in VOA bottles, proper preservation, etc. The sheets are to include the dates sampled, submitted, prepared for analysis, and analyzed.

11. IF PEAKS ARE FOUND, when running samples, that do not conform to the standard, laboratories are to report the peaks, including any unknown complex mixtures that elute at times varying from the standards. Recognizing that these mixtures may be contrary to the standard, they may not be readily identified; however, they are to be reported. At the discretion of the LIA or Regional Board the following information is to be contained in the laboratory report:

    The relative retention time for the unknown peak(s) relative to the reference peak in the standard, copies of the chroma- togram(s), the type of column used, initial temperature, temperature program is C/minute, and the final temperature.

12. REPORTING LIMITS FOR TPH are: gasoline standard ≤ 20 carbon atoms, diesel and jet fuel (kerosene) standard ≤ 50 carbon atoms. It is not necessary to continue the chromatography beyond the limit, standard, or EPA/DHS method protocol (whichever time is greater).

EPILOGUE

ADDITIVES: Major oil companies are being encouraged or required by the federal government to reformulate gasoline as cleaner burning fuels to reduce air emissions. MTBE (Methyl-tertiary butyl ether), ETHANOL (ethyl alcohol), and other chemicals may be added to reformulate gasolines to increase the oxygen content in the fuel and thereby decrease undesirable emissions (about four percent with MTBE). MTBE and ethanol are, for practical purposes, soluble in water. The removal from the water column will be difficult. Other compounds are being added by the oil companies for various purposes. The refinements for detection and analysis for all of these additives are still being worked out. If you have any questions about the methodology, please call your Regional Board representative.

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

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program
80 Swan Way, Rm 200
Oakland, CA 94621
(510) 271-4530

May 17, 1994
StID # 1059

RO229

Mr. David DeWitt
Unocal Corporation
2000 Crow Canyon Place, Suite 400
P.O. Box 5155
San Ramon, CA 94583

Re: Approval for March 22, 1994 Work Plan for Installation of Additional Monitoring Wells at 3220 Lakeshore Ave., Oakland 94610

Dear Mr. DeWitt,

This letter recounts our discussion after my recent site visit with you and Mr. Cliff Garratt of GeoStrategies at the above site. Recall, we discussed the locations of the proposed additional wells. You pointed out the locations of utilities which would make the installation of offsite wells difficult.

It was decided that the original well locations are acceptable, and may proceed, however, the well locations will not give any evidence whether offsite contamination exists from the former Shell Station on Rand Ave.

You may contact me at (510) 271-4530 if you have any questions.

Sincerely,

Barney M Chan

Barney M. Chan
Hazardous Materials Specialist

cc: C. Garratt, Geostrategies Inc,, 6747 Sierra Ct., Suite G, Dublin, CA 94568
E. Howell, files

2wp3220

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

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program
80 Swan Way, Rm 200
Oakland, CA 94621
(510) 271-4530

April 4, 1994
StID # 1059

Mr. David DeWitt
Unocal Corporation
2000 Crow Canyon Place, Suite 400
P.O. Box 5155
San Ramon, CA 94583

Re: Comment on March 22, 1994 Work Plan for the Installation of Additional Monitoring Wells at 3220 Lakeshore Ave., Oakland CA 94610

Dear Mr. DeWitt:

Our office has received and reviewed the above referenced work plan as provided by your consultant, GeoStrategies. We have also spoken with Mr. Robert Mallory, geologist from GeoStrategies, regarding the proposed location of the additional wells. Though the proposed three wells may help to further explain the site specific gradient, they will not determine if the former Shell station on the corner of Lakeshore and Rand Ave. is a potential up-gradient source. An earlier letter, dated April 1, 1993, from Mr. Tim Howard referred to this former Shell site. In my conversation with Mr. Mallory, I stated that an off-site monitoring well between the former Shell site and the Unocal site would be required. I also left a copy of the tank closure report detailing the removal of Shell's three underground tanks for GeoStrategie's review.

Please comment on this observation. If you concur, please send a revised site map indicating your new well location. Our office should be notified **48 working hours** prior to any field work so I may arrange to be onsite if possible.

You may contact me at (510 271-4530 if you have any questions.

Sincerely,

Barney M Chan

Barney M. Chan
Hazardous Materials Specialist

cc: C. Garratt, GeoStrategies Inc., 6747 Sierra Ct., Suite G, Dublin, CA 94568
E. Howell, files
wp3220

ALL ENVIRONMENTAL, INC.
2641 CROW CANYON BLVD., SUITE 5
SAN RAMON, CA 94583
(510) 820-3224
FAX: 838-2687

FAX TRANSMITTAL SHEET

TO: Barney Chan

FAX NUMBER: (510) 271-4530 / FAX: 569-4757

FROM: Steve Penshorn

MESSAGE: Soil sample results from the tank removal at 2036-2040 Livingston, Oakland

DATE: 4/1/94 **NO. OF PAGES (including cover page):** 2

PRIORITY ENVIRONMENTAL LABS

Precision Environmental Analytical Laboratory

March 31, 1994

PEL # 9403100

ALL ENVIRONMENTAL, INC.

Attn: Steve DeHope
Re: Three soil samples for Gasoline/BTEX and total lead analyses.

Project name: McNely
Project number: 1068

Date sampled: Mar 28, 1994
Date extracted: Mar 30-31, 1994

Date submitted: Mar 30, 1994
Date analyzed: Mar 30-31,1994

RESULTS:

SAMPLE I.D.	Lead (mg/Kg)	Gasoline (mg/Kg)	Benzene (ug/Kg)	Toluene (ug/Kg)	Ethyl Benzene (ug/Kg)	Total Xylenes (ug/Kg)
EBE 8'	10	N.D.	N.D.	N.D.	N.D.	N.D.
EBW 8'	17	N.D.	N.D.	N.D.	N.D.	N.D.
STKP 1-2*	8.9	N.D.	N.D.	N.D.	N.D.	N.D.
Blank	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Spiked Recovery	---	98.7%	79.9%	88.4%	91.7%	84.6%
Detection limit	1.0	1.0	5.0	5.0	5.0	5.0
Method of Analysis	7420	5030/ 8015	8020	8020	8020	8020

* composited soil sample .

David Duong
Laboratory Director

1764 Houret Court Milpitas, CA 95035 Tel: 408-946-9636 Fax: 408-946-9663

Unocal Corporation
2000 Crow Canyon Place, Suite 400
P.O. Box 5155
San Ramon, California 94583
Telephone (510) 867-0760
Facsimile (510) 277-2309

UNOCAL 76

1657

Northern Region
Corporate Environmental
Remediation and Technology

April 1, 1993

Mr. Barney Chan
Hazardous Materials Specialist
Alameda County
Dept. of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Re: Subsurface Investigation at
Unocal Service Station #5325
3220 Lakeshore Avenue
Oakland, CA

Dear Mr. Chan:

This letter has been prepared in response to your letter dated January 8, 1993. Unocal Corporation and Geostrategies, Inc. (GSI) have been in the process of obtaining the necessary access from the City Of Oakland to install upgradient and downgradient wells at the referenced site. This permitting process was initiated in January 1991. At this time (over one year later), The City of Oakland has requested a letter of indemnification from Unocal and an additional $100.00 to complete their review and processing of the permit. A permit to drill theses wells from Alameda County flood control - Zone 7 was initially obtained on February 27, 1992 and extended, but later canceled due to the lack of access from the City of Oakland. GSI is currently re-permitting these proposed wells with a new location chosen for the down gradient well. The proposed location of the downgradient well has been relocated to avoid any interference with possible contamination in the vicinity of a former Shell service station across Lakeshore Avenue from the Unocal site. Attached is a map showing the proposed well locations.

Recent research performed by GSI has revealed that on the opposite corner northwest of the Unocal site along Lakeshore Avenue and Lake Park Avenue was a former Shell Oil Service Station located at 3201 Lakeshore Avenue. Unconfirmed information has indicated that in 1980 a large release had occurred and product entered the storm sewer system. This product reportedly reached Lake Merrit through the storm sewer system and caught fire. Additionally, three underground storage

tanks were discovered in 1986 by PG&E during excavation activities in Rand Street.

Unocal has been diligent in pursuing downgradient definition for the past year. With the uncertainty of a possible unrelated release in the area of the originally proposed location for the downgradient well, it would be prudent to postpone the installation of a well at that location. A new downgradient well is being proposed on the west corner of the Unocal site. At this time it is requested that Alameda County - Zone 7 withdraw the work plan requested in your january 8, 1993 letter, so that any additional potential sources of contamination can be investigated. Additionally, because of the scarcity of documentation about the suspected release and UST discovery discussed above, it is requested that any related documentation or information you can provide be forwarded to Unocal at your earliest convenience. Any information discovered by Unocal or GSI will be forwarded to Zone 7.

If you any questions or comments, please contact me at 510-277-2354.

Very truly yours,

T E H

Tim Howard
Environmental Engineer
Unocal Corporation

enc.

cc: D. Vossler, Geostrategies, Inc.
File SS #5325;3

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

RAFAT A. SHAHID, ASST. AGENCY DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
State Water Resources Control Board
Division of Clean Water Programs
UST Local Oversight Program
80 Swan Way, Rm 200
Oakland, CA 94621
(510) 271-4530

January 8, 1993
StID # 1059

Mr. Tim Howard
Union Oil Co. of California
P. O. Box 5155
San Ramon, CA 94583

Re: **Request for Further Subsurface Investigation at Unocal #5325, 3220 Lakeshore Ave., Oakland CA 94610**

Dear Mr. Howard:

Our office has completed its review of the fourth quarter 1992 monitoring report for the above site. As has been the case previously, TPHg and BTEX concentrations remains moderate for gasoline and at concentrations exceeding the MCL for benzene in monitoring wells U-1 and U-2. Non-detectable concentrations of TPHg and BTEX remain in U-3. Our office's concern is that it appears that the extent of the groundwater contamination has not been determined. The groundwater gradient has varied from south to southwest and thus U-3 cannot detect the full extent of potential downgradient contamination. At one time, Unocal was seeking access to install an upgradient well on Lakeshore Ave. What is the status in obtaining this permit? In an effort to meet site closure requirements, our office now requests a workplan for the determination of the full extent of groundwater contamination. Please provide such a workplan to our office **within 45 days** of receipt of this letter.

You may contact me at (510) 271-4530 should you have any questions regarding this letter.

Sincerely,

Barney M. Chan
Hazardous Materials Specialist

cc: G. Jensen, Alameda County District Attorney Office
R. Hiett, RWQCB
D. Vossler, GeoStrategies Inc., 2140 West Winton Ave., Hayward, CA 94545
E. Howell, files

1-3220WP

3200 Lakeshore: Unocal Oil Co of CA
P.O. Box 7600 5155
~~Los Angeles CA 90051~~ San Ramon CA 94583
Mr. Tim Howard

DATE: 7/8/92

TO : **Local Oversight Program**

FROM: pe

SUBJ: **Transfer of Elligible Oversight Case**

Site name: Unocal #5325

Address: 3220 Lakeshore Ave City Oak Zip 94610

Closure plan attached? (Y) N DepRef remaining $_____

DepRef Project # 0568852 STID #(if any) 1059

Number of Tanks: 3 removed? (Y) N Date of removal 6/90

Leak Report filed? Y N Date of Discovery 10/24/90

Samples received? Y N Contamination: gasoline

Petroleum Y N Types: Avgas Jet leaded (unleaded) Diesel
fuel oil waste oil kerosene solvents

Monitoring wells on site 3 Monitoring schedule? (Y) N

Briefly describe the following:

Preliminary Assessment_____

Remedial Action_____

Post Remedial Action Monitoring_____

Enforcement Action_____

Comments:
Read the closure report, 2 10k UL gasoline & 1- 120 gallon waste oil tank removed in 6/90. Sidewall Spls ranged up to 2800 ppm g. 3 wells U-1 through U-3 were installed in 9/90. Have found TPHg & BTEX in U-1 & U-2 up & cross-gradient wells but ND in U-3. Are attempting to get access for installing addnl up gradient wells on other side of Lakeshore. Requested from David Vossler & GeoStrategies another closure report.

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

DEPARTMENT OF ENVIRONMENTAL HEALTH
Hazardous Materials Program
80 Swan Way, Rm. 200
Oakland, CA 94621
(415)

July 16,1990

Mr. Ron Bock
Unocal Corporation
3220 Lakeshore Ave.
Oakland, CA 94610

Subject: Unauthorized Release from Underground Tank Removals,
3220 Lakeshore Ave
Oakland, CA 94610

Dear Mr. Bock:

Alameda County Environmental Health, Hazardous Materials Division, has been informed of subsurface soil results from borings done by Gettler-Ryan Inc. on your behalf at the above address. Three borings were taken, U-A,U-B and U-C , surrounding the location of the underground tanks , see Soil Boring Report Unocal Service Station # 5325, Report No. 7814-1. Significant hydrocarbon contamination was found at all three locations as identified as total petroleum hydrocarbons as gasoline. In addition, benzene,toluene, ethyl benzene and xylenes (BTEX) were found at high levels. Because of the degree of contamination found, this facility is considered to have experienced a confirmed release of petroleum hydrocarbons that has impacted subsurface soil and potentially groundwater. The extent of this contamination must be assessed and remediated. Alameda County has been working with Mr. John Werfal of Gettler-Ryan in order to verify overexcavation to "clean" levels before the installation of three new underground tanks. This is a request for further work plans which may define the impact to groundwater and characterize the extent of any groundwater contamination.

Our office will be the lead agency overseeing both the soil and groundwater remediation of this site. The Regional Water Quality Control Board (RWQCB) is currently unable to oversee the large number of contamination cases within Alameda County and has delegated the handling of this case to our Division. We will be in contact with the RWQCB in order to provide you with guidance concerning the RWQCB's remediation requirements. However, please be aware that you are responsible for diligent actions to protect waters of the State.

To complete contaminant assessment and begin any possible remediation, we require that you submit a work plan which, at a minimum, addresses the items listed below and presents a timetable for their completion. Please submit this workplan within 30 days of the date of this letter.

I. Introduction

A. Statement of scope of work
B. Site map showing location of existing and past underground storage tanks and associated piping
C. Site History
- provide historical site use and ownership information. Include a description of types and locations of hazardous materials used on site.

II. Site Description

A. Vicinity description including hydrogeologic setting
B. Initial soil contamination and excavation results
- provide sampling procedures used
- indicate depth to ground water
- describe soil strata encountered
- provide soil sampling results, chain of custody forms, identity of sampler
- describe methods for storing and disposal of all soils

III. Plan for determining extent of soil contamination on site

A. Describe approach to determine extent of lateral and vertical contamination
- identify subcontractors, if any
- identify methods or techniques used for analysis
- provide sampling map showing all lines of excavation and sampling points
- if a step out procedure is used, define action level for determination of "clean" isopleth
- provide chain of custody forms, lab analysis results, all receipts and manifests, & identity of sampler

B. Describe method and criteria for screening clean versus contaminated soil. If onsite soil aeration/bioremediation is to be utilized, then provide a complete description of method that includes:

- volume and rate of aeration/turning
- method of containment and cover
- wet weather contingency plans
- permits obtained

C. Describe security measures

Plan for determining ground water contamination

- Construction and placement of wells should adhere to the requirements of the "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks". Provide a description of placement and rationale for the location of monitoring wells including a map to scale.

- The placement and number of wells must be able to determine the extent and magnitude of the free product and dissolved product plumes.

A. Drilling method for construction of monitoring wells

- expected depth and diameter of monitoring wells
- date of expected drilling
- casing type, diameter, screen interval, and pack and slot sizing techniques
- depth and type of seal
- development method and criteria for adequacy of development
- plans for cuttings and development water

B. Ground water sampling plan

- method for free product measurement, observation of sheen
- well purging procedures
- sample collection procedures
- chain of custody procedures
- procedures for determining ground water gradient

C. Sampling schedule

- measure free product weekly for first month following well installation
- measure free product and dissolved constituents monthly for first three months.
- after first three months monitor quarterly.
- monitoring must occur a minimum of one year.

V. Provide a site safety plan

Development of a Remediation Plan.

A. The Remediation Plan is to include a time schedule for remediation, and, at minimum, must address the following issues:

- removal of all free product. Manual bailing is not acceptable as a recovery system. Actual amount of free product removed must be monitored and tabulated.

- remediation of contaminated soils and dissolved constituents must follow RWQCB's resolution No. 68-16.

- soils containing 1,000+ ppm of hydrocarbons must be remediated. Soils containing between 100 and 1,000 ppm must be remediated unless sufficient evidence is provided which indicates no adverse effects on groundwater will occur. Clean up of soils to 100 ppm is strongly recommended.

- design of remedial action system should be based on a review of hydrogeologic and water quality data and on an evaluation of mitigation alternatives. The determination of probable capture zone(s) of extraction system(s) should be based on aquifer characteristics as determined by aquifer test data

VII Reporting

A. Technical reports should be submitted with a cover letter from Unocal Corporation or their authorized representative.

B. Monthly reports must be submitted for the next three months with the first report due 90 days from the above letter date.

C. Quarterly reports must be submitted with the first report due 90 days after the final monthly report. These reports should describe the status of the investigation and cleanup.

D. All reports and proposals must be signed by a California-Certified Engineering Geologist, California Registered Geologist or a California-Registered Civil Engineer (see page 2, 2 June 1988 RWQCB document). A statement of qualifications should be included in

all reports. Initial tank removal and soil sampling does not require such expertise; however, borehole and monitoring well installation and logging, and impact assessments do require such a professional.

All proposals, reports and analytical results pertaining to this investigation and remediation must be sent to our office and RWQCB. You should be aware that this Division is working in conjunction with the RWQCB and that this is a formal request for technical reports pursuant to California Water Code Section 13267 (b). Any extensions of agreed upon time deadlines must be confirmed in writing by either this Division or the RWQCB.

Should you have any questions concerning the contents of this letter or the status of this case please contact the undersigned at 271-4320.

Sincerely,

Barney M. Chan

Barney M. Chan,
Hazardous Materials Specialist,

cc: Gil Jensen, Alameda County District Attorney, Consumer & Environmental Protection
Lester Feldman, SFRWQCB
Howard Hatayama, DOHS
Mr. John Werfal, Gettler-Ryan Inc.

UNDERGROUND STORAGE TANK UNAUTHORIZED RELEASE (LEAK) / CONTAMINATION SITE REPORT

EMERGENCY ☐ YES ☒ NO

HAS STATE OFFICE OF EMERGENCY SERVICES REPORT BEEN FILED? ☐ YES ☐ NO

REPORT DATE: 06 08 90 (M M D D Y Y)

CASE #:

FOR LOCAL AGENCY USE ONLY
I HEREBY CERTIFY THAT I AM A DESIGNATED GOVERNMENT EMPLOYEE AND THAT I HAVE REPORTED THIS INFORMATION TO LOCAL OFFICIALS PURSUANT TO SECTION 25180.7 OF THE HEALTH AND SAFTY CODE.

SIGNED _____ DATE _____

REPORTED BY

NAME OF INDIVIDUAL FILING REPORT: JOHN WERFAL

PHONE: (415) 783-7500

SIGNATURE: [signature]

REPRESENTING ☒ OWNER/OPERATOR ☐ REGIONAL BOARD ☐ LOCAL AGENCY ☐ OTHER _____

COMPANY OR AGENCY NAME: GETTLER-RYAN INC.

ADDRESS: 2150 W. WINTON AVENUE (STREET) HAYWARD (CITY) CA (STATE) 94545 (ZIP)

RESPONSIBLE PARTY

NAME: UNOCAL CORPORATION ☐ UNKNOWN

CONTACT PERSON: RON BOCK

PHONE: (415) 2772303

ADDRESS: P. O. BOX 5155 (STREET) SAN RAMON (CITY) CA (STATE) 94583 (ZIP)

SITE LOCATION

FACILITY NAME (IF APPLICABLE): UNOCAL SERVICE STATION NO. 5325

OPERATOR: JERRY PIZZAGONI

PHONE: (415) 893-1675

ADDRESS: 3220 LAKESHORE AVENUE (STREET) OAKLAND (CITY) ALAMEDA (COUNTY) 94610 (ZIP)

CROSS STREET: LAKE PARK

TYPE OF AREA ☒ COMMERCIAL ☐ INDUSTRIAL ☐ RURAL ☐ RESIDENTIAL ☐ OTHER _____

TYPE OF BUSINESS ☒ RETAIL FUEL STATION ☐ FARM ☐ OTHER _____

IMPLEMENTING AGENCIES

LOCAL AGENCY / AGENCY NAME: ALAMEDA COUNTY ENVIRONMENTAL HEALTH

CONTACT PERSON: BARNEY CHAN

PHONE: (415) 271-4320

REGIONAL BOARD: SAN FRANCISCO BAY REGION

CONTACT PERSON: TOM CALLAGHAN

PHONE: (415) 464-1255

SUBSTANCES INVOLVED

(1) NAME: GASOLINE — QUANTITY LOST (GALLONS): _____ ☒ UNKNOWN

(2) NAME: _____ — QUANTITY LOST (GALLONS): _____ ☐ UNKNOWN

DISCOVERY/ABATEMENT

DATE DISCOVERED: 06 04 90 (M M D D Y Y)

HOW DISCOVERED ☐ INVENTORY CONTROL ☐ SUBSURFACE MONITORING ☐ NUISANCE CONDITIONS ☐ TANK TEST ☐ TANK REMOVAL ☒ OTHER SOIL BORINGS

DATE DISCHARGE BEGAN: _____ ☒ UNKNOWN

HAS DISCHARGE BEEN STOPPED? ☐ YES ☐ NO IF YES, DATE _____

METHOD USED TO STOP DISCHARGE (CHECK ALL THAT APPLY)
☐ REMOVE CONTENTS ☐ REPLACE TANK ☐ CLOSE TANK ☐ REPAIR TANK ☐ REPAIR PIPING ☐ CHANGE PROCEDURE ☒ OTHER ALL TANKS & PIPING TO BE REPLACED

SOURCE/CAUSE

SOURCE OF DISCHARGE: ☐ TANK LEAK ☒ UNKNOWN ☐ PIPING LEAK ☐ OTHER

TANKS ONLY/CAPACITY: _____ GAL. AGE _____ YRS ☐ UNKNOWN

MATERIAL: ☐ FIBERGLASS ☒ STEEL ☐ OTHER _____

CAUSE(S): ☐ OVERFILL ☐ RUPTURE/FAILURE ☐ CORROSION ☒ UNKNOWN ☐ SPILL ☐ OTHER _____

CASE TYPE

CHECK ONE ONLY
☐ UNDETERMINED ☒ SOIL ONLY ☐ GROUNDWATER ☐ DRINKING WATER - (CHECK ONLY IF WATER WELLS HAVE ACTUALLY BEEN AFFECTED)

CURRENT STATUS

CHECK ONE ONLY
☒ SITE INVESTIGATION IN PROGRESS (DEFINING EXTENT OF PROBLEM) ☐ CLEANUP IN PROGRESS ☐ SIGNED OFF (CLEANUP COMPLETED OR UNNECESSARY) ☐ NO ACTION TAKEN ☐ POST CLEANUP MONITORING IN PROGRESS ☐ NO FUNDS AVAILABLE TO PROCEED ☐ EVALUATING CLEANUP ALTERNATIVES

REMEDIAL ACTION

CHECK APPROPRIATE ACTION(S) (SEE BACK FOR DETAILS)
☐ CAP SITE (CD) ☒ EXCAVATE & DISPOSE (ED) ☐ REMOVE FREE PRODUCT (FP) ☐ ENHANCED BIO DEGRADATION (IT)
☐ CONTAINMENT BARRIER (CB) ☒ EXCAVATE & TREAT (ET) ☐ PUMP & TREAT GROUNDWATER (GT) ☐ REPLACE SUPPLY (RS)
☐ TREATMENT AT HOOKUP (HU) ☐ NO ACTION REQUIRED (NA) ☐ OTHER (OT) _____

COMMENTS

ANALYSIS OF SOIL SAMPLES COLLECTED FROM BORINGS ADJACENT TO UGSTs REVEALED TPH - GASOLINE CONTAMINATION IN SOIL. SOIL INVESTIGATION WAS CONDUCTED TO ASSESS SUBSURFACE CONDITIONS PRIOR TO TANK REPLACEMENT.

INSTRUCTIONS

EMERGENCY
Indicate whether emergency response personnel and equipment were involved at any time. If so, a Hazardous Material Incident Report should be filed with the State Office of Emergency Services (OES) at 2800 Meadowview Road, Sacramento, CA 95832. Copies of the OES report form may be obtained at your local underground storage tank permitting agency. Indicate whether the OES report has been filed as of the date of this report.

LOCAL AGENCY ONLY
To avoid duplicate notification pursuant to Health and Safety Code Section 25180.7, a designated government employee should sign and date the form in this block. A signature here does not mean that the leak has been determined to pose a significant threat to human health or safety, only that notification procedures have been followed if required.

REPORTED BY
Enter your name, telephone number, and address. Indicate which party you represent and provide company or agency name.

RESPONSIBLE PARTY
Enter name, telephone number, contact person, and address of the party responsible for the leak. The responsible party would normally be the tank owner.

SITE LOCATION
Enter information regarding the tank facility and surrounding area. At a minimum, you must provide the facility name and full address.

IMPLEMENTING AGENCIES
Enter names of the local agency and Regional Water Quality Control Board involved.

SUBSTANCES INVOLVED
Enter the name and quantity lost of the hazardous substance involved. Room is provided for information on two substances if appropriate. If more than two substances leaked, list the two of most concern for cleanup.

DISCOVERY/ABATEMENT
Provide information regarding the discovery and abatement of the leak.

SOURCE/CAUSE
Indicate source(s) of leak. Provide details on tank age; capacity and material if known. Check box(es) indicating cause of leak.

CASE TYPE
Indicate the case type category for this leak. Check one box only. Case type is based on the most sensitive resource affected. For example, if both soil and ground water have been affected, case type will be "Ground Water". Indicate "Drinking Water" only if one or more municipal or domestic water wells have actually been affected. A "Ground Water" designation does not imply that the affected water cannot be, or is not, used for drinking water, but only that water wells have not yet been affected. It is understood that case type may change upon further investigation.

CURRENT STATUS
Indicate the category which best describes the current status of the case. Check one box only. The response should be relative to the case type. For example, if case type is "Ground Water", then "Current Status" should refer to the status of the ground water investigation or cleanup, as opposed to that of soil.

IMPORTANT: THE INFORMATION PROVIDED ON THIS FORM IS INTENDED FOR GENERAL STATISTICAL PURPOSES ONLY AND IS NOT TO BE CONSTRUED AS REPRESENTING THE OFFICIAL POSITION OF ANY GOVERNMENTAL AGENCY

REMEDIAL ACTION
Indicate which actions have been used to cleanup or remediate the leak. Descriptions of options follow:

Cap Site - install horizontal impermeable layer to reduce rainfall infiltration.
Containment Barrier - install vertical dike to block horizontal movement of contaminant.
Excavate and Dispose - remove contaminated soil and dispose in approved site.
Excavate and Treat - remove contaminated soil and treat (includes spreading or land farming).
Remove Free Product - remove floating product from water table.
Pump and Treat Groundwater - generally employed to remove dissolved contaminants.
Enhanced Biodegradation - use of any available technology to promote bacterial decomposition of contaminants.
Replace Supply - provide alternative water supply to affected parties.
Treatment at Hookup - install water treatment devices at each dwelling or other place of use.
No Action Required - incident is minor, requiring no remedial action.

COMMENTS - Use this space to elaborate on any aspects of the incident.
SIGNATURE - Sign the form in the space provided.
DISTRIBUTION

If the form is completed by the tank owner or his agent, retain the last copy and forward the remaining copies in tact to your local tank permitting agency for distribution.

1. Original - Local Tank Permitting Agency
2. State Water Resources Control Board, Division of Water Quality, Underground Tank Program, P. O. Box 100, Sacramento, CA 95801
3. Regional Water Quality Control Board
4. County Board of Supervisors or designee to receive Proposition 65 notifications.
5. Owner/responsible party.

UNDERGROUND STORAGE TANK UNAUTHORIZED RELEASE (LEAK) / CONTAMINATION SITE REPORT

EMERGENCY ☐ YES ☒ NO

HAS STATE OFFICE OF EMERGENCY SERVICES REPORT BEEN FILED? ☐ YES ☐ NO

REPORT DATE: 06 08 90 (M M D D Y Y)

CASE #:

FOR LOCAL AGENCY USE ONLY
I HEREBY CERTIFY THAT I AM A DESIGNATED GOVERNMENT EMPLOYEE AND THAT I HAVE REPORTED THIS INFORMATION TO LOCAL OFFICIALS PURSUANT TO SECTION 25180.7 OF THE HEALTH AND SAFTY CODE.

SIGNED _____ DATE _____

REPORTED BY

NAME OF INDIVIDUAL FILING REPORT: JOHN WERFAL

PHONE: (415) 783-7500

SIGNATURE: [signature]

REPRESENTING ☒ OWNER/OPERATOR ☐ REGIONAL BOARD ☐ LOCAL AGENCY ☐ OTHER _____

COMPANY OR AGENCY NAME: GETTLER-RYAN INC.

ADDRESS: 2150 W. WINTON AVENUE (STREET) HAYWARD (CITY) CA (STATE) 94545 (ZIP)

RESPONSIBLE PARTY

NAME: UNOCAL CORPORATION ☐ UNKNOWN

CONTACT PERSON: RON BOCK

PHONE: (415) 2772303

ADDRESS: P. O. BOX 5155 (STREET) SAN RAMON (CITY) CA (STATE) 94583 (ZIP)

SITE LOCATION

FACILITY NAME (IF APPLICABLE): UNOCAL SERVICE STATION NO. 5325

OPERATOR: JERRY PIZZAGONI

PHONE: (415) 893-1675

ADDRESS: 3220 LAKESHORE AVENUE (STREET) OAKLAND (CITY) ALAMEDA (COUNTY) 94610 (ZIP)

CROSS STREET: LAKE PARK

TYPE OF AREA ☒ COMMERCIAL ☐ INDUSTRIAL ☐ RURAL ☐ RESIDENTIAL ☐ OTHER _____

TYPE OF BUSINESS ☒ RETAIL FUEL STATION ☐ FARM ☐ OTHER _____

IMPLEMENTING AGENCIES

LOCAL AGENCY / AGENCY NAME: ALAMEDA COUNTY ENVIRONMENTAL HEALTH

CONTACT PERSON: BARNEY CHAN

PHONE: (415) 271-4320

REGIONAL BOARD: SAN FRANCISCO BAY REGION

CONTACT PERSON: TOM CALLAGHAN

PHONE: (415) 464-1255

SUBSTANCES INVOLVED

(1) NAME: GASOLINE — QUANTITY LOST (GALLONS): _____ ☒ UNKNOWN

(2) NAME: _____ — QUANTITY LOST (GALLONS): _____ ☐ UNKNOWN

DISCOVERY/ABATEMENT

DATE DISCOVERED: 06 04 90 (M M D D Y Y)

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DATE DISCHARGE BEGAN: _____ ☒ UNKNOWN

HAS DISCHARGE BEEN STOPPED? ☐ YES ☐ NO IF YES, DATE: _____

METHOD USED TO STOP DISCHARGE (CHECK ALL THAT APPLY)
☐ REMOVE CONTENTS ☐ REPLACE TANK ☐ CLOSE TANK ☐ REPAIR TANK ☐ REPAIR PIPING ☐ CHANGE PROCEDURE ☒ OTHER ALL TANKS & PIPING TO BE REPLACED

SOURCE/CAUSE

SOURCE OF DISCHARGE: ☐ TANK LEAK ☒ UNKNOWN ☐ PIPING LEAK ☐ OTHER

TANKS ONLY/CAPACITY: _____ GAL. AGE _____ YRS ☐ UNKNOWN

MATERIAL: ☐ FIBERGLASS ☒ STEEL ☐ OTHER N. Calif. Blue Print

CAUSE(S): ☐ OVERFILL ☐ RUPTURE/FAILURE ☐ CORROSION ☒ UNKNOWN ☐ SPILL ☐ OTHER

CASE TYPE

CHECK ONE ONLY
☐ UNDETERMINED ☒ SOIL ONLY ☐ GROUNDWATER ☐ DRINKING WATER (CHECK ONLY IF WATER WELLS HAVE ACTUALLY BEEN AFFECTED)

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REPORTED BY
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Pump and Treat Groundwater - generally employed to remove dissolved contaminants.
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No Action Required - incident is minor, requiring no remedial action.

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3. Regional Water Quality Control Board
4. County Board of Supervisors or designee to receive Proposition 65 notifications.
5. Owner/responsible party.

ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY
DEPARTMENT OF ENVIRONMENTAL HEALTH
HAZARDOUS MATERIALS DIVISION
80 SWAN WAY, ROOM 200
OAKLAND, CA 94621
PHONE NO. 415/271-4320

ACCEPTED

DEPARTMENT OF ENVIRONMENTAL HEALTH
470 - 27th Street, Third Floor
Oakland, CA 94612
Telephone: (415) 874-7237

These plans have been reviewed and found to be acceptable and essentially meet the requirements of State and local health laws. Changes to your plans indicated by this Department are to assure compliance with State and local laws. The project proposed herein is now released for issuance of any required building permits for construction.

One copy of these accepted plans must be on the job and available to all contractors and craftsmen involved with the removal.

Any changes or alterations of these plans and specifications must be submitted to this Department and to the Fire and Building [illegible] Department to determine if such changes meet the requirements of State and local laws. Notify this Department at least 48 hours prior to the following required inspections:

_____ Removal of Tank and Piping

_____ Sampling

_____ [illegible]

Issuance of a permit to operate is dependent on compliance with accepted plans and all applicable laws and regulations.

[illegible]

OK - 5/25/90 Blha
with noted additions

U568852
$744.00
4-25-90

Installation plans have been approved and will be distributed pending results on soils and water if applicable from the excavation pits. Blha 6/6/90

UNDERGROUND TANK CLOSURE/MODIFICATION PLANS

1. **Business Name** UNOCAL SERVICE STATION #5325
   Business Owner JERRY N. PIZZAGONI
2. **Site Address** 3220 LAKESHORE AV.
   City OAKLAND **Zip** 94610 **Phone** (415) 893-1675
3. **Mailing Address** UNOCAL 2175 NO. CALIFORNIA BLVD. SUITE 650
   City WALNUT CREEK, CA **Zip** 94596 **Phone** (415) 945-7676
4. **Land Owner** UNION OIL CO. OF CALIFORNIA, dba UNOCAL
   Address 2175 NO. CALIFORNIA BLVD. #650 **City, State** WALNUT CREEK, CA **Zip** 94596
5. **EPA I.D. No.** CAD 982056368
6. **Contractor** GETTLER-RYAN CONSTRUCTION
   Address 2150 W. WINTON AV.
   City HAYWARD, CA 94545 **Phone** (415) 783-7500
   License Type B C61/D40 **ID#** 220793
7. **Consultant** ROBERT H. LEE & ASSOC.
   Address 900 LARKSPUR LANDING CIRCLE #125
   City LARKSPUR, CA 94939 **Phone** (415) 461-8890

8. Contact Person for Investigation

Name _____ Title FIELD ENGINEER

Phone (415) 945-7676

9. Total No. of Tanks at facility 3

10. Have permit applications for all tanks been submitted to this office? Yes [X] No [ ]

11. State Registered Hazardous Waste Transporters/Facilities

a) Product/Waste Tranporter

Name H & H SHIP SERVICE EPA I.D. No. CAD004771168

Address 220 CHINA BASIN

City SAN FRANCISCO State CA Zip 94107

b) Rinsate Transporter

Name H & H SHIP SERVICE EPA I.D. No. _____

Address (SAME AS ABOVE)

City _____ State _____ Zip _____

c) Tank Transporter

Name H & H SHIP SERVICE EPA I.D. No. _____

Address (SAME AS ABOVE)

City _____ State _____ Zip _____

d) Tank Disposal Site

Name H & H SHIP SERVICE EPA I.D. No. _____

Address (SAME AS ABOVE)

City _____ State _____ Zip _____

e) Contaminated Soil Transporter

Name H & H SHIP SERVICE EPA I.D. No. _____

Address (SAME AS ABOVE)

City _____ State _____ Zip _____

12. Sample Collecto

Name DICK BRADISH

Company KAPREALIAN ENGINEERING INC.

Address P.O. BOX 913

City BENICIA State CA Zip 94510 Phone (415) 676-910C

13. Sampling Information for each tank or area

Tank or Area		Material sampled	Location & Depth
Capacity	Historic Contents (past 5 years)		
10,000 GAL	GASOLINE	SOIL, GROUND WATER IF APPLICABLE	(2) CONFIRITORY SAMPLES BENEATH EACH TANK; ONE SAMPLE AT EACH END AT NATIVE SOIL/ BACKFILL INTERFACE. FOR SAMPLING PROTOCAL FOR SOIL/WATER, SEE ATTATCHED.
10,000 GAL	GASOLINE		
280 GAL	WASTE OIL		
	1 soil sple / 20 linear ft of pipeline is required and under swing joint at each dispenser.		

14. Have tanks or pipes leaked in the past? Yes [ ] No [X]

If yes, describe. _____

15. NFPA methods used for rendering tank inert? Yes [ ] No [ ]

If yes, describe. REFER TO DWG. J-6 SECTION II, GAS FREEING & TANK REMOVAL

An explosion proof combustible gas meter shall be used to verify tank inertness.

16. Laboratories

Name SEQUOIA ANALYTICAL LABORATORIES

Address 2549 MIDDLEFIELD RD.

City REDWOOD CITY State CA Zip 94063

State Certification No. 145

17. Chemical Methods to be used for Analyzing Samples

* Contaminant Sought	EPA, DHS, or Other Sample Preparation Method Number	EPA, DHS, or Other Analysis Number
TPH - GAS BTX & E	5030 SOIL/WATER	8015/8020
WASTE OIL: TPH - GAS TPH - DIESEL OIL & GREASE BTX+E	5030/GCFID SOIL/WATER 3550/GCFID SOIL 3510 WATER 8020 OR 8240	503 D&E, SOIL 503 A&E, WATER
CHLORINATED HYDROCARBONS		8010 -OR- 8240, SOIL 601 -OR- 624, WATER

18. Submit Site Safety Plan

19. Workman's Compensation: Yes [X] No [ ]

Copy of Certificate enclosed? Yes [ ] No [X]

Name of Insurer COOPER & COOK, PLEASANTON, CA.

20. Plot Plan submitted? Yes [X] No [ ]

21. Deposit enclosed? Yes [ ] No [ ]

22. Please forward to this office the following information within 60 days after receipt of sample results.

a) Chain of Custody Sheets

b) Original Signed Laboratory Reports

c) TSD to Generator copies of wastes shipped and received

d) Attachment A summarizing laboratory results

* IF ANY OF THESE CONTAMINANTS IS DETECTED, TESTS WILL BE RUN FOR THE FOLLOWING METALS: CADMIUM, CHROMIUM, LEAD & ZINC.

I declare that to the best of my knowledge and belief the statements and information provided above are correct and true. I understand that information in addition to that provided above may be needed in order to obtain an approval from the Department of Environmental Health and that no work is to begin on this project until this plan is approved.

I understand that any changes in design, materials or equipment will void this plan if prior approval is not obtained.

I understand that all work performed during this project will be done in compliance with all applicable OSHA (Occupational Saftey and Health Administration) requirements concerning personnel and safety.

I will notify the Department of Environmental Health at least two (2) working days (48 hours) after approval of this closure plan in advance to schedule any required inspections. I understand that site and worker safety are solely the responsibility of the property owner or his agent and that this responsibility is not shared nor assumed by the County of Alameda.

Signature of Contractor

Name (please type) JOHN GREGORIN, PROJECT DESIGNER, ROBERT H LEE & ASSOC.,

Signature John Gregorin LARKSPUR, CA (CONSULTANTS FOR UNOCAL)

Date 4/23/90

Signature of Site Owner or Operator

Name (please type) ROGER FOLDA, UNION OIL CO. OF CALIFORNIA, dba UNOCAL

Signature R J Folda

Date 4/20/90

NOTES:

1. Any changes in this document must be approved by this Department.

2. Any leaks discovered must be submitted to this office on an underground storage tank unauthorized leak/contamination site report form within 5 days of its discovery.

3. Three (3) copies of this plan must be submitted to this Department. One copy must be at the construction site at all times.

4. After approval of plan, notification of at least two (2) working days (48 hours) must be given to this Department prior to removal of tank(s).

5. A copy of your approved plan must be sent to the landowner.

6. Triple rinse means that:

   a) Final rinse must contain less than 100 ppm of Gasoline (EPA method 8020 for soil, or EPA method 602 for water) or Diesel (EPA method 418.1). Other methods for halogenated volatile organics (EPA method 8010 for soil, EPA method 601 for water) may be required. The composition of the final rinse must be demonstrated by an original or facsimile report from a laboratory certified for the above analyses.

   b) Tank interior is shown to be free from deposits or residues upon a visual examination of tank interior.

   c) Tank should be labelled as "tripled rinsed; laboratory certified analysis available upon request" with the name and address of the contractor.

If all the above requirements cannot be met, the tank must be transported as a hazardous waste.

7. Any cutting into tanks requires local fire department approval.

UNDERGROUND TANK CLOSURE/MODIFICATION PLANS

ATTACHMENT A

SAMPLING RESULTS

Tank or Area	Contaminant	Location & Depth	Results (specify units)

REFERENCE: **SITE SAFETY PLAN**
UNOCAL SERVICE STATION No. 5325
3220 LAKESHORE AVENUE
OAKLAND, CALIFORNIA

SITE SAFETY PLAN - GASOLINE TANK REMOVAL

1. For underground gasoline tanks, arrange for disposal of remaining liquid contents with authorized disposal service.

2. Drain and flush all piping into tank or appropriate container.

3. Remove all flammable liquid from the tank. Use a hand pump to remove the bottom few inches of liquid.

4. Uncover tank and disconnect attached piping.

5. Prior to complete excavation and tank removal the tanks must be re-purged by the following method.

   Preferred method for conditioning tank:

   Make vapors inert by adding 30 lbs. of dry ice (carbon dioxide) per 1000 gal. of tank capacity.

   The vapors in the tank will be made inert by adding solid carbon dioxide (dry ice) in the amount of 30 lbs. per 1000 gal. of tank capacity. The dry ice should be crushed and distributed evenly over the greatest possible area to secure rapid evaporation. As the dry ice vaporizes, flammable vapors will flow out of the tank and may surround the area. Hence, observe all normal safety precautions regarding flammable vapors. Make sure that all of the dry ice has vaporized.

   After the tank has been freed of vapors and verified to below 10% of the lower explosive level using calibrate has detector, and prior to moving tank from the site, plug or cap all holes. One tank fitting plug should have a 1/8" vent hole to prevent the tank from being subjected to an excessive pressure differential caused by extreme temperature changes.

6. Temporarily plug all tank openings, complete excavation and remove the tank; placing it in a secure location. Block the tank to prevent movement. USE EXTREME CAUTION DURING REMOVAL OPERATION.

7. Remove tanks and secure at grade.

8. No fiberglass of steel tank shall be reused. Render all tanks useless after removing from site.

9. As an added precaution, regardless of condition, the tanks shall be labeled adjacent to the fill opening in legible letters as follows:

"TANKS HAVE CONTAINED FLAMMABLE LIQUIDS
NOT GAS-FREE
NOT SUITABLE FOR FOOD OR DRINKING WATER"

10. Assure tank disposal is in accordance with governing regulations.

11. Company Representative and Contractor shall inspect open excavation for evidence of product leakage.

12. The Contractor shall have the following items on site:

a) Fire extinguishers
b) LEL meter
c) First Aid Kit
d) Hard hat and protective clothing for all personnel
e) Access to an Industrial Hygienist

13. A 6'-0" high removable chain link fence shall be placed around the entire property at all times during construction.

EMERGENCY PLAN

In the event of an accident, the Contractor shall proceed with the following steps:

1) Dial 911 and provide the following information:

"THERE IS A)FIRE OR DANGEROUS SPILL) AT 3220 LAKESHORE AVENUE, OAKLAND, CA" If anyone is trapped or needs medical attention, tell the answering dispatcher. Stay on the phone and be prepared to answer any questions concerning the situation.

2) Attend any injured persons and direct incoming assistance to them.

3) Attempt to extinguish any fire in you can do so safely. Have the extinguisher ready to use in the event of any dangerous spill. Try to contain any spill, or use absorbent on smaller spills.

4) Report to arriving emergency response personnel to provide them any information or assistance they may need.

5) Notify the following:

UNOCAL Representative, Tim Ross	415/945-7676
Alameda County Environmental Health	415/874-0500, 272-6399
State Office of Emergency Services	800/852-7550 (24 hrs)
	271-4320