

**Comments on Draft Site-Wide Risk Assessment, Volume I**  
**Human Health Risk Assessment**  
**(Part C – Risk Characterization for UC Davis Landfill Units)**

Prepared by Brown and Caldwell, August 12, 2005

Comments Submitted by  
G. Fred Lee, PhD, DEE

G. Fred Lee & Associates, El Macero, CA 95618  
Ph: (530)753-9630 Fx: (530)753-9956 Em: gfredlee@aol.com  
www.gfredlee.com

September 8, 2005

Julie Roth, Executive Director  
DSCSOC

Julie,

I wish to provide DSCSOC with my comments on the Draft Site-Wide Risk Assessment, Volume I: Human Health Risk Assessment (Part C – Risk Characterization for UC Davis Landfill Units), prepared by Brown and Caldwell, August 12, 2005. Basically, this draft report presents a discussion of UCD's assessment of the human health risks associated with the three landfills at the LEHR Superfund site. The other waste management areas for which UCD has responsibility will be discussed in addenda to this report.

The adequacy of UCD's delineation of the human health risks associated with the three landfills will be reviewed by the RPMs. I will examine those reviews and provide DSCSOC with any comments on potential problems with UCD's final approach for assessing the human health risks of the wastes in the landfills. For now, UCD's approach for assessing human health risks is obviously significantly flawed, since it is focusing on a limited number of the chemicals that are present in the wastes which can be a threat to public health and the environment. These issues have been discussed in detail in my recent comments submitted to DSCSOC on the August 31 RPM meeting and in my comments on the DOE SWRA/HHRA. Of particular concern is the assessment by Dr. Daughton of the US EPA of the deficiencies in regulatory agency allowed definition of constituents of concern associated with complex mixtures of wastes.

The issue I want to focus on in these comments is UCD's proposed approach of trying to use the US EPA Superfund site "Presumptive Remedy" for municipal landfills (see page 1-4 of the UCD draft report). A number of years ago the US EPA adopted a policy that a Presumptive Remedy for municipal landfills at Superfund sites would involve, without further investigation, capping the landfill. Those who understand the potential threat that municipal landfills represent to public health and the environment know that this approach at best may delay for a few years further pollution of groundwaters by landfilled wastes if caps of the type that UCD discusses (compacted soil or plastic sheeting) are used. This situation is part of the significant technical difficulties that exist in the US EPA's development of landfilling regulations, where in the late 1980s/early 1990s the Agency decided, under guidance from OMB, that the current administration did not want to face public criticism that would be associated with the increased

cost of developing landfills that would be truly protective of public health and the environment for as long as the wastes are a threat. The Presumptive Remedy is another example of the deficiencies in US EPA's guidance on Superfund site investigation/remediation.

While UCD asserts in its draft report that the three landfills should be considered municipal landfills and therefore be covered by the Presumptive Remedy, it would be more appropriate to consider these landfills as industrial landfills that have received some campus wastes which contain municipal waste components, since UCD's practice of waste disposal from its laboratories and research facilities introduces wastes into these landfills that are not typical municipal wastes. This issue will need to be addressed by the RPMs.

I have been involved in reviewing municipal landfill impacts since the mid-1950s. This activity has included university graduate-level research on landfill liners that was sponsored by the US EPA. I have published extensively on the problems with minimum design municipal solid waste landfills in protecting public health and the environment for as long as the wastes in the landfill will be a threat. Typically, in a dry tomb type landfill where there is an attempt to isolate the wastes from moisture, the wastes will be a threat forever.

In the fall of 2004 Dr. Anne Jones-Lee and I developed a comprehensive review of the problems with US EPA's minimum design Subtitle D municipal solid waste landfills. This review,

Lee, G. F. and Jones-Lee, A., "Flawed Technology of Subtitle D Landfilling of Municipal Solid Waste," Report of G. Fred Lee & Associates, El Macero, CA, December (2004) updated July(2005).

<http://www.members.aol.com/apple27298/SubtitleDFlawedTechnPap.pdf>

presents about a 50-page discussion of these issues, which includes over 90 references, with over half of them to peer-reviewed articles authored by others. Another quarter of these references are review articles that Dr. Jones-Lee and I have developed on various aspects of landfilling of wastes, which again provide numerous references to the literature on the issues discussed. As new information is developed we update the discussion of issues in our "Flawed Technology" review, where the update is posted on our website. The last update was in July 2005. We are just completing a September 2005 update, which provides additional references to new literature on deficiencies in clay liner design for landfills that is allowed by the US EPA and the state of California.

With respect to the Presumptive Remedy of a compacted soil cap for the UCD landfills, as discussed in our review, compacted soils have been found to rapidly develop cracks, which can readily allow moisture to enter the wastes through the cracks. The other alternative is a plastic sheeting layer in the cover, which, if properly constructed, can essentially prevent moisture from entering the wastes while the plastic sheeting is free from defects and points of deterioration. However, over time the plastic sheeting will deteriorate and allow moisture that passes through the topsoil layer and the drainage layer that overlie the plastic sheeting to penetrate into the wastes. This will lead to additional groundwater pollution by the UCD landfills.

It should be understood that, since the low-permeability layer of compacted soil or plastic sheeting is buried below a topsoil layer and a drainage layer, visual inspection of the surface of the landfill is not a reliable method for detecting the failure of the low-permeability layer in the landfill cover. This means that, for the UCD landfills, the failure of the low-permeability layer in the landfill cover, under the Presumptive Remedy approach, will have to be discovered by detection of renewed groundwater pollution by the landfill, through groundwater monitoring.

While UCD claims that new pollution would be detected by the groundwater monitoring wells, such claims can readily be superficial and unreliable. The points in the plastic sheeting layer where moisture will enter the wastes can generate narrow plumes of leachate that could readily fail to be detected by the current groundwater monitoring well array that is present at the LEHR site. If the proposed Presumptive Remedy is adopted for the UCD landfills, there will be need to greatly increase the number of monitoring wells on the downgradient side of each landfill to improve the ability to detect the inevitable failure of the plastic sheeting layer in the cap.

Page 1-3 of the UCD draft report presents the same ATSDR public health assessment conclusions for the LEHR site that DOE presented in its SWRA/HHRA dated August 20, 2005. My comments (which were submitted to the RPMs by Julie Roth on September 8, 2005) on the deficiencies in the DOE report with respect to presenting these conclusions without providing a discussion of the unreliable information in them, with particular reference to the role of the LEHR site as a source of mercury leading to excessive bioaccumulation of mercury in Putah Creek fish, apply equally well to the UCD presentation of this same information. It is inappropriate to present information of this type in a report when it is known to the authors that it is unreliable.