Glossary Of Water Quality And Water Resource Conservation Terms

abandoned well - An unused well. An easy route for direct contamination of groundwater.

absorption - To take up or receive as the movement of a chemical into a plant.

absorption system - A subsurface leaching system in which wastewater is piped to an underground field and allowed to seep down through the soil.

accelerated erosion - A rapid type of soil erosion that is induced by human activities, in contrast to the relatively slow processes of geological erosion.

acceptable daily intake - The daily dose of a substance that a person can ingest over a lifetime without suffering any adverse health effects. Used to set drinking water standards.

acid rain - Rain with a higher than normal acid range (pH lower than 5.6). Caused by the release of oxides of sulfur and nitrogen into the atmosphere. Can accelerate corrosion and make lakes devoid of fish.

action level - The concentration of lead or copper in water specified by the U.S. EPA as being acceptable for long-term consumption. The action level for copper is 1.3 milligrams per liter and the action level for lead is 0.015 milligrams per liter. If concentrations in pubic water facilities exceed these action levels, then the utilities must alter their treatment until copper and lead concentrations fall below the action levels.

activated alumina - An adsorption medium that reduces the concentration of fluoride, arsenic, lead, selenium, and chromium in water. Activated alumina is formed when aluminum hydroxide is dehydrated at a high temperature and then ground and screened. Now used in home water treatment devices.

activated carbon - An adsorption medium that reduces the concentration of some organic chemicals, radon, odor, tastes, and smells in water. Now used in home water treatment devices.

activated sludge - The solid organic waste that has been intensively aerated and "seeded" with bacteria (in a secondary or tertiary sewage-treatment process) to promote rapid bacterial decomposition.

adsorption - To gather a gas, liquid, or dissolved substance on a surface, such as adhesion of ions from an aqueous solution to mineral surfaces in soil.

aeration - A water treatment process that brings air into intimate contact with water, usually by spraying water into air or by bubbling air through water. Aeration increases the rate at which volatile organic chemicals (VOCs), radon, and other dissolved gases move from water to air.

aerobic - Living or occurring only under the presence of oxygen.

aesthetic - Refers to water characteristics such as taste, odor, color, and appearance that reduce the quality of drinking water but do not necessarily result in adverse health effects.

agricultural land - Land in farms regularly used for agricultural production. The term includes all land devoted to crop or livestock enterprises; for example, the farmstead lands, drainage and irrigation ditches, water supply, cropland, and grazing land of every kind in farms.

agronomic practices - The soil and crop activities employed in the production of farm crops, such as selecting seed, seedbed preparation, fertilizing, liming, manuring, seeding, cultivation, harvesting, curing, crop sequence, crop rotations, cover crops, strip-cropping, pasture development, etc.

algae - Simple rootless microscopic plants that grow in bodies of water in relative proportion to the amount of nutrients available. Certain types of algae, particularly blue-green forms, can grow so profusely as to become nuisances in nutrient-rich lakes.

algal bloom - A sudden excessive growth of algae that can affect water quality adversely. The large floating masses are called blooms. These blooms are characteristic of what is called a eutrophic lake.

American Rule - A groundwater doctrine which holds that an overlying property owner has the right to use only a reasonable amount of groundwater.

ammonification - The process by which the bacteria of decay convert complex nitrogenous compounds occurring in animal carcasses and the excretions of animals, as well as the dead bodies of plants, into relatively simple ammonia (NH_3).

ammonium fixation - The adsorption or absorption of ammonium ions (NH_4^+) by the mineral or organic fractions of the soil in a manner that they are relatively insoluble in water and relatively unexchangeable by the usual methods of cation exchange.

anaerobic - Able to live or occur in oxygen-free conditions.

animal unit - A measure of livestock numbers based on the equivalent of a mature cow (approximately 1,000 pounds live weight). Animal units can be calculated

by multiplying slaughter and feeder cattle by 1.0, mature dairy cattle by 1.4, swine over 55 pounds by 0.4, sheep by 0.1, horses by 2, turkeys by 0.18, and chickens by 0.01.

anion - A negatively charged ion such as chloride (Cl^-), fluoride (Fl^-) or nitrate (NO_3^-). See also **cation.**

anion exchange - A water treatment process in which objectionable anions such as nitrate are removed from water and replaced with less objectionable anions such as chloride. See also **cation exchange.**

anti-backflow (anti-backsiphoning) device - A check valve or other mechanical device to prevent unwanted reverse flow of liquids back down a water supply pipe into a well.

application rate - Rate that material is applied to a given area.

aquatic life - All the living forms in water, ranging from bacteria to fish and rooted plants. Also included in this group are insect larva and zooplankton.

aquiclude - A low-permeability unit that forms either the upper or lower boundary of a groundwater flow system.

aquifer - A subterranean layer of porous water-bearing rock, gravel, or sand capable of storing and conveying water to wells and streams.

aquifer, aeolian - Aquifer in which groundwater is held in materials that were transported and deposited by wind.

aquifer, alluvial - Aquifer in which groundwater is held in sediments deposited by flowing water in rivers and streams along channels and floodplains, usually shallow and unconfined.

aquifer, anisotropic - Aquifer in which the magnitude of hydraulic conductivity varies with direction.

aquifer, artesian - An aquifer in which groundwater is held under pressure by a confining layer or layers of rock, forcing water to rise in wells above the top of the aquifer.

aquifer, confined - An aquifer overlaid by impermeable layers of rock or soil, which prevent free movement of air and water. Same as an artesian aquifer.

aquifer, isotropic - An aquifer in which the magnitude of hydraulic conductivity is equal in all directions.

aquifer, lacustrine - An aquifer in which groundwater is found in materials deposited in a lake environment.

aquifer, perched - A region in the normally unsaturated zone of soil that may be locally saturated with water because it overlies a low-permeability unit.

aquifer, semiconfined - An aquifer confined by a low-permeability layer that permits water to slowly flow through it. Also known as a leaky artesian or leaky confined aquifer.

aquifer, unconfined - An aquifer in which there is no confining beds between the zone of saturation and the surface. These aquifers have a water table and are usually found close to the surface.

aquifuge - An absolutely impermeable unit that will neither store nor transmit water.

aquitard - A low-permeability layer of rock or clay which can store water but transmits it very slowly from one aquifer to another.

arid - A term applied to regions or climates that lack sufficient moisture for crop production without irrigation. The limits of precipitation vary considerably according to temperature conditions, with an upper annual limit for cool regions of 10 inches or less and for tropical regions as much as 15 to 20 inches.

available nutrient - That portion of any element or compound in the soil that readily can be absorbed and assimilated by growing plants.

available water-holding capacity (soils) - The capacity to store water available for use by plants, usually expressed in linear depths of water per unit depth of soil. Commonly defined as the difference between the percentage of soil water at field capacity and the percentage at wilting point. This difference, multiplied by the bulk density and divided by 100, gives a value in surface inches of water per inch depth of soil. See field capacity.

backflow - The unwanted reverse flow of liquids in a piping system.

back pressure - The pressure that builds up on the treated side of a reverse osmosis membrane as the treated water storage tank fills. See also **reverse osmosis.**

backsiphonage - Backflow caused by formation of a vacuum in a water supply pipe.

backwash - To subject a filter, filter element, or filter bed to water flow in a direction opposite to the service flow. Backwashing reconditions the filter and flushes solid materials that have accumulated. A special solution is sometimes used to regenerate a filter medium. See also **regeneration.**

bacteria - Single-cell, microscopic organisms which often consume the organic constituents of sewage.

bacteria, coliform - A type of bacteria found in the digestive system and waste of humans and warm-blooded animals. They do not cause diseases, but their presence in water indicates that other disease-causing bacteria may be present as well.

baseflow - The groundwater contribution to stream flow.

best management practice (BMP) - A technique that is determined to be the most effective, practical means of preventing or reducing pollutants from nonpoint sources in order to achieve water quality goals.

bioaccumulation - Build-up of toxic substances in fish flesh. Toxic effects may be passed on to humans eating the flesh.

biochemical oxygen demand (BOD) - The amount of dissolved oxygen required to oxidize the readily decomposable organic material. Any organic material added to water increases the BOD, making this value a direct indicator of the level of biodegradable organics in a given sample of polluted water.

bio-fouling - The colonization of a treatment device or water distribution system by microorganisms. Bio-fouling results in a film composed of bacteria, other microorganisms, and slimes produced by the microorganisms. It can result in malfunction or failure of a treatment device, odors, discolored water, and corrosion.

biomonitor - A biological monitor that detects very small levels of pollutants in the environment.

birm - A manufactured oxidizing material made of a light silicon dioxide with a manganese dioxide coating. Birm is used to reduce the concentration of iron and manganese in water.

blue baby syndrome (methemoglobinemia) - A condition that causes a baby to turn blue because of oxygen starvation. It is caused by excessive nitrate in water and can result in death if not treated.

braided stream - a stream flowing in several dividing and reuniting channels.

buffer strips - Strips of grass or other erosion-resisting vegetation between or below cultivated strips or fields.

canopy - The cover of leaves and branches formed by the tops or crowns of plants.

capillary forces - The forces acting on soil moisture in the unsaturated zone, attributable to molecular attraction between soil particles and water.

capillary fringe - The zone immediately above the water table, between the saturated and unsaturated zones where pore spaces are partly filled with water. Water can be drawn upward by capillary attraction.

carbon absorption - A process employed in water treatment by which dissolved organic compounds are removed as they pass through a tower, column, or filter packed with small particles of carbon.

carcinogen - A cancer-causing chemical.

carcinogenic - Capable of causing cancer in humans and animals.

cartridge sediment filter - A mechanical filter that uses a cartridge made of paper, cellulose, polypropylene sheets, cloth, ceramic, or string to separate particles from water. The replaceable cartridge is inserted in a housing that is usually plastic. Most common filter element in home water treatment devices.

casing - Steel or plastic pipe installed while drilling a well to prevent collapse of the well bore hole and entrance of contaminants and to allow placement of a pump or pumping equipment.

cation - A positively charged ion such as calcium (Ca^{2+}), magnesium (Mg^{2+}), or sodium (Na^{+}). See also **anion.**

cation exchange - A water treatment process in which objectionable cations such as calcium are replaced with sodium or hydrogen. See also **hardness** and **softening.**

cation exchange capacity (CEC) - The ability of a particular rock, soil, or other material to absorb cations.

channelization - The process by which a natural stream is converted into a ditch for flood control or other reasons. Subsequent environmental damage may be severe.

check dam - Small dam constructed in a gully or other small watercourse to decrease the stream-flow velocity, minimize channel scour, and promote deposition of sediment.

chemical feed pump - A mechanical device that introduces chemicals into a water system at a rate proportional to the water flow. Now available for home water treatment.

chemical pretreatment - A drinking water treatment process that relies on alum or other chemicals to form clumps of impurities, or "floc." Most of the floc settle out of the water; what remains can be removed through filtration.

chemical treatment - Treatment that inactivates, changes the chemical form of, or reduces the concentration of a drinking water contaminant by the addition of a solid, liquid, or gas.

chemicals, inorganic (IOCs) - Drinking water contaminants that may occur naturally in the earth or are caused by mining, industry, or agriculture. Examples in-

clude arsenic, barium, fluoride, mercury, nitrate, and selenium.

chemicals, synthetic organic (SOCs) - Drinking water contaminants that are man-made, carbon-containing chemicals, such as pesticides.

chemicals, volatile organic (VOCs) - Organic contaminants in drinking water that readily volatilize, or travel from the water into the air. Most are industrial chemicals and solvents, many petroleum-based products.

chiseling - Breaking or loosening the soil, without inversion, with a chisel cultivator or chisel plow. Increases infiltration and reduces erosion in contrast to soil inversion.

chlorinated hydrocarbon - A "family" of nondegradable or slowly degradable chemicals including pesticides such as DDT, dieldrin, and toxaphene. They have long persistence in the environment, undergo biological magnification in the food chain, and may have a harmful effect on nontarget organisms such as fish and birds.

chlorination - The addition of chlorine to water to destroy bacteria.

chlorination, shock - The addition, usually only once or twice, of a strong chlorine solution (200 to 400 parts per million) to disinfect new water systems.

chlorination, simple - The continuous addition of just enough chlorine (approximately 1 to 2 parts per million) to adequately disinfect water and leave a small residual of chlorine.

chlorination, super - The continuous addition of high doses of chlorine (in the range of 5 to 10 parts per million) to disinfect water and leave a high residual of chlorine.

chlorine - A widely used disinfectant and oxidizing agent available in gaseous, liquid, or solid form. The chemical symbol for chlorine is "Cl."

chlorine demand - The amount of chlorine that can be consumed or "used up" by organic matter (such as plant material), microorganisms, iron, and other oxidizable substances in untreated water. The chlorine demand is calculated by subtracting the free chlorine residual from the amount of chlorine added to the untreated water. See also **free chlorine residual.**

chlororganics - Potentially toxic organic compounds that form in water treated with chlorine. Common examples are chloroform and carbon tetrachloride.

clean tillage - Cultivation of a field so as to cover all plant residues and to prevent the growth of all vegetation except the particular crop desired.

clear water - A term used to differentiate between water containing dissolved iron (clear water) and water containing oxidized, or particulate iron.

climate - The sum total of all atmospheric or meteorological influences, principally temperature, moisture, wind, pressure, and evaporation, which combine to characterize a region and give it individuality by influencing the nature of its land forms, soils, vegetation, and land use.

coliform bacteria - A group of rod-shaped bacteria commonly found in the soil and intestines of higher animals, including humans. Since humans typically discharge from 100 to 400 billion coliform organisms per day, in water it is indicative of potential fecal contamination.

coliform, fecal - Coliform bacteria entirely of fecal origin, *Escherichia coli (E. coli)* is a specific indicator of fecal pollution. There is difficulty in determining fecal coliforms to the exclusion of soil coliforms, and for that reason, the entire coliform group is commonly used as an indicator of fecal pollution.

compaction - To unite firmly; the act or process of becoming compact, usually applied in geology to the changing of loose sediments into hard, firm rock. With respect to construction work with soils, engineering compaction is any process by which the soil grains are rearranged to decrease void space and bring them into closer contact with one another, thereby increasing the weight of solid material per cubic foot.

compost - Partially decomposed organic matter (plant or animal wastes, garbage) that can be used as a soil conditioner and fertilizer.

concentration - The ratio of the amount of one substance in another substance. For example, in seawater, the concentration of chlorine is approximately 19,000 milligrams of chlorine per liter of water.

condensation - The process that occurs when an air mass is saturated and water droplets form around particles or on surfaces.

cone of depression - The drawdown potentiometric surface surrounding a well or well field.

confining bed - A body of material of low water conductivity located adjacent to one or more aquifers. It may be above or below the aquifer.

conservation - The protection, improvement, and use of natural resources according to principles that will assure their highest economic or social benefits.

conservation district - A public organization created under state enabling law as a special-purpose district to develop and carry out a program of soil, water, and re-

lated resource conservation, use, and development within its boundaries; usually a subdivision of state government with a local governing body and always with limited authorities. Often called a soil conservation district or a soil and water conservation district.

conservation plan for farm, ranch, or nonagricultural land unit - The properly recorded decisions of the cooperating landowner or operator on how he plans, within practical limits, to use his land in an operating unit within its capability and to treat it according to its needs for maintenance or improvement of the soil, water, and plant resources.

conservation tillage - Sometimes called minimum or reduced tillage, this is a method of cultivating farmland with less soil disturbance to reduce erosion. Must have 30 percent residue cover on the surface after all tillage operations to meet USDA's current definition that qualifies producers for certain programs.

constructed wetland - An engineered, marsh-like area where especially established organisms and plants feed on the organics and nutrients in wastewater. This process uses the physical, chemical, and biological processes in nature to treat wastewater.

contact time - The amount of time that water is in contact with treatment medium or chemical.

contaminant - Any physical, chemical, biological, or radiological substance or matter in water.

contaminant removal capacity - The percent reduction in a contaminant between untreated and treated water and the total amount of contaminant a device can remove before servicing is needed.

contamination - Any degradation of natural water quality caused by human activities.

contour - (1) An imaginary line on the surface of the earth connecting points of the same elevation. (2) A line drawn on a map connecting points of the same elevation.

contour farming - Conducting field operations, such as plowing, planting, cultivating, and harvesting, on the contour. An effective technique for reducing erosion.

contour furrows - Furrows plowed approximately on the contour on pasture or rangeland to prevent soil loss and increase infiltration. Also, furrows laid out approximately on the contour for irrigation purposes.

contour stripcropping - Layout of crops in comparatively narrow strips in which the farming operations are performed approximately on the contour. Usually strips of grass, close-growing crops, or fallow are alternated with those in cultivated crops.

corrosion - A natural process of chemical/electrical degradation that occurs when metals are in contact with water. The dissolving or wearing away of metals.

cover crop - A close-growing crop grown primarily for the purpose of protecting and improving soil between periods of regular crop production or between trees and vines in orchards and vineyards.

cover, ground - Any vegetation producing a protecting mat on or just above the soil surface. In forestry, low-growing shrubs, vines, and herbaceous plants under the trees.

cover, vegetative - All plants of all sizes and species found on an area, irrespective of whether they have forage or other value. Same as plant cover.

cropland - Land used primarily for the production of adapted cultivated, close-growing, fruit or nut crops for harvest, alone or in association with sod crops.

crop residue - The portion of a plant or crop left in the field after harvest.

crop residue management - Use of that portion of the plant or crop left in the field after harvest for protection or improvement of the soil.

crop rotation - The growing of different crops in recurring succession on the same land.

cryptosporidiosis - An often severe diarrheal illness that is caused by ingestion of the *Cryptosporidium parvum* oocyst. It is particularly dangerous to the elderly, children, acquired immune deficiency syndrome (AIDS) patients, or others with low immunity. See also ***Cryptosporidium parvum (C. parvum).***

***Cryptosporidium parvum (C. parvum)* -** A parasitic protozoan. The environmentally persistent oocyst formed during one stage of the parasite's life cycle ranges in diameter from 4 to 6 microns and, when ingested, may cause cryptosporidiosis. *Cryptosporidium parvum* resists chlorine disinfection and must be removed from water via filtration methods, distillation, or boiling.

cyst - A dormant stage in the life cycle of some parasites in which a resistant shell is formed around the parasite.

debris - A term applied to the loose material arising from the disintegration of rocks and vegetative material; transportable by streams, ice, or floods.

debris dam - A barrier built across a stream channel to retain rock, sand, gravel, silt, or other material.

dechlorination - The removal of excess chlorine from a treated water supply, usually with activated carbon or a chemical process.

deep-well injection - Pumping wastewater into a deep subterranean aquifer or other formation below ground.

degradation - To wear down by erosion, especially through stream action. Also, lowering the quality of water or some other resource.

depression storage - Water from precipitation that collects in puddles at the land surface.

denitrification - The biochemical decomposition of ammonia compounds, nitrates, or nitrites to gaseous nitrogen, either as molecular nitrogen or as an oxide of nitrogen.

deposit - Material left in a new position by a natural transporting agent, such as water, wind, ice, or gravity, or by the activity of man.

deposition - The accumulation of material dropped because of a slackening movement of the transporting agent—water or wind.

desalinization - The removal of salt from seawater in order to make it usable to humans, crops, and wildlife.

desilting area - An area of grass, shrubs, or other vegetation used for inducing deposition of silt and other debris from flowing water, located above a stock tank, pond, field, or other area needing protection from sediment accumulation. See **filter strip.**

detention dam - A dam constructed for the purpose of temporary storage of streamflow or surface runoff and for releasing the stored water at controlled rates.

dew point - The temperature of a given air mass at which condensation will begin.

diatomaceous earth - A powdery material composed of the skeletal remains of sea organisms called diatoms. Diatomaceous earth, mined from deposits on dry land, is a common filter aid in precoat filters for home water treatment.

dioxin - An extremely toxic group of chlorine containing aromatic chemicals suspected of causing cancer, birth defects and miscarriages. Found as an impurity in certain herbicides and in wastewaters from the bleaching of paper pulp with chlorine compounds.

discharge - The flow of surface water in a stream or canal or the outflow of groundwater from a flowing artesian well, ditch, or spring.

disinfection - The process of destroying harmful microorganisms in water. The most common method of disinfection for water supplies is chlorination.

dispersion, soil - The breaking down of soil aggregates into individual particles, resulting in single-grain structure. Ease of dispersion is an important factor influencing the erodibility of soils. Generally speaking, the more easily dispersed the soil, the more erodible it is.

disposal field - Area used for spreading liquid effluent for separation of wastes from water, degradation of impurities, and improvement of drainage waters. Same as infiltration field.

distillation - A water treatment process in which water is boiled and the resulting steam is collected and cooled in a separate chamber. Distillation disinfects water, reduces the concentration of toxic metals, and removes some organic contaminants.

distilled water - Water that has been purified via evaporation followed by condensation. Distilled water contains minute amounts of dissolved solids.

diversion terrace - Diversions, which differ from terraces in that they consist of individually designed channels across a hillside, may be used to protect bottomland from hillside runoff or may be needed above a terrace system for protection against runoff from an unterraced area. They may also divert water out of active gullies, protect farm buildings from runoff, reduce the number of waterways, and they are sometimes used in connection with stripcropping to shorten the length of slope so that the strips can effectively control erosion. See **terrace.**

DPD (diethyl phenylene diamine) colorimetric test - A water test for detecting the presence of free chlorine residual in water.

drainage - The removal of excess surface water or groundwater from land by means of surface or subsurface drains.

drainage basin - The land area from which surface runoff drains into a stream system. Same as watershed.

drainage divide - A boundary line along a topographically high area that separates two adjacent drainage basins.

drawdown - A lowering of the water table of an unconfined aquifer or the potentiometric surface of a confined aquifer caused by pumping of groundwater from wells.

drilled wells - Wells not dug or driven including those constructed by a combination of jetting or driving. These wells are normally 4 to 8 inches in diameter.

drinking water standards - Two categories of contaminants (primary and secondary) for which EPA has established permissible levels in drinking water.

driven wells - Wells constructed by driving assembled lengths of pipe into the ground with percussion equipment or by hand. These wells are usually small in di-

ameter (2 inches or less), less than 50 feet deep, and can be installed in areas of relatively loose soils, such as sand.

drop-inlet spillway - Overall structure in which the water drops through a vertical riser connected to a discharge conduit.

drop spillway - Overall structure in which the water drops over a vertical wall onto an apron at a lower elevation.

duckfoot - An implement with horizontally spreading, V-shaped tillage blades or sweeps which are normally adjusted to provide shallow cultivation without turning over the surface soil or burying surface crop residues.

duff - The more or less firm organic layer on top of mineral soil, consisting of fallen vegetative matter in the process of decomposition, including everything from pure humus below to the litter on the surface. Duff is a general, nonspecific term more commonly associated with perennial crops.

dug wells - Large diameter wells, usually 30 inches or more in diameter, and often constructed by hand.

dynamic equilibrium - A condition in which the amount of recharge to an aquifer equals the amount of natural discharge.

effluent - Treated or untreated wastewater discharged into the environment; wastewater flowing from a septic tank into the soil absorption bed.

ecology - The study of the interrelationships that occur between organisms and their environment.

English Rule - A groundwater doctrine that holds that property owners have the right of absolute ownership of the groundwater beneath their land.

environment - The sum total of all the external conditions that may act upon an organism or community to influence its development or existence.

epilimnion - The upper stratum of a lake that is characterized by a temperature gradient of less that 1°C per meter of depth.

equilibrium - The state in which the action of multiple forces produces a steady balance, resulting in no change over time. When a chemical reaction can proceed in two directions, equilibrium is reached when the rate of reaction is equal for both directions.

erosion - (1) The wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as gravitational creep. (2) Detachment and movement of soil or rock fragments by water, wind, ice, or gravity.

erosion, accelerated - Erosion much more rapid than normal, natural, or geologic erosion, primarily as a result of the influence or activities of man or, in some cases, of other animals or natural catastrophes that expose base surfaces; for example, fires.

erosion, geological - The normal or natural erosion caused by geological processes acting over long geologic periods and resulting in the wearing away of mountains, the building of floodplains, coastal plains, etc. Same as natural erosion.

erosion, gully - The erosion process whereby water accumulates in narrow channels and, over short periods, removes the soil from this narrow area to considerable depth, ranging from 1 to 2 feet to as much as 75 to 100 feet.

erosion, natural - Wearing away of the earth's surface by water, ice, or other natural agents under natural environmental conditions of climate, vegetation, etc., undisturbed by human activities. Same as geological erosion.

erosion, normal - The gradual erosion of land used by man that does not greatly exceed natural erosion. See natural erosion.

erosion, rill - An erosion process in which numerous small channels only several inches deep are formed; occurs mainly on recently cultivated soils. See rill.

erosion, sheet - The removal of a fairly uniform layer of soil from the land surface by runoff water.

erosion, splash - The spattering of small soil particles caused by the impact of raindrops on bare soils. The loosened and spattered particles may or may not be subsequently removed by surface runoff.

erosive - Refers to wind or water having sufficient velocity to cause erosion. Not to be confused with erodible as a quality of soil.

euphotic zone - The open-water zone of the ocean, characterized by sufficient sunlight penetration to support photosynthesis; located just above the bathyal zone (that part between 100 and 1,000 fathoms deep; one fathom is 6 feet).

eutrophication - The process of accelerated aging of lakes whereby aquatic plants are abundant and waters are deficient in oxygen. The process is usually caused by excess nutrients and sediments brought into the lake.

evaporation - The process by which water changes from liquid to the vapor state. Caused by the sun warming water surfaces.

evapotranspiration - The sum of evaporation and transpiration.

fallow - Allowing cropland to lie idle, either tilled or untilled, during the whole or greater portion of the growing season.

farm management - The organization and administration of farm resources, including land, labor, crops, livestock, and equipment.

farm operator - A person who operates a farm either by performing the labor himself or directly supervising it.

fecal - Of, pertaining to, or being feces; the waste matter discharged through the anus.

fertility, soil - The quality of a soil that enables it to provide nutrients in adequate amounts and in proper balance for the growth of specified plants when other growth factors, such as light, moisture, temperature, and the physical condition of the soil, are favorable.

fertilizer - Any organic or inorganic material of natural or synthetic origin that is added to a soil to supply elements essential to plant growth.

field blank - A water-quality sample where highly purified water is run through the field sampling procedure and sent to a laboratory to detect if any contamination of the samples is occurring during the sampling process.

field capacity (field moisture capacity) - The amount of soil water remaining in a soil after the free water has been allowed to drain away for a day or two if the root zone has been previously saturated. It is the greatest amount of water that the soil will hold under conditions of free drainage, usually expressed as a percentage of the oven-dry weight of soil or other convenient unit.

field stripcropping - A system of stripcropping in which crops are grown in parallel strips laid out across the general slope but which do not follow the contour. Strips of grass or close-growing crops are alternated with strips of cultivated crops.

Filox - A manufactured resin introduced in oxidizing filters in recent years.

filter - To remove contaminants from water through filtration. A treatment device for carrying out the process of filtration. A filter consists of a filter medium and suitable hardware for positioning and supporting the filter medium in the path of the water. See also **filter medium.**

filter aid - A filter medium used in precoat filters. Common filter aids are diatomaceous earth and perlite. See also **diatomaceous earth** and **precoat filter.**

f**ilter cake -** A densely packed layer of filter medium and suspended solids that develops on the surface of a filter medium. See also **filter medium.**

filter element - A rigid structure that supports the septum in a precoat filter. See also **precoat filter** and **septum.**

filter medium - The permeable substance or material in a filtering device that separates contaminants from water.

filter strip - Strip of permanent vegetation above farm ponds, diversion terraces, and other structures to retard flow of runoff water, causing deposition of transported material, thereby reducing sediment flow. See **desilting area.**

filtration - The process of separating contaminants from water by passing water through a porous medium. Also the process of separating contaminants by passing water through a vegetated medium such as a filter strip or wetland area.

flocculation - The water treatment process where suspended matter that causes turbidity is removed by chemical treatment (usually with alum), which causes individual particles to stick together forming larger aggregates or "floc" which settle to the bottom and may be filtered.

flow rate capacity - The rate of water flow through a treatment device measured in gallons per minute or gallons per day.

flume - An open conduit on a prepared grade, trestle, or bridge for the purpose of carrying water across creeks, gullies, ravines, or other obstructions. It may also apply to an entire canal where it is elevated above natural ground for its entire length. Sometimes used in reference to calibrated devices used to measure the flow of water in open conduits.

fluoridation - The addition of fluorides to public drinking water to reduce the incidence of tooth decay. The practicality of this process is under debate.

free chlorine residual - Chlorine that remains in water after the chlorine demand is satisfied. The presence of a residual indicates sufficient chlorine was added to disinfect the water. A residual of 0.1 to 0.2 milligrams per liter of free chlorine should be measurable at the tap from a public water system disinfected with chlorine.

furrow dams - Small earth dams used to impound water in furrows.

***Giardia lamblia (G. lamblia)* -** A parasitic protozoan. The cyst formed during one stage of the parasite's life cycle ranges in diameter form 7 to 10 microns and may cause giardiasis in humans. *Giardia lamblia* can be removed from drinking water via filtration methods, distillation, boiling, and ozonation. See also **cyst** and **giardiasis.**

giardiasis - A disease, often characterized by diarrhea, that is caused by the presence of *Giardia lamblia* cysts in the intestinal tract. See also ***Giardia lamblia (G. lamblia)*.**

grade - (1) The slope of a road, channel, or natural ground. (2) The finished surface of a canal bed, roadbed, top of embankment, or bottom of excavation; any surface prepared for the support of construction like paving or laying a conduit. (3) To finish the surface of a canal bed, roadbed, top of embankment, or bottom of excavation.

grade stabilization structure - A structure for the purpose of stabilizing the grade of a gully or other watercourse, thereby preventing further headcutting or lowering of the channel grade.

gradient - Change of elevation, velocity, pressure, or other characteristics per unit length; slope.

grain - A unit of measure equal to 1.43×10^{-4} pound or 0.0648 gram.

grains per gallon (gpg) - The weight of a substance, in grains, in 1 gallon of water. Commonly, grains of minerals per gallon of water is used as a measure of hardness. One grain per gallon is equal to 17.1 milligrams per liter (mg/L).

grassed waterway - A natural or constructed waterway, usually broad and shallow, covered with erosion-resistant grasses, used to conduct surface water from cropland.

groundwater - Water that gathers below the surface of the earth in pores, voids, and fractures within soil and rock. Aquifers are formed when rainwater seeps into the ground and is held in layers of sand, gravel, and porous rocks in sufficient quantity that it can be pumped for use.

groundwater mining - The practice of withdrawing groundwater at rates in excess of the natural recharge.

grout - Slurry of cement or clay used to seal the space between the outside of the well casing and the bore hole or to seal an abandoned well.

grout curtain - An underground wall designed to stop groundwater flow; created by injecting grout into the ground which subsequently hardens to become impermeable.

gully - A channel or miniature valley cut by concentrated runoff, but through which water commonly flows only during and immediately after heavy rains or during the melting of snow. A gully may be dendritic or branching or it may be linear, rather long, narrow, and uniform width. The distinction between gully and rill is one of depth. A gully is sufficiently deep that it would not be obliterated by normal tillage operations, whereas a rill is of lesser depth and would be smoothed by ordinary farm tillage. See **erosion; rill.**

gully control plantings - The planting of forage, legume, or woody plant seeds, seedlings, cuttings, or transplants in gullies to establish or reestablish a vegetative cover adequate to control runoff and erosion and incidentally produce useful products.

hardness - A measure of the amount of calcium, magnesium, and iron dissolved in water. High hardness prevents soap suds from forming and results in mineral deposits in water heaters and other appliances.

hazardous materials - Substances that are flammable, corrosive, toxic, reactive, or explosive when mixed with other materials.

hazardous waste - Any flammable, corrosive, explosive, or toxic waste which is considered to be a present or potential danger to humans, other animals, or plants.

health advisory level - A non-regulatory, health-based reference level of chemical traces (usually in parts per billion) in drinking water at which there are no adverse health risks when ingested over various periods of time. These advisories include a large margin of safety.

herbicide - A chemical substance used for killing plants, especially weeds.

humidity, absolute - The amount of moisture in the air as expressed by the number of grams of water per cubic meter of air.

humidity, relative - The ratio of the absolute humidity to the saturation humidity for an air mass.

humus - That more or less stable fraction of the soil organic matter remaining after the major portion of added plant and animal residues have decomposed; usually amorphous and dark colored.

hydraulic conductivity - The rate at which water can move through a permeable medium.

hydrocarbon - A compound containing only carbon and hydrogen.

hydrodynamic dispersion - The process by which a solute or contaminant is diluted as it moves through an aquifer.

hydrogeology - The study of the interrelationships of geologic materials and processes with water, especially groundwater.

hydrology - The study of the occurrence, distribution, and chemistry of all waters of the earth.

hydrologic cycle - The cyclical process of water's movement from the atmosphere, its inflow and temporary storage on and in land, and its outflow to the

oceans. The cycle consists of three principal phases: precipitation, runoff into surface waters or groundwater, and evaporation and/or transpiration into the air.

hydrophyte - A type of plant that grows with the root system submerged in standing water.

hypolimnion - The bottom layer of water in a lake characterized by a temperature gradient of less than 1°C per meter of depth.

impoundment - Generally an artificial collection or storage of water, as a reservoir, pit, dugout, sump, etc. See **reservoir.**

infiltration - The flow of a liquid into a substance through pores or other openings. The flow of water downward into and through the upper soil layers.

infiltration rate - A soil characteristic determining or describing the maximum rate at which water can enter the soil under specified conditions, including the presence of an excess of water.

influent - Wastewater flowing into a treatment plant or septic system.

inorganic - Refers to naturally occurring or synthetic chemicals such as salts, metals, and minerals. Inorganics may or may not contain carbon.

integrated pest management (IPM) - A method of pest management that judiciously employs chemical, biological, and other methods (cultural), depending on the specific problem; the use of chemicals is minimized to avoid environmental damage.

intensive cropping - Maximum use of the land by means of frequent succession of harvested crops.

interception - The process by which precipitation is captured on the surfaces of vegetation before it reaches the land surface.

interflow - Lateral movement of water through the unsaturated zone of soil immediately after a precipitation event. Also called throughflow.

interstitial water - Water in the vadose zone above the water table. Also called soil water.

ion - An atom or molecule that has a positive or negative electric charge.

ion exchange - A water treatment process in which unwanted ions in water are replaced with less objectionable ones.

iron - A metallic element often found in water supplies that occurs in natural deposits in rocks and soil. It may also leach from pipes. Concentrations greater than 0.3 milligram per liter may give water a bitter, metallic taste, cause brown-orange stains on fixtures and laundry, discolor beverages, and result in red-brown sediment in dispensed water. The chemical symbol is "Fe."

i**ron bacteria -** Bacteria that use iron as a source of energy. Iron bacteria oxidize iron and form a slime that can accumulate in water systems and plug wells, water treatment devices, and water distribution lines. Their presence can also result in discolored, or "rusty," water.

karst - The type of geologic terrain underlain by carbonate rocks where significant solution of the rock has occurred due to flowing groundwater.

land capability class - One of the eight classes of land in the land capability classification of the Natural Resources Conservation Service. The classes are distinguished according to the risk of land damage or the difficulty of land use.

land leveling - Process of shaping the land surface for better movement of water and machinery over the land. Also called land forming, land shaping, or land grading.

land treatment - Process of putting wastewater or other waste products onto land for the purpose of biodegradation or removing of pollutants.

landfill - A natural or created depression in the earth's surface used for disposal or burial of various types of waste. The area is then covered by a layer of soil.

landfill, sanitary - A specially designed landfill with sanitary precautions and leachate prevention and treatment.

leachate - Liquid that leaks out of degraded soluble waste material from a landfill or septic system.

leachate collection system - A system installed in conjunction with a landfill liner to capture leachate that may be generated from the landfill.

leaching - The downward movement by water of dissolved or suspended minerals, fertilizers, ag chemicals, and other substances through the soil.

levee - A dike composed of earth, stone, or concrete that is erected along the margin of a river or other stream for the purpose of flood control.

limnetic zone - The region of open water in a lake, beyond the littoral zone, down to the maximum depth at which there is sufficient sunlight for photosynthesis. This depth varies with the turbidity of the water.

liner - A low-permeability material, such as clay or plastic sheeting, that is put beneath a landfill in order to capture any leachate generated so as to help prevent groundwater contamination.

liter - A unit of metric measurement for volume; roughly equivalent to 1 quart or 0.25 gallon.

littoral zone - The shallow, marginal region of a lake characterized by rooted vegetation.

loading rate - Rate at which pollutants accumulate in soil or surface waters. Also the rate of application of effluent or waste material to land or water.

lysimeter - A field device containing a soil column and vegetation; used for measuring actual evapotranspiration.

lysimeter, collection - A device installed in the unsaturated zone in soil to collect a water-quality sample by having the water drain downward by gravity into a collection pit.

lysimeter, suction - A device for withdrawing pore water samples from the unsaturated zone by applying tension to a porous ceramic cup.

macronutrient - Mineral nutrient used by organisms such as plants in relatively large quantities (nitrogen, phosphorus, potassium, calcium).

macropores - The large spaces that occur between individual soil particles. Usually result from some sort of physical disturbance and may accelerate leaching.

manure - The excreta of animals, with or without the admixture of bedding or litter, in varying stages of decomposition.

Maximum Contaminant Level (MCL) - Maximum permissible level of a contaminant in drinking water based on the maximum contaminant level goal and taking health risks and economic and technical considerations into account. The level is also known as a primary drinking water standard and must be met at the tap for public drinking water facilities.

Maximum Contaminant Level Goal (MCLG) - A nonenforceable health-based goal set for a substance in drinking water. Precedes establishment of a Maximum Contaminant Level.

mechanical filtration - A water treatment process used primarily to remove sediment, iron, manganese, or sulfur particles. Particles are physically trapped as water moves through a filter medium. Mechanical filtration devices include cartridge sediment filters, media filters, multimedia filters, and precoat filters.

mechanical practices - Soil and water conservation practices that primarily change the surface of the land or that store, convey, regulate, or dispose of runoff water without excessive erosion.

media filter - A mechanical filter that consists of a tank, a single filter medium, a support system, and an underdrain. Untreated water flows through the medium, which retains suspended solids that are too large to pass through the pore structure of the medium.

methemoglobin - A brownish compound of oxygen and hemoglobin, formed in the blood, which reduces the oxygen carrying capacity of the blood. This compound may result from the interaction of nitrite nitrogen with hemoglobin.

methemoglobinemia - The blood disease associated with the formation of methemoglobin. Can be life threatening if not treated.

microbically unsafe water - Water that is known to contain disease-causing bacteria, viruses, or other microbiological agents; shows a positive test for an indicator organism (coliform bacteria); or has been determined to be unsafe by an appropriate health or regulatory agency.

micrograms per liter (ug/L) - The weight of a substance measured in micrograms contained in 1 liter. It is equivalent to a concentration of 1 part per billion in water.

micron - (same as micrometer) A linear measurement one millionth of a meter or 0.00003937 inch.

micronutrient - A mineral nutrient required by organisms such as plants only in minute quantities (for example, zinc, copper, and iron).

microorganism - (same as microbe) A simple organism with microscopic dimensions.

milligrams per liter (mg/L) - The weight of a substance measured in milligrams contained in 1 liter. It is equivalent to a concentration of 1 part per million in water.

minimum tillage - That least amount of soil disturbance required to create the proper soil condition for seed germination, plant establishment, and prevention of competitive growth.

molecule - The smallest part of a substance capable of independent existence while retaining all of the properties of the substance. Molecules may be one atom or more than one atom.

mulch - A natural or artificial layer of plant residue or other materials such as sand or paper on the soil surface.

multimedia filter - A mechanical filter that consists of a tank, several layers of different filter media, a support system, and an underdrain. Untreated water flows through the media layers; suspended solids are retained in the layers.

mutual-prescription doctrine - A groundwater doctrine stating that in the event of an overdraft of a groundwater aquifer, the available groundwater will be appor-

tioned among all the users in amounts proportional to their individual pumping rates.

National Primary Drinking Water Regulations (NPDWRs) - These regulations, developed by the U.S. EPA, were designed to keep drinking water clean and protect the public from waterborne disease. These regulations define either a Maximum Contaminant Level or a treatment technique requirement to control the presence of contaminants in drinking water.

natural resource - Any component of the natural environment, such as soil, water, rangeland, forest, wildlife, minerals, that humans can use to promote their welfare.

neritic zone - The relatively warm, nutrient-rich, shallow water zone of the ocean that overlies the continental shelf; valuable in terms of fish production.

neutralization - The addition of an acid to a base or a base to an acid to produce a neutral solution. Generally, neutral solutions are considered to have a pH of 7. See also **pH.**

nitrate - A highly oxidized anionic (NO_3^-) form of nitrogen which is highly mobile in soil because of its water solubility and negative charge; a common component of nitrogen fertilizers and a breakdown product of organic matter decomposition. Nitrate when reduced to nitrite can cause methemoglobinemia in infants. A primary drinking water standard of 10 milligrams per liter has been set by the EPA.

nitrate bacteria - Bacteria that have the ability to convert nitrites into nitrates; essential bacteria in the cycling of nitrogen.

nitrite - A less oxidized anionic (NO_2^-) form of nitrogen which is toxic when ingested by humans and most mammals. It can cause methemoglobinemia and is suspected of interacting with other chemicals in the body to form N-nitroso compounds, several of which are potential human carcinogens. A primary drinking water standard has been set at 1 milligram per liter by the EPA.

nitrate dumping - An event that occurs when sulfate ions displace nitrate ions on an anion exchange resin. This may result in a nitrate concentration in treated water that is greater than that in untreated water.

nitrification - The biological oxidation of ammonium salts to nitrites and the further oxidation of nitrites to nitrates; essential steps in the cycling of nitrogen.

nonpoint source pollution - Pollution that cannot be attributed to a specific point of entry into air or water. It is the contamination of a widespread area from polluted stormwater.

no-tillage - A method of planting crops that involves no seedbed preparation other than opening the soil for the purpose of placing the seed at the intended depth. This usually involves opening a small slit or punching a hole into the soil. There is usually no cultivation during crop production. Chemical weed control is normally used. Also referred to as slot planting or zero tillage.

nutrients - Compounds, minerals, or elements needed by living organisms to carry on their functions. Nitrogen, phosphorus, potassium, and other elements, for example, are required for plant growth.

observation well - A nonpumping well used to observe the elevation of the water table or the potentiometric surface of a confined aquifer.

off-line - Describes a home water treatment device that is not connected to the water distribution system. Untreated water is added to the device manually. A countertop distiller is an example.

oligotrophic lake - A nutrient-poor lake characterized by sparse vegetation and low production of plankton and fish. Commonly found as deep mountainous lakes with sandy or gravelly bottoms at northern latitudes.

oocyst - One stage in the life cycle of a large class of parasites.

organic chemicals - Term refers to all chemical substances containing carbon. Hydrocarbons and their derivatives such as paint thinner, most pesticides, and gasoline belong to this group of chemicals.

osmosis - Diffusion of a solvent such as water through a semipermeable membrane; the membrane allows the solvent to pass but not most dissolved substances. See **reverse osmosis (RO).**

osmotic pressure - When two solutions of differing concentrations are separated by a semipermeable membrane (one permeable to water but not most dissolved solids), the excess pressure applied to the higher-concentration side to prevent water from moving across the membrane. See also **osmosis** and **reverse osmosis (RO)**.

overdraft - The process of removing more water from a supply than can be regularly replenished by precipitation.

overgrazing - Grazing so heavy that it impairs future forage production and causes deterioration through damage to plants or soil or both.

overland flow - The flow of water over a land surface due to direct precipitation; occurs when the precipitation rate exceeds the infiltration capacity of the soil or depression storage is full.

oxidation - The process of removing one or more electrons from an atom, ion, or molecule. Also referred to as the chemical union of oxygen with metals or organic compounds. The former process is an important factor in soil formation and corrosion; the latter process permits the release of energy from cellular fuels (sugars and fats).

oxidizing agent - Any chemical capable of oxidizing another substance. Oxygen, chlorine, and iodine are examples used in home water treatment.

ozone - A highly reactive gaseous form of pure oxygen, which contains three oxygen atoms instead of the more common diatomic molecule of standard oxygen, and found in the upper atmosphere at elevations of about 20 miles. Upper atmospheric ozone is critical in filtering ultraviolet radiation from the sun, but ozone is considered an air pollutant when produced by the interaction of sunlight and hydrocarbons from internal combustion engines at low elevations. Also, a chemical sometimes used to disinfect drinking water.

parts per billion (ppb) - A measurement of concentration of 1 unit of material dispersed in 1 billion units of another.

parts per million (ppm) - A measurement of concentration of 1 unit of material dispersed in 1 million units of another.

pathogen - A disease-causing agent such as a bacterium or a virus.

percent recovery - A term used to describe the amount of water flowing into a reverse osmosis treatment device that ultimately exits the device as treated water. See also **reverse osmosis (RO)**.

percent rejection - A term used to describe the amount of a specific contaminant or total dissolved solids that a reverse osmosis treatment device removes from water. See also **reverse osmosis (RO).**

percolation - Downward flow of water through pores or spaces in rock or soil.

percolation test - A measure of the rate of water movement into soil.

permeability - The capacity of a porous rock, sediment, or soil to transmit water.

pesticide - The general term applied to chemical substances used to control plant or animal pests; to include weeds, insects, fungi, mites, algae, rodents, and other undesirable agents.

pH - A numerical measure of acidity used to distinguish alkaline, neutral, and acidic water. The pH scale is from 1 to 14; neutral is pH 7.0, values below 7.0 are acidic, values above 7.0 are alkaline.

phosphates - Compounds used to tie up, or render inactive, metals or minerals in water. Phosphate use is banned in some states. The chemical symbol for phosphate is "PO_4^{3-}." See also **algal bloom.**

photosynthesis - The process occurring in green plants by which solar energy is utilized in the conversion of carbon dioxide and water into sugar.

phreatic zone - The zone below the ground surface in which all the pore spaces are filled with water. Also called saturated zone.

phreatophyte - A type of plant that typically has a high rate of transpiration by virtue of a taproot extending to the water table. Examples include willow, cottonwood, saltgrass, and mesquite.

physical treatment - A water treatment process that removes contaminants from water without the addition of chemicals.

picocurie (pCi) - A unit of measure used to express radioactivity.

piezometer - A nonpumping well, generally of small diameter, that is used to measure the elevation of the water table or piezometric surface in a confined aquifer. A piezometer generally has a short well screen through which water can enter.

piezometer nest - A set of two or more piezometers set close to each other but screened to different depths.

plankton - Tiny plants (algae) and animals (protozoa, small crustaceans, fish embryos, insect larvae) that live in aquatic environments and are moved about by water currents and wave action.

plant nutrients - The elements or groups of elements taken in by a plant which are essential to its growth and used in elaboration of its food and tissues. Includes nutrients obtained from fertilizer ingredients.

plant residue - See **crop residue; humus.**

plow layer - The soil ordinarily moved in tillage; equivalent to surface soil. A 7-inch plow layer is equivalent to about 2 million pounds or 1,000 tons of soil.

plow-plant - Plowing and planting a crop in one operation, with no additional seedbed preparation.

point of entry - A term that describes a device that treats all water entering a household.

point of use - A term that describes a device that treats water at a single tap or multiple taps but not water for the entire household.

pollutant, water - Any substance suspended or dissolved in water which builds up in sufficient quantity to impair its usefulness.

pollution, nonpoint source - Pollution arising from an ill-defined and diffuse source, such as runoff from cultivated fields, grazing land, or urban areas.

pollution, point source - Pollution that is discharged from an extremely restricted area or "point," such as a smoke stack or sewage discharge pipe, etc.

pollution, water - Any change in the character of water adversely affecting its usefulness. A polluted state is not an absolute condition but a matter of degree.

polychlorinated biphenyl (PCB) - A hazardous environmental pollutant that has various industrial applications and tends to accumulate in animal tissues.

porosity - The degree to which the total volume of soil, gravel, sediment, or rock is permeated with pores or cavities through which water or air can move.

posttreatment - Installing a device after the primary treatment in a home water treatment system. An example of posttreatment would be removing any lingering chlorine taste or smell after chlorination.

potable - Water of suitable quality for drinking without harmful effects.

potassium permanganate - A dry, purplish solid used as an oxidizing agent in water treatment. The chemical symbol for potassium permanganate is "$KMnO_4$." See also **oxidation.**

potentiometric surface - The level to which water will rise in tightly cased wells. The water table is a particular potentiometric surface for an unconfined aquifer.

precipitation - Water deposited on the earth as hail, mist, rain, sleet, or snow.

precoat filter - A mechanical filter that consists of a filter tank, powdered filter aid, and a porous membrane called the septum. Untreated water mixes with the filter and forms a filter cake that coats the septum. The filter cake traps suspended solids. See also **filter aid** and **septum.**

preferential treatment - An event that occurs when untreated water contains several contaminants that are removable by a treatment device, but the device prefers one over another. For example, an anion exchange unit prefers sulfate ions over nitrate ions, so sulfate ions are removed more readily when both ions are present in untreated water.

pressure filter - A filter such as a cartridge sediment filter or media filter that is installed in a pressurized home water distribution system. A pour-through countertop filter is not a pressure filter.

primary drinking water standards - Drinking water standards set by the U.S. Environmental Protection Agency for municipal water treatment facilities to regulate levels of drinking water contaminants that affect human health.

primary sewage treatment - A rudimentary sewage treatment that removes a substantial amount of the settleable solids and about 90 percent of the biological oxygen demand (BOD).

prior-appropriation doctrine - A doctrine stating that the right to use water is separate from other property rights and that the first person to withdraw and use the water holds the senior right. The doctrine has been applied to both ground and surface water.

profundal zone - The bottom zone of a lake, which extends from the lake bottom upward to the limnetic zone; characterized by insufficient sunlight for photosynthesis.

public trust doctrine - A legal theory holding that certain lands and waters in the public domain are held in trust for use by the entire populace. The basic principle is that private rights to use water may be limited by the need to preserve environmental, scenic, recreational, or scientific areas that benefit all. It is especially applicable to navigable waters.

pumping cone - The area around a discharging well where the water level in the aquifer drops in the shape of a cone due to pumping. Also called cone of depression.

quadrillion - The number 1 followed by 15 zeros.

quantification limit - The lower limit to the range in which the concentration of a solute can be determined by a particular analytical instrument.

radionuclides - Radioactive chemicals that usually occur naturally, such as radium. Man-made radionuclides may also contaminate water supplies, as a result of fallout from the use of nuclear weapons or accidental discharge from nuclear power plants.

radon - A colorless, odorless gas that is a natural byproduct of uranium decay and dissolves in groundwater. Radon is a health risk when inhaled. While it can enter the home environment by escaping from dispensed groundwater, it is a more serious danger when it enters the home as a gas through cracks in the foundation.

rainfall intensity - The rate at which rain is falling at any given instant, commonly expressed in inches per hour.

range of tolerance - The tolerance range of a species for certain factors in its environment such as moisture, temperature, radiation, micronutrients, oxygen, and pollutants.

rapid infiltration - Land application technique in which wastewater is applied to land and is allowed to percolate through the soil and enter the groundwater, thereby treating the wastewater.

reasonable use doctrine - A water-use doctrine whose basic premise is that water from a watercourse may be used for any purpose so long as quality and quantity of flow are adequate for other downstream users.

recharge - The addition of water to a surface water or groundwater system by natural or artificial processes.

recharge area - An area in which there is downward movement of water into an aquifer.

recharge basin - A basin or pit excavated to accelerate groundwater recharge over what it would be naturally.

recharge boundary - An aquifer boundary such as a lake or stream that adds water to an aquifer.

recharge well - A well specifically designed so that water can be pumped into an aquifer in order to recharge the groundwater reservoir.

regeneration - A maintenance process that restores the contaminant removal capacity of filter media. Regeneration may involve using a concentrated solution that is passed through the treatment device to remove contained contaminants and restore the contaminant removal capacity.

reservoir - Impounded body of water or controlled lake in which water is collected or stored.

resin - A petrochemical shaped into small beads that exchanges unwanted ions in water with less objectionable ions. The exchange occurs in an ion exchange device such as a water softener or anion exchange unit.

resin tank - The main component of a water softener or demineralizer unit that contains the ion exchange resin.

Resource Conservation and Recovery Act (RCRA) - Under terms of this act the EPA was given full authority to control pollution by solid waste. Amendments included control of pollution from liquid wastes.

return flow - That portion of irrigation water that flows back into a stream from which it was pumped. This water generally contains a higher concentration of salts, especially in arid climates, than the originally pumped water, due to accelerated evapotranspiration losses.

reverse osmosis (RO) - A process that uses applied pressure to reverse the flow of water in the natural process of osmosis. In reverse osmosis, water flows through a semipermeable membrane from a more concentrated solution to a more dilute solution. See also osmosis.

rill - A small, intermittent water course with steep sides, usually only a few inches deep and, hence, no obstacle to tillage operations.

riparian doctrine - A water-use doctrine whose basic premise is that water in its natural state, a watercourse, can be used only on that land through which it flows. Has been more loosely interpreted to mean that adjacent property owners have first right to withdraw the water.

risk estimate - The concentration of chemical estimated to cause an "acceptable level" of risk. Used to set drinking water standards.

rotation pasture - A cultivated area used as a pasture 1 or more years as part of a crop rotation sequence.

row crop - A crop planted in rows, normally to allow cultivation between rows during the growing season.

runoff - Direct or indirect flow of water which is not absorbed by soil, evaporated, or transpired by plants but which finds its way into streams or surface flow. It includes overland flow, return flow, interflow, and baseflow.

safe yield - The amount of groundwater which can be continually produced from an aquifer, economically, and legally without having adverse effect on the groundwater resource or surrounding environment.

salinity - The concentration of dissolved salts in water.

salinization - The accumulation of salts on land which renders it unsuitable for crop production. An adverse effect of irrigating land which has poor drainage, low rainfall or high evaporation with water containing excessive levels of dissolved salts.

salt-water intrusion - Movement of saline water into an aquifer or a saturated area previously containing fresh water. Generally occurs in coastal areas when fresh water has been withdrawn more rapidly than it can be recharged. Also called saline or salt-water encroachment.

sand - Soil material that contains 85 percent or more of sand.

saturated zone - A portion of the soil profile where all pores are filled with water. Aquifers are located in this zone. There may be multiple saturated zones at different soil depths separated by layers of clay or rock.

secondary drinking water standards - See **secondary standards.**

secondary sewage treatment - A more advanced type of sewage treatment than primary treatment that involves both mechanical and biological (bacterial action) phases; although superior to primary treatment, much of the phosphates and nitrates remain in the effluent.

secondary standards - These drinking water standards, sometimes called Secondary Maximum Contaminant Levels (SMCLs), address taste, odor, color, and other aesthetic aspects of drinking water that do not present health risks. These guidelines are recommended as reasonable goals, but federal law does not require water systems to comply with them; however, some states do choose to enforce them.

scum - Fats, oils, and other light-weight solids that float on the surface of wastewater in septic tanks.

sediment - Solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below water level.

sediment discharge - The quantity of sediment, measured in dry weight or by volume, transported through a stream cross-section in a given time. Sediment discharge consists of both suspended load and bedload.

sediment yield - The quantity of sediment arriving at a specific location.

sedimentation - The movement of sediment. The addition of soils to lakes which is part of the natural aging process. Also the drinking water treatment process of letting heavy particles in raw water settle out into holding ponds or basins before filtration.

seepage - Percolation of water through the soil from unlined canals, ditches, watercourses, or water storage facilities.

septic tank - Part of a conventional septic system in which all of the wastewaters from the home should flow.

septum - A porous membrane in a precoat filter that can be fabric, bronze, stainless steel, or a wire-wrapped cylinder. The septum supports the filter aid. See also **precoat filter.**

sequestering agent - A chemical that "ties up" or combines with objectionable substances in water, thus minimizing their negative impact on water quality.

service flow rate - The volume of water that flows through a specific area of a household water distribution system per minute, per hour, or per day.

sheet flow - Water, usually storm runoff, flowing in a thin layer over the ground surface. Same as overland flow.

sewage - The solid human waste and human-generated wastes that are normally discharged into wastewater transported through sewers.

sewer - An artificial conduit, usually underground, for carrying off wastewater and refuse, as in a town or city.

sewer, combined - A sewer system that does not separate storm sewer conduits from sanitary sewer conduits. All water in the system flows to a wastewater treatment plant. Such systems are subject to overflow during high stormwater runoff events.

sewer, sanitary - A sewer system that carries only sewage waste to a wastewater treatment plant. If a sanitary sewer is part of a combined system, stormwater may be mixed with sewage water causing overflows or lack of adequate treatment during high runoff situations.

sewer, storm - A sewer system that transports storm and surface runoff, in most cases directly to a receiving water body (river, lake, stream) without treatment. However, if a storm sewer is part of a combined system, stormwater and sewage are transported in a single pipe.

siltation - The filling up of a stream or reservoir with water-borne sediment.

sinkhole - A depression in the landscape, commonly where limestone has been dissolved in karst terrain.

slope - Degree of deviation of a surface from the horizontal, usually expressed in percent or degrees.

sludge - Solids removed from wastewater or raw water in the process of treatment; the heavy, partially decomposed solids found in the bottom of a septic tank.

soda ash - The most common name for sodium carbonate, a chemical compound used to raise the pH of acidic water to prevent corrosion. The chemical symbol for soda ash is "Na_2CO_3." See also **corrosion.**

sodium hydroxide - (called caustic or lye) A white solid that is used to raise the pH of acidic water in order to prevent corrosion. Sodium hydroxide is a hazardous chemical and must be handled and stored with care. The chemical symbol for sodium hydroxide is "NaOH." See also **corrosion.**

softening - The process of exchanging calcium and magnesium ions in water for sodium or potassium ions to prevent hardness. See also **cation exchange** and **hardness.**

soil-conserving crops - Crops that prevent or retard erosion and maintain or replenish rather than deplete soil organic matter.

soil erosion - The detachment and movement of soil from the land surface by wind or water. See **erosion.**

soil management - The sum total of all tillage operations, cropping practices, fertilizer, lime, and other treatments conducted on, or applied to, a soil for the production of plants.

soil organic matter - The organic fraction of the soil that includes plant and animal residues at various stages of decomposition, cells and tissues of soil organisms, and substances synthesized by the soil population. Commonly determined as the amount of organic material contained in a soil sample passed through a 2-millimeter sieve.

soil profile - A cross-sectional view of a particular soil type in which the characteristic layers or horizons are well represented.

soil structure - The combination or arrangement of primary soil particles into secondary particles, units, or peds. The secondary units are characterized and classified on the basis of size, shape, and degree of distinctness into classes, types, and grades, respectively. A soil with good structure has a spongy or crumbly quality with an abundance of pores through which water and oxygen can move.

soil texture - The relative proportions of the various size particles in a soil. The four categories of particles ranging from smallest to largest are clay, silt, sand, and gravel. Textural classes may be modified by the addition of suitable adjectives when coarse fragments are present in substantial amounts; for example, gravelly silt loam. Sand, loamy sand, and sandy loam are further subdivided on the basis of the proportions of the various sand separates present.

spring, contact - Type of spring that forms at a lithologic contact where a unit of more permeable material overlies less permeable or impermeable material.

spring, depression - Type of spring that forms when the water table reaches a land surface because of a change in topography.

spring, fault - A spring created by the movement of two rock units on a fault, allowing water to reach the surface.

spring, fracture - A spring created by fracturing or jointing of the rock of a confined aquifer.

spring, sinkhole - A spring created by groundwater flowing from a sinkhole in karst terrain.

stabilization - The controlled decomposition of organic material in wastewater. Usually accomplished by heat or raising pH above 12 for a period of time.

stabilized grade - The slope of a channel at which neither erosion nor deposition occurs.

storm hydrograph - A graph of the discharge of a stream over the time period when, in addition to direct precipitation, overland flow, interflow, and return flow are adding to the flow of the stream. The stream flow will peak owing to these additional flow elements.

strip-cropping - An agricultural practice in which an open row crop (corn, cotton, potatoes) is alternated with strips of a cover crop (alfalfa, clover, grass) to minimize soil erosion.

stubble - The basal portion of plants remaining after the top portion has been harvested; also, the portion of the plants, principally grasses, remaining after grazing is completed.

stubble mulch - The stubble of crops or crop residues left essentially in place on the land as a surface cover during fallow and the growing of a succeeding crop.

submersible pump - A pump that allows the motor to be submerged in a well below the water surface. This type of pump is required if water must be lifted more than 25 feet. Also called a deep-well pump.

subsoiling - The tillage of subsurface soil, without inversion, for the purpose of breaking up dense layers that restrict water movement and root penetration.

suction pump - A pump that allows the motor to remain above the surface of the water. Water is sucked through a pipe lowered into the water. Not effective at depths greater than 25 feet. Also called a shallow-well pump.

summer fallow - The tillage of uncropped land during the summer in order to control weeds and conserve moisture in the soil for the growth of a later crop.

Superfund Act (CERCLA) - The act that provided a fund to the EPA for the purpose of cleaning up extremely hazardous waste sites.

surface water - Water located on the land surface including lakes, rivers, streams, and oceans.

suspended solids - Small particles of solid pollutants in sewage that cause cloudiness; can generally be removed by flocculation with subsequent mechanical filtration.

synergistic pollutant effect - A condition in which the toxic effect of two or more pollutants (copper, zinc, heat) is much greater than the sum of the effects of the pollutants when operating individually.

terrace - An embankment or combination of an embankment and channel constructed across a slope to control erosion by diverting or storing surface runoff instead of permitting it to flow uninterrupted down the slope. Terraces or terrace systems may be classified by their alignment, gradient, outlet, and cross-section. Alignment is parallel or non-parallel. Gradient may be level, uniformly graded, or variably graded. Grade is often incorporated to permit paralleling the terraces. Outlets may be soil infiltration only, vegetated waterways, tile outlets, or combinations of these. Cross-sections may be narrow base, broad base, bench, steep backslope, flat channel, or channel.

terrace interval - Distance measured either vertically or horizontally between corresponding points on two adjacent terraces.

tertiary sewage treatment - The most advanced type of sewage treatment, which not only removes the BOD and the solids, but also most of the phosphorus, nitrates, and other chemicals. Also called advance sewage treatment.

thermocline - The middle layer of water in a lake in summer characterized by a temperature gradient of more than 1°C per meter of depth.

throughflow - Lateral movement of water through soil. Also called interflow.

tillage - The operation of implements through the soil to prepare seedbeds and root beds.

time of concentration - The time it takes for water to flow from the most distant part of the drainage basin (watershed) to the measuring point.

total acidity of water - Since carbon dioxide is an acid, water containing salts and carbon dioxide is said to have acidity if its pH is below 8.3. The milliequivalents per liter of standard base (reported as calcium carbonate equivalent), required to raise water from its initial pH to pH 8.3 is equivalent to its total acidity.

total alkalinity - The total concentration of bases in water expressed in milligrams per liter of calcium carbonate equivalent. Measured by titrating a water sample with standard acid from its initial pH to pH 4.5. Waters with pH below 4.5 have no alkalinity.

total dissolved solids (TDS) - The total residue, expressed in milligrams per liter, remaining after evaporation of a water sample first filtered to remove suspended matter. An indicator of dissolved salts or salinity.

total solids - The weight, in milligrams per liter, of the residue remaining after evaporation to dryness of an unfiltered sample. An indicator of total nonvolatile contaminants.

toxic - Harmful to human or animal life. Toxic substances can cause health effects through chronic (long-term) consumption of small amounts. Exposure to high concentrations may cause immediate (acute) health effects.

toxicity - A quantitative measure of health injury caused by a particular chemical through exposure by eating, breathing, drinking, or absorption through the skin.

Toxic Substances Control Act (TSCA) - This act makes it mandatory for a company to notify the EPA 90 days in advance of its intention to manufacture a new chemical. If the potential toxic effects and environmental danger is too great, the EPA will not give the company permission to produce the chemical.

transpiration - The process by which water passes as vapor from organisms, especially plants, through membranes or pores to the atmosphere.

transportation - The movement of detached soil material across the land surface or through the air. May be accomplished by running water, wind, or gravity. Soil erosion.

transverse dispersion - The dispersion of a solute or contaminant in a direction perpendicular to the direction of groundwater flow.

treatment technique requirement - This requirement is set for contaminants in drinking water that are difficult or costly to measure and is used instead of Maximum Contaminant Level (MCL). Under this requirement, specific water treatment practices, such as filtration or corrosion control, may be required.

trihalomethanes (THMs) - Disinfection by-products formed when chlorine reacts with organic matter during disinfection of drinking water. They are known carcinogens.

turbidity - A measure of the cloudiness in water caused by suspended material. It can interfere with disinfection of drinking water by shielding microorganisms, thus allowing live pathogens to enter a water system.

ultraviolet (UV) light - Radiation ranging from 60 to 390 nanometers in wavelength. Ultraviolet light has a shorter wavelength than visible light and a longer wavelength than X rays. At wavelengths between 200 and 300 nanometers, it has a strong germicidal ability and is used to disinfect drinking water. Most UV lamps used in home water treatment produce light in the range of 260 nanometers.

undergrazing - An intensity of grazing in which the forage available for consumption under a system of conservation pasture management is not used to best advantage. Contrast with overgrazing.

universal soil loss equation - An equation used for the design of water erosion control systems: A = RKLSCP wherein A = average annual soil loss in tons per acre per year; R = rainfall factor; K = soil erodibility factor; L = length of slope; S = percent of slope; C = cropping and management factor; and P = conservation practice factor. (T = soil loss tolerance value that has been assigned each soil, expressed T/A/Year.)

unloading - The process by which contaminants are released from a treatment device into treated water. Unloading occurs when a device is allowed to operate beyond the point of breakthrough and may result in higher contaminant concentration in treated water than in untreated water. Especially important in ion exchange and adsorption processes.

unsaturated zone - A portion of the soil profile which contains both water and air. The zone between the land surface and the water table. These soil formations do not yield usable amounts of free-flowing water. Also called zone of aeration and vadose zone.

vadose zone - The unsaturated zone of aeration in a soil, where pore spaces are only partially filled with water.

virus - One of a group of microscopic, self-reproducing organisms that infect humans, animals, and plants with disease. Viruses range from about 0.01 to 0.4 microns in diameter.

volatile organic chemicals (VOCs) - Organic chemicals that will form a gas when they come in contact with air.

wastewater - Used water from sewage treatment plants, septic systems, or industrial processing.

wastewater treatment - The process of removing pollutants from used water.

wastewater treatment, primary - The process of physically removing sand, grit, and larger solids from wastewater.

wastewater treatment, secondary - The process of biologically removing contaminants that are dissolved in wastewater.

wastewater treatment, tertiary - The process of chemically removing or filtering more suspended solids, organic matter, nitrogen, phosphorus, heavy metals, or bacteria from wastewater.

water, connate - Water below the land surface that has been out of contact with the atmosphere for an appreciable part of a geologic age.

water control (soil and water conservation) - The physical control of water by such measures as conservation practices on the land, channel improvements, and installation of structures for water retardation and sediment detention (does not refer to legal control or water rights as defined).

water density - The standard of 1 gram per cubic centimeter for comparing other substances. Water is most dense at 39°F and expands (becomes less dense) at both higher and lower temperatures.

water, fossil - Groundwater that was buried at the same time as the original sediment which holds the water.

water, juvenile - Water entering the hydrologic cycle for the first time.

water, phreatic - Water in the zone of saturation.

water quality criteria - The chemical, physical, and biological properties of water that affects its suitability for a particular purpose.

water, raw - Untreated surface or groundwater.

water renewal - The amount of water required to replace or to replenish surface water or groundwater volume during a given time interval.

water system, community - A public water system that has at least 15 service connections for year-round residents or that serves at least 25 year-round residents.

water system, large - A drinking water system that serves more than 10,000 people.

water system, public - A system that has 15 or more service connections or that regularly serves at least 25 people a day for at least 60 days each year. Public water systems are divided into two categories: community water systems and noncommunity water systems.

water system, medium - A drinking water system that serves 3,301 to 10,000 people.

water system, noncommunity - A public water system that does not meet the definition of a community water system. Noncommunity water systems can be either transient noncommunity water systems or nontransient noncommunity water systems.

w**ater system, noncommunity, nontransient -** This public water system serves the same 25 or more people a day for at least 6 months a year. Examples include schools, factories, and other work places that have their own drinking water supply.

water system, noncommunity, transient - This public water system typically serves travelers and others who are “passing through” or staying temporarily at locations such as highway rest stops, restaurants, and public parks. These systems serve at least 25 people a day for at least 60 days a year, but typically do not serve the same people each day.

water system, small - A drinking water system that serves fewer than 3,300 people.

water system, very small - Generally defined as a drinking water system that serves fewer than 500 people.

water system, very large - Generally defined as a water system that serves more than 50,000 people.

watershed - The total area drained by a particular stream; may range from a few square miles in the case of a small stream to thousands of square miles in the case of the Mississippi River. Same as drainage basin.

water table - The surface of an unconfined groundwater body defining the top of the saturated zone.

weed - A plant out of place.

well cap (seal) - A device used to cover the top of a well casing pipe.

wellhead protection area - The surface and subsurface area surrounding a water well or wellfield supplying a public water system.

well screen - A device fitted to the bottom of the well casing which allows water to enter the well freely but prevents the entrance of coarse sand.

wheel-track planting - Plowing and planting in separate operations with the seed planted in the wheel tracks.

wilting point - The soil-moisture content below which plants are unable to withdraw soil moisture.

woodland - Any land used primarily for growing trees and shrubs. Woodland includes, in addition to what is ordinarily termed "forest" or "forest plantations," shelterbelts, windbreaks, wide hedgerows containing woodland species for wildlife food or cover, stream and other banks with woodland cover, etc. It also includes farmland and other lands on which woody vegetation is to be established and maintained.

Winters doctrine - A United States doctrine holding that when Indian reservations were established, the federal government also reserved the water rights necessary to make the land productive.

woodland management - The management of woodlands and plantations that have passed the establishment stage, including all measures designed to improve the quality and quantity of woodland growing stock and to maintain litter and herbaceous ground cover for soil, water, and other resource conservation. Some of these measures are planting, improvement cutting, thinning, pruning, slash disposal, and protection from fire and grazing.

xerophyte - A desert plant capable of existing by virtue of a shallow and extensive root system in an area of minimal water.

xeriscaping - The use of drought-tolerant landscaping plants that do not require supplemental watering. Generally, the plants selected are native to the area in which they are used.

zeolite - A synthetic resin that is a crystalline formulation of aluminates and silicates. Depending on how it is prepared, zeolite can be used as an oxidizing agent or ion exchange resin.

zone of influence - The area of an aquifer that is affected by a pumping well or the area in which groundwater is actually flowing toward a well.

zooplankton - Minute animals (protozoans, crustaceans, fish embryos, insect larvae) that live in a lake, stream, or ocean and are moved aimlessly by water currents and wave action.