Comments on
UC Davis Laboratory for Energy-Related Health Research
Proposed Remediation Plan for DOE Areas
Rev. C 03/24/08

Comments Submitted to DSCSOC
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DOE distributed a proposed plan for remediation of the DOE parts of the UCD DOE LEHR Superfund site. According to the Plan introduction,

> *"This Proposed Plan identifies the preferred **remedial alternatives** for residual soil contamination in the United States Department of Energy (DOE) areas at the former Laboratory for Energy-Related Health Research (LEHR or the Site) and provides the rationale for these preferences."*

I have reviewed this proposed remediation Plan from an overall prospective focusing on the adequacy and reliability of the information provided. I have not checked the numeric values provided on the characteristics of each of the DOE areas; I am assuming that the RPMs will make that evaluation. Much of the proposed Plan is devoted to an abbreviated discussion of the merits and potential costs of alternative approaches for remediation of the DOE areas of the LEHR site. I have previously provided DSCSOC with detailed comments on many of the issues of concern on the various discussed remediation approaches. Those comments,

> Lee, G. F., "Comments on LEHR/SCDS Environmental Restoration Quarterly Monitoring Report, Winter 2006 Prepared for University of California, Davis, by Brown and Caldwell, August 2006," Report submitted to DSCSOC by Dr. G. Fred Lee, G. Fred Lee & Associates, El Macero, CA, January 24 (2007)

were submitted to the RPMs and are available on the DSCSOC website, www.dscsoc.com at http://members.aol.com/dscsoc/doc.htm.

In previous comments I have focused on deficiencies in the ability of some of the proposed remediation approaches in providing protection of public health and the environment from residual wastes proposed to be left at the LEHR site, for as long as these residual wastes will be a threat. I also commented on the inadequacies of the cost estimates for some of the remediation approaches in providing the necessary monitoring and remediation to ensure, with a high degree of reliability, that releases from the residual wastes do not occur.

In the comments provided herein I am not repeating all of my previous comments on potential problems with technical and economic aspects of the DOE Proposed Plan. I am focusing these comments on the DOE's indicated "preferred alternatives" and certain other issues that continue to need to be addressed.

Page 10 Table 4, Remedial Options, Alternatives and Estimated Costs for the LEHR Site DOE Areas has as a footnote,

"*No Further Action is the preferred alternative for DSS 1, DSS 5, DSS 6, DSS 7, DOE Disposal Box and Western Dog Pens areas.*"

In that table, DOE proposes that Ra/Sr Treatment Systems, DSS No. 3, DSS No. 4, Dry Wells AE Area, Southwest Trenches all receive:

"*Long-Term Groundwater Monitoring / Contingency Remediation.*"

and that the Eastern Dog Pens receive "*No Further Action / No Action*"

Based on that Table, DOE proposes to do no further remediation of its areas beyond the remediation that has already been implemented. This approach can be acceptable **provided that an adequate, comprehensive groundwater monitoring program be developed and implemented for as long as there are pollutants in the source areas that can be transported to groundwater at concentrations that can impair the use of the groundwater for water supply for domestic and other purposes.** This proposed approach is of concern, however, because the details of the groundwater monitoring program that would be implemented have not been defined. Thus, its adequacy cannot be assessed.

It has been my experience that both the USEPA and the CVRWQCB have approved groundwater monitoring systems for waste areas that are obviously deficient in detecting incipient groundwater pollution. There will be need to carefully examine the adequacy of the groundwater monitoring program that is developed and how well it is implemented. Further, there will be need for third-party, independent review of the monitoring program results and its implementation for as long as the waste residual left at the LEHR site are a threat to pollute (impair the uses of) groundwater.

In proposing this alternative, the DOE has grossly underestimated the costs of ad infinitum monitoring of groundwater with a high degree of reliability to detect incipient movement of the residual waste components from the waste area that could contaminate (impair the uses of) groundwater for as long as the wastes will be a threat. The current LEHR site groundwater monitoring well array will not be adequate for this purpose.

If this Preferred Alternative is adopted, deed restrictions will have to be adopted and effectively implemented for as long as the waste residuals are a threat when disturbed (brought to the surface), to prevent harm to public health and the environment.

Presented below are comments on some specific issues.

Page 6, left column, states

"A soil constituent was identified as a constituent of potential groundwater concern (COPGWC) when its existing concentration in groundwater was above background or when modeling calculations indicated the constituent could impact groundwater above the State maximum contaminant levels and/or background within 500 years."

As discussed previously, the 500-yr limitation is arbitrary, technically invalid, and non-protective, and does not conform to SWRCB or CIWMB regulatory requirements, which explicitly require that groundwater be protected for as long as the wastes are a threat. This finding is documented in my previous comments on DOE's approach to modeling the transport of pollutants through the soil and geological formations to the groundwater.

Page 7, Surface Water Risk, second paragraph states,

"The results of the Ecological Risk Assessment indicate Putah Creek presents acceptable risk to ecological receptors."

As I have documented in previous comments, the Ecological Risk Assessment associated with stormwater runoff and Putah Creek is grossly deficient in properly evaluating the impact of LEHR site wastes discharged to Putah Creek.

Page 8, left column, first paragraph states,

"Four consecutive groundwater sample results that exceed background and show an increasing or constant concentration trend would trigger a new evaluation of remedial options."

The hydrology and hydrogeology of the groundwater system underlying and near the LEHR site, and the area's climate, are such that pollution of the groundwaters can occur and pose a threat to public health without there having been consecutive exceedances of MCLs in the groundwater.

Page 9, left column, Asphalt Cap, states,

"An asphalt cap would consist of a thick plastic liner overlain by eight inches of compacted gravel and four inches of asphalt pavement. The liner and pavement would be sloped to direct stormwater runoff away from the area. The asphalt cap would be inspected periodically and repaired as necessary. Land-use restrictions would be implemented to protect the cap and ensure its longterm integrity."

As discussed in previous comments, the "thick plastic liner," which is the key to preventing moisture from entering the groundwater system under the cap, will deteriorate over time and fail to provide an effective barrier to water transport through the cap

system. Before the proposed approach is adopted, DOE should be required to define how it would detect the deterioration of the plastic liner, at any point in the liner, that would enable passage of moisture through it, for as long as the wastes at the site are a threat. Since the plastic liner is beneath asphalt, it would not be amenable to visual inspection. Further, funds should be set aside by DOE to periodically replace the cap, especially the so-called "thick plastic liner" when its deterioration begins to occur.

Page 9, right column, **7.8. *In Situ* Bioremediation**, states,

"This option would treat nitrate underground using an innovative bioremediation technology. Treatment would be achieved through a process called ***anaerobic*** *microbial denitrification. A liquid (e.g. sugar water) would be injected in the subsurface until complete* ***soil saturation*** *is achieved in the vicinity of the nitrate contamination."*

While if properly implemented, this approach can be effective in removing nitrate from a subsurface area, it can also lead to the pollution of groundwater by constituents mobilized during this treatment.

Questions on these comments should be directed to G. Fred Lee.