Review of Draft Memorandum for Detailed Evaluation of Remedial Alternatives for NAPL/Groundwater Contamination Source Areas, Soil and NAPL Feasibility Study, Del Amo Superfund Site

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Pursuant to a request from the U. S. Environmental Protection Agency (EPA) Work Assignment Manager (WAM), CH2M HILL has reviewed a technical memorandum entitled Draft Memorandum, Detailed Evaluation of Remedial Alternatives for NAPL/Groundwater Contamination Source Areas, Soil and NAPL Feasibility Study, Del Amo Superfund Site, and dated May 5, 2006. The technical memorandum was prepared by URS Corporation (URS) on behalf of the Del Amo Superfund Site PRPs, and presents a CERCLA nine-criteria evaluation remedial alternatives for Del Amo Source Areas 1, 9, and 12. CH2M HILL's review comments are divided into general comments and specific comments.

In general, the memorandum has been improved to provide more background information and clearer objectives. However, the overall tone and bias of the memorandum has not changed. Based on the selection of alternatives and the means in which the alternatives are evaluated, the PRPs appear to be biased toward Alternative 2 – intrinsic biodegradation with institutional controls and long-term monitoring. Additionally, some previous agency comments were not addressed. Thus, some of our previous comments are repeated along with new comments.

General Comments

1) For Alternatives 1 and 2 (No action and MNA), the memorandum considers compliance with ARARs to be “good” because the source area is in a TI waiver zone. Their rationale shows a misunderstanding of the definition of a TI waiver zone. In a TI waiver zone, the requirements to comply with ARARs have been waived because achieving ARARs are technically impracticable. Because compliance with the ARARs in the source areas is poor, this necessitates the waiver. With no active remedial action, compliance with ARARs remains poor. This provides a reason for evaluating remedial alternatives. If no action complied with ARARs, there would be no reason to prepare an FS.

2) The first RAO listed in the FS memo is “Remove, destroy, or contain NAPL where practicable and where it provides measurable benefit.” “Measurable benefit” is then...
defined as “restoration of the aquifer in a reasonable timeframe to achieve a usable groundwater resource for one or more beneficial uses.” This definition of “measurable benefit” creates an RAO that may be applicable for the Groundwater OU, but is not appropriate for evaluating Del Amo NAPL source areas. Removing 100% of NAPL in the evaluated source areas would not necessarily achieve an RAO of restoring the aquifer to beneficial use. The FS memo references Tech Memo #1 as the source of this RAO. However, in Table 1 of Tech Memo #1 the RAO is stated as “Protect groundwater resources outside of the Benzene TI-waiver zone”. Under “General Response Actions” Table 1 states “Where practicable, and where measurable benefits would result, implement source control measures to immobilize, contain, and/or remove NAPL to limit its migration to or contact with groundwater resources.” There is no mention of restoring the aquifer to beneficial use.

3) CH2M HILL recommends that the objective of the remedial action should be to reduce impacts to the environment caused by the presence of soil contamination and NAPL and reduce the risk of future harm to groundwater and/or surface receptors by bringing the source area in the TI waiver zone closer to compliance, where it is reasonable to do so.

4) The memorandum suggests excessively long durations for aquifer restoration for several alternatives. First, complete aquifer restoration is not an objective so the duration for achieving it is not pertinent. Second, if aquifer restoration is the objective, the FS process requires an initial screening of alternatives followed by a detailed evaluation. Any alternative that requires hundreds or thousands of years to be effective should be screened out and not included in a detailed evaluation. We recommend that any discussion of aquifer restoration be omitted. The stated objective is “to remove, destroy or contain NAPL where practical and where it provides measurable benefit.” Discussions of durations should focus on timeframes necessary to achieve the stated objective.

5) Alternative 3, soil vapor extraction, is clearly a technology used to remediate the vadose zone. The evaluation of this alternative considers SVE with respect to its ability to remediate groundwater. SVE will not achieve aquifer restoration and there is no reason to evaluate it for that purpose. To properly evaluate SVE, there needs to be a discussion of the extent of vadose zone contamination and the risk of contaminant migration to groundwater or surface receptors.

6) Thermal treatment of soil and chemical injection could be implemented in smaller areas or more gradually than proposed. The risks mentioned include explosion hazard, vapor migration and increased NAPL mobility. These risks should be considered in the context of the engineering controls that would be employed to mitigate these risks as part of any remediation project of this type.

7) The scope of the Memorandum is to provide a nine-criteria evaluation of remediation alternatives for Source Areas 12, 9, and 1. However, no evaluation was provided for Source Area 1, and it is not clear from the limited information provided that source area 1 has the same type of contamination issues as Source Areas 12 and 9. If a nine-criteria evaluation is not going to be performed for Source Area 1, an explanation should be provided in Section 1.5.
8) The first sentence of every paragraph in Section 3 ends with the phrase, “as for SA12.” It is understood that SA12 is used as a model for evaluation of remedial options for SA9. This does not need to be repeated in every paragraph.

9) Short term effectiveness – STE should consider possible exposure during construction and implementation of the remediation alternative. In general, alternatives that treated either soil vapor or groundwater were given poor to moderate STE ratings because on-site workers and the community would be impacted by the treatment system. There should be very little impact to site workers or the community from treated air or water. Even “system upsets” can be mitigated to minimize impacts to site workers and the community.

10) Long term effectiveness – LTE is rated moderate for all of the alternatives except for no action. LTE for source removal (Alt 3 through Alt 6) has to be rated higher than MNA (Alt 2). The alternatives should be rated on whether the alternative will permanently remove contamination, thus reducing long-term exposure.

11) Reduction of toxicity, mobility or volume – The source removal alternatives (Alt 3 through Alt 6) are all rated poor to moderate. They should at least be rated Moderate, since Alt 6 may remove 50% of the contaminant mass, and Alt 5 may remove 40%. These are both significant reduction volumes, and are likely underestimated. For example, it is likely that heating near the building may remove a significant portion of the mass beneath the building. There are several case studies to support higher volume reduction, including beneath the building, than is estimated in the memo.

12) Overall protection of human health and the environment – is rated good for MNA (Alt 2) and poor to moderate or poor for the source removal alternatives (Alt 3 through Alt 6). Source removal has to be rated higher for protection of human health and the environment than MNA alone. Even a small amount of mass removal from the source areas will affect the overall risk more than MNA. ICs will be implemented for all alternatives, so Alt 2 cannot be rated higher than the other alternatives. Also, the memo states that human health will be “impacted” by the treated air and/or water. There should be no impacts from treated air and water.

Specific Technical Comments

1) Page 1, Section 1.1. The statement that PCE and TCE detected in soil and groundwater are “believed to be the result of offsite releases of these compounds or more recent industrial activities since the rubber plant was demolished” should be reworded. The source of the PCE and TCE in onsite soil has not been established.

2) Page 1, Section 1.2. Eleven source areas are mentioned in the text and presented in Table 1-1. However, there are twelve source areas depicted on Figure 1-2. Is there some reason that SA10 was excluded from Table 1-1? If because it is part of the Del Amo Waste Pits OU, include that explanation in the table or in Section 1.2.

3) Page 3, Section 1.4. Remove the sentence “Measurable benefits would involve restoration of the aquifer in a reasonable timeframe to achieve a useable groundwater resource for one or more beneficial uses.” This statement contradicts the objectives. The objective requires the alternative to be practical and restoration of the aquifer in a TI
waiver zone is not practical. Therefore, "measurable benefits" must measure something other than restoration of the aquifer which is impracticable. There are many other things that can be measured such as "total mass of contaminants removed, reduction in migration from the source area, reduction in air emissions from soil, etc."

4) **Page 3, Section 1.5.** As stated above, SAI was not included in the evaluation. Please provide an explanation in Section 1.5.

5) **Page 5, Section 2.2.1, Alternative 2.** The statement is made that LTM will "ensure" that there is no lateral or vertical movement of hydrocarbons. Monitoring is used to document movement rather than "ensure" it does not happen.

6) **Page 5, Section 2.2.1, Alternative 3.** "SVE is assumed as the preferred option". This statement is unclear. We assume it means that SVE is preferred compared to biotripping or similar technologies involving extracting or injecting vapors.

7) **Page 6, Section 2.2.1, Alternative 4.** The alternative is "expected" to operate for about 10 years. What is the basis for the 10 year operation? A brief explanation for the durations and mass reduction estimates for all alternatives would be beneficial (note that Alt 4 through Alt 6 have a duration estimate, Alt 3 did not).

8) **Page 8, Section 2.2.1, Alternative 6.** ERH is the only technology evaluated. During the last set of comments, EPA requested that other methods, such as steam, air, electrical conductance heating be considered. CH2M HILL recommends that the naming and description of the alternative be expanded to include various types of in-situ soil heating with ERH selected as the specific technology for the purpose of developing a conceptual design that can be evaluated. Six phase electrical resistance heating is only offered by a limited number of specialized vendors with proprietary technology. The alternative should not be eliminated if the vendors are no longer available. We had a similar issue on the Del Amo Waste Pits Site with specialized resin adsorption systems. A specific vendor went out of business and the PRPs claimed that the alternative could not be implemented because of lack of availability of the technology.

9) **Page 9, Section 2.3, Alternative 1, Compliance with ARARs.** If there are no groundwater ARARs to meet Compliance with ARARs should be rated "Not Applicable" rather than "Good". Per earlier comments regarding groundwater ARARs, we recommend changing the first two sentences of this paragraph to "Compliance with ARARs is poor. However, the requirement for compliance in the source area has been waived because it is in a TI waiver zone."

10) **Page 9, Section 2.3, Alternative 2.** Overall Protection of Human Health and Environment should be rated "Poor to Moderate" rather than "Moderate to Good." MNA cannot be rated higher than the active source area remediation alternatives. If there are short term effectiveness issues regarding the treatment, they should be discussed in that criteria evaluation rather than this one.

11) **Page 10, Section 2.3, Alternative 2, Compliance with ARARs.** If there are no groundwater ARARs to meet Compliance with ARARs should be rated "Not Applicable" rather than "Good." Per earlier comments regarding groundwater ARARs, we recommend changing the first two sentences of this paragraph to "Compliance with
ARARs is poor. However, the requirement for compliance in the source area has been waived because it is in a TI waiver zone.

12) Page 10, Section 2.3, Alternative 2. Long Term Effectiveness (LTE) should be rated “Poor to Moderate” rather than “Moderate.” MNA cannot be rated higher than the active source area remediation alternatives.

13) Page 10, Section 2.3, Alternative 2. Reduction of Toxicity, Mobility, and Volume. The discussions of timeframes should be limited to the durations for achieving the stated objective. This applies to the “reduction of toxicity, mobility and volume” portions of all the alternatives.

14) Page 12, Section 2.3, Alternative 4. Overall Protection of Human Health and Environment should be rated “Moderate to Good” rather than “Poor to Moderate.” MNA cannot be rated higher than the active source area remediation alternatives. Again, STE issues are used to justify the lower rating, which is not appropriate for evaluating this criterion.

15) Page 13, Section 2.3, Alternative 4. Compliance with ARARs should be rated “Moderate to Good” rather than “Moderate.” Meeting the ARARs for SVE and groundwater treatment is reasonable given current technologies.

16) Page 13, Section 2.3, Alternative 4. Short Term Effectiveness (STE) should be rated “Moderate to Good” rather than “Moderate.” Mitigating “potential system upsets” for SVE and groundwater treatment is reasonable given current technologies.

17) Page 14, Section 2.3, Alternative 5. Overall Protection of Human Health and Environment should be rated “Moderate to Good” rather than “Poor.” MNA cannot be rated higher than the active source area remediation alternatives. Again, STE issues are used to justify the lower rating, but are not appropriate for evaluating this criterion.

18) Page 14, Section 2.3, Alternative 5. Compliance with ARARs should be rated “Moderate to Good” rather than “Moderate.” Meeting the ARARs for SVE and ISCO is reasonable given current technologies.

19) Page 15, Section 2.3, Alternative 5. Long Term Effectiveness. In-situ chemical oxidation can be performed beneath buildings. For example, in a recirculation system, chemicals are injected upgradient and groundwater is extracted and treated downgradient. Also, small injection wells can be installed inside buildings.

The memorandum states that “Active remediation will leave a significant fraction (>60%) of the contaminant in the source area”. Will successive applications of chemical oxidation continue to reduce the contaminant? How many times would chemical injection need to be repeated to meet the objective of removing, destroying or containing NAPL and providing a measurable benefit?

20) Page 15, Section 2.3, Alternative 5. Reduction of Toxicity, Mobility or Volume should be rated “Moderate” rather than “Poor to Moderate.” Per agency discussions in October 2005, removing 50% of the mass deserves a rating of Moderate, which is the middle of the rating scale.
21) Page 15, Section 2.3, Alternative 5. Short Term Effectiveness (STE) should be rated "Moderate" rather than "Poor to Moderate." Mitigating problems with oxidant injection and "potential system upsets" for SVE and groundwater treatment is reasonable given current technologies.

22) Page 15-16, Section 2.3, Alternative 5. ISCO gets poor marks for implementability and effectiveness due to the anticipated problems injecting the oxidant into the relatively impermeable silts underlying the site. Technologies such as hydraulic fracturing or pneumatic fracturing used in conjunction with ISCO have been successful in a number of projects to increase the mass removal in less permeable formations.

23) Page 16, Section 2.3, Alternative 6. Overall Protection of Human Health and Environment should be rated "Moderate to Good" rather than "Poor." MNA cannot be rated higher than the active source area remediation alternatives. Again, STE issues are used to justify the lower rating, which is not appropriate for evaluating this criterion.

24) Page 16, Section 2.3, Alternative 6. Compliance with ARARs should be rated "Moderate to Good" rather than "Moderate." Meeting the ARARs for SVE and soil heating is reasonable given current technologies.

25) Page 17, Section 2.3, Alternative 6. Reduction of Toxicity, Mobility or Volume should be rated "Moderate" rather than "Poor to Moderate." Per discussions in the 10/25/05 meeting, removing 50% of the mass deserves a rating of Moderate, which is the middle of the rating scale.

26) Page 17, Section 2.3, Alternative 6. Short Term Effectiveness (STE) should be rated "Moderate" rather than "Poor to Moderate." Mitigating problems with soil heating and "potential system upsets" for SVE and groundwater treatment is reasonable given current technologies.

27) Page 21, Section 3.1, Third Paragraph. The statement that "Only the extent of contamination that is outside the building area can be addressed by the active remedial alternatives" is incorrect. The active remedial alternatives can potentially remove mass beneath the building area.

28) Pages 24–30, Section 3.2.2. The ratings for each alternative for SA9 should be consistent with the changes specified above for SA12.
Hi Dante. Per EPA's request CH2M HILL has reviewed the PRPs' FS evaluation document entitled *Draft Memorandum, Detailed Evaluation of Remedial Alternatives for NAPL/Groundwater Contamination Source Areas, Soil and NAPL Feasibility Study, Del Amo Superfund Site*, dated May 5, 2006. Our review comments are attached.

If you have any questions or would like to set up a conference call to discuss our review comments, please feel free to call.

Have a great weekend!

Thanks,

Randy

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