

6280 Brookshire Drive, Rocklin, CA 95677 July 9, 2006 Tel: (916) 415-1134, FAX: (916) 415-1154

Mr. Jerry Wickham Alameda County -Environmental Health Services Environmental Protection 1131 Harbor Bay Parkway, Suite 250 Alameda, California 94502-6577

Subject: Plume Delineation Work Plan and Limited Well Survey Tesoro Station No. 67107 (Former Beacon Station No. 3721) 44 Lewelling Boulevard San Lorenzo, California RDM Project No. 02-67107

Dear Mr. Wickham:

On Behalf of Tesoro Petroleum Companies (Tesoro), RDM Environmental (RDM) and Haley & Aldrich (H&A) are submitting the following Plume Delineation Work Plan and Limited Well Survey to the Alameda County Environmental Health Department (ACEHD). This down gradient delineation is being requested by the ACEHD due to the historically elevated petroleum hydrocarbon concentrations in ground water in the vicinity of monitoring wells MW-10 and MW-11. The location of the site is presented in Figure 1, and the site detail map with well locations are included in Figure 2. This Work Plan is being submitted at the request of the ACEHD in its letter dated December 9, 2005. A copy of the ACEHD letter is included in Enclosure A.

Site Conditions

The petroleum hydrocarbon-impacted ground water related to the site is present in the upper water bearing zone approximately 12 to 15 feet below grade (bsg). This upper water bearing zone appears to be separated from other lower water bearing zones by a regional homogenous aquitard. There appears to be a sand lens above the aquitard running from the tank basin area toward wells MW-10 and MW-11. This may have provided preferential pathway for a slug of petroleum hydrocarbons to migrate off site.

Due to historical non-detect laboratory analytical results, monitoring wells MW-7, MW-8 and MW-9 were previously removed from the quarterly monitoring schedule with ACEHD approval.

There is a square concrete lined drainage ditch (San Lorenzo Creek) Approximately 40 feet south of MW-11 traveling in an east/west direction. The construction of the drainage ditch appears to be intersecting the ground water table and may be creating a damming effect on the leading edge of the plume.

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The petroleum hydrocarbon concentrations over the past several quarters in MW-11 (front end of the plume) have shown a decreasing trend in observed concentrations suggesting the plume is attenuating naturally. The total petroleum hydrocarbon concentrations in MW-10 are stable. Due to the limited distance between MW-11, and the concrete channel, and topography (downward slope), any further down gradient wells would need to be placed on the southern side of the concrete channel (vicinity of the three referenced domestic wells). To address future potential migration of petroleum hydrocarbons from the former tank basin, the existing ground water extraction system will be modified in August 2006. A copy of the modified ground water system design is included in Enclosure B.

Limited Well Survey

As requested by the ACEHD in its December 9, 2005 letter, RDM conducted a door to door well search in June 2006. During the well search, the closest down gradient wells located by RDM were three domestic wells just south of the concrete channel, at 15800 and 15808 Via Cordoba, and 246 Peach Drive, as illustrated in Figure 3. Results of the full well survey will be reported in next quarterly monitoring report. Both 15800 and 15808 Via Cordoba were last sampled on March 20, 2003, and the laboratory analytical results were non-detect for all analyses.

Proposed Delineation

Due to the homogenous nature of the aquitard beneath the site, RDM and H&A do not believe penetrating this aquitard is prudent. The use of direct push technology tends to drag impacted soil and ground water to lower depths and generates false positives in grab ground water samples. Another limitation of direct push technology is that duplicate ground water samples cannot be collected once the borings are destroyed.

Instead of additional investigation work, RDM recommends an increase sampling regimen. Reinstating sampling of MW-7, MW-8, and MW-9 will help delineate the lateral extent of the plume. In addition, RDM recommends sampling the down gradient domestic wells located at 15800 and 15808 Via Cordoba, and 246 Peach Drive to help define the down gradient and vertical extent of the plume. Based on field observations and interviews with property owners, it appears the domestic wells are constructed in a lower water bearing zone (approximately 50 feet bsg). RDM recommends that ground water samples be collected from wells MW-7, MW-8, MW-9, and domestic wells 246, 15800, and 15808 on a semi-annual basis. These additional ground water samples will be submitted to Kiff Analytical for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX), total petroleum hydrocarbons (TPH) as gasoline, MTBE, diisopropyl ether (DIPE), ethyl-t-butyl ether (ETBE), tert-amyl methyl ether (TAME) tert-butanol (TBA), and ethanol using EPA Method 8260.

Monitored Natural Attenuation Parameters

In addition to using the existing well network to monitor the vertical and lateral extent of the petroleum hydrocarbon plume, RDM and H&A recommend conducting monitored natural attenuation (MNA) sampling during the next three quarterly monitoring events. In addition to the standard quarterly monitoring analysis of BTEX, TPH gasoline, and oxygenates, the proposed field MNA parameters include the following; pH, dissolved oxygen, oxygen reduction potential, specific conductivity, temperature, dissolved

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carbon dioxide, and ferrous iron (Fe^{+2}). In addition to the field parameters, MNA laboratory parameters include total alkalinity, total organic carbon, and total iron.

The interpretations contained in this report represent our professional opinions and are based, in part, on information supplied by the client. These opinions are based on currently available information and are arrived at in accordance with currently accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended.

If you have any questions concerning this project, please contact Richard Munsch at (916) 415-1134.

RDM] Richard Project-Manager

Michael G. Lee, P.E. California Registered Civil Engineer No. C055795

RDM (67107 Plume Delineation 7-9-06.doc)

Enclosures:

- Enclosure A:
 - A: A Copy of the ACEHD December 9, 2005 Letter
 - Enclosure B: Modified Ground Water System Design









ENCLOSURE A

A Copy of the ACEHD December 9, 2005 Letter

ALAMEDA COUNTY HEALTH CARE SERVICES



DAVID J. KEARS, Agency Director

AGENCY

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

December 9, 2005

Mr. Jeffrey Baker Tesoro Petroleum Companies, Inc. 3450 S. 344th Way, Ste. 100 Auburn, WA 98001-5931

Douglas Oil Company of California P.O. Box 1267 Ponca City, OK 74603 Mr. Sam Hirbod Hirbod Enterprises 111 Deerwood Road, Suite 110 San Ramon, CA 94583

Subject: Fuel Leak Case No. RO0000498, Beacon #721, 44 Lewelling Blvd., San Lorenzo, CA

Dear Mr. Baker:

Alameda County Environmental Health (ACEH) staff has reviewed the fuel leak case file for the above-referenced site including the documents entitled, "Quarterly Monitoring Report and Remediation Status Report, Third Quarter 2005," dated November 10, 2005, "Ozone Sparge Well Installation Work Plan," dated November 24, 2004, and "Recovery Well Installation Results Report," dated November 3, 2004. ACEH also reviewed the Site Conceptual Model, which is available at the project internet web site. The "Quarterly Monitoring Report and Remediation Status Report, Third Quarter 2005," includes results of quarterly groundwater monitoring and presents conclusions and recommendations for future actions.

Based on our review of these documents and the case file, we request that you address the following technical comments, perform the proposed work, and send us the technical reports requested below.

TECHNICAL COMMENTS

- 1. Site Conceptual Model. The Site Conceptual Model (SCM) on the project internet web site is a useful resource for review of the site. We encourage you to periodically update the SCM as additional results become available.
- 2. Ozone Sparge Well Installation. ACEH concurs with the proposal in the "Ozone Sparge Well Installation Work Plan," to install three ozone sparge wells along the western boundary of the property. The Work Plan indicates that soil samples will be collected every five feet for logging purposes. ACEH requests that soil samples be collected continuously for logging purposes in order to provide better definition of soil conditions. Previous borings at the site have been sampled at five-foot intervals and have shown significant differences between adjacent borings. We have no objection to screening the soil samples to make decisions regarding submitting soil samples for laboratory analyses. However, we request that soil samples be submitted for laboratory analyses for all depth intervals where staining, odor, or elevated PID readings are observed. If staining, odor, or elevated PID readings are

observed over an interval of several feet, a sufficient number of soil samples from this interval should be submitted for laboratory analyses to characterize the fuel hydrocarbon concentrations within this interval. We concur with the proposed analyses but request that ethanol also be included as an analyte. Please include these results in the Quarterly Monitoring and Remediation Status Report for the First Quarter 2006.

- 3. Addition of Ozone Generator. The proposed addition of an ozone generator to the air sparging system as proposed in the "Quarterly Monitoring Report and Remediation Status Report, Third Quarter 2005," is acceptable.
- 4. Expansion of Groundwater Extraction System. ACEH concurs with the proposed addition of recovery wells MW-3R and RW-2 to the groundwater extraction system. ACEH has no objections to the equipment modifications proposed for the soil vapor extraction blower and air sparging compressor. Please provide information regarding these modifications in the Quarterly Monitoring and Remediation Status Reports.
- 5. Plume Delineation. The plume of dissolved fuel hydrocarbons originating from the site has not been sufficiently defined laterally and vertically. The two monitoring wells within the downgradient portion of the plume, MW-10 and MW-11, do not provide sufficient plume delineation, particularly given the heterogeneous hydrogeologic conditions encountered in the area. In addition, well MW-10 appears to be screened within a different soil unit than well MW-11. Please consider the collection of detailed lithologic information using soil borings, direct push sampling, and/or cone penetrometer to better define the hydrogeology of the site along with the use of depth-discrete groundwater samples collected along transects to characterize the site prior to installation of monitoring wells. We request that you plot the detailed lithologic information and analytical data on hydrogeologic cross sections to determine the appropriate locations and designs for monitoring wells/well clusters that are needed to characterize the three-dimensional extent of soil and groundwater contamination at the site. Please include your plans for plume delineation in the Work Plan requested below.
- 6. Updated Well Survey. The previous well survey for the site was presented in a report entitled "Problem Assessment Report," dated November 22, 1989. The well survey did not include well construction details and did not identify the two irrigation wells on Via Cordoba. ACEH requests that you conduct a current well survey to locate all wells (monitoring and water supply wells: active, inactive, standby, decommissioned, and abandoned wells) within a 2,000-foot radius of the site. Submittal of maps showing the location of all wells identified in your study, and the use of tables to report the data collected as part of your survey are required. We recommend that you obtain well information from the Alameda County Public Works Agency and State of California Department of Water Resources, at a minimum. Please include an analysis and interpretation of your findings, and report your results in the Work Plan requested below.
- 7. Utility Survey. We request that you complete the utility survey for the site and evaluate whether any underground utilities could potentially act as preferential pathways for contaminant migrations. Please show the locations of utilities that may act as preferential pathways along with the high and low depths to groundwater on cross sections.

8. Groundwater Monitoring. Please continue quarterly groundwater monitoring and present the results in the reports requested below. ACEH requests that ethanol be included as an analyte for the on-site monitoring wells in addition to the current analytes. In addition, the irrigation wells at 15800 and 15808 Via Cordoba are to be sampled on a semi-annual basis and the results presented in the groundwater monitoring reports requested below.

TECHNICAL REPORT REQUEST

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

- February 15, 2006 Quarterly Monitoring and Remediation Status Report for the Fourth Quarter 2005
- February 27, 2006 Work Plan for Site Characterization
- May 15, 2006 Quarterly Monitoring and Remediation Status Report for the First Quarter 2006
- August 15, 2006 Quarterly Monitoring and Remediation Status Report for the Second Quarter 2006

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

ELECTRONIC SUBMITTAL OF REPORTS

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

PERJURY STATEMENT

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

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

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

UNDERGROUND STORAGE TANK CLEANUP FUND

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

AGENCY OVERSIGHT

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

If you have any questions, please call me at (510) 567-6791.

Sincerely,

Jerry Wickham Hazardous Materials Specialist

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Richard Munsch RDM Environmental 1704 Via Riata Roseville, CA 95747

> Donna Drogos, ACEH Jerry Wickham, ACEH File

ENCLOSURE B

Modified Ground Water System Design

REMEDIATION EQUIPMENT LAYOUT AND CONSTRUCTION DETAILS TESORO STATION NO. 67107 (FORMER BEACON STATION NO. 3721) 44 LEWELLING BOULEVARD SAN LORENZO, CA.



SHEET NO. SHEET TITLE

1	GENERAL - COVER SHEET	. G
2	GENERAL - SITE REMEDIATION & TRENCHING LAYOUT	G
3	PROCESS - PROCESS FLOW DIAGRAM	P
4	PROCESS - REMEDIATION SYSTEM EQUIPMENT LIST	. P
5	DETAILS - CONSTRUCTION DETAILS-REMEDIATION COMPOUND LAYOUT	D
6	DETAILS - CONSTRUCTION DETAILS-TRENCHING CROSS SECTION DETAILS	D
7	DETAILS - CONSTRUCTION DETAILS-TRENCHING CROSS SECTION DETAILS	D
8	DETAILS - CONSTRUCTION DETAILS-TRENCHING CROSS SECTION DETAILS	D

THE PROFESSIONAL ENGINEERING REVIEW OF THESE DRAWINGS EXCLUDES ELECTRICAL COMPONENTS.





PIPING SPECIFICATIONS

PIPE IDENTIFICATION	SPECIFICATIONS	DIAMETER
A	PVC Sch 40	1-Inch
В	Flexible Hose	1-Inch
С	PVC Sch 40 or 80	2-Inch

EQUIPMENT SPECIFICATIONS

ITEM NO.	ITEM	NO. REQUIRED	SUPPLIER	STOCK NO.	PHONE NO.	MANUFACTURER	SPECIFICATIONS
1	Submersible Pump	2	Odels Pump	55QE03490	(916) 925-9508	Grundfos	1/3hp, 5 gpm
2	Floats	1	McMaster Carr	46715K57	(562) 692-5911	n/a	Three Probes
3	Transfer Pump	2	Grainger	5ZT18	(916) 372-7800	Teel	SS, 1.5hp
4	Bag Filter System	2	McMaster Carr	6870K61	(562) 692-5911	n/a	300psi, Hiflow, 13.5"
5	Totalizer	1	McMaster Carr	4041K23	(562) 692-5911	McMaster Carr	1-50gpm
6	Aqueous Carbon	2	US Filter	ASC-2000	(510) 639-7274	US Filter	1,000lb Aqueous Carbon Column
7	Floats	1	McMaster Carr	46715K56	(562) 692-5911	n/a	Three Probes
8	LEL Sensor	1	Existing	n/a	n/a	n/a	Lower Explosive Limit Meter









