

## **LEHR Site Groundwater Remediation Issues**

Dr. G. Fred Lee, Advisor to DSCSOC

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At the July 23, 2003, RPM meeting, there was discussion about groundwater remediation issues. Presented below are comments on several of these issues.

### **Chromium**

Several of the UCD/DOE LEHR Superfund site RPMs have raised issues about the pollution of groundwaters by chromium at the LEHR site. As I indicated at the RPM meeting on July 23, 2003, the geological strata in the greater Davis area contains naturally occurring chromium that results in chromium concentrations above the US EPA drinking water MCL of 50 µg/L at some times in some domestic wells located near the LEHR site. There are a variety of factors, such as water table location, season, etc., which are likely influencing the chromium concentration in a domestic well in this area.

In accordance with Patti Collins' requested approach for defining issues set forth at the July 23, 2003, RPM meeting, there is no doubt that groundwaters containing UCD/DOE waste-derived chromium require remediation. The issue that has not been defined is whether naturally occurring chromium that occurs at the LEHR site requires remediation if it is found in the groundwaters but not pumped to the surface as part of the remediation program. Obviously, if it is pumped to the surface, then there should be remediation of the chromium-polluted groundwaters for chromium, even if it is reinjected into the ground or spread on the soil surface.

P. Collins indicated that, based on the existing situation, UCD is going to have a difficult time proving that chromium in monitoring wells is derived from natural sources, and therefore does not need to be remediated. P. Collins made it clear that the burden of proof with respect to chromium being derived from waste disposal practices, versus naturally occurring, is on UCD, to convincingly demonstrate that chromium found in the groundwaters at the LEHR site downgradient from the waste management units is naturally derived chromium, versus waste-derived chromium.

The basic problem is the same issue that I have raised for over half a dozen years of the inadequate characterization of groundwaters relative to the various waste management units at the LEHR site. I have repeatedly suggested that the RPMs should require UCD to develop a groundwater model for the LEHR site, which can be used to define the size of the plumes that will be located down groundwater gradient from a hypothetical disposal pit in each of the waste management units. It is well-established that UCD's disposal of wastes in each of the waste management units is not the same for each location within the unit. Therefore, there could readily be groundwater pollution plumes, down groundwater gradient from the waste management unit, of limited dimensions, where a single monitoring well downgradient from the waste management unit would not necessarily reliably sample the groundwaters.

With respect to the background wells that were discussed at the July 23, 2003, meeting, it would be inappropriate to take an average of wells' chromium concentrations, and assume that that is the upgradient concentration of chromium in the groundwater for each of the waste

management units. As I understand the situation, only one of the half a dozen wells that are being considered as background groundwater monitoring wells contains elevated chromium. The flow path from that well needs to be defined, to see if that would lead to the conclusion that chromium found in an appropriate number of groundwater monitoring wells just downstream from a waste management unit is derived from upstream natural sources. Since there is a possibility that there is naturally occurring chromium in the groundwaters between the location of the background monitoring wells which do not have chromium in them now and the waste management unit, there is a possibility that the groundwaters flowing under a waste management unit could be contaminated by naturally occurring chromium. The only way to address this issue is to develop a sufficient number of upgradient monitoring wells for each waste management unit to properly characterize the groundwaters flowing under a waste management unit.

The alternative to properly defining the chromium released from each waste management unit is to adopt the approach that any chromium found in groundwaters at the LEHR site is derived from UCD's waste disposal practices.

### **Total Dissolved Solids (TDS)**

P. Collins, at the July 23, 2003, RPM meeting, mentioned that the US EPA will require that UCD remediate the groundwater for chromium and nitrate. Both of these constituents are a threat to human health, and therefore fall under the regulatory requirements of the US EPA CERCLA. However, the US EPA CERCLA regulations are deficient in addressing other constituents that are not health hazards, but which can cause a groundwater to be polluted by Superfund site waste that render the groundwater unusable or impaired for use. An example of this situation is TDS. There is no issue that UCD's LEHR site waste disposal practices have resulted in increased TDS in groundwater. While the US EPA may not require remediation of the groundwater to control TDS, Porter-Cologne and the Central Valley Regional Water Quality Control Board Basin Plan requirements do require that the pollution of groundwater by TDS must be remediated. In order to eliminate any ambiguity on this, the Regional Board (Susan Timm) needs to make a definitive statement on this issue with respect to UCD's requirements for groundwater remediation for TDS and other constituents that can cause the groundwater downgradient of a waste management unit to be in violation of CVRWQCB Basin Plan objectives, including tastes and odors, etc.