Comment on LEHR Superfund Site July 20, 2005 RPM Meeting Issues

Submitted by G. Fred Lee, PhD, DEE, DSCSOC Advisor

Julie Roth, Executive Director
DSCSOC

Julie,

I wish to provide DSCSOC with some comments on the July 20, 2005 LEHR National Superfund Site RPM meeting.

Susan Timm's Comments on the Adequacy of Definition of LEHR Site Groundwater Pollution Sources

Associated with her review of the draft DOE Risk Assessment [Weiss Associates, "Draft Site-Wide Risk Assessment, Volume I: Human Health Risk Assessment (Part B – Risk Characterization for DOE Areas) at the Laboratory for Energy-Related Health Research University of California, Davis," Rev D, May 13 (2005)], Susan Timm raised the issue of the adequacy of the definition of the contribution to groundwater pollution from the individual waste management units at the LEHR site. DSCSOC has repeatedly raised the issue of the adequacy of the site characterization specifically with regard to the role of the various waste management units in causing groundwater pollution. As Susan pointed out, the groundwater monitoring well array was not designed to determine whether a particular waste management unit is causing groundwater pollution. Christine Judal indicated at the meeting that the groundwater monitoring well array was designed to provide a general assessment of the pollution of groundwater by the LEHR site waste disposal. In order to properly assess whether a particular waste disposal area has, is currently, or could at sometime in the future, cause groundwater pollution, there is need to develop waste-management-unit-specific upgradient and downgradient wells. This is a normal and necessary approach used in investigating groundwater pollution by specific areas. Until this is done, the existing and potential future contribution of a particular waste management unit to the pollution of the groundwater cannot be reliably assessed.

DOE Prediction of the Rate of Pollution of Groundwater by Residual Waste Left in Soil Column

In previous comments DSCSOC has repeatedly pointed out that the DOE approach to predicting the rate of pollution of groundwaters is flawed. As DSCSOC has pointed out, the modeling approach used incorporates several assumptions (e.g., average annual moisture content, and that pure-solution Kd values are appropriate for predicting transport under field conditions that exist at the LEHR site) that are not in accord with reliably predicting the rate of groundwater pollution by residual pollutants in the soil column. One of the issues of concern is the assumption that the rate of moisture movement in the vadose zone can be predicted based on uniform flow. As others and I have pointed out, it is well-established that in most cases vadose zone transport is through

preferential pathways. Such transport makes predicting the rate of pollutant transport highly unreliable unless there is a detailed characterization of preferential pathways that exist in the area of concern. Recently a review article discussing preferential pathways transport in Central Valley soils was published by a number of UCD faculty. That paper,

Harter, T., Onsoy, Y., Heeren, K., Denton, M., Weissmann, G., Hopmans, J., and Horwath, W., "Deep Vadose Zone Hydrology Demonstrates Fate of Nitrate in Eastern San Joaquin Valley," California Agriculture 59(2):124-132, April-June (2005).

is available at http://CaliforniaAgriculture.ucop.edu.

That paper states,

"This heterogeneity should be considered when interpreting soil and deep vadose zone monitoring data and assessing of the leaching potential of agricultural chemicals. The transport of contaminants through the vadose zone may be significantly faster than previously assumed, while denitrification is likely limited or insignificant in the oxic, alluvial vadose zone of the eastern San Joaquin Valley."

It is highly likely that the actual rate of groundwater pollution at the LEHR Superfund site can be much more rapid than that predicted by DOE.

LEHR Superfund Wastewater Discharges to UCD Campus Wastewater Treatment Plant

At the RPM meeting on July 20, 2005 UCD representatives indicated that it is discharging LEHR site wastewaters to the campus wastewater treatment plant. As I indicated, this is of concern from several perspectives. First, the Central Valley Regional Water Quality Control Board should be informed of this situation. Second, at the meeting, a UCD representative attempted to justify this with the assertion that the wastewater effluent from the LEHR site represents only a small portion of the flow to the campus sewage treatment plant. He also stated that the campus sewage treatment plant effluent is being adequately monitored for potential adverse impacts of this additional wastewater load.

As I indicated, that rationale is not in accord with technically valid approaches for properly disposing of and regulating Superfund site wastewaters. The monitoring program that was established for the UCD campus wastewater treatment plant was not based on an understanding that partially treated Superfund site wastewaters would be discharged to the treatment plant. I know, as the DSCSOC repeatedly pointed out, that the degree of characterization of the constituents of concern related to the LEHR site is inadequate to ensure that there are no constituents in the wastewaters from the IRA of the LEHR site treatment plant that could be adverse to Putah Creek water quality. There are substantial amounts of uncharacterized organic carbon present in groundwaters at the LEHR site that could readily contain hazardous and otherwise deleterious chemicals that would pass through the campus wastewater treatment plant without adequate treatment.

UCD needs to alert the Central Valley Regional Water Quality Control Board that it has changed the character of the wastewaters being discharged to the campus sewage plant to now include partially treated (air-stripped) Superfund site wastewaters.

During our discussions I mentioned that the RPM should review whether the UCD wastewater is now in compliance with the current Central Valley Regional Water Quality Control Board NPDES permit. As I pointed out, if the campus sewage treatment plant is not in full compliance with permit conditions there is even a greater likelihood that the uncharacterized wastewater components from the LEHR Superfund site could pass through treatment works without adequate treatment. UCD should provide the monitoring reports for the past year for this treatment plant's discharge to Putah Creek for examination by the RPMs to determine whether there is compliance with NPDES permit requirements.

Weiss Associates, "Draft Site-Wide Risk Assessment, Volume I: Human Health Risk Assessment (Part B – Risk Characterization for DOE Areas) at the Laboratory for Energy-Related Health Research University of California, Davis," Rev D, May 13 (2005).

Over the past several months, considerable time has been spent by the RPMs reviewing the DOE-area draft site-wide risk assessment Volume 1 – Human Health report. I have followed closely the progress that has been made in the RPMs' review of this draft report, DOE's responses to the RMP's comments, and the RPMs' comments DOE's responses. I see no major problems at this time with that report as it is being re-drafted based on the RPMs' comments.