Stormwater Runoff Soil Lead Water Quality and Public Health Issues

G. Fred Lee & Associates

27298 E. El Macero Dr.
El Macero, California 95618-1005
Tel. (530) 753-9630 • Fax (530) 753-9956
e-mail gfredlee@aol.com
web site: http://members.aol.com/gfredlee/gfl.htm
Please note the new area code for telephone and fax has been changed to 530

Via E-mail

March 15, 1998

Dave Brent,
Chair State Stormwater Quality Task Force
City of Sacramento
Sacramento, CA

Dear Dave:

At the Task Force meeting last Friday, there were discussions about California EPA Department of Toxic Substances Control (DTSC) reclassification of hazardous wastes being of importance to urban area stormwater dischargers. This importance stems from the fact that urban area stormwater conveyance structures can accumulate sediments that must be disposed of as hazardous wastes if the concentrations of certain constituents exceed the DTSC critical concentration for classification as a hazardous waste. Some stormwater dischargers are aware of this issue and manage infiltration and detention basins accumulation of sediments to avoid creating a hazardous waste that must be disposed of in a hazardous waste landfill rather than a municipal landfill. Several years ago as a result of the NRDC vs. Caltrans lawsuit, Caltrans has been forced to spend large amounts of money cleaning out highway stormwater conveyance structures because some of the sediments in these structures contained sufficient lead to cause the sediments to be classified as a hazardous waste. As I mentioned when this issues was raised by someone else at the Task Force meeting last Friday, DTSC is holding a meeting on March 20, 1998 to discuss these issues.

DTSC as part of its current hazardous waste regulatory reform efforts, has proposed to raise the lead hazardous waste classification level from 1,000 to 4,000 mg/kg. To my knowledge there are no sediments in urban area and highway stormwater conveyance structures with lead that even begin to approach 4,000 mg/kg. The only place that might occur would be near bridges where lead based paint has been scraped from the bridge and allowed to fall to the soil in the area. I have attached to these comments an announcement I received last week from DTSC on their forthcoming review of their "Risk Based Criteria for Non-RCRA Hazardous Waste" which will be held in Sacramento on March

20, 1998. This review will cover the report that DTSC has submitted to the National Research Council for independent peer review of the revised proposed hazardous waste classification approach.

While I have not seen the final version of this report I, like a number of others had great difficulties with some aspects of the staff's proposed approaches for conducting the risk based hazardous waste classification. While in some respects, such as raising the hazardous waste classification for lead in sediments in stormwater conveyance structures is appropriate dependant on how the lead contaminated sediments are managed, there are a number of problems with DTSC's proposed approach which can cause constituents which are not now hazardous wastes to become hazardous wastes. This is an area that our Task Force should address at some time in the future. I am raising this issue now because of Task Force members' interest in lead and because of the DTSC meeting next Friday March 20. I plan to attend that meeting. I have ordered a copy of the DTSC National Research Council report. A copy of the DTSC report "Risk Based Criteria for Non-RCRA Hazardous Waste," is available from:

M. Gottfried
DTSC- SWMP - HQ10
PO Box 806
Sacramento, CA 95812-0806
at a cost of $33.60.

Last year the City of Sacramento had one of its contractors Jeanne Wallberg present a summary of the work that the City is doing on lead control in stormwater runoff at a Stormwater Quality Task Force meeting. After review of the City's work on lead, Dr. Jones-Lee and I developed a review "Lead as a Stormwater Runoff Pollutant" (June 1997) which discussed a number of issues that needed to be considered beyond those covered in the Sacramento studies. Our report is available from our web site (http://members.aol.com/gfredlee/gfl.htm) as a downloadable file. Because of the importance of lead as an issue in stormwater runoff impacts, I wish to provide the Task Force with some updated information on this topic.

While the concentrations of lead in urban area and street stormwater runoff have decreased significantly since the mid-1980s with the termination of the use of leaded gasoline, there is still appreciable lead in highway and urban area street stormwater runoff due to the residual lead in gasoline. This lead is derived from the lead naturally present in oil. At the time that leaded gasoline was used, it typically contained about 250 mg/L lead, today unleaded gasoline can contain up to 15 mg/L lead and be considered unleaded. In my report of a year ago, I pointed out that I had a student do his PhD dissertation on highway and urban street stormwater runoff associated lead where we found as would be expected, that this lead is inert, i.e. not toxic and not available to aquatic life.

The primary issue of concern as discussed in that report is the management of the stormwater runoff conveyance structure sediments with concentrations of lead above 400

mg/kg so that children cannot gain access to the sediments, i.e. do not spread them in a public park schoolground, etc. At that time DTSC had already concluded that it could raise the adult soil lead exposure level to 4,000 mg/kg and still be protective. I wish at this time to bring to the attention of the Task Force that the US EPA has issued a report which updates the information available on critical concentrations of lead in soil as it may impact adults. In late January 1998 I presented a paper "Development of a Stormwater Runoff Water Quality Evaluation and Management Program for Hazardous Chemical Sites"at the Third ASTM Symposium on Superfund Risk Assessment devoted to stormwater monitoring from hazardous chemical sites, such as Superfund sites. A pre-print of this paper is available from my web site. It will appear in the conference proceedings. At this same conference, one of the keynote speakers, M Madiloni, was a US EPA representative from Region 2 (New York) who presented a review of the US EPA report that was released in December 1996, "Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil." This is a 36 page report that is available from the web at (http://www.epa.gov/oerrpage/superfnd/web/oerr/ini_pro/lead/txtprods.htm). The US EPA report is a consensus report that was developed by representatives from each of the US EPA regions.

The bottom line from this report is that according to the US EPA, at Superfund sites, lead above about 750 mg/kg would be considered a threat to adults. The basis for this value is an empirical model that indicates that lead above about these concentrations can cause blood lead levels in women and fetuses above the 10 µg/dL, which is the critical value that the Center for Disease Control (CDC) has established for children. The issue of concern is not women eating dirt, per se, like children playing with dirt, but rather women who are exposed to dust in the household which contains lead above these levels. It is the US EPA's position that exterior soil lead at these concentrations can be carried into the house and lead to household dust which contains lead above critical levels.

I wish to emphasize that this new information applies only to situations where women of child-bearing age (about age 13 through 40 +) could be exposed to dust containing lead above about 750 mg/kg. At this point, there is no evidence that adult males or females are directly impacted by lead except at very high concentrations above about 4,000 mg/kg. Further, there is considerable evidence that soil lead, even at 1,000 or more mg/kg is not adverse to the beneficial uses of a water body, since it is in an inert form.

I talked to the US EPA staff about the Agency's position with respect to urban or highway soil lead. He indicated that the US EPA Washington, D.C. headquarters had determined that at this time, these values are to be used as clean-up values for Superfund sites and are not applicable to urban area or highway stormwater runoff lead. He also indicated that there had been a test case where an environmental group tried to get the Agency to declare an area near a highway bridge a Superfund site, based on the high concentrations of lead in the soils near the bridge. That lead had been derived primarily from sandblasting of the bridge, which at one time contained leaded paint. Thus far, the Agency has not declared that site a Superfund site, and probably will not do so. However, this situation could change if the environmental groups take this matter to court.

For years the US EPA has not been looking for additional Superfund sites, and in fact, has bent over backwards trying to avoid declaring any more sites, even though there are many sites that are as qualified to be on the list as those that are on the list. It is also my impression that the Agency does not want to open up the urban soil lead issue as a national issue, since most inter-city soils contain lead at concentrations above 500 mg/kg and many above 1000 mg/kg. This lead is derived from the former use of leaded gasoline. It is important to understand that DTSC's efforts are devoted to waste classification which is used to determine whether a waste material is to be placed in a hazardous waste landfill or can be placed in a municipal solid waste landfill. Even though it is inappropriate to do this, frequently the US EPA and DTSC hazardous waste classification values become clean-up goals for contaminated soils.

Some parts of the country, such as the state of Georgia, are lowering the lead clean-up values for Superfund sites where pregnant females could at some time in the future be exposed to dust from the area to about 250 mg/kg dependent on the drinking water lead concentration of a region. Georgia is attempting to compensate for lead derived from drinking water adding to the lead derived from soil or dust. The 250 mg/kg value would be for an area that has water that meets the drinking water standard (action level) of 15 µg/L. If the lead concentration of drinking water is less, then the soils can have higher lead. The US EPA staff feels that this is an over-compensation for drinking water lead, since the drinking water lead is in part already built into the model as a standard value.

Overall, from a Task Force perspective, the situation today is not as encouraging as it was a year ago with respect to the lead concentrations in urban area, street and highway stormwater runoff conveyance structure sediments occurring at concentrations less than those that are considered a hazardous waste. Any lead concentration in sediments and soils above 750 mg/kg is of concern with respect to pregnant female exposure even to dust at some distance from the highway or street area where the soils contain lead above this amount. Based on what is known now, young children should not be allowed to play in soils with lead above 400 mg/kg.

If there are questions about these issues, please contact me.

-FRED

Cal/EPA
Department of Toxic Substances Control
400 P Street
4th Floor
P.O. Box 806
Sacramento, CA
95812-0806

March 6, 1998

To: Regulatory Structure Update Waste Classification Focus Group Interested Parties

Subject: Waste Classification

The RU Waste Classification document, 'Risk Based Criteria for Non-RCRA Hazardous Waste, which is a report to the National Research Council introducing proposed changes for the definition of hazardous waste in California regulation, is available for review at Department of Toxic Substances Control offices. Details of times and locations of review are enclosed. This document will be discussed at an upcoming Waste Classification Focus Group meeting planned for March 20. 1998. See the enclosure for the time and location of this meeting.

If you need additional information, please contact me at (916) 324-1819.

Enclosures

Jan Radimsky

RSU Coordinator

Department of Toxic Substances Control
Regulatory Structure Update

FOCUS GROUP MEETING ANNOUNCEMENT

WASTE CLASSIFICATION AND SPECIAL WASTE MANAGEMENT STANDARDS

Date: March 20, 1998
Time: 9:30 a.m. - 4:00 p.m.
Location: Board of Equalization
450 N Street, Room 121
Sacramento, California 95814

Contacts: Jim Carlisle, D.V.M., M.Sc.
Science, Pollution Prevention and Technology Program - HQ-26
P.O. Box 806, Sacramento, California 95812-0806
Telephone: (916) 327-2506: Fax: (916) 327-2509

Jan Radimsky, HQ-10
Hazardous Waste Management Program
P.O. Box 806.
Sacramento, California 95812-0806
Telephone:(916) 324-1819; Fax: (916) 327-4495

Reference as:"Lee, G.F., 'Stormwater Runoff Soil Lead Water Quality and Public Health Issues,' letter to D. Brent, State Stormwater Quality Task Force, Sacramento, CA, March (1998)."