

# TCE (Trichloroethylene) in Rockwood Sensitive Area groundwater

**Does TCE occur in your well water? If you live in the Rockwood Sensitive Area, your well water may contain TCE. The only way to know for sure is to test your water.**

## Is my well water safe to drink?

The quality of groundwater in the Rockwood Sensitive Area is typically good. However, it is naturally variable and can be influenced by man-made conditions. One chemical which has been found in well water in some areas of the Rockwood Sensitive Area is trichloroethylene (TCE). Drinking or breathing TCE may cause health problems.

## What is TCE?

TCE is a manufactured chemical that does not occur naturally in the environment. It is a colourless liquid with a somewhat sweet odour and a sweet, burning taste. TCE is used mainly as a solvent to clean and remove grease from metal parts and had previously been used in the dry-cleaning process.

TCE is also a volatile organic compound (VOC) meaning it is a carbon-containing chemical that can easily evaporate into the air.

## What is the Rockwood Sensitive Area?

TCE was discovered in groundwater beneath an industrial site (locally known as the Rockwood plant) in the early 1990's. TCE solvent had been used at the plant site as a cleaner and degreaser in manufacturing and assembly operations. The discovery triggered an extensive program of soil and groundwater investigation to define the sources of the solvent on the plant site and the areal and vertical extent of solvent in the aquifer system. An area of TCE contaminated groundwater was found to extend four kilometres to the east and six kilometres to the south of the plant site. A second smaller area of TCE groundwater contamination, separate from the plant site, was also found southeast of Stony Mountain.

The areas containing known TCE contaminated groundwater along with an adjacent buffer zone was designated as the Rockwood Sensitive Area under the Rockwood Sensitive Area Regulation of The Environment Act of Manitoba.

## Where is the Rockwood Sensitive Area?

Refer to map on the back page of this information sheet.

## What happens to TCE when it enters the environment?

- TCE exposed to air evaporates easily and occurs as vapour.
- When TCE comes into contact with surface water it evaporates readily as vapour. However, TCE is heavier than water and has low solubility. As a result, most of it sinks and settles below the surface of the water.
- TCE evaporates less easily from soil and rock than surface water. It can travel through soil and rock but may stick to particles and remain for long periods of time.
- When TCE comes into contact with groundwater, some of it dissolves and travels with the groundwater but most of it sinks and may stick to or become trapped within the soil or the rock.
- TCE does not build up significantly in plants and animals.

## How TCE gets into well water

A well drilled into an aquifer containing TCE will produce TCE contaminated water. The pumping effect of a well located near a source of TCE contaminated groundwater might pull TCE contaminated water towards and into the well.

## Exposure to TCE

TCE in well water can enter people's bodies by breathing it in, by drinking or eating it, or through the skin. TCE can evaporate into the air in a house from shower and bath water, water sitting in toilets, or water used to wash hands. Some ways that TCE can be eaten or drank are through making infant formula or juice, mixing with food, washing fruits or vegetables, brushing teeth and soaking false teeth.

The source of the public (municipal) water supply system serving both Stony Mountain and the rural area via pipeline is located outside the area of TCE contaminated groundwater. It does not contain TCE and undergoes regular water quality testing that includes TCE.

## Drinking water quality standard for TCE

Manitoba has adopted Health Canada's maximum acceptable concentration (MAC) of 0.005 milligrams per litre (mg/L) as a water quality standard for TCE in drinking water. Public and semi-public water systems are legally required to meet this standard. Private well owners on the other hand are not legally required but, where concentrations are above the MAC, a treatment device or other corrective action is recommended.

## Permit required for drilling, modifying or abandoning a well

By Manitoba law, no person can drill, modify or abandon a well within the Rockwood Sensitive Area without first obtaining a permit. The application for a permit allows a process for the review of the well location and stipulates any special requirements for the drilling, modification or abandonment of the well. The drilling of a private well in an area serviced by a municipal water supply system within the Rockwood Sensitive Area is not allowed. In this case, the property owner must hook up to the municipal water supply.

To obtain a permit for drilling, modifying or abandoning a well, contact Manitoba Sustainable Development at 204-785-5030. The well owner must ensure that a permit has been approved prior to work commencing.

## Health effects of TCE

TCE's effect on human health depends on factors such as the concentration, length and type of exposure.

The main health concerns from the lowest exposures to TCE are the risk of harm to the immune system (for example autoimmune disease), kidney damage and increased risk of heart defects in the developing fetus if the pregnant mother is exposed in the first trimester. At higher levels, TCE may increase the risk of harm to the brain and nervous system, liver, and male reproductive system.

TCE causes cancer. Long term exposures to TCE can cause kidney cancer in humans. There is also evidence that TCE exposure might increase the risk of non-Hodgkin's lymphoma and liver cancer.

The drinking water quality standard of 0.005 mg/L will protect people from increased health risks.

For health related questions, consult your doctor, who can consult with your regional medical officer of health for more information.

## Recommendations for TCE testing of well water in the Rockwood Sensitive Area

Private well owners are responsible for ensuring that their wells are tested and, if necessary, treated to make sure their water is safe for domestic use. All new wells should be tested to ensure they are not contaminated by TCE. Annual testing of well water is also recommended if TCE is detected but below the drinking water quality standard of 0.005 mg/L.

Public water supply systems in the Rockwood Sensitive Area and in Manitoba that use well water are tested regularly by the water system owner or the Office of Drinking Water as required under *The Drinking Water Safety Act*.

## How to test well water for TCE

Water containing TCE may exhibit a sweet odour or a sweet, burning taste. However, the only way to know if well water contains TCE is to have a water sample tested by an accredited laboratory. Three laboratories in Manitoba accredited to test for TCE are:

### **ALS Environmental**

12-1329 Niakwa Road E.  
Winnipeg, MB R2J 3T4  
Phone: 204-255-9720  
Toll Free: 1-800-607-7555  
Fax: 204-255-9721

### **Horizon Lab Ltd.**

4055 Portage Avenue  
Winnipeg, MB R3K 2E8  
Phone: 204-488-2035  
Fax: 204-488-4772

### **Bureau Veritas Canada Inc.**

Unit D, 675 Berry Street  
Winnipeg, MB R3H 1A7  
Phone: 204-772-7276  
Fax: 204-772-2386

Test costs will vary from year to year, and well owners should contact the laboratories directly for an estimate and sampling instructions.

## What to do if TCE is found in your well water

If the TCE concentration in the well water is above the drinking water quality standard of 0.005 mg/L, private well owners should consider how they are using this water and may wish to discuss health risks with their doctor, who can consult their regional medical officer of health for more information.

Private well owners should not use contaminated water for domestic use such as drinking, making infant formula or juice, mixing with food, washing fruits or vegetables, brushing teeth, soaking false teeth, or bathing and showering. If your well water is contaminated with TCE above the drinking water quality standard of 0.005 mg/L, your options include:

- Hooking up to a public (municipal) system. Contact your municipal office to inquire if one is available in your area.
- Installing a cistern and arranging for the delivery of safe drinking water by a water hauler.
- Drilling a new well at a different location or to a different depth. This may or may not solve a TCE problem. For more information, contact Manitoba Sustainable Development's Groundwater Management Section at 204-945-6959.
- Treating the well water.

## Treating the well water

Water treatment systems like water softeners and sediment filters, or boiling the water do not remove TCE from well water. The most common and effective residential water treatment system for reducing concentrations of TCE in drinking water is granular activated carbon (GAC) filters.

## Types of treatment systems

A treatment device may be installed at the faucet (point of use) or where water enters the home (point of entry). Point-of-entry systems are preferred for volatile organic compounds such as TCE because they provide treated water for bathing, showering and laundry as well as for cooking and drinking. Treatment devices are available for purchase at most stores that sell water treatment equipment.

Quotes should be obtained from reputable water treatment equipment suppliers. The supplier should provide information on how much TCE will be removed, maintenance requirements and costs.

Any treatment device should be certified to meet the NSF International (NSF)/American National Standards Institute (ANSI) standard 53 for removal of volatile organic compounds, which includes TCE. Certified devices are tested to ensure the safety of materials used in the devices and to ensure they perform as claimed.

For more information on certification of residential point-of-use or point-of-entry water treatment devices, visit [www.nsf.org](http://www.nsf.org) or call their Consumer Information Office at 1-800-673-8010, or visit the websites of other certifying bodies ([www.csagroup.org](http://www.csagroup.org); [www.ul.com](http://www.ul.com); [www.iapmo.org](http://www.iapmo.org); [www.wqa.org](http://www.wqa.org)).

## Maintenance of treatment systems

Once installed, manufacturers' instructions on the use and maintenance of treatment devices and disposal of filter media should be followed. The raw well water and treated drinking water should be tested annually for TCE to confirm that the treatment system is working properly.

For more information on well water treatment or assistance with understanding test results, contact the Office of Drinking Water at 204-945-5762.

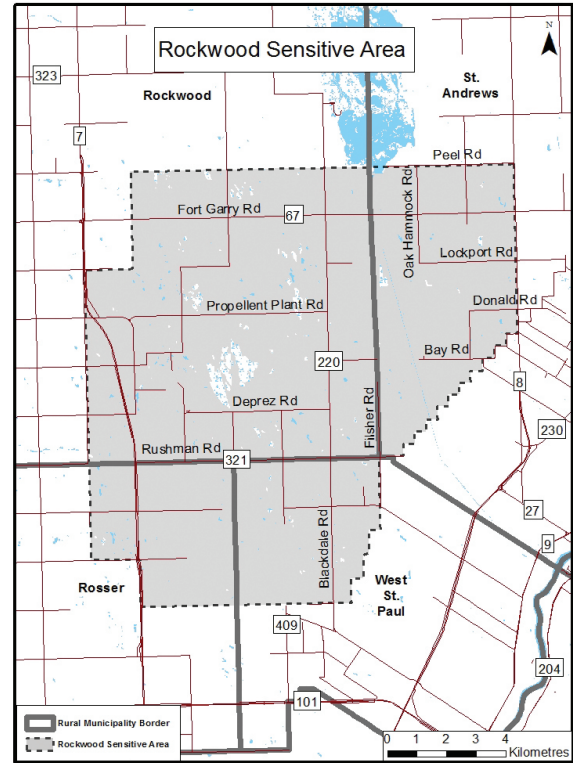
## How is TCE contamination being addressed in the Rockwood Sensitive Area?

A groundwater pumping and treatment (pump and treat) system has been operated at the Rockwood plant since 1994 to reduce and contain the highest concentrations of TCE in the aquifer. The system operates by pumping groundwater in the area of the aquifer having the highest concentrations of TCE and then safely removing the TCE from the pumped water by means of air stripping technology.

A groundwater quality monitoring program is also completed annually to determine the effectiveness of the pump and treat system and assess the extent and migration of TCE in groundwater within the Rockwood Sensitive Area. In general, the pump and treat system has been successful in removing some of the TCE contamination and reducing the size of the areas of highly contaminated groundwater. However, lower concentrations of TCE continue to be present in groundwater to the south and east of the Rockwood plant and in an area to the southeast of Stony Mountain.

A map of the approximate boundary of TCE contamination in the Rockwood Sensitive Area is available online at [www.gov.mb.ca/conservation/waterstewardship/odw/public-info/fact\\_sheets/index.html](http://www.gov.mb.ca/conservation/waterstewardship/odw/public-info/fact_sheets/index.html).

Concerns and questions related to the impact of TCE contamination on private well users in the Rockwood Sensitive Area are addressed by Manitoba Sustainable Development and Manitoba Health, Seniors and Active Living. For information on the TCE contamination, contact Manitoba Sustainable Development at 204-785-5030.



## Additional water quality analyses that well owners should consider

Private well owners are also reminded to test their well water for bacteria (total coliform and E. coli) on an annual basis. Testing is recommended during times of high surface run-off such as following the spring snow melt, or following a particularly heavy rainfall. You should also test for bacteria if you see any changes in the water (ex: change in taste, clarity, colour or odour). A sample for nitrate should also be collected every three to five years. For more information on well water sampling, please refer to [www.manitoba.ca/drinkingwater](http://www.manitoba.ca/drinkingwater) and click on "Private Well Information".