Water Quality

Glossary of Water Quality Terms

Words within the definitions which are bold are themselves defined in the glossary.

A

Absorption
The incorporation of a substance into the body of another, (see sorption, adsorption).

Accuracy
This is an indicator of how close a measured value comes to the actual or true value (see precision).

Acid
A compound resulting in a pH less than 7 when in aqueous solution, a molecule that can give up a proton to a base, accept an unshared pair of electrons from a base or react with a base to form a salt, a substance that has more free hydrogen ions, H+, than hydroxyl ions, OH-, (see alkaline).

Acidity
Having the properties of an acid; a pH less than 7.

Activated carbon
Pure carbon heated to promote active sites which can adsorb pollutants, used in some water treatment systems to remove certain organic chemicals and radon gas.

Acute toxicity
As commonly used it is a pronounced effect, severe biological harm or death, produced in an organism by a toxicant, a substance or a mixture of substances within a short period of time, usually 96 hours or less, after exposure. The strict implication is simply one of rapid onset of effects, in comparison with the life span of the organism; severity is not necessarily implied. For algae and bacteria 96 hours would be a chronic exposure since it would last for several generations.

Adhesion
The molecular attraction exerted between the surfaces of materials in contact, (see cohesion).

Adsorbable organic halides, AOX
The total of all halogenated organic compounds, particularly that are fluoridated, chlorinated or brominated, (see adsorption, halides).
Adsorption

The attachment or adhesion of a substance or chemicals generally on the surface of another solid material, adsorption is often used to extract pollutants by causing them to be attached to materials such as activated carbon, (see sorption).

Aeration

The addition, by bubbling, mixing or turbulent exposure, of air or oxygen into water, or by spraying the water into the air, increasing the dissolved oxygen concentration in the water and dissipating or stripping volatile contaminants and other pollutants from the water into the air.

Aerobic

The presence of gaseous or dissolved oxygen, the presence of or utilizing oxygen, (see anaerobic).

Aesthetic

Pleasing or acceptable to the senses, primarily taste, odor and vision.

Algae

A group of chlorophyll-containing, non-flowering plants, mostly aquatic, although many are planktonic, some species are extremely large.

Algal bloom

A bloom of algae occurs when their growth is so rapid that they become numerous enough to colour a body of water, a population explosion of phytoplankton in response to changing environmental conditions, including eutrophication from wastewater and non-point sources, blooms can result in oxygen depletion and biological impacts such as fish kills, blooms are often the result of urban runoff of lawn fertilizers.

Alkaline

Having a pH greater than 7, the measurement of constituents in a water supply which determine alkaline conditions, the alkalinity of water is a measure of its capacity to neutralize acids.

Alkalinity

The measurement of chemicals in a water supply which determine alkaline conditions, the alkalinity of water is a measure of its capacity to neutralize acids.

Alluvial

Refers to particles carried by running water which are deposited when the flow rate decreases.

Alum

An aluminum sulphate salt, generally potassium or ammonium is the cation, used to coagulate particles in water treatment.

Amphipoda

An Order of Crustacea which includes shrimp, these numerous small, but generally visible, flea-like organisms which are laterally flattened, are abundant in marine environments.
Ambient
Refers to natural background conditions in the surrounding environment outside the zone in which water quality may be influenced by a discharge or source of contamination.

Anadromous
Ascending from the sea to fresh water for spawning at certain seasons.

Anaerobe
An organism that can only exist in the absence or near-absence of gaseous or dissolved oxygen.

Anaerobic
Denotes absence of gaseous or dissolved oxygen, submerged sediments below a narrow oxygenated layer may be anaerobic, also refers to metabolic activities, glycolysis, in the absence of oxygen which occurs in some microorganisms.

Anion
A negatively charged ion.

Annelids
A phylum of segmented marine and freshwater worms, distinguished from non-segmented roundworms and flatworms, (see worms, polychaetes and oligochaetes).

Anoxia
Absence of oxygen, (see anaerobic, hypoxia).

Anthropogenic
Having to do with the activities of man as opposed to those of nature, man-made, modified or influenced.

AOX, Adsorbable organic halides
The total of all halogenated organic compounds particularly those that are fluoridated, chlorinated or brominated, (see adsorption, halides).

Aquatic
Living and growing in or on and generally requiring water, (see freshwater, marine, brackish).

Aqueous
Water based; an aqueous solution is a solution where water is the solvent.

Aquifer
Water within the soil or rocks beneath the surface of the earth that supplies wells and springs, water in the zone of saturation where all openings in rocks and soil are filled with water, the upper surface of which forms the water table, the streams or pools of water that flow or collect under the surface of the land and not on the surface, these may be confined if there are layers of impermeable material both above and below and it is under pressure so that when the aquifer is penetrated by a well, the water will rise above the top of the aquifer, or unconfined when the upper water surface, the water table, is at atmospheric pressure, and is able to rise and
any geological formation containing or transmitting water, especially one that supplies the water for wells and springs. Use of the term may be restricted to those water-bearing formations capable of yielding water in sufficient quantity to constitute a usable supply, (see surfacewater, ground water).

Arithmetic mean
The average of the sum of all the observations, (see geometric mean).

Artificial recharge
The process where water is put into ground water, or aquifer, storage from surface water supplies such as irrigation water, reclaimed wastewater or induced infiltration from streams or wells.

Aromatic
A general term that includes the organic compounds containing at least one benzene ring.

Assimilative capacity
The amount of pollution a water body can receive without noticeable degradation, as a result of the natural ability of the water and its associated chemical and biological systems to dilute or transform contaminants.

Atmospheric deposition
The contribution of atmospheric pollutants or chemical constituents to land or water ecosystems, deposition results from materials in rain or snowfall, combined with dry dust fallout, atmospheric sources are a significant source of nutrients and contaminant to aquatic systems.

Backwashing
Reversing the flow of water through a water treatment filter or membrane to clean and remove deposits.

Bacteria
Small unicellular organisms lacking a nucleus and some other eukaryotic organelles, they may have photosynthetic pigments but lack chloroplasts, the specialized photosynthetic organelles in higher plants, and mitochondria.

Base
A compound resulting in a pH greater than 7 when in aqueous solution, a molecule that can accept a proton from an acid, donate an unshared pair of electrons to an acid or react with an acid to form a salt, a substance that has fewer free hydrogen ions, H+, than hydroxyl ions, OH−, (see alkaline).
Base flow
The volume of flow in a stream or river during dry conditions, as opposed to conditions influenced by storm runoff.

Bay
A relatively small body of water partially isolated from the main portion of the sea, ocean or lake by a relatively narrow opening or channel.

Beneficial use
Water used for an anthropogenically accepted purpose such as domestic and municipal water supply, industry, irrigation, mining, hydroelectric power, navigation, recreation, livestock raising, aesthetics, aquatic life and wildlife, (see contact recreation, non-contact recreation).

Benthic
Associated with the sediments on the bottom of a water body

Benthic organism
Any organism that lives in or near the bottom of a water body or in the sediment.

Benthos
The organisms that live in or near the bottom of a water body or in the sediment.

Benzene
An organic compound, a ring molecule of six carbons and six hydrogens with three shared or resonant double carbon-to-carbon bonds, known as an aromatic compound.

Bioaccumulation
The uptake, retention and concentration above background levels of environmental substances by an organism from its environment and food, (see biomagnification).

Bioassay
The quantitative estimation of biologically active substances by the amount of their actions under standardized conditions on or in living organisms; often linked, unnecessarily, with drug testing; some people prefer to simply use toxicity test.

Biochemical oxygen demand, BOD
A measure of the amount of dissolved oxygen required to completely oxidize the available organic wastes, a quantitative measure of the degree to which organic compounds consume oxygen in water, based on a five-day test in which loss of oxygen in a sample results from bacterial respiration and chemical processes, a traditional water quality measurement applied to wastewater such as treated sewage.

Bioconcentration
The increase of a substance or contaminant in a food web such that the organisms eventually contain higher concentrations of the substance than their food sources, the magnification of contaminant concentrations in organisms due to increased tissue concentrations at each successive trophic level in a food chain, generally, but not always, occurs due to
a contaminant being soluble in fatty tissues and not in water.
(see bioaccumulation, biomagnification).

Biomagnification
The increase of a substance or contaminant in a food web such that the organisms eventually contain higher concentrations of the substance than their food sources, the magnification of contaminant concentration in organisms due to increased tissue concentrations at each successive trophic level in a food chain, generally, but not always, occurs due to a contaminant being soluble in fatty tissues and not in water,
(see bioaccumulation, bioconcentration).

Biomass
The total amount of biological material present at any given time or over a defined time period, (see productivity, standing crop).

Biosolids
A nutrient-rich organic material resulting from the treatment of wastewater which contains nitrogen and phosphorus along with smaller amounts of other nutrients, such as potassium, sulfur, magnesium, calcium, copper and zinc, soil that is lacking in these substances can be fertilized with biosolids which also improve soil properties and plant productivity reducing dependence on inorganic fertilizers.

Biota
All living organisms including bacteria, plants and animals.

Bioturbation
The disturbance of sediments due to displacement by organisms, bioturbation resulting from burrowing of organisms in the benthic habitat increases sediment aeration and influences contaminant equilibria with the overlying water.

Blackwater
Wastewater from toilets, latrines, privies, water containing feces or body fluids and water from sinks used for food preparation or disposal of chemical or biological ingredients,
(see greywater).

Blue-green algae
Prokaryotic organisms with a bacteria-like cell structure, lacking a nucleus and other organelles, these species manufacture photosynthetic pigments but lack chloroplasts, the specialized photosynthetic organelles in higher plants, in some situations an increase in blue-green algae can indicate an environmental stress such as pollution.

BOD, Biochemical oxygen demand
A measure of the amount of dissolved oxygen required to completely oxidize the available organic wastes, a quantitative measure of the degree to which organic compounds consume oxygen in water, based on a five-day test in which loss of oxygen in a sample results from bacterial respiration and chemical processes, a traditional water quality measurement applied to wastewater such as treated sewage.
Bog
A wetland that is perched above the watertable and has no direct hydraulic connection to it, bogs accumulate peat and the vegetation is dominated by sphagnum moss.

Brackish
Water that is neither fresh water nor marine but a mixture of the two or intermediate in salinity, usually found in estuaries where the amount of salinity is constantly fluctuating.

Brine
Highly salty and heavily mineralized water containing heavy metal and organic contaminants.

Brominated
A compound that has been reacted with the halide bromine and now contains at least one bromine atom in the molecule.

Buffer
A compound or solution capable of resisting a change in pH.

Carcinogen
A substance capable of causing cancer.

Cation
A positively charged ion.

CFS, Cubic feet per second
A quantitative measure of the flow, in streams and rivers, it is equal to a volume of water one foot high and one foot wide flowing a distance of one foot in one second, one cfs is equal to 7.48 gallons of water per second.

CFU, Colony forming units
A quantitative measure of the concentration of bacteria in a water sample, bacterial colonies on laboratory media resulting from filtering and culturing bacteria from a water sample, each colony in the laboratory culture is presumed to have arisen from the multiplication of a single bacterium in the original sample.

Chlorinated
A compound that has been reacted with the halide chlorine and now contains at least one chlorine atom in the molecule.

Chlorination
The addition of chlorine to water primarily for the purpose of disinfection but also for other biological or chemical purposes.
Chlorophenols
   Broad spectrum pesticides produced when phenol rings have a number of chlorine atoms attached, formerly used in cut lumber treatment to prevent discoulouration by fungus, often associated with pulpmill effluent and wood preservatives.

Chlorophyll
   The coloured pigments, often green, red or brown, found in plants and algae which trap and convert light energy to chemically stored energy which is then used to create organic molecules from inorganic raw materials.

Chlorophyll-a
   The primary green-coloured pigment found in plants and algae which traps and converts light energy to chemically stored energy which is then used to create organic molecules from inorganic raw materials.

Chloroplasts
   The organelles, in eukaryotic cells that carry out photosynthesis, where the chlorophyll pigments and related enzymes are located, specialized structures that carry out photosynthesis in plants and algae.

Chromosomes
   The structures in the nucleus of a eukaryotic cell which carries the DNA or genetic material in genes.

Chronic toxicity
   A long-term toxic effect produced in an organism by a toxicant, a substance or a mixture of substances.

Cilia
   Many short fine hairs on the cell surface which are used for locomotion or food gathering in many microscopic organisms and their larvae.

Ciliate
   Having many cilia on the surface which are used for locomotion or food gathering.

Coagulation
   The use of chemicals to make suspended solids clump together into larger aggregates, flocs, for easier filtration or sedimentation, coagulation in water treatment uses alum to congregate solids in the water into a mass that can be readily trapped by a filter, (see flocculation).

Cohesion
   The molecular attraction by which the particles of a body are united throughout the mass, whether like or unlike, (see adhesion).

Coliform
   Non-pathogenic natural gut bacteria monitored when testing water to indicate the possible presence of pathogenic bacteria.
Colloids
Finely divided solids which will not settle out by gravity alone but which may be removed by coagulation or biochemical action.

Colony forming units, CFU
A quantitative measure of the concentration of bacteria in a water sample, bacterial colonies on laboratory media resulting from filtering and culturing bacteria from a water sample, each colony in the laboratory culture is presumed to have arisen from the multiplication of a single bacterium in the original sample.

Combined sewer
A sewer system that carries both sanitary sewage and stormwater runoff, when sewers are constructed this way, wastewater treatment plants have to be sized to handle stormwater flows and often some of the water receives little or no treatment during overflows or bypasses during extreme storm events, (see separate sewer).

Combined sewer overflow
A point in a sewer collection system where domestic sewage mixed in varying proportions with stormwater overflows to a receiving water body.

Composite sample
A series of samples taken over space and/or time to determine the average condition of an area or a time period, (see grab sample).

Concentration
Quantitative amount of a solute, chemical or pollutant in a specified volume or weight of solvent, air, water, soil or other medium, accumulating a level of some material over and above the level found in the ambient environment, generally applied to an organism.

Condensation
The change of state from a gas to a liquid, (see evaporation, sublimation, vapourization, transpiration, evapotranspiration).

Consumptive use
The quantity of water not available for reuse since it is incorporated into a product or in some way at least temporarily removed from the water cycle, evapotranspiration, evaporation, incorporation into plant tissue, infiltration into ground water and consumption by humans, wildlife or livestock, are some of the reasons water may not be immediately available for reuse. (see non-consumptive use).

Contact recreation
Activities involving a significant risk of ingestion of water, such as wading by children, swimming, water skiing, diving and surfing, human activity involving bodily contact with water and therefore the potential for increased risk to health when contaminants or pathogens are present, (see non-contact recreation).

Contaminant
A substance that causes harm by contact or association, sewage or other materials that will
render water unfit for its intended use, anything added to a substance that makes the substance impure or unfit for its intended use, (see pollutant).

Contamination
Introducing a substance into water that causes harm by contact or association, the introduction into water of sewage or other materials that will render the water unfit for its intended use, (see pollution).

Copepoda
Subclass of Crustacea, small aquatic invertebrates that are food for fish, free living forms are common in benthic and planktonic samples, some species are parasitic.

Crustacean
A class of segmented Arthropod organisms with an exoskeleton, a pair of appendages on each segment and two pairs of antennae, includes crabs, lobsters, crayfish, shrimp, wood lice, barnacles and water fleas or Daphnia.

Cubic feet per second, CFS
A quantitative measure of the flow, in streams and rivers, it is equal to a volume of water one foot high and one foot wide flowing a distance of one foot in one second, one cfs is equal to 7.48 gallons of water per second.

Deionized water
Water free of inorganic chemicals

Delta
An alluvial deposit consisting of rock particles, sediment and debris, dropped by a stream or river as it enters another body of water, the fan-shaped deposit where a river discharges to a larger, slower moving water body, important for wetland habitat values.

Denitrification
The natural chemical conversion of dissolved nitrite nitrogen to nitrate and finally to gaseous nitrogen, removing it from the aquatic system.

Desalination
The process of salt removal from sea or brackish water, the removal of salts from saline water to provide fresh water, an increasingly popular way of providing fresh water to coastal populations.

Designated water use
A water use that is to be protected at a specific location for such purposes as use by aquatic life or wildlife, for irrigation or stock watering, in industrial activities, for recreation or as drinking water, (see contact recreation, non-contact recreation).
Detection limit
The lowest concentration of a substance in water that can be reproducibly determined by a specific analytical procedure or test method.

Diatom
A group of phytoplankton species utilizing silica as a structural component of the cell wall, a dominant component of the plankton population in many areas.

Diffuser
A structure composed of perforated pipes, placed at the end of an outfall pipe, which is designed to spread the effluent widely so as to facilitate dilution.

Dilution
The process of mixing a liquid, usually water, that has a lower concentration of a substance or pollutant with effluent containing the substance or pollutant, or the pollutant or substance itself, such that the final concentration after mixing is lower than that in the effluent or of the pure substance.

Dinoflagellate
A unicellular, generally motile species of planktonic algae with two whip-like flagella arranged in a characteristic pattern, this group includes some common plankton species and also red tide organisms such as Gonyaulax monilata and Ptychodiscus brevis.

Dioxins
Toxic organic compounds containing a specific complex aromatic ring structure and containing at least one chlorine atom in the molecule, (see furans).

Diploid
The condition when there are two complimentary sets of chromosomes in a cell which occurs after fertilization and remains so until the cell undergoes meiosis to form haploid eggs and sperm.

Discharge
The release of water which may or may not contain waste into the environment, often via a pipe or ditch into a stream, the volume of water that passes a given point within a given period of time, an all-inclusive outflow term, describing a variety of flows such as from a pipe to a stream or from a stream to a lake or ocean, usually expressed in cubic feet per second.

Disinfectant
A chemical usually an oxidant, such as chlorine, chloramine, ozone, hydrogen peroxide or potassium permanganate, or radiation, such as ultraviolet light or ionizing radiation which destroys pathogens in water, a substance or action used to purify a medium and kill or inactivate infectious organisms, chlorine is currently the most common disinfectant used with water.

Disinfection
The process of destroying microorganisms in water by the application of a disinfectant, killing most of the harmful and objectionable bacteria in sewage or drinking
water usually accomplished by introduction of chlorine or exposure to ultraviolet radiation which sterilizes the bacteria.

Disinfection byproducts
Chlorinated organic chemicals, including trihalomethanes, are formed when water containing organic materials is disinfected with chlorine, these compounds are toxic, the formation of these compounds can be minimized by filtering or otherwise removing the organic compounds before chlorination.

Dispersion
The movement and spreading of contaminants from the point of introduction in an aquifer or surface water body.

Dissolve
The process by which solid particles separate from the mass and mix molecule by molecule with a liquid and appear to become part of the liquid.

Dissolved
Separated into individual atoms or molecules and dispersed in a liquid like water.

Dissolved metals
In a liquid, metals which pass through a filter of a designated pore size, are assumed for environmental purposes to be dissolved.

Dissolved organic matter, DOM
Carbon compounds in water solution, generally from the decomposition of natural plant and animal tissues, but including some anthropogenic contaminants.

Dissolved oxygen, DO
The amount of oxygen gas dissolved in a given quantity of water at a given temperature and atmospheric pressure, usually expressed as a concentration in parts per million, ppm, or as a percentage of saturation.

Dissolved oxygen deficit, DO deficit
The difference between the oxygen saturation value in water as calculated for the measured conditions at the point and time of sampling, and the actual oxygen concentration, the measure is useful because it corrects for temperature, salinity, and atmospheric pressure which influence the saturation level, a high deficit can be an indicator of a water quality problem.

Dissolved solids
Inorganic material dissolved in water or liquid wastes, excessive dissolved solids make water unsuitable for drinking or industrial uses, (see TDS, total dissolved solids).

DO, Dissolved oxygen
The amount of oxygen gas dissolved in a given quantity of water at a given temperature and atmospheric pressure, usually expressed as a concentration in parts per million, ppm, or as a percentage of saturation.
DO deficit, Dissolved oxygen deficit
The difference between the oxygen saturation value in water as calculated for the measured conditions at the point and time of sampling, and the actual oxygen concentration, the measure is useful because it corrects for temperature, salinity, and atmospheric pressure which influence the saturation level, a high deficit can be an indicator of a water quality problem.

DOM, Dissolved organic matter
Carbon compounds in water solution, generally from the decomposition of natural plant and animal tissues, but including some anthropogenic contaminants.

Domestic
Of or related to a household or dwelling as opposed to an industry.

Domestic water use
Water used for household purposes, such as drinking, food preparation, bathing, washing clothes, dishes and dogs, flushing toilets and watering lawns and gardens, most domestic water is delivered to homes by a public water supply facility.

Drainage area
The drainage area of a stream or river at a specified location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff normally drains by gravity into the stream above the specified location.

Drainage basin
The land area where precipitation runs off into streams, rivers, lakes and reservoirs, a land feature that can be identified by tracing a line along the highest elevations between two areas on a map, often a ridge, large drainage basins contain many smaller drainage sub-basins, (see watershed).

Drawdown
A lowering of the ground water surface caused by pumping from an aquifer or lowering the water surface in a reservoir by releasing water either through the turbine or outlet pipes or over the spillway.

Drinking water
A water supply, treated or untreated which is intended for human consumption and uses and which is considered to be free of toxins and pathogenic bacteria, cysts or viruses, potable water, fit to drink, potable water that has or is to be treated additionally, to enhance aesthetic quality and/or reduce mineral content plus other known or unknown, undesirable substances: by one or more point-of-use water processing devices or systems or purified bottled water.

Dyne
Metric unit of force, energy needed to accelerate 1 gram at 1 centimetre/second^2.
Effluent

The out-flow water or waste water from any water processing system or device, softeners, filters or reverse osmosis units, the product water of a given water treatment system, alternatively a general term in waste water treatment for the final water which is discharged from a treatment plant, usually into a natural flowing river or stream, after complete treatment steps which meet current effluent water quality standards. Effluent water is often recycled as irrigation water for golf courses, parklands and some agricultural applications, particularly a liquid, that enters the environment from a point source, generally refers to wastewater from a sewage treatment or industrial plant.

Egg

A large immobile gamete produced by the female organism which contains one haploid set of chromosomes and unites with the sperm to bring about fertilization.

Electrodialysis

The salts are extracted from the water by using a membrane with an electrical current to separate the ions, positive ions go through one membrane, while the negative ions flow through a different membrane, leaving the fresh water behind.

Emergent wetlands

Marshes in which vegetation is rooted underwater with only the tops exposed, in contrast to fully submerged aquatic vegetation or upland habitats where the roots are also above the water surface.

Enteric

Associated with the gut or intestines of animals or gut products such as feces.

Enteric viruses

A group of viruses associated with human feces found in water.

Enterocci

Bacteria species which live in the gut of man or other homeothermic animals, some are pathogens, often used instead of fecal coliform bacteria as an indicator of water contamination.

Epibenthic

Located at the surface of the sediments, generally referring to algae.

Epilimnion

The upper, warmer, less dense zone of water in a lake, separated by the fairly thin thermocline zone, from the lower, colder, denser zone of water, the hypolimnion.

Erg

Metric unit of work, 1 dyne over a distance of 1 centimetre.

Erosion

The wearing away of the land surface by wind, water, ice or other geologic agents, occurs naturally from weather or runoff but is often intensified by human land use
practices, **erosion** is a source of **sediments**, **suspended sediments**, TDS, **total dissolved solids**, **particulate matter** **turbidity** and **soluters** in natural waters.

**Estuary, Estuaries, Estuarine zone**

The lower portion of a **river** where the **ocean** and the **river** mix, the semi-enclosed zone along a coastline where **fresh water** meets and mixes with the **ocean**, such as a **bay**, mouth of a **river**, **salt marsh** or **lagoon**, deepwater tidal **habitat** and tidal **wetland**, they are usually partially enclosed by land but have free access to the **ocean** and are at least occasionally diluted by **fresh water runoff** from the land.

**Eukaryotic**

Organisms whose cells have a nucleus, **chloroplasts** in plants and **mitochondria**, (see **prokaryotic**).

**Euphotic**

The surface layer of an **ocean**, **lake**, or other body of water into which light can penetrate, also known as the zone of **photosynthesis**.

**Eutrophic**

Having a large or excessive supply of plant **nutrients**, nitrates and phosphates, usually resulting in an increase in **biomass** and **productivity**, (see **oligotrophic**).

**Eutrophication**

The process of increasing the **nutrients**, primarily nitrate and phosphate, content of natural waters, usually resulting in an increase in **biomass** and **productivity** of **algae** which may result in the depletion of the oxygen **concentration** in the water leading to a fish kill, from natural **erosion** and **runoff** from the land or from **anthropogenic** sources.

**Evaporation**

The change of state from a liquid to a gas, the change by which any substance is converted from a liquid state and carried off as a vapor, the process of liquid water becoming water vapor from water surfaces, land surfaces and snow fields, (see **condensation**, **sublimation**, **vapourization**, **transpiration**, **evapotranspiration**, **volatilization**).

**Evapotranspiration**

The combination of **evaporation** and **transpiration** of water into the atmosphere from living plants, the water surface and soil.

---

**F**

**Fecal**

Refers to **waste** matter, feces, from the gut or gastrointestinal tract of animals.
Fecal coliform bacteria
     *Enteric bacteria* which ferment lactose with gas and *acid* formation at a temperature typical of warm-blooded animals, in water, *fecal coliforms* are commonly used as an *indicator* of *contamination* and are normally measured using *filtration* and culture on disk media, the portion of the *coliform bacteria* group which is present in the intestinal tracts and feces of warm-blooded animals, a common *pollutant* in water, (see *most probable number, MPN*).

Fen
     A *wetland* that is at the *water table* and has a direct *hydraulic* connection to it, *fens* accumulate peat and the vegetation is dominated by sphagnum moss and small herbs.

Fertilization
     The process where *haploid eggs* and *sperm* unite to form a *diploid zygote* and begin a new generation.

Filter
     A device used to remove solids from a mixture or to separate materials, materials are frequently separated from water using *filters*, a *screening* device or *porous* substance used as a *strainer* for removing solid material from liquids.

Filtering, Filtration
     Passing a *solvent* with *particulate* material *suspended* in it through a material which allows the *solvent* to pass but retains the *particulates*, the mechanical process which removes *particulate* matter by separating water from solid material, by passing it through a *filter* such as sand in many water *filtration* plants.

Flagella
     Several long stout hairs on the cell surface which are used for locomotion or food gathering in many microscopic organisms and their *larvae*.

Flagellate
     Having several long stout hairs on the cell surface which are used for locomotion or food gathering.

Flocculation
     A large scale treatment process involving gentle stirring whereby small particles in flocs are collected into larger particles so their weight causes them to *settle* to the bottom of the treatment tank, (see *coagulation*).

Flood
     An overflow or inundation that comes from a *river* or other body of water and causes or threatens damage, it can be any relatively high streamflow overtopping the natural or artificial banks in any reach of a *stream*, also a relatively high *flow* as measured by either gauge height or *discharge* quantity.

Flood plain
     A strip of relatively flat and normally dry land alongside a *stream*, *river* or *lake* that is covered by
water during a **flood**, land next to a **river** that becomes covered by water when the river overflows its banks.

**Fluoridated**
A compound that has been reacted with the **halide** fluorine and now contains at least one fluorine atom in the molecule.

**Flow**
The *quantitative* rate of water **discharged** from a source, or passing by a given point, expressed as volume per unit of time, (see **CFS, cubic feet per second**).

**Flushing**
A measure of how often, usually measured in years, water is replaced in a **reservoir**, **bay** or other system, based upon **flow** rates into and out of the system, (see **residence time**).

**Food chain**
The transfer of food energy from producers through a series of consumers.

**Food web**
A series of inter-connecting and inter-related **food chains**.

**Fraser River Estuary**
The area of joint social, economic and environmental concerns which, for the purposes of the FREMP Agreement, means in general, the land and water outside the boundary of the dykes and between Kanaka Creek and the outlet from Pitt Lake in the east, the **estuary** drop off in the west, Point Grey to the north, and the international boundary to the south, including Boundary Bay and Semiahmoo Bay.

**Fresh water**
Lakes and rivers running off the land to the sea and having much lower **solute concentrations** than the ocean into which most eventually drain, water containing less than 1,000 parts per million, **ppm** of dissolved solids of any type, water that contains less than 1,000 milligrams per liter, mg/L, of dissolved solids, generally, more than 500 mg/L of dissolved solids is undesirable for drinking and many **industrial** uses, (see **saline** water).

**Freshet**
An influx of **freshwater** inflow, for example following seasonally high rain and snowfall or the spring melt.

**Freshwater**
An adjective to describe water that meets the definition of **fresh water**.

**Fully recorded**
The situation where all the available water in a waterbody is allocated or authorized for use through licences.
Fungi, fungus  
A major group of multicellular organisms that are non-photosynthetic and often saprophytic, pathogenic or parasitic.

Furans  
Toxic organic compounds containing a specific complex aromatic ring structure and containing at least one chlorine atom in the molecule, (see dioxins).

Gamete  
Sperm produced by the male organism or eggs produced by the female organism, which contain one haploid set of chromosomes, they unite to cause fertilization and a diploid zygote.

Gastropod  
Organisms in the Class Gastropoda of the Phylum Mollusca, the snails and similar organisms with an asymmetrical, spirally-coiled shell.

Geometric mean  
The Nth root of the product of N observations, (see arithmetic mean).

Grab sample  
A single sample taken at a given place and time, (see composite sample).

Green Algae  
A common algae group, often green in colour, with nucleated cells and photosynthetic pigments contained in organelles called chloroplasts.

Greywater  
Wastewater from clothes washing machines, showers, bathtubs, handwashing, lavatories and sinks that are not used for disposal of chemical or chemical-biological ingredients or feces, (see blackwater).

Ground water  
Water within the earth that supplies wells and springs, water in the zone of saturation where all openings in rocks and soil are filled, the upper surface of which forms the water table, water that flows in aquifers under the surface of the land and not on the surface, water that flows or seeps downward and saturates soil or rock, the upper surface of the saturated zone is called the water table, water beneath the surface of the ground, consisting largely of surface water that has seeped down, water beneath the earth’s surface, occurring in aquifers at one or more depth levels, (see surface water).

Ground water hydrology  
The branch of hydrology that deals with ground water, its occurrence and movements,
its replenishment and depletion, the properties of rocks that control ground water movement and storage and the methods of investigation and utilization of ground water.

Ground water recharge
The inflow of water to a ground water reservoir, primarily from the surface, infiltration of rain and snowfall and its movement to the water table is one form of natural recharge, the volume of water added by this process, (see ground water).

Ground water reservoir
An aquifer or aquifer system in which ground water is stored, water may be placed in the aquifer by artificial or natural means.

Habitat
A place within an ecosystem with a particular kind of environment whereby organisms, populations or communities live, feed, reproduce or grow.

Halide
One of the very reactive elements in column 7 of the periodic table that are only one electron short of a full outer orbital, primarily fluorine, chlorine and bromine.

Halogenated
A compound that has been reacted with, and now contains, one of the elements in column 7 of the periodic table that are only one electron short of a full outer orbital, primarily fluorine, chlorine and bromine.

Haploid
The condition when there is only one set of chromosomes in a cell which occurs after meiosis to form eggs and sperm.

Hard water
Water containing a high level of calcium, magnesium, and other minerals, hard water reduces the cleansing power of soap and produces scale in hot water lines, boilers and appliances.

Hardness (water)
A condition caused predominantly by dissolved salts of calcium, magnesium and iron, such as bicarbonates, carbonates, sulfates, chlorides and nitrates, a water-quality indicator of the concentration of alkaline salts in water, hard water requires more soap, detergent or shampoo to raise a lather.

Headwaters
The source and upper reaches of a stream, also the upper reaches of a reservoir, the
water upstream from a structure or point on a stream, the small streams that come together to form a river, any and all parts of a river basin except the mainstream river and main tributaries.

Heavy metals
Metallic elements of high molecular weight, typically with specific gravities greater than 5, a few examples include copper, lead and zinc.

Hepatic
With reference to the liver.

Hermaphrodite
An organism containing functional male and female reproductive organs.

Homeothermic
Animals which control their own body temperature at some fixed value, warm-blooded animals, (see poikilothermic).

Hydraulic
Related to water and the flows and pressures within a connected water-containing system.

Hydrograph
A chart that measures the amount of water flowing past a specified point as a function of time.

Hydrologic
With reference to water and the water cycle in the environment.

Hydrologic cycle
The natural pathway water follows as it changes between liquid, solid, and gaseous states; biogeochemical cycle that moves and recycles water in various forms through the environment, evaporation from oceans to the atmosphere, rain and snowfall to the earth's surface, replenishment of ground water, runoff, uptake by plants, and storage in oceans and ice caps, the movement of water from the atmosphere to the earth and its return to the atmosphere through condensation, precipitation, evaporation and transpiration, the cyclic transfer of water from the Earth's surface via evapotranspiration into the atmosphere, from the atmosphere via precipitation back to earth, and through runoff into streams, rivers, and lakes and ultimately into the oceans, (see water cycle).

Hydrology
The science that deals with the hydrologic cycle or water cycle in the environment-land, soil and atmosphere; properties, distribution and circulation of water.

Hydrophobic
Literally, hating water, materials that do not dissolve in water but tend to dissolve in organic solvents and fats or sorb to sediments, (see hydrophylic).
Hydrophyllic
Literally, loving water materials that do dissolve in water not in organic solvents and fats and are found in the water column, (see hydrophobic).

Hypolimnion
The colder, lower, denser zone of water in a lake, separated by the fairly thin thermocline zone, from the upper, warmer, less dense zone, the epilimnion.

Hypoxia
Depletion of dissolved oxygen in water to low levels, for example less than two mg/L, which can result from natural or human introduction of materials with a high BOD or from eutrophication resulting from high nutrient concentrations, (see anoxia, anaerobic).

Impermeable
A surface or membrane through which water, or other liquids, will not penetrate, a layer of solid material, such as rock or clay, which does not allow water to pass through, any material that does not permit fluids to penetrate.

Impervious
A material through which water, or other liquids, will not penetrate and thus must run off over the surface or accumulate on the top, surfaces with a low capacity for soil infiltration, paving, roofs, roadways or other human structures, impervious cover increases runoff and affects the quantity and composition of non-point source pollution, the quality or state of being impermeable, resisting penetration by water or plant roots.

Indicator organism
Microorganisms, such as coliform bacteria, that are not in themselves harmful but whose presence is indicative of possible pollution or the presence of other more harmful microorganisms which, through its population size or condition, mirrors environmental conditions within an ecosystem.

Indicator tests
Tests for a specific contaminant, organism, group of contaminants or constituent which signals the presence of something else, coliforms indicate the possible presence of other pathogenic bacteria, tests for a specific contaminant, or constituent which signals the possible presence of something else.

Industrial water use
Water used for industrial purposes in such industries as steel, chemical, paper and petroleum refining, primarily from private sources, such as local wells or withdrawal points in a river, but some comes from public sources.

Infiltration
Flow of water from the land surface into the subsurface.
Initial dilution zone
Areas immediately adjacent to a wastewater discharge in which chronic water quality objectives for water or sediment, but not those for fish, may be exceeded; however, they may not exceed the acute objectives; they are defined on a site-specific basis and may not encroach on water intakes, bathing beaches, shellfish beds, fish spawning and rearing areas, areas of sensitive aquatic vegetation or other specified sensitive areas.

Injection well
A well constructed for the purpose of injecting treated wastewater directly into the ground, wastewater is generally pumped into the well for dispersal or storage into a designated aquifer, one that does not deliver drinking water, an unused aquifer or below the levels of fresh water.

Inorganic chemicals or compounds
Usually chemicals or compounds which do not contain carbon atoms or if so the carbon atoms are not connected directly to each other in long chains, generally substances not made by living organisms.

Instream use
Use of water that does not require withdrawal or diversion from its natural watercourse, the use of water for navigation, recreation and habitat for fish and wildlife, (see contact recreation, non-contact recreation).

Intake
The place at which a fluid is taken into a channel or pipe, the location where water is withdrawn from a stream.

Invertebrate
An organism without a backbone.

Ion
A negatively or positively charged atom or molecule which has either an excess or shortage, respectively, of electrons.

Irrigation water
Water application on lands to assist in the growing of crops and pastures or to maintain vegetative growth in recreational lands, such as parks and golf courses, water which is applied to assist crops in areas or during times where rainfall is inadequate, the controlled application of water for agricultural purposes through man-made systems to supply water requirements not satisfied by rainfall.

Isopod
A member of the Crustacean Order Isopoda, small but generally visible species flattened from top to bottom, common benthic and epibenthic invertebrates.
Jet
A concentrated, high velocity flow of water capable of causing erosion, used in mining some placer deposits to wash the unconsolidated deposits into sluice boxes.

Joule
The metric unit of work or energy, $1 \times 10^7$ ergs, 1 joule is about 0.7375 foot-pounds.

K

Kilifish
Small oviparous Cyprinodontidae or ovoviviparous Poeciliidae, fish used in bioassays and for mosquito control or as bait.

L

Lacustrine
Relating to a lake environment.

Lagoon
A shallow pond where sunlight, bacterial action and oxygen work to purify wastewater, typically used for the storage of wastewaters, sludges, liquid wastes or spent nuclear fuel, a shallow sound, channel or pond, near and generally connected to, a larger body of water.

Lake
A generally permanent inland body of fresh water of considerable size occupying a basin or hollow in the earth's surface.

Larva
Singular, the pre-adult form in which some animals with multiple life stages hatch from the egg.

Larvae
Plural, the pre-adult form in which some animals with multiple life stages hatch from the eggs.

Leachate
Water containing contaminants which leaks from a disposal site such as a landfill or dump.

Leaching
Extraction or flushing out of dissolved or suspended materials from the soil, solid waste or another medium by water or other liquids as they percolate down through the medium to ground water or flow laterally through the waste material, the process by which soluble materials in the soil, such as salts, nutrients, pesticide chemicals or contaminants, are washed into a lower layer of soil or are dissolved and carried away by water.
Lentic
Static or standing, non-flowing waters such as lakes, ponds and reservoirs, (see lotic).

Limnology
The scientific study of physical, chemical and biological conditions and interactions in lentic systems, lakes, ponds and reservoirs.

Littoral zone
Area on or near the shore of a body of water in relatively shallow water.

Livestock water use
Water used for livestock watering, feed lots, dairy operations, fish farming, and other on-farm needs.

Loading
The rate of introduction of a constituent or contaminant to a receiving water from the environment, significant in relation to the volume and circulation of the receiving water, problems occur when high loadings occur into receiving waters with limited assimilative capacity.

Lotic
A flowing body of fresh water, such as a river or stream, (see lentic).

Mainstem
The main course of a river or stream where most of the water flows most of the time.

Marine
Refers to the ocean or to a sea, saltwater.

Marsh
A wetland that is usually submerged in shallow water and whose vegetation is dominated by herbs.

Maximum contaminant level, MCL
The greatest amount of a contaminant that can be present in water without causing a risk to its intended use, the maximum level of a contaminant allowed in water to maintain aquatic life, to minimize pollution, to permit recreation or allow the water to be used as a drinking water source, (see contact recreation, non-contact recreation).

MCL, Maximum contaminant level
The greatest amount of a contaminant that can be present in water without causing a risk to its intended use, the maximum level of a contaminant allowed in water to maintain aquatic life, to minimize pollution, to permit recreation or allow the water to be used as a drinking water source, (see contact recreation, non-contact recreation).
Meiosis
The process of cell division which separates the pair of complementary chromosomes to produce eggs and sperm with only one set of chromosomes each.

Metalloid
Resembling a metal, or having chemical properties similar to metals.

Methylation
The process whereby a compound is modified chemically, often through bacterial action, by the replacement of a hydrogen atom by a methyl group, -CH₃.

Mg/L, Milligrams per litre
A concentration unit of chemical constituents in solution, the weight of solute per unit volume of solvent, usually water, this measure is equivalent to parts per million or ppm.

Micrograms per litre, µ/L
A concentration unit of chemical constituents in solution; the weight of solute per unit volume of solvent, usually water, one thousand micrograms per liter is equivalent to 1 milligram per litre, this measure is equivalent to parts per billion or ppb.

Micron, µ
A quantitative measure of thickness equal to one millionth of a meter, one thousandth of a millimeter, one ppm.

Milligrams per litre, Mg/L
A concentration unit of chemical constituents in solution, the weight of solute per unit volume of solvent, usually water, this measure is equivalent to parts per million or ppm.

Mitochondria
The organelles in eukaryotic cells that carry out terminal respiration, specialized structures that carry out respiration and store energy.

Mollusca
An organism in the invertebrate Phylum Mollusca, a major group of marine, aquatic and terrestrial animals which are soft bodied and usually have a hard shell, examples are clams, mussels, snails, octopus and squid.

Monitoring
To check, measure or examine water quality over a period of time to note any changes which may occur.

Most Probable Number, MPN
The statistically determined number that represents the number of individual bacteria most likely to have been present in a given sample, measurement of fecal coliform indicator bacteria based on gas production in tubes, alternative to the standard fecal coliform test involving filtration and culture on disk media.
**MPN, Most Probable Number**
The statistically determined number that represents the number of individual *bacteria* most likely to have been present in a given *sample*, measurement of *fecal coliform indicator bacteria* based on gas production in tubes, alternative to the standard *fecal coliform* test involving *filtration* and culture on disk media.

**Municipal sewage**
*Sewage* from a community which may be composed of *domestic sewage, industrial wastes* or both.

**Muscle**
*Tissue* consisting of cells which are highly contractile, most of the edible portions of animal flesh is *muscle*.

**Muskeg**
*A wetland* or *peatland* such as a *fen* or *bog* that accumulates peat and whose vegetation is dominated by sphagnum moss and small shrubs or herbs.

**Nekton**
*Aquatic* animals in the *water column* with sufficient powers of locomotion to overcome currents and go where they want under their own power as opposed to the *plankton* which, although some are motile, are at the mercy of water currents, fish are examples of the *nekton*.

**Nephelometric turbidity unit, NTU**
The unit of measure for the *turbidity* of water, a measure of the cloudiness of water as measured by a nephelometer, based on the amount of light that is reflected off particles in the water.

**Non-consumptive use**
Using water in a way that does not reduce the immediate supply such as hunting, fishing, boating, water-skiing, swimming and some power production, (see *consumptive use*).

**Non-contact recreation**
Recreational pursuits not involving a significant risk of water ingestion, including fishing, commercial and recreational boating, and limited body contact incidental to shoreline activity, (see *contact recreation*).

**Non-filterable residue**
Solids that are not in true *solution* and that can be removed by *filtration* they usually contribute directly to *turbidity*, small particles of solid *pollutants* that resist separation by conventional methods; operationally greater than 0.45 microns in size; also known as *suspended solids*, *suspended matter* or *suspended sediment*. 
Non-point Source Pollution, NPS
Constituents in water, including pollutants, originating from diffuse, land-based sources and generally transported in runoff from precipitation, pollution discharged over a wide land area, not from one specific location, diffuse pollution caused by sediment, nutrients, organic and toxic substances originating from land-use activities, which are carried to lakes and streams by surface runoff, contamination that occurs when rainwater, snowmelt or irrigation washes off plowed fields, city streets or suburban backyards. As this runoff moves across the land surface, it picks up soil particles and pollutants, such as nutrients and pesticides, source of pollution in which wastes are not released at one specific, identifiable point but from a number of points that are spread out and difficult to identify and control, (see point source pollution).

Non-porous
A material which does not allow water to pass through it, (see porous).

Non-potable
Not suitable for drinking due to toxins, pathogens or aesthetics, (see potable).

NTU, Nephelometric turbidity unit
The unit of measure for the turbidity of water, a measure of the cloudiness of water as measured by a nephelometer, based on the amount of light that is reflected off particles in the water.

Nutrient
A substance, element or compound, necessary for the growth, development and reproduction of plants and animals, as a pollutant any element or compound, such as phosphorus or nitrogen that encourages abnormally high organic growth in ecosystems, (see eutrophic).

Nutrient cycle
Chemical transformations of nitrogen, phosphorus, silica and other essential elements in continuous cycles between organic and living systems and inorganic and non-living phases in an ecosystem as organisms grow and die.

Ocean
The large, permanent body of saline water surrounding the continents and covering most of the surface of the earth.

Oligochaetes
Primarily fresh water or terrestrial hermaphroditic annelid worms that lack a distinctive head segment, (see worms, polychaetes).

Oligotrophic
Having a low supply of nutrients and thus a low productivity or biomass, (see eutrophic).
**Organelles**

The structures in **eukaryotic** cells, notably **chloroplasts** and **mitochondria**, specialized structures that carry out respiration, **photosynthesis** and other functions in the cell.

**Organic chemicals or compounds**

Usually chemicals or compounds which contain carbon atoms; usually chains of carbon atoms connected directly to each other, chemicals containing carbon, **organic** matter, plant and animal residues, or substances made by living organisms.

**Organic contaminants**

**Organic chemicals** which are **toxic** to organisms; they may be persistent and mobile in the environment.

**Osmosis**

The movement of water molecules through a thin membrane while leaving the **dissolved salts** behind, the process occurs in our bodies and is also a technical and commercial method of removing **salts** from **saline** water.

**Outfall**

The end of the pipe leading from a **sewage** treatment plant which delivers the **wastewater** to the environment, often via a **diffuser**, the **discharge** point for a **wastewater flow**, for example from a **sewage** treatment plant or refinery, the place where a **wastewater** treatment plant **discharges** treated water into the environment, the place where a **sewer**, drain, or **stream** **discharges**, the outlet or structure through which reclaimed water or treated **effluent** is finally **discharged** to a receiving water body.

**Oviparous**

Fish and other organisms that produce **eggs** which hatch externally, **fertilization** may be internal or external, the **fertilized eggs** are self-contained and receive no **nutrients** from the mother.

**Ovoviviparous**

Fish and other organisms that produce **eggs** which hatch internally, **fertilization** is internal, the **fertilized eggs** are self-contained and receive no further **nutrients** from the mother.

**Oxidation**

Literally — combining with oxygen, chemically — transfer of electrons in a chemical reaction.

**Oxygen demand**

The need for molecular oxygen to meet the needs of biological and chemical processes in water, even though very little oxygen will **dissolve** in water, it is extremely important in biological and chemical processes, (see **BOD, biochemical oxygen demand**).
PAHs, Polycyclic aromatic hydrocarbons
A family of organic compounds with several linked aromatic rings in their structure which are derived from the combustion of fossil fuels, the higher molecular weight PAHs are an environmental concern due to their bioaccumulation in organisms and their toxic and carcinogenic activity.

Palustrine
Relating to a freshwater environment, such as a marsh, fen, lake, pond, river, bog or swamp.

Parasite, parasitic
Organisms that are pathogens and are obliged to live on or in other organisms, often causing disease or death.

Particulate
Consisting of many small individual particles, not dissolved.

Pathogen
An organism, generally a microorganism, causing, or capable of causing, disease or death, a disease-producing agent, usually applied to a living organism, any worms, protozoans, viruses, bacteria or fungi that cause disease.

Pathogenic
Causing, or capable of causing, disease or death, generally applied to microorganisms.

PCBs, Polychlorinated biphenyls
Man-made liquid chemicals that are stable, non-corroding, fire resistant, toxic and relatively non-biodegradable, once used in electrical transformers because of these properties and in paint, composed of two joined phenol molecules that have chlorine atoms replacing many of the hydrogen atoms, frequently found in industrial wastes, and subsequently in surface water and ground waters, accumulate in the environment, particularly in the sediment where they can remain indefinitely, virtually banned in 1979 but continuing to appear in the flesh of fish and other animals.

Peak flow
The maximum instantaneous discharge of a stream or river at a given location, usually occurs at or near the time of maximum height.

Peatland
A wetland such as a fen or bog that accumulates peat and whose vegetation is dominated by sphagnum moss and small herbs.

Pelecypoda
Bivalves, class of aquatic molluscs with two shells.

Percolation
The movement of water through the subsurface soil layers, usually continuing downward to the ground water or water table, the oozing or soaking of water through the soil, the movement
of water through the openings in rock or soil, the entrance of a portion of the streamflow into the channel materials to contribute to ground water replenishment.

**Periphyton**
Organisms attached to and growing on structures, sediments or organisms submerged in water.

**Permeability**
The ability of a water bearing material to transmit water, measured by the quantity of water passing through a unit cross section, in a unit time, the ability of a material to allow the passage of a liquid, such as water through rocks, materials, such as gravel and sand, allow water to move quickly through them, whereas impermeable materials, such as clay, do not allow water to flow freely.

**pH**
The numeric value which is the negative reciprocal of the logarithm, in base 10, of the hydrogen ion concentration in moles per litre, a quantitative expression for the amount of acidity or alkalinity of a solution, the scale ranges from 0 to 14, where pH 7 is neutral, less than 7 is acid, more than 7 is alkaline or basic, numeric value that describes the intensity of the acid or basic, alkaline, conditions of a solution.

**Phenol**
A benzene ring with one of the hydrogens replaced by a hydroxyl or -OH group.

**Photic zone**
The upper portion of the water column which admits sufficient light for photosynthesis, the photic zone is reduced with increased turbidity.

**Photosynthesis**
The process by which the chlorophyll-bearing cells of green plants, in the presence of light, convert carbon dioxide and water into sugar, an organic compound, with the evolution of oxygen, incorporation of solar energy into carbon compounds by green plants, ultimately providing energy and oxygen for the vast majority of life on earth.

**Phytoplankton**
The photosynthetic portion, primarily algae, of the free-floating community of small, mostly microscopic, organisms in water, collectively called plankton.

**Plankton**
The total free-floating community of small, mostly microscopic, organisms in water, some are motile but all are at the mercy of water currents, (see nekton).

**Planktonic**
Drifting unattached in water, the plankton include both plants and animals ranging from microscopic to macroscopic.

**Plume**
A portion of a water body which is distinguishable from the remainder because it is not completely mixed and its characteristics are measurably different, generally downstream
from the junction of another stream of water from a tributary or waste discharge, the area taken up by contaminants in an aquifer.

Poikilothermic
Animals which do not automatically control their own body temperature at some fixed value, cold-blooded animals, their body temperature is controlled by ambient conditions or by behaviour, (see homeothermic).

Point source pollution
Source of pollution that involves discharge of wastes from an identifiable point, such as a smokestack or sewage treatment plant, water pollution coming from a single point, such as a sewage outflow pipe, (see non-point source pollution).

Pollutant
Waste material which causes harm to organisms directly or to their environment.

Pollution
Causing the release of a pollutant into the environment, harmful or undesirable changes in the physical, chemical, or biological characteristics of the air, water or land that may affect the health, survival or activities of human or other living organisms, degradation of the environment by a substance or condition to such a degree that the environment fails to meet specified standards or cannot be used for a specific purpose.

Polychaetes
Primarily marine annelid worms with paired segmental appendages, separate sexes and free-swimming trochophore larvae, worms of the Class Polychaeta of the invertebrate worm order Annelida, dominant in marine benthos, highly diversified, ranging from detritivores to predators, some species serving as good indicators of environmental stress, (see oligochaetes).

Polychlorinated biphenyls, PCBs
Man-made liquid chemicals that are stable, non-corroding, fire resistant, toxic and relatively non-biodegradable, once used in electrical transformers because of these properties and in paint, composed of two joined phenol molecules that have chlorine atoms replacing many of the hydrogen atoms, frequently found in industrial wastes, and subsequently in surface water and ground waters, accumulate in the environment, particularly in the sediment where they can remain indefinitely, virtually banned in 1979 but continuing to appear in the flesh of fish and other animals.

Polycyclic aromatic hydrocarbons, PAHs
A family of organic compounds with several linked aromatic rings in their structure which are derived from the combustion of fossil fuels, the higher molecular weight PAHs are an environmental concern due to their bioaccumulation in organisms and their toxic and carcinogenic activity.

Pond
A relatively small, sometimes ephemeral or seasonal, inland body of fresh water occupying a basin or hollow in the earth's surface.
**Pore water**
The water found in the interstices of submerged *sediments*, the basis of some types of *toxicity* testing, since it is pore water to which benthic organisms are exposed.

**Porosity**
A measure of the water-bearing capacity of subsurface rock, with respect to water movement, it is not just the total magnitude of porosity that is important, but the size of the voids and the extent to which they are interconnected, as the *pores* in a formation may be open and interconnected, or closed and isolated, clay may have a very high porosity with respect to potential water content, but it constitutes a poor *flow* medium as an *aquifer* because the *pores* are usually so small.

**Porous**
A material which allows water to pass through it, (see *nonporous*).

**Potable**
Water that is *toxicologically* and *pathologically* safe and *aesthetically* fit to drink, (see *non-potable*).

**ppb**
A *concentration* unit of chemical constituents in *solution*; the weight of *solute* per unit volume of *solvent*, usually water, one thousand micrograms per liter is equivalent to 1 milligram per litre, this measure is equivalent to parts per billion.

**ppm**
A *concentration* unit of chemical constituents in *solution*; the weight of *solute* per unit volume of *solvent*, usually water, one thousand milligrams per liter is equivalent to 1 gram per litre, this measure is equivalent to parts per million.

**ppt**
A *concentration* unit of chemical constituents in *solution*; the weight of *solute* per unit volume of *solvent*, usually applied to *marine*, *brackish* or *saline water*, this measure is equivalent to parts per thousand.

**Precipitate**
A solid or particles which have come out of an *aqueous*, or other fluid, *solution*.

**Precipitation**
Water, normally in the form or rain, snow and hail, which falls from the atmosphere to the earth as part of the water cycle, the process whereby solids or particle come out of *solution*.

**Precision**
This is an indicator of how close a series of measured values come to each other, how tight is the cluster of values, regardless of whether or not the values are accurate or reflect the actual or true value, (see *accuracy*).

**Primary sewage treatment**
The first stage of the *wastewater* treatment process consisting of mechanical removal of
large settleable solids through filtering, screening and/or settling, primary sewage treatment is a mechanical treatment in which relatively large solids are removed from the sewage by settling out as sludge, mechanical methods, such as filters and scrapers, are used to remove pollutants, solid material in sewage also settles out in this process, (see secondary sewage treatment, tertiary sewage treatment).

Primary wastewater treatment

The first stage of the wastewater treatment process consisting of mechanical removal of large settleable solids through filtering, screening and/or settling, primary wastewater treatment is a mechanical treatment in which relatively large solids are removed from the sewage by settling out as sludge, mechanical methods, such as filters and scrapers, are used to remove pollutants, solid material in sewage also settles out in this process, (see secondary sewage treatment, tertiary sewage treatment).

Pristine

Describes a natural system, water for example, that has not been affected by anthropogenic pollution.

Productivity

The total amount of biological material produced over a defined time period, (see biomass, standing crop).

Profundal zone

The deep-water region of a lake that is not penetrated by sunlight.

Prokaryotic

Unicellular organisms with a bacteria-like cell structure, lacking a nucleus and some other eukaryotic organelles, they may have photosynthetic pigments but lack chloroplasts, the specialized photosynthetic organelles in higher plants, and mitochondria, (see eukaryotic).

Protozoan

Single-celled, nucleated, eukaryotic organisms, lacking cell walls, generally microscopic, some are photosynthetic.

Qualitative

Refers to what, which chemical or compound or identity regardless of how much, (see quantitative).

Quantitative

Refers to a measured value as how much, how fast, how deep, how many or what concentration, (see qualitative).
Receiving waters
A river, ocean, stream or other watercourse into which wastewater or treated effluent is discharged.

Recharge
Water entering an underground aquifer through faults, fractures or direct absorption, replenishing an aquifer.

Reclaimed wastewater
Treated wastewater that can be used for beneficial purposes, such as irrigating certain plants, domestic wastewater which has been treated to a quality suitable for a beneficial use.

Recycled
Using water or other materials more than once before returning it to the natural environment, wastes that are used for a beneficial purpose or made into new product rather than being landfilled or burned.

Recycled water
Water that is used more than once before it returns to the natural hydrologic system.

Red tide
Algal bloom involving dinoflagellate phytoplankton species, such as Gonyaulax monilata and Ptychodiscus brevis, which naturally manufacture biotoxins, can cause fish kills and several types of shellfish poisoning in people.

Reservoir
A natural or artificial basin for collecting and holding a supply of water, tanks, dammed areas, lakes or underground aquifers, where water is collected and used for water storage, regulation and control, large bodies of ground water are called ground water reservoirs, water behind a dam is called a surface reservoir.

Residence time
The period of time water is retained in a reservoir, bay or other system, based upon flow rates into and out of the system, (see flushing).

Residual chlorine
The unreacted chlorine which remains in solution after the reactions with all the organic compounds present have occurred.

Return flow
That part of a diverted flow that is not consumptively used and is returned to its original source or to another body of water, drainage water from irrigated farmlands that re-enters the water system to be used further downstream, irrigation water that is applied to an area and which is not consumed in evaporation or transpiration and returns to a surface stream or aquifer.
Reverse osmosis, RO

A water treatment method whereby water is forced through a semi-permeable membrane which filters out impurities, similar in function to a kidney dialysis machine and used in most space programs and navy vessels to turn waste water into potable water, removing salts from water using a membrane, the product water passes through a fine membrane that the salts are unable to pass through, while the salt waste, brine is removed, method of water or wastewater treatment that relies on a semi-permeable membrane to separate waters from pollutants, an external force is used to reverse the normal osmotic process resulting in the solvent moving from a solution of higher concentration to one of lower concentration.

Riparian zone

A stream and all the vegetation on its banks out to the high water mark, associated with the bank of a watercourse, the woodlands bordering a river.

River

A relatively large and usually permanent flowing body of fresh water, in a defined channel.

Runoff

Surface flows of water entering rivers, lakes, the ocean or reservoirs, surface water entering rivers, fresh water lakes, or reservoirs, the portion of precipitation that is not absorbed into the soil, but flows into surface streams, that part of the precipitation or irrigation water that appears in uncontrolled surface streams, rivers, drains or sewers, direct runoff or base runoff, storm interflow or ground water runoff, total discharge during a specified period of time, the depth to which a drainage area would be covered if all of the runoff for a given period of time were uniformly distributed over it.

Saline

Waters having solute concentrations approaching or exceeding that of seawater, slightly saline water — from 1,000 ppm to 3,000 ppm, moderately saline water — from 3,000 ppm to 10,000 ppm, highly saline water — from 10,000 ppm to 35,000 ppm, water containing more than 1,000 parts per million of dissolved solids of any type, water that contains significant amounts of dissolved solids, water containing dissolved salts, such as the ocean, (see brine, fresh water).

Salinity

A quantitative measure of the solute concentration dissolved in water, usually measured as parts per thousand or ppt, amount of dissolved salts in a given volume of water, salt concentration in marine waters, ranging from zero to about 33 parts per thousand, ppt, in estuaries, does not have a precise chemical definition, since the proportions of various ions vary in the different waters of the world.

Salmonid

Fish of the family Salmonidae which includes trout, salmon and char.
Salt
The product formed when an acid and a base react.

Saltwater
The water in the ocean or a sea which has high salinity.

Sample
A small portion of water or other substance taken at a given place and time for analysis; it is assumed to be representative of the whole body of water or the rest of the substance within specified statistical limits (see grab sample, composite sample).

Sanitary sewer
A system of pipes, conduits and pumps used to convey sewage from its source generally to a treatment plant but also to a ground disposal site, the ocean, irrigation site, holding lagoon or a stream, conveys domestic and institutional sewage and blackwater and industrial wastewater, as opposed to stormwater.

Saprophyte, saprophytic
Organisms that do not manufacture their own food and use the organic matter of dead, decaying or decayed other organisms as a source of nutrients for growth.

Saturation
A measure of the proportion of the maximum amount of a gas, or solid, that can be dissolved in a liquid, usually water, at the specified temperature and pressure, alternatively a measure of the maximum amount of water, or other liquid, that can be absorbed or held in a porous medium, the condition of a liquid when it has taken into solution the maximum possible quantity of a given substance at a given temperature and pressure.

Screening
Passing sewage or wastewater through a coarse mesh to remove the larger particles, (see filtration).

Sea
The large, permanent body of salt water surrounding the continents and covering most of the surface of the earth or one of the smaller landlocked or nearly isolated bodies of salt water.

Secchi disc
An opaque, black and white disk lowered into water until the demarcation between the black and white portions is no longer visible, this secchi depth is a practical, traditional measurement of water clarity, and is correlated with turbidity and the depth of the biological photic zone.

Secondary sewage treatment
Includes primary sewage treatment and provides in addition conditions conducive to the biological oxidation of the remaining organic wastes, the second step in most waste treatment systems, in which bacteria break down the organic parts of sewage wastes, usually accomplished by bringing the sewage and bacteria together in trickling filters or in the activated sludge process, involving the biological process of reducing suspended, colloidal and dissolved organic matter in effluent from primary sewage
treatment systems and generally removing 80 to 95 percent of the Biochemical oxygen demand, BOD, and suspended matter, accomplished by biological or chemical-physical methods, removes floating and settleable solids and about 90 percent of the suspended solids, disinfection is the final stage of secondary treatment, (see primary sewage treatment, tertiary sewage treatment).

Secondary wastewater treatment
Includes primary sewage treatment and provides in addition conditions conducive to the biological oxidation of the remaining organic wastes, the second step in most waste treatment systems, in which bacteria break down the organic parts of sewage wastes, usually accomplished by bringing the sewage and bacteria together in trickling filters or in the activated sludge process, involving the biological process of reducing suspended, colloidal and dissolved organic matter in effluent from primary sewage treatment systems and generally removing 80 to 95 percent of the Biochemical oxygen demand, BOD, and suspended matter, accomplished by biological or chemical-physical methods, removes floating and settleable solids and about 90 percent of the suspended solids, disinfection is the final stage of secondary treatment, (see tertiary sewage treatment).

Sediment
Undissolved soil particles, sand and minerals washed from the land into aquatic systems as a result of natural and human activities, usually applied to material in suspension in water or recently deposited from suspension, all kinds of deposits from the waters of streams, lakes or seas.

Sedimentation
A large scale water treatment process where heavy solids settle to the bottom of the treatment tank by gravity after flocculation, the process by which solids suspended in water are allowed to settle to the bottom of a basin or container.

Sedimentation tanks
Wastewater tanks in which floating wastes are skimmed off and settled solids are removed for disposal.

Seepage
The slow movement of water through small cracks, pores and interstices of a material, into or out of a body of surface or subsurface water, the loss of water by infiltration into the soil from a canal, ditch, lateral, watercourse, reservoir, storage facility or other body of water, or from a field.

Separate sewer
A sewer system that carries only sanitary sewage or stormwater runoff, when sewers are constructed this way, wastewater sewage treatment plants do not have to be sized to handle stormwater flows avoiding overflows of untreated sewage, (see combined sewer).

Settleable solids
Suspended solids that will settle when the sewage, wastewater or any other water containing suspended material, is held static for a period of time, usually about two hours for sewage treatment.
Settling
Allowing sewage or wastewater to sit in a holding basin for a period of time while the larger and heavier particles settle to the bottom before the liquid with its solutes and some smaller particulates is sent for further treatment or directly to the environment.

Sewage
Primarily feces, kitchen waste and wash water but usually with other organic and inorganic materials present.

Sewage treatment
The complete sewage treatment process typically involves a three-phase process, in the primary sewage treatment process, which incorporates physical aspects, untreated water is passed through a series of screens to remove solid wastes, in the secondary sewage treatment process, typically involving biological and chemical processes, screened sewage is then passed a series of holding and aeration tanks and ponds, the tertiary sewage treatment process consists of flocculation basins, clarifiers, filters and chlorine basins or ozone or ultraviolet radiation processes.

Sewage treatment plant
A facility designed to receive the wastewater from domestic sources and to remove materials that damage water quality and threaten public health and safety when discharged into receiving streams or bodies of water, removes greases and fats, solids from human waste and other sources, dissolved pollutants from human waste and decomposition products, and dangerous microorganisms, facilities employ a combination of mechanical removal steps and bacterial decomposition to achieve these results, chlorine is often added to discharge from the plants to reduce the danger of spreading disease by the release of pathogenic bacteria.

Sewer
A system of pipes, conduits and pumps used to convey sewage from its source generally to a treatment plant but also to a ground disposal site, the ocean, irrigation site, holding lagoon or a stream.

Side channel
A slow moving body of water usually with two ends open to the main water body.

Site specific
Limited to the particular site or location under discussion.

Siltation
The accumulation of sediments transported by water, the deposition of finely divided soil and rock particles on the bottom of stream and river beds and lakes and reservoirs.

Slough
A slow moving body of water usually with one end open to the main water body.

Sludge
Solid matter that settles to the bottom of sedimentation tanks in a sewage treatment plant and must be disposed of by digestion or other methods or recycled to the land.
Solute
Any solid material that is dissolved in a liquid which is the solvent.

Solution
The mixture of dissolved material, the solute and the liquid solvent.

Solvent
The liquid, usually water, in which solutes are dissolved, a substance that dissolves other substances, thus forming a solution.

Sorbed
A general term for the results of the process of absorption and adsorption, often used to denote that either or both have occurred.

Sorption
A general term for the process of absorption and adsorption, often used to denote the occurrence of both.

Spatial
Of or relating to space.

Spawning
Term used to denote the process where fish, and other water dwelling organisms, deposit and fertilize eggs during reproduction.

Specific conductance
A quantitative measure of the ability of a water to conduct an electrical current, related to the type and concentration of ions in solution and can be used for approximating the total dissolved solids concentration in water, one can monitor electrical conductivity quickly in the field and estimate total dissolved solids or TDS without doing any lab tests at all using handheld testers, expressed in units of dissolved conductance, Siemens per centimeter at 25 degrees Celsius, used in ground water monitoring as an indicator of the presence of ions of chemical substances that may have been released by a leaking landfill or other waste storage or disposal facility.

Specific gravity
The density of a material related to that of water whose specific gravity is defined as one.

Sperm
A small motile gamete produced by the male organism which contains one haploid set of chromosomes and swims to the egg to bring about fertilization.

Standing crop
The total amount of biological material present at any given time, (see productivity, biomass).
**Stomata**  
The small pores in the epidermis of plants, usually in the leaves, through which atmospheric gas and water exchange takes place and is controlled.

**Storm drain**  
A drainage system designed for stormwater which is surface runoff from streets and other impervious surfaces associated with urbanization or other anthropogenic activities and distinct from the sewage system, a sewer that carries only surface runoff, street wash and snow melt from the land, storm drains are completely separate from those that carry domestic and commercial wastewater, (see sanitary sewers).

**Storm sewer**  
A drainage system designed for stormwater which is surface runoff from streets and other impervious surfaces associated with urbanization or other anthropogenic activities and distinct from the sewage system, a sewer that carries only surface runoff, street wash and snow melt from the land, storm sewers are completely separate from those that carry domestic and commercial wastewater, (see sanitary sewers).

**Stormwater**  
Water which is primarily surface runoff from streets and other impervious surfaces associated with urbanization or other anthropogenic activities.

**Stormwater discharge**  
Precipitation that does not infiltrate into the ground due to impervious land surfaces, or evaporate, but instead flows onto adjacent land or water areas and/or is routed into storm drain or sewer systems.

**Stratification**  
Vertical separation of water masses into layers with different characteristics, dense salt water intruding under fresh water in a navigation channel can establish salinity stratification, temperature differences in fresh water can form distinct water layers separated by density, (see epilimnion, thermocline, hypolimnion, specific gravity).

**Stream**  
A relatively small and sometime ephemeral or seasonal flowing body of fresh water, in a defined channel.

**Stream improvement**  
One or more works, situated in or near a stream, relating to diversion, storing, measuring, conserving, conveying, retarding, confining or using water from the stream.

**Sublethal**  
Involves an effect that does not cause death of the organism.

**Sublimation**  
The change of state from a solid directly to a gas, (see evaporation, condensation, vapourization, transpiration).
Supersaturation
A concentration of a gas in water above the equilibrium concentration, this occurs when the gas enters solution more quickly than it can be released from the liquid to gas phase as in extremely high rates of plankton photosynthesis or in the tail races of dams and under waterfalls where air is entrained.

Surface microlayer
The immediate surface of the water only microns thick, important as the interface for atmosphere and water equilibrium processes, the location of highest concentration of hydrophobic pollutants like oil, and the location of floating marine eggs and other biological larval forms.

Surface water
Water that flows in streams and rivers and in natural lake and ponds, in wetlands and in reservoirs constructed by humans but on the surface of the land and not underground, water on the surface on the earth, as distinguished from ground water.

Survey
A general overview study of a problem or area, not too specific or localized.

Suspended matter
Solids that are not in true solution and that can be removed by filtration they usually contribute directly to turbidity, small particles of solid pollutants that resist separation by conventional methods; operationally greater than 0.45 microns in size; also known as non-filterable residue, suspended solids or suspended sediment.

Suspended metals or substances
Metals or substances attached to suspended solids.

Suspended sediment
Very fine soil particles that remain in suspension in water for a considerable period of time due to the upward components of turbulence and currents, can be removed by filtration and contribute to turbidity.

Swamp
A wetland that is permanently or seasonally submerged in shallow water and whose vegetation is dominated by shrubs and trees.
**Synergism**
Combined activity such that the effect is either the additive of separate effects or greater than the sum of the separate effects.

**TDS, total dissolved solids**
A quantitative measure of the total dissolved organic and inorganic solids concentration in water, an indicator test used for water analysis and also a measure of the mineral content of bottled water and ground water, one can monitor electrical conductivity quickly in the field and estimate total dissolved solids or TDS without doing any lab tests at all using hand-held testers since there is a relationship between TDS and conductivity, sum of all dissolved materials such as salts, which are non-filterable and remain following evaporation of the water, (see specific conductance).

**Temporal**
Of, or relating to, time.

**Tertiary sewage treatment**
A third step in sewage treatment usually directed towards greatly increasing the removal efficiency of nutrients, removal from wastewater of traces of organic chemicals and dissolved solids that remain after primary sewage treatment and secondary sewage treatment, selected biological, physical, and chemical separation processes to remove organic and inorganic substances that resist conventional treatment practices, consists of flocculation basins, clarifiers, filters and chlorine basins or ozone and ultraviolet radiation processes, the additional treatment of effluent beyond that of primary and secondary sewage treatment methods to obtain a very high quality of effluent.

**Tertiary wastewater treatment**
A third step in sewage treatment usually directed towards greatly increasing the removal efficiency of nutrients, removal from wastewater of traces of organic chemicals and dissolved solids that remain after primary sewage treatment and secondary sewage treatment, selected biological, physical, and chemical separation processes to remove organic and inorganic substances that resist conventional treatment practices, consists of flocculation basins, clarifiers, filters and chlorine basins or ozone and ultraviolet radiation processes, the additional treatment of effluent beyond that of primary and secondary sewage treatment methods to obtain a very high quality of effluent.

**Thermal pollution**
An increase in air or water temperature that harms the climate or ecology of an area, a reduction in water quality caused by increasing its temperature, often due to disposal of waste heat from industrial or power generation processes.

**Thermocline**
The fairly thin zone in a lake that separates the upper warmer zone, epilimnion, from the lower colder zone, hypolimnion.
Tissue
A group of cells of similar structure and function which perform a specific task in an organism.

TOC, Total organic carbon
Sum of all organic carbon compounds in water.

Total dissolved solids, TDS
A quantitative measure of the total dissolved organic and inorganic solids concentration in water, an indicator test used for water analysis and also a measure of the mineral content of bottled water and ground water, one can monitor electrical conductivity quickly in the field and estimate total dissolved solids or TDS without doing any lab tests at all using hand-held testers since there is a relationship between TDS and conductivity, sum of all dissolved materials such as salts, which are non-filterable and remain following evaporation of the water, (see specific conductance).

Total metals or substances
A quantitative measure of the metals or substances both in the dissolved state and those sorbed to particulate matter in suspension.

Total organic carbon, TOC
Sum of all organic carbon compounds in water.

Total suspended solids, TSS
The total suspended solids in water removable with a 0.45 micrometer mesh filter.

Toxic
Poisonous or harmful.

Toxicant
An element or compound with a harmful or lethal effect on the physiology, behaviour, reproduction or survival of an organism.

Toxicity
A measure of how poisonous a toxin is to an organism.

Toxicity test
A bioassay to determine the toxicity of a chemical or an effluent using living organisms, a toxicity test measures the degree of response of an exposed test organism to a specified concentration of chemical or effluent sample, living organisms are subjected to varying dilutions of polluted water or water containing known amounts of presumed or known toxins or contaminated sediment, mortality, declines in reproductive rates or behavioral changes indicate a toxic response.

Toxin
A compound or element which is toxic or poisonous in common usage. More strictly a toxin is a natural toxicant made by an organism as opposed to poisons manufactured by man.
Transpiration
The loss of water into the atmosphere from living plants, direct transfer of water from the leaves of living plants to the atmosphere, the passage of water vapour from a living body through membranes or pores, process by which water that is absorbed by plants, usually through the roots, is evaporated into the atmosphere from the plant surface, such as leaf pores or stomata, (see evapotranspiration, vapourization, evaporation.)

Tributary
A smaller stream which joins a larger stream, usually, a number of smaller tributaries merge to form a river.

Trihalomethanes
Chlorinated organic chemicals which are formed when water containing organic materials is disinfected with chlorine, these compounds are toxic.

Trochophore
Free-swimming ciliate larvae of marine polychaete worms and other invertebrates.

Trophic
Related to nutrition, referring to one of the hierarchal levels in the food web or food chain between the many producers at the bottom and the few predators at the top.

TSS, Total suspended solids
The total suspended solids in water removable with a 0.45 micrometer mesh filter.

Turbid
Coloured or opaque due to matter in suspension, rivers and lakes may become turbid after a rainfall due to erosion and surface runoff containing particulate matter, there is sufficient material in suspension that visibility is decreased.

Turbidity
The relative lack of clarity or cloudiness, of water, caused by suspended material, sediments, colored materials in solution and plankton, correlates, inversely, with available light for photosynthesis, the quantity of solid particles that are suspended in water and that cause light rays passing through the water to scatter, turbidity makes the water opaque in extreme cases, measured in nephelometric turbidity units, NTU.

μ/L, Micrograms per litre
A concentration unit of chemical constituents in solution; the weight of solute per unit volume of solvent, usually water, one thousand micrograms per litre is equivalent to 1 milligram per litre, this measure is equivalent to parts per billion or ppb.
Unsaturated zone
The zone immediately below the land surface where the soil pores contain both water and air, the soil is not totally saturated with water, (see aquifer where the pores are saturated with water).

Vapourization
The change of state from a liquid to a gas, the change by which any substance is converted from a liquid state and carried off as a vapor, the process of liquid water becoming water vapor from water surfaces, land surfaces and snow fields, (see condensation, sublimation, evaporation, transpiration, evapotranspiration).

Virus
Small non-cellular parasitic organisms consisting of little more than DNA, or RNA in a protein coat, often crystalline, dependent completely on the cellular machinery of their hosts to complete their life cycle and reproduce.

Volatilization
The change of state from a liquid to a gas, the change by which any substance is converted from a liquid state and carried off as a vapor, the process of liquid water becoming water vapor from water surfaces, land surfaces and snow fields, volatilization, (see condensation, sublimation, vapourization, transpiration, evapotranspiration, evaporation).

Waste
Refuse or other unwanted material.

Waste discharge
A pipe or ditch containing wastewater which empties into a water course.

Wastewater
Water with waste materials or pollutants dissolved in it, containing waste including greywater, blackwater or water contaminated by contact with waste, including process-generated and contaminated rainfall runoff, water that has been used in homes, industries and businesses that is not suitable for reuse unless it is treated.

Wastewater treatment
The complete wastewater treatment process typically involves a three-phase process, in the primary wastewater treatment process, which incorporates physical aspects, untreated water is passed through a series of screens to remove solid wastes, in the secondary
wastewater treatment process, typically involving biological and chemical processes, screened wastewater is then passed a series of holding and aeration tanks and ponds, the tertiary wastewater treatment process consists of flocculation basins, clarifiers, filters and chlorine basins or ozone and ultraviolet radiation processes.

Water column
The portion of an aquatic or marine environment extending from the water surface to the bottom or the surface of the sediment.

Water cycle
The natural pathway water follows as it changes between liquid, solid and gaseous states, biogeochemical cycle that moves and recycles water in various forms through the ecosphere, the circuit of water movement from the oceans to the atmosphere and to the Earth and back to the atmosphere through various stages or processes such as precipitation, interception, runoff, infiltration, percolation, storage, evaporation and transportation, (see hydrologic cycle).

Water pollution
Degradation of a body of water by a substance or condition to such a degree that the water fails to meet specified standards or cannot be used for a specific purpose.

Water quality
A term used to describe the chemical, physical and biological characteristics of water, usually in respect to its suitability for a particular purpose.

Water quality criteria
Scientifically derived ambient numerical values for physical, chemical or biological characteristics of water, biota or sediment which must not be exceeded to prevent specified detrimental effects from occurring to water uses, recommended concentrations, levels or narrative statements that should not be exceeded in order to protect the life or health of organisms.

Water quality guideline
Numerical concentration or narrative statement recommended to support and maintain a designated water use.

Water quality objective
A water quality criterion or water quality guideline adapted to protect the most sensitive designated water use at a specific location with an adequate degree of safety, taking local circumstances into account.

Water quality standard
Law or regulation that consists of the designated use or uses of a waterbody or a segment of a waterbody and the water quality criteria that are necessary to protect the use or uses of that particular waterbody.

Water table
The level below the surface of the earth at which the ground becomes saturated with water, the
surface of an unconfined aquifer which fluctuates due to seasonal precipitation, the top of the water surface in the saturated part of an aquifer.

Water treatment
A method of cleaning water for a specific purpose, such as drinking water, irrigation water or discharge to a stream.

Water use
Water that is used for a specific purpose, such as for domestic use, irrigation, or industrial processing, associated with human influence on the hydrologic cycle, includes water withdrawal from surface water and ground water sources, water delivery to homes and businesses, consumptive use of water, water released from wastewater treatment plants, water returned to the environment and in-stream uses, such as using water to produce hydroelectric power or for navigation.

Watershed
The land area where precipitation runs off into streams, rivers, lakes and reservoirs, a land feature that can be identified by tracing a line along the highest elevations between two areas on a map, often a ridge, large drainage basins contain many smaller drainage sub-basins, land area drained by a river or stream, the natural hydrologic unit associated with numerous ecological and physical processes involving water, the most appropriate geographic unit for management of water quality, (see drainage basin).

Well
An artificial excavation, by any method, for the purposes of withdrawing water from the underground aquifer, a bored, drilled, or driven shaft, or a dug hole whose depth is greater than the largest surface dimension and whose purpose is to reach underground water supplies or oil, or to store or bury fluids below ground.

Wetland
Area that is regularly wet or flooded and has a water table that stands at or above the land surface for at least part of the year, an area where saturation with water is the dominant influence on soil parameters and on composition of the plant community, a bog, pond, fen, estuary, swamp, peatland or marsh.

Whole-effluent toxicity
The aggregate toxic effect of an effluent measured directly by a toxicity test.

Withdrawal
Water removed from a ground water or surface water source for anthropogenic use.

Worm
Multicellular invertebrate organisms in several different Phyla which are soft-bodied, elongate and often parasitic or pathogenic.
**Xerophytic**
Refers to plants, generally, that are able to grow under very arid conditions where water is scarce, physiological and morphological adaptations to allow growth under arid conditions.

**Xeroscaping**
Planting vegetation that requires very little water.

---

**Y**

**Yield**
A quantitative measure of how much water can be pumped from a well, for example, either in absolute units or as a percentage of what is actually present in the aquifer, expressed as an amount per unit of time or as an instantaneous, continuous withdrawal rate, the various values will differ depending upon the recharge rate of the aquifer, the increase in biomass or productivity over a season which is not necessarily reflected in the instantaneous standing crop.

---

**Z**

**Zooplankton**
Primarily microscopic animals which swim freely in the water column or are carried about by water currents, many feed on phytoplankton and are in turn a staple diet of small fish.

**Zygote**
The diploid union of haploid sperm and haploid egg, the start of the next generation.