

Different Types of Water

Blackwater - Wastewater that contains animal, human or food wastes.

Brackish Water - A mixture of freshwater and saltwater.

Greywater is the term used to describe water segregated from a domestic wastewater collection system and reused on site. This water can come from a variety of sources such as showers, bathtubs, washing machines, and bathroom sinks. It contains some soap and detergent, but is clean enough for non-potable uses. Water from toilets or wash water from diapers is not considered to be greywater. Kitchen sink water is not considered greywater in many states. Many buildings or individual dwellings have systems that capture, treat and distribute greywater for irrigation or other non-potable uses.

Groundwater - Water that has percolated into natural, underground aquifers; water in the ground, not water puddled on the ground.

Potable water – drinking water that meets or exceeds state and federal drinking standards.

Reclaimed water – previously used water that has been treated for reuse but has not yet been put to another use. Once reclaimed water is put to some purpose it is referred to as recycled or reused water.

Recycled water – water that is used more than once and has been treated to a level that allows for its reuse for a beneficial purpose.

Sewage – the used water of a household and commercial businesses that contains human waste. The term sewage is distinguished from industrial wastewater. The term sewage can be used interchangeably with wastewater.

Wastewater – the used water of a community or industry that contains dissolved or suspended matter. Types of wastewater include domestic wastewater/sewage from household uses and industrial/commercial wastewater generated by industries, small businesses and commercial enterprises.

Water and Groundwater Basics

Acre-foot (AF) - A common water industry unit of measurement. An acre-foot is 325,851 gallons, or the amount of water needed to cover one acre with water one foot deep. An acre-foot serves annual needs of two typical California families.

Aquifer - An underground geologic formation of rock, soil or sediment that is naturally saturated with water; an aquifer stores groundwater.

Bedrock - The solid rock that underlies all soil, sand, clay, gravel and other loose materials on the earth's surface. Un-fractured bedrock is impermeable while fractured bedrock may store and transmit groundwater.

Capillary Action - The process by which water rises through rock, sediment, or soil caused by the cohesion between water molecules and an adhesion between water and other materials that "pulls" the water upward through the pore spaces.

Condensation – Process by which water vapor changes to a liquid. Condensation is a key part of the water cycle because it is responsible for the formation of clouds. Cloud formation occurs around condensation surfaces such as small particles of matter (dust and salt) suspended in the atmosphere

Confined Aquifer - An aquifer that is bound above and below by dense layers of rock and contains water under pressure.

Cubic Feet Per Second (CFS) - A measure of volume of water flow per time (also known as *discharge*) of water through a stream or pipe. A cubic foot per second is 450 gallons per minute.

Cubic foot - Measurement of a volume of water, used frequently in the water industry. One cubic foot (cf) equals 7.48 gallons.

Deposition - The process of dropping or getting rid of sediments by an erosional agent such as a river or glacier; also called sedimentation.

Discharge - The amount of water flowing past a location in a stream/river in a certain amount of time - usually expressed in liters per second or gallons per minute.

Drought - A prolonged period of below-average precipitation.

Erosion - The processes of picking up and moving sediments or rocks by various agents including streams, glaciers, wind, and gravity. This process changes the shape of the land surface and is active in some form across the globe.

Evaporation - Water changing into vapor and rising into the air.

Floodplain - Area formed by fine sediments spreading out in the drainage basin on either side of the channel of a river as a result of the river's fluctuating water volume and velocity.

Groundwater Recharge or Replenishment - Pumping or percolating storm water runoff or imported water into an aquifer to replenish its supplies.

Hydrology - The scientific study of the behavior of water in the atmosphere, on the Earth's surface, and underground.

MAF - Million acre-feet. Commonly used to describe large amounts of water in the industry.

Water Cycle - describes how water moves on the Earth. Water evaporates from water bodies (such as oceans, lakes, and rivers), forms clouds, and returns to earth as precipitation (rain or snow). The amount of water that evaporates each year and the amount that falls back to the ground are virtually constant, meaning that the amount of water on Earth does not change. Water reuse solutions essentially use technology to mimic the natural cycle and create clean water – faster and more efficiently – than it would otherwise be available.

Water Production, Treatment, and Transport

Abandoned well - A well whose use has been permanently discontinued or which is in a state of disrepair such that it cannot be used for its intended purpose.

Advanced purified water or purified water – water that has passed through proven treatment processes and has been verified through monitoring to be safe for augmenting drinking water supplies. The source water for advanced treatment is often clean water from a wastewater treatment or resource recovery plant. Purification processes can involve a multistage process such as microfiltration, reverse osmosis and advanced oxidation, as well as Soil Aquifer Treatment. Any of these options are capable of producing water quality that has been verified through monitoring to be safe for augmenting drinking water supplies

Aqueduct - Man-made canal or pipeline used to transport water.

Bond - A promise to repay money borrowed, plus interest, over a specified period of time.

Bond Issue - A means of raising large amounts of money for major projects by selling bonds.

Central Valley Project (CVP) - A series of dams, reservoirs and canals in the San Joaquin Valley of California.

Colorado River Aqueduct (CRA) - Built 1933-1941 and owned and operated by the Metropolitan Water District of Southern California.

Combined Sewers- A sewer system that carries both sewage and storm-water runoff.

Conjunctive Use - Storing imported water in a local aquifer, in conjunction with groundwater, for later retrieval and use. Conjunctive use means actively managing the aquifer systems as an underground reservoir. During wet years, when more surface water is available, surface water is stored underground by recharging the aquifers with surplus surface water.

Diamond Valley Lake (DVL) - Metropolitan's major reservoir near Hemet, in southwestern Riverside County.

Effluent - Water flowing from a structure such as a treatment plant. (Contrast with *influent*)

Hydroelectric Plant - A power plant that produces electricity from the power of rushing water turning turbine-generators.

Million gallons per day (MGD) - A measure of volume of water per time. Commonly used for water treatment plants and other facilities' production and/or pumping.

Primary treatment – process where solid matter is removed. The remaining liquid may be discharged or subjected to further treatment.

Secondary treatment – process where dissolved and suspended biological matter is removed to a non-potable level so that the water may be disinfected and discharged into a stream or river, or used for irrigation at controlled locations.

Tertiary treatment or advanced water treatment – processes that purify water for uses such as irrigation or for water blended with other environmental systems such as a river, reservoir, or groundwater basin prior to reuse. It can also include treatment processes to remove nitrogen and phosphorus in order to allow discharge into a highly sensitive or fragile ecosystem (estuaries, low-flow-rivers, coral reefs, etc.).

Title 22 Standards – requirements established by the California Department of Health Services (now the State Water Resources Control Board) for the production

Water Policies and Regulations

Adjudication - A court determination of water rights for a groundwater basin or a stream; adjudication sets priorities during shortages.

BMPs - Best Management Practices. Generally, a set of standardized efficiencies. At Met, refers to a set of water conservation measures agreed to by participants in the California Urban Water Conservation Council.

California Environmental Quality Act (CEQA) - Requires an assessment of the possible environmental impacts of projects.

California Plan - Officially "California's draft Colorado River Water Use Plan," also sometimes called the "4.4 Plan." A planning document designed to reduce California's reliance on surplus Colorado River water over the next 15 years through conservation, water transfers, and conjunctive use measures.

Environmental Impact Report (EIR) - A state-mandated written summary of the positive and negative effects on the environment caused by the construction and operation of a project.

Sustainable Groundwater Management Act of 2014- California enacted landmark legislation in 2014 known as the Sustainable Groundwater Management Act (SGMA). The legislation provides a framework for sustainable management of groundwater supplies by local authorities, with a limited role for state intervention only if necessary to protect the resource.

Water Agencies and Governing Bodies

California Urban Water Conservation Council (CUWCC) - Created to increase efficient water use statewide through partnerships among urban water agencies, public interest organizations and private entities. The Council's goal is to integrate urban water conservation Best Management Practices into the planning and management of California's water resources.

California Department of Water Resources (DWR) - Guides development and management of California's water resources; owns and operates State Water Project and other water-development facilities.

California Urban Water Agencies (CUWA) - Group of 11 member agencies serving two-thirds of state's population.

County Water Authority - A public water district serving a county-wide area.

Municipal Water District - A public water provider governed by a locally elected board of directors, which supplies water to the public directly or through sub agencies.

Municipal Water Quality Investigation (MWQI) - Section of the CA Department of Water Resources that monitors water quality in the Delta for drinking water purposes. Water quality samples and studies are performed throughout the Sacramento watershed, the Sacramento-San Joaquin Delta, and the San Francisco Bay Area.

Water Quality and Monitoring/Mitigation

Abatement - Reducing the degree or intensity of, or eliminating, pollution.

Acid - A substance that has the ability to react with bases to form salt. The pH of an acidic solution is less than 7. pH 7 is neutral (e.g., pure water)- acids are pH 0 to less than 7. Similarly, bases are greater than 7 to 14. The usual definition of an acid is any substance that can donate a hydrogen ion.

Acid Deposition ("acid rain") - Water that falls to or condenses on the Earth's surface as rain, drizzle, snow, sleet, hail, dew, frost, or fog with a pH of less than 5.6.

Acidic- The condition of water or soil which contains a sufficient amount of acid substances to lower the pH below 7.0.

Aeration - The addition of air to water or to the pores in soil.

Age Tank- A tank used to store a known concentration of a chemical solution for feed to a chemical feeder. Also known as a day tank.

Agricultural Pollution - The liquid and solid wastes from farming, including: runoff and leaching of pesticides and fertilizers; erosion and dust from plowing; animal manure and carcasses; crop residue; and debris.

Algae- Microscopic plants which contain chlorophyll and float or suspend in water. Excess algae growths can impact tastes and odors to potable water. Their biological activities affect the pH and dissolved oxygen of the water.

Alkali-Any of certain soluble salts, principally of sodium, potassium, magnesium, and calcium, that have the property of combining with acids from neutral salts and may be used in chemical water treatment processes.

Alkaline-The quality of being bitter due to alkaline content (pH is greater than 7).

Arsenic - A naturally occurring element in the environment. Arsenic in drinking water commonly comes from natural sources in the ground, but some can come from industrial pollution. At high concentrations it can cause cancer.

Assay- A test for a particular chemical or effect.

Bacteria (Plural) / Bacterium (Singular)- A microscopic unicellular organism that lacks a nuclear membrane. Some can cause disease.

Bailer- A 10- to 20-foot-long pipe equipped with a valve at the lower end. Used to retrieve groundwater samples from monitoring wells.

Base- A substance that has a pH value between 7 and 14.

Cesspool - A covered hole or pit for receiving sewage.

Chloride (Cl⁻) - One of the major anions commonly found in water and wastewater. Its presence is often determined by ion chromatographic or volumetric analysis. Consumers who drink water with concentrations of chloride exceeding a secondary maximum contaminant level of 250 milligrams per liter may notice a salty taste.

Chlorination - The treatment of a substance, such as drinking water, with chlorine in order to kill disease-causing organisms.

Clarity - Clearness of liquid, as measured by a variety of methods.

Coagulation - The process, such as in treatment of drinking water, by which dirt and other suspended particles become chemically stuck together so they can be removed from water.

Coliform bacteria - Bacteria of the family Enterobacteriaceae, commonly found in the intestinal tracts of warm-blooded animals. In sanitary bacteriology, these organisms are defined as all aerobic and facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria that ferment lactose with gas and acid formation within 48 hours at 95° Fahrenheit (35° Celsius).

Color (of water) - A physical characteristic describing the appearance of water (different from turbidity, which is the cloudiness of water). Color is frequently caused by fulvic and humic acids.

Corrosivity- An indication of the corrosiveness of water. The corrosiveness of water is described by the water's pH, alkalinity, hardness, temperature, total dissolved solids, dissolved oxygen concentration, and Langelier saturation index.

CT- The product of disinfectant concentration (in milligrams per liter) determined before or at the first customer and the corresponding disinfectant contact time (in minutes). It is also called the CT value. Units are milligram minutes per liter.

Disinfectant - An agent that destroys or inactivates harmful microorganisms.

Ecosystem- An interacting network of groups of organisms together with their nonliving or physical environment.

Fecal Coliform (FC) - Members of the total coliform group of bacteria that are characterized by their ability to ferment lactose at 112.1° Fahrenheit (44.5° Celsius) and that are considered more specific indicators of fecal contamination than are coliforms that ferment lactose only at 95° Fahrenheit (35° Celsius). *Escherichia coli* and some *Klebsiella pneumoniae* strains are the principal fecal coliforms.

Filtration - Passing water through coal, sand and gravel to remove particles.

Floc - Clumps of impurities removed from water during the purification process; formed when alum is added to impure water.

Flocculation - A step in water filtration in which alum is added to cause particles to clump together.

Fluoride Ion (F⁻) - A halide ion. Fluoride salts are added to drinking water for fluoridation. Fluoride is regulated by the US Environmental Protection Agency.

Giardia- The genus name for a group of single-celled, flagellated, pathogenic protozoas found in a variety of vertebrates, including mammals, birds, and reptiles. These organisms exist either as trophozoites or as cysts, depending on the stage of the life cycle.

Hardness- A characteristic of water determined by the levels of calcium and magnesium.

Leach- To remove components from the soil by the action of water trickling through.

Maximum Contaminant Level (MCL) - According to health agencies, the maximum amount of a substance that can be present in water that's safe to drink and which looks, tastes and smells good.

Microbiological- Relating to microorganisms and their life processes.

Microorganism- An organism of microscopic size, such as bacterium.

Mitigation - A way in which an agency may offset negative environmental impacts of a project or make the impacts less serious.

MTBE (Methyl tertiary butyl ether) - An oxygenate used in California gasoline to help prevent air pollution. The chemical has a long life and has been determined to have polluted lakes, reservoirs and groundwater after leaking from watercraft, underground tanks and pipelines. Required to be phased out by Dec. 31, 2002.

Nitrate (NO₃-) - An oxidized ion of nitrogen. Nitrifying bacteria can convert nitrite (NO₂-) to nitrate in the nitrogen cycle. Sodium nitrate (NaNO₃) and potassium nitrate (KNO₃) are used as fertilizer. The nitrate ion is regulated by the US Environmental Protection Agency.

Nitrite (NO₂-) - An intermediate oxidized ion of nitrogen. Nitrifying bacteria can convert ammonia (NH₃) to nitrite (NO₂-) to nitrate (NO₃-) in the nitrogen cycle. Sodium nitrite (NaNO₂) is used in curing meats. The nitrite ion is regulated by the US Environmental Protection Agency.

Nonpoint Source Pollution - Pollution which comes from diffuse sources such as urban and agricultural runoff. Non-point source pollution is often difficult to identify and to treat.

Water Use and Conservation

Beneficial Reuse - the use of recycled water for purposes that contribute to the water needs, economy and/or environment of a community.

Contour Plowing - Plowing done in accordance with the natural outline or shape of the land by keeping the furrows or ditches at the same elevation as much as possible to reduce runoff and erosion.

De-facto, Unacknowledged or Unplanned Potable Reuse - when water intakes draw raw water supplies downstream from discharges of clean water from wastewater treatment plants, water reclamation facilities, or resource recovery facilities. For example, if you are downstream of a community, that community's used water gets put back into a river or stream and is delivered downstream to your community and after further treatment becomes part of your drinking water supply.

Direct Potable Reuse (DPR) involves putting recycled water directly into a potable water supply distribution system downstream of a water treatment plant or into the source water supply immediately upstream of the water treatment plant

Direct or indirect potable reuse - commonly involves a more formal public process and public consultation program than is observed with de-facto or unacknowledged reuse.

Endangered Species- A species of animal or plant threatened with extinction.

Fallowing - A program to reduce agricultural water use by paying farmers to *fallow* land, i.e., not grow crops. The water not used for irrigation is then transferred to urban areas or stored for future use.

Indirect Potable Reuse (IPR) - involves blending recycled water with other environmental systems such as a river, reservoir or groundwater basin, before the water is reused for drinking water.

Integrated Resources Plan (IRP) - The district's plan to ensure reliable water delivery to its customer member agencies despite population growth, dry spells and droughts. The IRP resources mix includes water storage, conservation, best management practices (BMPs), recycling, desalination, and groundwater recovery, among others.

Irrigation - Supplying water to agriculture by artificial means, such as pumping water onto crops in an area where rainfall is insufficient.

Non-potable Reuse - the use of recycled water for purposes other than drinking purposes, such as irrigation and industrial uses.

Planned Potable Reuse - an intentional project to use recycled water for drinking water. It is sometimes further defined as either:

Potable Reuse - the use of recycled water for drinking water purposes. The water is purified sufficiently to meet or exceed federal and state drinking water standards and is safe for human consumption.