LEAD AND COPPER BASICS

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With the new LCR (Lead and Copper Rule) coming our way, I thought I would just go over a few facts with you. Most of this I know you are already aware of but maybe I will share something new with you as well.

The 1991 Lead and Copper Rule (LCR) (USEPA,1991a) established maximum contaminant level goals (MCLGs) (zero for lead and 1.3 milligrams per liter (mg/l) for copper) and action levels (0.015 mg/l for lead and 1.3 mg/l for copper) in public water systems (PWSs). These levels are exceeded if the concentration in more than 10 percent of water samples taken (i.e. the 90th percentile level) after a 6 hour stagnation period are greater than the respective action level. These samples must be collected as first draw allowing for the 6 hour stagnation period from within the home. The number of samples required is dependent on the size of the system as specified by the regulation. The 1991 LCR also established requirements that are triggered by exceedances of the action levels. These include installation of corrosion control treatment (CCT) and source water monitoring/treatment, public education, and lead service line (LSL) replacement.

As we all know, Lead and Copper are rarely present in raw water sources. While the main source of lead and copper in drinking water are the materials used for supply lines from the water main to the building (service lines), they are primarily present in the customer's household plumbing and come out in the water due to corrosion issues in that material. Corrosion in water systems is defined as the electrochemical interaction between a metal surface such as pipe wall or solder and water. The metal is oxidized and transferred to the water as a metal ion. The form of lead and copper in the water can be dissolved, colloidal, or particulate (i.e., bound up with other compounds such as iron and aluminum).

Many water conditions can affect lead and copper release in drinking water. Here is a list of some of them:

- Alkalinity, pH, and Dissolved Inorganic Carbon (DIC)
- Corrosion inhibitors
- Hardness (calcium and magnesium)
- Buffer intensity
- Dissolved oxygen (DO)
- Oxidation reduction potential (ORP)
- Ammonia, chloride, and sulfate
- Natural organic matter (NOM)
- Iron, aluminum, and manganese

In addition to water quality parameters, physical disturbances, hydraulics, water use and water temperature will affect lead and copper levels at the customer's tap.

For years we have been using alkalinity and pH adjustment to try to control or at least limit the release of lead and copper in the drinking water. In my opinion, the most effective treatment we use today is the addition of a phosphate based corrosion inhibitor. The water is tested and a blend is created specifically for that water's chemistry. The analysis will usually include a targeted dosage for your water as well. It is critical that you test your distribution system and maintain this dosage in order to maximize the benefit of your corrosion control program. As stated above, this is just a quick overview of what we will need to continue to do in our battle with both corrosion issues as well as the never ending regulatory tightening in this area of water treatment. Please visit the EPA's website for much more information on the subject and feel free to contact your local Rural Water Association contact for assistance in developing or refining your current corrosion control program. 💦💦💦