Water Fluoridation in Washington

A RESOURCE GUIDE FOR POTABLE WATER PRODUCTION FACILITY OPERATORS

SODIUM FLUOROSILICATE and SODIUM FLUORIDE

Your Community Benefits

- Thousands of research studies and 60 years of experience have shown that water fluoridation is safe, effective and the best method of improving oral health in a community.
- Water fluoridation is recognized as a major public health achievement of the 20th century by the Centers for Disease Control and Prevention (CDC).
- Although dental caries (tooth decay) is largely preventable, it remains the most common chronic disease of children aged 5 to 17 years. In the U.S., tooth decay affects
  - 1 out of 4 elementary school children
  - 2 out of 3 adolescents
  - 9 out of 10 adults
- Both children and adults benefit from water fluoridation. Studies have demonstrated that people in communities with fluoridated water have 20 to 40 percent less tooth decay than those in communities without fluoridated water.
- The cost to fluoridate water for the lifetime of one person is less than the cost to treat one cavity.
- Every dollar spent on fluoridation saves $38 in avoided dental bills.
- In 2002, the CDC estimated that 66 percent of U.S. residents who receive their water from community water systems, or 170 million people, had access to fluoridated water. The *Healthy People 2010* goal is to increase this to 75 percent. In Washington, 58.9 percent of the population has access to fluoridated water, resulting in better oral health, less dental pain, and fewer cavities for millions of people living in Washington.

Optimal Fluoridation

For Washington, the most benefit to oral health is achieved when waters are fluoridated to 1.0 mg/L.

Optimal fluoridation is achieved when the fluoride level in potable water is maintained in the control range of 0.8 to 1.3 mg/L.

The benefits of fluoridation are quickly lost when fluoride levels drop below the optimal range.

The U.S. Environmental Protection Agency (EPA) has set both the maximum contaminate level (MCL) and the maximum contaminant level goal (MCLG) for fluoride to 4 mg/L. In addition, the secondary maximum contaminant level goal (SMCLG) of 2 mg/L has been set for fluoride to minimize potential dental fluorosis (staining of the teeth).

Operation

- Monitor water fluoride levels daily to ensure optimal fluoridation, and adjust feed rates as necessary.
- Send split samples monthly to the state health laboratory to verify your accuracy in measuring fluoride levels.
- Saturators and volumetric feeders work best when the correct amount of sodium fluorosilicate or sodium fluoride is maintained. Too much or too little in the saturator bed or hopper results in inconsistent feeds. Therefore, periodically clean saturators and volumetric feeders to remove inert cinders and clear encrustations, and verify that all plumbing and instrumentation is in working order.
- In some locations, natural fluoride levels can vary seasonally. Verify the quantity of additive to add to achieve the optimum dosage.
- Inspect equipment, connections, and pipes/tubes for wear and replace them as necessary. Also check for possible encrustations and for accumulated air pockets, both of which can restrict flow. Ensure that all replacement parts are fluoride compatible.
- Recheck the pump calibration delivery weekly to verify proper operation of the pump.

Safety Corner

- Although fluoride is entirely safe at the recommended optimum dosage levels in potable water, it can be harmful at more concentrated levels.
- When handling sodium fluorosilicate or sodium fluoride, always wear Neoprene gloves, an apron, boots, and a NIOSH/MSHA dust respirator with a soft rubber face to-mask seal and replaceable cartridges.
- Inspect all pipes and tubing regularly for leaks, and repair them promptly if necessary.
- Always clean equipment and gear after their exposure to sodium fluorosilicate or sodium fluoride. Promptly sweep spills and keep area clean to minimize dust. Do not tear or puncture bags; use a knife to open bags with a clean cut.
- Do not consume food or beverages in proximity to the fluoride storage area.
- Never store sodium fluorosilicate or sodium fluoride with other chemicals. Store unopened bags on pallets, not directly on concrete floors. When adding sodium fluorosilicate or sodium fluoride to the saturator or hopper, ensure that the ventilation is adequate to evacuate fugitive dust.

Important Contacts

For questions on the health effects of fluoridation, or on the Fluoridation Program in Washington State, contact the Department of Health, Oral Health Program, 360-236-3524.

For fluoridation engineering questions, contact the Office of Drinking Water, 360-236-3138.

The Office of Drinking Water emergency after-hours hotline number is: 1-877-481-4901.

The following Web sites are good sources of information about fluoridation:

American Dental Association:
www.ada.org/public/topics/fluoride/index.asp

Centers for Disease Control and Prevention:
www.cdc.gov/OralHealth/topics/fluoridation.htm

American Water Works Association:
http://awwa.org/Advocacy/pressroom/fluoride.cfm

The poster was jointly issued by the State of Washington, Department of Health's Office of Drinking Water and the Oral Health Program. March, 2005.

Recommended fluoride overfeed actions for community water systems, MMWR 1995 (CDC)

Fluoride level	Actions Recommended
0.1 mg/L above control range to 2.0 mg/L	1. Leave the fluoridation system on. 2. Determine malfunction and repair.
2.1 mg/L to 4.0 mg/L	1. Leave the fluoridation system on. 2. Determine malfunction and repair. 3. Notify supervisor and report the incident to the appropriate county or state agencies.
4.1 mg/L to 10.0 mg/L	1. Determine malfunction and immediately attempt repair. 2. If the problem is not found and corrected quickly, turn off the fluoridation system. 3. Notify supervisor and report the incident to the appropriate county or state agencies. 4. Take water samples at several points in the distribution system and test the fluoride content. Retest if results are still high. 5. Determine malfunction and repair. Then, with supervisor's permission, restart the fluoridation system.
10.1 mg/L or greater+	1. Turn off the fluoridation system immediately. 2. Notify supervisor and report the incident immediately to the appropriate county or state agencies and follow their instructions. 3. Take water samples at several points in the distribution system and test the fluoride content. Retest if results are still high. Save part of each sample for the state laboratory to test. 4. Determine malfunction and repair. Then, with supervisor's and the state's permission, restart the fluoridation system.

+The state might require public notification to prevent consumption of high levels of fluoridated water.