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Six-Mile Richardson Highway Areawide Groundwater Investigation

View detailed information from database on this site.

Status: Active

Database Name: Six-Mile Richardson Highway Groundwater Investigation

Location: Six-Mile Richardson Highway, Fairbanks, AK

Latitude: 64.797441 Longitude: -147.552356

DEC Contaminated Sites contact: Janice Wiegers, Project Manager, 907-451-2127

Contacts updated: July 8, 2013

PDF Version

Summary updated: July 8, 2013

Click on photos or maps for larger versions.

Drinking water wells and a TCE plume

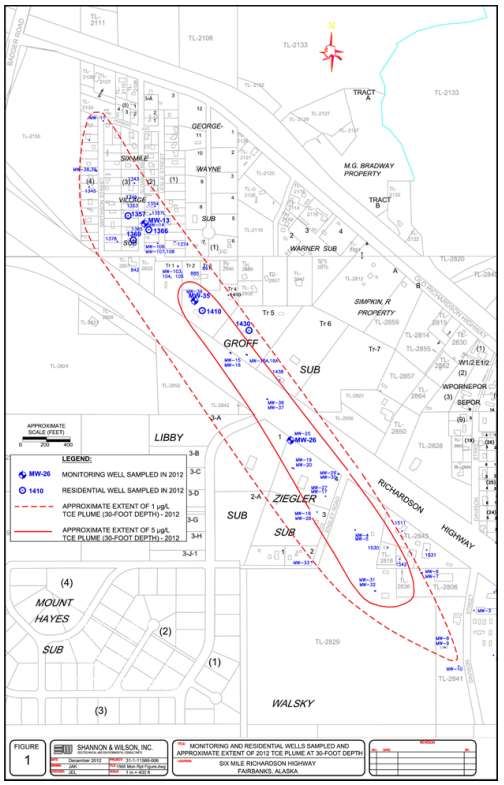
Trichloroethene, or TCE, was discovered in 17 drinking water wells in homes and businesses in the Six-Mile Richardson Highway area of Fairbanks in 1995, and the Alaska Department of Environmental Conservation has monitored the groundwater quality in the area since then.

When the TCE was discovered in the wells, the TCE concentrations exceeded 3.5 parts per billion (ppb), or micrograms per liter (µg/L), which is 70 percent of the public safe drinking water maximum contaminant level of 5 parts per billion. DEC established 3.5 ppb as an action level for the installation of household water treatment systems.

The TCE in the groundwater is part of a TCE groundwater plume in the area that measured slightly more than a mile long, up to 1,200 feet wide and more than 100 feet deep when it was discovered in 1995-1996. (See the December 1999 fact sheet, as well as the other fact sheets, below for more historical background on the site.)

The TCE concentrations in the plume have gradually decreased since 1995 as the result of natural breakdown. DEC has continued annual testing since 1995 (except for two years) of the drinking water wells that have TCE concentrations above the action level of 3.5 ppb. That testing will continue. DEC also pays for the annual maintenance costs for the water treatment systems, most of which were installed in 1995 and 1996.

The groundwater monitoring consists of regularly sampling a series of permanent monitoring wells and a selected number of private drinking water wells to track the location and concentration of the plume.



The above map shows the results from DEC's groundwater sampling in July 2011 and August 2012. The solid red line surrounds the area where groundwater monitoring wells (marked as "MW") have TCE concentrations above the maximum contaminant level of 5 parts per billion TCE. The area between the dotted and solid lines has TCE in concentrations between 1 ppb and 5 ppb. It's important to note that the above map shows groundwater monitoring wells, not drinking water wells. (The December 2012 map is from Shannon & Wilson, Inc., a DEC contractor)

The results from a fall 2012 sampling showed that
none of the drinking water wells contained TCE concentrations above the 3.5 ppb treatment threshold or the maximum contaminant level of 5 ppb. Those results are consistent with the 2011 sampling results – indicating the contamination is not increasing.

Sampling the groundwater for TCE

DEC sampled the groundwater in July 2011 and August 2012. (See map.) The solid red line surrounds the area where TCE in groundwater is above the maximum contaminant level of 5 ppb. The area between the dotted and solid lines has TCE in concentrations between 1 ppb and 5 ppb.

Vapor intrusion – sampling soil gas and indoor air

In 2011, DEC began investigating whether TCE was present in soil gas in the area and whether vapor intrusion was occurring. (See box.)

DEC installed 25 soil gas probes outside homes and businesses in the plume area to find out if TCE was present in the soil gas.

Based on the results of soil gas sampling, additional testing was done in three homes or businesses.

TCE was present in one of the buildings above DEC's residential indoor air target level of 2.1 micrograms per cubic meter. The sub-slab soil gas was collected from beneath the building's foundation, but it contained lower concentrations of TCE. Therefore, the source of the TCE in that building is uncertain, and it may not be the result of vapor intrusion from the Six-Mile Richardson Highway groundwater contamination.

What are vapor intrusion and soil gas?

Many chemicals off fumes – these chemicals are called "volatile." When released into the soil or groundwater, a certain amount of the chemical vaporizes into the small air spaces within the soil. The larger the chemical spill and the more volatile the chemical, the more chemical vapors move into the air spaces. This air is called soil gas. If the air pressure inside the building is lower than in the soil, or if the amount of chemicals in the soil gas is high, the vapors move, or intrude, into any open space, such as cracks in foundations, crawl spaces and basements. People in buildings can sometimes smell a chemical, but often the chemicals are odorless or too faint to smell.

See DEC's Vapor Intrusion page

Future sampling

DEC plans to continue its investigation of vapor intrusion, which could include more soil gas and indoor air sampling, and will continue sampling drinking water wells as necessary.

More Information

- The Contaminated Sites Program's Vapor Intrusion Web page, DEC.
- Fact sheet (June 2009) – "Vapor Intrusion," Contaminated Sites Program, DEC.
- The former "Six-Mile Richardson Highway Groundwater Investigation" Web page (December 2009), Contaminated Sites Program, DEC.
- Fact sheet (July 2003) – "ToxFAQs for Trichloroethylene (TCE)," Agency for Toxic Substances Disease Registry, U.S. Department of Health and Human Services.

The following are previous fact sheets for the Six-Mile Richardson Highway site from the Contaminated Sites Program, DEC:

- Fact sheet, December 2007 (PDF 19K)
- Fact sheet, August 2006 (PDF 19K)
- Fact sheet, January 2005 (PDF 622K)
- Fact sheet, January 2004 (PDF 106K)
- Fact sheet, January 2003 (PDF 87K)
- Fact sheet, February 2002 (PDF 681K)
- Fact sheet, January 2001 (PDF 79K)
- Fact sheet, December 1999 (PDF 23K)
- Fact sheet, August 1999 (PDF 81K)

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