

# APPENDIX F

## Glossary

The list of terms that follows is representative of those used by soil scientists, engineers, developers, conservationist planners, etc. The terms are not necessarily used in the text, nonetheless they are in common use in conservation matters.

**AASHTO CLASSIFICATION (soil engineering)** — The official classification of soil materials and soil aggregate mixtures for highway construction used by the American Association of State Highway Transportation Officials.

**ACID SOIL** — A soil with a preponderance of hydrogen ions, and probably of aluminum in proportion to hydroxyl ions. Specifically, soil with a pH value less than 7.0. For most practical purposes, a soil with a pH less than 6.6, the values obtained vary greatly with the method used consequently there is no unanimous agreement on what constitutes an acid soil. The term is usually applied to the surface layer or to the root zone unless specified otherwise.

**ACRE-FOOT** — The volume of water that will cover 1 acre to a depth of 1 foot.

**AGGRADATION** — The process of building up a surface by deposition. This is a long-term or geologic trend in sedimentation.

**ALKALINE SOIL** — A soil that has a pH greater than 7.0, particularly above 7.3, throughout most or all of the root zone, although the term is commonly applied to only the surface layer or horizon of a soil.

**ALLUVIAL** — Pertaining to material that is transported and deposited by running water.

**ALLUVIAL LAND** — Areas of unconsolidated alluvium, generally stratified and varying widely in texture, recently deposited by streams, and subject to frequent flooding. A miscellaneous land type.

**ALLUVIAL SOILS** - An axonal great soil group of soils, developed from transported and recently deposited material (alluvium) characterized by a weak modification (or none) of the original material by soil forming processes.

**ALLUVIUM** — A general term for all detrital material deposited or in transit by streams, including gravel, sand, silt, clay, and all variations and mixtures of these. Unless otherwise noted, alluvium is unconsolidated.

**ANGLE OF REPOSE** — Angle between the horizontal and the maximum slope that a soil assumes through natural processes.

**ANTECEDENT SOIL WATER** — Degree of wetness of a soil prior to irrigation or at the beginning of a runoff period, expressed as an index or as total inches soil water.

**ANTI-SEEP COLLAR** — A device constructed around a pipe or other conduit and placed through a dam, levee, or dike for the purpose of reducing seepage losses and piping failures.

**ANTI-VORTEX DEVICE** — A facility placed at the entrance to a pipe conduit structure such as a drop inlet spillway or hood inlet spillway to prevent air from entering the structure when the pipe is flowing full.

**APRON (soil engineering)** — A floor or lining to protect a surface from erosion. An example is the pavement below chutes, spillways, or at the toes of dams.

**AUXILIARY SPILLWAY** — A dam spillway built to carry runoff in excess of that carried by the principal spillway. See *Emergency Spillway*.

**BACKFILL** — The material used to refill a ditch or other excavation, or the process of doing so.

**BEDROCK** — The solid rock underlying soils and the regolith in depths ranging from zero (where exposed by erosion) to several hundred feet.

**BEDLOAD** — The sediment that moves by sliding, rolling, or bounding on or very near the streambed; sediment moved mainly by tractive or gravitational forces or both but at velocities less than the surrounding flow.

**BEST MANAGEMENT PRACTICES (BMP)** — A collection of structural practices and vegetative measures which, when properly designed, installed and maintained, will provide effective erosion and sedimentation control for all rainfall events up to and including a 25-year, 24-hour rainfall event.

**BLINDING MATERIAL** — Material placed on top and around a closed drain to improve the flow of water to the drain and to prevent displacement during backfilling of the trench.

**BLIND INLET** — Inlet to a drain in which entrance of water is by percolation rather than open flow channels.

**BORROW AREA** — A source of earth fill material used in the construction of embankments or other earthfill structures.

**BOTTOM LANDS** — A term often used to define lowlands adjacent to streams.

**BOX-CUT** — The initial cut driven in a property where no open side exists, resulting in a highwall on both sides at the cut.

**BRUSH MATTING**  
(1) A matting of branches placed on badly eroded land to conserve moisture and reduce erosion while trees or other vegetative covers are being established.  
(2) A matting of mesh wire and brush used to retard streambank erosion.

**CHANNEL** — A natural stream that conveys water; a ditch or channel excavated for the flow of water. See *Watercourse*.

**CHANNEL IMPROVEMENT** — The improvement

of the flow characteristics of a channel by clearing, excavation, realignment, lining, or other means in order to increase its capacity. Sometimes used to con- note channel stabilization.

**CHANNEL SLOPE** — Natural or excavated sides (banks) of a watercourse.

**CHANNEL STABILIZATION** — Erosion prevention and stabilization of velocity distribution in a channel using jetties, drops, revetments, vegetation, and other measures.

**CHANNEL STORAGE** — Water temporarily stored in channels while enroute to an outlet.

**COLLOID** — In soil, organic or inorganic matter having very small particle size and a correspondingly large surface area per unit of mass. Most colloidal particles are too small to be seen with the ordinary compound microscope.

**COMPACTION** — In soil engineering, the process by which the silt 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.

**CONDUIT** — Any channel intended for the conveyance of water, whether open or closed.

**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 related resource conservation, use, and development within its boundaries, usually a subdivision of state government with a local governing body. Often called a soil conservation district or a soil and water conservation district.

#### **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.

**COVER CROP** — A close-growing crop grown primarily for the purpose of protecting and improving soil between periods of permanent vegetation.

**CRADLE** — A device, usually concrete, used to support a pipe conduit or barrel.

**CREEP (SOIL)** — Slow mass movement of soil and soil material down relatively steep slopes, primarily under the influence of gravity but facilitated by saturation with water and by alternate freezing and thawing.

**CRITICAL AREA** — A severely eroded sediment producing area that requires special management to establish and maintain vegetation to stabilize soil conditions.

**CUT** — A portion of land surface or area from which earth has been removed or will be removed by excavation;

the depth below the original ground surface to the excavated surface. Syn. *Excavation*.

**CUT-AND-FILL** — Process of earth moving by excavating part of an area and using the excavated material for adjacent embankments or fill areas.

**CUTOFF** — A wall, collar or other structure, such as a trench, filled with relatively impervious material intended to reduce seepage of water through porous strata.

**DAM** — A barrier to confine or raise water for storage or diversion, to create a hydraulic head, to prevent gully erosion, or for retention of soil, rock, or other debris.

**DEBRIS** — 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.

**DEBRIS GUARD** — A screen or grate at the intake of a channel, drainage, or pump structure for the purpose of stopping debris.

**DEGRADATION** — To wear down by erosion, especially through stream action.

**DESIGN HIGHWATER** — The elevation of the water surface as determined by the flow conditions of the design floods.

**DESIGN LIFE** — The period of time for which a facility is expected to perform its intended function.

**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.

**DIKE (engineering)** — An embankment to confine or control water, especially one built along the banks of a river to prevent overflow of lowlands; a levee. (geology) A tabular body of igneous rock that cuts across the structure of adjacent rocks or cuts massive rocks.

**DISCHARGE (hydraulics)** — Rate of flow, specifically fluid flow; a volume of fluid passing a point per unit time, commonly expressed as cubic feet per second, million gallons per day, gallons per minute, or cubic meters per second.

**DISCHARGE COEFFICIENT (hydraulics)** — The ratio of actual rate of flow to the theoretical rate of flow through orifices, weirs, or other hydraulic structures.

**DISCHARGE FORMULA (hydraulics)** — A formula to calculate rate of flow of fluid in a conduit or through an opening. For steady flow discharge,  $Q =$

AV, wherein Q is rate of flow, A is cross-sectional area and V is mean velocity. Common units are cubic feet per second, square feet, and feet per second, respectively. To calculate the mean velocity, V for uniform flow in pipes or open channels see Manning's Formula.

**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.

**DIVERSION** — A channel with or without a supporting ridge on the lower side constructed across the top or bottom of a slope for the purpose of intercepting surface runoff.

**DIVERISION DAM** — A barrier built to divert part or all of the water from a stream into a different course.

#### **DRAIN**

- (1) A buried pipe or other conduit (closed drain).
- (2) A ditch (open drain) for carrying off surplus surface water of groundwater.
- (3) To provide channels, such as open ditches or closed drains, so that excess water can be removed by surface flow or by internal flow.
- (4) To lose water (from the soil) by percolation.

#### **DRAINAGE**

(1) The removal of excess surface water or groundwater from land by means of surface or subsurface drains.

(2) Soil characteristics that affect natural drainage.

**DRAINAGE, SOIL** — As a natural condition of the soil, soil drainage refers to the frequency and duration of periods when the soil is free of saturation; for example, in well-drained soils the water is removed readily but not rapidly; in poorly drained soils the root zone is waterlogged for long periods unless artificially drained, and the roots of ordinary crop plants cannot get enough oxygen: in excessively drained soils the water is removed so completely that most crop plants suffer from lack of water. Strictly speaking, excessively drained soils are a result of excessive runoff due to steep slopes or low available water holding capacity due to small amounts of silt and clay in the soil material. The following classes are used to describe soil drainage:

Well drained — excess water drains away rapidly and no mottling occurs within 36 inches of the surface.

Moderately well drained — water is removed from the soil somewhat slowly, resulting in small but significant periods of wetness. Mottling occurs between 8 and 18 inches.

Somewhat poorly drained - water is removed from the soil slowly enough to keep it wet for significant periods but not all of the time. Mottling occurs between 0 to 18 inches.

Poorly drained — water is removed so slowly that the soil is wet for a large part of the time. Mottling occurs between 0 to 8 inches.

Very poorly drained — water is removed so slowly that the water table remains at or near the surface for the greater part of the time. There may also be periods of surface ponding. The soil has a black to gray surface layer with mottles up to the surface.

**DRAWDOWN** — Lowering of the water surface (in open channel flow), water table, or piezometric surface (in groundwater flow) resulting from a withdrawal of water.

**DROP-INLET SPILLWAY** — An overfall structure in which the water drops through a vertical riser connected to a discharge conduit.

**DROP SPILLWAY** — An overfall structure in which the water drops over a vertical wall onto an apron at a lower elevation.

**DROP STRUCTURE** — A structure for dropping water to a lower level and dissipating its surplus energy; a fall. A drop may be vertical or inclined.

**EARTH DAM** — Dam constructed of compacted soil material.

**EMBANKMENT** — A man-made deposit of soil, rock, or other material used to form an impoundment.

**EMERGENCY SPILLWAY** — A spillway used to carry runoff exceeding a given design flood. Syn. *Auxiliary Spillway*.

**ENERGY DISSIPATOR** — A device used to reduce the energy of flowing water.

**ERODIBLE (geology and soils)** — Susceptible to erosion.

#### **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. The following terms are used to describe different types of water erosion:

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

**GEOLOGIC EROSION** — The normal or natural erosion caused by geological processes acting over long geologic periods and resulting in the wearing away of mountains, the building up of floodplains, coastal plains, etc. See *Natural Erosion*.

**GULLY EROSION** — The erosion process whereby water accumulates in narrow channels and, over short periods, removes the soil from this narrow area to considerable depths, ranging from 1 to 2 feet to as much as 75 to 100 feet.

**NATURAL EROSION** — Wearing away of the

earth's surface by water, ice, or other natural agents under natural environmental conditions of climate, vegetation, etc., undisturbed by man. See *Geological Erosion*.

**NORMAL EROSION** — The gradual erosion of land used by man which does not greatly exceed natural erosion. See **Natural Erosion**.

**RILL EROSION** — An erosion process in which numerous small channels only several inches deep are formed; occurs mainly on recently disturbed and exposed soils. See *Rill*.

**SHEET EROSION** — The removal of fairly uniform layer of soil from the land surface by runoff water.

**SPLASH EROSION** — The spattering of small soil particles caused by the impact of raindrops on wet soils. The loosened and spattered particles may or may not be subsequently removed by surface runoff.

**EROSION AND SEDIMENTATION CONTROL PLAN** — A plan for the control of erosion and sediment resulting from a land-disturbing activity.

**EROSION CLASSES (soil survey)** — A grouping of erosion conditions based on the degree of erosion or on characteristic patterns; applied to accelerated erosion, not to normal, natural, or geological erosion. Four erosion classes are recognized for water erosion and three for wind erosion.

**EROSION INDEX** — An interaction term of kinetic energy times maximum 30-minute rainfall intensity that reflects the combined potential of raindrop impact and turbulence of runoff to transport dislodged soil particles from a field.

**EROSIVE** — Having sufficient velocity to cause erosion; refers to wind or water. Not to be confused with erodible as a quality of soil.

**ESCARPMENT** — A steep face or ridge of highland; the scarpment of a mountain range is generally on that side nearest the sea.

**EXISTING GRADE** — The vertical location of the existing ground surface prior to cutting or filling.

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

**FERTILIZER ANALYSIS** — The percentage composition of fertilizer, expressed in terms of nitrogen, phosphoric acid, and potash. For example, a fertilizer with a 6-12-6 analysis contains 6 percent nitrogen (N), 12 percent available phosphoric acid (P<sub>2</sub>O<sub>5</sub>) and 6 percent water-soluble potash (K<sub>2</sub>O). Minor elements may also be included. Recent analysis expresses the percentages in terms of the elemental fertilizer (nitrogen, phosphorus, potassium).

**FILLING** — The placement of any soil or other solid material either organic or inorganic on a natural ground surface or an excavation.

**FILTER STRIP** — A long, narrow vegetative planting used to retard or collect sediment for the protection

of diversions, drainage basins or other structures.

**FINAL CUT** — The last cut or line of excavation made when mining a specific property or area.

**FINISHED GRADE** — The final grade or elevation of the ground surface forming proposed design.

**FLOOD** — An overflow or inundation that comes from a river or other body of water and causes or threatens damage.

**FLOOD CONTROL** — Methods or facilities for reducing flood flows.

**FLOOD CONTROL PROJECT** — A structural system installed for protection of land and improvements from floods by the construction of dikes, river embankments, channels, or dams.

**FLOODGATE** — A gate placed in a channel or closed conduit to keep out floodwater or tidal backwater.

**FLOODPEAK** — The highest value of the stage or discharge attained by a flood. The peak stage or peak discharge.

**FLOODPLAIN** — Nearly level land situated on either side of a channel which is subject to overflow flooding.

**FLOODROUTING** — Determining the changes in the rise and fall of floodwater as it proceeds downstream through a valley or reservoir.

**FLOOD STAGE** — The stage at which overflow of the natural banks of a stream begins to cause damage in the reach in which the elevation is measured.

**FLOODWATER RETARDING STRUCTURE** — A structure providing for temporary storage and controlled release of floodwater.

**FLOODWAY** — A channel, either natural, excavated, or bounded by dikes and levees, used to carry excessive flood flows to reduce flooding; sometimes considered to be the transitional area between the active channel and the floodplain.

**FLUME** — A device constructed to convey water on steep grades lined with erosion resistant materials.

**FRAGIPAN** — A natural subsurface horizon with high bulk density relative to the solum above, seemingly cemented when dry but showing a moderate to weak brittleness when moist. The layer is low in organic matter, mottled, slowly or very slowly permeable to water, and usually shows occasional or frequent bleached cracks forming polygons. It may be found in profiles of either cultivated or virgin soils but not in calcareous material.

**FREEBOARD (hydraulics)** — Vertical distance between the maximum water surface elevation anticipated in design and the top of retaining banks or structures provided to prevent overtopping because of unforeseen conditions.

**GAGE OR GAUGE** — Device for registering precipitation, water level, discharge, velocity, pressure, temperature, etc.

**GAGING STATION** — A selected section of a stream channel equipped with a gage, recorder, or other facilities for determining stream discharge.

**GEOTEXTILE** — A term used to describe woven or non-woven fabric materials used to reinforce or separate soil and other materials.

**GRADATION (geology)** — The bringing of a surface or a streambed to grade by running water. As used in connection with sedimentation and fragmental products for engineering evaluation, the term gradation refers to the frequency distribution of the various sized grains that constitute a sediment, soil, or material.

#### **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 canal bed, roadbed, top of embankment, or bottom of excavation.

**GRADED STREAM** — A stream in which, over a period of years, the slope is delicately adjusted to provide, with available discharge and with prevailing channel characteristics, just the velocity required for transportation of the load (of sediment) supplied from the drainage basin. The graded profile is a slope of transportation. It is a phenomenon in which the element of time has a restricted connotation. Works of man are limited to his experience and of design and construction.

**GRADE STABILIZATION STRUCTURE** — A structure for the purpose of stabilizing the grade of a gully or other watercourse, thereby preventing further head-cutting or lowering of the channel grade.

**GRADIENT** — Change of elevation, velocity, pressure, or other characteristics per unit length; slope.

**GRADING** — Altering surfaces to specified elevations, dimensions, and/or slopes; this includes stripping, cutting, filling, stockpiling and shaping or any combination thereof and shall include the land in its cut or filled condition.

**GRASS** — A member of the botanical family Gramineae, characterized by bladelike leaves arranged on the culm or stem in two ranks.

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

**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 of 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 use of ordinary tillage equipment. See *Erosion, Rill*.

**GULLY EROSION** — See *Erosion*.

**GULLY CONTROL PLANTINGS** — The planting of forage, legume, or woody plant seeds, seedlings, cuttings, or transplants in gullies to establish or re-establish a vegetative cover adequate to control runoff and erosion and incidentally produce useful products.

**HABITAT** — The environment in which the life needs of a plant or animal organism, population or community are supplied.

#### **HEAD (hydraulics)**

- (1) The height of water above any plane of reference.
- (2) The energy, either kinetic or potential, possessed by each unit weight of a liquid, expressed as the vertical height through which a unit weight would have to fall to release the average energy possessed; used in various compound terms such as pressure head, velocity head, and lost head.
- (3) The internal pressure expressed in "feet" or pounds per square inch of an enclosed conduit.

**HEAD GATE** — Water control structure; the gate at the entrance to a conduit.

**HEAD LOSS** — Energy loss due to friction, eddies, changes in velocity, or direction of flow. Syn. *friction-head*.

#### **HEADWATER**

- (1) The source of stream.
- (2) The water upstream from a structure or point on a stream.

**HOOD INLET** — Entrance to a closed conduit that has been shaped to induce full flow at minimum water surface elevation.

**HYDROGRAPH** — A graph showing variation in stage (depth) or discharge of a stream of water over a period of time.

**IMPOUNDMENT** — Generally an artificial collection or storage of water, as a reservoir, pit, dugout, sump, etc. Syn. *reservoir*.

**INFILTRATION** — The gradual downward flow of water from the surface through soil to ground water and water table reservoirs.

**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.

#### **INLET (hydraulics)**

- (1) A surface connection to a closed drain.
- (2) A structure at the diversion end of a conduit.
- (3) The upstream end of any structure through which water may flow.

**INOCULATION** — The process of introducing pure or mixed cultures or micro-organisms into natural or artificial cultural media.

**INTAKE**

- (1) The headworks of a conduit, the place of diversion.
- (2) Entry of water into soil. See *Infiltration*.

**INTAKE RATE** — The rate of entry of water into soil. See *Infiltration Rate*.

**INTENSITY** — Rainfall rate usually in/hr.

**INTERCEPTION (hydraulics)** — The process by which precipitation is caught and held by foliage, twigs, and branches of trees, shrubs, and other vegetation. Often used for “interception loss” or the amount of water evaporated from the precipitation intercepted.

**INTERCEPTION CHANNEL** — A channel excavated at the top of earth cuts, at the foot of slopes or at other critical places to intercept surface flow; a catch drain. Syn. Interception Ditches of water.

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**INTERCEPTOR DRAIN** — Surface or subsurface drain, or a combination of both, designed and installed to intercept flowing water.

**INTERFLOW** — That portion of rainfall that infiltrates into the soil and moves laterally through the upper soil horizons until intercepted by a stream channel or until it returns to the surface at some point downslope from its point of infiltration.

**INTERMITTENT STREAM** — A stream or portion of a stream that flows only in direct response to precipitation. It receives little or no water from springs and no long-continued supply from melting snow or other sources. It is dry for a large part of the year, ordinarily more than 3 months.

**INTERNAL SOIL DRAINAGE** — The downward movement of water through the soil profile. The rate of movement is determined by the texture, structure, and other characteristics of the soil profile and underlying

layers and by the height of the water table, either permanent or perched. Relative terms for expressing internal drainage are: none, very slow, slow, medium, rapid, and very rapid.

**LAND** — The total natural and cultural environment within which production takes place; a broader term than soil. In addition to soil, its attributes include other physical conditions, such as mineral deposits, climate, and water supply; location in relation to centers of commerce, population, and other land; the size of the individual tracts or holdings; and existing plant cover, works of improvement, and the like. Some use the terms loosely in other senses: as defined above but without the economic or cultural criteria; especially in the expression “natural land” as a synonym for “soil”; for the solid surface of the earth; and also for earthy surface formations, especially in the geomorphological expression “land form”.

**LAND CAPABILITY** — The suitability of land for use without permanent damage. Land capability, as ordinarily used in the United States, is an expression of the effect of physical land conditions, including climate, on the total suitability for use without damage for crops that require regular tillage, for grazing, for woodland, and for wildlife. Land capability involves consideration of (1) the risks of land damage from erosion and other causes and (2) the difficulties in land use owing to physical land characteristics, including climate.

**LAND CAPABILITY CLASSIFICATION** — A grouping of kinds of soils into special units, subclasses, and classes according to their capability for intensive use and the treatments required for sustained use. (Prepared by the Natural Resources Conservation Service, USDA.)

**LAND CAPABILITY MAP** — A map showing land capability units, subclasses and classes, or a soil survey map colored to show land capability classes.

**LAND CAPABILITY UNIT** — Capability units provide more specific and detailed information for application to specific fields on a farm or ranch than the subclass of the land capability classification. A capability unit is group of soils that are nearly alike in suitability for plant growth and responses to the same kinds of soil management.

**LAND CLASSIFICATION** — The arrangement of land units into various categories based on the properties of the land or its suitability for some particular purpose.

**LAND-DISTURBING ACTIVITY** — Any land change which may result in soil erosion from water or wind and the movement of sediments into State water or onto lands within the State, including, but not limited to, clearing, dredging, grading, excavating, transporting and filling of land.

**LAND FORM** — A discernible natural landscape,

such as a floodplain, stream terrace, plateau, valley, etc.

**LAND RECLAMATION** — Making land capable of more intensive use by changing its general character, as by drainage of excessively wet land; irrigation of arid or semiarid land; or recovery of submerged land from seas, lakes, and rivers. Large-scale reclamation projects usually are carried out through collective effort. Simple improvements, such as cleaning of stumps or stones from land, should not be referred to as land reclamation.

**LEACHING** — The removal from the soil in solution of the more soluble materials by percolating waters.

**LEGUME** — A member of the legume or pulse family, Leguminosae. One of the most important and widely distributed plant families. The fruit is a "legume" or pod that opens along two sutures when ripe. Flowers are usually papilionaceous (butterflylike). Leaves are alternate, have stipules, and are usually compound. Includes many valuable food and forage species, such as the peas, beans, peanuts, clover, alfalfas, sweet clovers, lespedezas, vetches, and kudzu. Practically all legumes are nitrogen-fixing plants.

**LEVEL SPREADER** — A shallow channel excavation at the outlet end of a diversion with a level section for the purpose of diffusing the diversion out-flow.

**LIME** — Lime, from the strictly chemical standpoint, refers to only one compound, calcium oxid (CaO); however, the term "lime" is commonly used in agriculture to include a great variety of materials which are usually composed of the oxide, hydroxide, or carbonate of calcium or of calcium and magnesium. The most commonly used forms of agriculture lime are ground limestone (carbonates), hydrated lime (hydroxides), burnt lime (oxides), marl, and oyster shells.

**LIME, AGRICULTURAL** — A soil amendment consisting principally of calcium carbonate, but including magnesium carbonate and perhaps other materials, used to furnish calcium and magnesium as essential elements for the growth of plants and to neutralize soil acidity.

**LIMING** — The application of lime to land, primarily to reduce soil acidity and supply calcium for plant growth. Dolomitic limestone supplies both calcium and magnesium. It may also improve soil structure, organic matter content, and nitrogen content of the soil by encouraging the growth of legumes and soil microorganisms. Liming an acid soil to pH value of about 6.5 is desirable for maintaining a high degree of availability of most of the nutrient elements required by plants.

**LIQUEFICATION (spontaneous liquefaction)** — The sudden large decrease of the shearing resistance of a cohesionless soil, caused by a collapse of the structure from shock or other type of strain and asso-

ciated with a sudden but temporary increase in the pore-fluid pressure. It involves a temporary transformation of the material into a fluid mass.

**LIQUID LIMIT (LL)** — The water content corresponding to the arbitrary limit between the liquid and plastic states of consistency of a soil.

**LITTER** — In forestry, a surface layer of loose organic debris in forests, consisting of freshly fallen or slightly decomposed organic materials.

**LOAMY** — Intermediate in texture and properties between fine-textured and coarse-textured materials.

**LOOSE ROCK DAM** — A dam built of rock without the use of mortar, a rubble dam. See *Rock-Fill Dam*.

**MADE LAND** — Areas filled with earth or earth and trash mixed, usually made by or under the control of man. A miscellaneous land type.

**MANNING'S FORMULA (hydraulics)** — A formula used to predict the velocity of water flow in an open channel or pipelines:

$$V = \frac{1.486r^{2/3} S^{1/2}}{n}$$

wherein V is the mean velocity of flow in feet per second; r is the hydraulic radius; s is the slope of the energy gradient or for assumed uniform flow the slope of the channel in feet per foot; and n is the roughness coefficient or retardance factor of the channel lining.

**MEAN DEPTH (hydraulics)** — Average depth; cross-sectional area of a stream or channel divided by its surface or top width.

**MEAN VELOCITY** — Average velocity obtained by dividing the flow rate discharge by the cross-sectional area for that given cross-section.

**MEASURING WEIR** — A shaped notch through which water flows are measured. Common shapes are rectangular, trapezoidal, and triangular.

**MECHANICAL ANALYSIS** — The analytical procedure by which soil particles are separated to determine the particle size distribution.

**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. See *Structural Practices*.

**MONOLITHIC** — Of or pertaining to a structure formed from a single mass of stone.

**MOUNTAIN TOP REMOVAL** — A mining method in which 100 percent of the overburden covering a mineral deposit is removed in order to recover 100 percent of the mineral. Excess spoil material is hauled to a nearby hollow to create valley fill.

**MOVEABLE DAM** — A moveable barrier that may be opened in whole or in part, permitting control of the flow of water through or over the dam.

**MUCK SOIL**

(1) An organic soil in which the organic matter is well decomposed (USA usage).

(2) A soil containing 20 to 50 percent organic matter.

**MULCH** — A natural or artificial layer of plant residue or other materials, such as sand or paper, on the soil surface.

**NATURAL GROUND SURFACE** — The ground surface in its original state before any grading, excavation or filling.

**NOISE POLLUTION** — The persistent intrusion of noise into the environment at a level that may be injurious to human health.

**NORMAL DEPTH** — Depth of flow in an open conduit during uniform flow for the given conditions. See *Uniform Flow*.

**OPEN DRAIN** — Natural watercourse or constructed open channel that conveys drainage water.

**OUTFALL** — Point where water flows from a conduit, stream, or drain.

**OUTLET** — Point of water disposal from a stream, river, lake, tidewater, or artificial dam.

**OUTLET CHANNEL** — A waterway constructed or altered primarily to carry water from man-made structures, such as terraces, tile lines, and diversions.

**OVERFALL** — Abrupt change in stream channel elevation; the part of a dam or weir over which the water flows.

**OVERHAUL** — Transportation of excavated material beyond a specified haul limit, usually expressed in cubic yard stations (1 cubic yard hauled 100 feet).

**PARENT MATERIAL (soils)** — The unconsolidated, more or less chemically weathered, mineral or organic matter from which the solum of soils has developed by pedogenic processes. The C horizon may or may not consist of materials similar to those from which the A and B horizons developed.

**PEAK DISCHARGE** — The maximum instantaneous flow from a given storm condition at a specific location.

**PERCOLATION** — The downward movement of water through soil, especially the downward flow of water in saturated or nearly saturated soil at hydraulic gradients of the order of 1.0 or less.

**PERMEABILITY** — Capacity for transmitting a fluid. It is measured by the rate at which a fluid of standard viscosity can move through material in a given interval of time under a given hydraulic gradient.

**PERMEABILITY, soil** — The quality of soil horizon that enables water or air to move through it. The permeability of a soil may be limited by the presence of one nearly impermeable horizon even though the others are permeable.

**pH** — A numerical measure of the acidity or hydrogen ion activity. The neutral point is pH 7.0. All pH values below 7.0 are acid and all above are alkaline.

**PIPE DROP** — A circular conduit used to convey water down steep grades.

**PLASTICITY INDEX (PI)** — The numerical difference between the liquid limit and the plastic limit.

**PLASTIC LIMIT (PL)** — The water content corresponding to an arbitrary limit between the plastic and semisolid states of consistency of soil.

**PLASTIC SOIL** — A soil capable of being molded or deformed continuously and permanently by relatively moderate pressure.

**PLUNGE POOL** — A device used to dissipate the energy of flowing water that may be constructed or made by the action of flowing. These facilities may be protected by various lining materials.

**POOLS** — Areas of a stream where the velocity provides a favorable habitat for plankton. Silts and other loose materials that settle to the bottom of pools are favorable for burrowing forms of benthos. Syn. *riffle*.

**PRINCIPAL SPILLWAY** — A water conveying device generally constructed of permanent material and designed to regulate the normal water level, provide flood protection and/or reduce the frequency of operation of the emergency spillway.

**PURE LIVE SEED (PLS)** — A term used to express the quality of seed, even if it is not shown on the label. Expressed as a percentage of the seeds that are pure and will germinate. Determined by multiplying the percent of pure seed times the percents of germination and dividing by 100.

**RATIONAL FORMULA** —  $Q = CIA$ . Where "Q" is the peak discharge measured in cubic feet per second, "C" is the runoff coefficient reflecting the ratio of runoff to rainfall, "I" is the rainfall intensity for the duration of the storm measured in inches per hour, and "A" is the area contributing drainage measured in acres.

**RELIEF DRAIN** — A drain designed to remove water from the soil in order to lower the water table and reduce hydrostatic pressure.

**RELIEF WELL** — Well, pit, or bore penetrating the water table to relieve hydrostatic pressure by allowing flow from the aquifer.

**RESTORATION** — The process of restoring site conditions as they were before the land disturbance.

**RETURN FLOW** — That portion of the water diverted from a stream that finds its way back to the stream channel either as surface or underground flow.

**RILL** — A small intermittent watercourse with steep sides, usually only a few inches deep and thus no obstacle to tillage operations.

**RILL EROSION** — See *Erosion*.

**RIPRAP** — Broken rock, cobbles, or boulders placed on earth surfaces, such as the face of a dam or the bank of a stream for protection against the action of water (waves); also applied to brush or pole mat-

tresses, or brush and stone, or other similar materials used for soil erosion control.

**RISER** — The inlet portions of drop inlet spillway that extend vertically from the pipe conduit barrel to the water surface.

**RIVER BASIN** — A major water resource region. The United States has been divided into 20 river basin areas.

**ROCK-FILL DAM** — A dam composed of loose rock usually dumped in place, often with the upstream part constructed of handplaced or derrick-placed rock and faced with rolled earth or with an impervious surface of concrete, timber, or steel.

**RUNOFF (hydraulics)** — That portion of the precipitation on a drainage area that is discharged from the area in stream channels. Types include runoff, groundwater runoff, or seepage.

**SCARIFY** — To abrade, scratch, or modify the surface; for example, to scratch the impervious seed coat of hard seed or to break the surface of the soil with a narrow-bladed implement.

**SCREENING** — The use of any vegetative planting, fencing, ornamental wall of masonry, or other architectural treatment, earthen embankment, or a combination of any of these which will effectively hide from view any undesirable areas from the main traveled way.

**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, as a product of erosion.

**SEDIMENT BASIN** — A depression formed from the construction of a barrier or dam built at a suitable location to retain sediment and debris.

**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 LOAD** — See Sediment Discharge.

**SEDIMENT POOL** — The reservoir space allotted to the accumulation of submerged sediment during the life of the structure.

**SEEDBED** — The soil prepared by natural or artificial means to promote the germination of seed and the growth of seedlings.

#### **SEEPAGE**

(1) Water escaping through or emerging from the ground along an extensive line or surface as contrasted with a spring where the water emerges from a localized spot.

(2) (percolation) The slow movement of gravitational water through the soil.

**SHEET FLOW** — Water, usually storm runoff, flowing in a thin layer over the ground surface; also called overland flow.

**SHRINK-SWELL POTENTIAL** - Susceptibility to volume change due to loss or gain in moisture content.

**SHRINKAGE INDEX (SI)** — The numerical difference between the plastic and shrinkage limits.

**SHRINKAGE LIMIT (SL)** — The maximum water content at which a reduction in water content will not cause a decrease in the volume of the soil mass. This defines the arbitrary limit between the solid and semi-solid states.

**SIDE SLOPE** — Generic term used to describe slope of earth-moving operations, generally stated in horizontal to vertical ratio.

#### **SILT**

(1) A soil separate consisting of particles between 0.05 and 0.002 millimeter in equivalent diameter.

(2) A soil textural class.

**SILTING** — See *Sediment*.

**SILT LOAM** — A soil textural class containing a large amount of silt and small quantities of sand and clay.

**SILTY CLAY** — A soil textural class containing a relatively large amount of silt and clay and a small amount of sand.

**SILTY CLAY LOAM** — A soil textural class containing a relatively large amount of silt, a lesser quantity of clay, and a still smaller quantity of sand.

**SLOPE** — The degree of deviation of a surface from horizontal, measured in a numerical ratio, percent, or degrees. Expressed as a ratio or percentage, the first number is the vertical distance (rise) and the second is the horizontal distance (run), as 2:1 or 200 percent. Expressed in degrees, it is the angle of the slope from the horizontal plane with a 90° slope being vertical (maximum) and 45° being a 1:1 slope.

**SLOPE CHARACTERISTICS** — Slopes may be characterized as concave (decrease in steepness in lower portion), uniform, or convex (increase in steepness at base). Erosion is strongly affected by shape, ranked in order of increasing erodibility from concave to uniform to convex.

**SOIL** — The unconsolidated mineral and organic material on the immediate surface of the earth that serves as a natural medium for the growth of land plants.

**SOIL AMENDMENT** — Any material, such as lime, gypsum, sawdust, or synthetic conditioner, that is worked into the soil to make it more amenable to plant growth.

**SOIL HORIZON** — A layer of soil or soil material approximately parallel to the land surface and differing from adjacent genetically related layers in physical, chemical, and biological properties or characteristics, such as color, structure, texture consistence, kinds and numbers of organisms present, degree of alkalinity, etc.

**SOIL PROFILE** — A vertical section of the soil from the surface through all horizons, including C horizons.

**SPILLWAY** — An open or closed channel, or both, used to convey excess water from a reservoir. It may contain gates, either manually or automatically controlled, to regulate the discharge of excess water.

**SPOIL** — Soil or rock material excavated from a canal, ditch, basin, or similar construction.

**STABILIZATION** — The process of establishing an enduring soil cover of vegetation and/or mulch or other ground cover in combination with installing temporary or permanent structures for the purpose of reducing to a minimum the transport of sediment by wind, water, ice or gravity.

**STABILIZED GRADE** — The slope of a channel at which neither erosion nor deposition occurs.

**STAGE (hydraulics)** — The variable water surface or the water surface elevation above any chosen datum. See *Gaging Station*.

**STATE SOIL AND WATER CONSERVATION COMMISSION** — The state agency established by soil and water conservation district enabling legislation to assist with the administration of the provisions of that law.

**STORM DRAIN OUTLET PROTECTION STRUCTURE** — A device used to dissipate the energy of flowing water. Generally constructed of concrete or rock in the form of a partially depressed or partially submerged vessel and may utilize baffles to dissipate velocities.

**STORM FREQUENCY** — An expression or measure of how often a hydrologic event of a given size or magnitude should on an average occur, based on a reasonable sample.

**STREAMBANKS** — The usual boundaries, not the flood boundaries, of a stream channel. Right and left banks are named facing downstream.

**STREAM GAGING** — The quantitative determination of stream flow using gages, current meters, weirs, or other measuring instruments at selected locations. See *Gaging Station*.

**STREAM LOAD** — Quantity of solid and dissolved material carried by a stream. See *Sediment Load*.

**STRUCTURAL PRACTICES** — Soil and water conservation measures, other than vegetation, utilizing the mechanical properties of matter for the purpose of either changing the surface of the land or storing, regulating, or disposing of runoff to prevent excessive sediment loss. Including but not limited to riprap, sediment basins, dikes, level spreaders, waterways or outlets, diversions, grade stabilization structures, sediment traps, land grading, etc. See *Mechanical Practices*.

**SUBSOIL** — The B horizons of soils with distinct profiles. In soils with weak profile development, the subsoil can be defined as the soil below the plowed

soil (or its equivalent of surface soil), in which roots normally grow. Although a common term, it cannot be defined accurately. It has been carried over from early days when "soil" was conceived only as the plowed soil and that under it as the "subsoil".

**SUBWATERSHED** — A watershed subdivision of unspecified size that forms a convenient natural unit.

**TERRACE** — An embankment or combination of an embankment and channel across a slope to control erosion by diverting or storing surface runoff instead of permitting it to flow uninterrupted down from the soil.

**TILE, DRAIN** — Pipe made of burned clay, concrete, or similar material, in short lengths, usually laid with open joints to collect and carry excess water from the soil.

**TILE DRAINAGE** — Land drainage by means of a series of tile lines laid at a specified depth and grade.

**TILTH** — A soil's physical condition as related to its ease to work (till).

**TOE (engineering)** — Terminal edge or edges of a structure.

**TOE DRAIN** — Interceptor drain located near the downstream toe of a structure.

**TOPSOIL** — Earthy material used as top-dressing for house lots, grounds for large buildings, gardens, road cuts, or similar areas. It has favorable characteristics for production of desired kinds of vegetation or can be made favorable.

**TRASH RACK** — A structural device used to prevent debris from entering a spillway or other hydraulic structure.

**UNIFIED SOIL CLASSIFICATION SYSTEM (engineering)** — A classification system based on the identification of soils according to their particle size, gradation, plasticity index, and liquid limit.

**UNIFORM FLOW** — A state of steady flow when the mean velocity and cross-sectional area are equal at all sections of a reach.

**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.

**VEGETATIVE MEASURES** — Stabilization of erosive or sediment-producing areas by covering the soil with:

- (a) Permanent seeding, producing long-term vegetative cover, or
- (b) Short-term seeding, producing temporary vegetative cover, or
- (c) Sodding, producing areas covered with a turf of perennial sod-forming grass.

**WATER CLASSIFICATION** — separation of water of an area into classes according to usage, such as

domestic consumption, fisheries, recreation, industrial, agricultural, navigation, waste disposal, etc.

**WATER CONSERVATION** — The physical control, protection, management, and use of water resources in such a way as to maintain crop, grazing, and forest lands; vegetal cover; wildlife; and wildlife habitat for maximum sustained benefits to people, agriculture, industry, commerce, and other segments of the national economy.

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

**WATER CUSHION** — Pool of water maintained to absorb the impact of water flowing from an overfall structure.

**WATER DEMAND** — Water requirements for a particular purpose, such as irrigation, power, municipal supply, plant transpiration, or storage.

**WATER DISPOSAL SYSTEM** — The complete system for removing excess water from land with minimum erosion. For sloping land, it may include a terrace system, terrace outlet channels, dams and grassed waterways. For level land, it may include surface drains or both surface and subsurface drains.

**WATER QUALITY STANDARDS** — Minimum requirements of purity of water for various uses; for example, water for agricultural use in irrigation systems should not exceed specific levels of sodium bicarbonates, pH total dissolved salts, etc.

**WATER RESOURCES** — The supply of groundwater and surface water in a given area.

**WATERCOURSE** — Any natural or artificial watercourse, stream, river, creek, channel, ditch, canal, conduit, drain, waterway, gully, ravine, or wash in which water flows either continuously or intermittently and which has a definite channel, bed and banks, and including any area adjacent thereto subject to inundation by reason of overflow or floodwater.

**WATERSHED AREA** — All land and water within the confines of a drainage divide or a water problem area consisting in whole or in part of land needing drainage or irrigation.

**WATERSHED LAG** — Time from center of mass of effective rainfall to peak of hydrograph.

**WATERSHED MANAGEMENT** — Use, regulation, and treatment of water and land resources of a watershed to accomplish stated objectives.

**WATERSHED PLANNING** — Formulation of a plan to use and treat water and land resources.

**WATERWAY** — An natural course or constructed channel for the flow of water. See *Grassed Waterway*.

**WEIR** — Device for measuring or regulating the flow of water.

**WEIR NOTCH** — The opening in a weir for the passage of water.

**WETTING AGENT** — A chemical that reduces the surface tension of water and enables it to soak into porous material more readily.

This glossary was compiled from definitions supplied by the Natural Resources Conservation Service, Soil and Water Conservation Society of America, Resource Conservation Glossary, and other state and federal publications.



## REFERENCES