

## ARSENIC IN DRINKING WATER COMPLIANCE SUCCESS STORIES

# Seattle, WA: Arsenic in Public Schools

### Case Study Contact Information

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Seattle Public Schools investigated arsenic levels in school drinking water after finding high levels at several new drinking water fountains. Monitoring results show that regular use of drinking water fountains and periodic flushing significantly reduce arsenic to safe levels.

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### Lessons Learned

A comprehensive program of monitoring drinking water taps and fountains in Seattle Public Schools (SPS) indicates that regular use of the school drinking water fountains helps to prevent accumulation of arsenic, and that flushing is an effective approach to reducing arsenic levels.

### Background

Seattle Public Schools (SPS) provides educational opportunities to approximately 47,000 students in more than 100 schools and administrative buildings. SPS purchases water exclusively from Seattle Public Utilities (SPU) for drinking water, other potable uses, and fire protection service. There is no indication that water from the SPU is the source of the arsenic.

In April 2006, SPS measured high levels of arsenic at several school drinking water fountains while testing new fountains for lead and other standard water quality parameters. Although the fountain samples did not have elevated lead levels, several samples were found to have arsenic levels in the range of 10 to 50 parts per billion (ppb). All but one of these samples represented fountains that had recently been replaced and that contained water that had been stagnant for 1 week to 3 months. Arsenic levels were <10 ppb or below the detection limit for over 99 percent of samples collected from new fountains containing water with a standing time of 12 to 18 hours.

## Strategy to Address Arsenic Problem

SPS turned off all school drinking water fountains and taps on May 1, 2006, and provided bottled water for students and staff as an interim measure until the source and extent of the arsenic problem could be identified.



Typical iron/brass connection linked to elevated arsenic levels at some Seattle Public School drinking water fountains.

From May to August 2006, SPS measured arsenic levels in water from every drinking water tap and fountain at all District schools. Of more than 3,500 samples tested to date, 21 samples had arsenic levels greater than 10 ppb.

Only 2 of these samples represented school water sources that were active at the time of sampling. Of these 21 samples, eight were in a single school with recently repaired fountains that exhibited galvanic corrosion from newly created iron/brass connections (see photo). These same causative factors apply at some but not all of the other sources where arsenic was found at levels >10 ppb. Test results consistently indicate that regular use of the school drinking water fountains helps to prevent accumulation of arsenic, and that flushing is an effective approach to reducing arsenic levels. At this time, SPS has returned regular water service to all but one of the affected buildings (one building has not been tested yet).

SPS has adopted the EPA standard of 10 ppb as a maximum allowable level for all drinking water sources where water has been flushed and then held for 12 to 18 hours. Any school drinking water tap or fountain found to have an arsenic level >10 ppb in a water sample that represents these conditions (standing overnight sample) will remain out-of-service until the source of arsenic is found.

SPS consultants tested and investigated every possible arsenic source including piping, fixtures, and materials used in plumbing and cleaning and concluded that the concern is limited to new fixtures that have not been adequately flushed and remain stagnant for extended periods. Brass/iron connections will be removed where found, but no additional remedial action will be taken beyond compliance with the existing SPS protocols for flushing and testing. Follow-up testing will be performed to confirm the absence of arsenic.

SPS has worked with local and state health departments, Seattle Public Utilities, scientists, and other experts to share results and identify possible health impacts. The school district's Water Quality Oversight Committee has provided guidance on actions needed to ensure the health and safety of students and staff. SPS has also communicated directly with parents, staff, and students about water quality. Fact sheets, testing results, and other resources were posted on the [Seattle Public Schools Web site](#) EXIT Disclaimer, and information was sent to all principals, SPS staff, and community members. The district frequently updates their Web site as more information becomes available.