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*11:12 am, Nov 22, 2011*

Alameda County  
Environmental Health

Ms. Barbara Jakub  
Alameda County Health Care Services Agency  
1131 Harbor Bay Parkway  
Alameda, CA 9502-6577

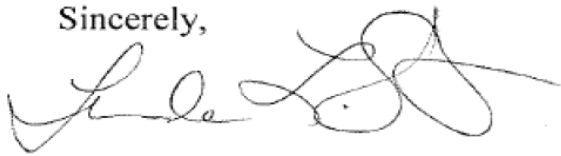
Subject: Former Val Strough Chevrolet Site  
327 34<sup>th</sup> Street, Oakland, CA  
Site ID #3035, RO#0000134

Dear Ms. Jakub:

This enclosed report has been prepared by LRM Consulting, Inc. on behalf of the Strough Family Trust. I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge.

If you have any questions, please contact Mr. Mehrdad Javaherian of LRM Consulting, Inc. at 650-343-4633.

Sincerely,



Linda L. Strough, Trustee

cc: Mehrdad Javaherian, LRM Consulting, Inc.  
534 Plaza Lane, #145, Burlingame, CA 94010

Greggory Brandt, Wendel Rosen Black & Dean  
1111 Broadway, 24<sup>th</sup> Floor, Oakland, CA 94607

November 21, 2011

Ms. Barbara Jakub  
Alameda County Health Care Services Agency  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA

**RE: Draft Corrective Action Plan (CAP) Addendum**  
Former Val Strough Chevrolet,  
327 34<sup>th</sup> Street, Oakland, CA  
RO0134

Dear Ms. Jakub:

In response to your letter dated November 18, 2011 and our telephone conversation on the same day, LRM Consulting, Inc. (LRM) has prepared this brief Draft CAP Addendum letter report to provide the following information:

- A table summarizing estimated costs for each of the four remedial alternatives evaluated in the Draft CAP (LRM, 2011), including the two preferred remedial alternatives proposed for the site; high-vacuum dual phase vapor extraction (DPE) to address separate phase hydrocarbons (SPHs) and source materials within the residual source area, to be followed by in-situ chemical oxidation (ISCO) to address the localized dissolved hydrocarbon plume after the SPHs have been removed via DPE.
- A basemap showing DPE system location and wells to be used.

Specifically, Table 1 accompanying this letter provides a side-by-side comparison of estimated costs to each of the four remedial alternatives evaluated in the Draft CAP; the table includes a summary of the various cost components and the expected duration of each alternative. As indicated in the table, costs were prepared for:

- 1) A no-action/long-term monitoring alternative (i.e., Alternative Number 1) consisting of 30 years of groundwater monitoring with no other engineering controls implemented to address SPHs and dissolved groundwater plume within the residual source area onsite: Long-term monitoring is expected to last at least 30 years in the absence of any SPH or source removal activities. This 30-year time frame is also consistent with the long-term monitoring duration outlined by the EPA's National Contingency Plan (NCP).
- 2) Groundwater pump-and-treat technology (Alternative Number 2), consisting of 15 years of groundwater extraction, treatment, disposal, and related monitoring and reporting activities: Due to the limited effectiveness of pump-and-treat in the presence of SPHs, at least 15 years of pump-and-treat (and related operations & maintenance [O&M] monitoring and reporting) is expected as necessary to help reduce dissolved hydrocarbon concentrations toward remedial action objectives (RAOs) outlined in the Draft CAP;
- 3) ISCO injections (Alternative Number 3) corresponding to one round of RegenOx injections consisting of 3 independent injection events spaced two weeks apart, in addition to related O&M monitoring and reporting: If SPHs are removed prior to ISCO injections as recommended in the

Draft CAP, it is expected (based on site-specific pilot testing already conducted) that one round of RegenOx injections (10,000 gallons of RegenOx) consisting of three separate injection events taking place at 2-week intervals at 20 injection locations<sup>1</sup> will be necessary to help reduce dissolved hydrocarbon concentrations and create a declining concentration trend toward RAOs. Table 1 includes a cost to implement the three injection events, in addition to a unit cost for each additional round of injection, should additional injections be deemed necessary.


- 4) Short-term DPE (Alternative Number 4) consisting of at least 6 months of DPE operations and related O&M monitoring and reporting: Based on site-specific DPE pilot testing, it is expected that 6 months of DPE operations will be sufficient to remove SPHs and hydrocarbon source material within the localized residual source area at the site, allowing ISCO treatment of the dissolved hydrocarbon plume to be more effective. Included in Table 1 is a cost to implement 6 months of DPE, in addition to a unit cost for each additional month of DPE activities, should DPE operations warrant operation beyond 6 months. Figure 1 shows the DPE system location and wells targeted for extraction; existing underground piping and existing DPE impoundment (see Figure 1) used in past DPE pilot testing at the site will be used during DPE implementation.

As indicated in the Draft CAP and in Table 1, Alternatives 3 and 4 above are not only the most technically effective and feasible remedial alternatives to meet the remedial action objectives (RAOs) outlined in the Draft CAP, but they are also the most cost-effective. As such, the Draft CAP (see Section 5.2- Preferred Remedial Alternatives section) identifies both of these alternatives as preferred alternatives for implementation at the site; DPE is recommended as the preferred alternative for treating the SPHs present, while ISCO is the preferred alternative for treating the dissolved hydrocarbon plume.

Since the presence of SPHs have been shown through site-specific pilot testing to limit the effectiveness of the ISCO applications, the Draft CAP (see Section 5.2 and Section 6) recommends implementing DPE first (for an estimated 6-month period), targeting removal of SPHs and hydrocarbon source material which impact the dissolved plume. Once SPHs and hydrocarbon source material have been removed from the residual source area, the dissolved hydrocarbon plume would then be treated effectively via ISCO. The details of the transition between DPE to ISCO, including the monitoring triggers for this transition and related communication with and approval from the County are documented in Section 6.2 of the Draft CAP.

## CLOSING

LRM appreciates your efforts toward review of the Draft CAP and your support on this project. If you have any questions, please contact Mehrdad Javaherian at 415-706-8935 or at [mehrdad@lrm-consulting.com](mailto:mehrdad@lrm-consulting.com).

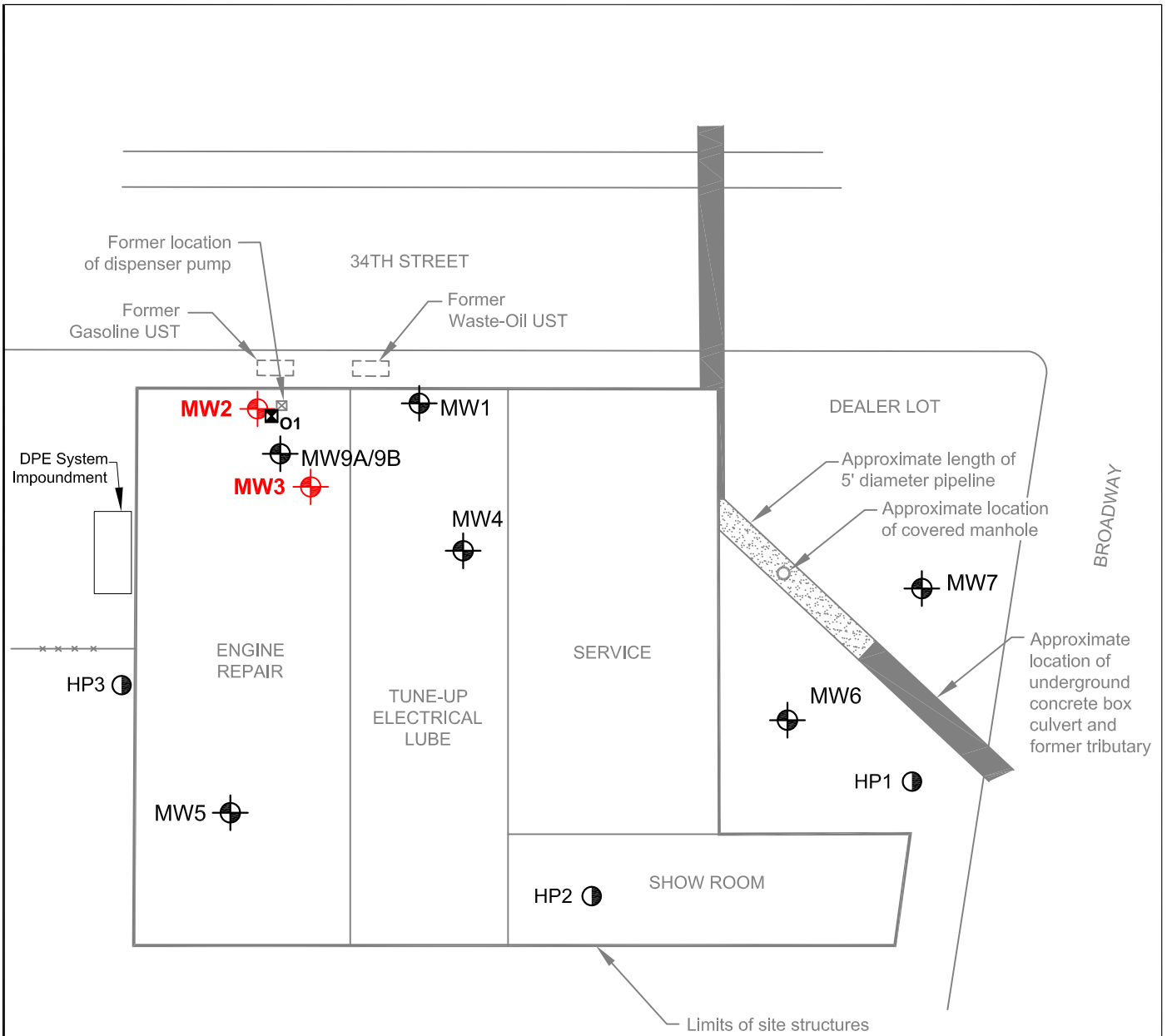
  
Mehrdad Javaherian  
LRM Consulting, Inc.



<sup>1</sup> Please note that the County's comment letter dated November 18, 2011 suggests that the Draft CAP has recommended 6 direct push locations for ISCO; this is incorrect. Section 6.3 of the Draft CAP indicates that 20 direct-push locations is proposed. Figure 3 of the Draft CAP shows locations of 20 injection points.

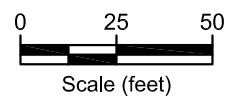
**Table 1. Cost Comparison of Remedial Alternatives**

<b>Remedial Alternative No.</b>	<b>Description</b>	<b>Cost Components and Time Frame</b>	<b>Estimated Cost</b>	<b>Comments</b>
1	No Remedial Action/Long-Term Monitoring	Routine groundwater monitoring and reporting for 30 years	\$ 420,000.00	10 years of quarterly monitoring, 10 years of semi-annual monitoring, and 10 years of annual monitoring.
2	Groundwater pump-and-treat	Groundwater extraction, treatment, and disposal for 15 years. System permitting, well installation, groundwater treatment and disposal, O&M and groundwater monitoring and reporting.	\$ 1,000,000.00	Two-well groundwater extraction system, onsite treatment and disposal via NPDES.
3	In-situ chemical oxidation	One round of chemical oxidation injection (10,000 gallons of RegenOx) consisting of three injection events spaced 2-weeks apart. 20 direct-push locations, groundwater monitoring and reporting.	\$ 60,000.00	Cost estimate for additional injection (\$5,000 gallons of RegenOx) and related O&M monitoring events is approximately \$30,000/event.
4	High-vacuum dual phase extraction	Short-term (6 months) DPE application. System permitting and setup, DPE operation over 6 months, vapor and groundwater treatment and disposal, groundwater monitoring and reporting.	\$ 60,000.00	Cost estimate for additional monthly DPE events is \$ 6500/month.



**LEGEND:**

- HP2 ● Grab groundwater sampling location
- MW5 ● Groundwater monitoring well
- MW2** ● DPE Extraction Well



**DPE LOCATIONS**  
 FORMER VAL STROUGH CHEVROLET  
 327 34TH STREET, OAKLAND, CALIFORNIA  
 NOVEMBER 2011

FIGURE:  
1