

GLOSSARY

abandoned well – a water well that is no longer in use or is in such a state of disrepair that continued use is unsafe or impractical.

ag(ricultural) drainage well – a drilled shaft that drains excess water into underlying bedrock; upper parts are often cistern-like structures that form a discharge point for tile-drainage lines.

alluvial aquifer – sand and gravel deposits that fill valleys along rivers and streams; important for public, industrial, and agricultural water supplies along large rivers.

alluvium – gravel, sand, silt, or clay deposited by flowing water.

annular space – the ring-shaped space between a borehole and the casing set within it.

aquifer – a body of earth materials that yields groundwater to wells or springs; a water-bearing formation.

aquitard (or aquiclude) – a body of earth materials capable of absorbing water but not transmitting it in sufficient quantities to supply a well; functions as the upper or lower boundary of an aquifer.

artesian – describes groundwater under pressure from the weight of water at higher elevations in a *confined aquifer*.

baseflow – that portion of stream flow originating from groundwater discharge into the stream channel.

bedrock – solid rock that underlies soil or other unconsolidated surficial materials.

bentonite – naturally occurring clays that swell greatly in volume as water is absorbed; used as an impermeable seal in well construction and abandonment.

brecciated – said of rock composed of broken, angular fragments.

buried-valley (“channel”) aquifers – sand and gravel deposits along ancient river valleys, often carved into bedrock, and buried beneath other sediments.

capillary fringe – a zone in which water is drawn upward immediately above the *water table*, held by surface tension within tiny pores.

casing – the tubular steel or plastic lining of a well, installed to support the well opening and keep fluids and earth materials out.

coliform bacteria – a group of bacteria whose presence in well water indicates a direct path for potential contaminants from the land surface.

cone of depression (drawdown cone) – a conical depression in the *water table* or the *potentiometric surface* that forms in response to pumping groundwater from a well.

confined aquifer – an aquifer bounded above and below by impermeable strata and under *artesian* pressure.

discharge – the outflow of water from a stream or groundwater aquifer; opposite of *recharge*; also, outflow from a pumping well.

drawdown – the difference between water levels in a well before pumping and during pumping.

evapotranspiration – process by which water moves into the atmosphere by evaporation from land and water and by transpiration from plants.

fen – a special type of wetland sustained by mineralized groundwater flow and including saturated peat deposits, often in mounded positions on hill slopes.

floodplain – the relatively level land that lies adjacent to a river channel and periodically is covered with flood water.

geothermal gradient – the rate of increase in temperature with depth within the Earth.

glacial drift aquifers – pockets of water-bearing sand and gravel within pebbly clay material left by glacial and associated meltwater activity; their configurations are irregular and locations are often unpredictable.

glacial till – an unsorted and unstratified mixture of clay, silt, sand, gravel, and boulders deposited directly by a glacier without subsequent reworking by meltwater.

groundwater – subsurface water that occupies pores, fractures, or other openings within earth materials.

grout – slurry mixture of cement or bentonite and water that can be pumped through a pipe and placed as a protective fill or seal during well construction.

hydraulic conductivity – the capacity of porous earth materials to transmit groundwater; the rate is determined by size and shape of the pore spaces and their degree of interconnection.

hydraulic head – the pressure of groundwater at a given point caused by the height of groundwater higher in the aquifer; represented by the elevation to which water will rise in a well.

hydrogeology – the study of groundwater and its relationship to the geologic environment.

hydrologic cycle (water cycle) – the continuous circulation of water from the atmosphere to earth and into the ground by precipitation and infiltration, and its eventual return to the atmosphere from land and water surfaces by evaporation and *transpiration*.

impermeable – describes earth materials that will not readily transmit water.

infiltration – the downward movement of water into the ground; percolation.

karst – describes topography formed by the dissolving action of groundwater on underlying carbonate bedrock and characterized by sinkholes, caves, underground drainage, and springs.

leachate – a solution formed by groundwater percolating through shallow materials containing soluble minerals or chemicals.

loess – wind-blown silt, usually porous and friable, deposited as a by-product of glacial and meltwater activity.

mafic – describes igneous rocks composed mainly of dark-colored minerals (ferromagnesian).

nonpoint-source contamination – pollution stemming from diffuse, widespread sources such as runoff and percolation from agricultural or urban areas.

outwash – sand and gravel carried by glacial meltwater and deposited beyond the ice margin.

paleosol – a soil formed in the geologic past and buried by younger materials.

perched water table – the mounding of water above a low permeability material located above the water table.

permeable/permeability – the capacity of earth materials to allow free passage of water; a measure of the interconnectedness of porous openings in rock, sediment, or soil.

pluton – an intrusion of igneous rock formed at great depth.

point-source contamination – pollution stemming from a single, identifiable source, such as a drainpipe, sewer, ditch, or underground container.

porosity – a measure of the open spaces in a deposit of earth materials; capacity to store water.

potentiometric (or pressure) surface – an imaginary surface defined by the level to which water will rise in a well.

recharge – the replenishment of groundwater supplies by infiltrating precipitation and surface water.

recharge area – a portion of the land surface over which infiltrating water eventually reaches an aquifer.

runoff – precipitation that flows over land until it reaches surface water, infiltrates into the ground, or evaporates.

saturated zone (phreatic zone) – that portion of earth materials in which all subsurface openings are filled with water; the upper surface of this zone is the *water table*.

Source Water Assessment and Protection – a program to determine susceptibility of public water supplies to contamination; key components are defining the hydrogeologic area (source) that contributes to a water supply, and then assessing land surface contaminant sources in order to minimize risk.

spring – natural discharge of groundwater to the land surface or into a lake, stream, or wetland.

static water level – the standing water level in a well that is not being pumped.

subcrop – (in Iowa) an occurrence of bedrock lying directly beneath the much younger mantle of glacial deposits; a “subsurface outcrop.”

surficial aquifer – occurs in earth materials lying above bedrock; typically includes alluvial, glacial drift, and buried valley groundwater sources.

total dissolved solids – the combination of all dissolved mineral constituents in groundwater.

transpiration – the process by which plants evaporate water into the atmosphere.

unconfined aquifer – an aquifer having a freely fluctuating water table, open to atmospheric pressure; not confined beneath *impermeable* strata.

unsaturated zone (zone of aeration; vadose zone) – an underground area where pore or fracture openings contain both air and water; lies between the land surface and the *water table*.

watershed – the land area drained by a stream; a drainage basin.

water table – the top (upper boundary) of the saturated zone in an *unconfined aquifer*.

well – a cylindrical hole drilled or excavated into a water-bearing zone so that water can be pumped or will flow to the land surface.

well development – a process to increase water yield by enlarging voids and flushing sediment from a well.

wellhead protection – a program that encourages communities to determine groundwater sources for and contamination threats to their public water wells; protection of well sources including the surface and subsurface area through which contaminants could move toward a well or well field.

well interference – when the *cone-of-depression* of one well overlaps with that of another well pumping from the same aquifer.

wetlands – lands where water-saturation during all or part of the year determines soil types and plant and animal communities.