BROOKHAVEN NATIONAL LABORATORY
a passion for discovery

Getting the Lead Out of Your Faucet

Let your cold-water tap run before using it for cooking or drinking

Brookhaven Lab produces its own tap water, which is drawn from drinking-water wells on site and "finished" at the Water Treatment Facility. Last year, as in the past, BNL's water was in full compliance with all county, state, and federal regulations governing drinking-water quality.

While sources of tap and bottled water around the world, such as BNL's groundwater, may be free of lead, this metal can leach into drinking water if the water-supply system and/or a building's plumbing system have components made of lead or made with lead.

Ensuring drinking-water quality in the United States since 1974, the federal Safe Drinking Water Act mandates limits and testing to minimize the contamination of water by microbes, chemicals, and metals such as lead. Under this act, the U.S. Environmental Protection Agency has set the limit in a first-draw sample of 15 parts per billion or 0.015 milligrams of lead per liter of water, above which corrective action must be taken. In complying with the Safe Drinking Water Act, the Lab tests for lead at 20 faucets around site as required by law. Lead testing is also conducted at BNL on water from other taps for quality assurance or as requested.

The simplest ways to reduce or eliminate the presence of lead in drinking water are to:
- ***Flush your tap*** *for 1 to 3 minutes, or until the water is noticeably colder.*
- ***Use only cold water*** *for drinking and cooking.*

How can I reduce lead in my water?

While some municipal water works chose to introduce additional chemicals, such as polyphosphates or metasilicate, to reduce the leaching of lead from existing plumbing, the simplest and safest ways to reduce or eliminate the presence of lead in drinking water are these:
- **Flush your tap:** run your water until it is colder, which usually takes up to one to three minutes.
- **Use only cold water for drinking and cooking:** Since hot water dissolves lead more quickly than cold water, use only water from the cold-water tap for drinking, cooking, mixing juices, making baby formula, etc. If you need hot water, then heat cold water on the stove or in the microwave.

What is lead and why is it used?

Lead is a bluish-gray, non-magnetic metal which occurs naturally in trace amounts in soil and rocks. As a result of the weathering of soil and rocks, lead may also be found in source water.

Soft, malleable, and easy to work with, lead melts at low temperature, resists corrosion, and is very dense and durable. As a result, lead has been used throughout the years for many products, such as fishing sinkers, radiation shielding — and piping. And it has been used as an additive in fuels such as gasoline, as the basic pigment in paints — and in solder and brass.

The use of lead is restricted today because it is understood how lead accumulates in the body over time and results in toxicity. Most exposure to lead comes from the ingestion of paint chips and inhalation of dust, and auto and industrial emissions. Those at most risk are young children, and pregnant women and their fetuses.

Where is lead found in plumbing?

The word plumbing, which is the system of pipes and other fixtures for conveying water and wastes, comes from the Latin word "plumbum" for lead. While the Romans are noted for their municipal water supply systems using miles of aqueducts and lead pipe, many Romans, including Julius Caesar and Caesar Augustus, are known to have suffered from "plumbism" or lead poisoning, which is thought to have contributed to the fall of the Roman Empire.

In the U.S., depending upon the age of the structure and how recently it was repaired, lead can be found in plumbing as follows:

- In buildings constructed before the 1930s, water pipes were often made of lead. Since BNL's oldest buildings date from the 1940s, no lead piping exists at the Lab, with the exception of the possibile existence of small transition pieces connecting older buildings to BNL's water mains.
- In structures built between the 1930s and the early 1980s, copper pipes were most often installed, but they were often joined with solder containing lead. At Brookhaven, lead solder joints are replaced in water plumbing as repairs are made. Because of elevated lead levels caused by their internal plumbing, water fountains around site have been taken out of service.
- In construction erected or repaired after the 1986 amendments to the Safe Drinking Water Act, solder used in plumbing may not contain more than 0.2 percent lead, and plumbing pipes, fittings, and fixtures may not contain more than 8 percent lead. In installing or repairing plumbing between 1986-96, Laboratory plumbers adhered to this standard.
- In buildings constructed or repaired after the 1996 amendments to the Safe Drinking Water Act, plumbing pipes, fittings, and fixtures must not contain more than 8 percent lead and must not leach more lead than set by standard. In installing or repairing plumbing since 1996, Laboratory plumbers use plumbing parts that adhere to this standard.

How does lead leach into water?

Because many U.S. buildings were constructed before 1996 or have not been repaired since then, there are many plumbing pipes, fittings, and fixtures around the country that can leach lead into drinking water above the current standard.

For instance, brass is an alloy of copper and zinc to which lead is added to increase its suitability for die casting, the process by which plumbing faucets, valves, and couplings are made. In contact with water over time, brass can leach lead into water through the process of corrosion.

Leaching rates vary with the quality of the water and the age of the plumbing. Regardless, when water stands motionless in plumbing because it is not used for an extended time — such as overnight at home or over a weekend at work — lead concentrations can increase greatly.

October 2002

For additional information, contact the following members of the BNL Drinking Water Quality Committee, who can get answers to your drinking-water questions, provide you with the latest copy of the annual BNL Water Quality Consumer Confidence Report, or obtain the most recent complete analysis of the Lab's tap-water samples for you:

- *Ed Murphy, Division Manager, Plant Engineering Division, Ext. 3466, etmurphy@bnl.gov*
- *William Chaloupka, Assistant Manager of Operations & Environment, Plant Engineering Division, Ext. 7136, chaloupka@bnl.gov*
- *Bob Lee, Deputy Manager, Environmental Services Division, Ext. 3148, blee@bnl.gov*
- *Ken Erickson, Safety & Health Services Division, Ext. 4935, erickson@bnl.gov*
- *Marsha Belford, Community, Education, Government & Public Affairs, Ext. 5053, belford@bnl.gov*

Or contact:

- *Suffolk County Department of Health Services, (631) 853-2251*

Pictured above at BNL's Water Treatment Plant are some of the water treatment engineers and others involved in producing the Lab's drinking water. Last year, as in the past, BNL's drinking water was in full compliance with all county, state, and federal regulations governing drinking-water quality.

At BNL, the Plant Engineering Division is responsible for providing safe, high-quality drinking water and a reliable drinking-water supply on site. To ensure that the Lab's drinking water meets all local, state, and federal quality standards, BNL's Environmental Services Division is responsible for having the Lab's drinking water regularly tested and analyzed, using approved independent and in-house laboratories.