Comments on "2000 Annual Groundwater Treatment System and Water Monitoring Report: LEHR/SCDS Environmental Restoration, Davis, California,"

Prepared by

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Comments by
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Presented below are comments on the year 2000 monitoring report prepared by UCD for the LEHR national Superfund site located on the University of California, Davis campus.

Overall

This data report presents important data on the LEHR UCD campus national Superfund site. Unfortunately, UCD continues to mix propaganda with science in discussing the data. For example, UCD continues to mistake the chloroform standard that is applicable to waste chloroform. As UCD has been informed by DSCSOC and the RPMs, the drinking water MCL is not used to regulate waste chloroform such as occurs at the LEHR site.

One of the new examples of propaganda is the statement that Putah Creek"non-potable" water supply. The designated beneficial uses of Putah Creek include domestic water supply.

UCD is still continuing to fail to conduct reliable stormwater runoff monitoring from the LEHR site. It is now clear that UCD continue to violate its NPDES stormwater permit in terms of the concentrations pollutants in the stormwater runoff.

Also UCD still fails to address the full range of constituents of concern at the LEHR site. UCD and DOE will have to conduct a proper search for COC at the site before the site can be cleaned up.

This data report like the previous data reports still has sloppy presentation of data with respect to concentration units, etc.

I hope that the RPMs will not follow the approach of the past where they do not require that UCD correct the errors in this report rather than allowing a obviously flawed report to be entered into the public record.

Specific Comments

Page vii, fifth paragraph again attempts to define the only constituents of concern for the site as *"chloroform; chromium; nitrate; total-dissolved solids (TDS); and the radionuclides tritium and carbon-14."* This is an inappropriate assessment of the true constituents of concern at the site. These are the ones that have been selected by UCD and DOE to initially focus on in site

investigation. Inadequate attention has been given by UCD and DOE to the full range of constituents of concern at the LEHR site.. There are likely others that will need to be addressed before the site will be considered properly investigated and remediated.

Page viii, first paragraph discusses the IRA system shutdown due to scaling of the injection well. It was pointed out to UCD, before the IRA system was ever operated, that scaling would be a problem, and that there would be need to treat the water through recarbonization to prevent scaling, or else there would be significant operations problems.

Page viii, under the fifth bulleted item, it is stated that, *"UCD2-29 is the only Site monitoring well with chloroform levels greater than the drinking-water regulatory threshold for trihalomethanes."* This is more of the highly distorted approach that UCD allows its consultants (Dames & Moore) to perpetrate on the public. As has been discussed in detail, drinking water regulatory limits for trihalomethanes has nothing to do with managing waste chloroform that UCD mismanaged as part of its campus operations. So long as UCD's Vanderhoef administration allows its staff and consultants to make inaccurate or unreliable representations of issues, this administration and its staff will have no credibility in properly conducting the LEHR Superfund site investigation/ remediation.

Rather than making this statement in an attempt to minimize the significance of UCD"s mismanagement of its campus chloroform wastes, by making an inappropriate comparison between drinking water trihalomethanes and UCD's past waste disposal practices which have polluted groundwaters by chloroform (a constituent regulated by the US EPA as a human carcinogen), UCD should have reported that the 200 μg/L concentration is about 1,000 times that allowed in drinking water associated with waters polluted by chloroform wastes.

Page ix, last bulleted item fails to mention that some of the analytical methods used for stormwater runoff, such as for mercury and chlordane, were not adequate to detect these constituents at levels that could be adverse to the beneficial uses of the receiving waters for the stormwater runoff from the LEHR Superfund site. Again, since this issue has been discussed many times, this is another one of the distorted representations of information that UCD practices in presenting the results of its studies.

Page ix, under "Recommendations," the first paragraph states that, *"...the VOC plume is being captured and off-Site migration minimized. Chloroform concentrations at the toe of the plume are declining,..."* It is my understanding that the toe of the offsite plume has not yet been defined, so this statement cannot be made without a significant number of increased offsite monitoring wells.

Page ix, under "Recommendations," the third paragraph includes the statement, *"This program was designed with the recognition that the current groundwater monitoring network meets the objectives of the RI/FS."* This is an understatement of the facts. Inadequate groundwater monitoring has been done at the LEHR site to properly characterize the full extent of groundwater pollution by the LEHR site by UCD's mismanagement of its campus and LEHR wastes.

With respect to the statement in the next paragraph, *"An assessment of the existing storm water and surface water monitoring programs suggests that modifications of these programs may be appropriate,"* I agree. In this case, they need to be strengthened to address the mercury problem, chlordane problem and other issues of concern with respect to inadequate monitoring at the LEHR site.

Page 1, under "1.1 Purpose and Objectives," states in the second bulleted item, *"Provide seasonal storm water and surface water runoff monitoring data to evaluate if chemical releases from the Site are occurring,"* where it is stated that this was a goal *"... developed as part of the RI/FS Work Plan (U.S. Department of Energy, 1994) for the Site."* It should be noted that the RI/FS Work Plan, as developed by UCD and DOE was fundamentally flawed in terms of achieving the stated goals with respect to surface water monitoring, since the analytical methods, sampling locations and other characteristics of this plan were grossly inadequate compared to those needed to achieve this goal. Only now, after repeated efforts by DSCSOC, is the surface water monitoring program beginning to take the form it should have taken in 1994 of properly assessing the concentrations of constituents in stormwater runoff from the LEHR site and their potential impacts on the beneficial uses of the receiving waters for the runoff.

Page 2, under "1.2 Project Overview," the end of the first paragraph states, *"...where there have been releases of hazardous substances, and which are the focus of the investigative and remediation programs."* UCD will be required to remediate all pollution of groundwater, independent of whether the constituents happen to be classified as "hazardous" or not. The Central Valley Regional Water Quality Control Board Basin Plan requires protection of groundwaters from impaired uses from all substances, independent of their "hazardous" or "nonhazardous" classification.

Page 2, under "1.2 Project Overview," the second paragraph, last sentence states, "The primary COCs for the Site include ..." The words "at this time" should be added. It is recognized that the definitions of COCs is significantly deficient, compared to the vast arena of chemicals that could be present and a threat to groundwater quality.

Page 5, the third paragraph states, *"This condition supports a very low permeability of this unit and strongly suggests that HSU-2 and HSU-4 are not hydraulically connected."* As DSCSOC has commented in the past, there has been inadequate investigation of the characteristics of HSU-3 to be able to make such definitive statements about the lack of connection. Others who have investigated this situation have concluded that it is possible that there is sufficient hydraulic connection between the two so that some of the pollutants that reach HSU-2 could, in time, be expected to pollute HSU-4 as well. As of yet, there has been insufficient investigation of the characteristics of HSU-4 to be certain that it is not polluted by HSU-2-associated constituents.

The statements about the lack of connectivity between the two primary aquifers underlying the LEHR site, which are based on inadequate investigation, represent more of the propaganda that has prevailed throughout UCD and its consultants' work at the LEHR site. This causes those who

examine these issues objectively to justifiably mistrust any statements made by UCD and its consultants on critical issues.

Page 7, under the section "3.2.1 Groundwater Monitoring," item 3 states that, *"Chloroform has been reported near the contract-required detection limit (CRDL) in irrigation well 22K, ..."* The report should have listed this detection limit.

Page 15, under "Tritium," "HSU-1," the word "Spring" should not be capitalized. The seasons of the year are not capitalized.

Page 20, under "Metals" in stormwater runoff, no mention is made of mercury. Was it not analyzed? It is somewhat curious that studies in the winter 2001 have shown mercury at quite high concentrations in LEHR stormwater runoff compared to those that can bioacummulate to excessive levels.

Page 20, under "Pesticides & PCBs," note that chlordane was again detected at high concentrations relative to those that can bioaccumulate to excessive levels in fish. A similar situation exists with respect to DDT.

Page 21, last line, again, this is an inadequately developed report where the statement that concentrations were less than the CRDL, without giving the value. The RPMs should insist that when UCD reports results like this, they include in parentheses the CRDL value, so that the reviewers do not have to spend time looking this up. In this way, it is possible to judge whether the CRDL value is adequate to detect potential problems. This has been a chronic problem with the way UCD reports the results of its monitoring program, where the UCD administration and its staff try to make it difficult for anyone to properly evaluate the information provided in its monitoring data tables.

Page 22, under "Surface Water Monitoring Results for Non COC Constituents" again does not mention mercury. Is this an attempt to cover up the inadequate mercury analyses that UCD has been conducting over the years?

Page 25, the last sentence contains the distorted statement that is designed to mislead the readers into believing that there is some relationship between the drinking water regulatory threshold for trihalomethanes and chloroform derived from waste disposal operations. There is none.

Page 26, under "Storm Water Monitoring Program," the second paragraph includes the statement, *"There is no directly applicable promulgated storm water regulatory thresholds for Site-COCs."* This is gobbledygook, and represents either ignorance of what UCD and its contractors should know with respect to water quality criteria and standards or a deliberate distortion of information that has been provided to them. These issues have been discussed in detail in previous submissions. Failure for UCD and its contractors to properly represent a discussion of these issues is another serious problem with the quality of the work that is being done by UCD and its contractors at the LEHR site.

In accord with federal regulations, stormwater runoff from industrial properties, like the UCD campus waste disposal areas, must meet water quality standards,(objectives) in their discharge at the point where it enters Putah Creek. I have recently reviewed this matter with the head of the stormwater management section of the CVRWQCB who has confirmed this requirement. UCD has been violating its stormwater NPDES permit since it was issued by failing to meet this requirement. Concentrations of pollutants in excess of the California Toxics Rule criteria represent a violation of UCD's NPDES stormwater permit.

Page 26, under "Storm Water Monitoring Program, the last sentence in the second paragraph states, *"Where there are no applicable surface water standards, other promulgated risk-based standards, such as drinking-water maximum contaminant level (MCL), may be considered for evaluating the significance of impacts on non-potable waters such as Putah Creek."* Putah Creek is not considered a "non-potable" water. It's designated beneficial uses include the use of the creek water for domestic water supply. Putah Creek contributes to groundwater recharge and pollution of groundwaters by constituents in the Creek. This section needs to be rewritten by someone who understands water quality criteria and standards and will reliably report on them.

Section "5.6 Surface Water Monitoring Program" also has serious deficiencies in technical quality. The issue is not the Water Quality Goals of the CVRWQCB, 1998, as referenced in the last paragraph on page 26. It is the CTR criteria, which are applicable to Putah Creek. Where did UCD get the notion that Putah Creek is non-potable surface water? UCD clearly understands these issues, since UCD's campus wastewater treatment plant has been in violation of the criteria, UCD tried to sue the state to get these criteria voided, and lost in the courts.

Page 27, under "Chloroform," again, UCD and its contractors are providing unreliable information on the regulatory standard for chloroform as a waste. UCD's wastewater treatment plant is discharging chloroform above CTR criteria, and, therefore, it is violating its NPDES permit.

Page 27, under "Hexavalent Chromium," Hexavalent chromium is present at concentrations above those that are known to be toxic to zooplankton. Why did UCD not discuss the chlordane and mercury issues? Because they do not want these issues reviewed? Or they hope that the RPMs and DSCSOC will not be sufficiently knowledgeable in these issues to catch this deliberate omission? This is now the sixth year in a row where UCD and its contractors have provided unreliable information on stormwater monitoring from the LEHR site.

Page 29, section "6.1 Groundwater IRA Monitoring," repeats the statement commented on earlier (in the first paragraph), "Chloroform concentrations at the toe of the plume are declining, ..." UCD should specifically discuss which wells it considers are sampling the "toe" of the plume, which show declining chloroform. Further, there is no discussion of the situation that was mentioned earlier with respect to the IRA, of failing to capture some significant part of the recirculated groundwater. This issue should have been discussed.

Page 29, in section "6.2 Water Monitoring Program" again repeats the propaganda statement, *"This program was designed with the recognition that the current groundwater monitoring network*

meets the objectives of the RI/FS." As discussed earlier, this is not the case. It is somewhat curious that, in the next-to-last paragraph on page 29, UCD continues to discuss the recent results of the DDC, but fails to discuss the mercury data, which was available earlier, which shows that the stormwater runoff has very high concentrations of mercury. This is more of the biased reporting that prevails throughout UCD's presentation of information on the LEHR site.

It is of interest to find, upon examination of Table 5, that UCD has still failed to reestablish ammonia analyses on their wastewater effluent. Several years ago, when DSCSOC first became involved and reviewed the data on monitoring of the effluent, it was found that UCD's wastewater discharges were violating ammonia criteria by discharging ammonia at concentrations which would be toxic to aquatic life. UCD's approach toward addressing the ammonia situation was to stop monitoring ammonia in the effluent so that the LEHR data would not show violations associated with its wastewater effluent discharges to Putah Creek.

Table 9 presents the "Storm-water statistics showing COC detections, 1997-2000." Examination of Table 9 for the pesticide compounds listed on page 1 shows that the average concentrations of a number of the organochlorine pesticides found in stormwater runoff is a factor of 10 or more greater than the California Toxics Rule criteria that are designed to protect against excessive bioaccumulation of these pesticides in aquatic life, that could be a threat to human health. As discussed in the past, so long as it is not known whether fish in Putah Creek contain excessive concentrations of the organochlorine pesticides, PCBs and dioxins compared to US EPA Region 9 guidelines for protection of human health from consumption of fish, and so long as the concentrations in stormwater runoff from the LEHR site are well above the concentrations that could bioaccumulate to excessive levels, it is possible that the LEHR site is a significant contributor to excessive bioaccumulation problems for organochlorine pesticides and PCBs in Putah Creek fish. This issue can no longer be ignored by the PRPs. The RPMs must require that proper studies be done to determine the organochlorine pesticide, PCB and dioxin concentrations in Putah Creek fish. If these concentrations are excessive, then there will be need to control the organochlorine pesticides, PCBs and dioxins in stormwater runoff from the LEHR site in order to prevent this runoff from contributing to the excessive bioaccumulation that would be occurring if these pesticides, PCBs and dioxins found in fish to be present above EPA Region 9 guidelines.

Table 9, page 1 presents the results of the arsenic analysis in the stormwater runoff from the LEHR site. Examination of this table shows that the average concentrations found in the runoff are well above those that the US EPA has found to lead to excessive bioaccumulation of arsenic in fish. This is based on the US EPA national recommended water quality criteria – correction, of April 1999. This is another issue that needs to be considered in properly evaluating arsenic in stormwater runoff from the LEHR site. Do the fish in Putah Creek have excessive arsenic in their edible tissue? Certainly, if they do, then LEHR is a contributor to this problem.

Table 9, page 2 presents the data for chromium and hexavalent chromium in stormwater runoff. The maximum concentrations found of hexavalent chromium violate the CTR criteria of 11 μg/L. One value, of over 7,000 μg/L, is extremely high. There is need to address the issue of chromium runoff from the LEHR site as it may affect aquatic life, since concentrations are being

found in stormwater runoff that violate the CTR criteria. As discussed previously, the concentrations of hexavalent chromium needed to protect some forms of aquatic life (such as zooplankton) from toxicity is less than 1 µg/L.

Table 9, page 3, the representation of the units for alkalinity should be $CaCO_3$. The units of hardness are not specified. They should be.

Table 9, page 3, the total organic carbon in the stormwater runoff from landfill no. 1 is exceptionally high. This is of concern, and needs to be investigated/understood, since there could be unidentified or unquantified hazardous chemicals that are part of this TOC.

Table 10 presents "Surface-water statistics showing COC detections, 1997-2000." The standards that are listed in this table are not necessarily appropriate. What should be used for protection of aquatic life are the CTR criteria that were released in the summer 2000.

Table 11 presents "Proposed 2001 monitoring program." TOC must be included in this program as an indicator of potential problems with unidentified organics. The stormwater runoff should include chronic aquatic life toxicity, using the US EPA standard three-species tests. Dioxins should be added to the list of parameters that are monitored in stormwater runoff and in the Creek.

Figure 36 under "Chloroform" lists the standard as 100. That is an inappropriate standard, as UCD knows, for Chloroform disposed of as a waste. This issue has been discussed in the past. UCD's L. Vanderhoef administration and staff attempt to perpetuate this unreliable information on the public with the hope that someone might believe them. This issue has been previously addressed by the RPMs where UCD was told to stop providing distorted information on the Chloroform standard that is applicable to the LEHR site..

Appendix B, Metals - Stormwater (and elsewhere), there is a problem with significant figures on some of the reports. For example, arsenic is reported as 4.970. The analyses are not that accurate/precise. Similar problems exist for chromium. This table shows very high concentrations of hexavalent chromium present in some of the stormwater runoff samples.

Appendix B presents the mercury data, where it is reported as less than 0.04 µg/L. Why did UCD and its contractors not discuss mercury earlier, pointing out that the detection limits used of 40 ng/L is well above the concentrations that have been found to bioaccumulate to excessive levels in fish?

It is clear that there is a chromium problem in stormwater runoff from the LEHR site that needs to be addressed. Also, as shown from these data, as well as this year's data, there is also a mercury problem. Further, the concentrations of arsenic are present at sufficient levels to lead to excessive bioaccumulation in fish in receiving waters.

Appendix B, page 5 again has some problems with units on hardness, by failing to properly identify them. There is also a problem with the PCB analysis, as reported by Aroclor, where the

detection limits used are well above those that are necessary to detect PCBs at concentrations found in stormwater runoff that will bioaccumulate to excessive levels.

Appendix B, page 3, under "General Chemistry - Surface Water," the reporting of the toxicity results is inappropriate. UCD should present the data, rather than "less than 100," which is an uninterpretable value.