MDH Minnesota Department of Health

CONTAMINANTS OF EMERGING CONCERN PROGRAM

Copper Sulfate Screening Profile

Copper sulfate is a contaminant that may be present in potential drinking water sources in Minnesota. The information in this profile was originally collected for the screening process of the Minnesota Department of Health's Contaminants of Emerging Concern (CEC) program in September 2012 and updated in June 2016. The chemicals nominated to the CEC program are screened and ranked based on their toxicity and presence in Minnesota waters. Based on these rankings, some chemicals are selected for a full review. CEC program staff have not selected copper sulfate for a full review.

Copper Sulfate Uses

Copper sulfate is an inorganic compound that can be used as a(n):

Pesticide registered to control for: [1]

- Pests in food and feed crops
- Algae and aquatic weeds in ponds, drainage systems, fountains, lakes, and sewage lagoons
- Leeches, tadpole shrimp, and snails that cause swimmer's itch
- Roots growing in sewers

Antimicrobial agent used in building and construction materials, like paints and glues

Food additive approved by the US Federal Drug Administration as "Generally Recognized as Safe"[2]

Copper Sulfate in the Environment

Copper sulfate occurs naturally in the environment and can be released into the environment through mining operations and agricultural and residential pesticide use.[1] Copper sulfate separates in water to form copper. Copper occurs naturally in many foods and can be found in drinking water due to the use of copper plumbing fixtures and pipes.[1]

Copper sulfate is not currently being monitored for in Minnesota surface or groundwater. Public water systems have been sampling for copper in water since the US Environmental Protection Agency (USEPA) established rules for controlling copper levels in public water supplies in 1991.[3]

Exposure to Copper Sulfate

Too much exposure to copper may occur from drinking contaminated water, eating foods that contain pesticide residues, or swimming in waters where copper sulfate was recently applied.

Potential Health Effects

Copper sulfate presents a health risk because the compound breaks down into copper. Our bodies need some copper but too much can be harmful. Exposure to high levels of copper can cause nausea, vomiting, and diarrhea.[3] Too much exposure to copper for a long time may harm the liver.[3] The USEPA action level (MCLG) for copper in drinking water is 1,300 parts per billion (ppb).[4] California established a Public Health Goal of 300 ppb to protect bottle-fed infants.[5]

Based on the screening assessment, a full review of copper sulfate may be possible, but it is ranked lower than other nominated CEC chemicals at this time.

References

1. USEPA. Rereregistration Eligibility Decision (RED) for Coppers. 2009. https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/red_G-26_26-May-09.pdf
2. US Food and Drug Administration. 2015. 21 CFR 184.1261. Copper Sulfate and 21 CFR 165.110. Bottled Water.
3. MDH. Copper in Drinking Water. 2005. http://www.health.state.mn.us/divs/eh/water/factsheet/com/copper.html
4. USEPA. 2016. Table of Regulated Drinking Water Contaminants. https://www.epa.gov/ground-water-and-drinking-water/table-regulated-drinking-water-contaminants
5. California Environmental Protection Agency. Public Health Goal for Copper in Drinking Water. 2008. http://oehha.ca.gov/water/public-health-goal/public-health-goal-copper-drinking-water

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CLEAN WATER LAND & LEGACY AMENDMENT

Contaminants of Emerging Concern Program

Chemical Review Process

The Contaminants of Emerging Concern (CEC) program investigates the potential health concerns of contaminants of emerging concern in drinking water. This investigation includes a rapid assessment ('screening') to prioritize nominated chemicals for in-depth research and evaluation that result in drinking water guidance and information about exposure.

Chemical Nomination and Eligibility

Minnesota risk managers, stakeholders, and the public are encouraged to nominate contaminants for review. After chemicals are nominated, MDH program staff determine eligibility by examining the likelihood that the chemical will enter Minnesota waters and whether adequate guidance already exists.

Screening and Risk Based Selection

Program staff conduct a screening of where and how a contaminant is used in the state, its potential to enter the water supply, and its potential to harm humans. The results from the screening are used to prioritize nominated chemicals.

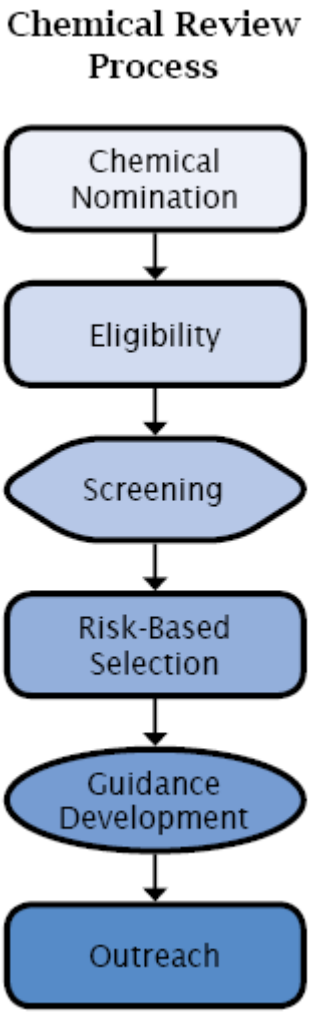
Chemicals having higher exposure and harm potential are selected for in-depth review and development of guidance (a contaminant water concentration that is not harmful to people). Chemicals that rank lower remain candidates for future in-depth review. For some contaminants, however, the information is too limited. For chemicals that are not selected for in-depth review, the results of the screening assessment are summarized in a Screening Profile. The screening and prioritization process is repeated as additional chemicals are nominated and screened.

Guidance Development

When a chemical is selected for a full review, program staff carefully review exposure and toxicological information to understand how humans may be exposed and what adverse health effects occur from exposure. Staff combine the results of in-depth analyses of toxicity and exposure to calculate a guidance, a level of contaminant in water that causes little to no harm to someone drinking the water.

Outreach

CEC program staff work to communicate the results of the chemical review process. This includes making key findings publicly available on web pages and at a variety of meetings and events. An email subscription service (GovDelivery) is also used to alert the interested public (subscribers) of chemical review activities and guidance values.



Subscribe to the CEC Program GovDelivery service to receive notification when reviews are initiated for water contaminants and other announcements by visiting: http://www.health.state.mn.us/cec