



# Overview of Groundwater Regulation

## Groundwater Basics

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Groundwater is the water found beneath the Earth's surface. According to the U.S. Geological Survey, 30% of the world's freshwater is considered groundwater. Especially in arid regions, groundwater is relied upon to supplement surface water for human uses, such as drinking water, domestic use, agriculture, and mining. Groundwater exists in different formations depending on the geological conditions and porosity of the underground soil and rock. This includes aquifers, percolating water, underground streams, and tributaries. Unlike surface water, groundwater is often not visible. Therefore, it can be difficult to detect contamination or overuse, or determine the interconnectedness between groundwater and surface water. Often, groundwater is connected to surface water through tributary groundwater. Even though groundwater is often connected to surface water, most states regulate surface water and groundwater separately. Groundwater is regulated by a combination of appropriation systems, pollution statutes, and land ownership rights that vary by state.

## Systems for Regulating Groundwater

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States utilize a variety of management systems for determining the legal rights and liabilities pertaining to groundwater, and many states utilize a combination of management systems.

### Absolute Ownership Doctrine

Landowners have an unlimited right to withdraw any water found beneath their land. This Doctrine is also known as the "English Rule" because it was established in an early English court case in 1843. Today, states utilizing the Absolute Ownership Doctrine have modified the doctrine to regulate use of groundwater and impose liability for negligent pumping or use.

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### Correlative Rights Doctrine

Landowners have the right to use water under their land, but when multiple landowners own land over a single aquifer, each landowner is limited to a reasonable share of the total groundwater supply.

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### Prior Appropriation Rights

Many states that use a [prior appropriation](#) system have modified the doctrine to balance the interests of senior appropriators with the need to assure that there is a sustained supply of groundwater available for pumping.

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### Public Trust Management

Many states consider groundwater to be public property under the [Public Trust Doctrine](#) and administer permits for groundwater use. The authority for state management of groundwater stems from the Police Power established in the U.S. Constitution. The Police Power allows states to take action to protect the safety, health, and general welfare of citizens. States exercise this power to allocate groundwater in the public interest.

## Pollution and Groundwater

Many federal laws control and limit pollution into groundwater. Below is a list of some of these federal pollution control statutes.

### Safe Drinking Water Act (SDWA)

Provides protections for wells and well fields that are used for drinking water. The SDWA also requires permits for underground injection and regulates the disposal of certain types of hazardous liquid waste.

### Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

Establishes a program to clean up hazardous substances and a cause of action for clean-up costs and damages to natural resources. Groundwater may be designated in a clean-up site.

### Resource Conservation and Recovery Act (RCRA)

Regulates hazardous waste disposal and underground storage tanks to prevent leakage of hazardous waste into groundwater.

### The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

Regulates the use of toxic substances and requires registration of pesticides and chemicals that might indirectly pollute groundwater.

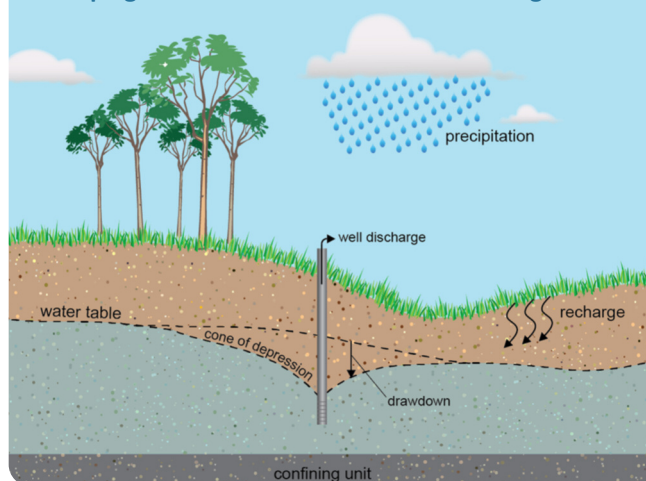
### Surface Mining Control and Reclamation Act (SMCRA)

Requires mining operations to replace the water supply, such as groundwater, that may have been harmed from mining operations. SMCRA also prevents water pollution by regulating coal-mining activities and reclaiming old mine sites.

### Clean Water Act (CWA)

Prohibits discharges of pollutants from point sources into navigable waters of the United States without a permit. While the CWA does not specifically apply to groundwater, surface water and groundwater can be connected, and pollution into groundwater may end up in surface water. Application of the CWA to groundwater has been a source of contention and confusion for many years. The CWA also requires states to develop plans for non-point source discharges, such as irrigation flows and agricultural runoff.

### Cone of Depression: Pumping a well can cause water level lowering



In *City of Maui v. Hawaii Wildlife Fund*, 140 S. Ct. 1462, 1482 (2020), the U.S. Supreme Court applied a “functional equivalent” test to determine that pollutants injected into wastewater that migrated through groundwater to navigable waters was a violation of the CWA.

**Cones of Influence:** When groundwater is pumped, the water table can take the shape of an inverted cone called a cone of influence or cone of depression. As more water is pumped, the slope of the cone becomes steeper and can result in a slope in the water table. This means more groundwater will flow towards the cone of depression, and this can influence the availability of other groundwater sources.