



Minnesota  
Pollution  
Control  
Agency

# Trichloroethylene Monitoring Results and Swimming Use Health Consultation

Long Lake, New Brighton, Ramsey County  
Lake ID 62-0067

Water Quality/Surface Water #1.25 • December 2008

**L**ong Lake, a popular fishing and swimming lake, is situated in an urban watershed that historically had many industries, some of which handled solvents, degreasers, and petroleum products. The Minnesota Pollution Control Agency (MPCA) and other investigators have routinely monitored Long Lake for conventional (e.g. nutrients and bacteria) pollutants, but more recently included chemical pollutants associated with past industrial activities. Previous and ongoing monitoring of Long Lake and local ground water indicate low concentrations of trichloroethylene (TCE) and *cis*-1,2-dichloroethylene (DCE), a breakdown product of TCE, but no human health concerns for recreational users of the lake.

## Lake Monitoring Results

Past and recent water monitoring in Long Lake indicate decreasing concentrations and yet a continued presence of TCE and DCE (see Figure 1). The MPCA worked cooperatively with the Minnesota Department of Health (MDH) to compare recreational exposure to water quality standards and health-based screening values for swimming and wading. The MPCA has also utilized their remediation programs to initiate additional ground water investigations and cleanup activities.

The map (see Figure 1) shows locations of water samples and areas with remediation activities. The range of TCE and DCE concentrations in 1986-88 were TCE: 3.8 to 12 µg/L and DCE: 0.5 to 1.1 µg/L. From

2002-05 the highest TCE and DCE concentrations were in April 2002 at 3.4 µg/L and 1.1 µg/L, respectively. Sampling July 2003 and June 2005 showed even lower concentrations of about 1 µg/L for TCE and 0.2 µg/L for DCE.

**Figure 1. Overview of Past and Recent Monitoring for TCE and DCE (April-September)**



Concentrations of TCE and DCE measured in the lake are much lower than TCE's water quality standards (WQSs) and DCE's water quality guidance value; the standards and guidance value are based on protecting aquatic organisms and human health for fish consumption and incidental intake of water during swimming (Minn. R. ch. 7050). However, because of recent advances in understanding the toxicity of TCE and assessing swimming exposure, MPCA requested that MDH conduct a health consultation.

## MDH Health Consultation

MDH toxicologists look at the levels of chemicals in water, the way people are coming into contact with the chemical in the water, the way the chemical enters the body, and how often people of different ages might be in contact with the water. All of these factors affect whether or not a chemical could cause a health effect in people.

For example, TCE moves very quickly from water to air (volatilizes), especially when the temperature is warmer outside. This characteristic of TCE means that people who are swimming could inhale TCE as it moves from the water into the air. If the level of TCE in the water is high enough, it could be a concern for people's health. On the other hand, TCE is not accumulated in fish, so being exposed to TCE by eating fish is not a concern.

Kids are more vulnerable because they breathe in more air for their size, they swallow water as they swim and play, and they could spend much more time around the water in the summer than a working adult. MDH toxicologists take all of these factors into consideration, including how much a person might be exposed through all the factors combined together.

The MDH Long Lake Health Consultation (available at: [www.health.state.mn.us/divs/eh/hazardous/sites/ramsey/longlakehc0808.pdf](http://www.health.state.mn.us/divs/eh/hazardous/sites/ramsey/longlakehc0808.pdf)) concludes that levels of TCE, DCE, and vinyl chloride in Long Lake are well below levels of health concern at the time the water was sampled. However, although the levels are slowly decreasing, the levels do suggest that there is a continuing source of these contaminants.

The MPCA's most stringent WQS for TCE is 120 µg/L and 529 µg/L guidance value for DCE. The MDH Health Consultation's recommended screening values were 40 µg/L for TCE and 700 µg/L for DCE.

While TCE does not accumulate in fish, people who eat fish from Long Lake should consult the MDH Fish Consumption Advisory when choosing which fish to eat and how often. MDH's advice helps people get the health benefits of eating fish while avoiding mercury, a contaminant commonly found statewide in fish.

## Remediation Sites

Historical industrial sites, including a refinery, a solvent recycler, a petroleum facility and a former dump, are located in the vicinity of Long Lake (highlighted green areas in Figure 1). MPCA remediation programs currently oversee past and present investigation and cleanup activities at these sites. The MPCA staff worked with voluntary and responsible parties in order to evaluate potential risks posed to surface and ground waters by these contaminated sites. The parties recently installed approximately ten monitoring wells in the area immediately east of Long Lake. As a result, the MPCA obtained new ground water data for shallow aquifers (i.e., up gradient) of Long Lake. These recent monitoring data did not show any elevated concentrations of TCE or DCE in shallow ground water or any nearby source of TCE or DCE that would explain the observed detections in Long Lake. In addition, these investigations did not suggest any reasons for other concerns stemming from the presence of these low concentrations in local shallow ground water.

## Future Plans

The MDH recommended that future activities related to Long Lake include investigation of potential TCE and DCE source areas and follow-up on other means of human exposure (such as contaminated soil and vapors). As mentioned above, potential TCE source investigations in the area immediately east of Long Lake have already been conducted in conjunction with MPCA's remediation programs. However, other potential TCE sources that are discovered may require additional investigations. Recent activities conducted through MPCA's remediation programs evaluated soil and vapor exposure pathways based on current and future land uses. The MPCA will continue to work with responsible and voluntary parties in the Long Lake area to ensure that both human health and the environment are protected.

The MPCA is also working with local groups that already monitor Long Lake to continue TCE and DCE monitoring to ensure that concentrations will continue to decline and to provide future data as recommended in MDH's Health Consultation. The MPCA and the MDH also continue to evaluate the latest toxicological data on TCE to determine if future updates in water quality standards or screening values will be needed.

## For additional information

MDH Fish Consumption Advice

[www.health.state.mn.us/divs/eh/fish/index.html](http://www.health.state.mn.us/divs/eh/fish/index.html)

Minnesota Department of Natural Resources Lake Finder

[www.dnr.state.mn.us/lakefind/index.html](http://www.dnr.state.mn.us/lakefind/index.html)

MPCA Risk-based Site Evaluation Process Guidance Documents

[www.pca.state.mn.us/cleanup/riskbasedoc.html](http://www.pca.state.mn.us/cleanup/riskbasedoc.html)

MPCA Water Quality Standards

[www.pca.state.mn.us/water/standards/index.html](http://www.pca.state.mn.us/water/standards/index.html)

MPCA “What’s in My Neighborhood?”

[www.pca.state.mn.us/backyard/neighborhood.html](http://www.pca.state.mn.us/backyard/neighborhood.html)

## Contacts

### MPCA

Contact the Water Quality Standards Unit or the Remediation Division at 651-296-6300 or 800-657-3864.

### MDH

Contact the Site Assessment and Consultation Unit at 651-201-4897.