

**Follow-up on UCD/DOE LEHR Superfund Site
Stormwater Runoff Management Issues**

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Following the November 10, 2009 RPM meeting, J. Roth sent to the RPMs/PRPs a November 4, 2009 draft writeup that I had prepared on stormwater runoff water quality management issues at the UCD/DOE LEHR Superfund site. As follow-up to that RPM meeting I am providing these additional comments on LEHR site stormwater runoff water quality management issues that evolved from that meeting and from the 2009 Semi-Annual Water Monitoring Report that was dated November 9, 2009.

In my previous comments and at the RPM meeting I mentioned that, based on my review of the US EPA Superfund site investigation guidance, the US EPA has not developed specific Superfund guidance for monitoring stormwater runoff. However, in my discussion of this issue with US EPA headquarters representatives, they suggested that the US EPA Stormwater monitoring guidance,

US EPA, “NPDES Stormwater Sampling Guidance Document (EPA/833/B-92/001)” for implementing the Agency NPDES stormwater management program. (1992). (<http://yosemite.epa.gov/R10/WATER.NSF/NPDES+Permits/SW+guidance+&+fact+sheets+-+Region+10/>).

would be applicable to stormwater runoff monitoring at Superfund sites.

At the November 10, RPM meeting I learned that the CVRWQCB had apparently issued an NPDES stormwater runoff permit for the LEHR site as an “Industrial Site.” The above-referenced US EPA (1992) stormwater runoff monitoring document provides guidance for monitoring programs that should be followed for monitoring industrial sites. It is now clear that the CVRWQCB and the RPMs made a significant error in allowing UCD/DOE to monitor the stormwater runoff from the LEHR Superfund site as though it were an urban area (requiring collection of only a single grab sample of runoff at some arbitrary time during a couple of storms events each year) rather than an industrial site with hazardous wastes present at the site. This error needs to be corrected by the CVRWQCB; guidance provided by the US EPA for monitoring stormwater runoff from an industrial site, especially an NPL Superfund site with substantial hazardous chemicals at the site, needs to be incorporated into the monitoring requirements. Of particular import is the sampling of the true first-flush stormwater runoff each year – at the beginning of the storm and repeatedly during the runoff event – and continuing with such sampling for a sufficient number of storms each year to adequately characterize the runoff of hazardous chemicals from the LEHR site.

At the November 10, RPM meeting, S. Fields of UCD stated that the sampling of the first stormwater runoff for the LEHR site this season, on October 13-15, 2009, demonstrated that the BMPs (installed in response the CVRWQCB requirements to control the mercury in the runoff sufficiently so as not to cause exceedance of the CTR criterion) were effective since the

concentration of mercury in each of the two single-grab samples collected by UCD (47 ng/L for LF-03 and 11 ng/L for LF-01) was below the 50 ng/L CTR criterion. I pointed out that that assessment could readily be in error because the chemical composition of the stormwater runoff from the LEHR site is likely to be variable during a runoff event; with only one sample's having been collected, an exceedance of the CTR criterion in the runoff could easily have been missed. This situation is well-recognized by those familiar with patterns of pollutant concentrations in stormwater runoff from industrial sites. This is the reason that the US EPA specified in its 1992 guidance that a sample must be collected at the beginning of runoff (true "first flush") and at several times during a runoff event. As I indicated during the November 10, 2009 RPM meeting, while finding that a single grab sample exceeds a water quality criterion/objective is sufficient to determine that the BMPs are not adequate to meet regulatory requirements, finding that a single grab sample contains a contaminant at levels below the criterion is not adequate to justify the conclusion that the BMPs are working.

As reported in the past, and again herein, the times that the samples of stormwater runoff were collected have not been provided. UCD and DOE should be required to report, along with the pollutant concentrations, the time at which the rainfall event started, the time at which the first runoff occurred, and the time at which the sample was collected. That information is important for understanding the potential representativeness of a particular sampling regimen for the particular chemical being measured.

Also, as I have discussed in DSCSOC's previous comments on inadequacies in the monitoring of stormwater runoff from the LEHR site, just meeting the CTR criterion for mercury does not preclude excessive bioaccumulation of mercury in Putah Creek fish. Based on current understanding, in order to achieve that level of protection, the total mercury in LEHR site runoff should be less than about 5 ng/L. The past US EPA administration did not follow through with updating the CTR criterion from the 50 ng/L level to about 5 ng/L, as was indicated needed to be done when the CTR criterion was originally adopted.

Over the years, based on my more than four decades of work on monitoring stormwater runoff, DSCSOC has repeatedly pointed out to the LEHR Superfund site RPMs significant deficiencies in how the sampling is being conducted (see the DSCSOC reports on the DSCSOC website, <http://www.gfredlee.com/dscsoc/doc.htm>). It is well-understood that collecting stormwater samples only when it is convenient for UCD staff to sample and not collecting samples on weekends or at night will not yield a reliable assessment. Indeed, following that approach resulted in missing the first storm of the fall season for several years because these events occurred on weekends. I provided a reference to a paper on my website,

Kluesener, J. W., and Lee, G. F., "Nutrient Loading from a Separate Storm Sewer in Madison, Wisconsin," *Journ. Water Pollut. Control Fed.* **46(5)**:920-936 (1974).
<http://www.gfredlee.com/Nutrients/KluesenerLeeNutrLoad.pdf>

discussing work my graduate student, J. Klusener, did in the 1960s. He developed and installed a flow monitoring device and automatic sampler in the city of Madison, Wisconsin storm sewer to collect samples of stormwater runoff at the beginning of, and periodically during, stormwater runoff events. That device worked automatically, at all times, including on weekends and at night. This is now the conventional approach for properly monitoring stormwater runoff. UCD

and DOE should be required to install and operate such a system for the three stormwater runoff locations at the LEHR Superfund site.

At the November 10, 2009 RPM meeting S. Fields indicated that it was UCD policy not to do more than the minimum monitoring needed to meet the regulatory requirements. This has been UCD policy for many years despite the fact that the regulatory requirements are well-known to be inadequate for the protection of public health and the environment. This is how the taxpayers of California are now spending many tens of millions of dollars in the LEHR site Superfund cleanup even though it has been known since the 1950s, based on studies conducted at UC Berkley, that placing campus wastes in LEHR site landfills would lead to groundwater pollution. The UC Berkley studies were discussed 50 years ago in an American Society of Civil Engineers publication,

ASCE, "Sanitary Landfill," Report Committee on Sanitary Landfill Practice of the Sanitary Engineering Division of the American Society of Civil Engineers, New York, NY (1959).

Rather than doing the least possible to just get by a regulatory agency's nominal requirements, UCD should become pro-active and do what is recognized as necessary to provide for environmental protection. While that approach may be a little more expensive initially, it could, in the longer run, save the taxpayers of California large amounts of money and resources.

At the November 10, RPM meeting the UCD 2009 Semi-Annual Water Monitoring Report was made available. That report reveals important information on LEHR site stormwater runoff mercury water quality issues. Mercury concentrations in the LF-01 samples during the February 6, and February 12, 2009 runoff events were 590 ng/L and 170 ng/L. The mercury concentration in the LS-01 sample collected on February 13, 2009 was 96 ng/L; the duplicate sample contained of 97 ng/L. Any value above 50 ng/L is a violation of the CTR and the LEHR Superfund site NPDES permit.

I visited the LEHR site during a rainfall event on February 20, 2009 and took a set of photographs of the LF-01 area that showed the straw rolls were in the flow path for LF-01 discharge. The water on the downstream side of the lower-most straw roll was turbid indicating that erosional materials from the LEHR site was, as expected, passing through the straw rolls. The high mercury concentrations in the February 2009 samples noted above demonstrate, again as expected, that the BMPs being used (straw rolls) are not reliable for preventing violations of the CTR criteria.

The UCD 2009 annual monitoring reports states on page 11, "*For results monitored by DOE at LS-01, mercury, TSS, and TOC concentrations were the highest they have been for recent years.*" It is clear that there is need to install effective BMPs to control mercury from areas of the LEHR site that contribute flow to LS-01.

Contrary to claims made at the November 10, 2009 RPM meeting that the BMPs for the LEHR site are adequate to control mercury in stormwater runoff to concentrations below the CTR criterion as was done, it is clear that, as expected, the BMPs that have been installed thus far are not effective in controlling excessive mercury in stormwater runoff from the LEHR site.

Since UCD mixed soils containing elevated levels of mercury into the soils associated with each of the waste CERCLA management units at the LEHR site, it is likely that the CERCLA areas of LEHR are sources of some of the excessive mercury in some samples of stormwater runoff from the LEHR site. This should make the mercury in the stormwater runoff from these areas a CERCLA issue and cause mercury from these areas to be named as a LEHR site “constituent of concern.” There is need to study the sources of mercury from the CERCLA and non-CERCLA areas, and ultimately control the mercury from the CERCLA areas as needed in the remediation of the area.

If there are questions or comments on these comments and/or the attached paper please contact me.

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