

# Groundwater: an Important Water Source for People, Agriculture, and the Environment

Groundwater is the largest supply of freshwater on earth, and the biggest source of drinking water for the U.S. This unseen source, which exists under layers of soil, rock, and sediment, contains significantly more freshwater than rivers and lakes combined.

Protecting groundwater is both an important public health and environmental issue and concern. By understanding how we impact this resource and following simple practices, we all can be better stewards of our groundwater.

## Why is Clean, Abundant Groundwater Important?

Approximately two million Marylanders—or 1 in 3 residents—rely on private groundwater wells for drinking water and home use. In addition, 64% of U.S. groundwater is used to produce our food supply by irrigating crops.

However, this water source is susceptible to contamination from natural and human activities. Certain bacterial and chemical contaminants can impair human health, causing gastrointestinal distress, nervous system problems, organ failure, and cancers. Infants, children, older individuals, and others with compromised immune systems tend to be at greater risk from water contamination.

In recent decades, increased groundwater pumping use from new development and agricultural irrigation have caused groundwater levels to decline across Maryland, especially in the deeper aquifers of Maryland's Upper Eastern Shore. Some shallower groundwater levels are increasing, though this rising water can come with greater salinity, likely due to sea level rise.

## How Does Groundwater Get Contaminated and Depleted?

Groundwater forms as a result of a natural process called the hydrologic, or water, cycle. As rain percolates vertically down through the ground, the soil and rock will

naturally filter the water. The water also fills in voids and spaces within the soil and bedrock, eventually reaching underground water storage areas called aquifers. The water in shallow aquifers tends to be less filtered than in deeper ones simply because it has spent less time passing through the soil. Water in shallow aquifers may have only traveled for days, weeks, or years, compared to the centuries or millennia that water travels to reach deeper aquifers. Shallow groundwater is also more susceptible to contaminants from the surface.

As water moves across the land and percolates down through the ground, it also picks up characteristics of the natural and man-made elements that it contacts. The effect of natural elements can range from nuisance concerns, like hard drinking water (from calcium and magnesium) water or high iron levels, to serious health risks, like cancer from arsenic or radon (Figure 1).

Human-related pollutants account for most contamination issues with groundwater. These sources include animal and human waste from livestock production, leaking sewer lines and septic systems; industrial operations; agricultural and residential fertilizers and pesticides; mining operations; stormwater, including road salts; and, improper disposal of household chemicals.

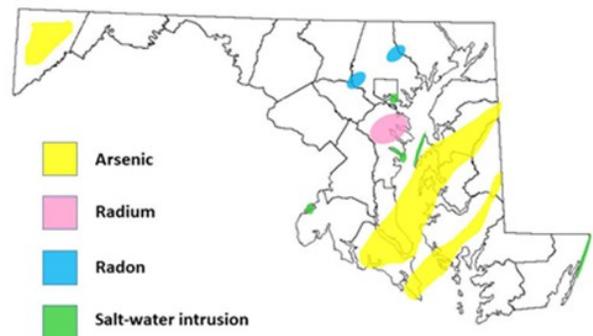


Figure 1 Naturally occurring groundwater contaminants that can impair human health.

## Protecting Groundwater Starts at Home

- To protect groundwater, homeowners can adopt the following maintenance and conservation practices.
- Use a state-certified lab to test their drinking water annually for bacteria and nitrate, which can be signs of fecal contamination.
- Pump their septic tanks at least every three to five years, or as determined by an annual professional inspection.
- Protect their septic drainfields from traffic, tree or shrub roots, and excessive water runoff.
- Properly store and dispose of household chemicals such as cleaning products, fertilizers, paints, pesticides, prescription drugs, and petroleum products. Do not dump them down the drain or toilet, or on the ground.
- Use high efficiency appliances and fixtures like front loading clothes washers, low flow faucets and low-flush toilets to reduce the water volume entering sewer or septic system
- Limit water use by taking shorter showers, turning off water when brushing teeth, fully loading appliances (dishwashers, laundry machines and driers), using mulch around landscaping to reduce watering needs, and installing a rain barrel to collect rainwater for irrigation use.

## Get More Information and Recommendations:

University of Maryland Extension Well Water and Septic Homeowner Education Program: <http://extension.umd.edu/well-and-septic>

Maryland Department of the Environment – Water Supply Program: [http://mde.maryland.gov/programs/Water/water\\_supply/Pages/index.aspx](http://mde.maryland.gov/programs/Water/water_supply/Pages/index.aspx)

Maryland Geological Survey: <http://www.mgs.md.gov/>

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