From:	Roe, Dilan, Env. Health
To:	"Kristene Tidwell"
Cc:	Couch, Shannon L. (URS) (Shannon.Couch@bp.com); Matt Herrick
Subject:	Fuel Leak Case RO0000494, ARCO Station #2111
Date:	Monday, January 14, 2013 7:38:00 PM

Hi Kristine:

Thank you for the recently submitted document prepared by Broadbent and Associates, Inc. (Broadbent) on behalf of Atlantic Richfield Company (ARCO) entitled, *"Revised Soil & Groundwater Investigation Work Plan"* (Revised Work Plan), dated November 6, 2012, for the ARCO Station No. 2111, Fuel Leak Case No. RO0000494. Alameda County Environmental Health (ACEH) staff has reviewed the proposed Work Plan in conjunction with our review of the case under the State Water Resources Control Board's Low Threat Underground Storage Tank Case Closure Policy (LTCP).

The Work Plan is intended to supersede the initial *Soil and Groundwater Investigation Work Plan*, dated August 31, 2009, prepared by Broadbent on behalf of ARCO in response to a September 24, 2009 directive letter from ACEH. ACEH concurs with Broadbent's assertion that "since 2009, site conditions, regulatory oversight, and the regulations have changed" and therefore a Revised Work Plan was necessary to address these changes". The operation of the dual-phase extraction system from 2007 until September 2009 appears to have effectively reduced petroleum hydrocarbon contaminant mass in soil and groundwater as indicated by decreasing trends in contaminants detected in groundwater samples collected from on-site monitoring wells.

Based on ACEH's review of the Work Plan and the case files, and our discussions during the meetings held on October 9, 2012 and January 11, 2013 with representatives from ACEH, Broadbent, and ARCO, we request that you resubmit the work plan to address the data gaps and technical comments listed below in order to move the site towards case closure under the LTCP.

- **Soil Boring Locations -** Broadbent states that the initial *Soil and Groundwater Investigation Work Plan*, dated August 31, 2009, and prepared by Broadbent on behalf of ARCO, was prepared in response to a July 9, 2009 directive letter from ACEH. Broadbent further states that the August 31, 2009 work plan, which included installation of three off-site groundwater monitoring wells, was approved by ACEH but never implemented due to off-site access issues on neighboring property. However, a review of the case file indicates that ACEH requested an addendum to the work plan in a directive letter dated September 24, 2009 to justify proposed monitoring well construction (15 foot screen intervals) and groundwater sample representativeness.

  In the Revised Work Plan, Broadbent proposes to install two soil borings rather than the three groundwater monitoring wells originally proposed in the August 31, 2009 Work Plan to determine the downgradient extent of hydrocarbons in groundwater. Boring SB-1 is proposed to be located in the general vicinity of the previously proposed monitoring well MW-11, approximately 20 feet south of former boring H-2 on the First Christian Church and Community property. Boring SB-2 is proposed to be located on Douglas Court in a

residential area west of the Site, and corresponds to the location of the originally proposed monitoring well MW-10.

A review of historic groundwater elevation maps indicates the direction of groundwater flow at the site has ranged from southwest to northwest. However, no boring is proposed in the Revised Work Plan in the vicinity of the originally proposed monitoring well MW-9 (i.e., within the Liberty Fitness parking lot southwest of the site) due to unsuccessful attempts by ACEH, Broadbent and ARCO to obtain offsite access from the property owners at 1290 Davis Street. ACEH recommends ARCO and Broadbent make a final attempt to gain access to the property for advancement of a third boring in the location previously proposed in the August 31, 2009 work plan. ACEH will assist in this matter by writing a second letter to the Jaheh's requesting access to their property for the purpose of conducting a subsurface investigation.
Additionally, ACEH recommends advancing an additional boring in the vicinity of boring H-4/H-5 to define the extent of the groundwater plume and potential impacts on the residences located downgradient in the west-northwest direction.

- **Well Survey –**According to a well survey conducted in 1996 (based on the County of Alameda Public Works Agency database) 43 irrigations wells, 6 industrial supply wells, and 4 domestic supply wells are within ½ mile radius of the site. Wells identified downgradient of the site included several active irrigation and industrial wells and one domestic supply well. The downgradient domestic supply well (#2S/3W 27R-7) was reported to be located approximately 650 feet west-southwest of the site. ACEH understands a new well survey has been conducted by Closure Solutions, Inc. on behalf of ARCO. Due to off-site access issues, ACEH recommends Broadbent evaluate the results of the new well survey and identify the location of additional borings into the Work Plan if appropriate and/or develop a well sampling plan to rule out the possibility that downgradient wells have been impacted by the site.

- **Soil Sample Collection** - Broadbent proposes to advance the soil borings using direct-push technology to a proposed total approximate depth of 25 feet below ground surface (bgs). Soil samples will be collected from borings at three-foot intervals, beginning at a depth of 6.5 feet bgs following borehole clearance with an air knife or hand auger methods until total depth. The soil samples from above the first encountered groundwater (capillary fringe) within each boring will be submitted to the laboratory for chemical analysis. ACEH understands that the depth to groundwater has historically ranged from approximately to 12 feet bgs to 24 feet bgs. Therefore, please prepare a scope of work to submit soil samples collected within the entire extent of the smear zone to the laboratory for chemical analysis.

- **Groundwater Sample Collection –** Broadbent proposes to collect one grab-groundwater sample from each boring for submittal to the laboratory for chemical analysis using a hydropunch-type sampler. Although ACEH agrees that this type of groundwater sample allows a specific interval of groundwater to be isolated, ACEH is concerned that due to the low permeability of the soil and difficulties collecting depth discrete groundwater samples

during the 2004 field investigation, the proposed use of direct push technology may not provide sufficient delineation of the subsurface conditions and groundwater plume and adequately define permeable layers extending in the vicinity and down-gradient beyond boring H-2 which contained high petroleum concentrations in grab groundwater at the time it was collected in 2004. Please prepare a scope of work using cone penetration technology (CPT) to adequately delineate the vertical distribution of soil and groundwater impacts and identify locations for collection of depth discrete groundwater samples.

- **Soil Sample Analysis –** Broadbent proposes to analyze soil samples collected from borings SB-1 and SB-2 for gasoline range organics (hydrocarbon chain lengths of C6 – 12) by EPA Method 8015B, and benzene, toluene, ethyl benzene, and xylenes (BTEX), methyl tertiary-butyl ether (MTBE), t-butyl alcohol (TBA), tert-amyl-methyl ether **(**TAME), ethyl tert-butyl ether (ETBE), di-isopropyl ether (DIPE), ethylene dibromide (EDB), 1,2,- DCA, and ethanol by EPA Method 8260. Please include ethylene dichloride (EDC) in the list of analytes for soil samples.

- **Groundwater Sample Analysis -** ACEH also notes that Broadbent does not propose specific analytes for groundwater samples. Please revise the Work Plan to include appropriate analytes for groundwater. Additionally, please collect and analyze groundwater samples from the proposed soil borings SB-1 and SB-2 and existing groundwater monitoring wells for volatile organic compounds, polycyclic aromatic hydrocarbons (PAHs) and napthalene by EPA Method 8260 in order to close the data gap on potential impacts from the waste oil tank removed in 2004 due to laboratory reporting limits being greater than the environmental screening limits for these analytes.

- **Existing Monitoring Well MW-8 –** A review of the construction log and historic groundwater elevation data for monitoring well MW-8 indicates the well may not be screened appropriately to adequately characterize groundwater conditions. Please present an analysis of this data and make conclusions regarding the validity of data collected from this well and recommendations for corrective action if appropriate.

- **Confirmation Sampling –** As indicted above, ACEH concurs that operation of the dual-phase extraction system from 2007 until September 2009 appears to have effectively reduced petroleum hydrocarbon contaminant mass in soil and groundwater as indicated by decreasing trends in contaminants detected in groundwater samples collected from on-site monitoring wells. ACEH recommends collection of confirmation sampling in the source areas to verify that the site satisfies the LTCP media specific criteria for Direct Contact and Outdoor Air Exposure in the upper ten feet of soil. Please note, in lieu of this data, the LTCP allows closure under the LTCP if the maximum concentration 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 or the regulatory agency determines that the concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health as a result of controlling exposure through the use of institutional controls (i.e., land use restrictions, etc).

- **Field Investigation Standard Operating Procedures –** The Work Plan does not provide a description of the proposed methods for collection of soil and groundwater samples. Please include Broadbent's standard operating procedures in an appendix to the Work Plan.

- **Site Figures –** As requested in ACEH's Directive Letter dated July 9, 2009, please prepare site maps which utilize aerial photographs as base maps for the site, and accurately depict neighboring structures and site features in relation to the groundwater contaminant plume in all future reports.

- **Vapor Intrusion to Indoor Air –** Although the site is an active commercial petroleum fueling facility, it does not qualify for an exemption from the LTCP Media Specific Criteria for Vapor Intrusion to Indoor Air due historic off-site migration of the petroleum hydrocarbon groundwater plume and potentially impacted adjacent residential and commercial parcels. Evidence of historic off-site migration can be found in free product observations in MW-2, soil and groundwater analytical data collected from the off-site monitoring well MW-5 and the onsite perimeter monitoring well network, and depth-discrete and grab groundwater samples collected from offsite borings H-1 through H-5. Please prepare a work plan to collect and analyze the data required to evaluate vapor intrusion to indoor air impacts on buildings located on parcels potentially impacted by the site using one of the three petroleum vapor intrusion to indoor air specific criteria in the LTCP criteria (i.e., survey of building foundations, characterization of bioattenuation zone, direct measurement of soil gas concentrations, or a site specific risk assessment).

ACEH looks forward to working with Broadbent and ARCO in identifying and implementing the steps necessary to move the site to closure under the LTCP as expeditiously as possible. Please submit a schedule with proposed dates to ACEH by **January 25, 2013** for resubmittal and implementation of the Revised Soil and Groundwater Investigation Work Plan, as well as the other phases of work discussed above as deemed necessary to satisfy the LTCP General and Media Specific Criteria (i.e., Groundwater, Vapor Intrusion to Indoor Air, Direct Contact and Outdoor Air Exposure).

Regards,

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PDF copies of case files can be reviewed/downloaded at:

http://www.acgov.org/aceh/lop/ust.htm