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February 21, 2013

Mr. Pete Mizera
State Water Resources Control Board
1001 I Street, 16th Floor
Sacramento, CA 95814
(*Sent via E-mail to: DFA-USTClosures@waterboards.ca.gov*)

Subject: **Comment Letter - BP 11133 Case Closure Summary**, Revised Notice of Opportunity for Public Comment; Response to Underground Storage Tank Cleanup Fund Case Closure Recommendation for Claim Number 5502; Fuel Leak Case No. RO0000403; Global ID # T0600100210; BP #11133, 2220 98th Avenue, Oakland, CA 94603

Dear Ms. Townsend:

Alameda County Environmental Health (ACEH) staff has received the Underground Storage Tank Cleanup Fund's (USTCF's) *Revised Notice of Opportunity for Public Comment* (Revised Notice), dated December 20, 2012, for the subject site. The Revised Notice supersedes two previous notices for public comment sent by the USTCF including the *Notice of Opportunity for Public Comment* dated August 31, 2012, and the *Revised Notice of Opportunity for Public Comment,* dated September 10, 2012. The purpose of the Revised Notice is to inform interested parties of 1) USTCF's intent to recommend closure of the subject site to the California State Water Resources Control Board's (SWRCBs) Executive Director rather than at a future Board meeting as previously anticipated, and 2) the sixty day public comment period on the Fund's *UST Case Closure Review Summary Report* (Case Closure Summary)*, dated December 16, 2012.* According to the Revised Notice, written comments to the SWRCB on the Fund's Case Closure Summary must be received by 12:00 noon on February 21, 2013. This letter herein transmits ACEH's comments.

Requirements for Investigation and Cleanup of Unauthorized Releases from USTs

ACEH reviewed the *UST Case Closure Summary*, dated August 31, 2012, signed by Lisa Babcock the Fund Manager, and the *UST Case Closure Review Summary Report*, dated December 16, 2012, prepared by Pat Cullen with the Sullivan International Group (a United States Environmental Protection Agency Contractor), also signed by Lisa Babcock, including *Attachment 1: Compliance with State Water Board Policies and State Law* (i.e., the SWRCB's Low-Threat UST Case Closure Policy Paper Check List), and *Attachment 2: Summary of Basic Site Information (Conceptual Site Model)* in conjunction with the case files for the above-referenced site. A complete record of the case files (i.e., regulatory directives and correspondence, reports, data submitted in electronic deliverable format, etc.) can be obtained through review of both the SWRCB's Geotracker database, and the ACEH website at http://www.acgov.org/aceh/index.htm.

ACEH additionally reviewed the requirements for investigation and cleanup of unauthorized releases from USTs contained in the following resolutions, policies, codes, and regulations:

- SWRCB Draft Resolution 2012-0062, *Directing Additional Actions to Improve the Underground Storage Tank Cleanup Program*, adopted on November 6, 2012;
- SWRCB *Plan for Implementation of Low-Threat Underground Storage Tank Case Closure Policy and Additional Program Improvements*, adopted by the SWRCB on November 6, 2012;

- SWRCB Resolution 2012-0016, *Approve a Substitute Environmental Document and Adopt a Proposed Water Quality Control Policy for Low-Threat Underground Storage Tank Case Closure*, adopted on May 1, 2012; and effective August 17, 2012;
- California Code of Regulations (CCR) Title 23, Article 5 and Article 11, UST Regulations, as amended and effective July 1, 2011;
- California Health & Safety Code (HS&C) Sections 25280-15299.8, Underground Storage of Hazardous Substances, as amended on January 1, 2011;
- SWRCB Resolution 2009-0081, *Directing Additional Actions to Improve Administration of the UST Cleanup Fund and UST Cleanup Program*, adopted November 17, 2009;
- SWRCB Resolution 2009-0042, *Actions to Improve Administration of the UST Cleanup Fund and UST Cleanup Program*, adopted May 19, 2009;
- SWRCB Resolution 1992-0049, *Policies and Procedures for the Cleanup and Abatement of Discharges under California Water Code Section 13304*, as amended on April 21, 1994 and October 2, 1996.

Application of Case Review Tools

ACEH's case closure evaluation was also guided by the application of the principles and strategies presented in the SWRCB's *Leaking Underground Fuel Tank Guidance Manual* (CA LUFT Manual), dated September 2012. This guidance document was developed by the SWRCB "…[t]o provide guidance for implementing the requirements established by the Case Closure Policy" (Low Threat Closure Policy or LTCP) and associated reference documents including but not limited to:

- *Technical Justification for Vapor Intrusion Media-Specific Criteria*, SWRCB dated March 21, 2012;
- *Technical Justification for Groundwater Media-Specific Criteria*, SWRCB dated April 24, 2012;
- *Technical Justification for Soil Screening Levels for Direct Contact and Outdoor Air Exposure Pathways*, SWRCB dated March 15, 2012;
- *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air, Final* DTSC, dated October, 2011.

ACEH also utilized other case review tools developed by the SWRCB to aid in determining compliance of the subject fuel leak site with LTCP criteria, including both the paper *Policy Checklist* (available at www.waterboards.ca.gov/ust/docs/checklist.pdf) and the electronic version of the *Policy Checklist* (available on the SWRCB's GeoTracker website at http://geotracker.waterboards.ca.gov). While ACEH embraces the Policy and has found the CA LUFT Manual to be a valuable tool, we are concerned that the brevity of the SWRCB checklists can result in inaccurate conclusions regarding recommendations for case closure and uncertainty regarding the decision making process. Therefore, ACEH staff utilizes an enhanced LTCP checklist entitled *Data Gap Identification Tool* (DGIT) that integrates the requisite level of questioning to enable consistent application of the LTCP, ensure that decisions are founded in appropriate technical basis, identify impediments to closure, improve the efficiency of the UST cleanup program, and document the decision making process as transparently as possible for all interested parties.

Our evaluation of the subject site is presented in the subsequent pages of this document.

Summary of ACEH's Review of the USTCF's UST Case Closure Summary

The results of ACEH's case closure review, indicates the Fund's *UST Case Closure Summary*, dated August 31, 2012, and the *UST Case Closure Review Summary Report*, dated December 16, 2012 and closure recommendation under the LTCP to be lacking an appropriate technical basis. ACEH does not agree with the USTCF's technical analysis presented in the two above-referenced documents, nor do we agree with the analysis and conclusions presented in the *Case Closure Summary Closure Report*, dated November 11, 2011, prepared by ARCADIS, Inc. on behalf of Atlantic Richfield Company (ARCO).

Our review indicates that the Conceptual Site Model (CSM) is deficient and that the site is uncharacterized in a number of elements. Our concerns include but are not limited to the omission and misrepresentation of data; use of inappropriate soil analytical data (i.e., data from one off-site soil boring) to determine compliance with the LTCP Criterion for Direct Contact and Outdoor Air Exposure; inadequacy of the vapor intrusion risk assessment and use of soil gas data from samples collected using outdated sampling protocols to assess the risk to residential homes, apartment buildings, and a school in close proximity to the site; lack of analysis of the quality and validity of data obtained by the groundwater monitoring well network including potential sample biases (dilution), and the inability to monitor the status of free product at the site due to submerged well conditions; lack of evaluation of rising groundwater elevation trends and potential impact on contaminant migration (free product, groundwater, and soil gas) in subsurface utility trenches present beneath and adjacent to the site; lack of evaluation of historic groundwater flow direction variability and its influence on off-site plume migration and plume stability; and resultant validity of conclusions. Details of our analysis are provided in the narrative section below and in the accompanying attachments including the *SWRCB's Policy Checklist*.

ACEH met with representatives of ARCO and their consultants to present our analysis of site data and discuss our concerns about the technical analysis and recommendations for case closure of the subject site presented in the *Case Closure Summary Report* prepared by ARCADIS, as well as similar concerns on other ARCO UST sites under the regulatory oversight of ACEH. During our meetings, ARCO assured ACEH that they were concerned about the errors and quality issues identified in the subject site's case document files, and would take action to identify and rectify problems on ARCO UST sites under ACEH regulatory oversight, including retracting case closure requests previously submitted to ACEH.

Subsequent to our meetings with ARCO, ACEH presented our analysis and concerns to the USTCF, and informed them of our discussions with ARCO. However, despite ACEH's and ARCO's concerns about the data and technical analysis presented in ARCADIS's *Case Closure Summary Report*, the USTCF proceeded with the issuance of the above referenced Case Closure Summary reports and recommendation for case closure, that inappropriately oversimplifies ACEH's technical evaluation.

ARCO has withdrawn five of the six requests for closures for UST cases previously submitted to ACEH. The unfortunate exception to this is that for the subject site, due to the USTCF's decision to recommend the case for closure under the LTCP.

ACEH's Review of the USTCF's Compliance with Public Notification Requirements

While the USTCF has made the Above referenced Case Closure Summary reports available for public comment on the SWRCB's website, it appears to have failed to notify in a timely basis all interested parties, *including all residents of adjacent properties,* as required by the UST Regulations contained in CCR Chapter 16, and Chapter 6.7 of the H&SC.

Further, it appears the USTCF has not conducted public notification requirements in accordance with the SWRCB and Regional Water Quality Control Boards April 2005 guidance document entitled *Final Draft Public Participation at Cleanup Sites*. According to this document "the level of public participation effort at a particular site should be based on the site's threat (to human health, water quality, and the environment), the degree of public concern or interest in site cleanup, and any environmental justice factors associated with the site. There may be more public concern or interest about a site when: contaminants have migrated or are likely to migrate off-site…".

The USTCF's *Revised Notice of Opportunity for Public Comment*, dated September 10, 2012, states that "A copy of the Case Closure Summary has been provided to the owner/operator, environmental consultant of record, the local agency that has been overseeing correction action, the local water purveyor, and the water district specified by Health & Safety Code section 25299.39.2 subdivision (a)(1)." Concerned by this limited list of recipients, ACEH contacted the USTCF and requested the list of recipients that the *Revised Notice of Opportunity for Public Comment*, dated September 10, 2010, was sent to. Our review of the list of recipients (received by ACEH on October 22, 2012) indicates a lack of notification of many of the owners and residents of surrounding properties potentially affected by off-site migration of free product, contaminated groundwater, and/or soil gas, including residents of parcels owned by the Oakland Housing Authority. In the *Revised Notice of Opportunity for Public Comment*, dated December 16, 2012, the USTCF expanded the language regarding the list of recipients to state that

"Notification has been provided to all entities that require notice as specified in the Low-Threat Closure Policy." ACEH requested confirmation of the list of recipients in an email correspondence dated February 8, 2012 to Bob Trommer with the USTCF, however has not received a response as of the date of this letter. The USTCF's list of recipients for the *Revised Notice of Opportunity for Public Comment*, dated September 10, 2012, and an appropriate public notification area map and a list of owners and tenants identified by ACEH's search of the County of Alameda Assessor's Office Property Value System who should receive notification of the USTCF's recommendation for case closure is provided as attachment to this response letter.

Case Closure Analysis Using the LTCP General and Media Specific Criteria

ACEH's case closure analysis for the subject site is provided in the narrative section below and in the accompanying attachments.

General Criteria a: The unauthorized release is located within the service area of a public water system
The policy is limited to areas with available public water systems to reduce the likelihood that new wells in developing areas will be inadvertently impacted by residual petroleum in groundwater. Although the site is located within the service area of East Bay Municipal Utility District, a well search conducted in October 2004 located 11 domestic wells, seven irrigation wells, and one industrial well within a one-mile radius of the site. No wells were identified within a 2,000 foot radius of the site, however the complexity of the site hydrogeology (see General Criteria e below) and the possible influence of pumping of wells with respect to apparent changes in groundwater flow direction have not been addressed. A current Department of Water well search should be conducted, and potentially a backyard survey of wells in the area to rule out the possibility of impacts to or influence of nearby wells.
General Criteria b: The unauthorized release consists only of petroleum
The unauthorized release consists of petroleum hydrocarbons originating from gasoline underground storage tanks (USTs).
General Criteria c: The unauthorized ("primary") release from the UST system has been stopped
In 1987, three single-walled steel gasoline USTs (one 10,000-gallon, one 8,000-gallon, and one 5,000-gallon) were removed from the southwestern portion of the site and replaced with three double-walled fiberglass unleaded gasoline USTs (two 10,000-gallon and one 12,000-gallon). In 1998, the UST system including tanks, pipes, and dispensers were permanently removed from the site.
General Criteria d: Free product has been removed to the maximum extent practicable
Free product has been historically detected in wells MW-1 and RW-1 at maximum thicknesses exceeding 3 feet in MW-1 and 1.6 feet in RW-1 (see ***Tables 1***, ***Table 2***, *and* ***Figure 1***). Although free product has been removed by several techniques including passive floating product removal systems and bailing in MW-1 and RW-1, and operation of a soil vapor extraction (SVE) system and groundwater extraction and treatment (GWET) system in RW-1, it is not clear from the data presented in the case files whether free product remains at the site or whether it has been removed to the maximum extent practicable. ACEH is concerned about misrepresentation of data by Atlantic Richfield Company (ARCO), ARCADIS, and Broadbent and Associates, lack of evaluation of data contained in historical reports, and the validity of conclusions presented about free product in the November 30, 2011 *Case Closure Summary Report* prepared by ARCADIS on behalf of ARCO, and the October 4, 2011 Second Five Year Review Report prepared by the SWRCB Underground Storage Tank Cleanup (USTCF) staff.

General Criteria d: Free product has been removed to the maximum extent practicable (continued)
Our concerns include the following: • **Submerged Wells.** All of the site wells with the exception of vapor extraction wells VEW-6 and VEW-7 have been submerged during 6 percent to 80 percent of monitoring events conducted at the site, thereby making data about free product in the wells suspect (see ***Table 3*** for well construction details and ***Table 4*** for submerged condition statistics). If the water table rises above the top of the well screen, it is not possible to use the well for detection of light non-aqueous phase liquids (LNAPLs). Therefore, reliance on data collected from of a submerged well may provide a false indication of the absence of LNAPL. Although ARCADIS presents hydrographs for select wells (AW-1, AW-2, AW-3, AW-4, AW-5, AW-6, AW-8, MW-1, MW-3) in the *Case Closure Summary Report* which show the submerged condition of the wells, no evaluation or discussion regarding the submerged wells and the effect on data quality has been conducted or even mentioned. Additionally, hydrographs for groundwater monitoring wells MW-2 and AW-9, remediation and pilot test wells RW-1, IW-1, IW-2, IW-3, and OW-1, and soil vapor extraction wells VW-1 through VW-3, and VEW-4 through VEW-9 were not presented nor were the submerged conditions in these wells evaluated.
• **Preferential Pathways.** The depth to water in vapor extraction wells VW-2 and VW-3 has ranged between 0.25 to 6.06 feet below ground surface (bgs) during all monitoring events in which water levels were measured (i.e., from 2008 to 2011). These wells are adjacent to a sanitary sewer line that runs beneath the site at approximately the same depths and are within the estimated limits of free product and capillary fringe residual hydrocarbon footprint prepared by RESNA and presented in the Remedial Action Plan for the site in 1993. Although this sanitary sewer line was identified in a utility survey conducted in 2005 by URS, there is no evaluation of its potential to act as a preferential pathway in the case files (see ***Figures 2***, ***3***, and ***4***). • **Data Misrepresentation/Omission.** Free product thicknesses are falsely reported as 0.00 feet or omitted (i.e., reported as not analyzed, applicable, measured, or available) in groundwater monitoring reports prepared by Broadbent and Associates on behalf of ARCADIS (see ***Table 1*** and ***Table 2***). Free product data was also omitted from summary tables contained in reports prepared by other consultants (i.e., free product observed in well RW-1 at a thickness of 1.6 feet subsequent to the shutdown of the SVE and GWET systems in 1998 was reported in the 2nd quarter 1999 groundwater monitoring report, however reference to the measurement was omitted from subsequent monitoring reports). • **Product Removal Data.** Free product was removed from wells MW-1 and RW-1 from 1993 until 2001 (see ***Table 1*** and ***Table 2***). Product removal data often conflicts with reported free product thickness data measured in wells during monitoring events (e.g., free product thickness reported as zero in summary tables are made without reference to product removal occurring immediately prior to well monitoring). • **Free Product Measurement.** ARCADIS states that 0.70 gallons of free product were removed from well MW-1 between 1993 and 1996, and measureable free product has not been observed at this well since 1998; and approximately 161 gallons of free product were removed from well RW-1 between 1993 and 2001, and measurable free product has not been observed at this well since 2001. A review of the data presented in ***Table 1*** and ***Table 2***, indicates that "sheen" and/or "heavy sheen" has been observed repeatedly in monitoring wells MW-1 and RW-1 since 1998 and 2001, respectively, with the most recent observations occurring in March 2010. During this event the wells were under submerged conditions and thus an observation of sheen may be indicative of the bottom of the column of free product in the wells. Additionally, although sheen was not observed in the subsequent monitoring events conducted in 2010 and 2011 in wells MW-1 and

General Criteria d: Free product has been removed to the maximum extent practicable (continued)

RW-1, a review of the data presented in ***Table 1*** and ***Table 2*** indicates MW-1 was under submerged conditions in 1 out of the 4 events, and well RW-1 was submerged during 3 out of the 5 events. As discussed above, submerged wells may provide a false indication of the absence of LNAPL in a well. This data has not been evaluated.

- **Corrective Action Effectiveness.** No evaluation has been presented regarding the success or infeasibility of corrective actions implemented at the site, including presentation of valid long-term monitoring data (as discussed above and in General Criteria e below) to demonstrate that concentrations have not rebounded following the cessation of corrective action. For example, although the GWET and SVE systems were reportedly successful at removing approximately 13,495 pounds of total petroleum hydrocarbons as gasoline (TPH-g) vapors and 345 pounds of dissolved TPH-g from groundwater, no assessment was found in the case files regarding the subsequent observation of 1.6 feet of free product in recovery well RW-1 two months after the system was shutdown. Additionally, due to the observation of sheen in wells MW-1 and RW-1 in March 2010 and the submerged conditions of the monitoring wells (including the SVE wells) as discussed above, it is not clear whether the corrective actions implemented at the site have removed free product to the maximum extent possible or resulted in abatement of free product migration.

General Criteria e: A conceptual site model that assesses the nature, extent, and mobility of the release has been developed

In the *Case Closure Summary Report*, ARCADIS contends that case closure is warranted for the site based on the following:

- The site has been adequately characterized through regular groundwater monitoring and various soil and/or soil vapor sampling events.
- Petroleum hydrocarbon sources and residual hydrocarbons in site soil have been removed as evidenced by the most recent site analytical data, and the absence of high concentrations of constituents of concern (COCs) observed in soil and groundwater suggests that residual hydrocarbons in soil have been removed via previous remedial activities and through natural attenuation. COCs in site soil were either non-detect or detected at very low concentrations below their respective environmental screening levels (ESLs), with the exception of methyl tertiary butyl ether (MTBE) which was detected slightly above the applicable ESL.
- COCs in site groundwater have exhibited decreasing trends and this trend is expected to continue. Review of historical groundwater data indicates that concentrations of these analytes have declined and this trend is expected to continue.
- Active remediation was conducted at the site between 1994 and 1998.
- The plume is not migrating offsite as evidence by the non-detect or low detected COC concentrations in downgradient monitoring wells.
- No sensitive receptors are likely to be impacted, including surface water bodies, municipal wells, and drinking water sources.
- The site presents no significant risk to human health and the environment.

General Criteria e: A conceptual site model that assesses the nature, extent, and mobility of the release has been developed (continued)

- Groundwater collected during the third quarter 2011 sampling event generally indicate that COCs in site wells are either non-detect or detected at concentrations below their respective ESLs. Exceptions included low levels of TPH-g in MW-1, AW-1, and RW-1; benzene in AW-1 and AW-4; MTBE in AW-1 and AW-6; and ethylbenzene and tert butyl alcohol (TBA) in AW-1.

Based on our review of the case files, these conclusions are not supported by a conceptual site model (CSM). Although components of a CSM have been presented in pieces in historical reports, significant data gaps exist and include an accurate geologic and hydrogeologic assessment, identified stratigraphic and manmade migration pathways, delineation of the lateral and vertical extent of contamination in all affected media, an adequate assessment of vapor intrusion pathways, an evaluation of the effectiveness of corrective actions implemented at the site, and an evaluation of whether any site contamination is present in locations that have the potential to pose nuisance conditions during common or reasonably expected activities.

A summary of identified data gaps is presented below and in subsequent General and Media Specific Criteria sections.

- **Plume Delineation and Stability**. The horizontal and vertical extent of the plume has not been adequately defined. ARCADIS presents plots of decreasing concentrations in select wells to demonstrate plume stability. However, while data presented in these plots generally show decreasing trends in concentrations of COCs in the wells, ACEH is concerned that the data has not been adequately been validated and therefore the analysis is not sufficient. Plume stability must be demonstrated using a technical analysis that considers the following factors that can affect data quality.

- **Well Placement within the Plume.** ACEH has concerns regarding the effectiveness of the remediation and monitoring well network at the site. A total of 26 wells have been installed in the vicinity of the site, including 12 groundwater monitoring wells (MW-1 through MW-3, and AW-1 through AW-9), one groundwater extraction well (RW-1), nine vapor extraction wells (VW-1 through VM-3, and VEW-4 through VEW-9), three pilot study injection wells (IW-1 through IW-3), and one pilot study observation well (OW-1). Details of the well locations and construction are provided in Table 3. Although a similar table is provided in Section IB in the USTCF's Second Five Year Review Summary Report, the table contains errors and omits information pertinent to the evaluation of effectiveness of the remediation wells, and the monitoring well network to provide reliable measurements of chemical parameters and hydraulic head at each monitoring point (i.e., well type, installation date, screen interval and length, and type of geologic formations the wells are screened across). No such table is presented in *Case Closure Summary Report* prepared by ARCADIS.

- **Submerged Groundwater Monitoring Wells.** Historical depth to water measurements in the sites 13 groundwater monitoring wells indicate that the wells have been under submerged conditions during 6 percent to 80 percent of monitoring events conducted (see ***Table 4***). Six of the wells, including three on-site wells (MW-2, AW-5, and AW-6), and three off-site wells (AW-2, AW-7, and AW-8), have been submerged during more than 50 percent of monitoring events. As previously discussed, conclusions regarding the absence of free product based on observation collected from submerged wells may be misleading.

General Criteria e: A conceptual site model that assesses the nature, extent, and mobility of the release has been developed (continued).

- **Groundwater Flow Directions.** In the 2005 Soil and Water investigation Report, URS presents groundwater flow direction data between July 1992 and July 2005. Based on this data URS reports that groundwater flow directions in the western and eastern sections of the site have predominantly been easterly and westerly, respectively, converging to a generally northwest-southeast trending potentiometric depression or trough across the center of the site, with groundwater flow direction along the axis of the trough generally to the east and southeast, which represents the overall predominant groundwater flow direction at the site. In the *Case Closure Summary Report*, ARCADIS states that the groundwater flow direction has been highly variable, but is predominantly from the east to the west. ARCADIS provides a summary of historical groundwater flow directions and gradients from which they base their conclusions, however, as seen in the data presented in ***Table 5***, ARCADIS presents groundwater flow directions and gradient data for 2006 through 2011, and omits data from 1989 to 2006 that is pertinent to understanding contaminant transport at the site. The missing data, included by ACEH in ***Table 5***, shows that groundwater at the site has been characterized as westerly, easterly, northeasterly, southerly, southeasterly,southwesterly, radially inwards towards the site, and radially outward from the site. The historic groundwater elevation contour maps demonstrate the widely variable interpretation of hydraulic head from water level measurements and the resultant conclusions about site hydrogeology and groundwater flow directions. Upon examination of the groundwater contour maps, it can be seen that the variability in reported groundwater flow direction has been due to use of different wells to generate the contour lines. Reported reasons for not using data from all monitoring wells include "anomalous" water levels, use of off-site wells only due to the complex hydrogeology beneath the site, free product in wells, well inaccessibility due to parked cars, and the inability to locate off-site well AW-7. Based on ACEH's review, characterization of data as "anomalous" has been used to exclude data that has been consistent over time, without adequate justification for doing so. ACEH is concerned that the reported "anomalous" data has never been investigated and that the site hydrogeology and potential anthropogenic influences in hydraulic conditions (e.g., leaking sewer/storm drain/water lines, groundwater pumping from nearby water supply and remediation wells) has not been adequately characterized.

- **Groundwater Levels.** Depth to groundwater in the on-site monitoring wells has historically varied by up to 14 feet across the site during a single monitoring event. Groundwater elevations at the site have exhibited an increasing trend since monitoring began in the late 1980's. Water level measurements in select site wells have been consistently and inappropriately labeled as "anomalous" data. Rather than investigating hypothesis for the rising trends over time and large deltas seen in water level measurements across the site during the same monitoring event, the site has been largely characterized as having "complex hydrogeology". ACEH's review of the case files reveals two conflicting hypothesis:

    - The first hypothesis surmises that there are two separated, shallow water-bearing zones underlying the site, based on the relatively high water levels observed in MW-1 through MW-3 as compared to the lower levels observed in the other wells (a delta of ranging from 7 to 14 feet across a short distance).

General Criteria e: A conceptual site model that assesses the nature, extent, and mobility of the release has been developed (continued).

- The second hypothesis, presented in the Remedial Action Plan prepared in 1993, surmises that shallow groundwater underlying the site to the depth explored occurs in one hydraulically connected water-table aquifer, and that the apparently “anomalous” water levels observed in wells MW-1 through MW-3 are the result of external circumstances unrelated to natural hydrogeologic conditions (e.g., leakage from a water line or sewer along Bancroft Avenue, or perching of groundwater in the tank cavity).

Based on ACEH’s review of water level measurements, site maps showing the locations of underground utilities, and boring and monitoring well logs, each of these hypothesis are plausible, have not been validated, and warrant further investigation.

- **Sample Biases and Cross Contamination.** ACEH has concerns related to potential sample biases due to the construction of the wells and subsurface conditions at the well locations. These concerns include:

  - **Long-Screen Monitoring Wells.** All of the wells at the site can be classified as conventional single interval long-screened monitoring wells screened across multiple geologic formations (see ***Table 3***). Water samples collected from these these types of monitoring wells are actually blended or composite samples of groundwater within the vertical interval of the aquifer screened by the wells. If the dissolved contaminants are stratified within the aquifer, compositing in long screen wells during sampling results in underestimation of the maximum concentrations present in the aquifer. By using results obtained from composite samples, the risk to the downgradient receptors may be underestimated, including the risk posed to vapor receptors. Additionally, borehole flow and transport of contaminants in long-screen wells may contaminate parts of the aquifer that would not otherwise become contaminated in the absence of a long-screen well.

  - **Local Vertical Flow Systems.** As discussed previously, the reasons for the observed variations in hydraulic head in monitoring wells across the site has not been adequately evaluated and may be due to vertical gradients. Installation of a monitoring well may set up a local vertical flow system because of the natural vertical gradient at the well location. The well can act as a “short circuit” along this gradient, with the resulting flow in the wellbore often of significant magnitude to compromise the integrity of any samples collected from the well. Therefore samples could yield biased and misleading data concerning solute concentration, source location, and plume geometry.

  - **Groundwater Recharge.** A review of historic groundwater elevation contour maps indicates areas of localized mounding. Groundwater recharge at a site could create a layer of clean water atop a deeper dissolved contaminant plume. The layer of clean water may constitute an effective diffusion barrier that impedes the upward migration of volatile contaminants from the dissolved plume.

- **Remediation System Design.** The GWET and SVE system operated intermittently from 1994 until 1998. The system was initially connected to eight vapor extraction wells (VEW-1 through VEW-8) and one groundwater extraction well (RW-1). Although no boring logs or details of the monitoring well construction for the SVE wells were found in the case files, the total depths and screen intervals of the wells are inferred to be 20 feet below ground surface (bgs), and 5 to 20 feet bgs, respectively, based on the work plan for well

General Criteria e: A conceptual site model that assesses the nature, extent, and mobility of the release has been developed (continued)

installation. Off-site well VEW-9 was installed and connected to the SVE and GWET system in April 1996. This well is screened from 6 to 20 feet bgs. Water level measurements taken in 2008 through 2011 indicate that many of these well are submerged. Although the SVE and GWET systems were reportedly successful at removing approximately 13,495 pounds of TPH-g vapors and 345 pounds of dissolved TPH-g from groundwater, no assessment was found in the case files regarding the impacts of the submerged wells on the effectiveness of the SVE system or the subsequent observation of 1.6 feet of free product in recovery well RW-1 two months after the system was shutdown. Effective remediation systems can be designed only if the concentration and distribution of the contaminants are accurately defined.

- **Preferential Pathway Study.** ACEH is concerned given the uncertainty in the hydrogeology at the site and rising groundwater elevation trends, that the subsurface utilities have not been adequately investigated as discussed below:

  - During a preferential pathway study conducted in July 2005, URS measured measured depth to water and collected groundwater samples, from three soil vapor extraction wells (VEW-4, VEW-5, and VEW-8) located in the vicinity of the sanitary sewer line (running beneath the north and northwestern section of the site at approximately 6.5 to 7 feet bgs) to assess the potential for the sewer line to act as a preferential pathway for contaminant migration. At the time of measurement in July 2005, the depth to water in wells VEW-4, VEW-5, and VEW-8 was 14.04 feet bgs, greater than 20 feet bgs, and 16.10 feet bgs, respectively. Analytical results from groundwater samples collected from wells with water (VEW-4 and VEW-8) reported concentrations of total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene, and xylenes (BTEX) in well VEW-4 at concentrations of 680 micrograms per liter (µg/L), 41 ug/L, 24 µg/L, 20 µg/L, and 67 µg/L, respectively. No analytes were detected above laboratory reporting limits in well VEW-8. Based on this data it was concluded that the sewer line in the north and northwestern section of the site did not act as a preferential pathway for contaminant migration. However, given the rising groundwater elevations at the site, ACEH is concerned that this potential pathway has not been adequately evaluated.

  - Although other underground utilities were identified beneath and adjacent to the site, no investigation activities were conducted in their vicinity to evaluate the potential for the utility trenches to serves as preferential pathways for contaminant migration. As previously discussed, our review of the case files indicates the depth to water in vapor extraction wells VW-2 and VW-3 has ranged between 0.25 to 6.06 feet bgs during all monitoring events in which water levels were measured (i.e., from 2008 to 2011). These wells are adjacent to a sanitary sewer line that runs beneath the southeastern portion of the site near the UST pit at approximately the same depths as the other sewer line bisecting the site and are within the estimated limits of free product and capillary fringe residual hydrocarbons prepared by RESNA and presented in the Remedial Action Plan for the site. Although this sanitary sewer line was identified in a utility survey conducted in 2005, there is no evaluation of it acting as a preferential pathway in the case files.

General Criteria e: A conceptual site model that assesses the nature, extent, and mobility of the release has been developed (continued)
• **Analytical Detection Limits**. A review of site data indicates that analytical reporting limits have been higher than the corresponding environmental screening levels (ESLs) presented in the revised May 2008 Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater guidelines (RWQCB, 2008) for some of the COCs and thus reports of non-detects are incorrect. For example, the reporting limits for 1,2-DCA consistently exceed the ESLs and therefore claims that this COC is below its corresponding ESL are not validated. **Changes in Areal Extent of the Plume**. Historic isoconcentration contour maps for MTBE, benzene, and TPH-g groundwater plumes indicate the plumes have migrated offsite beyond the perimeter of the site in all directions with the maximum estimated plume length exceeding 300 feet in the southwest direction (see ***Figures 5***, ***6***, and ***7***). Plume maps should be provided to show the current spatial distribution of contaminants in the subsurface. The maps should display the contaminant distribution for soil gas, soil matrix, and groundwater for all the COCs. All data used to construct the contour maps should be clearly annotated on the maps. Ideally the base map for plume presentation should be provided on an aerial photograph. • **Geologic Cross Sections.** Geologic cross sections illustrating the subsurface lithology, water levels, and distribution of contaminants in soil based on available boring logs, were provided in the 2005 Feasibility Study Report prepared by URS. However, since that time new data has been generated and should be presented on new cross-sections. This data should show the relationship between utility trenches and groundwater elevations at the site. • **Well Survey.** A recent well survey that uses all available well from both the Department of Water Resources and local agencies (Zone 7 Water Agency or Alameda County Public Works as appropriate) should be conducted. Water supply wells located within 2,000 feet of the site should to be presented on a site figure with a table identifying each well along with the well construction details.
General Criteria f: Secondary source has been removed to the extent practicable
The secondary source is the petroleum-impacted soil, free product, or groundwater that acts as a long-term source releasing contamination to the surrounding area. Unless site conditions prevent secondary source removal (e.g., physical or infrastructural constraints exist whose removal or relocation would be technically or economically infeasible), petroleum-release sites are required to undergo secondary source removal to the extent practicable. According to the LTCP, to the extent practicable means implementing a cost-effective corrective action which removes or destroys-in-place the most readily recoverable fraction of source-area mass within one year or less. Following removal or destruction of the secondary source, additional removal or active remedial actions shall not be required by regulatory agencies unless (1) necessary to abate a demonstrated threat to human health or (2) the groundwater plume does not meet the definition of low threat as described in this policy. Although corrective action at the site has included soil excavation, free product removal, and operation of an SVE and GWET systems, it is not clear from our review of the case files whether the secondary source(s) at the site have been removed to the maximum extent practicable. As described in General Criteria e above and in the Media Specific Criteria sections below, ACEH has concerns about the quality of soil, soil gas, and groundwater data and lack of a site conceptual model, and therefore the effectiveness of the corrective actions at removing secondary sources of petroleum hydrocarbons. Our concerns regarding the adequacy of secondary source removal include the following:

General Criteria f: Secondary source has been removed to the extent practicable (continued)

- No evaluation has been presented of the areas of success or infeasibility of corrective actions implemented at the site, including presentation of valid long-term monitoring data after the subsurface has reached equilibrium to demonstrate that concentrations have not rebounded following the cessation of corrective action. For example, although the GWET and SVE systems were reportedly successful at removing approximately 13,495 pounds of TPH-g vapors and 345 pounds of dissolved TPH-g from groundwater, no assessment was found in the case files regarding the subsequent observation of 1.6 feet of free product in recovery well RW-1 two months after the system was shutdown.

- The SVE and GWET systems were connected to nine vapor extraction wells and recovery well RW-1, Although the drilling and installation activities associated with five of the SVE wells (VEW-4 through VEW-8) are not in the case files, no assessment has been made regarding the effectiveness of the wells. Even though groundwater data has been collected from all of the site's eight soil vapor extraction wells on a quarterly basis from January 2008 until July 2009, and then on a semi-annual basis from 2010 through 2011, no analysis has been presented to assess the effects of submerged conditions identified in two of the on-site soil vapor extraction wells (VW-2, VW-3) during 100% of the monitoring events, and one off-site soil vapor extraction well (VEW-9) during 30% of the monitoring events. Depth to water in on-site well VW-2 has ranged from 0.25 feet bgs to 1.99 feet bgs during all monitoring events in which depth to water measurements were reported.

- No subsurface confirmation sampling has been conducted to demonstrate the effectiveness of secondary source removal and verify that cleanup activities have reduced subsurface volatile chemical concentrations to levels protective of human health, including receptors subject to vapor intrusion. Site soil was last sampled in 2005.

- In 2009, groundwater contaminant concentrations exhibited an increasing trend in monitoring well AW-1. At that time, ACEH did not concur with USTCF staff that case closure should be considered in light of elevated concentrations of TPH-g and benzene and observations of a sheen in wells MW-1 & AW-1 during the 1st quarter 2010 monitoring event, indicating that the site may pose a potential risk to human health and the environment, an elementary school located directly down-gradient of the site, and adjacent residences. Subsequently, ACEH directed ARCO to implement the approved corrective action to abate elevated concentrations of petroleum hydrocarbons and sheen and proceed with a three month pilot study for the injection of nutrients to enhance biodegradation of TPH-g in soil and groundwater.

- In September 2010, ARCADIS installed three injection wells (IW-1 through IW-3) and one observation well (OW-1) at the site. Following the well installation activities, downgradient injection well IW-3 was sampled to further delineate the plume in the vicinity of the pilot study area. Based on the reported low levels of COCs (benzene at 5.8 µg/L, ethylbenzene at 8.3 µg/L, toluene at 2.9 µg/L, xylenes at 8.5 µg/L, MTBE at 2.5 µg/L, and TPHg at 1,000 µg/L) in groundwater samples collected from the well, ARCADIS requested that implementation of the pilot test be postponed until after additional sampling was conducted to evaluate groundwater concentrations in the wells in the vicinity injection wells. Results of groundwater samples collected from AW-1, AW-2, and MW-1 indicated that MTBE, benzene, and TAME were present in AW-1 at low concentrations of 4.4 µg/L, 0.92 µg/L, and 0.80 µg/L, respectively; AW-2 contained MTBE at a concentration of 0.52 ug/L; and MW-1 contained TPHg at a concentration of 230 µg/L. Based on the low COC levels in these wells, ARCADIS recommended the postponement of the pilot injection test until third quarter 2011 sampling results could be

General Criteria f: Secondary source has been removed to the extent practicable (continued)

reviewed. ARCADIS did not present data nor include a discussion regarding the potential low bias of the analytical results due to submerged conditions of the newly installed wells.

- The pilot study was never implemented as claimed by the USTCF staff in the Second Five Year Review Summary Report.

General Criteria g: Soil and groundwater have been tested for MTBE and results reported in accordance with Health and Safety Code section 25296.15

The primary source of release at the site has been determined to be from the gasoline underground storage tank system including piping and dispensers. MTBE was included in the list of analytes in 1993.

General Criteria h: Nuisance as defined by Water Code section 13050 does not exist at the site

Water Code section 13050 defines "nuisance" as anything which meets all of the following requirements:

(1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.

General Criteria h: Nuisance as defined by Water Code section 13050 does not exist at the site (continued)

(2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

(3) Occurs during, or as a result of, the treatment or disposal of wastes. For the purpose of the Policy, waste means a petroleum release.

Based on ACEH's review of the case files, and the fact that the site is located in a commercial and residential community, sufficient data has not been presented to support whether a nuisance condition currently exists or potentially could exist in the future. A nuisance evaluation should been incorporated into the CSM and should describe whether any site contamination is present in locations that have the potential to pose nuisance conditions during common or reasonably expected activities. The types of data relevant to determining whether nuisance exists at the site include:

- Descriptions of the type and vertical and lateral extent of shallow soil or lateral extent of surface soil contamination
- Depths to contamination
- Analytical results for surface soil, shallow soil, and groundwater samples
- Discussion of any odors or visual evidence of contamination
- Preferential pathway and utility conduit surveys
- Review of potential points for exposure (such as groundwater seeps into basements)
- Expected future use of site
- Description of surface water runoff from the property to storm drains or other sites

Please refer to the CSM discussion presented in General Criteria e above for details.

Unique site attributes or site-specific conditions that demonstrably increase the risk associated with residual petroleum constituents

The land use in the vicinity of the site is mixed commercial and residential with residential homes and an apartment building located immediately adjacent to the northeastern and southeastern property lines, residential and commercial property located across 98th Avenue to the northwest, and a school located across Bancroft Ave approximately 0.15 miles southwest of the site.

Media-Specific Criteria 1. Groundwater

In order to meet the low-threat groundwater-specific criteria, if groundwater with an existing or potential designated beneficial use is affected by an unauthorized release, the contaminant plume that exceeds water quality objectives must be:

- Stable or decreasing in areal extent (i.e., the contaminant mass that has expanded to its maximum extent: the distance from the release where attenuation exceeds migration)
- Meet all of the additional characteristics of one of the five classes of sites (groundwater-specific criteria) listed in the LTCP.

In the Second Five Year Review Summary Report, USTCF staff recommends closure of the site on the contention that based on the concentrations of other water quality parameters such as alkalinity, hardness, total dissolved solids, metals, nutrients, methane and carbon dioxide, the groundwater has no current or future beneficial use. USTCF further concludes that considering the poor water quality, this site should be considered for closure providing the land use remain commercial. This statement is not consistent with state policy for water quality control as prescribed in Resolution 92-49 (*Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304*) nor "the fundamental tenet of the LTCP that if the closure criteria described in this policy are satisfied at a petroleum unauthorized release site, attaining background water quality is not feasible, establishing an alternate level of water quality not to exceed that prescribed in the applicable Basin Plan is appropriate, and that water quality objectives will be attained through natural attenuation within a reasonable time, prior to the expected need for use of any affected groundwater.

Although, ARCADIS contends in the *Case Closure Summary Report* that the plume is not migrating offsite as evidenced by the non-detect or low detected COC concentrations in downgradient monitoring wells, ACEH review of the case files indicates that sufficient data has not been presented to base a determination that threats to existing and anticipated beneficial uses of groundwater have been mitigated or are de minimis. Additional site characterization activities are required to adequately define the groundwater-specific criteria (i.e., contaminant plume length, status of free product removal, distance to the nearest groundwater or surface water receptor from the plume boundary, and dissolved concentrations of MTBE and benzene).

Please refer to the CSM discussion presented in General Criteria e above for details.

Media-Specific Criteria 2. Petroleum Vapor Intrusion to Indoor Air

The low-threat vapor-intrusion criteria in the Policy apply to release sites and impacted or potentially impacted adjacent parcels when:

(1) existing buildings are occupied or may be reasonably expected to be occupied in the future, <u>or</u>

(2) buildings for human occupancy are reasonably expected to be constructed in the near future.

According to the LTCP, petroleum release sites must be considered low-threat for the vapor-intrusion-to-indoor-air pathway if they satisfy the following media-specific criteria:

- Site-specific conditions satisfy all the assumptions, characteristics, and screening criteria of scenarios 1 through 3 as applicable, or all of the characteristics and screening criteria of scenario 4 of the Policy; <u>or</u>

Media-Specific Criteria 2. Petroleum Vapor Intrusion to Indoor Air (continued)

- A site-specific risk assessment for the vapor intrusion pathway is conducted and demonstrates that human health is protected to the satisfaction of the regulatory agency; <u>or</u>
- As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, the regulatory agency determines that that petroleum vapors migrating from soil or groundwater will have no significant risk of adversely affecting human health.

The land use in the vicinity of the site is mixed commercial and residential with residential homes and an apartment building located immediately adjacent to the northeastern and southeastern property lines, residential and commercial property located across 98th Avenue to the northwest, and a school located across Bancroft Ave approximately 0.15 miles southwest of the site. Therefore, the vapor-intrusion criteria in the Policy must be satisfied to consider the site for low-threat closure under the LTCP.

Both ARCADIS and the USTCF staff use the results of an October 2001 soil gas investigation and Risk Based Corrective Action (RBCA) Tier 1 through 3 evaluations conducted in May 2002, to support their recommendation for site closure. Both the 2001 investigation and the RBCA evaluations were conducted to address the potential for inhalation potential risks from residual subsurface hydrocarbon concentration particularly to off-site residents. ARCADIS and the USTCF staff state that the results of the RBCA study indicate that the theoretical upper-bound incremental lifetime cancer hazard indices associated with levels of TPH, BTEX and MTBE in on-site soils and groundwater are below acceptable risks. Accordingly, it was concluded that no further action is necessary for the protection of human health at the site. However, ACEH has the following concerns regarding the adequacy of 2001 investigation and the 2002 RBCA evaluation:

- The methods used to evaluate the fate and transport of contaminants in the 2002 RBCA evaluation are outdated. The 2002 RBCA evaluations were guided by applicable standards at the time including the American Society for Testing and Materials (ASTM) Standard Guide for Risk-Based Corrective Acton Applied at Petroleum Release Sites (e1739-95e1; ASTM 1999), the Oakland Risk-Based Corrective Acton: Technical Background Document (2000), the Oakland Urban Land Redevelopment Program: Guidance Document (2000), the California Regional Water Quality Control Board – San Francisco Bay Region Application of Risk Based Screening Levels and Decision Making to Sites with Impacted Soil and Groundwater (2001), and the U.S. Environmental Protection Agency's Risk Assessment Guidance for Superfund: Volume 1 – Human Health Evaluation Manual (EPA, 1989). Guidance for collecting soil gas samples and evaluating the risks from vapor intrusion has changed significantly since the 2001 investigation and 2002 RBCA evaluation were conducted.
- Technical justification for the input parameters used in the evaluations is not adequately supported by a CSM, including:
  - **Depth to Groundwater.** The depth to groundwater was assumed to range from 10 to 22 feet bgs; however groundwater elevations at the site have exhibited a rising trend since the evaluations were conducted.
  - **Maximum Soil Concentrations.** Samples collected during the second UST removal in 1998 (SW1, SW2, SW3, SW4) were considered representative of the current soil conditions in the pit area. However, a review of the data indicates that the 1998 samples were collected at 12 feet bgs whereas samples collected from soil beneath the tanks during the 1987 tank removal (A1, A2, B1, and C1) were collected at a depth of 13.5 feet bgs. A concentration of 33 mg/kg (detected at well RW-1 at 25 feet bgs) was used in the RBCA evaluations as the maximum TPH-g concentration in soil; however

Media-Specific Criteria 2. Petroleum Vapor Intrusion to Indoor Air (continued)

our review indicates TPH-g has been detected in six samples (collected at depths ranging from 11 to 25 feet bgs) above 33 mg/kg, up to a maximum concentration of 420 mg/kg at boring A1 at a depth of 13.5 feet bgs. The RBCA also states that TPHg was detected in one deep off-site soil location (AW-4 at 21 feet bgs); however historic soil data indicates that TPHg was also detected in off-site soil location AW-3 at depths of 21 and 26 feet bgs.

- **Groundwater Flow Direction.** A westward flow direction was used in the evaluations; however groundwater flow direction has been variable at the site and has not yet been adequately characterized.
- **Free Product.** The evaluation was based on the assumption that no free product remained at the site. Site characterization activities have not adequately justified this assumption.

Soil Vapor Concentrations. The RBCA evaluations used soil vapor data collected during a 2001 site investigation, to evaluate exposure to the residential properties adjacent to the site. The soil vapor samples used in the evaluation were collected from six borings located adjacent to a sanitary sewer line and thus may have been biased low due to vapor migration in the trench materials.

- The site-specific risk assessment for the vapor intrusion pathway used to satisfy the criteria under the LTCP, should be done in accordance with current industry standards as contained in the California Environmental Protection Agency's Department of Toxic Substances Control (DTSC) Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (October 2011). The DTSC Guidance recommends the following:
  - Use of multiple lines of evidence (i.e., soil gas, soil matrix and groundwater data) to reasonably estimate the level of risk posed by vapor intrusion;
  - Use of maximum contaminant concentration (i.e., data collected above the source);
  - Use of reasonable site-specific input parameters in the California version of USEPA's Vapor Intrusion Model by Johnson and Ettinger, created by the DTSC to include California-specific chemical toxicity factors;
  - Preferential pathways should not exist at the site;
  - Knowledge of adjacent building construction (slab-on-grade, crawl spaces, etc.);
  - Calculation of cumulative health effects;
  - Use of data representing seasonable variability before making a final risk determination as short term measurements rarely represent long-term conditions.

In the absence of an adequate site-specific risk assessment that demonstrates that petroleum vapors migrating from soil or groundwater will have no significant risk of adversely affecting human health, site-specific conditions must satisfy all the assumptions, characteristics, and screening criteria of Scenarios 1 through 3 as applicable, or Scenario 4 of the LTCP.

- Scenarios 1 and 2 pertain to sites with unweathered LNAPL in groundwater. Unweathered LNAPL is defined by the LTCP to mean petroleum product that has not been subjected to significant volatilization or solubilization, and therefore has not lost a

Media-Specific Criteria 2. Petroleum Vapor Intrusion to Indoor Air (continued)

significant portion of its volatile or soluble constituents (e.g., comparable to recently dispensed fuel).

- Scenario 3 provides low threat criteria based on the dissolved phase concentration of benzene in groundwater and characteristics of the bioattenuation zone including oxygen content and separation distance between building foundations and groundwater.

- Scenario 4 provides low threat criteria based on soil gas sampling data for benzene, ethylbenzene, and naphthalene.

Our review of the case files indicates that additional site characterization activities are required in order to define the characteristics of the bioattenuation zone and concentrations of COCs in groundwater (Scenario 3), or soil vapor concentration in soil (Scenario 4), and adequately assess the potential for human health risk due to vapor-intrusion into residential and commercial buildings in the vicinity of the site. Scenarios 1 and 2 do not apply to the site as the primary release occurred prior to 1998. ACEH is concerned about the data representativeness, data quality, spatial distribution relative to current or potential receptors and sources, temporal variability, and resultant conclusions.

Examples of our concerns include:

- **Misrepresentation of Soil Vapor Data.** In the *Case Closure Summary Report*, ARCADIS states that soil vapor slightly exceeded the ESL for TPHg (6.9 parts per million by volume [ppmv]) in two of 18 samples collected in 2001. One sample (B-3-V1) was collected at 5 feet bgs and contained 7.0 ppmv, the second sample (B-1-V2) was collected at 10 feet bgs and contained 9.0 ppmv. ARCADIS fails to identify a third soil vapor sample that exceeded the ESL for TPHg in the sample collected from B-2-V2 at 11 feet bgs. They also fail to identify one sample collected at 15 feet bgs from B-6-V3 that exceeded the ESL for benzene (0.089 ppmv) at a detected concentration of 0.340 ppmv.

- **Lack of Seasonal and Temporal Soil Gas Data.** Our review of the case files indicates that soil gas data is limited to the analytical data collected during the October 2001 investigation only, and therefore does not adequately determine long-term stability of contaminant concentrations.

- **Spatial Distribution of Soil Vapor Data.** Soil vapor samples were collected from six borings (B-1 through B-6) drilled in the eastern and southeastern property boundaries adjacent to a 2-story apartment building and a single story residence in October 2001. Although the locations of the borings were in the vicinity of a sanitary sewer line, no assessment was made on the potential dilution of samples in those locations due to migration of soil gas in the trench materials. Additionally, no borings were advanced along the northern property boundary adjacent to two additional single story residences.
- **Bioattenuation Zone Determination.** Results from preferential pathway and utility conduit surveys need to be presented and evaluated to determine whether a continuous bioattenuation zone is present.
- **Soil Gas Sampling Methodology.** ARCADIS concludes that based on the depth and the years since the samples were collected it is unlikely a soil vapor threat to human health or the environment remains at the site. ACEH is concerned about the lack of discussion of the sampling methodology used to collect the soil gas samples and the validity of the data with respect to current protocols for conducting soil gas investigations in accordance with the DTSC's April 2012 Advisory – Active Soil Gas Investigations.

- **Assessment of all COCs.** There is a lack of an assessment of analytical data for all COCs in soil, including total petroleum hydrocarbons and MTBE, in order to determine whether unique conditions not considered in the Policy may exist at the site.

Please refer to the CSM discussion presented in General Criteria e above for details on the adequacy of site characterization activities with respect to evaluating vapor-intrusion potential.

Media-Specific Criteria 3. Direct Contact and Outdoor Air Exposure.

The LTCP describes conditions where direct contact with contaminated soil or inhalation of contaminants volatized to outdoor air poses a low threat to human health. According to the Policy, release sites where human exposure may occur shall be considered for closure if they meet any of the following media-specific criteria for direct contact and outdoor air exposure:

a. Maximum concentrations of petroleum constituents (i.e., benzene, ethylbenzene, naphthalene, and poly-aromatic hydrocarbons [PAHs]) in soil are less than or equal to those listed in Table 1 of the LTCP for the specified depth bgs;

b. Maximum concentrations of petroleum constituents in soil are less than levels that a site specific risk assessment demonstrates will have no significant risk of adversely affecting human health; <u>or</u>

c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, the regulatory agency determines that the concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health.

As previously described, the land use in the vicinity of the site is mixed commercial and residential with residential homes and an apartment building located immediately adjacent to the northeastern and southeastern property lines, residential and commercial property located across 98th Avenue to the northwest, and a school located across Bancroft Ave approximately 0.15 miles southwest of the site. Therefore, human exposure through direct contact and outdoor air exposure must be evaluated.

ARCADIS and the USTCF staff use the results of the RBCA Tier 1 through 3 evaluations conducted in May 2002, to support their recommendation for site closure. As discussed previously in the Media-Specific Criteria 2 section for Petroleum Vapor Intrusion to Indoor Air**,** ACEH has concerns regarding the adequacy of the 2002 RBCA evaluations and technical justification of input parameters. T

Therefore, in lieu of an adequate site-specific risk assessment that demonstrates that maximum concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health, maximum concentrations of petroleum constituents in soil must meet the soil criteria for the prescribed depth ranges of 0 to 5 feet and 5 to 10 feet bgs listed in Table 1 of the Policy. The USTCF use analytical data from soil boring SB-1 to support their evaluation that the maximum concentrations in soil are less than those in Table 1 of the Policy. However, our review of this data indicates that this boring is located off-site and that on-site analytical data for the 0 to 5 and 5 to 10 foot intervals is not sufficient to make the determination that the case meets the Policy Criterion 2b.

Our review of the case files indicates that additional site characterization activities are required in order to adequately assess the potential for direct contact and outdoor air exposure to residential, commercial, and utility workers and determine that soil concentrations are protective of ingestion of soil, dermal contact with soil, inhalation of volatile soil emissions, and inhalation of particulate emissions. The assessment should present analytical data for all COCs in soil, including total petroleum hydrocarbons and MTBE, in order to assess whether unique conditions not considered in the Policy may exist at the site.

Please refer to the CSM discussion presented in General Criteria e above for details on the adequacy of site characterization activities.

Path to Closure Plan

ACEH believes that the data gaps identified above can be largely addressed in a single comprehensive effort which may then either allow the site to close under the LTCP, or identify conditions that require further investigation in order to support closure under the LTCP.

In accordance with the SWRCB's *Plan for Implementation of Low-Threat UST Case Closure Policy and Additional Program Improvements*, ACEH has been working with ARCO and it's consultants on other cases under regulatory oversight by ACEH, to develop strategies for moving other ARCO UST sites under regulatory oversight by ACEH towards closure under the LTCP in an efficient and appropriate manner. These strategies include preparation of baseline schedules with proposed milestones and timelines for resolution of impediments to closure including preparation of updated CSM's to identify data gaps warranting further investigation, and or support the validity of site data, technical analysis, and recommendations for case closure under the LTCP.

ACEH recommends that a similar Path to Closure Plan be developed for the subject site to address the data gaps discussed in our analysis above.

Conclusions

The evaluations presented in the Fund's *UST Case Closure Summary*, dated August 31, 2012 and *UST Case Closure Review Summary Report*, dated December 16, 2012, and ARCADIS' *Case Closure Summary Closure Report*, dated November 11, 2011, fail to demonstrate that this site meets the criteria for the LTCP. The technical analysis conducted by the USTCF staff and Contractor, and ARCADIS conflicts with "state-of-the-art" practices recommended by multiple technical resources, including the SWRCB's CA LUFT Manual, which has been revised in part to provide guidance for analysis of candidate sites for closure under the LTCP. While ACEH recognizes that the LTCP allows for exceptions, the subject site has not been characterized to the extent required by the policy, as presented in detail in this response letter and in conversations with the USTCF staff. The recommended closure is not supported by a valid CSM or technical analysis and therefore does not provide the requisite assurances that owners and occupants of property potentially impacted by the petroleum release are protected from contaminants that have migrated off-site as required by the LTCP.

Consequently ACEH recommends that the SWRCB not concur with closure at this time, the CSM be updated, the data gaps be addressed as identified above, a data gap work plan be prepared and submitted to ACEH for review and approval, and the work be conducted in order to move the site towards closure under the LTCP in an appropriate manner.

Thank you for providing ACEH with the opportunity to comment on the subject site. Should you have any questions regarding the responses above, please contact me at (510) 567-6767 or send me an electronic mail message at dilan.roe@acgov.org.

Sincerely,

Dilan Roe

Dilan Roe, P.E.
LOP Supervisor

Attachments: Attachment 1 – Free Product Data for Well MW-1
Attachment 2 – Free Product Data for Well RW-1
Attachment 3 – Site Remediation and Monitoring Well Network
Attachment 4 – Submerged/Dry Well Statistics
Attachment 5 – Historic Groundwater Flow Direction and Contaminant Plume
Attachment 6 – SWRCB Public Notification Map and List of Owners and Tenants
Attachment7 – ACEH Identification of Appropriate Public Notification Map and List of Owners and Tenants
Attachment 8 – SWRCB LTCP Paper Checklist

cc: Mr. Terry Grayson, ConocoPhillips, 76 Broadway Street, Sacramento, CA 95818

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Donna Drogos, (sent via electronic mail to donna.drogos@acgov.org)
Dilan Roe (sent via electronic mail to dilan.roe@acgov.org)
Electronic File, GeoTracker

Attachment 1

Table 1 – Free Product Data for Well MW-1

Table 1 - Free Product Data for Well MW-1

Former BP Station #11133, 2220 98th Avenue, Oakland, CA 94603

Fuel Leak Case No. RO0000403, GeoTracker Global ID T0600100210, USTCF Claim No. 5502

Date Sampled	Free Product Thickness (feet)	Depth to Water (feet)	Well Submerged[1] (Y/N)	Product Removed (gallons)
12/21/1988	>3	15.86		
1/17/1988	2.5	15.46		
2/15/1989	1.08	15.17		
1/24/1990	0.2	18.07		
7/5/1990	0.22	13.31		
4/5/1991	0.22	13.31		
6/1/1991	GLOBULES	14.76		
4/1/1992	~~0.00~~ 0.01	11.25		
7/6/1992	~~0.00~~ 0.02	13.61		
10/7/1992	~~0.00~~ 0.09	15.15		
1/14/1993	~~0.00~~ 0.01	10.73		
4/22/1993	~~0.00~~ 0.16	11.64		
7/15/1993	~~0.00~~ 1.11	13.50		
10/20/1993			?	0.10
10/21/1993	~~0.00~~ 1.00	15.21		
11/10/1993			?	0.10
1/27/1994	~~0.00~~ 0.81	17.48		
4/21/1994	0.00	10.94		
9/9/1994			?	SHEEN
9/19/1994	~~0.00~~ SHEEN	13.80		
10/26/1994			?	SHEEN
11/16/1994			?	SHEEN
12/21/1994	~~0.00~~ 0.02	12.60		0.25
1/30/1995	NM	NM	?	
2/8/1995			?	0.00
4/10/1995	0.00	10.62		0.25
6/29/1994	0.00	18.72		SHEEN
9/18/1995	0.00	12.92		SHEEN
12/7/1995	0.00	13.82		SHEEN
3/28/1996	~~0.00~~ 0.01	10.03		<0.001
6/20/1996	~~0.00~~ 0.02	11.29		SHEEN
10/11/1996	~~0.00~~ 0.01	14.86		<0.001
1/2/1997	~~0.00~~ 0.01	11.03		<0.01
4/14/1997	~~0.00~~ 0.01	12.25		<0.01
4/15/1997	NM	NM	?	
7/2/1997	0.00	14.11		<0.01
9/30/1997	0.00	14.40		
1/21/1998	~~0.00~~ 0.01	7.99	Y	<0.01
4/9/1998	0.00	7.89	Y	
4/10/1998	NM	NM	?	
6/19/1998	0.00	10.31		<0.01
11/30/1998	0.00	11.16		0.00
1/21/1999	0.00	10.76		SHEEN
4/30/1999	0.00	10.78		SHEEN
7/9/1999	0.00	12.62		SHEEN
11/3/1999	0.00	14.00		0.00
1/12/2000	0.00	15.25		0.00

Table 1 - Free Product Data for Well MW-1
Former BP Station #11133, 2220 98th Avenue, Oakland, CA 94603
Fuel Leak Case No. RO0000403, GeoTracker Global ID T0600100210, USTCF Claim No. 5502

Date Sampled	Free Product Thickness (feet)	Depth to Water (feet)	Well Submerged[1] (Y/N)	Product Removed (gallons)
4/13/2000	0.00	15.57		0.00
5/24/2000	0.00	11.75		0.00
6/1/2000			?	0.00
6/8/2000	0.00	11.68		0.00
6/15/2000	0.00	11.85		0.00
6/21/2000	0.00	11.41		
7/26/2000	0.00	16.19		
10/24/2000	0.00	13.89		
1/19/2001	0.00	12.90		
7/24/2001	0.00	13.55		
1/18/2002	0.00	10.91		
8/1/2002	0.00	12.97		
1/16/2003	0.00	10.45		
7/7/2003	~~0.00~~ SHEEN	12.40		
2/5/2004	0.00	10.26		
7/1/2004	~~0.00~~ SHEEN	13.20		
3/16/2005	0.00	9.62	Y	
7/22/2005	~~0.00~~ SHEEN	11.23		
1/25/2006	~~0.00~~ SHEEN	8.75	Y	
7/6/2006	0.00	10.36		
1/8/2007	0.00	11.55		
7/10/2007	~~0.00~~ SHEEN	13.01		
1/15/2008	0.00	10.96		
7/15/2008	0.00	13.82		
10/21/2008	0.00	14.70		
1/6/2009	0.00	13.67		
4/21/2009	0.00	12.31		
7/21/2009	0.00	13.85		
3/18/2010	~~0.00~~ SHEEN	9.29	Y	
7/29/2010	0.00	12.63		
2/22/2011	0.00	15.72		
5/9/2011	0.00	8.03	Y	
7/14/2011	0.00	10.96		

Notes:

[1] MW-1 Screen Interval - 10 to 29 feet below ground surface

Highligted data not presented/evalauted by ARCADIS and Broadbent

Strikethrough data misreported by ARCADIS and Broadbent

Attachment 2

Table 2 – Free Product Data for Well RW-1

Table 2 - Free Product Data for Well RW-1
Former BP Station #11133, 2220 98th Avenue, Oakland, CA 94603
Fuel Leak Case No. RO0000403, GeoTracker Global ID T0600100210, USTCF Claim No. 5502

Date Sampled	Free Product Thickness (feet)	Depth to Water (feet)	Well Submerged (Y/N)	Product Removed (gallons)
7/5/1990	1.21			
4/5/1991	NS (Due to presence of free product)			
4/1/1992	~~0.00~~ 0.30	22.81		
7/6/1992	~~0.00~~ 0.41	26.92		
10/7/1992	~~0.00~~ 1.26	28.51		
1/14/1993	~~0.00~~ 0.25	23.75		
4/22/1993	~~0.00~~ 1.38	22.70		
7/15/1993	~~0.00~~ 0.81	26.10		
10/6/1993			?	1.00
10/21/1993	~~0.00~~ 0.49	25.40		
1/27/1994	~~0.00~~ 0.37	28.02		
4/21/1994	~~0.00~~ 0.91	23.10		
9/19/1994	~~0.00~~ 1.04	24.39		
10/14/1994			?	1.00
10/20/1994			?	18.00
10/26/1994			?	3.00
11/2/1994			?	5.00
11/10/1994			?	6.00
11/16/1994			?	2.50
11/23/1994			?	5.00
11/30/1994			?	2.00
12/7/1994			?	4.00
12/17/1993			?	1.50
1/4/1994			?	5.00
1/12/1994			?	3.50
1/20/1994			?	2.50
2/11/1994			?	4.00
2/18/1994			?	3.50
2/25/1994			?	3.00
3/4/1994			?	3.50
3/18/1994			?	5.50
3/30/1994			?	4.00
4/13/1994			?	4.60
4/21/1994			?	4.20
4/29/1994			?	4.50
5/6/1994			?	5.50
5/13/1994			?	3.50
5/20/1994			?	3.50
5/26/1994			?	4.50
6/2/1994			?	3.50
6/9/1994			?	2.50
6/16/1994			?	3.50
6/23/1994			?	4.00
6/29/1994			?	2.50
7/7/1994			?	2.00
7/12/1994			?	3.00
7/20/1994			?	1.50

Table 2 - Free Product Data for Well RW-1
Former BP Station #11133, 2220 98th Avenue, Oakland, CA 94603
Fuel Leak Case No. RO0000403, GeoTracker Global ID T0600100210, USTCF Claim No. 5502

Date Sampled	Free Product Thickness (feet)	Depth to Water (feet)	Well Submerged (Y/N)	Product Removed (gallons)
7/20/1994			?	1.50
7/29/1994			?	3.50
8/5/1994			?	1.50
8/12/1994			?	2.00
8/18/1994			?	2.50
9/9/1994			?	3.50
9/16/1994			?	4.00
9/23/1994			?	2.00
12/7/1994			?	0.00
12/21/1994	NM	NM		
1/30/1995	~~0.00~~ 1.04	25.71		
4/10/1995				
6/29/1994				
9/18/1995				
12/7/1995				
3/28/1996	~~0.00~~ 0.18	16.75		0.01
6/20/1996	~~0.00~~ 0.02	25.10		0.00
10/11/1996	0.00	25.51		
1/2/1997	~~0.00~~ 0.01	24.49		
4/14/1997	~~0.00~~ 0.04	23.99		<0.05
4/15/1997	NM	NM		
7/2/1997	~~0.00~~ 0.02	16.40		0.25
9/30/1997	0.00	27.97		<0.01
1/21/1998	~~0.00~~ 0.44	14.14	Y	0.50
4/9/1998	~~0.00~~ 0.05	25.01		
4/10/1998	NM	NM		0.09
6/19/1998	0.00	11.43	Y	<0.01
11/30/1998	0.00	7.87	Y	0.00
1/21/1999	0.00	18.90		0.00
4/30/1999	1.60	16.80		0.11
7/9/1999	0.00	18.58		0.00
11/3/1999	0.00	20.85		1.06
1/12/2000	0.00	21.20		0.53
2/14/2000				0.13
3/20/2000				0.00
4/13/2000	0.00	21.71		0.26
4/26/2000				0.00
5/17/2000				0.00
5/24/2000	0.00	21.89		0.53
6/1/2000				0.00
6/8/2000	0.00	17.88		0.26
6/15/2000	0.00	16.72		0.13
6/20/2000	0.00	21.04		0.53
6/21/2000	0.00	16.30		
6/28/2000	0.00			
7/7/2000	0.00	17.21		0.01
7/20/2000	0.00	21.87		0.11

Table 2 - Free Product Data for Well RW-1
Former BP Station #11133, 2220 98th Avenue, Oakland, CA 94603
Fuel Leak Case No. RO0000403, GeoTracker Global ID T0600100210, USTCF Claim No. 5502

Date Sampled	Free Product Thickness (feet)	Depth to Water (feet)	Well Submerged (Y/N)	Product Removed (gallons)
7/26/2000	0.00	21.45		0.13
7/31/2000	0.00	22.11		0.00
8/8/2000	0.00	17.80		0.01
8/16/2000	0.00	17.92		0.00
8/23/2000	0.00	18.11		0.13
8/31/2000				0.40
9/8/2000				0.53
9/25/2000				0.01
10/24/2000	0.00	18.93		0.00
10/25/2000	0.00	19.04		
1/19/2001	0.00	18.19		0.11
2/14/2001				0.01
3/20/2001				0.13
4/26/2001				0.00
5/17/2001				0.00
6/28/2001				0.00
7/24/2001	0.00	17.93		0.00
9/21/2001				0.01
10/23/2001				0.00
11/30/2001				0.00
1/18/2002	0.00	14.87	Y	0.00
2/7/2002				0.00
8/1/2002	0.00	16.84		
1/16/2003	0.00	14.42	Y	
7/7/2003	~~0.00~~ SHEEN	16.11		
2/5/2004				
7/1/2004	0.00	16.75		
3/16/2005	0.00	12.48	Y	
7/22/2005	~~0.00~~ HEAVY SHEEN	14.40	Y	
1/25/2006	0.00	12.00	Y	
7/6/2006	0.00	13.01	Y	
1/8/2007	0.00	14.75	Y	
7/10/2007	0.00	16.21		
1/15/2008	0.00	14.63	Y	
7/15/2008	0.00	17.04		
10/21/2008	0.00	18.44		
1/6/2009	0.00	17.50		
4/21/2009	0.00	15.37		
7/21/2009	0.00	17.20		
3/18/2010	~~0.00~~ SHEEN	12.87	Y	
7/29/2010	0.00	15.90		
11/12/2010	0.00	17.25		
2/22/2011	0.00	12.60	Y	
5/9/2011			Y	
7/14/2011	0.00	13.87	Y	

Table 2 - Free Product Data for Well RW-1
Former BP Station #11133, 2220 98th Avenue, Oakland, CA 94603
Fuel Leak Case No. RO0000403, GeoTracker Global ID T0600100210, USTCF Claim No. 5502

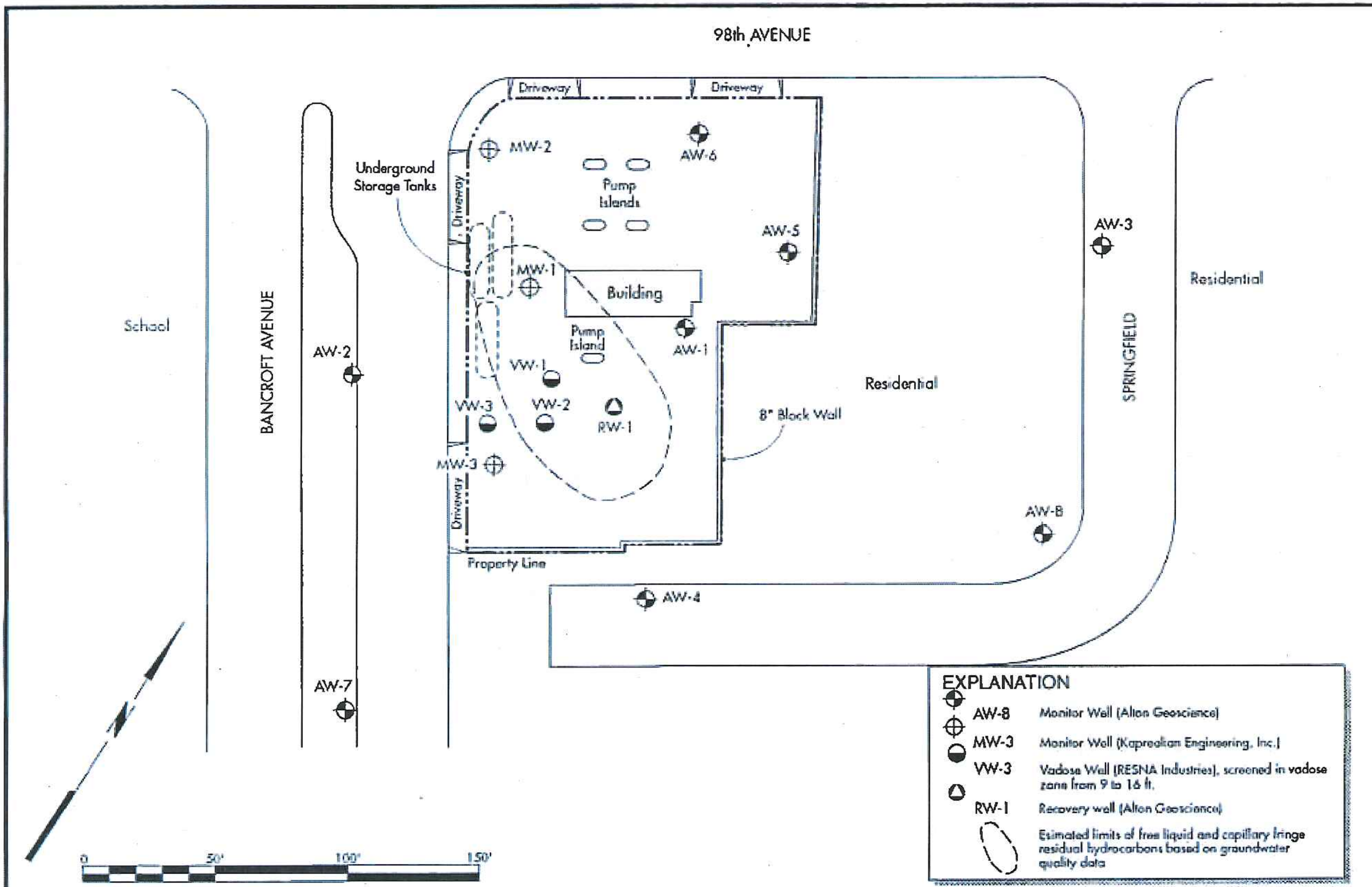
Date Sampled	Free Product Thickness (feet)	Depth to Water (feet)	Well Submerged (Y/N)	Product Removed (gallons)

Notes:

[1] RW-1 Screen Interval - 15 to 40 feet below ground surface

Highligted data not presented/evalauted by ARCADIS and Broadbent

Strikethrough data misreported by ARCADIS and Broadbent



RESNA

PROJECT NO. 32006.03 | 12/92

ESTIMATED LIMITS OF FLOATING AND RESIDUAL HYDROCARBONS

BP Facility No. 11133
2220 98th Avenue
Oakland, California

PLATE
4

FIGURE 1

Attachment 3

Table 3 – Site Remediation and Monitoring Well Network

Table 3 – Site Remediation and Monitoring Well Network
Former BP Station #11133, 2220 98th Avenue, Oakland, CA 94603
Fuel Leak Case No. RO0000403, GeoTracker Global ID T0600100210, USTCF Claim No. 5502

Well No.	Date Installed	Screen Interval (feet bgs)	Screen Length (feet)	Well Stratigraphy (USCS Description)	Type of Well	Location
MW-1	May 1988	~~NA~~ 10 to 29	19	CL, CH	Groundwater Monitoring	On-site
MW-2	May 1988	~~NA~~ 12 to 32	20	CL, SC, CH	Groundwater Monitoring	On-site
MW-3	May 1988	~~NA~~ 14 to 34	20	SC, CL	Groundwater Monitoring	On-site
AW-1	~~April 1991~~ June 1990	~~NA~~ 15 to 35	20	ML, SC	Groundwater Monitoring	On-site
AW-2	~~April 1991~~ June 1990	~~NA~~ 20 to 40	20	CL, SC	Groundwater Monitoring	Off-site
AW-3	~~April 1991~~ June 1990	~~NA~~ 15 to 35	20	CL	Groundwater Monitoring	Off-site
AW-4	~~April 1991~~ June 1990	~~NA~~ 15 to 35	20	CL	Groundwater Monitoring	Off-site
AW-5	April 1991	~~NA~~ 20 to 45	25	SM, CL	Groundwater Monitoring	On-site
AW-6	April 1991	~~NA~~ 20 to 35	15	SM, CL	Groundwater Monitoring	On-site
AW-7	April 1991	~~NA~~ 20 to 35	15	CL	Groundwater Monitoring	Off-site
AW-8	April 1991	~~NA~~ 20 to 40	20	SM, SC, CL	Groundwater Monitoring	Off-site
AW-9	January 1997	~~NA~~ 12 to 28	16	SM, GM-GC	Groundwater Monitoring	Off-site
RW-1	~~1994~~ June 1990	~~NA~~ 15 to 40	25	ML, SC, CL	Groundwater Extraction	On-site
VW-1	~~1994~~ March 1992	~~NA~~ 9 to 16	7	ML, GM	Vapor Extraction	On-site
VW-2	~~1994~~ March 1992	~~NA~~ 9 to 16	7	CL, SM, SW	Vapor Extraction	On-site
VW-3	~~1994~~ March 1992	~~NA~~ 9 to 16	7	CL	Vapor Extraction	On-site
VEW-4	1994	~~NA~~ (5 to 20)*	NA	NA	Vapor Extraction	On-site
VEW-5	1994	~~NA~~ (5 to 20)*	NA	NA	Vapor Extraction	On-site
VEW-6	1994	~~NA~~ (5 to 20)*	NA	NA	Vapor Extraction	On-site
VEW-7	1994	~~NA~~ (5 to 20)*	NA	NA	Vapor Extraction	On-site
VEW-8	1994	~~NA~~ (5 to 20)*	NA	NA	Vapor Extraction	On-site
VEW-9	~~January 2008~~ May 1996	~~NA~~ 6 to 20	14	ML, CL, SC	Vapor Extraction	Off-site
IW-1	September 2010	20 to 40	20	CL, SM-SC, ML-SC	Injection Well (Pilot Test)	On-site
IW-2	September 2010	20 to 40	20	SM-SC, CL, ML, SC	Injection Well (Pilot Test)	On-site
IW-3	September 2010	20 to 40	20	CL, SM, ML-CL, ML	Injection Well (Pilot Test)	On-site
OW-1	September 2010	20 to 40	20	ML	Observation Well (Pilot Test)	On-site

Notes:

Shaded – Additional data not included in USTCF Monitoring Well Information Table

Strikethrough – Inaccurate data presented in USTCF Monitoring Well Information Table

NA – Information Not Available

USCS – United Soil Classification System Description

* No boring/well logs or well installation report in case files. Depths and screen intervals based on information presented in the Work Plan for Installation of Vapor Extraction Wells (Alisto, 1994)

Attachment 4

Table 4 – Submerged/Dry Well Statistics

Table 4 - Submerged/Dry Well Statistics
Former BP Station #11133, 2220 98th Avenue, Oakland, CA 94603
Fuel Leak Case No. RO0000403, GeoTracker Global ID T0600100210, USTCF Claim No. 5502

Well ID	Location	# of Sampling Events	# of Events with Submerged Wells	# of Events with Dry Wells	Percent of Events Submerged (%)	Percent of Events Dry (%)	Notes
Groundwater Monitoring & Extraction Wells							
AW-1	On-site	70	4		6%	0%	3/5 events since 2010
AW-2	Off-site	59	47		80%	0%	5/5 events since 2010
AW-3	Off-site	65	24		37%	0%	3/5 events since 2010
AW-4	Off-site	65	4		6%	0%	1/5 events since 2010
AW-5	On-site	63	32		51%	0%	5/5 events since 2010
AW-6	On-site	61	48		79%	0%	5/5 events since 2010
AW-7	Off-site	36	19		53%	0%	Since 1,100 ug/L of MTBE detected in 9/30/1997, well was submerged in all subsequent monitoring events with ND
AW-8	Off-site	45	35		78%	0%	Since 820 ug/L of MTBE detected in 9/30/1997, well was submerged in all subsequent monitoring events with ND
AW-9	Off-site	19	4		21%	0%	4/6 events submerged before determining no off-site impacts
MW-1	On-site	63	6		10%	0%	2/5 events since 2010
MW-2	On-site	62	46		74%	0%	5/5 events since 2010
MW-3	On-site	63	21		33%	0%	4/5 events since 2010
RW-1	On-site	67	13		19%	0%	3/5 events since 2010
Vapor Extraction Wells							
VEW-4	On-site	11	0	1	0%	9%	depth to water greater than 20 feet
VEW-5	On-site	12	0	11	0%	92%	
VEW-6	On-site	11	0	0	0%	0%	
VEW-7	On-site	11	0	0	0%	0%	
VEW-8	On-site	12	0	5	0%	42%	
VEW-9	Off-site	10	3	4	30%	40%	
VW-1	On-site	11	0	9	0%	82%	
VW-2	On-site	11	11		100%	0%	All events since 2008
VW-3	On-site	11	11		100%	0%	All events since 2008
Pilot Test Injection and Observation Wells							
IW-1	On-site	1	1		100%	0%	
IW-2	On-site	1	1		100%	0%	
IW-3	On-site	1	1		100%	0%	
OW-1	On-site						

Notes:
Highlighted Data - Off site wells

Attachment 5

Table 5 – Historic Groundwater Flow Direction Data

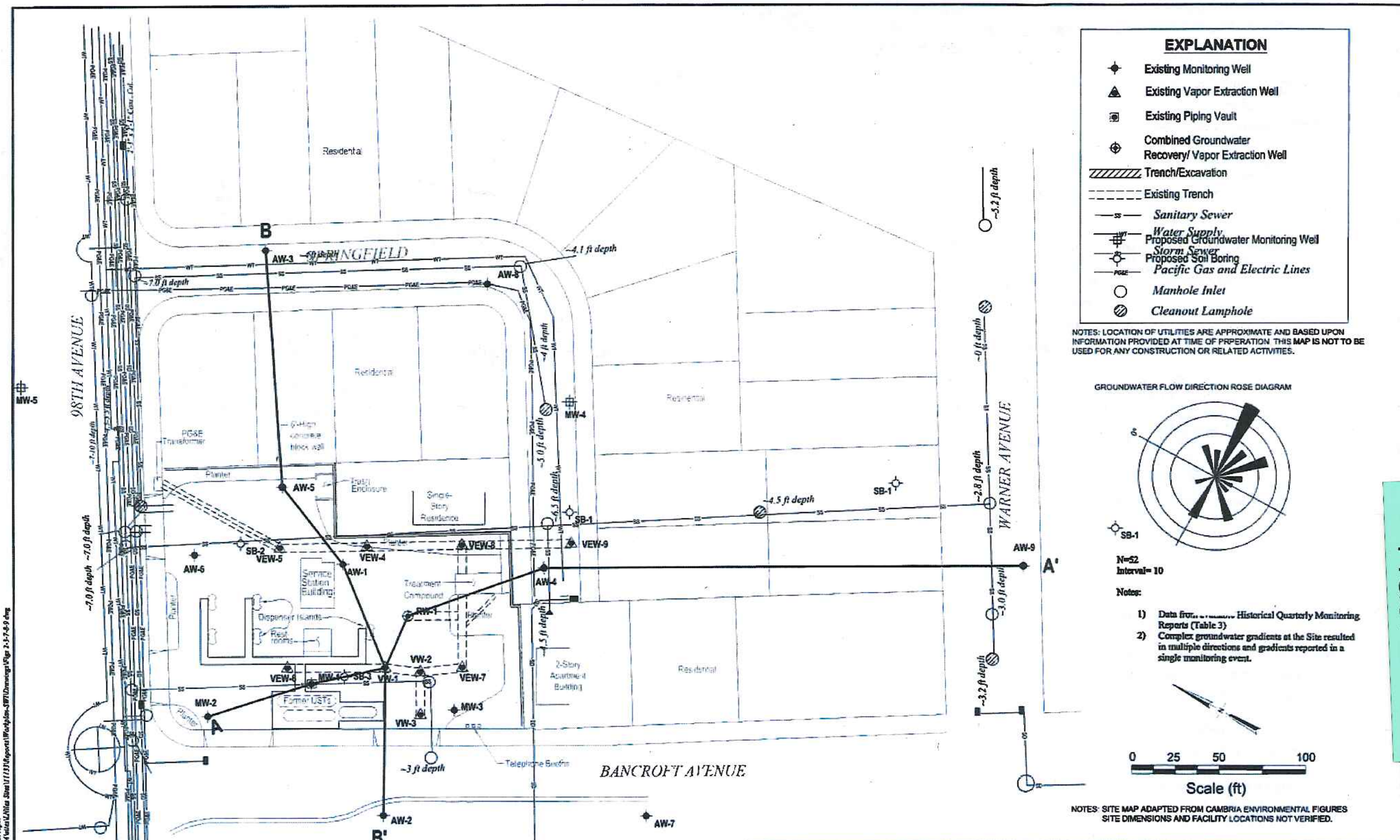
Table 5 – Historic Groundwater Flow Direction Data
Former BP Station #11133, 2220 98th Avenue, Oakland, CA 94603
Fuel Leak Case No. RO0000403, GeoTracker Global ID T0600100210, USTCF Claim No. 5502

Date Measured	Flow Direction	Hydraulic Gradient (feet/feet)
02/15/1989	Westerly	NA
07/05/1990	West	0.01
04/05/1991	Southerly	0.08
6/28/1991	Radially inward towards site, southwest	0.01
9/26/1991	Radially inward towards site, southwest	0.03
12/11/1991	Radially inward towards site, southwest	0.015
04/01/992	Radially inward towards site	NA
07/06/1992	Radially outward from site	0.04
10/07/1992	Radially inward towards and outward from site, South-southeast	0.022 to 0.13
01/14/1993	Radially inward towards and outward from site, South-southeast	0.05 to 0.3
4/22/1993	Radially inward towards and outward from site, South-southeast	0.20
07/15/1993	Radially inward towards and outward from site, South-southeast	0.10 to 0.20
10/21/1993	Radially inward towards and outward from site, South-southeast	0.13 to 0.15
01/27/1994	Radially inward towards and outward from site, South-southeast	0.13 to 0.2
04/21/1994	Radially inward towards and outward from site, South-southeast	0.13
09/09/1994	Radially inward towards and outward from site, South-southeast	0.10
12/21/1994	Radially inward towards and outward from site, South-southeast	0.07
01/30/1995	Radially inward towards and outward from site, South-southeast	0.06
04/10/1995	Radially inward towards and outward from site, South-southeast	0.07
06/29/1995	Radially inward towards and outwards from site	0.14
09/18/1995		
12/07/1995	Southeast	0.11
03/28/1996	East	0.05
06/20/1996	East	0.07
06/20/1996	West	0.04
10/11/1996	East	0.06
01/02/1997	East	0.15
04/14/1997	East	0.08
07/02/1997	East-northeast	0.05
09/30/1997		
01/21/1998	Southeast	0.04
04/09/1998		
06/19/1998		
11/30/1998		
01/21/1999		
04/30/1999		
07/09/1999		
11/03/1999		
01/12/2000	East	0.07
01/12/2000	West	0.07
04/13/2000	East	0.05
04/13/2000	Southwest	0.05
07/26/2000	Southwest	0.03

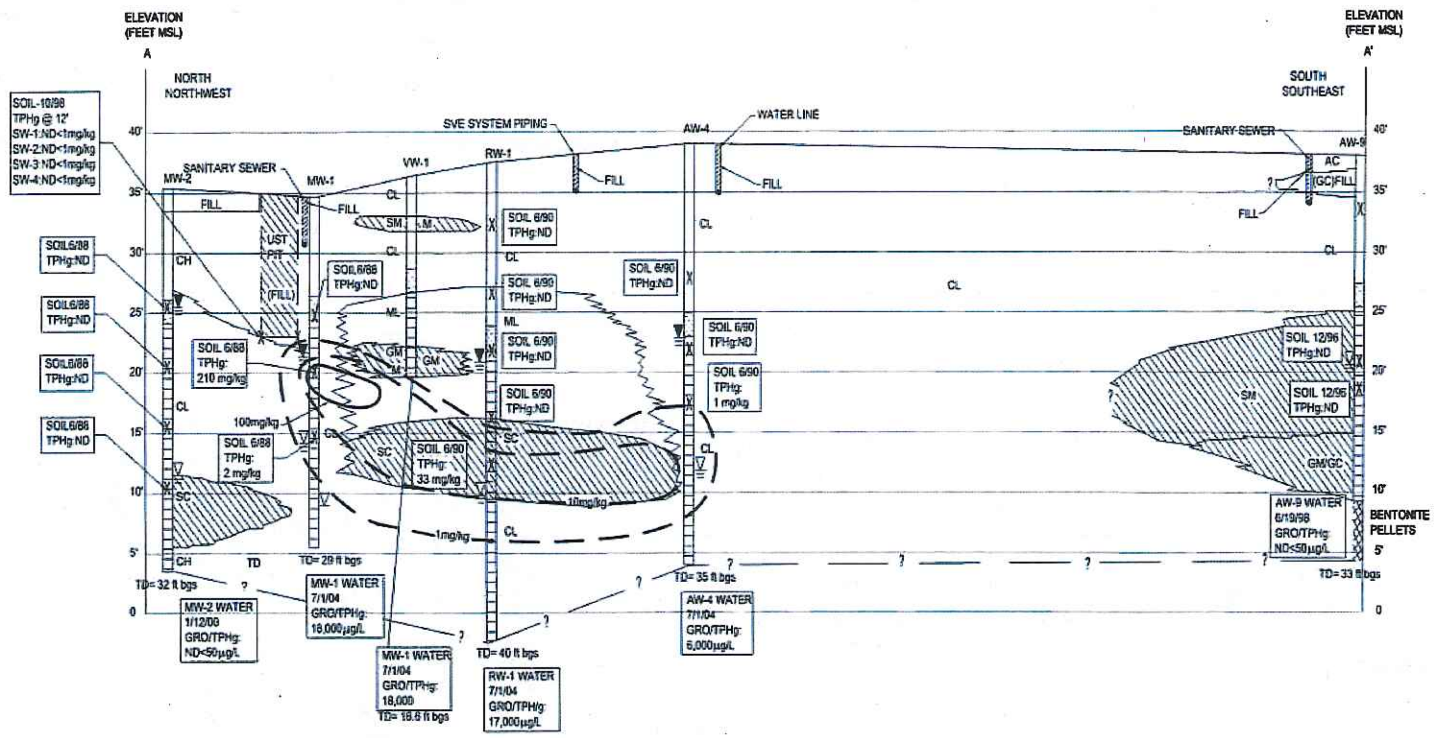
Date Measured	Flow Direction	Hydraulic Gradient (feet/feet)
10/24/2000	Southeast	0.04
01/19/2001	East-southeast	0.04
07/24/2001	East	0.08
07/24/2001	West	0.03
01/18/2002	West	0.04
08/01/2002	East	0.05
08/01/2002	Southwest-southwest	0.04
01/16/2003	East-southeast	0.06
01/16/2003	West	0.02
03/14/2003	East	0.06
03/14/2003	West	0.02
02/05/2004	Southwest	0.03
02/05/2004	Northwest	0.06
07/07/2003	Southwest	0.03
07/07/2003	East	0.08
02/05/2004	Variable: Southwest to Northeast	Variable: 0.03 to 0.06
07/01/2004	Southwest	0.03
07/01/2004	East	0.08
03/16/2005	Variable: Southwest to Northeast	Variable: 0.03 to 0.08
07/22/2005		
01/25/2006	Variable: East to Southeast	0.03 to 0.09
07/06/2006	Variable: East to West towards Center	0.04 to 0.05
01/08/2007	Variable: East to West towards Center	0.03 to 0.05
07/10/2007	West	0.01
01/15/2008	West-Southwest	0.006
07/15/2008	West-Southwest	0.01
10/21/2008	West-Southwest	0.01
01/06/2009	West	0.009
04/21/2009	West	0.01
07/21/2009	West	0.01
03/18/2010	West	0.008
07/29/2010	West	0.008
11/12/2010	West-Southwest	0.01
02/22/2011	Variable: North to West	0.03 to 0.04
07/14/2011	West	0.01

Notes:

Shaded data not presented in Case Closure Summary Report prepared by ARCADIS



URS	Project No. 38486823 Former BP Service Station #11133 2220 98th Avenue Oakland, California	SITE MAP WITH CROSS SECTION TRANSECTS AND UNDERGROUND UTILITIES	FIGURE 3



EXPLANATION

- WELL CASING
- FILTER PACK INTERVAL
- SCREENED INTERVAL
- FIRST ENCOUNTERED WATER WHILE DRILLING
- STATIC WATER LEVEL IN COMPLETED WELL, JULY 1, 2004
- MSL — FEET ABOVE MEAN SEA LEVEL
- X-SOIL-TPH-G 0.018mg/kg — SOIL SAMPLE ANANYTICAL RESULTS IN MILLIGRAMS PER KILOGRAM
- WATER-GRO/TPH-G 75 µg/L — WATER SAMPLE ANANYTICAL RESULTS IN MICROGRAMS PER LITER
- LITHOLOGY CONTACT; INFERRED WHERE DASHED OR QUERIED
- UST EXCAVATION; BACKFILLED WITH GRAVEL
- GP= GRAVEL, GW= GRAVEL, SP= SAND, SW=SAND — HIGH PERMEABILITY
- SM=SILTY SAND, GM=SILTY GRAVEL, GC=CLAYEY GRAVEL, SC=CLAYEY SAND — MODERATE PERMEABILITY
- ML=SILT, CL=CLAY, CH=CLAY — LOW PERMEABILITY
- UTILITY LINE BACKFILLED TRENCH
- 10 mg/kg — ISOCONCENTRATION CONTOUR, TPH-g IN mg/kg

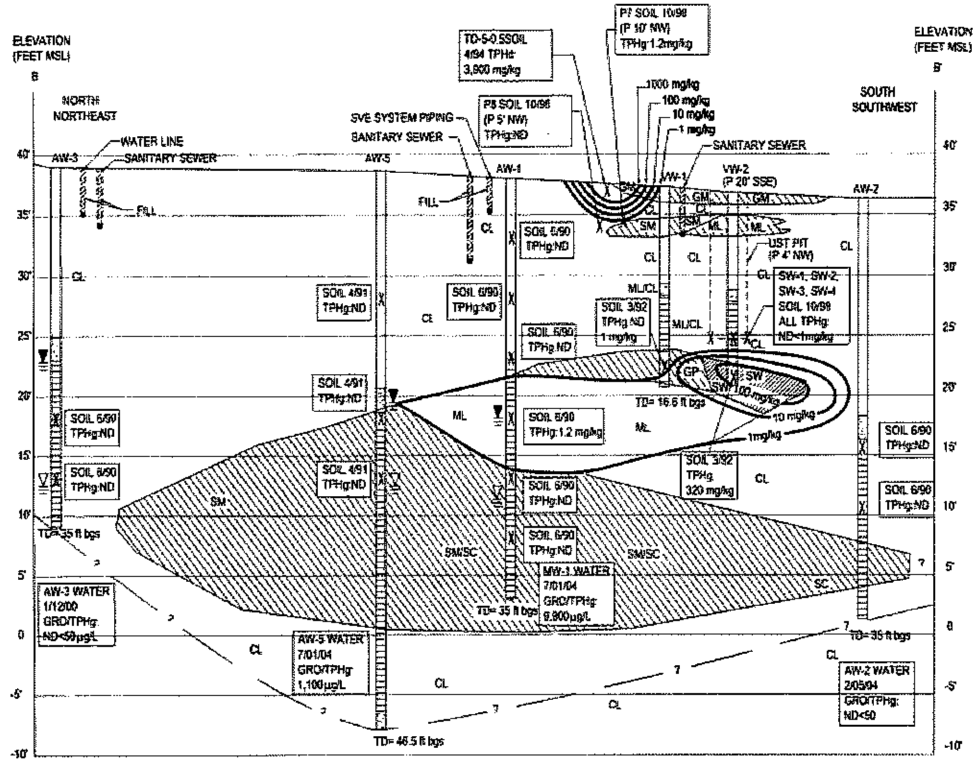
0 50 100 HORIZONTAL SCALE IN FEET

0 10 20 VERTICAL SCALE IN FEET

URS	Project No. 38486828 Former BP Service Station #11133 2220 98th Avenue Oakland, California	HYDROGEOLOGIC CROSS-SECTION A-A'	FIGURE 4

FIGURE 3

X:\X_env_waste\BP GEM\sites\LHiles Sites\11133\Reports\Workplan-SW\Drawings\SCM Figures\fig4-5.dwg



EXPLANATION

(P 20' SSE)	BORING IS PROJECTED, WITH DISTANCE IN FEET AND DIRECTION FROM CROSS-SECTION LINE.
	WELL CASING
	FILTER PACK INTERVAL
	SCREENED INTERVAL
▽	FIRST ENCOUNTERED WATER WHILE DRILLING
▼	STATIC WATER LEVEL IN COMPLETED WELL JULY 1, 2004
MSL	FEET ABOVE MEAN SEA LEVEL
X-SOIL-TPH-G 0.018mg/kg	SOIL SAMPLE ANANYTICAL RESULTS IN MILLIGRAMS PER KILOGRAM
WATER-GRO/TPH-G .75 µg/L	WATER SAMPLE ANANYTICAL RESULTS IN MICROGRAMS PER LITER
? CL SM	LITHOLOGY CONTACT; INFERRED WHERE DASHED OR QUERIED
	UST EXCAVATION: BACKFILLED WITH GRAVEL
	GP= GRAVEL GW= GRAVEL } HIGH PERMEABILITY SP= SAND SW-SAND
	SM=SILTY SAND GM=SILTY GRAVEL GC=CLAYEY GRAVEL } SC=CLAYEY SAND MODERATE PERMEABILITY
	ML=SILT CL=CLAY } LOW PERMEABILITY CH=CLAY
	UTILITY LINE BACKFILLED TRENCH
10 mg/kg	ISOCONCENTRATION CONTOUR, TPH-g IN mg/kg

0 50 100
HORIZONTAL SCALE IN FEET

0 10 20
VERTICAL SCALE IN FEET

URS	Project No. 38486828 Former BP Service Station #11133 2220 98th Avenue Oakland, California	HYDROGEOLOGIC CROSS-SECTION B-B'	FIGURE 5

FIGURE 4

X:\x_env_waste\BP OEM\sites\LNites Sites\11133\Reports\Workplan-SW\Drawings\SCM Figures\fig4-5.dwg

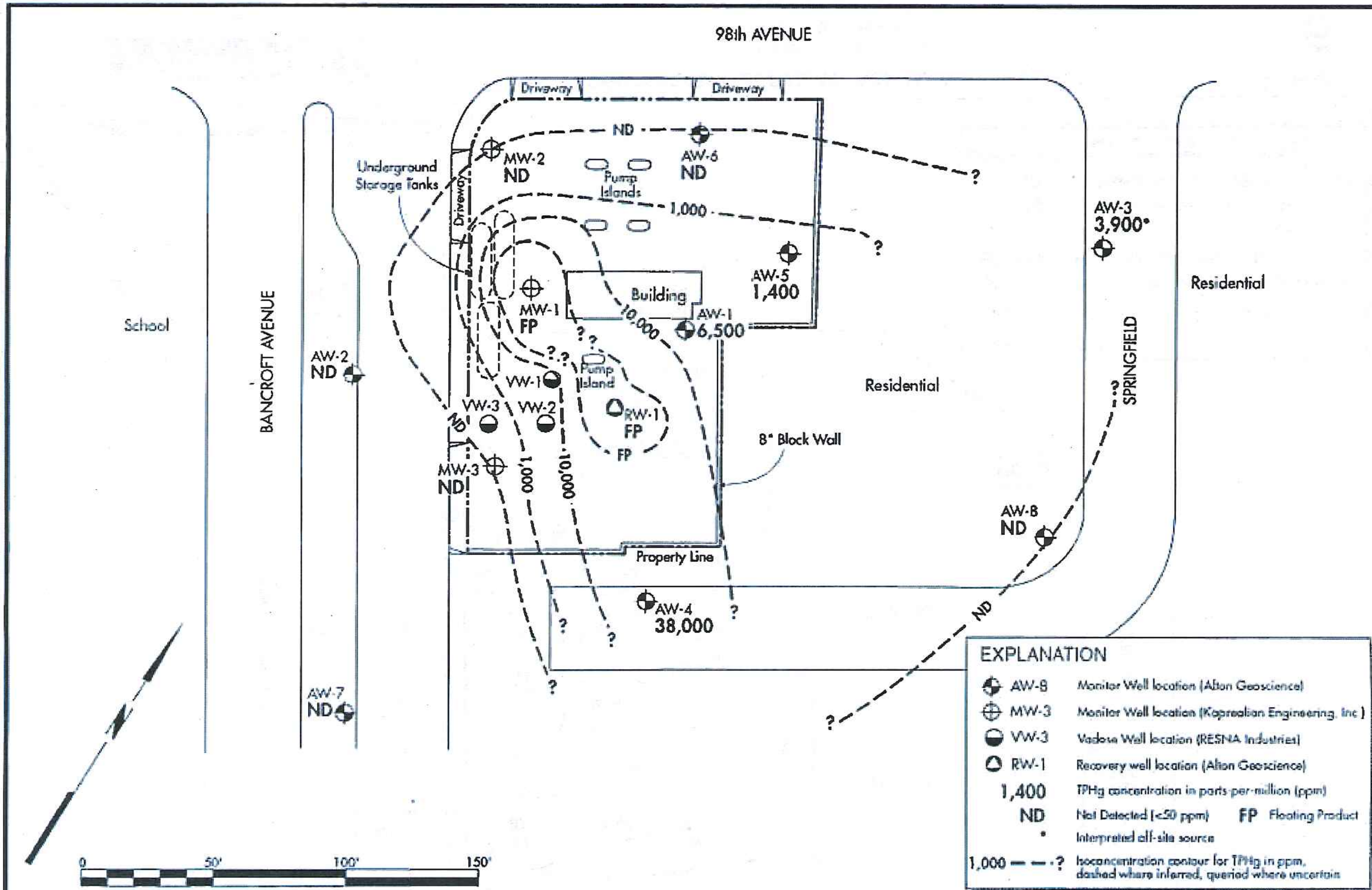


FIGURE 5

RESNA

PROJECT NO. 32006.03 | 12/92

TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (TPHg)
ISOCONCENTRATION MAP—July 6, 1992

BP Facility No. 11133
2220 98th Avenue
Oakland, California

PLATE
5

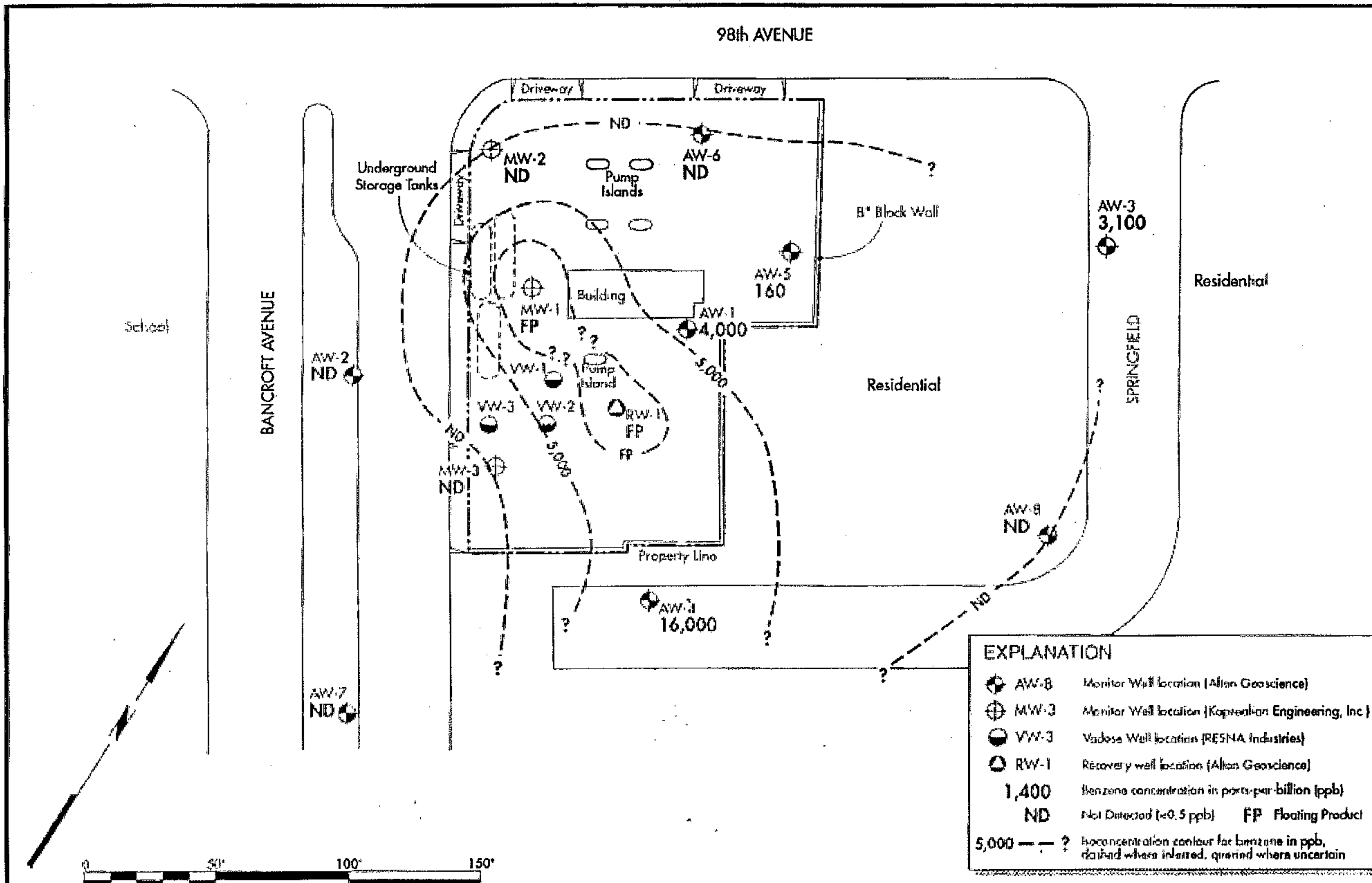


FIGURE 6

RESNA

PROJECT NO. 32006.03 | 12/92

BENZENE ISOCONCENTRATION MAP—July 6, 1992

BP Facility No. 11133
2220 98th Avenue
Oakland, California

PLATE
6

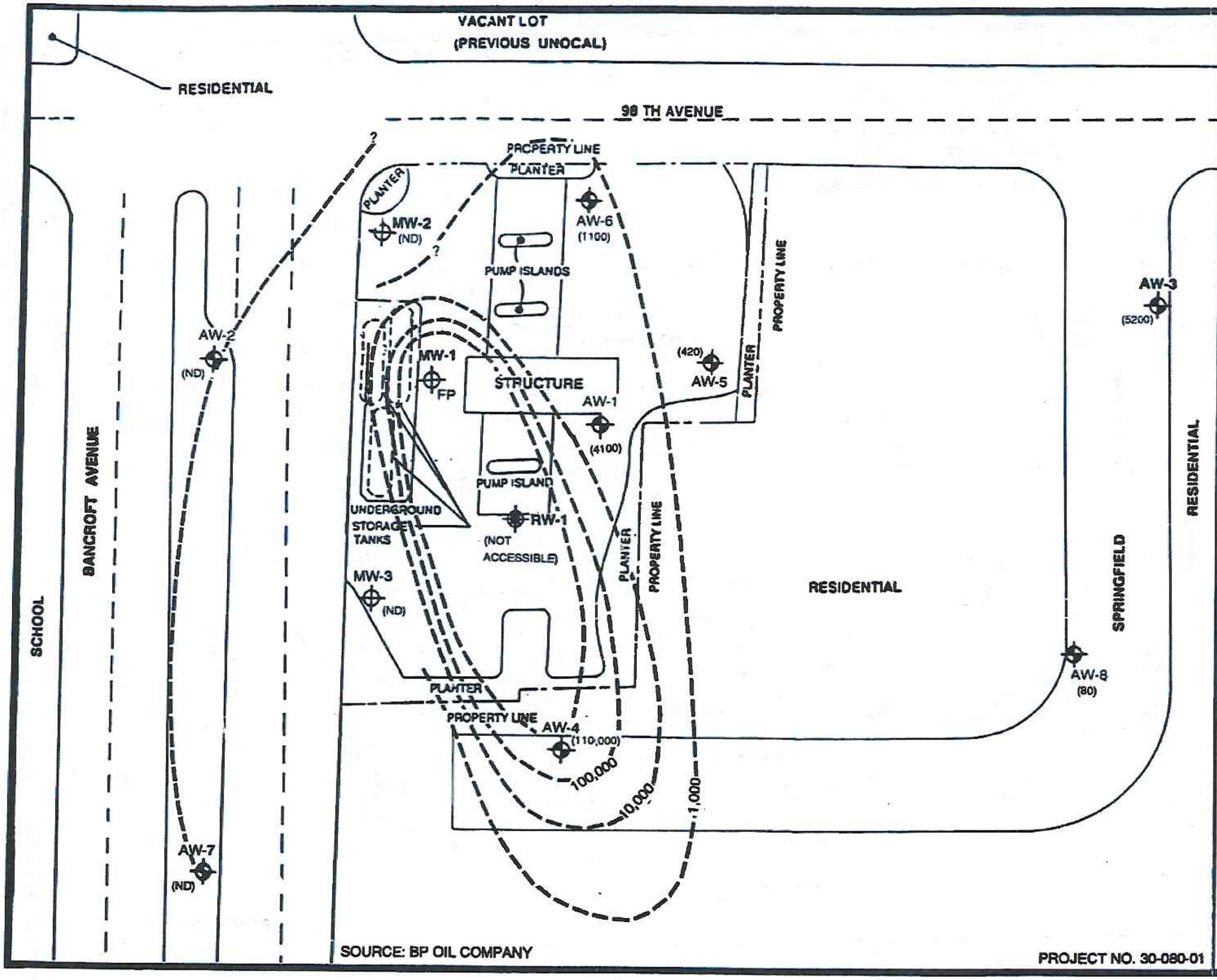
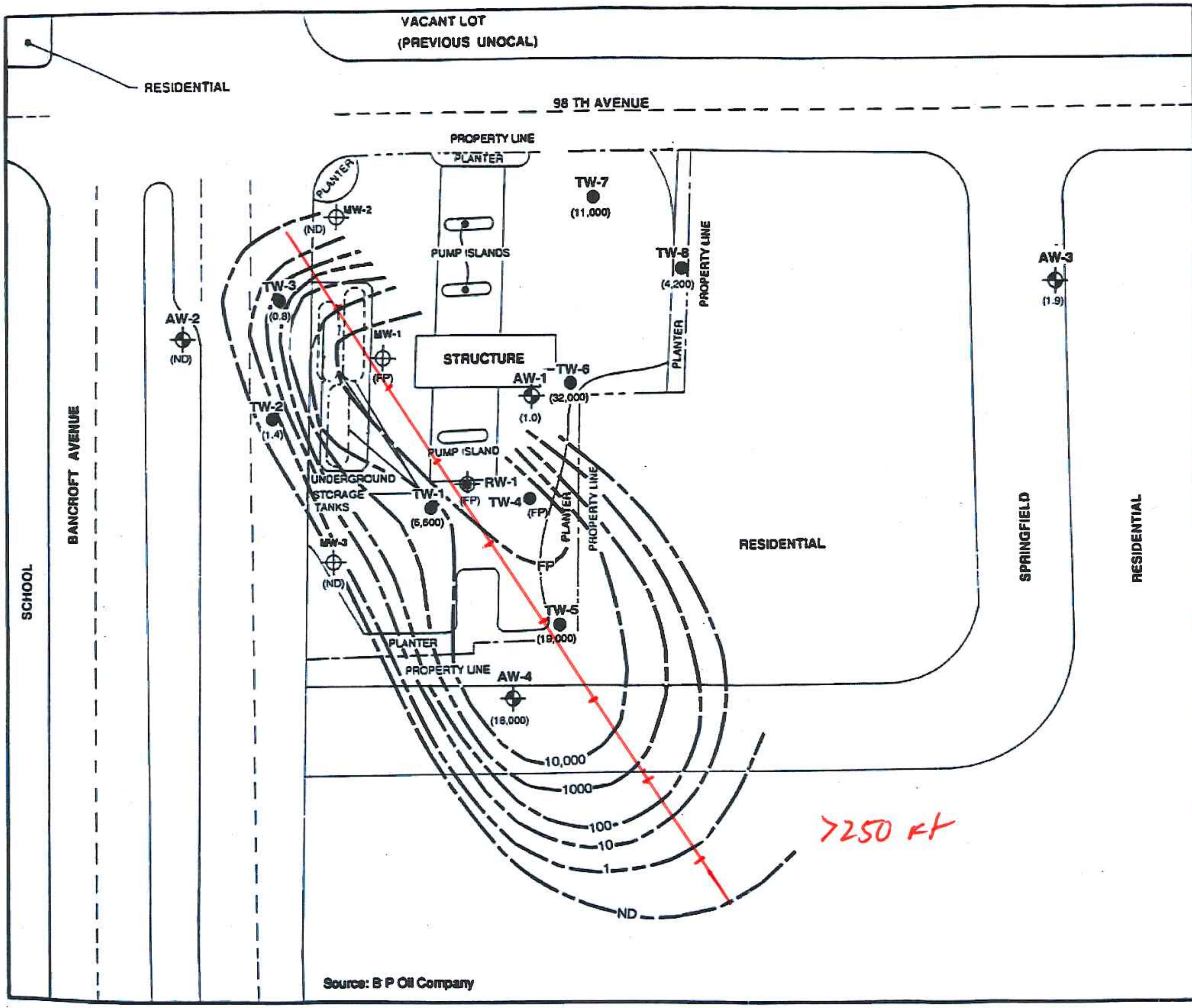


FIGURE 4: TPH-G ISOCONCENTRATION CONTOUR MAP (ppb)

BP OIL COMPANY
SERVICE STATION NO. 11133
2220 98th AVENUE
OAKLAND, CALIFORNIA

ALTON GEOSCIENCE
1000 Burnett Ave., Ste. 140
Concord, CA 94520

FIGURE 7



LEGEND:

- MONITORING WELLS INSTALLED BY ALTON GEOSCIENCE, INC. ON MAY 17, JUNE 5, AND JUNE 6, 1990
- MONITORING WELLS INSTALLED BY KAPREALIAN ENGINEERING, INC.
- RECOVERY WELL INSTALLED BY ALTON GEOSCIENCE, INC.
- QUALITATIVE SHALLOW GROUND WATER SURVEY POINT, JANUARY 24 AND 25, 1990, SEE APPENDIX A FOR EXPLANATION
- (1.9) BENZENE CONCENTRATION IN PARTS PER BILLION (ppb)
- 10 BENZENE ISOCONCENTRATION LINE

FIGURE 5: BENZENE ISOCONCENTRATION MAP

B P OIL COMPANY
SERVICE STATION NO. 11133
2220 98TH AVENUE
OAKLAND, CALIFORNIA

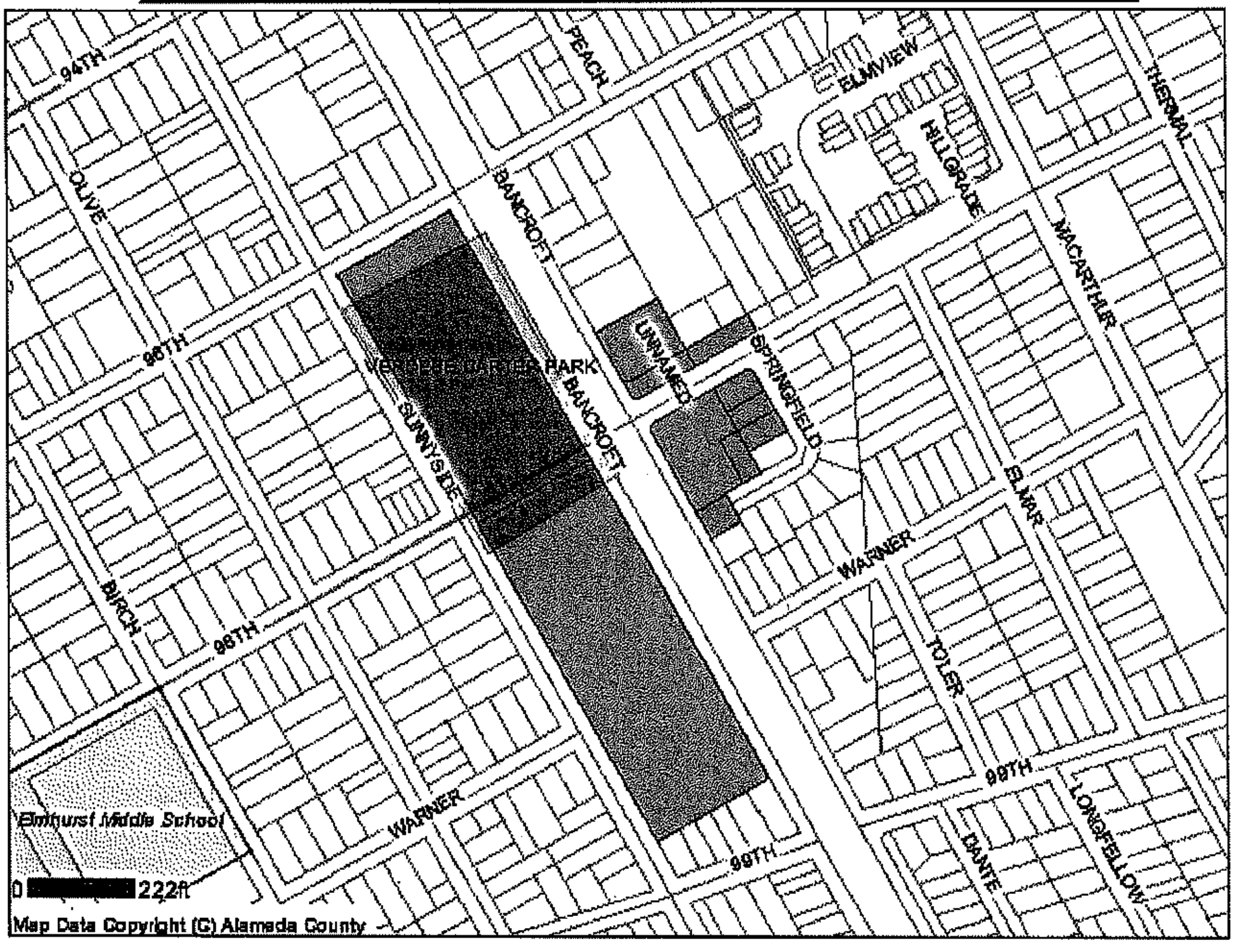
PROJECT NO. 30 - 080

FIGURE 8

Attachment 6

SWRCB Public Notification Map and List of Owners and Tenants

2220 98th Ave, Oakland, CA - Parcels Notified By SWRCB



LEGEND

selected	Water Body	Closed Conduit
Landmark	Railroad	Improved Creek
Landmark Name	Street Centerline	Natural Creek
County Buildings	Parcel	Park
	Concrete Channel	

Printed: 11/5/2012

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Public Notification Addresses for Claim #5502

Claimant:

BP Products North America, Inc., Assignee
Attn: Chris Winsor
6 Centerpointe Dr
La Palma, CA 90623

Suncor Holding Corp.
11601 Wilshire Blvd., #700
Los Angeles, CA 90025

Conoco Phillips
Attn: Terry Grayson
76 Broadway Street
Sacramento, CA 95818

Regional Board Contact:

San Francisco Bay RWQCB (Region 2)
Cherie McCaulou
1515 Clay Street, Suite 1400
Oakland, CA 94612

LOP Contact:

Alameda County Lop
Dilan Roe
1131 Harbor Bay Parkway
Alameda, CA 94502

Consultant:

Hollis E. Phillips
ARCADIS
100 Montgomery Street, Suite 300
San Francisco, CA 94104

Water Company:

East Bay Municipal Utility District
P O Box 24055.
Oakland, CA 94623

Building Permit Agency:

City of Oakland – Permit Center
250 Frank H. Ogawa Plaza, Rm 2114
Oakland, CA 94612-2031

Adjacent Property Owners:

Oakland Unified School District
1025 2^{nd} Avenue, Suite 316
Oakland, CA 94606-2296

City of Oakland
250 Frank H Ogawa Plaza, Suite 4
Oakland, CA 94612-2010

Pak T & Yong G Leung
112 E Vista Avenue
Daly City, CA 94014-1826

Suncor Holdings Cop. II LLC
525 Colorado Avenue
Santa Monica, CA 90401-2407

Carl & Phyllis Rice
9801 Springfield Street
Oakland, CA 94603-2823

Joe Hathorn
5130 James Avenue
Castro Valley, CA 94546-3745

Wanda Shanks
9817 Springfield Street
Oakland, CA 94603-2823

Eliezer Diaz
9857 Springfield St.
Oakland, CA 94603-2823

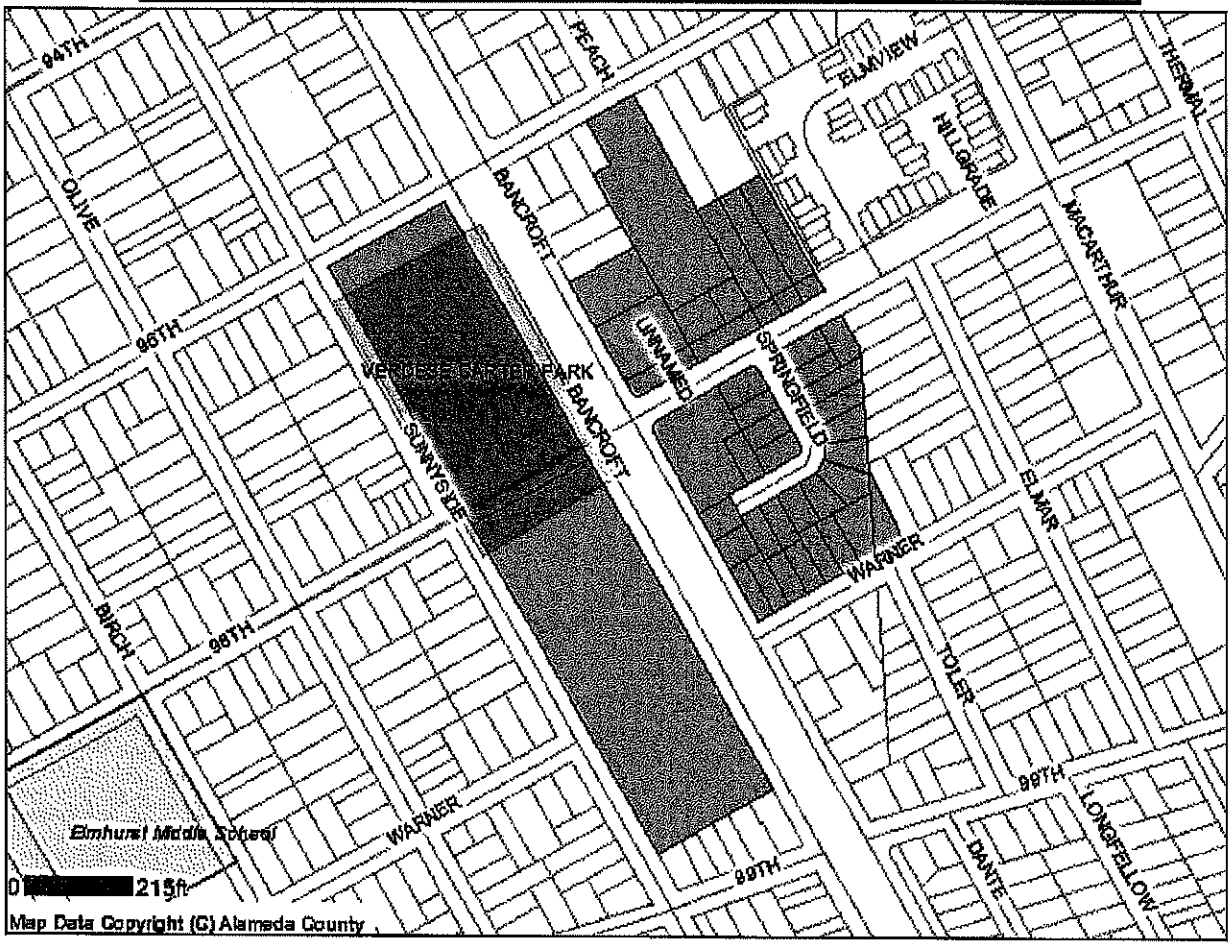
Jose & Alma Ortega
9826 Bancroft Avenue
Oakland, CA 94603-2814

Current Resident
9809 Springfield Street
Oakland, CA 94603-2823

Attachment 7

ACEH Identification of Appropriate Public Notification Map and List of Owners and Tenants

2220 98th Ave, Oakland, CA ACEH Parcel Identification For Notification



LEGEND

- selected
- Landmark
- Landmark Name
- County Buildings
- Water Body
- Railroad
- Street Centerline
- Parcel
- Concrete Channel
- Closed Conduit
- Improved Creek
- Natural Creek
- Park

Printed: 11/5/2012

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AVALOS LILIANA A
Parcel #: 46-5477-13
9826 SPRINGFIELD ST
OAKLAND CA 94603

BROUSSARD EDWARD &
Parcel #: 46-5477-17
2379 WEST ST
BERKELEY CA 94702

CITY OF OAKLAND
Parcel #: 46-5475-7-2
250 FRANK H OGAWA PLZ #4
OAKLAND CA 94612

CITY OF OAKLAND
Parcel #: 46-5475-6-14
250 FRANK H OGAWA PLZ #4
OAKLAND CA 94612

CITY OF OAKLAND
Parcel #: 46-5468-3-3
250 FRANK H OGAWA PLZ #4
OAKLAND CA 94612

CITY OF OAKLAND
Parcel #: 46-5475-3-1
250 FRANK H OGAWA PLZ
OAKLAND CA 94612

CITY OF OAKLAND
Parcel #: 46-5475-4-1
250 FRANK H OGAWA PLZ
OAKLAND CA 94612

CITY OF OAKLAND
Parcel #: 46-5475-5-1
250 FRANK H OGAWA PLZ #4
OAKLAND CA 94612

DAVIS FLOYD & MELVERDIA
Parcel #: 46-5477-11
1055 RINGWOOD AVE
MENLO PARK CA 94025

DIAZ ELIEZER
Parcel #: 46-5477-22
9857 SPRINGFIELD ST
OAKLAND CA 94603

DICKERSON HENRY T &
Parcel #: 46-5493-15
2301 WARNER AVE
OAKLAND CA 94603

EDWARDS VIKKIE L
Parcel #: 46-5477-16
9808 SPRINGFIELD ST
OAKLAND CA 94603

EOFF SIDNEY J SR
Parcel #: 46-5477-10
1433 WASHO DR
FREMONT CA 94539

FANFELLE ARTHUR
Parcel #: 46-5477-15
PO BOX 1176
SAN BRUNO CA 94066

FRANCO JUAN & LOPEZ
Parcel #: 46-5477-14
9820 SPRINGFIELD ST
OAKLAND CA 94603

FULLER JAMES & THERESIE &
Parcel #: 46-5477-6
2231 WARNER AVE
OAKLAND CA 94603

HATHORN JOE C TR
Parcel #: 46-5477-19
5130 JAMES AVE
CASTRO VALLEY CA 94546

HILL CHARLES D JR
Parcel #: 46-5477-24-6
2227 WARNER AVE
OAKLAND CA 94603

HOUSING AUTHORITY OF THE
Parcel #: 46-5475-6-12
1619 HARRISON ST
OAKLAND CA 94612

HOUSING AUTHORITY OF THE
Parcel #: 46-5475-6-13
1619 HARRISON ST
OAKLAND CA 94612

HOUSING AUTHORITY OF THE
Parcel #: 46-5475-3-2
837 ARLINGTON AVE
OAKLAND CA 94608

HOUSING AUTHORITY OF THE
Parcel #: 46-5475-4-2
837 ARLINGTON AVE
OAKLAND CA 94608

JACKSON FLOYD SR & LINDA
Parcel #: 46-5477-4
2243 WARNER AVE
OAKLAND CA 94603

JONES STEVE A
Parcel #: 46-5477-8
9856 SPRINGFIELD ST
OAKLAND CA 94603

KUNS ILENE TR
Parcel #: 46-5477-9
25 KENDALL LN
DANVILLE CA 94526

LEGARE ETHEL R
Parcel #: 46-5477-12
3334 GUIDO ST
OAKLAND CA 94602

LEUNG PAK T & YONG Q ETAL
Parcel #: 46-5475-30
112 E VISTA AVE
DALY CITY CA 94014

MARR MICHAEL TR & TRAGNI
Parcel #: 46-5475-19-1
3577 FRUITVALE AVE
OAKLAND CA 94602

MITCHELL HELEN B
Parcel #: 46-5477-3
2249 WARNER AVE
OAKLAND CA 94603

OAKLAND UNIFIED SCHOOL
Parcel #: 46-5467-1-2
1025 2ND AVE #316
OAKLAND CA 94606

ORTEGA JOSE JR & ALMA
Parcel #: 46-5477-24-14
9824 BANCROFT AVE
OAKLAND CA 94603

PIPER ALEXIS
Parcel #: 46-5477-5
15335 WASHINGTON AVE #305
SAN LEANDRO CA 94579

RESIDENT
Parcel #: 46-5477-12
9830 SPRINGFIELD ST
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5475-19-1
2250 96TH AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5475-6-12
2243 98TH AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5477-26-1
2216 98TH AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5475-7-2
BANCROFT AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5477-11
9836 SPRINGFIELD ST
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5477-24-14
9826 BANCROFT AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5467-1-2
2124 98TH AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5477-10
9842 SPRINGFIELD ST
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5477-5
2237 WARNER AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5475-30
9750 BANCROFT AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5475-6-13
2263 98TH AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5475-6-14
2253 98TH AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5477-9
9850 SPRINGFIELD ST
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5477-17
2300 98TH AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5477-19
9809 SPRINGFIELD ST
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5477-24-16
9836 BANCROFT AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5475-3-2
98TH AV
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5477-7
9862 SPRINGFIELD ST
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5475-5-2
2301 98TH AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5468-3-3
9600 SUNNYSIDE ST
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5477-2
2253 WARNER AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5475-4-2
98TH AV
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5475-3-1
2315 98TH AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5475-4-1
2309 98TH AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5477-24-7
2219 WARNER AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5475-5-1
98TH AV
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5475-29
9750 BANCROFT AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5477-15
9814 SPRINGFIELD ST
OAKLAND CA 94603

RICE CARL & PHYLLIS A
Parcel #: 46-5477-18
9801 SPRINGFIELD ST
OAKLAND CA 94603

SCOTT JOSEPH & LEONARD
Parcel #: 46-5477-24-16
P.O. BOX 6473
OAKLAND CA 94603

SHANKS WANDA
Parcel #: 46-5477-20
9817 SPRINGFIELD ST
OAKLAND CA 94603

SIHOTA GURSHIRN &
Parcel #: 46-5475-29
PO BOX 190374
SAN FRANCISCO CA 94119

SMITH BERNARD
Parcel #: 46-5477-2
1158 84TH AVE
OAKLAND CA 94612

STEPHENS GWENDOLN W
Parcel #: 46-5477-7
11026 CALODEN ST
OAKLAND CA 94605

SUNCOR HOLDINGS COP II
Parcel #: 46-5477-26-1
525 COLORADO AVE
SANTA MONICA CA 90401

TEJEDA OFELIA P
Parcel #: 46-5477-21
9825 SPRINGFIELD ST
OAKLAND CA 94603

UGBAJA CHIKA E
Parcel #: 46-5475-5-2
279 CERRO DR
DALY CITY CA 94015

YARBROUGH NAOMI
Parcel #: 46-5477-1
2316 98TH AVE
OAKLAND CA 94603

ZHOU CHARLES C & YING
Parcel #: 46-5477-24-7
10610 MORENGO DR
CUPERTINO CA 95014

CITY OF OAKLAND
Parcel #: 46-5475-7-2
250 FRANK H OGAWA PLZ #4
OAKLAND CA 94612

CITY OF OAKLAND
Parcel #: 46-5475-6-14
250 FRANK H OGAWA PLZ #4
OAKLAND CA 94612

CITY OF OAKLAND
Parcel #: 46-5468-3-3
250 FRANK H OGAWA PLZ #4
OAKLAND CA 94612

DIAZ ELIEZER
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9857 SPRINGFIELD ST
OAKLAND CA 94603

HATHORN JOE C TR
Parcel #: 46-5477-19
5130 JAMES AVE
CASTRO VALLEY CA 94546

LEUNG PAK T & YONG Q ETAL
Parcel #: 46-5475-30
112 E VISTA AVE
DALY CITY CA 94014

OAKLAND UNIFIED SCHOOL
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1025 2ND AVE #316
OAKLAND CA 94606

ORTEGA JOSE JR & ALMA
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9824 BANCROFT AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5477-26-1
2216 98TH AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5475-7-2
BANCROFT AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5477-24-14
9826 BANCROFT AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5467-1-2
2124 98TH AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5475-30
9750 BANCROFT AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5475-6-14
2253 98TH AVE
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5477-19
9809 SPRINGFIELD ST
OAKLAND CA 94603

RESIDENT
Parcel #: 46-5468-3-3
9600 SUNNYSIDE ST
OAKLAND CA 94603

RICE CARL & PHYLLIS A
Parcel #: 46-5477-18
9801 SPRINGFIELD ST
OAKLAND CA 94603

SHANKS WANDA
Parcel #: 46-5477-20
9817 SPRINGFIELD ST
OAKLAND CA 94603

SUNCOR HOLDINGS COP II
Parcel #: 46-5477-26-1
525 COLORADO AVE
SANTA MONICA CA 90401

ATTACHMENT 8

SWRCB LTCP PATER CHECKLIST

ATTACHMENT 1
ALAMEDA COUNTY ENVIRONMENTAL HEALTH LOCAL OVERSIGHT PROGRAM
CASE REVIEW FOR COMPLIANCE WITH STATE WATER RESOURCES CONTROL BORARD
LOW THREAT CLOSURE POLICY

Agency Name : Alameda County Environmental Health Local Oversight Program	Date: 02/20/2013
Case Worker: Dilan Roe	Fuel Leak Case No: RO0000403
Site Name: BP Station #11133	GeoTracker Global ID: T0600100210
Site Address: 2220 98th Avenue, Oakland, CA 94603	USTCF Claim No: 5502

☐ PASS ☒ FAIL

The site does not comply with the requirements of the Low-Threat Underground Storage Tank Case Closure Policy (LTCP) as described below.[1]

General Criteria General criteria that must be satisfied by all candidate sites:	
a. Is the unauthorized release located within the service area of a public water system?	☒ Yes ☐ No ☐ NA ☐ UND
b. Does the unauthorized release consist only of petroleum?	☒ Yes ☐ No ☐ NA ☐ UND
c. Has the unauthorized ("primary") release from the UST system been stopped?	☒ Yes ☐ No ☐ NA ☐ UND
d. Has free product been removed to the maximum extent practicable?	☐ Yes ☐ No ☐ NA ☒ UND
e. Has a conceptual site model that assesses the nature, extent, and mobility of the release been developed?	☐ Yes ☒ No ☐ NA ☐ UND
f. Has secondary source been removed to the extent practicable?	☐ Yes ☐ No ☐ NA ☒ UND
g. Has soil or groundwater been tested for MTBE and results reported in accordance with Health and Safety Code Section 25296.15?	☒ Yes ☐ No ☐ NA ☐ UND
h. Does nuisance as defined by Water Code section 13050 exist at the site?	☐ Yes ☐ No ☐ NA ☒ UND
Are there unique site attributes or site-specific conditions that demonstrably increase the risk associated with residual petroleum constituents?	☒ Yes ☐ No ☐ NA ☐ UND

ATTACHMENT 1
ALAMEDA COUNTY ENVIRONMENTAL HEALTH LOCAL OVERSIGHT PROGRAM
CASE REVIEW FOR COMPLIANCE WITH STATE WATER RESOURCES CONTROL BORARD
LOW THREAT CLOSURE POLICY

BP Station #11133

Media-Specific Criteria Candidate sites must satisfy all three of the media-specific criteria (i.e., Groundwater, Petroleum Vapor Intrusion to Indoor Air, and Direct Contact and Outdoor Air Exposure):	
1. Groundwater: To satisfy the media-specific criteria for groundwater, the contaminant plume that exceeds water quality objectives must be stable or decreasing in areal extent, and meet all of the additional characteristics of one of the five classes of sites:	
Is the contaminant plume that exceeds water quality objectives stable or decreasing in areal extent?	☐ Yes ☐ No ☐ NA ☒ UND
Does the contaminant plume that exceeds water quality objectives meet all of the additional characteristics of one of the five classes of sites? If YES, check applicable class: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	☐ Yes ☐ No ☐ NA ☒ UND
For sites with releases that have not affected groundwater, do mobile constituents (leachate, vapors, or light non-aqueous phase liquids) contain sufficient mobile constituents to cause groundwater to exceed the groundwater criteria?	☐ Yes ☐ No ☒ NA ☐ UND
2. Petroleum Vapor Intrusion to Indoor Air: The site is considered low-threat for vapor intrusion to indoor air if site-specific conditions satisfy all of the characteristics of one of the three classes of sites (a through c) or if the exception for active commercial fueling facilities applies.	
Is the site an active commercial petroleum fueling facility? Exception: Satisfaction of the media-specific criteria for petroleum vapor intrusion to indoor air is not required at active commercial petroleum fueling facilities, except in cases where release characteristics can be reasonably believed to pose an unacceptable health risk.	☐ Yes ☒ No ☐ NA ☐ UND
a. **Do site-specific conditions at the release site satisfy all of the applicable characteristics and criteria of scenarios 1 through 3 or all of the applicable characteristics and criteria of scenario 4?** If YES, check applicable scenarios: ☐ **1** ☐ **2** ☐ **3** ☐ **4**	☐ Yes ☒ No ☐ NA ☐ UND
b. **Has a site-specific risk assessment for the vapor intrusion pathway been conducted and demonstrates that human health is protected to the satisfaction of the regulatory agency?**	☐ Yes ☒ No ☐ NA ☐ UND
c. **As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, has the regulatory agency determined that petroleum vapors migrating from soil or groundwater will have no significant risk of adversely affecting human health?**	☐ Yes ☐ No ☒ NA ☐ UND

ATTACHMENT 1
ALAMEDA COUNTY ENVIRONMENTAL HEALTH LOCAL OVERSIGHT PROGRAM
CASE REVIEW FOR COMPLIANCE WITH STATE WATER RESOURCES CONTROL BORARD
LOW THREAT CLOSURE POLICY

BP Station #11133

Media-Specific Criteria (continued) Candidate sites must satisfy all three of the media-specific criteria (i.e., Groundwater, Petroleum Vapor Intrusion to Indoor Air, and Direct Contact and Outdoor Air Exposure):	
3. Direct Contact and Outdoor Air Exposure: The site is considered low-threat for direct contact and outdoor air exposure if site-specific conditions satisfy one of the three classes of sites (a through c).	
a. Are maximum concentrations of petroleum constituents in soil less than or equal to those listed in Table 1 for the specified depth below ground surface (bgs)?	☐ Yes ☐ No ☐ NA ☒ UND
b. Are maximum concentrations of petroleum constituents in soil less than levels that a site specific risk assessment demonstrates will have no significant risk of adversely affecting human health?	☐ Yes ☐ No ☐ NA ☒ UND
c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, has the regulatory agency determined that the concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health?	☐ Yes ☐ No ☒ NA ☐ UND

Notes:

[1]This site does not comply with the State Water Resources Control Board (SWRCB) policies and state law. Section 25296.10 of the Health and Safety Code requires that sites be cleaned up to protect human health, safety, and the environment. The current site conceptual model based on information contained in the case file databases (Alameda County Environmental Health ftp site and SWRCB GeoTracker website), is not adequate to determine that residual petroleum constituents at the site do not pose a significant risk to human health, safety, or the environment. See Attachment 2 for details.

UND– Undetermined due to incomplete site characterization and/or site conceptual model (e.g., changing site conditions not evaluated, trends in groundwater and vapor concentrations not clear, preferential pathways not adequately evaluated, current well survey not complete, groundwater flow direction and gradients not adequately evaluated, unable to judge limits of extent and stability of groundwater and soil vapor plumes due to quality problems with data collected from monitoring well network, unable to assess the impact of groundwater and soil vapor plumes on adjacent properties, misrepresentation of data, use of outdated protocols for vapor intrusion risk evaluation, etc.). See Attachment 2 for details.