

# How Alaska's Groundwater is Contaminated

GWQ-00947

A variety of human activities can result in groundwater contamination. These activities include waste disposal practices (both hazardous and non-hazardous), applications of fertilizers and pesticides, and accidental spills and leaks of fuel or chemicals.

## How is groundwater contaminated?

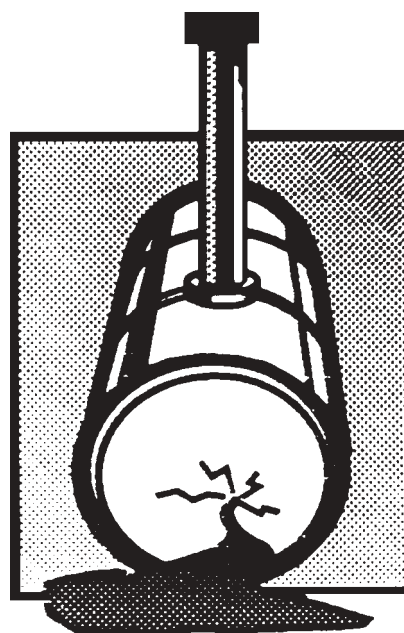
Contaminants spilled on the soil surface are moved with water, percolating downward allowing them to reach the groundwater. Recharge areas are areas that transmit precipitation and snowmelt downward into groundwater. Once contaminants reach groundwater they travel along with the water towards discharge areas. Discharge areas are those areas where the groundwater seeps or flows out of the ground and into a body of surface water.

## What are the most common surface activities that cause groundwater pollution?

Waste disposal in dumps and landfills, fuel storage in underground storage tanks, and waste disposal or malfunctions in septic systems are the most common activities resulting in groundwater pollution.

## How do each of these activities become a source of groundwater pollution?

*Dumps and landfills* generate a liquid called leachate from rain and snowmelt filtering down through decomposing materials, releasing and entraining soluble materials along the way. Leachate amount and composition depend upon how much (or how little) water passes through the waste material, and waste composition. Leachate can seep downward into groundwater, or it can leak out into the surface water. Areas near landfills or dumps have



a greater possibility of groundwater contamination because of the potential contamination from leachate from the nearby sites.

*Underground storage tanks* are a potential groundwater contamination source when they corrode or leak. Unstable and corrosive soils in many parts of Alaska make this an especially serious problem. Fuel that has leaked into the ground moves through the soil, leaving a residue trapped between the soil particles. Recharge water that contacts this residue becomes contaminated and can eventually contaminate groundwater. The contaminated groundwater continues to flow towards discharge areas and

then into surface waters. Individuals who use groundwater or surface water for their water sources can be affected even when a small amount of fuel leaks into nearby soil.

*Septic systems* that are poorly designed or located, or systems that are incorrectly used can become sources of groundwater contamination. Such systems may fail to contain harmful levels of bacteria, nitrates, effluents, or other introduced substances, and allow excessive amounts of contaminants to enter groundwater.

### **What are the most common types of groundwater contaminants?**

Excess dissolved minerals, road salt, organic solvents (both household and industrial), fuels and oils, some pesticides, and excess fertilizers are some of the more common contaminants of groundwater. Activities involving these substances can greatly affect the groundwater beneath the surrounding soil, especially when these products are used irresponsibly or excessively.

Surface activities can greatly affect groundwater quality when potentially harmful materials are allowed to enter the soil. For more information on how to reduce the possibility of groundwater pollution from surface activities, contact the Department of Environmental Conservation Water Quality Division, or your District Cooperative Extension Service Office.



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