

Exploratory Drilling Fact Sheet #3

Protection of Water Resources

Since 1966, Minnesota has leased state-managed lands for mineral exploration. As interest in exploration grows, the Department of Natural Resources (DNR) remains committed to providing Minnesotans with clear, science-based information. These fact sheets explain how exploratory drilling is conducted in Minnesota, outline the environmental safeguards in place, and summarize the state laws and regulations that guide the process. They are designed to support informed conversations about exploratory drilling grounded in data, state law, and sound natural resource management practices.

How are wetlands and waters protected during drilling?

Exploratory drilling in Minnesota is closely regulated to protect wetlands, surface waters, and groundwater. The DNR works with the Minnesota Department of Health (MDH) to ensure that exploratory drilling activities comply with state laws and best management practices.



**PROTECTING
WATERS &
WETLANDS**

Drilling is allowed in wetlands only under frozen conditions or when additional best management practices, such as protective mats, are used. These methods minimize or prevent disturbance to the soil horizon, allowing the site to reclaim usually within a single growing season.

To protect waters and wetlands, there is no discharge of drilling materials or fluids to surface waters or wetlands. The drillhole is cased from the surface down into bedrock to prevent interaction with groundwater. All cuttings (crushed rock created during the drilling process) and drilling fluids are contained within dug sumps or containers. For details on how this oversight works see Exploratory Drilling FAQ #2 – Regulation and Construction.

Does drilling contaminate groundwater?



**REGULATED
& INSPECTED**

Groundwater is protected throughout the exploration drilling process. In Minnesota, traditional well drilling and exploratory borings are subject to strict regulations that prohibit the use of toxic drilling fluids or chemicals. In fact, the drilling fluids used in mineral exploration are safe for drinking water. Regulatory staff inspect and verify that only approved drilling fluids are used at every site. In addition, drillholes are engineered, cased, and sealed to prevent cross-contamination between rock layers. These protections work. *As a result, there are no documented instances or data showing that regulated exploratory drilling has negatively impacted groundwater.*

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What liquids are used in drilling of exploratory borings?

Only potable (drinkable) water and additives certified safe for use in drinking water (NSF-60 approved) are allowed for exploratory drilling. These are the same additives used in domestic water well drilling. These requirements are set by state law and enforced through regular inspections. Toxic chemicals are not allowed at any stage of the drilling process.

Are sumps a source of water pollution?

Sumps are temporary excavations used to hold non-toxic drilling fluids, water, and crushed rock (called “cuttings”) generated during exploratory drilling. Dug sumps are only allowed in upland areas. Dug sumps and the disposal of drilling fluids and/or cuttings are prohibited in wetlands.

While some cuttings may include material from sulfide-bearing ore bodies the risk of water pollution is extremely low. Most of the rock that is brought to the surface is recovered as solid core and only a small portion becomes cuttings. Sulfide-bearing rock is not encountered in every drillhole. If a sulfide bearing ore-zone is encountered, the mineralized zone is a small fraction of the total drill core.

This small fraction of sulfide mineral cuttings, diluted by non-reactive cuttings, water, and non-toxic fluids, is such a small volume that it does not create conditions that pose a significant risk to groundwater or surface water. The volume of sulfide minerals is too low to alter groundwater chemistry or generate acid mine drainage. Therefore, sumps and the disposal of cuttings do not pose a contamination risk to nearby water wells, aquifers, lakes, streams, or wetlands. *

Why are sumps covered when drilling is complete?

Covering sumps is a standard part of the reclamation process. Cuttings settle to the bottom before being covered by the originally displaced soils. After being backfilled, sumps are allowed to naturally re-vegetate to stabilize the site and restore natural conditions. This practice reflects best management standards for land reclamation.



Recommended sources for additional information on mineral exploration

For more information and additional fact sheets:

https://www.dnr.state.mn.us/lands_minerals/metallic_nf/regulations.html

DNR websites on mineral exploration:

https://www.dnr.state.mn.us/lands_minerals/metallic_nf/explore.html

* U.S. Department of Agriculture, U.S. Forest Service. *Final Environmental Impact Statement: Federal Hardrock Mineral Prospecting Permits Project, Superior National Forest*. May 2012.

https://eplanning.blm.gov/public_projects/nepa/75057/100003/121171/SNF_Fed_Hardrock_Pros_Permits_FEIS.pdf