Advanced Certificate in Engineering Geology and Soil Mechanics

Water resources and contamination

Water Resources and Contamination Glossary

Aquifer
An aquifer is a geological formation that contains and transmits groundwater. It is typically composed of rock or sediment that can store and transmit water, allowing wells and springs to draw water from it.

Related Terms: Groundwater, Permeability, Porosity

Bioremediation
Bioremediation is a process that uses microorganisms to degrade contaminants in soil or water. These microorganisms break down pollutants into less harmful substances, reducing the impact of contamination on the environment.

Related Terms: Microorganisms, Contaminants, Remediation

Contaminant
A contaminant is any substance that is present in water or soil in concentrations higher than natural levels and has the potential to cause harm to human health or the environment. Common contaminants include heavy metals, pesticides, and industrial chemicals.

Related Terms: Pollution, Concentration, Hazardous

Desalination
Desalination is the process of removing salt and other impurities from seawater or brackish water to produce freshwater. This technology is essential in regions where freshwater resources are limited, and it involves various methods such as reverse osmosis and distillation.

Related Terms: Salinity, Freshwater, Desalination Plant

Effluent
Effluent refers to wastewater or liquid waste that is discharged from industrial, agricultural, or domestic sources. Effluent can contain pollutants and contaminants that require treatment before being released into the environment to prevent environmental damage.

Related Terms: Wastewater Treatment, Discharge, Pollution

Groundwater
Groundwater is the water that is stored underground in the tiny spaces between soil particles or within porous rocks. It is an essential source of drinking water and irrigation for many communities around the world.

Related Terms: Aquifer, Percolation, Water Table

Hydrogeology
Hydrogeology is the science that studies the distribution and movement of groundwater in the subsurface. Hydrogeologists use geological principles to understand how water interacts with rocks and soil and how contaminants can be transported through groundwater.

Related Terms: Groundwater Flow, Aquifer Properties, Contaminant Transport

Infiltration
Infiltration is the process by which water seeps into the ground and moves downward through the soil layers. It is an essential component of the water cycle and recharges groundwater supplies.

Related Terms: Percolation, Porosity, Soil Moisture

Leachate
Leachate is a liquid that forms when water passes through solid waste or contaminated soil, picking up pollutants along the way. Leachate can be highly toxic and must be managed carefully to prevent environmental contamination.

Related Terms: Landfill, Waste Management, Contaminant Migration

Permeability
Permeability is a measure of how easily water can flow through rocks or soil. Highly permeable materials allow water to move quickly, while low permeability materials restrict water flow.

Related Terms: Porosity, Aquifer, Groundwater Flow

Pollution
Pollution refers to the presence of harmful substances in the environment that can cause damage to human health, wildlife, or ecosystems. Water pollution can come from various sources, including industrial discharges, agricultural runoff, and improper waste disposal.

Related Terms: Contaminant, Effluent, Environmental Damage

Potable Water
Potable water is water that is safe for drinking and meets the standards set by regulatory agencies. Potable water must be free from harmful contaminants and pathogens to ensure public health and safety.

Related Terms: Drinking Water, Water Quality, Water Treatment

Remediation
Remediation is the process of cleaning up and restoring contaminated sites to reduce environmental risks and protect human health. Remediation techniques can include physical, chemical, or biological methods to remove or neutralize pollutants.

Related Terms: Contamination, Remediation Technologies, Cleanup

Salinity
Salinity is a measure of the concentration of salt in water. High salinity levels can make water unsuitable for drinking or irrigation and can have negative impacts on soil quality and plant growth.

Related Terms: Desalination, Brackish Water, Saline Intrusion

Solute
A solute is a substance that is dissolved in a solvent to form a solution. In the context of water contamination, solutes can include pollutants, chemicals, or minerals that are present in water in varying concentrations.

Related Terms: Solution, Solvent, Dissolved Contaminants

Surface Water
Surface water is water that is located on the Earth's surface, such as rivers, lakes, and reservoirs. Surface water is an essential source of freshwater for drinking, irrigation, and industrial use.

Related Terms: Surface Runoff, Surface Water Quality, Surface Water Management

Water Table
The water table is the underground boundary between the soil surface and the saturated zone where groundwater fills all the available pore spaces. The water table fluctuates depending on rainfall, infiltration, and pumping activities.

Related Terms: Groundwater, Aquifer Recharge, Water Table Depth

Wastewater Treatment
Wastewater treatment is the process of removing contaminants and pollutants from sewage or industrial wastewater before it is discharged into the environment. Treatment plants use physical, chemical, and biological methods to clean water to meet regulatory standards.

Related Terms: Effluent, Sewage Treatment, Water Reclamation

Water Quality
Water quality refers to the chemical, physical, and biological characteristics of water that determine its suitability for various uses. Good water quality is essential for human health, aquatic ecosystems, and agricultural productivity.

Related Terms: Water Pollution, Water Testing, Water Quality Standards

Water Reclamation
Water reclamation is the process of treating and reusing wastewater for non-potable purposes such as irrigation, industrial processes, or environmental restoration. Reclaimed water helps conserve freshwater resources and reduces the demand on potable water supplies.

Related Terms: Water Recycling, Reuse, Reclaimed Water Quality

Water Scarcity
Water scarcity is a condition where the demand for water exceeds the available supply, leading to insufficient access to clean and safe water for drinking, sanitation, and agriculture. Water scarcity is a growing global challenge exacerbated by population growth and climate change.

Related Terms: Water Stress, Water Shortage, Drought

Water Treatment
Water treatment is the process of improving the quality of water to make it safe for drinking, industrial use, or environmental discharge. Treatment methods can include filtration, disinfection, and chemical treatment to remove contaminants and pathogens.

Related Terms: Water Purification, Treatment Plant, Drinking Water Standards

Wellhead Protection
Wellhead protection is a strategy to prevent contamination of groundwater sources near wells. By implementing measures to control land use, manage pollutants, and monitor water quality, wellhead protection programs aim to safeguard drinking water supplies from contamination.

Related Terms: Groundwater Protection, Wellhead Area, Source Water Protection

References
- United States Environmental Protection Agency. (2021). Ground Water and Drinking Water. Retrieved from https://www.epa.gov/ground-water-and-drinking-water
- World Health Organization. (2020). Water Quality and Health. Retrieved from https://www.who.int/water_sanitation_health/publications/water-quality-health/en/

This glossary provides a comprehensive overview of key terms related to water resources and contamination in the field of engineering geology and soil mechanics. Understanding these terms is essential for professionals working in environmental remediation, water management, and groundwater protection to effectively address challenges related to water quality and sustainability.