

# Water Glossary

**Acid** - a substance with a pH less than 7

**Acidity** - a characteristic of substances with a pH less than 7; tending to form an acid

**Activated sludge** - sludge particles produced by the growth of microorganisms in aerated tanks as a part of the wastewater treatment process

**Adhesion** - the attraction of water molecules to other substances

**Aeration** - exposing to circulating air, adds oxygen to the wastewater during the first step in secondary treatment

**Aerobic** - requiring oxygen or air to live

**Alkaline** - having a pH of more than 7

**Anaerobic** - able to live without free oxygen

**Aquifer** - a geologic formation of sand, soil and gravel where groundwater is stored

**Aquitard** - rock or clay that does not transmit water easily and therefore retards the motion of the water

**Artesian well** - a well in which the water comes from a confined aquifer and is under pressure; a flowing well where water flows or bubbles out of the ground without being pumped

**Atom** - the smallest particles of an element that combine with similar atomic particles of other elements to produce molecules; made up of electrons, neutrons, and protons

**Bacteria** - a unicellular microorganism

**Base** - a substance with a pH greater than 7

**Basic** - a characteristic of substances with a pH greater than 7

**Bedrock** - rock which has not been significantly eroded and is still connected to the underlying strata

**Biodegradable** - capable of being broken down by living things like microorganisms and bacteria

**Biosolids** - sludge that is intended for beneficial use; example: fertilizer, compost

**Bottled water** - water that is sealed in food grade bottles and is intended for human consumption



**Calcite** - a mineral composed of calcium carbonate; the principal element of limestone

**Capillary action** - the movement of water within the spaces of a porous material due to the forces of adhesion, cohesion and surface tension

**Carbon dioxide** - a gas formed during organic decomposition and respiration

**Carbonic acid** - a weak acid formed when carbon dioxide mixes with water

**Cave/ cavern** - naturally formed underground passageways or rooms, most commonly caused by the dissolving action of slightly acidic groundwater in beds of limestone

**Chemical Symbol** - a single alphabetic letter or a pair of letters that stands for a chemical element

**Chlorine** - a chemical compound used as disinfectant in wastewater treatment and drinking water; Cl<sub>2</sub>

**Cloud** - a visible mass of tiny bits of water or ice hanging in the air usually high above the Earth

**Cohesion** - the attraction between water molecules (molecules of the same kind)

**Collection** - the process in wastewater treatment where used water is drained from houses and businesses and conducted through sewers to a treatment facility

**Compost** - fertilizing material consisting of organic, decaying matter

**Compound** - a substance formed by the bonding of two or more atoms or ions that share electrons (covalent compounds) or transfer electrons (ionic compounds)

**Community** - a group of people living in a particular local area

**Community water cycle** - the movement of drinking water through a distribution system to users and wastewater to a treatment facility before being released back into the environment

**Concentration** - the amount of mass of a chemical or pollutant in a particular volume of water

**Condensation** - stage of the water cycle when water transforms from a gas into a liquid and becomes suspended in the atmosphere; visually represented by clouds

**Confined aquifer** - aquifer that is wedged between layers of relatively impermeable material and is consequently under pressure; also known as artesian aquifer

**Conserve** - to use a resource wisely and efficiently

**Conservation** - not wasting, using something wisely; to protect from loss or depletion

**Contamination** - an impurity in air, soil or water that can cause harm to human health or the environment caused by natural materials

**Covalent bond** - a bond formed between two atoms when they share pairs of electrons

**Cycle** - a process that repeats itself

**Decomposition** - the process of breaking down into constituent parts or elements

**Density** - the ratio of mass of an object to its volume; the compactness or crowdedness of matter in a given area

**Depletion** - occurs when water is used faster than it is replaced; can cause a shortage

**Deposition** - the act of settling or forming (layering) by natural process

**Desalination** - the purification of salt or brackish water by removing the dissolved salts

**Discharge** - to expel; water that naturally moves from an aquifer to a surface stream or lake

**Disinfectant** - a substance that destroys microorganisms that might carry disease

**Dissolution** - the act of breaking down a soluble component of a material; example: dissolving calcium carbonate in limestone

**Dissolve** - the process of going into solution; example: dissolving salt in water

**Distillation** - the process of heating a liquid or solid until it sends off a gas or vapor and then cooling the gas or vapor until it becomes a liquid

**Distribution system** - all of the pipes and devices that provide water to a community

**Domestic water** - wastewater that comes primarily from individuals and does not generally include industrial or agricultural wastewater

**Drought** - an extended period of dry weather

**Effluent** - treated wastewater, flowing from a lagoon, tank, treatment process or treatment plant

**Element** - natural substances that cannot be broken into anything simpler by ordinary means

**Elevation** - the height above sea level

**Environment** - the sum of all external conditions and influences affecting the development and life of organisms

**Environmental Protection Agency (EPA)** - the U.S. agency responsible for efforts to control air and water pollution, radiation and pesticide hazards, ecological research and solid waste disposal

**Epidemiologist** - a medical scientist who studies the transmission and control of epidemic diseases

**Erosion** - removal of weathered materials

**Evaporation** - to convert or change into a vapor with the application of heat

**Fertilizer** - any chemical used to improve soil and promote plant growth

**Filtration** - the process by which wastewater is passed through a screen to filter out large objects

**Fluoride** - a binary compound of fluorine added to drinking water to help prevent tooth decay

**Freezing point** - the temperature at which a substance begins to change from a liquid to a solid

**Gas (vapor)** - a state of matter; a gas always has the same shape as the container it fills

**Graduated cylinder** - a piece of laboratory glassware used to measure volume

**Gravity** - the force of attraction between all masses in the universe, especially the attraction of the earth's mass for bodies near its surface

**Grit chamber** - a chamber or tank used in primary treatment of wastewater where the water slows down and heavy, large solids settle out and are removed

**Groundwater** - water contained under the ground's surface; a common source of water for drinking and irrigation

**Groundwater flow** - the movement of groundwater beneath the earth's surface

**Hardness** - a measure of the amount of calcium and magnesium in water

**Hazard** - something that is dangerous; unsafe

**Hazardous chemicals** - chemical compounds that are dangerous to human health and or the environment

**Humidity** - the degree of wetness, especially of the atmosphere

**Hydrogen** - the lightest, simplest and most plentiful known element; a component of water

**Hydrogen bond** - a type of chemical bond caused by electromagnetic forces, occurring when the positive pole of one molecule is attracted to and forms a bond with the negative pole of another molecule

**Hydrologic system (water cycle)** - the cycles of the earth's water supply from the atmosphere to the earth and back which includes precipitation, transpiration, evaporation, runoff, infiltration, and storage in water bodies and groundwater

**Impermeable** – material that does not permit water to pass through it

**Impervious surfaces** - surfaces which will not allow water to penetrate; such as sidewalks and parking lots

**Infiltration** - to increase the amount of groundwater through precipitation or surface water that absorbs into the aquifer; see recharge

**Influent** - wastewater flowing into a treatment plant

**Industrial pollution** - pollution caused by industry

**Irrigation** - to supply water to crops, parks, golf courses and lawns

**Karst** - a topography formed over limestone, dolomite, or gypsum and characterized by sinkholes, caves, and underground drainage

**Landfill** - a low area of land that is filled in with layers of garbage

**Limestone** - a sedimentary rock consisting mainly of calcium that was deposited by the remains of marine animals

**Liquid** - fluid composed of molecules that move freely among themselves but do not tend to separate like those of gases; state of matter that has a definite volume but not a definite shape

**Mass** – the amount of matter in a substance

**Matter** - any substance that has mass and takes up space

**Meniscus** - the curved upper surface of water (and other liquids) produced by surface tension

**Microorganisms** - microscopic organisms; bacteria, protozoa, viruses

**Mineral** - an inorganic substance occurring naturally in the earth and having definite physical and chemical properties

**Mixture** - a substance which consists of two or more substances which are not bound together chemically and can be separated

**Model** - a representation that aids in understanding something too small or too far away to see

**Molecule** - a group of atoms held together by chemical bonds; the smallest particle of a compound that can exist in the free state and still retain the characteristics of the compound

**Municipal** - of or relating to a municipality; city, town, etc.

**National Pollutant Discharge Elimination System (NPDES)** - part of the Clean Water Act requiring municipal and industrial wastewater treatment facilities to obtain permits which specify the types and amounts of pollutants that may be discharged into water bodies

**Natural resource** - something (as a mineral, forest, water) that is found in nature and is valuable to humans

**Non-point source pollution** - water contamination which originates over a broad area resulting from a variety of causes

**Organic material** - material derived from organic or living things; relating to or containing carbon compounds

**Overuse** - using more than necessary; wasteful

**Oxygen** - an element needed by nearly all organisms to survive; a component of water

**Pathogen** - any agent, such as bacterium, that causes disease

**Percolation** - the movement of water through porous materials such as soil or gravel

**Permeable** - material that allows water to pass through it

**Pesticide** - any chemical or biological agent that kills plant or animal pests; example: herbicides, insecticides, fungicides, etc.

**pH** - a measure of the concentration of hydrogen ions in a solution; the pH scale ranges from 0 - 14, where 7 is neutral, values less than 7 are acidic, and values greater than 7 are basic or alkaline

**Pipes** - tubes that transport water

**Plume** - a part of an aquifer that has become contaminated

**Point source pollution** - pollution that can be traced to a single point source, such as a pipe or culvert

**Pollutant** - an impurity (contaminant) that causes an undesirable change in the physical, chemical or biological characteristics of the air, water or land that may be harmful to or affect the health, survival or activities of humans or other living organisms

**Pollution** - an alteration in the character of the quality of the environment, such as physical, chemical or biological properties of water by a substance that makes the water harmful to use

**Porosity** - having pores, channels or open spaces

**PPM** - parts per million; unit commonly used to represent contaminant concentration

**Potable** - fit or suitable for drinking; as in potable water

**Precipitation** - stage of the water cycle when water molecules become too large and heavy to remain in the atmosphere and fall to the ground in the form of rain, snow, sleet, hail

**Preliminary treatment** - the initial stages of wastewater treatment where large objects are removed at the bar (fine) screens and in the grit chamber

**Primary treatment** - one of the first stages of wastewater treatment that removes settleable or floating solids only

**Properties** - physical and chemical characteristics of matter

**Quality** - to be at a high degree of excellence; something that is good or well done

**Recharge** - replenish a water body or an aquifer with water

**Recharge zone** - an area where water flows into the earth to re-supply an aquifer

**Recycle** - to produce a new item from an old item; to reuse parts of

**Reservoir** - a place where water is collected and can be drawn, above or below ground

**Resource** - a new or reserve supply that can be drawn upon when needed

**Runoff** - water (originating as precipitation) that flows across surfaces rather than soaking in; eventually enters a water body; may pick up and carry a variety of pollutants

**Safe Drinking Water Act** - a regulatory program passed by the U.S. Congress in 1974 to help ensure safe drinking water in the United States; sets maximum contaminant levels for a variety of chemicals, metals, and bacteria in public water supplies

**Salinity** - an indication of the amount of salt in water

**Saturated zone** - underground layer in which every available space is filled with water

**Secondary treatment** - a type of wastewater treatment used to convert dissolved and suspended pollutants into a form that can be removed

**Sediment** - insoluble material suspended in water that consists mainly of particles derived from rocks, soil, and organic materials; a major non-point source pollutant to which other pollutants may attach

**Sedimentary** - rock layers formed by or from sediment

**Sedimentation** - the process used in both primary and secondary wastewater treatment that takes place when gravity pulls particles to the bottom of a tank (settling)

**Septic system** - underground pipes and tanks that store and dispose of human waste

**Settling** - the process of a substance, such as sediment, sinking or being deposited

**Sewage** - waste and wastewater produced by residential, commercial and light industrial establishments typically discharged into sewers or septic tanks

**Sewer system** - an underground system of pipes used to carry off sewage and surface water runoff

**Sinkhole** - a natural depression in a land surface connected to a subterranean passage; generally occurring in limestone regions and formed by solution or by collapse of a cavern roof

**Sludge** - any solid, semi-solid, or liquid waste that settles to the bottom of sedimentation tanks

**Solid** - a material in which the atoms are held in definite positions relative to each other; solids have a definite volume and shape

**Soluble** - capable of being dissolved

**Solute** - a substance that can be dissolved into another substance

**Solution** - a homogenous mixture of two substances, usually a gas or solid in a liquid

**Solvent** - a liquid capable of dissolving another substance (Example: paint thinner, mineral spirits and water)

**Storm water runoff** - surface water runoff that flows into storm sewers or surface streams

**Strata** - layers formed in rock or soil

**Surface tension** - a property of liquids in which the exposed surface tends to contract to the smallest possible area causing it to have a film or "skin"

**Surface water** - precipitation that does not soak into the ground or return to the atmosphere by evaporation or transpiration, and is stored in streams, lakes, wetlands, reservoirs and oceans

**Suspension** - a mixture whose particles are temporarily dispersed through a fluid but not dissolved in it

**Tap water** - water that comes from the tap; water delivered to homes and businesses

**Tertiary treatment** - any level of treatment beyond secondary treatment; also called advanced treatment

**Transpiration** - direct transfer of water from the leaves of living plants into the atmosphere

**Treatment plant** - facility for cleaning and treating fresh water for drinking, or cleaning and treating wastewater before discharging into a water body

**Unconfined aquifer** - an aquifer with no upper confining layer so the system is not under pressure; water table levels fluctuate both seasonally and from year to year

**Universal solvent** - water, a material that can dissolve almost any other substance



**Unsaturated zone** - the area underground above the saturated zone where air fills the spaces between soil, sand and rock

**Urban area** - an area that is highly populated, such as a city or town

**Vapor (gas)** - a substance in gaseous form

**Wastewater** - water that has been used for domestic or industrial purposes

**Wastewater treatment** - physical, chemical and biological processes used to remove pollutants from wastewater before discharging it into a water body

**Water** - colorless, odorless, tasteless substance; a water molecule consists of two atoms of hydrogen linked by chemical bonds to one atom of oxygen; a necessity for life on earth; found on the surface and under the ground

**Waterborne disease** - disease caused by microorganisms in contaminated water

**Water cycle** - the never-ending movement of water through the atmosphere, ground and back again; also called the hydrologic cycle

**Water main** - pipe used for transporting water

**Water pressure** - the force of the water available in a water supply system

**Water quality** - the condition of water with respect to its content of contaminants

**Water source** - surface water (lakes, rivers and streams) and groundwater

**Water table** - the top of the saturated zone; the boundary between the saturated and unsaturated zone

**Water tower** - a large elevated water tank used as a reservoir or for maintaining equal pressure in a water system

**Watershed** - an area of land where all water collects and drains into a common body of water (ocean, river, lake)

**Weathering** - natural breaking up of materials by various methods

**Well** - a bored, drilled or dug hole or shaft in the earth to pump water to the surface