Alaska Department of Environmental Conservation
Division of Spill Prevention and Response
Contaminated Sites Program

FACT SHEET
ANNUAL LONG-TERM GROUNDWATER MONITORING RESULTS
ASSESSMENT OF RESIDENTIAL CARBON FILTER SYSTEMS
SIX MILE RICHARDSON HIGHWAY
FAIRBANKS, ALASKA

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What's New

The year 2000 groundwater monitoring event of the regional trichloroethylene (TCE) plume was performed during August and September 2000 with the monitoring results published in November 2000. In addition, the Alaska Department of Environmental Conservation (ADEC) performed an assessment of the operational efficiency of residential carbon filter systems that were installed in 1995/1996 due to the discovery of the regional TCE plume. This fact sheet provides a synopsis of the monitoring results and the filter assessment.

Executive Summary

The monitoring data indicates that the size of the regional TCE plume has not changed significantly from past years. In some parts of the plume, the concentration levels are decreasing at a predictable rate; whereas, in other parts of the plume, the concentration levels have remained essentially constant. At two wells, one residential and one monitoring, the concentration levels have increased slightly.

The number of Six-Mile Village Subdivision residences that have well water (i.e., water sampled from the well before any treatment) above the safe drinking water standard for TCE decreased from twelve in 1995 to four in 2000. However, it should be noted that three of the twelve residences sampled in 1995 did not allow re-sampling in 2000 and it is unknown if these three homes are above the safe drinking water standard. The remaining four residences are marginally above the standard but they all have treatment systems capable of removing the low levels of contamination.

The residential carbon filter treatment systems (if properly serviced and maintained) are capable of removing organic contaminants to essentially non-detect limits: generally 0.5 µg/l or one tenth of the safe drinking water standard of 5 µg/l. The assessments of the filter systems found that the majority of them needed servicing and filter changes. If the filters were serviced properly, all systems effectively removed organic contamination to acceptable limits.

Groundwater Monitoring Results

The 2000 groundwater monitoring data provided the following conclusions.

The size of the regional plume remained generally stable suggesting that natural attenuation is likely occurring at the regional scale. Natural attenuation refers to the breakdown of hazardous substances through naturally occurring conditions. This includes dilution, dispersion, sorption, volatilization, and biotic and abiotic transformations.

Geochemical data from the local aquifer and the presence of TCE breakdown products (i.e., products produced by the biodegradation of TCE) provide evidence that natural attenuation is occurring. However, dilution and dispersion may contribute much more than biodegradation to concentration decreases.

The trend in TCE levels vary where concentration levels are decreasing at a predictable rate in some areas but, levels have remained essentially constant with no apparent trend in other parts of the plume. And in one monitoring well, there was a slight but discernable increase in concentration (i.e., 4.6 µg/l to 5.3 µg/l).

Only four residences in the Six-Mile Village Subdivision currently have TCE levels above the safe drinking water standard of 5 µg/l as compared to twelve residences in 1995. All of the homes have carbon filter systems that can effectively remove the low levels of contamination.

Three of the four residences above the safe drinking water standard in 2000 have concentration levels of 7.2 µg/l, 5.9 µg/l, and 5.25 µg/l but they have steadily decreased since 1995. The fourth residence has a concentration level of 6.1 µg/l that has decreased from 10.1 µg/l in 1995. This residence experienced a slight increase from its 1999 level of 5.83 µg/l.

The possible reasons why some levels in the groundwater increase are not clearly understood. As a result, ADEC has installed additional monitoring wells to clarify the problem.

Assessment of Residential Filter Systems

Since 1995, only a selected number of residences were tested annually as part of the long-term groundwater-monitoring program. In September 1999, ADEC offered to re-test all residential wells within the regional TCE plume as a "five year check-up" after discovery of the plume.

In addition, ADEC offered to install a treatment system if any well tested at or above 3.5 µg/l (70% of safe drinking water standard for TCE). This was the same criterion used in 1995.

In 1995, seventeen residences qualified for grant monies to install treatment systems and fifteen residences accepted. Two residences chose not to participate. The grant recipients used the monies to upgrade and install treatment systems of their choice. All homeowners installed some form of carbon filtration system for which they were responsible for the service and maintenance.

From September 1999 to July 2000, ADEC tested the well water and inspected the treatment systems (if present) at approximately thirty residences. Twelve of the original fifteen grant recipients allowed re-testing and it was concluded that the majority of carbon treatment systems needed service and filter changes.

ADEC changed filters and serviced the systems and then re-tested the water. All systems were determined adequate to remove the organic contaminants to nearly non-detect limits. The normal laboratory detection limit is 0.5 µg/l that is one tenth of the safe drinking water standard of 5 µg/l for TCE.

Questions or Need Additional Information

If you have any questions or need additional information, please contact the ADEC project manager, Douglas Bauer at (907) 451-2192 or at doug_bauer@envircon.state.ak.us.