EPA proposes new rules to get the lead out

Ingested lead can do a lot of damage. And drinking water now accounts for about 20 percent of the typical U.S. resident's lead exposure, according to Environmental Protection Agency Administrator Lee M. Thomas. Last week, the EPA proposed new requirements aimed at lowering human exposure to the metal from U.S. drinking water. The regulations would affect an estimated 43,000 public water systems and lower exposures to lead in drinking water for about 138 million people.

Following a 60-day public comment period, EPA can enact the proposal or draft a revised one. Though some environmentalists say the current proposal fails to go far enough, they widely acknowledge its cost effectiveness. Besides reducing such risks as mental retardation, hearing loss and hypertension, the tougher regulations — expected to cost about $207 million annually — should save $500 million annually in corrosion to U.S. plumbing, according to EPA estimates.

Most of the lead in U.S. drinking-water supplies comes from pipes (water mains to household plumbing) and the solder and brass fittings used to connect them. Though contact with water is all it takes to release lead from plumbing, corrosion of these pipes by acidic water greatly enhances their lead release.

Corrosivity — and therefore lead leaching — increases with water temperature, notes William E. Sharpe, a water resources specialist at Pennsylvania State University in University Park. A preliminary study by Sharpe and David R. DeWalle of eight homes in Pennsylvania — where 85 percent of public water supplies are corrosive — recorded more than a four-fold seasonal lead increase in one home's water. For instance, cold water leaving the tap during March and April was typically 44°F in one home — and its lead concentrations consistently lower than 10 micrograms per liter (μg/l). By July, water from that same cold faucet was about 71°F and carried as much as 42 μg/l lead.

To limit excess lead leaching, EPA proposes a new corrosion control program. It would require public water suppliers to treat their water with alkaline additives when average lead levels at their consumers' taps are greater than 10 parts per billion (ppb), or if the water has a pH of less than 8. But EPA's Thomas concedes that even where they're needed, most corrosion controls will not likely be adopted quickly. A year or more of tap-water surveys may be necessary to establish where problems exist. And the new rules permit water suppliers up to three years to study and develop treatment strategies tailored for their specific water-distribution system.

The proposal also would lower allowable levels of lead in drinking water to 5 ppb. Though the current limit is 50 ppb, the actual reduction would not be truly 10-fold, because the current limit is for water measured at the tap while the proposed standard would measure it leaving the treatment plant. Because most lead enters water after it leaves the treatment plant, this move to upstream measurement of the enforceable standard "is really not going to accomplish very much" in lowering public exposures, contends toxicologist Ellen Silbergeld of the Environmental Defense Fund in Washington, D.C.

Moreover, says Silbergeld, in the event corrosion control doesn't solve the tap-water-lead problem, EPA will not require water suppliers to do much more than initiate public information campaigns to teach consumers practices that minimize lead exposure — such as "flushing" the pipes by letting water run for several minutes at the beginning of each day — or suggest people replace their household plumbing.

Silbergeld thinks water suppliers should have to replace any of their leaded distribution pipes, and where the primary lead problem is in the home, the owner should be warned. She objects to EPA's suggestion that homeowners flush their pipes to lower lead exposure. This practice could "waste 3 billion gallons of water a day," she says. — *J. Raloff*

Environmentalism in the Space Age

The scientists meeting in Washington, D.C., this week to discuss pollution, debris and noise had a different set of concerns than the usual environmental issues. Instead of PCBs in a river, it was stray light in the dark sky; the debris was pieces of orbiting space hardware; the noise was electromagnetic, interfering with the sensitive instruments that "hear" for radio astronomers.

The gathering was the first colloquium on the subject sponsored by the International Astronomical Union. It was headed by David Crawford of Kitt Peak National Observatory in Tucson, Ariz., whose first direct involvement with the problem of space pollution came from light pollution that can ruin telescopic observations of faint stars and other astronomical objects.

"People have become so accustomed to bad lighting that they think there's *no* lighting unless there's some glare," Crawford says.

The famous 200-inch Hale Telescope on Palomar Mountain, 100 miles from the lights of Los Angeles, went into use in 1948. By the 1960s, spectral measurements made with the instrument were already showing emission lines of the element mercury due to street lights. Today's sky over Palomar, says Robert Brucato, assistant director of the observatory, is about 0.75 magnitude brighter — around twice as bright — as it would be without light pollution.

The problem has been eased somewhat around both Palomar and Kitt Peak in the 1980s by the installation of low-pressure sodium streetlamps. Many Arizona counties, in fact, now require them.

NASA has been studying debris hazards to (and caused by) spacecraft for a decade, and there is a host of international organizations involved with the dense thicket of regulations governing radio-frequency interference.

Luo Xianhan of Beijing, China, reports that several observations of apparent solar microwave bursts have proved to be radio-frequency interference from sources as diverse as radar and sparks from automobile ignition systems. Michael M. Davis of the Arecibo radio observatory in Puerto Rico notes that a system of tethered, balloon-borne transmitters planned for use in battling drug smugglers had threatened studies of natural hydrogen radio emissions, which are important in understanding galactic evolution. Fortunately, he says, intervention by the National Science Foundation and the Puerto Rican government led to radio-frequency changes that made the transmitters "less intrusive on astronomical work."

Of particular concern is debris — not only meteorites and space dust but also fragments of satellites that break up in orbit, leaving smaller but vastly more shards of what amounts to orbiting shrapnel. As of last week, says Sidney van den Bergh of the Dominion Astrophysical Observatory in Victoria, British Columbia, some 7,300 pieces of human-made debris were being tracked in orbit, moving at velocities of about 20,000 miles an hour. "In another century," he adds, "if the trend continues, a lethal layer will develop," posing a risk to astronauts.

Also of concern are satellites powered by nuclear reactors, such as the Soviet Cosmos 1900, expected to reenter the atmosphere late next month. About 70 percent of Earth's surface is ocean, so most satellite debris that reaches the ground should fall there, but in 1978 one satellite strewed debris over thousands of square miles of northern Canada.

Scientists at the meeting discussed the oft-mentioned possibility of a huge radio-telescope on the far side of the moon, never facing Earth, where the moon itself would block out terrestrial radio emissions. But even with that distant and protected outpost, Crawford says, "the polluters are going to get there first. And they're better funded." — *J. Eberhart*