

Water facts

#3

Island Drinking Water Quality

October 2006

Background

Groundwater is a great source of drinking water because most impurities tend to bind to the soil cleaning the rainwater as it percolates down to the water table. Groundwater feeds our



springs and combines with surface water to form our streams. Groundwater, springs and stream water are all used for drinking water on the Island. Our drinking water is generally good and Islanders have a long tradition of caring for it.

Federal, state and local regulators place limits on certain contaminants in drinking water. These limits are called "Maximum Contamination Levels" or MCLs. King County Department of Natural

Resources and Parks (DNRP) has been monitoring water quality in 20 wells and 2 springs on the Island since 2001. In addition, public water systems monitor their water supply on a regular basis and have strict requirements to notify their customers should they exceed a MCL.

Nitrate

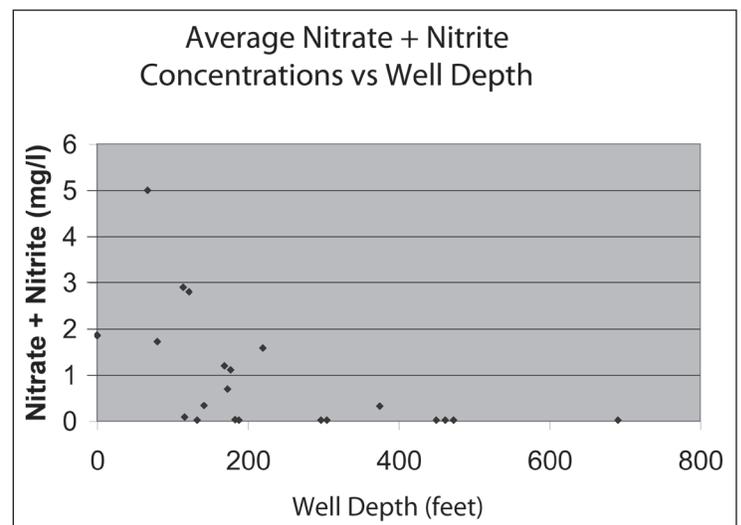
Nitrate is regulated because it can affect the blood's ability to carry oxygen. Because nitrate contamination of groundwater can be caused by human activity, it is often used as a general indicator of water quality. Septic system effluent, fertilizers, and livestock manure can increase groundwater nitrate levels. None of the Island drinking water samples tested by King

Ways to Help Reduce Nitrate in Water

- Keep your septic system maintained
- Practice water conservation
- Reduce or avoid using fertilizers
- Fence livestock away from wells
- Rake up and compost livestock manure

County had nitrate levels that exceeded the federal 10 mg/l MCL. However, when nitrate levels reach 5 mg/l in public water systems, the state does "flag" these systems for closer scrutiny and requires more frequent testing.

The United States Geologic Survey notes that nitrate levels in natural groundwater are usually less than 2 milligrams/liter. In 2005, 15% of the Island's Group A water systems had nitrate that exceeded 2 milligrams/liter. Elevated nitrate levels, though still below the 10 mg/l MCL standard, are found in different parts of the Island and shallow wells less than 100 feet deep tend to be more vulnerable to nitrate contamination.



The chart above shows a three-year average (2002-2004) of nitrate-nitrite concentrations in Vashon-Maury Island wells and springs being monitored by King County. Shallow wells of 100 feet or less tend to be more vulnerable to nitrate contamination. Although nitrite is measured in the analysis, its concentration is negligible compared to nitrate. The detection limit of the analysis is .02 mg/l.

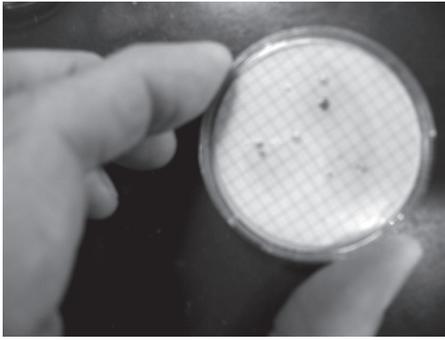
Bacteria

Public water systems must test for the presence of coliform bacteria. Coliforms are commonly found in soils and surface water, but their presence in well water may indicate leakage of surface water into a poorly sealed well.

A more serious concern is the presence of "fecal" coliform which is a type of coliform bacteria found in the gut of warm-blooded animals. Its presence in drinking water is an indication that there is fecal contamination which can harbor a

Islanders working together to protect our groundwater

Produced by Susie Kalhorn for the Vashon-Maury Island Groundwater Protection Committee



Fecal Coliform colonies in a petri dish.

variety of disease-causing organisms. This could be the result of, say, a failing septic system near the water source or even rodent droppings. Whatever the cause, a public water system must notify their customers with-

in 24 hours usually telling customers that the water must be boiled before drinking until the problem has been rectified.

Arsenic

Copper smelting operations took place in Ruston, just north of Tacoma and south of Vashon-Maury Island, from 1890-1985 disseminating heavy metals, including arsenic, some of which landed on our Island. The U.S. Environmental Protection Agency considers arsenic a cancer-causing agent. Studies by the University of Washington conducted in the late 1980s found that this smelter-generated arsenic gets into the human body primarily by inadvertently eating contaminated dirt. You can reduce exposure by washing home-grown vegetables, washing hands after playing or working in dirt, and controlling household dust by damp mopping. Research is continuing on plants that help cleanse the soil by taking up arsenic and other heavy metals.



The good news is that the smelter arsenic does not appear to be getting into our groundwater. The highest concentrations of arsenic in the soils are found in the upper foot of undisturbed soil. The maximum limit for arsenic in drinking water is .010 milligrams per liter (mg/l). The



King County Groundwater Monitoring Program found arsenic levels that exceeded the drinking water limit in two of the twenty-two sites tested (.01 and .02 mg/l), but the researchers believe this arsenic is from naturally occurring minerals which more readily leach arsenic. Their results indicate that the greatest arsenic values in groundwater are centered in wells about 300 feet below surface with concentrations decreasing toward shallower and deeper depths.



Iron, Manganese and Hydrogen Sulfide

Iron and manganese are common components in Island drinking water. They are managed for aesthetic reasons, not for health concerns, because they tend to discolor bathroom fixtures and can add a somewhat metallic taste to the water. Dissolved iron and manganese may be accompanied by a rotten-egg smell caused by hydrogen sulfide. Hydrogen sulfide is produced when there is little to no oxygen available, as is common in deep wells. While extremely high levels of hydrogen sulfide gas can be harmful, your nose is very sensitive and detects levels 400 times below the threshold for human health effects.

Testing Your Water

Public water systems are required to test for bacteria as well as many other constituents in water. Although homeowners with private wells are under no such obligation, you may choose to do so for your own safety. Seattle-King County Health Department's Drinking Water Program (206-296-4932) offers a bacterial sampling kit and analysis for \$15.00. If you would like to test for other constituents in your water, check the yellow pages under "Laboratories-Analytical."



Resources

Vashon-Maury Island Library Reference Shelf has numerous documents on water quality, groundwater monitoring, arsenic in soils, and water system plans.

King County Department of Natural Resources

Groundwater Protection Program: 206 263-6159
<http://dnr.metrokc.gov/wlr/wq/groundwater.htm>

Seattle-King County Department of Health

Drinking Water Program: 206 296-4932
<http://www.metrokc.gov/health/water/index.htm>

Washington State Department of Health

Office of Drinking Water:
<http://www.doh.wa.gov/ehp/dw/>

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