

Ethylbenzene and Groundwater

Ethylbenzene

Ethylbenzene is naturally found in crude oil. It is included in a group of chemicals known as BTEX, which stands for benzene, toluene, ethylbenzene, and xylenes. The chemicals in BTEX are commonly found in gasoline and petroleum products. Ethylbenzene is used in the production of styrene, which is used to make Styrofoam. Ethylbenzene can be found in consumer products including plastics, paints, glues, and some automobile products. It is a component of tobacco smoke.

Ethylbenzene in Minnesota Waters

Ethylbenzene has been detected in groundwater at closed landfill and petroleum remediation sites in Minnesota. At sites with known contamination, it has been detected at levels ranging from 0.09 to 5800 µg/L*.¹

In groundwater, ethylbenzene has been detected in approximately two percent of samples with a maximum concentration of 0.92 µg/L.² Ethylbenzene is not looked for or monitored in surface water as often as groundwater. It has been detected in six percent of samples in Minnesota surface water, with a maximum detected concentration of 0.4 µg/L.³

Ethylbenzene has been detected in approximately one percent of drinking water samples collected in the last five years, with an average detection of 1.41 µg/L and a maximum detection of 7.8 µg/L. All detections have been below the Safe Drinking Water Act limit of 700 µg/L.

*One microgram per liter (µg/L) is the same as one part per billion (ppb).

MDH Guidance Value

Based on available information, MDH developed a guidance value of 40 parts per billion (ppb) for ethylbenzene in drinking water. MDH does not use guidance values to regulate water quality, but they may be useful for situations in which no regulations exist. MDH develops guidance values to protect people who are most vulnerable to the potentially harmful effects of a contaminant. A person drinking water at or below the guidance value would be at little or no risk for harmful health effects.

Potential Health Effects

In animal studies, eating or drinking some ethylbenzene for up to 30 days caused changes in the weights of the liver and kidneys. For longer timeframes, laboratory animals showed additional effects to the liver after eating or drinking ethylbenzene. Short exposures to breathing ethylbenzene at high doses may cause eye and throat irritation as well as dizziness.

There is inadequate data to assess whether eating or drinking ethylbenzene causes cancer in animals or people. Ethylbenzene is classified as carcinogenic via breathing in animals.

Potential Exposure to Ethylbenzene

You may breathe in ethylbenzene from traffic emissions or tobacco smoke, eat or drink it from contaminated food or water, or come into contact with it when handling gasoline and other products that contain ethylbenzene. You can also breathe it in if you shower, bathe, or cook with water containing ethylbenzene.⁵

If you smoke or work in an industry that uses gasoline, paints and varnishes, or other products that contain ethylbenzene, you may be exposed to higher levels of ethylbenzene than most people.⁵

Using Ethylbenzene Safely

You can reduce the ethylbenzene you breathe in by quitting smoking, not being around people who smoke, and limiting your exposure to vehicle emissions or heavy traffic. Always follow the directions on plastics, paints, glues, or other products that contain ethylbenzene and use adequate ventilation when using these products and gasoline.

Ethylbenzene in the Environment

Ethylbenzene enters the environment from spills or leaks of gasoline and other fuels, as well as through improper disposal of industrial and household wastes.⁵

Ethylbenzene easily moves into the air from water and soil. Once in the soil, it can also enter groundwater at sites of contamination. Ethylbenzene normally takes a few weeks to break down in groundwater. In soil, bacteria break ethylbenzene down.^{5,6}

Potential Environment Impacts of Ethylbenzene

Ethylbenzene would only have negative impacts on aquatic life at concentrations that are much higher than observed in Minnesota surface waters.

Health Risk Assessment Unit

The MDH Health Risk Assessment Unit evaluates the health risks from contaminants in drinking water sources and develops health-based guidance values for groundwater. MDH works in collaboration with the Minnesota Pollution Control Agency and the Minnesota Department of Agriculture to understand the occurrence and environmental effects of contaminants in water.

References

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JUNE 2019

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