Environmental Resources Management

1777 Botelho Drive
Suite 260
Walnut Creek, CA 94596
(925) 946-0455
(925) 946-9968 (fax)

27 October 2006

Ms. Mary Rose Cassa
California Regional Water Quality Control Board
San Francisco Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subject: Feasibility Study Addendum
Hookston Station Site
Pleasant Hill, California

Dear Ms. Cassa:

On behalf of the Hookston Station Responsible Parties (RPs), ERM-West, Inc. (ERM) submits this *Feasibility Study Addendum* in response to the California Regional Water Quality Control Board's (RWQCB's) Conditional Approval of the *Hookston Station Feasibility Study* (ERM, 10 July 2006). The Hookston Station RPs include Union Pacific Railroad Company (UPRR) and Mr. Daniel Helix, who is acting on behalf of himself and Mary Lou Helix, Elizabeth Young, John V. Hook, Steven Pucell, Nancy Ellicock, and the Contra Costa Redevelopment Agency.

ERM has prepared the following responses to Conditions outlined in the RWQCB's *Conditional Approval of Feasibility Study – Hookston Station Site, 228 Hookston Road, Pleasant Hill, Contra Costa County* (3 October 2006). The RWQCB's Conditions are presented below in italic type, with ERM's responses immediately following each Condition.

RESPONSES TO CONDITIONS

Condition 1. *Timetable: We are concerned about the timetable presented in the report for completing pilot studies and implementing full-scale cleanup. Please provide a discussion of the factors and considerations involved in estimating the timetable, including identification of opportunities to shorten the time to full-scale implementation.*

Response to Condition 1: The proposed work requires significant effort to complete engineering, design, planning, procurement, coordination, permitting, and approval tasks. The RPs must perform pre-design field and laboratory tests related to the remedial technologies selected in the Feasibility Study to properly design the remediation systems. Based on the results of these tests, the RPs will then design the full remediation systems. The RWQCB must then review and approve this design following public notice and comment. Once the design is approved, the RPs must obtain a variety of permits, negotiate access agreements, and contract with vendors before any construction can commence. The proposed schedule presented in the Feasibility Study represents the shortest timeframe that can reasonably be expected for completing these tasks.

The Feasibility Study includes a *Preliminary Implementation Schedule* as Table 8-1, which identified 10 general tasks. By design, the schedule contains no contingencies for delays between tasks. The preliminary schedule assumes the concurrent implementation of Tasks 2, 3, and 4, which reflects an aggressive push for speedy remedy implementation. Factors and considerations involved in estimating the schedule for each task, including identification of opportunities to shorten the time to full-scale implementation, are provided below.

- Task 1 – Final RWQCB Approval of Feasibility Study and Implementation Plan – This is a milestone event that represents the starting point of the implementation schedule.
- Task 2 – Implementation of Vapor Intrusion Prevention Systems and Well Abandonment – Most of the vapor intrusion prevention systems that are expected to be required have already been installed, and only two private wells are known to remain within the footprint of the ground water plume. The assumed 90-day duration to complete this task is consistent with our experience in this neighborhood based on the durations for homeowner approval, permitting, system installation, and, in the case of well abandonment, modifying irrigation systems to utilize the municipal water supply. It should be noted that the schedule for this task is not directly linked to the initiation of the ground water cleanup activities.
- Task 3 – Soil Management Plan (SMP) Development and Submittal – The 60-day duration for this task is based on our experience with

other SMPs that have been developed for industrial properties. Given that the SMP is limited to a small area of arsenic impacted soils, it is possible that this SMP could be produced in less time than indicated in this schedule. It should be noted that the schedule for this task, like Task 2, is not directly linked to the initiation of the ground water cleanup activities.

- Task 4 – Pre-Design Investigation Work Plan Development and Submittal – This workplan will include the scope of work and sampling methods for completing cone penetrometer borings along the permeable reactive barrier (PRB) alignment and the upgradient plume boundary, as well as a chemical oxidation pilot study on the Hookston Station parcel. The 60-day duration for this task is based on our experience writing similar workplans.
- Task 5 – Pre-Design Investigation Work Plan RWQCB Review and Approval – The 60-day duration for this task is based on our experience with similar documents submitted to the RWQCB. If the RWQCB requires less time for its review, the RPs will begin the pre-design investigation fieldwork sooner than anticipated on the schedule.
- Task 6 – Pre-Design Investigation Implementation and Reporting – The 90-day duration for this task is based on our site-specific experience with private property access, field sampling, pilot testing, laboratory analysis, and reporting. Some of this work, such as the zero-valent iron bench-scale treatability study (described in Section 8.1.3 of the Feasibility Study), is currently underway.
- Task 7 – Remedial Design – The 90-day duration for this task is based on our experience preparing remedial designs for similar sites.
- Task 8 – RWQCB Review and Final Approval of Remedial Design – The 60-day duration for this task is based on our experience with similar documents submitted to the RWQCB. If the RWQCB requires less time for review, the RPs will begin Task 9 sooner than anticipated on this schedule.
- Task 9 – Permitting, Utility Clearance, and Procurement – Based on our experience for similar sites, the 60-day duration for this task is optimistic and the actual duration will likely be greater. This task is more complex for the off-site PRB construction, where temporary

relocation of subsurface utilities may be necessary to accommodate the PRB construction.

- Task 10 – Remedy Implementation – The 6-month duration in this preliminary schedule is the amount of time that is estimated to complete all field operations (i.e., PRB construction, chemical oxidation injections, and site restoration). It is likely that the A-Zone PRB will be installed within the first 60 to 90 days of this period, to be followed by a longer period of effectiveness monitoring. For the purpose of this preliminary schedule, the B-Zone chemical oxidation was included within this task, but we are currently evaluating the possibility of accelerating this work to begin shortly after the completion of Task 6.

Opportunities for schedule acceleration are very limited, as described above. It may be possible to perform some elements of various tasks in advance of how they are depicted in the preliminary schedule. A detailed schedule will be provided in the Remedial Design, which will identify all remediation program tasks, subtasks, and durations.

Condition 2. *Characterization of A-Zone: The report raises some issues regarding estimated time to achieve interim cleanup goals for the A-Zone groundwater (below the level at which indoor air impacts would be expected). Alternative 3 includes enhanced bioremediation of A-Zone groundwater, using injection of an amendment to promote reductive dechlorination of TCE. This alternative is expected to reduce concentrations of TCE to below the interim cleanup goal within 5 years. Alternatives 4 and 5 include zero-valent iron permeable reactive barrier for A-Zone groundwater, which is expected to reduce concentrations of TCE below the interim cleanup goal within 3 years. Alternative 6 includes pumping water from extraction wells in the A-Zone and is expected to reduce concentrations of TCE to below the interim cleanup goal in 2 years.*

In the Detailed Evaluation of Remedial Alternatives (Section 7.2), the text states that the <u>discontinuous nature</u> [emphasis added] *of the A-Zone could make effective distribution of biological amendments difficult (short-term effectiveness score = 3). The text goes on to state that the short-term effectiveness score for Alternatives 4, 5, and 6 is 4. It is unclear from this discussion why the report concludes that alternative 6 (groundwater extraction) would be expected to attain interim cleanup goals any faster than the other alternatives. Further,*

based on our experience with groundwater extraction systems throughout the region over more than 20 years, this technology does not result in rapid decreases in VOC concentrations in discontinuous water-bearing units such as the A-Zone at this site.

Please provide additional evaluation of the effectiveness of the alternatives with respect to the discontinuous nature of the A-Zone. Please also include a discussion that clarifies why an additional technology down gradient from the PRB, such as ground water extraction and treatment or targeted injection of zero-valent iron (perhaps phased, after one or two quarters of monitoring), would not be appropriate.

Response to Condition 2: Responses to each primary part of this comment are provided separately below:

Part 1: *Clarify why the report concludes that Alternative 6 (groundwater extraction) would be expected to attain interim cleanup goals any faster than the other alternatives.*

Alternative 6 was expected to have a slightly shorter timeframe to reach interim cleanup goals, primarily because the modeled pump-and-treat system has an extensive network of ground water extraction locations throughout the plume (compare Figures 6 through 15 of the Feasibility Study with other proposed remedy configurations) and has hydrogeologic influence to draw lower concentration ground water from the fringes of the plume, causing dilution of the area of concern. Conversely, Alternative 3 used enhanced biodegradation, which resulted in slower overall reduction of concentrations in the downgradient area, primarily because the biological process takes 1 to 2 years to completely develop a stable microbial population, and the process was being completed under natural ground water flow conditions.

Part 2: *Provide additional evaluation of the effectiveness of the alternatives with respect to the discontinuous nature of the A-Zone.*

The discontinuous nature of the A-Zone has little bearing on Alternatives 1 (no action) and 2 (monitored natural attenuation). The long term effectiveness of Alternative 3 (in situ bioremediation) is described in Section 7.2.3 of the Feasibility Study, which states, "The enhanced

bioremediation can be implemented extensively across the portion of the A-Zone on the Hookston Station Parcel, but the accessibility of the downgradient study area is lower, resulting in a limited area of influence from the injected bioremediation amendment. This could produce a potential for localized areas of reduced treatment effectiveness and residual risk within the downgradient study area. Therefore, this alternative has moderate long-term effectiveness (score = 3)." Alternatives 4 and 5 (both PRBs for the A-Zone) are expected to have a higher degree of long-term effectiveness than Alternative 3 because the PRB will intercept all ground water passing through the A-Zone into the downgradient area, and is not limited by localized delivery systems such as direct-push borings or dedicated wells. Alternative 6 (pump and treat) is similarly ranked with Alternatives 4 and 5 with respect to long-term effectiveness. It is expected to have a slightly higher long-term effectiveness than Alternative 3, because Alternative 6 is theoretically expected to induce hydraulic stresses that draw lower concentration water into the core area of the plume.

Part 3: *Clarify why an additional technology down gradient from the PRB, such as ground water extraction and treatment or targeted injection of zero-valent iron would not be appropriate.*

The accessibility of the downgradient residential neighborhood is limited, resulting in a limited area of influence using injectable treatment alternatives. This is why injected A-Zone bioremediation amendments and chemical oxidants (or reductants) all either ranked lower or were screened out for further evaluation within the Feasibility Study. This is a delivery-limited geologic formation. Although ground water extraction in the neighborhood could theoretically increase ground water flow through portions of the PRB, the difficulty in facility placement and the cost of such a system are high, and such a system would do nothing to decrease risks to the local residents compared with the proposed remedial alternative. For these reasons, the pump and treat alternative considered in the FS ranked low in long-term effectiveness and cost criteria. In addition, PRBs are designed to clean up ground water under natural ground water flow conditions. Increasing the flow through portions of the PRB could have the negative effect of reducing contact time within the zero-valent iron, therefore potentially limiting the effectiveness of the PRB.

Condition 3. *Vinyl chloride in soil vapor: The report does not include any mention of specific concerns about vinyl chloride that has developed as a result of commingling of TCE with petroleum hydrocarbons (near the Pitcock Petroleum site on Hookston Road and near a former natural gas leak along Hookston Road). Please provide an evaluation of measures to address these incidental occurrences of vinyl chloride in groundwater and soil vapor.*

Response to Condition 3: Vinyl chloride will be addressed in the same manner as TCE from Hookston Station, and the PCE and associated breakdown products from other nearby sources that are in ground water. The measures that will be implemented to address these occurrences in ground water and soil vapor are (1) installation of the A-Zone PRB, (2) installation of vapor intrusion prevention systems, and (3) continued soil vapor and ground water monitoring.

Condition 4. *Groundwater capture zone: Please provide a clear explanation of measures that will be taken to ensure an adequate ground water capture zone for the proposed PRB.*

Response to Condition 4: Pre-design study activities will be conducted along the proposed alignment of the PRB. These activities will include advancing soil borings along the proposed PRB alignment for the purposes of collecting lithological and chemical distribution data. The data collected from these borings will be used to determine the appropriate depth and width of the PRB for meeting the remedial action objectives and cleanup goals discussed in the Feasibility Study.

Once the PRB is constructed, a monitoring network using new and existing monitoring points in the immediate vicinity of the PRB will be used to evaluate its effectiveness and to ensure that the PRB is intercepting the ground water plume it is designed to treat. The location of these monitoring points will be described in the Remedial Design.

Condition 5. *Cost of Institutional Controls: The cost of implementing and monitoring the Institutional Control to prohibit future well installation (e.g., County ordinance) is not specifically discussed in the FS. Experience has shown that such costs may be substantial. Please provide clarification on this issue.*

Response to Condition 5: This is a component common to all the remedial alternatives presented in the Feasibility Study (other than the no-action Alternative 1). Therefore, the costs associated with this task did not differentiate one alternative over another and thus were not presented in the Feasibility Study. In addition, the County (which is one of the Dischargers under the current Cleanup and Abatement Order) has advised that predicted costs for this activity are not substantial.

Condition 6. *Contingency plan: Please provide a discussion that clearly explains potential contingencies should Alternative 4 not function as expected.*

Response to Condition 6: The system's overall effectiveness will be regularly evaluated and reviewed by the RPs and the RWQCB staff. As warranted, system changes may be implemented. This may include, where appropriate, additional vapor intrusion prevention systems based on indoor air sampling that is being required within the neighborhood, or additional chemical oxidation injections in B-Zone ground water based on water quality monitoring results.

Condition 7. *Pitcock Petroleum: Please provide discussion that clarifies the impact of the Pitcock Petroleum plume on the Hookston plume and treatment options, including extent of overlap, differences between chemicals, and source of chemicals.*

Response to Condition 7: Given the constituents that have been identified during previous site investigations, there are no anticipated impacts to the proposed Hookston Station remedial alternatives from the Pitcock Petroleum plume. The petroleum compounds emanating from Pitcock Petroleum provide conditions that enhance the biodegradation of VOCs in the surrounding area ground water. This degradation process is not expected to negatively impact the downgradient PRB. However, it should be noted that the PRB is not designed to treat many of the chemicals associated with the Pitcock Petroleum plume, including petroleum hydrocarbons and MTBE. These chemicals will continue to migrate with the groundwater flow through the PRB.

The remainder of this response addresses our current understanding of the extent of overlap, differences between chemicals, and sources of chemicals. Based on the most recent phase of site investigation, the

geographic extent of the Pitcock Petroleum plume has not been completely defined and, as such, the complete extent of plume overlap has not been determined. Pitcock Petroleum is currently conducting investigation activities to further characterize the downgradient extent of their plume under the direction of the RWQCB.

In general, Pitcock Petroleum wells contain elevated concentrations of petroleum hydrocarbons, which include benzene, toluene, ethylbenzene, xylenes, and MTBE. According to existing reports on file with the RWQCB, the property has been operated as a bulk fueling facility since the 1950s; activities associated with bulk fueling at Pitcock Petroleum are the likely source for hydrocarbon impacts. Chlorinated solvents (primarily PCE and lower concentrations of TCE) are also found in Pitcock Petroleum monitoring wells.

The ground water plume originating from the Hookston Station Parcel consists of chlorinated VOCs, including TCE and associated degradation compounds. Existing soil vapor, soil, and ground water data suggest the TCE was released in the southwestern portion of the Hookston Station Parcel, near the structure identified as 199 Mayhew Way. PCE and TCE that originate upgradient of the Hookston Station parcel (as observed in the MW-20A/B and MW-21A/B well clusters) have also migrated onto the Hookston Station parcel. The RWQCB is currently directing investigations into the source(s) of VOCs in this upgradient area.

Condition 8. *"Common Components": Section 6.3 describes the three common components of the "active remediation" alternatives: a soil management plan for arsenic in soil, vapor intrusion prevention systems, and private well removal. This section does not discuss institutional controls to prevent installation of wells until final ground water cleanup goals are achieved (see Section 8.3.5, Land Use Restrictions and Institutional Controls). Please clarify the full suite of common elements of the "active remediation" alternatives.*

Response to Condition 8: The common components identified in Section 6.3 of the Feasibility Study should have included the following:

- Institutional controls for arsenic-impacted subsurface soil in the form of an SMP;

- Vapor intrusion prevention components for homes in the Colony Park Neighborhood, in which TCE is present in indoor air at concentrations that exceed the associated indoor air cleanup goals;
- Removal of private wells, which are used for irrigation and filling swimming pools, from residences in the Colony Park Neighborhood that overlie the commingled plume; and
- Institutional controls that prohibit the use of ground water at the Hookston Station Parcel and the Colony Park Neighborhood until water quality goals are met.

These four components will be implemented for Hookston Station as well as the proposed A-Zone zero-valent iron PRB and in situ chemical oxidation of B-Zone ground water.

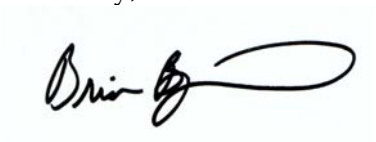
Condition 9. *Land Use Controls: Table 4-2, Action-Specific Applicable or Relevant and Appropriate Requirements, includes DTSC as the relevant agency for land use controls and includes this comment: "In the event a remedy is selected that does not result in unrestricted use, a LUC between the City of Pleasant Hill and DTSC will be signed and recorded with Contra Costa County prior to DTSC certification that the removal action has been completed." Because this is a Water Board-lead site, DTSC would not be involved in any land use covenants for the site. Any land use controls associated with the Hookston Station site would be between the landowner or the city and the Water Board. Please clarify this issue.*

Response to Condition 9: DTSC should not have been referenced on Table 4-2; all references to DTSC should be replaced with RWQCB.

CONCLUSIONS

We appreciate the opportunity to clarify the contents of the Feasibility Study and hope that these responses adequately address your concerns. If you have any questions, please call me at (925) 946-0455.

Sincerely,



Brian Bjorklund, PG, CHG
Project Manager

KLL/bsb/0020557.10

cc: Mike Grant, UPRR
Dan Helix
Jim Kennedy, Contra Costa County Redevelopment Agency