

TDCPP and Drinking Water

Tris(1,3-dichloroisopropyl)phosphate (TDCPP) is a contaminant that has been found in waters that could be used as drinking water sources in Minnesota. The Minnesota Department of Health (MDH) developed a health-based guidance value for TDCPP in drinking water and, based on this value, does not expect levels of TDCPP in drinking water to harm Minnesotans.

What is TDCPP?

TDCPP is chemical that is added to materials to help reduce the spread of fire. TDCPP is added to polyurethane foams and plastics that are used to make many household products, including furniture, electronic devices and flame-resistant, machine-washable, and shrink resistant fabrics. TDCPP was used as a flame retardant for children's and infant's clothing until May 1977. Household items containing TDCPP cause TDCPP to be present in the indoor environment in dust. TDCPP has also been found in human tissue and breast milk at levels below health concerns.

Has TDCPP been found in Minnesota waters?

TDCPP has been detected at low levels in wastewater influent and effluent in Minnesota. TDCPP was present at levels below 0.4 parts per billion (ppb) in seven of 40 wells studied by the Minnesota Pollution Control Agency (MPCA), including one shallow, domestic drinking water well.¹ TDCPP was not found above 0.5 ppb in a United States Geological Survey (USGS) study of municipal water supplies.²

What is the MDH drinking water guidance value for TDCPP?

Based on available information, MDH derived a guidance value of 0.8 ppb for TDCPP in drinking water.³ A person drinking water at or below this level, whether briefly, occasionally, or daily for a lifetime, would have little or no risk of any health effects from TDCPP.

Can TDCPP in drinking water affect my health?

Limited studies have been done on the noncancer health effects of TDCPP. Studies indicate that the kidney and male reproductive organs appear to be sensitive targets for TDCPP toxicity. Studies using human cells indicate that TDCPP may disrupt normal endocrine function and neurological development. Studies indicate that TDCPP is genotoxic. Long-term exposure studies in laboratory animals resulted in increased incidence of kidney, testicular and liver tumors. TDCPP has recently been added to California's Proposition 65 list as a carcinogen.

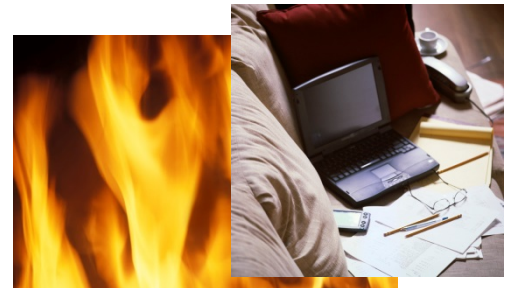
At a Glance

TDCPP is...

- a fire retardant used in household consumer products like plastics, foams, textiles, and electronics.

TDCPP enters your body primarily from...

- breathing contaminated indoor air and
- ingesting contaminated dust.



Your exposure to TDCPP can be reduced by....

- minimizing the purchase/use of TDCPP-containing products,
- vacuuming with a HEPA filter,
- wet dusting surfaces and floors, and
- hand washing.

TDCPP in drinking water is safe if...

The level is lower than the MDH guidance value of 0.8 ppb.

In March 2013, EPA completed a preliminary assessment of the potential health risks from flame retardants. TDCPP was included in a subgroup of flame retardants known as chlorinated phosphate ester flame retardants. Based on this assessment, tris(2-chloroethyl)phosphate (TCEP) was selected for full risk assessment as a representative of that subgroup. The EPA assessment is in progress and results are not yet available. In 2011, MDH developed a drinking water health based guidance value for TCEP.⁴

How does TDCPP get into the environment?

As noted above, TDCPP enters the home environment from household products such as furniture and electronic devices and is often found at low levels in household dust. It may also be found in air in industrial settings. TDCPP can also be released to the wastewater stream by industrial facilities that use TDCPP in manufacturing, and also by household wastewater. Most treatment facilities can only remove a small amount of TDCPP from wastewater. Because of this, TDCPP can be found in surface water (primarily streams) at low concentrations (less than 0.5 ppb).⁵ TDCPP can also enter groundwater through the leaching of fire-resistant foams and plastics in landfills.

How long does TDCPP stay in the environment?

TDCPP tends to stay in the environment and does not easily break down into other chemicals. It does not biodegrade under most conditions.

What are the potential environmental impacts of TDCPP?

Laboratory studies show that TDCPP harms fish and other animals that live in water. The harmful levels of TDCPP are much higher than levels that, as far as we know, are in our lakes and rivers. However, little is known about how often and how much TDCPP is in water across Minnesota. Studies of fish embryos exposed to TDCPP suggest that even very low levels may interfere with normal endocrine function. These low levels of TDCPP are not expected to harm humans. Compared to humans, fish and other animals are more likely to be harmed by TDCPP in lakes and rivers.

What Minnesotans Need to Know ...

TDCPP is common in indoor and outdoor environments. It is sometimes found in groundwater, but at concentrations below the MDH guidance value. For most people, the main route of exposure to TDCPP is through contact with household dust.



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The Contaminants of Emerging Concern (CEC) Program...

Evaluates health risks from contaminants in drinking water.

References

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3. www.health.state.mn.us/divs/eh/risk/guidance/gw/tris13dichloro.pdf
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5. Kolpin et al. 2002. Pharmaceuticals, hormones, and other organic wastewater contaminants in U.S. streams, 1999-2000: A national reconnaissance. *Environ. Sci. Technol.* 36:1202-1211.