

General Information and Frequently Asked Questions About Groundwater Analysis: Filtered or Unfiltered

- Groundwater monitoring is done under the direction of the Department of Toxic Substances Control (DTSC) according to an approved Sampling Plan.
- This sampling plan calls for groundwater samples for gross alpha, beta and gamma activity to be filtered and preserved in the field.
- Groundwater moves slowly and the primary contaminants at SSFL --- TCE and tritium --- tend to be dissolved.
- The reason we filter is to remove suspended solids which makes the samples more representative of natural groundwater.
- Filtering allows us to reach lower levels of detection for dissolved radionuclides, which have greater potential to move offsite.
- Filtering of groundwater is a required procedure in the U.S. Geological Survey Field Manual for Collection of Water Quality Data and the EPA Multi-Agency Radiological Lab Analytical Protocol Manual.
- Two studies were done at SSFL in 1989 and 1998 comparing the results of filtered and unfiltered groundwater samples.
- The 1989 study found that gross alpha detections tended to be higher in unfiltered samples. The source of this gross alpha was found to be naturally occurring uranium isotopes.
- The 1998 study was conducted jointly with EPA. The EPA found that:
 - Split sample results were comparable
 - Sampling protocols were appropriate.
 - The gross alpha detections were generally higher in the unfiltered samples, similar to the 1989 study.
 - Naturally occurring isotopes were identified in both filtered and unfiltered samples
- Tritium samples are not filtered because tritium (H^3) is part of the water molecule.

What are the differences between filtering and not filtering?

In filtered samples, only the chemicals that are dissolved in the water are measured. In unfiltered samples, all of the particles in the water are also measured. These particles are likely to settle out or otherwise be removed from the water before it is consumed.

Why is the groundwater so cloudy that you have to filter?

Construction of groundwater wells causes disturbances in the rock and soil formations which release particles into the groundwater. The sampling of the wells further stirs up the sediments, and makes the sample cloudy.

What chemicals might be in the unfiltered groundwater particles?

Higher concentrations of the same chemicals we see dissolved in the filtered samples, such as aluminum, calcium, iron, manganese, magnesium, thorium, uranium, zinc, and other metals. Some forms of radiation, such as gross alpha and beta particles, are significantly reduced by filtering. The protocol for tritium samples does not require filtering.

Why are there concerns about filtering groundwater?

Some stakeholders and community members are concerned that the groundwater particles (the stirred up sediment) could move along with the groundwater, and that these particles may eventually end up in drinking water and/or surface water (streams, lakes, and reservoirs) where the possibility of human exposure exists.

How should we proceed?

Current DTSC approved sampling protocols include the filtering of SSFL groundwater samples. Revised sampling protocols are being reviewed by the agencies. These revisions include implementation of "low-flow" sample methods to reduce the turbidity of samples--potentially eliminating the need to filter samples.

Who is checking your data?

In addition to the 1998 EPA study, the Department of Health Services regularly collects split samples from onsite and offsite monitoring wells.

Who can I contact for more information?

Mike Lopez (DOE) at 510.637.1633 or Majelle Lee (Boeing) at 818.586.5283.