

Section 8: Glossary of Erosion Control Terminology

A

Accretion. Outward growth of bank or shore by sedimentation. Increase or extension of boundaries of land by action of natural forces.

Active Construction Area. The area where the contractor intends to be actively involved in soil disturbing work during the ensuing 20 day period during the winter season. This may include areas where soils have been disturbed, as well as areas where soil disturbance has not yet occurred.

Aggradation. General and progressive rising of a stream bed by deposition of sediment. Modification of the earth's surface in the direction of uniformity of grade or slope by deposition as in a river bed.

Aggressive. Refers to the corrosive properties of soil and water.

Alluvial. Referring to deposits of silts, sands, gravels, and similar detrital material which have been transported by running water.

Alluvium. Stream-borne materials deposited in and along a channel.

Apron. A lining of the bed of the channel upstream or downstream from a lined or restricted waterway. A floor or lining of concrete, rock, etc., to protect a surface from erosion, such as the pavement below chutes, spillways, at the toes of dams, or along the toe of bank protection.

Aqueduct. (1) A major conduit. (2) The entire transmission main for a municipal water supply that may consist of a succession of canals, pipes, tunnels, etc. (3) Any conduit for water; especially one for a large quantity of flowing water. (4) A structure for conveying a canal over a river or hollow.

Aquifer. Water-bearing geologic formations that permit the movement of ground water.

Arid Area. Area receiving less than 10 inches of rainfall per year.

Armor. Artificial surfacing of bed, banks, shore or embankment to resist erosion or scour.

Arroyo. Waterway of an ephemeral stream deeply carved in rock or ancient alluvium.

Artesian Waters. Percolating waters confined below impermeable formations with sufficient pressure to spring or well up to the surface.

Articulated. Made flexible by hinging, particularly of small rigid slabs adapted to revetment.

B

Backfill. Earth used to fill a trench or excavation.

Backing Layer. A layer of graded rock between rock riprap and underlying engineering fabric or filter layer to prevent extrusion of the soil or filter layer material through the riprap.

Backwater. An unnaturally high stage in stream caused by obstruction or confinement of flow, as by a dam, a bridge, or a levee. Its measure is the excess of unnatural over natural stage, not the difference in stage upstream and

downstream from its cause.

Baffle. A pier, vane, sill, fence, wall, or mound built on the bed of a stream to parry, deflect, check, or disturb the flow, or to float on the surface to deflect or dampen cross currents or waves.

Bank. The lateral boundary of a stream-confining water flow. The bank on the left side of a channel looking downstream is called the left bank, etc.

Bank Protection. Revetment or other armor protecting a stream bank from erosion, includes devices used to deflect the forces of erosion away from the bank.

Bar. An elongated deposit of alluvium within a channel or across its mouth.

Barrier. A low dam or rack built to control flow of debris.

Base Flood. The flood or tide having a 1 percent chance of being exceeded in any given year (100-year flood). The 'base flood' is commonly used as the 'standard flood' in Federal flood insurance studies (see Regulatory Flood).

Base Floodplain. The area subject to flooding by the base flood.

Base Flow. The groundwater flow contribution to a creek. During dry periods, base flow constitutes the majority of stream flow.

Basin. (1) The surface of the area tributary to a stream or lake. (2) Space above or below ground capable of retaining or detaining water or debris.

Bay. An indentation of bank or shore, including erosional cuts and slipouts, not necessarily large.

Beach. The zone of sedimentary material that extends landward from the low water line to the place where there is marked change in material or form, or to the line of permanent vegetation (usually the effective limit of storm waves). The seaward limit of a beach, unless otherwise specified, is the mean low water line. A beach includes foreshore and backshore.

Bed. The earth below any body of water, limited laterally by bank or shore.

Bed Load. Sediment that moves by rolling, sliding, or skipping along the bed, and is essentially in contact with the stream bed.

Bedding. The foundation under a drainage structure.

Beneficial Uses. As referred to in the State Water Quality Standards, beneficial uses are activities that range from recreational to agricultural uses, depending on the source of the water.

Berm. (1) A bench or terrace between two slopes. (2) A nearly horizontal part of the beach or backshore formed at the high water line by waves depositing material. Some beaches have no berms, other have one or several.

Best Management Practice (BMP). (1) A measure that is implemented to protect water quality and reduce the potential for pollution associated with storm water runoff. (2) Any program, technology, process, silting criteria, operating method, measure, or device that controls, prevents, removes, or reduces pollution.

Block. Precast prismatic unit for riprap structure.

Bluff. A high, steep bank composed of erodible materials.

Boom. Floating log or similar element designed to dampen surface waves or control the movement of drift.

Boulder. Largest rock transported by a stream or rolled in the surf; arbitrarily heavier than 12 kg and larger than 200 mm.

Braided Stream. A stream in which flow is divided at normal stage by small islands. This type of stream has the aspect of a single, large channel with which there are subordinate channels.

Breakwater. A fixed or floating structure that protects a shore area, harbor, anchorage, or basin by intercepting waves.

Bulkhead. A steep or vertical structure placed on a bank, bluff, or embankment to retain or prevent sliding of the land and protect the inland area against damage.

Bulking. The increase in volume of flow due to air entrainment, debris, bedload, or sediment in suspension.

Buoyancy. Uplift force on a submerged body equal to the mass of water displaced, times the acceleration of gravity.

C

Canal. An artificial, open channel.

Canyon. A large, deep valley; also the sub-marine counterpart.

Capacity. The effective carrying ability of a drainage structure. Generally measured in cubic meters per second.

Capillarity. The attraction between water and soil particles, which cause water to move in any direction through the soil mass regardless of gravitational forces.

Capillary Water. Water which clings to soil particles by capillary action. It is normally associated with fine sand, silt, or clay, but not normally with coarse sand and gravel.

Catch Basin. A drainage structure which collects water. May be either a structure where water enters from the side or through a grating.

Causeway. A raised embankment or trestle over swamp or overflow areas.

Cavitation. Erosion by suction, especially in the partial vacuum of a diverging jet.

Channel. The space above the bed, and between banks, occupied by a stream.

Channelization. The process of making a channel or channels. A channel is the bed of a stream or river, or the hollow or course in which a stream flows.

Check. A sill or weir in a channel to control stage or velocity.

Check Dam. A small dam generally placed in steep ditches for the purpose of reducing the velocity in the ditch.

Clean Water Act (CWA). The Federal Water Pollution Control Act enacted in 1972 by Public Law 92-500 and amended by the Water Quality Act of 1987. The Clean Water Act prohibits the discharge of pollutants to Waters of the United States unless said discharge is in accordance with an NPDES permit. The 1987 amendments include guidelines for regulating municipal, industrial, and construction storm water discharges under the NPDES program.

Cleanout. An access opening to a roadway drainage system. Usually consists of a manhole shaft, a special chamber or opening into a shallow culvert or drain.

Cliff. A high, steep face of rock; a precipice.

Cloudburst. Rain storm of great intensity usually over a small area for a short duration.

Coast. (1) The strip of land, of indefinite width (up to several kilometers), that extends from the shoreline inland to the first major change in terrain features. (2) As a combining form, upcoast is northerly and downcoast is southerly.

Cobble. Rock, smaller than a boulder and larger than gravel; arbitrarily 0.5 to 12 kg, or 75 to 200 mm in diameter.

Coefficient of Runoff. Percentage of gross rainfall, which appears as runoff.

Composite Hydrograph. A plot of mean daily discharges for a number of years of record on a single year time base for the purpose of showing the occurrence of high and low flows.

Concentrated Flow. Flowing water that has been accumulated into a single, fairly narrow stream.

Concentration. In addition to its general sense, means the unnatural collection or convergence of waters so as to discharge in a narrower width, and at greater depth or velocity.

Conduit. Any pipe, arch, box or drain tile through which water is conveyed.

Cone. Physiographic form of sediment deposit washed from a gorge channel onto an open plain; a debris cone, also called an alluvial fan.

Confluence. A junction of streams.

Constriction. An obstruction narrowing a waterway.

Construction Activity. Includes clearing, grading, or excavation and contractor activities that result in soil disturbance.

Construction Site. The area involved in a construction project as a whole.

Contraction. The reduction in cross sectional area of flow.

Control. (1) A section or reach of an open conduit or stream channel which maintains a stable relationship between stage and discharge. (2) For flood, erosion, debris, etc., remedial means or procedure restricting damage to a tolerable level.

Conveyance. (1) A measure of the water carrying capacity of a stream or channel. (2) Any natural or man-made channel or pipe in which concentrated water flows.

Core. Central zone of dike, levee, rock groin, jetty, etc.

Cradle. A concrete base generally constructed to fit the shape of a structure that is to be forced through earthen material by a jacking operation. The cradle is constructed to line and grade. Then, the pipe rides on the cradle as it is worked through the given material by jacking and tunneling methods. Also serves as bedding for pipes in trenches in special conditions.

Creek. A small stream, usually active.

Crest. (1) Peak of a wave or a flood. (2) Top of a levee, dam, weir, spillway or other water barrier or control.

Crib. An open-frame structure loaded with earth or stone ballast to act as a baffle in bank protection.

Critical Depth. (Depth at which specific energy is a minimum) - The depth of water in a conduit at which under

certain other conditions the maximum flow will occur. These other conditions are: 1) the conduit is on the critical slope with the water flowing at its critical velocity, and 2) there is an adequate supply of water. The depth of water flowing in an open channel or a conduit partially filled, for which the velocity head equals one-half the hydraulic mean depth.

Critical Flow. That flow in open channels at which the energy content of the fluid is at a minimum. Also, that flow which has a Froude number of one.

Critical Slope. That slope at which the maximum flow will occur at the minimum velocity. The slope or grade that is exactly equal to the loss of head per meter resulting from flow at a depth that will give uniform flow at critical depth; the slope of a conduit which will produce critical flow.

Critical Velocity. Mean velocity of flow when flow is at critical depth.

Culvert. A closed conduit, other than a bridge, which allows water to pass under a highway. A culvert has a span of less than 6.1 m, or if multispan, the individual spans are 3.0 m or less.

Current. Flow of water, both as a phenomenon and as a vector. Usually qualified by adjectives like downward, littoral, tidal, etc. to show relation to a pattern of movement.

Cutoff Wall. A wall at the end of a drainage structure, the top of which is an integral part of the drainage structure. This wall is usually buried, and its function is to prevent undermining of the drainage structure if the natural material at the outlet of the structure is scoured by the water discharging from the end of the structure. Cutoff walls are sometimes used at the upstream end of a structure when there is a possibility of erosion at this point.

D

Debris. Any material including floating woody materials and other trash, suspended sediment, or bed load moved by a flowing stream.

Debris Barrier. A deflector placed at the entrance of a culvert upstream, which tends to deflect heavy floating debris or boulders away from the culvert entrance during high-velocity flow.

Debris Basin. Any area upstream from a drainage structure utilized for the purpose of retaining debris, in order to prevent clogging of drainage structures downstream.

Debris Rack. A straight barrier that, when placed across the stream channel, tends to separate light and medium floating debris from stream flow and prevent the debris from reaching the culvert entrance.

Degradation. General and progressive lowering of the longitudinal profile of a channel by erosion.

Denuded. Land stripped of vegetation.

Deposit. An earth mass of particles settled or stranded from moving water or wind.

Depth. Vertical distance: (1) from surface to bed of a body of water, (2) from crest or crown to invert of a conduit.

Design Discharge. The quantity of flow that is expected at a certain point as a result of a design storm. Usually expressed as a rate of flow in cubic meters per second.

Design Flood. The peak discharge (when appropriate, the volume, stage, or wave crest elevation) of the flood associated with the probability of exceedance selected for the design of an encroachment in a FEMA flood plain.

Design Frequency. The recurrence interval for hydrologic events used for design purposes. As an example, a design frequency of 50 years means a storm of a magnitude that would be expected to recur on the average of every 50 years (See Probability of Exceedance).

Design High Water. The flood stage or tide crest elevation adopted for design of drainage and bank protection structures (See Design Flood and High Water).

Design Storm. That particular storm which contributes runoff which the drainage facilities were designed to handle. This storm is selected for design on the basis of its probability of exceedance or average recurrence interval (See Probability of Exceedance).

Detention. The process of temporarily collecting and holding back storm water for later release to receiving waters.

Detention Storage. Surface water moving over the land is in detention storage. Surface water allowed to temporarily accumulate in ponds, basins, reservoirs or other types of holding facility and which is ultimately returned to a watercourse or other drainage system as runoff, is in detention storage (See Retention Storage).

Detritus. Loose material such as rock, sand, silt, and organic particles.

Dike. (1) Usually an earthen bank alongside and parallel with a river or open channel to restrict overflow (See Levee). (2) An asphalt, concrete berm along the edge of a shoulder.

Dike, Finger. Relatively short embankments constructed normal to a larger embankment, such as an approach fill to a bridge. Their purpose is to impede flow and direct it away from the major embankment.

Dike, Spur. Relatively short embankments constructed at the upstream side of a bridge end for the purpose of aligning flow with the waterway opening and to move scour away from the bridge abutment.

Dike, Toe. Embankment constructed to prevent lateral flow from scouring the corner of the downstream side of an abutment embankment. Sometimes referred to as training dikes.

Dike, Training. Embankments constructed to provide a transition from the natural stream channel or floodplain, both to and from a constricting bridge crossing.

Discharge. A volume of water flowing out of a drainage structure or facility. Measured in cubic meters per second.

Dissipate. Expend or scatter harmlessly, as of energy of moving water.

Disturbed Areas. Areas that have been purposefully cleared, grubbed, excavated, or graded by the contractor; ground surface that has been disrupted by construction activities, including construction access/roads, staging, and storage sites producing significant areas of exposed soil and soil piles.

Ditch. Small artificial channel, usually unlined.

Diversion. (1) The change in character, location, direction, or quantity of flow of a natural drainage course (a deflection of flood water is not a diversion). (2) Draft of water from one channel to another. (3) Interception of runoff by works which discharge it through unnatural channels.

Downdrain. A prefabricated drainage facility assembled and installed in the field for the purpose of transporting water down steep slopes.

Downdrift. The direction of predominant movement of littoral materials.

Drain. Conduit intercepting and discharging surplus ground or surface water.

Drainage. (1) The process of removing surplus ground or surface water by artificial means. (2) The system by which

the waters of an area are removed. (3) The area from which waters are drained; a drainage basin.

Drainage Area (Drainage Basin) (Basin). That portion of the earth's surface upon which falling precipitation flows to a given location.

Drainage Course. Any path along which water flows when acted upon by gravitational forces.

Drainage Divide. The rim of a drainage basin. A series of high points from which water flows in two directions, to the basin and away from the basin.

Drainage Easement (See Easement).

Drainage System. Usually a system of underground conduits and collector structures which flow to a single point of discharge.

Drawdown. The difference in elevation between the water surface elevation at a constriction in a stream or conduit and the elevation that would exist if the constriction were absent. Drawdown also occurs at changes from mild to steep channel slopes and weirs or vertical spillways.

Drift. (1) Floating or non-mineral burden of a stream. (2) Deviation from a normal course in a cross current, as in littoral drift.

Drop. Controlled fall in a stream to dissipate energy.

Dry Weather Flows. A small amount of water which flows almost continually due to lawn watering, irrigation or springs.

Dune. A sand wave of approximately triangular cross section (in a vertical plane in the direction of flow) formed by moving water or wind, with gentle upstream slope and steep downstream slope and deposition on the downstream slope.

E

Easement. Right to use the land of others.

Ebb. Falling stage or outward flow, especially of tides.

Eddy Loss. The energy lost (converted into heat) by swirls, eddies, and impact, as distinguished from friction loss.

Eddy. Rotational flow around a vertical axis.

Embankment. Earth structure above natural ground.

Embayment. Indentation of bank or shore, particularly by progressive erosion.

Encroachment. Extending beyond the original or customary limits, such as by occupancy of the river and/or flood plain by earth fill embankment.

Endwall. A wall placed at the end of a culvert. It may serve three purposes: 1) to hold the embankment away from the pipe and prevent sloughing into the pipe outlet channel, 2) to provide a wall which will prevent erosion of the roadway fill, and 3) to prevent flotation of the pipe.

Energy. Potential or kinetic, the latter being expressed in the same unit (meters) as the former.

Energy Dissipater. A structure for the purpose of slowing the flow of water and reducing the erosive forces present in any rapidly flowing body of water.

Energy Grade Line. The line which represents the total energy gradient along the channel. It is established by adding together the potential energy expressed as the water surface elevation referenced to a datum and the kinetic energy (usually expressed as velocity head) at points along the stream bed or channel floor.

Energy Head. The elevation of the hydraulic grade line at any section plus the velocity head of the mean velocity of the water in that section.

Entrance. The upstream approach transition to a constricted waterway.

Entrance Head. The head required to cause flow into a conduit or other structure; it includes both entrance loss and velocity head.

Entrance Loss. The head lost in eddies and friction at the inlet to a conduit or structure.

Environmental Protection Agency (EPA). Government agency that issued the regulations to control pollutants in storm water runoff discharges (Clean Water Act and NPDES permit requirements).

Ephemeral. Of brief duration, as the flow of a stream in an arid region.

Erosion. The wearing away of natural (earth) and unnatural (embankment, slope protection, structure, etc.) surfaces by the action of external forces. In the case of drainage terminology, this term generally refers to the wearing away of the earth's surface by flowing water. It can also refer to the wear on a structural surface by flowing water and the material carried therein.

Erosion Control. Vegetation, such as grasses and wildflowers, and other materials, such as straw, fiber, stabilizing emulsion, protective blankets, etc., placed to stabilize areas disturbed by grading operations, reduce loss of soil due to the action of water or wind, and prevent water pollution.

Estuary. That portion of a river channel occupied at times or in part by both sea and river flow in appreciable quantities. The water usually has brackish characteristics.

Evaporation. A process whereby water as a liquid is changed into water vapor, typically through heat supplied from the sun.

Excavation. The process of removing earth, stone, or other materials.

Existing Vegetation. Any vegetated area that has not already been cleared and grubbed.

F

Face. The outer layer of slope revetment.

Fan. A portion of a cone, but sometimes used to emphasize definition of radial channels. Also reference to spreading out of water or soils associated with waters leaving a confined channel.

Feasible. Economically achievable or cost-effective measures which reflect a reasonable degree of pollutant reduction, achievable through the application of available nonpoint pollution control practices, technologies, processes, site criteria, operating methods, or other alternatives.

Fetch. The unobstructed distance over water in which waves are generated by wind of relatively constant direction and speed.

Filter. A porous article or mass (as of fabric or even-graded mineral aggregate) through which water will freely pass, but which will block the passage of soil particles.

Filter Fabric (RSP fabric). An engineering fabric (geotextile) placed between the backfill and supporting or underlying soil through which water will pass and soil particles are retained.

Filter Layer. A layer of even-graded rock between rock riprap and underlying soil to prevent extrusion of the soil through the riprap.

Filter Sock. A fabric tube filled with wood chips, compost or some other filter medium, used to filter sediment from storm water or to reduce velocity of flow in channels and slopes.

Filter Strip. A strip of vegetation left between exposed soil and a ditch or other receiving water for the express purpose of trapping sediment.

Flocculants. Substances (chemical additives) that cause solids suspended in storm water to aggregate into a mass and settle out of suspension.

Flood Frequency. Also referred to as exceedance interval, recurrence interval or return period. The average time interval between actual occurrences of a hydrological event of a given or greater magnitude; the percent chance of occurrence is the reciprocal of flood frequency, e.g., a 2 percent chance of occurrence is the reciprocal statement of a 50-year flood (See Probability of Exceedance).

Flood Plane. The position occupied by the water surface of a stream during a particular flood. Also, loosely, the elevation of the water surface at various points along the stream during a particular flood.

Flood Stage. The elevation at which overflow of the natural banks of a stream begins to cause damage in the reach in which the elevation is measured.

Flood Waters. Former stream waters which have escaped from a watercourse (and its overflow channel) and flow or stand over adjoining lands. They remain as such until they disappear from the surface by infiltration, evaporation, or return to a natural watercourse. They do not become surface waters by mingling with such waters or stream waters by eroding a temporary channel.

Floodplain Encroachment. An action within the limits of the base flood plain.

Floodplain. Normally dry land areas subject to periodic temporary inundation by stream flow or tidal overflow. Land formed by deposition of sediment by water; alluvial land.

Flow. A term used to define the movement of water, silt, sand, etc.; discharge; total quantity carried by a stream.

Flow Line. A term used to describe the line connecting the low points in a watercourse.

Flow, Steady. Flow at constant discharge.

Flow, Unsteady. Flow on rising or falling stages.

Flow, Varied. Flow in a channel with variable section.

Free Outlet. A condition under which water discharges with no interference such as a pipe discharging into open air.

Free Water. Water which can move through the soil by force of gravity.

Freeboard. (1) The vertical distance between the level of the water surface usually corresponding to the design flow and a point of interest such as a bridge beam, levee top or specific location on the roadway grade. (2) The distance between the normal operating level and the top of the sides of an open conduit; the crest of a dam, etc.,

designed to allow for wave action, floating debris, or any other condition or emergency, without overtopping the structure.

French Drain. A trench loosely backfilled with stones, the largest stones being placed in the bottom, with the size of stones decreasing towards the top. The interstices between the stones serve as a passageway for water.

Friction. Energy-dissipating conflict among turbulent water particles disturbed by irregularities of channel surface.

Froude Number. A dimensionless expression of the ratio of inertia forces to gravity forces, used as an index to characterize the type of flow in a hydraulic structure in which gravity is the force producing motion, and inertia is the resisting force. It is equal to a characteristic flow velocity (mean, surface, or maximum) of the system divided by the square root of the product of a characteristic dimension (as diameter of depth) and the gravity constant (acceleration due to gravity) all expressed in consistent units $Fr = V/(gy)^{1/2}$.

G

Gabion. A wire basket or cage filled with stone and placed as, or as part of, a bank-protection structure.

Gauging Station. A location on a stream where measurements of stage or discharge are customarily made. The location includes a reach of channel through which the flow is uniform, a control downstream from this reach and usually a small building to house the recording instruments.

General Permit. A general permit for storm water discharges associated with industrial or construction activity issued by EPA or a delegated state under the NPDES storm water regulations.

Gorge. A narrow, deep valley with steep or vertical banks.

Grade. Elevation of bed or invert of a channel.

Grade to Drain. A construction note often inserted on a plan for the purpose of directing the Contractor to slope a certain area in a specific direction, so that the surface waters will flow to a designated location.

Gradient (Slope). The rate of ascent or descent expressed as a percent or as a decimal as determined by the ratio of the change in elevation to the length.

Gradually Varied Flow. In this type of flow, changes in depth and velocity take place slowly over large distances, resistance to flow dominates and acceleration forces are neglected.

Gravel. Rock larger than sand and smaller than cobble, arbitrarily ranging in diameter from 5 to 50 mm.

Groin. A fingerlike barrier structure usually built perpendicular to the shoreline or oblique to primary motion of water, to trap littoral drift, retard erosion of the shore, or to control movement of bed material.

Ground Water. That water which is present under the earth's surface. Ground water is situated below the surface of the land, irrespective of its source and transient status. Subterranean streams are flows of ground waters parallel to and adjoining stream waters, and usually determined to be integral parts of the visible streams.

Grouted. Bonded together with an inlay or overlay of cement mortar.

Gulch. A relatively young, well-defined and sharply cut, erosional channel.

Gully. Diminutive of gulch. A well-defined and sharply cut, erosional channel with a cross sectional area greater than 16 sq.in.

H

Head. Represents an available force equivalent to a certain depth of water. This is the motivating force in effecting the movement of water. The height of water above any point or plane of reference. Used also in various compound expressions, such as energy head, entrance head, friction head, static head, pressure head, lost head, etc.

Headcutting. Progressive scouring and degrading of a streambed in the upstream direction, usually characterized by one or a series of vertical falls.

High Water. Maximum flood stage of a stream or lake; periodic crest stage of tide. Historic HW is stage recorded or otherwise known.

Hydraulic. Pertaining to water in motion and the mechanics of the motion.

Hydraulic Gradient. A line that represents the relative force available due to the potential energy available. This is a combination of energy due to the height of the water and the internal pressure. In any open channel, this line corresponds to the water surface. In a closed conduit, if piezometers are placed along the top of the pipe, a line connecting the water surface in each of these tubes would represent the hydraulic grade line.

Hydraulic Jump (or Jump). Transition of flow from the rapid to the tranquil state. A varied flow phenomenon producing a rise in elevation of water surface. A sudden transition from supercritical flow to the complementary subcritical flow, conserving momentum and dissipating energy.

Hydraulic Mean Depth. The area of the flow cross section divided by the water surface width.

Hydraulic Radius. The cross sectional area of a stream of water divided by the length of that part of its periphery in contact with water; the ratio of area to wetted perimeter.

Hydric. Characterized by, relating to or requiring an abundance of moisture. Also refers to soils that are formed in wet conditions.

Hydrograph. A graph showing stage, flow, velocity, or other property of water with respect to time.

Hydrographic. Pertaining to the measurement or study of bodies of water and associated terrain.

Hydrography. Water Surveys. Measuring, recording, and analyzing the flow of water; and of measuring and mapping watercourses, shore lines, and navigable waters.

Hydrologic. Pertaining to the cyclic phenomena of waters of the earth; successively as precipitation, runoff, storage and evaporation, and quantitatively as to distribution and concentration.

Hydrology. The science of the occurrence and movement of water upon and beneath the land areas of the earth. Overlaps and includes portions of other sciences such as meteorology and geology. The particular branch of Hydrology that a design engineer is generally interested in is surface runoff that is the result of excessive precipitation.

Hydrophyte. A perennial vascular aquatic plant having its over-wintering buds under water; a plant growing in water or in soil too waterlogged for most plants to survive. These are plants found in wetlands.

Hydrostatic. Pertaining to pressure by and within water due to gravitation acting through depth.

Hyetograph. Graphical representation of rainfall depth plotted in units of time, e.g. depth of precipitation in a five minute period.

I

Impervious. A surface that cannot be easily infiltrated; for instance, rain does not readily penetrate or infiltrate asphalt or concrete surfaces.

Impinge. To strike and attack directly, as in curvilinear flow where the current does not follow the curve but continues on tangent into the bank on the outside of bend in the channel.

Incised Channel. Those channels which have been cut relatively deep into underlying formations by natural processes. Characteristics include relatively straight alignment and high, steep banks such that overflow rarely occurs, if ever.

Infiltration. The passage of water through the soil surface into the ground.

Inlet. An entrance into a ditch, storm drain, or other water conveyance system.

Inlet Time. The time required for storm runoff to flow from the most remote point, in flow time, of a drainage area to the point where it enters a drain or culvert.

Inlet Transition. A specially shaped entrance to a box or pipe culvert. It is shaped in such a manner that in passing from one flow condition to another, the minimum turbulence or interference with flow is permitted.

Inundate. To cover with a flood.

Invert. The bottom of a drainage facility along which the lowest flows would pass.

Isohyet/Isohyetal Line A line drawn on a map or chart joining points that receive the same amount of precipitation.

Isohyetal Map. A map containing isohyetal lines and showing rainfall intensities.

J

Jacking Operations. A means of constructing a pipeline under a highway without open excavation. A cutting edge is placed on the first section of pipe and the pipe is forced ahead by hydraulic jacks. As the leading edge pushes ahead, the material inside the pipe is dug out and transported outside the pipe for disposal.

Jetty. An elongated, artificial obstruction projecting into a stream or the sea from bank or shore to control shoaling and scour by deflection of strength of currents and waves.

Jump. Sudden transition from supercritical flow to the complementary subcritical flow, conserving momentum and dissipating energy; the hydraulic jump.

L

Lag. Variously defined as time from beginning (or center of mass) of rainfall to peak (or center of mass) of runoff.

Lake. A water filled basin with restricted or no outlet. Includes reservoirs, tidal ponds and playas.

Laminar Flow. That type of flow in which each particle moves in a direction parallel to every other particle and in which the head loss is approximately proportional to the velocity (as opposed to turbulent flow).

Lateral. In a drainage system, a drainage conduit transporting water from inlet points to the main drain trunk line.

Level Spreader. A device used to transform concentrated flows to uniform sheet flow

Levee. An embankment to prevent inundation, usually on or along the bank of a stream or lake to protect outer lowlands(See Dike).

Lining. Protective cover of the perimeter of a channel.

Littoral. Pertaining to or along the shore, particularly to describe currents, deposits, and drift.

Littoral Drift. The sedimentary material (sand) moved along the shoreline under the influence of waves and currents.

Littoral Transport. The movement of littoral drift along the shoreline by waves and currents. Includes movement parallel and perpendicular to the shore.

Loading. The total amount of material entering a system from all sources.

Local Depression. A low area in the pavement or in the gutter established for the special purpose of collecting surface waters on a street and directing these waters into a drainage inlet.

M

Marginal. Within a borderland area; more general and extensive than riparian.

Marsh. An area of soft, wet, or periodically submerged land, generally treeless and usually characterized by grasses and other low vegetation.

Maximum Historical Flood. The maximum flood that has been recorded or experienced at any particular highway location.

Mean Annual Flood. The flood discharge with a recurrence interval of 2.33 years.

Mean Depth. For a stream at any stage, the wetted normal section divided by the surface width. Hydraulic mean depth.

Meander. In connection with streams, a winding channel usually in an erodible, alluvial valley. A reverse or S-shaped curve or series of curves formed by erosion of the concave bank, especially at the downstream end, characterized by curved flow and alternating shoals and bank erosions. Meandering is a stage in the migratory movement of the channel, as a whole, down the valley.

Mesh. Woven wire or other filaments used alone as revetment, or as retainer or container of masses of gravel or cobble.

Mulch. A natural or artificial layer of plant residue or other material that covers the land surface and conserves moisture, holds soil in place, aids in establishing vegetation, and reduces temperature fluctuations.

N

"n" Value. The roughness coefficient in the Manning formula for determination of the discharge coefficient in the Chezy formula, $V = C(RS)^{1/2}$, where $C = (1/n)R^{1/6}$

National Pollutant Discharge Elimination System (NPDES). The EPA program to control the discharge of pollutants to waters of the United States. NPDES is a part of the federal CWA, which requires point and nonpoint source dischargers to obtain permits. These permits are referred to as NPDES permits.

Natural and Beneficial Floodplain Values. Includes but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aqua-culture, forestry, natural moderation of floods, water quality maintenance, and groundwater recharge.

Navigable Waters. Those stream waters lawfully declared or actually used as such. Navigable Waters of the United States are those determined by the Corps of Engineers or the U.S. Coast Guard to be so used in interstate or international commerce. Other streams have been held as navigable by courts under the common law that navigability in fact is navigability in law.

Nonactive Construction Area. Any area not considered to be an active construction area. Typically, active construction areas become nonactive construction areas whenever construction activities are expected to be discontinued for a period of 20 or more days during the winter season.

Nonpoint Sources (NPS). Diffuse sources from which contaminants originate to accumulate in surface water or groundwater. These sources can add to a cumulative problem with serious health or environmental consequences.

Nonuniform Flow A flow in which the velocities vary from point to point along the stream or conduit, due to variations in cross section, slope, etc.

Normal Depth. The depth at which flow is steady and hydraulic characteristics are uniform.

Normal Water Surface (Natural Water Surface). The free surface associated with flow in natural streams.

Notice of Intent (NOI). A formal notice to the EPA or a state agency having delegated NPDES authority that a construction project seeking coverage under a General Permit is about to begin. The NOI provides information on the owner, location, and type of project, and certifies that the permittee will comply with conditions of the construction General Permit. The NOI is *not* a permit application and no approval is required. Some local permits may require submittal of a Notice of New Construction (NONC) in lieu of filing a NOI with the state or EPA.

Notice of Termination (NOT). A formal notice to the EPA or delegated state agency for General Permit site terminating coverage under the permit.

O

Off-Site Drainage. Flow of water that originates outside the property.

On-Site Drainage. Flow of water that originates inside the property.

Open Channel. Any conveyance in which water flows with a free surface.

Ordinary High Water Mark. The line on the shore established by the fluctuation of water and physically indicated on the bank (1.5 + years return period).

Outfall. Discharge or point of discharge of a culvert or other closed conduit.

Outwash. Debris transported from a restricted channel to an unrestricted area where it is deposited to form an alluvial or debris cone or fan.

Overflow. Discharge of a stream outside its banks; the parallel channels carrying such discharge.

P

Peak Flow. Maximum momentary stage or discharge of a stream in flood; design discharge.

Pebble. Stone 10 to 75 mm in diameter, including coarse gravel and small cobble.

Perched Water. Ground water located above the level of the water table and separated from it by a zone of impermeable material.

Percolating Waters. Waters which have infiltrated the surface of the land and move slowly downward and outward through devious channels (aquifers) unrelated to stream waters, until they reach an underground lake or regain and spring from the land surface at a lower point.

Permanent Erosion Control. Permanent erosion control is most often associated with the reestablishment of vegetation. This can be either grasses as in the case of most transportation facilities or reforestation needed to reestablish woody vegetation after fires.

Permeability. The property of soils which permits the passage of any fluid. Permeability depends on grain size, void ratio, shape and arrangement of pores.

Permeable. Open to the passage of fluids, as for (1) pervious soils and (2) bank-protection structures.

Permit. An authorization, license, or equivalent control document issued by EPA or an approved state agency to implement the requirements of an environmental regulation.

Physiographic Region. A geographic area whose pattern of landforms differ significantly from that of adjacent regions.

Pier. Vertical support of a structure standing in a stream or other body of water. Used in a general sense to include bents and abutments.

Pile. A long, heavy timber or section of concrete or metal that is driven or jetted into the earth or bottom of a water body to serve as a structural support or protection.

Piping. The action of water passing through or under an embankment and carrying some of the finer material with it to the surface at the downstream face.

Point of Concentration. That point at which the water flowing from a given drainage area concentrates.

Point Sources. A source of pollutants from a single point of conveyance such as a pipe. For example, the discharge pipe from a sewage treatment plant or factory is a point source.

Practicable. Capable of being done within reasonable natural, social, and economic constraints.

Precipitation. Discharge of atmospheric moisture as rain, snow, or hail, measured in depth of fall or in terms of intensity of fall in unit time.

Preserve. To avoid modification to the functions of the natural floodplain environment or to maintain it, as closely as practicable, in its natural state.

Probability. The chance of occurrence or recurrence of a specified event within a unit of time, commonly expressed in three ways. Thus a 10-year flood has a chance of 0.1 per year and is also called a 10%-chance flood.

Probability of Exceedance. The statistical probability, expressed as a percentage, of a hydrologic event occurring or being exceeded in any given year. The probability (p) of a storm or flood is the reciprocal of the average recurrence interval (N).

Probable Maximum Flood. Flood discharge that may be expected from the most severe combination of critical meteorological and hydrological conditions reasonably possible in the region.

Q

Quality Assurance/Quality Control. A system of procedures, checks, audits, and corrective actions to ensure that all research design and performance, environmental monitoring and sampling, and other technical and reporting activities are of the highest achievable quality.

R

Rainfall. Point precipitation: That which registers at a single gauge. Area precipitation: Adjusted point rainfall for area size.

Range. Difference between extremes, as for stream or tide stage.

Ravine. A valley larger than a gulch, smaller than a canyon, and less bold in relief than a gulch or arroyo.

Reach. The length of a channel uniform with respect to discharge, depth, area, and slope. More generally, any length of a river or drainage course.

Recession. Retreat of shore or bank by progressive erosion.

Reef. Generally, any solid projection from the bed of a stream or other body of water.

Regulatory Floodway. The open floodplain area that is reserved in by federal, state, or local requirements, i.e., unconfined or unobstructed either horizontally or vertically, to provide for the discharge of the base flood so that the cumulative increase in water surface elevation is no more than a designated amount (not to exceed 0.3048m as established by the Federal Emergency Management Agency (FEMA) for administering the National Flood Insurance Program (NFIP)).

Regulatory Framework. A particular set of laws, rules, procedures, and agencies designed to govern a particular type of activity or solve a particular program.

Repose. The stable slope of a bank or embankment, expressed as an angle or the ratio of horizontal to vertical projection.

Restore. To reestablish a setting or environment in which the functions of the natural and beneficial floodplain values adversely impacted by a development can continue to operate.

Restriction. Artificial or natural control against widening of a channel, with or without construction.

Retard. Bank-protection structure designed to check the riparian velocity and induce silting or accretion.

Retarding Basin. Either a natural or man made basin with the specific function of delaying the flow of water from one point to another. This tends to increase the time that it takes all the water falling on the extremities of the drainage basin to reach a common point, resulting in a reduced peak flow at that point.

Retention. The holding of runoff in a basin without release except by means of evaporation, infiltration, or emergency bypass.

Retention Storage. Water that accumulates and ponds in natural or excavated depressions in the soil surface with no possibility for escape as runoff (See Detention Storage).

Revegetation. Planting of indigenous plants to replace natural vegetation that is damaged or removed as a result of construction projects or permit requirements.

Revetment. Bank protection to prevent erosion.

Rill. A streamlet or small surface channel caused by the erosion of the soil surface with a cross sectional area of up to 16sq.in.

Rill Erosion. The formation of numerous, closely spaced streamlets due to uneven detachment of surface soils by runoff on slopes.

Riparian. Pertaining to the banks of a stream.

Ripple. (1) The light fretting or ruffling of a water caused by a breeze. (2) Undulating ridges and furrows, or crests and troughs formed by action of the flow.

Riprap. A layer, facing, or protective mound of broken concrete, sacked concrete, rock, rubble, or stones randomly placed to prevent erosion, scour, or sloughing of a structure or embankment; also, the stone used for this purpose.

River. A large stream, usually active when any streams are flowing in the region.

Rock. (1) Cobble, boulder, or quarry stone as a construction material. (2) Hard natural mineral, in formation as in piles of talus.

Rock Check. A low dam made of coarse rock placed across a channel as a means of trapping sediment and reducing velocity.

Rounded Inlet. The edges of a culvert entrance that are rounded for smooth transition which reduces turbulence and increases capacity.

Rubble. Rough, irregular fragments of rock or concrete.

Runoff. (1) The surface waters that exceed the soil's infiltration rate and depression storage. (2) The portion of precipitation that appears as flow in streams. Drainage or flood discharge which leaves an area as surface flow or a pipeline flow, having reached a channel or pipeline by either surface or subsurface routes.

S

Sand. Granular soil coarser than silt and finer than gravel, ranging in diameter from 0.05mm to 5mm.

Scour. The result of erosive action of running water, primarily in streams, excavating and carrying away material from the bed and banks. Wearing away by abrasive action.

Sediment. Fragmentary material that originates from weathering of rocks and is transported by, suspended in, or deposited by water.

Sediment Bags. Large bags made of filter fabrics used to trap and filter sediment from storm water. Storm water is usually collected in a basin and then pumped to the sediment bag.

Sediment Control. Actions take to trap sediments suspended in storm water by settling, filtration, or chemical deflocculation.

Sedimentation. Gravitational deposit of transported material in flowing or standing water.

Sediment Trap. A device used to trap and remove sediment from storm water by settling, or filtration.

Seepage. Percolation of underground water through the banks and into a stream or other body of water.

Semi-Arid Area. Area receiving between 10 and 20 inches of rainfall per year.

Sheet Erosion. Erosion of thin layers of soil by sheets of flowing water.

Sheet Flow. Any flow spread out and not confined; i.e., flow across a flat open field.

Sheet Pile. A pile with a generally slender, flat cross-section that is driven into ground or bottom of a water body and meshed or interlocked with like members to form a wall or bulkhead.

Shoal. A shallow region in flowing or standing water, especially if made shallow by deposition.

Shoaling. Deposition of alluvial material resulting in areas with relatively shallow depth.

Shore. The narrow strip of land in immediate contact with the water, including the zone between high and low water lines. See backshore, foreshore, onshore, offshore, longshore, and nearshore.

Silt. (1) Water-borne sediment. Detritus carried in suspension or deposited by flowing water, ranging in diameter from 0.005 to 0.05 mm. The term is generally confined to fine earth, sand, or mud, but is sometimes both suspended and bedload. (2) Deposits of water-borne material, as in a reservoir, on a delta, or on floodplains.

Silt Fence. Fabric materials used to filter suspended sediments from storm water

Sinuosity. The ratio of the length of the river thalweg to the length of the valley proper.

Skew. When a drainage structure is not normal (perpendicular) to the longitudinal axis of the highway, it is said to be on a skew. The skew angle is the smallest angle between the perpendicular and the axis of the structure.

Slide. Gravitational movement of an unstable mass of earth from its natural position.

Slipout. Gravitational movement of an unstable mass of earth from its constructed position. Applied to embankments and other man-made earthworks.

Slope. (1) Gradient of a stream. (2) Inclination of the face of an embankment, expressed as the ratio of horizontal to vertical projection. 3) The face of an inclined embankment or cut slope. In hydraulics it is expressed as percent or in decimal form.

Slough. (1) Pronounced SLU. A side or overflow channel in which water is continually present. It is stagnant or slack; also a waterway in a tidal marsh. (2) Pronounced SLUFF. Slide or slipout of a thin mantle of earth, especially in a series of small movements.

Source Control BMP. An effort to prevent or limit the exposure of significant materials to storm water at the source.

Specific Energy. The energy contained in a stream of water, expressed in terms of head, referring to the bed of a stream. It is equal to the mean depth of water, plus the velocity head of the mean velocity.

Spur Dike. A structure or embankment projecting a short distance into a stream from the bank and at an angle to deflect flowing water away from critical areas.

Stage. The elevation of a water surface above its minimum; also above or below an established 'low water' plane; above or below any datum of reference; gage height.

Steady Flow. A flow in which the flow rate or quantity of fluid passing a given point per unit of time remains constant.

Stone. Rock or rock-like material; a particle of such material, in any size from pebble to the largest quarried blocks.

Storage. Detention or retention of water for future flow which occurs naturally in channel and marginal soils, or artificially in reservoirs.

Storage Basin. Space for detention or retention of water for future flow, naturally in channel and marginal soils, or artificially in reservoirs.

Storm. A disturbance of the ordinary, average conditions of the atmosphere which, unless specifically qualified, may include any or all meteorological disturbances, such as wind, rain, snow, hail, or thunder.

Storm Drain. That portion of a drainage system expressly for collecting and conveying former surface water in an enclosed conduit. Often referred to as a 'storm sewer', storm drains include inlet structures, conduit, junctions, manholes, outfalls and other appurtenances.

Storm Water. Storm water runoff, snow melt runoff, and surface runoff and drainage.

Storm Water Management. The recognition of adverse drainage resulting from altered runoff and the solutions resulting from the cooperative efforts of public agencies and the private sector to mitigate, abate, or reverse those adverse results.

Storm Water Pollution Prevention Plan (SWPPP). A plan required by storm water regulations or permits that includes site map(s), an identification of construction/contractor activities that could cause pollutants in the storm water, and a description of measures or practices to control these pollutants.

Stream Waters. Former surface waters which have entered and now flow in a well defined natural watercourse, together with other waters reaching the stream by direct precipitation or rising from springs in bed or banks of the watercourse. They continue as stream waters as long as they flow in the watercourse, including overflow and multiple channels, as well as the ordinary or low-water channel.

Subcritical Flow. In this state, gravity forces are dominant, so that the flow has a low velocity and is often described as tranquil and streaming. Also defined as flow that has a Froude number less than one.

Subdrain. A conduit for collecting and disposing of underground water. It generally consists of a pipe, with perforations in the bottom through which water can enter.

Subsidence. A general lowering of the land surface by consolidation or removal of underlying soil.

Substrate. The layer of earth or rock that lies immediately below the surface soil.

Sump. In drainage, any low area that does not permit the escape of water by gravity flow.

Supercritical Flow. In this state, inertia forces are dominant, so that flow has a high velocity and is usually described as rapid, shooting, and torrential. Also defined as flow that has a Froude number greater than one.

Support Base Floodplain Development. To encourage, allow, serve, or otherwise facilitate additional base floodplain development. Direct support results from an encroachment, while indirect support results from an action out of the base floodplain.

Surcharge. A condition where the hydraulic capacity of the storm drain system is temporarily exceeded (e.g., during a storm event), and the amount of water that enters the system exceeds the conveyance capacity.

Surface Runoff. Water movement on earth's surface, whether flow is over the surface of the ground, or in channels.

Surface Waters. Surface waters are those which have been precipitated on the land from the sky or forced to the surface in springs, and which have then spread over the surface of the ground without being collected into a definite body or channel. They appear as puddles, sheet or overland flow, and rills, and continue to be surface waters until they disappear from the surface by infiltration or evaporation, or until by overland or vagrant flow, they reach well-defined watercourses or standing bodies of water like lakes or seas.

Suspended Load. Sediment that is supported by the upward components of turbulent currents in a stream and that stay in suspension for an appreciable amount of time.

Suspended Solids. Organic or inorganic particles, which are suspended in and carried by the water. The term includes sand, mud, and clay particles, as well as solids in wastewater.

T

Tapered Inlet. A transition to direct the flow of water into a channel or culvert. A smooth transition to increase hydraulic efficiency of an inlet structure

Temporary Construction Site BMPs. BMPs that are required, only temporarily, to address a short-term storm water contamination threat. For example, silt fences are located near the base of newly graded slopes that have a substantial area of exposed soil. Then, during rainfall, the silt fences filter and collect sediment from runoff flowing off the slope.

Terrace. Berm or bench-like earth embankment with a nearly level plain bounded by rising and falling slopes.

Tetrahedron. Bank protection element, basically composed of 6 steel or concrete struts joined together (like the edges of a triangular pyramid) with subdividing struts and tie wires or cables.

Tetrapod. Bank protection element, precast of concrete, consisting of 4 legs joined at a central block, each leg making an angle of 109.5 degrees with the other three, like rays from the center of a tetrahedron to the center of each face.

Texture. The arrangement and interconnection of surface and near-surface particles of terrain or channel perimeter.

Time of Concentration. The time required for storm runoff to flow from the most remote point of a drainage area to the point under consideration (in flow time). It is usually associated with the design storm.

Total Maximum Daily Load (TMDL). A process established by the Clean Water Act to guide the application of state water quality standards to individual water bodies and watersheds by defining the amount of a particular pollutant that a water body can absorb on a daily basis without violating applicable water quality standards. Once this load is determined, the regulatory agency allocates a portion to each source of that pollutant within a particular watershed.

Total Suspended Solids (TSS). The weight of particles that are suspended in water. Suspended solids in water reduce light penetration in the water column, can clog the gills of fish and invertebrates, and are often associated with toxic contaminants because organics and metals tend to bind to particles.

Training. Control of current direction.

Transition. A relatively short reach or conduit leading from one waterway section to another of different width, shape, or slope.

Transport. To carry solid material in a stream in solution, suspension, saltation, or entrainment.

Trash Rack. A grid or screen across a stream designed to catch floating debris.

Tributary. A river or stream which flows into a larger river or stream.

Trunk (or Trunk Line). In a drainage system, the main conduit for transporting the storm waters. This main line is generally quite deep in the ground so that laterals coming from fairly long distances can drain by gravity into the trunk line.

Turbidity. A measure of the amount of material suspended in the water. Increasing the turbidity of the water decreases the amount of light that penetrates the water column. High levels of turbidity are harmful to aquatic life.

Turbulence. The state of flow wherein the water is agitated by cross-currents and eddies, as opposed to a condition of flow that is quiet and laminar.

Turbulent Flow. That type of flow in which any particle may move in any direction with respect to any other particle, and in which the head loss is approximately proportional to the square of the velocity.

U

Undercut. Erosion of the low part of a steep bank so as to compromise stability of the upper part.

Underflow. The downstream flow of water through the permeable deposits that underlie a stream. (1) Movement of water through a pervious subsurface stratum, the flow of percolating water, or water under ice, or under a structure. (2) The rate of flow or discharge of subsurface water.

Urban Runoff. A substance, such as rain, that runs off of surfaces in a watershed in excess of the amount absorbed by the surfaces (usually the ground). Urban runoff can contain sediments and contaminants (nonpoint source pollution) that can add to water quality degradation in the watershed. Increases in impervious surface usually result in increased urban runoff.

V

Velocity. The rate of motion of objects or particles, or of a stream of particles.

Velocity Head. A term used in hydraulics to represent the kinetic energy of flowing water. This "head" is represented by a column of standing water equivalent in potential energy to the kinetic energy of the moving water, calculated as $(V^2/2g)$, where the "V" represents the velocity in meters per second and "g" represents the potential acceleration due to gravity, in meters per second per second.

Vernal Pools. Vernal pools are seasonally flooded landscape depressions that support distinctive (and many times rare) plant and animal species adapted to periodic or continuous inundation during the wet season, and the absence of either ponded water or wet soil during the dry season.

W

Wash. Flood plain or active channel of an ephemeral stream, usually in recent alluvium.

Water Table. The surface of the groundwater below which the void spaces are completely saturated.

Watercourse. A definite channel with bed and banks within which water flows, either continuously or in season. A watercourse is continuous in the direction of flow and may extend laterally beyond the definite banks to include overflow channels contiguous to the ordinary channel. The term does not include artificial channels such as canals and drains, except natural channels trained or restrained by the works of man. The term also does not include depressions or swales through which surface or errant waters pass.

Waters of the United States. (a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate wetlands; (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial sea; and (g) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waste treatment systems, including

treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11 (m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States.

Watershed. The area that contributes surface water runoff into a tributary system or water course.

Waterway. (1) That portion of a watercourse that is actually occupied by water. (2) A navigable inland body of water

Wattles. Bundles or branches, or rolls made of materials such as excelsior, coir or straw. Generally placed perpendicular to the flow to act as a sediment trap, filter or as a velocity control measure.

Weephole. A hole in a wall, invert, apron, lining, or other solid structure to relieve the pressure of groundwater.

Weir. A low overflow dam or sill for measuring, diverting, or checking flow.

Wetland. Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Wet Weather Flow. Rainfall (storm water) runoff.

Windbreak. (1) A barrier fence or line of trees to break or deflect the velocity of wind. (2) Any device designed to block wind flow and intended for protection against any ill effects of wind, particularly wind erosion.