

US EPA ARCHIVE DOCUMENT

**Proceedings of the Environmental Protection Agency  
PUBLIC MEETING ON WASTE LEACHING  
Session III - Leaching Science**

**Overview of California EPA Approach - Bart Simmons**

Bart Simmons of the Hazardous Material Laboratory, Department of Toxic Substances Control, California Environmental Protection Agency (Cal/EPA), presented an overview of the approach that Cal/EPA is currently using to classify wastes. A copy of Mr. Simmons' presentation materials is available through the following link: [simmons.pdf](#). During his presentation, he discussed the development process used by Cal/EPA in developing their criteria for toxicity testing, basing their requirements on both the TCLP regulatory limits and the Waste Extraction Test (WET) soluble threshold limit concentrations (STLCs). Cal/EPA also considered calculated values for oral, dermal, and inhalation toxicity of the target analytes, as well as reports of fish toxicity at concentrations under 500 mg/L, and reported carcinogenicity at concentrations greater than 100 ppm.

Mr. Simmons contrasted the conditions of the TCLP vs. the WET, noting differences in leachant (acetate buffer vs. citrate buffer), duration of leaching (18 hrs vs. 48 hrs), and ratio of liquid (leachant) to solid (waste) (20:1 vs. 10:1).

Cal/EPA designed extraction studies to decide which extraction test (WET, TCLP, or SPLP) best simulates extraction with municipal solid waste leachate. The study determined the concentrations of metals extracted over 48-84 days, with 10% replacement of the leachant, from the following wastes:

1. mine tailings (As, Pb)
2. composite of burnt or catalyst wastes (Ag, Co, Sb, Zn)
3. composite of water-precipitated wastes (Be, Cd, Cr, Mo, Ni, V)
4. composite of metallic wastes (Be, Co, Cr, Mo, Ni, V)
5. composite of miscellaneous wastes (Ag, As, Ba, Be, Cd, Cr, Cu, Mo, Ni, Se, Tl, V)

using the following leachants:

6. citrate (WET protocol)
7. acetate (TCLP protocol)
8. Synthetic Precipitation Leaching Procedure (SPLP) solution
9. Ukiah landfill leachate

From this study, Cal/EPA concluded that the TCLP was better than WET or SPLP at simulating leachate extraction for beryllium, cadmium, chromium (Cr III), cobalt, copper, lead, nickel, and zinc. Cal/EPA further concluded that none of the tests evaluated consistently predicted leachate extraction for antimony, arsenic, molybdenum, selenium, and vanadium, but WET was better than TCLP or SPLP.

The National Academy of Science (NAS) published a report on this study in April, 1999, entitled "Risk-Based Waste Classification in California" that considered the results of the Cal/EPA extraction study as well as other factors. The report presented three recommendations:

10. Work with stakeholders and EPA to address shortcomings of TCLP and WET.
11. Use extraction study data in probabilistic modeling.
12. Incorporate groundwater pathway into multimedia model.

At the close of the presentation, Paul Abernathy, Association of Lighting & Mercury Recyclers, asked where mercury fell in the two categories identified in the study conclusions. Mr. Simmons indicated that the TCLP was more aggressive than the WET, with respect to mercury.

Marty Huppert, SAIC, asked at what stage of its life cycle (e.g., young, or old) was the landfill that supplied the waste samples. Mr Simmons replied that they did not find any leachates at pH = 5, even in relatively young cells. They also did not characterize the organic content of the leachate.