

7 Glossary and Acronyms

Glossary

A

Armor-in-Place: Restoration technique intended to help stream banks withstand high flows from altered hydrology. “Armor” can consist of hard elements such as concrete, rip rap, or rock, or natural materials such as fiber logs or root wads. This technique is usually used when site constraints limit other restoration options.

B

Baseflow: The portion of stream flow that is not from runoff, resulting from seepage of groundwater into a channel. Also called dry weather flow.

Berm: A ridge of earth formed to direct or control the flow of surface water.

Best Management Practice (BMP): A practice designed to lessen the impacts of changes in land use on surface water and groundwater. Structural BMPs are physical structures which generally involve engineering, design and construction. Non-structural BMPs are more programmatic and usually focus on controlling stormwater at the source.

Bioengineering: Stream restoration techniques which use plants and living materials in preference to rock to stabilize eroding streams or to redirect flow to improve habitat.

Bioretention: A water quality practice that uses landscaping and soils to collect and treat urban stormwater runoff. Water is collected in shallow depressions in the ground and allowed to slowly filter through a layer of filter media and soil, while plants take up water and nutrients.

Build-out: The total potential land development area based on current and future land development and zoning plans.

Buffer: A vegetated, natural area adjacent to shorelines, wetlands, or streams. See also, *Resource Protection Area* and *Riparian Buffer*.

C

Channel: A natural or manmade waterway.

Chesapeake Bay Preservation Area (CBPA): Land area regulated during the process of development or redevelopment that is considered to have a significant effect on the water quality and health of the Chesapeake Bay, as established in accordance with Chapter 118 of the Fairfax County Code. See also *Intensely Developed Area*, *Resource Management Area*, and *Resource Protection Area*.

Confluence: The point where two or more streams join to create a combined, larger stream.

Control Structure: See Riser

D

Daylighting: A stream restoration technique which involves demolition and removal of a section of storm sewer and reconstructing a natural stream channel in its place, restoring the stream flow to “daylight”.

Deposition: The process in which particles (e.g., silt, sand, gravel) in the water settle to the stream bottom. Too much deposition can create a thick layer of particles on the stream bottom causing a loss of habitat and spawning areas for *aquatic* insects and fish. Stream bank erosion is a common source for the particles.

Detention: The temporary storage of stormwater runoff used to control peak runoff amounts and provide time for the gradual settling of pollutants.

Dewatering Device: A component of a stormwater pond which can be opened up to drain the pond completely dry for maintenance.

Discharge: The volume of water that passes a given location within a given period of time, usually expressed for stream flow and stormwater in cubic feet per second.

Disconnected Impervious Area (DCIA): Impervious area which drains to a pervious area. It is considered disconnected from the storm drain system because the flow can infiltrate and evaporate. A roof where the downspouts flow on to a lawn is disconnected.

Dissolved Oxygen (DO): The amount of oxygen that is present in water. An adequate supply of oxygen is necessary to support life in a body of water. Measuring the amount of dissolved oxygen in water provides a means of determining the water quality.

Drainage: The flow of surface water or *groundwater* from a land area.

Drainage Area: The area of land draining to a single outlet point.

Dry Pond: See *Detention Basin*.

Detention Basin: A stormwater management pond that temporarily holds runoff and slowly releases it to a downstream stormwater system. Since a detention basin holds runoff only temporarily, it is normally dry during periods of no rainfall. (Also called a *Dry Pond*.)

Dwelling Unit: A residential building or part of a building intended for use as a complete, independent living facility.

E

Ecosystem: All of the organisms in an ecological community and their environment that together function as a unit.

Effluent: Water that flows from a sewage or other type of treatment plant after it has been treated.

Embankment: The structure, typically of earth or concrete, which is designed to hold back water in a stormwater pond.

Endwall: A structure at the point where a free-flowing stream enters or discharges from a pipe or culvert. The endwall protects the pipe end from erosion and guides the flow in or out.

Ephemeral: A stream with no baseflow which flows only periodically or occasionally, usually during and immediately after precipitation.

Erosion: The wearing away of the land surface by running water, wind, ice, or other geological agents. In streams, erosion is the removal of soil from the stream banks or streambed by rapid flows.

Estuary: A partially enclosed body of water where freshwater from rivers and streams mixes with salty seawater. Although influenced by the tides, estuaries are protected from the full force of ocean waves, winds, and storms by the reefs, barrier islands, or fingers of land, mud, or sand.

Eutrophication: The process of over-enrichment of waterbodies by nutrients, often resulting in excess algae. Excess algae reduces dissolved oxygen in water, required for living organisms.

Evapotranspiration: The loss of water to the atmosphere from the earth's surface by both evaporation and by *transpiration* through plants.

Extended Detention: Additional depth in a stormwater pond (usually 2 to 3 feet) above the permanent pool or dry bottom to increase holding time and sedimentation. The additional storage is used for improving water quality or reducing flooding or peak discharges that can cause downstream channel erosion.

F

Fecal Coliform Bacteria: A group of organisms that live in the intestinal tracts of humans and animals. The presence of fecal coliform bacteria in water is an indicator of pollution from human and/or animal excrement.

Filter Strips: A vegetated area that treats *sheet flow* and/or interflow by removing sediment and other pollutants. The area may be grass-covered, forested or of mixed vegetative cover (e.g., wildflower meadow).

Fish Passage: Unobstructed movement of fish within the stream system. Fish require the ability to move between various habitat types and during migration.

Flashy: A description of stream flow that varies widely and rapidly between very low baseflow and significantly higher flows in wet weather.

Floatables: Trash, debris, and other large (gross) pollutants that tend to float on the surface of streams, lakes, and ponds, and which are not removed by sedimentation, filtration, or other processes in most stormwater management facilities.

Flood limit: Those land areas in and adjacent to streams subject to continuous or periodic inundation from flood events. A 100-year flood limit is an area with a 1 percent chance of inundation in any given year. Differs from a floodplain.

Floodplain: An ecosystem adjacent to a stream which undergoes fairly frequent inundation during high flows when the stream overtops its banks.

Forebay: A small storage area near the inlet of a stormwater pond to trap incoming sediment where it can be removed easily before it can accumulate in the pond.

G

Gabion: A wire basket or cage that is filled with rock, used to stabilize stream banks, change flow patterns, or prevent erosion.

Geographic Information System (GIS): A computer system for mapping and spatial analysis.

Grade Control (Streams): A method of stream restoration intended to halt and repair incision by adjusting the slope of the stream through a series of step pools, riffles and pools, or other constructed features.

Groundwater: Water that flows or seeps downward and saturates soil or rock, supplying springs and wells. The upper surface of the saturated zone is called the water table.

H

Habitat (Aquatic): A measurable description of the features of a stream which are necessary for insects, fish, and other creatures to thrive, including depth, flow, velocity, substrate, substrate size, and riparian cover.

Head Cut: A type of incision in a streambed consisting of a sudden change in elevation from upstream to downstream, similar to a waterfall. High flows erode the upstream channel at a headcut, resulting in the erosion and incision migrating upstream.

Headwater: The source of a stream or watercourse.

Hydraulics: The physical science and technology of the stationary and active behavior of fluids.

Hydrology: The science dealing with the distribution and movement of water, including the hydrologic cycle of rainfall, runoff, groundwater flow, surface water flow, and evaporation.

I

Impervious Surface: A surface composed of any material that impedes or prevents *infiltration* of water into the soil. Impervious surfaces include roofs, buildings, streets, and parking areas. Also called impervious cover.

Incised (Stream): A channel which has cut downward through its bed, becoming disconnected from its floodplain. High flows which previously overtopped the stream banks and dissipated energy in the floodplain stay within the banks of an incised channel, increasing erosion.

Infill: A residential development that has occurred near, or within, an already established neighborhood.

Infiltration: The process by which water drains into the ground. Some of this water will remain in the shallow soil layer, where it will gradually move through the soil and subsurface material. Eventually, it might enter a stream by seepage out of a stream bank or it may penetrate deeper, recharging *groundwater aquifers*.

Infiltration Facility: A stormwater management facility that temporarily stores runoff so it can be absorbed into the surrounding soil. Since an infiltration facility confines runoff only temporarily, it is normally dry during periods of no rainfall. Infiltration ponds, infiltration trenches, infiltration dry wells, and porous pavement are considered infiltration facilities.

Inflow: The source of flow into a stormwater pond. Usually a pipe or man-made channel.

Intensely Developed Area (IDA): CBPA areas consisting of existing development and *infill* sites where development is concentrated and little of the natural environment remains.

Invert: The lowest elevation of a feature in the drainage network: the bottom of a pond, the bottom of a manhole or pipe, the lowest part of a control structure,

L

Land Development: A man-made change to, or construction on, the land surface.

Land Use: Describes the type of activity on the land such as commercial or residential. The County zoning requirements dictates the type of land use allowed for a given area.

Low-flow Channel: In a stormwater pond, the low-flow channel guides baseflow through the pond during dry periods. Older designs used straight channels made with concrete; newer designs use meandering paths in natural soils, frequently planted with wetland vegetation.

Low-Impact Development (LID): A suite of stormwater management techniques that reduces the stormwater impacts from new development or redevelopment, which combines site design and onsite treatment techniques. Site design can include reducing the amount of *impervious surfaces* and designing the site to take advantage of the natural conditions can reduce the amount of runoff produced by a development area. Onsite treatments include techniques such as vegetated swales and *bioretention* filters or basins to reduce runoff rates and promote *infiltration*.

M

Marsh: A wet land area, periodically inundated with water.

Meander: A stream bend or series of stream bends. Erosion is frequently found on the outer banks of meander bends because they take the force of the flow as it turns.

Median (Parking lot): A small unpaved area in the middle of a parking lot. Most designs use raised medians with curbs. LID techniques can use depressed medians for stormwater treatment.

Micropool: A small permanent pool in a larger stormwater pond system, usually at the pond outlet to provide additional settling of pollutants.

Mitigation: To make a development scenario less harmful than the original plan; or to provide a habitat in another more conducive, larger, or better-suited area, typically in a different location from the original.

Municipal Separate Storm Sewer System (MS4) Permit: An NPDES (National Pollutant Discharge Elimination System) permit issued to municipalities requiring the reduction in pollutants contributing to the discharges from the municipality's storm sewer system outfalls.

N

National Pollutant Discharge Elimination System (NPDES): The national program for issuing, modifying, monitoring, and enforcing permits under Sections 307, 402, 318 and 405 of the Clean Water Act. The NPDES permits regulate wastewater and stormwater discharges to the waters of the United States, and are administered by the Virginia Department of Environmental Quality and Virginia Department of Conservation and Recreation.

Nested Channel: A stream restoration technique for incised and overwidened streams which mimics a natural, recovered stream by constructing a small, low-flow channel with an adjacent floodplain bench, all within the existing channel.

Nitrogen: A chemical element that occurs naturally as a gas and makes up 78 percent of the atmosphere. Combined with oxygen as nitrate, it is required by plants for growth and is found in most fertilizers. Too much nitrogen in the water can cause *eutrophication* and result in excess algal blooms, reducing the amount of oxygen available to aquatic life. *Total Nitrogen* refers to all nitrogen compounds forms: nitrate, nitrite, ammonia, and organic nitrogen.

Nutrient: A substance that provides food or nourishment. In the aquatic environment, nutrients refer to compounds of phosphorus, nitrogen, and potassium that contribute to *eutrophication*.

O

Open Space: A portion of a development site that is permanently set aside for public or private use and will not be developed. The space may be used for recreation, or may be reserved to protect or buffer natural areas.

Outfall: Defined in the *NPDES* program as the point where discharge from a regulated system flows into waters of the United States.

Outlet: The point at which water flows from one waterbody to another, such as a stream or river to a lake or larger river.

Overwidened (Stream): A stream with a channel cross-section which has eroded and become wider over time. Low flows become very shallow and provide poorer habitat.

P

Peak Discharge: The maximum flow rate at a given location during a rainfall event. Peak discharge is a primary design factor for the design of stormwater runoff facilities such as pipe systems, storm inlets and culverts, and swales.

Perennial Streams: A body of water that normally flows year-round, supporting a variety of aquatic life.

Pervious: Any material that allows for the passage of liquid through it. Any surface area that allows *infiltration*.

Phosphorus: An element found in fertilizers and soil that can contribute to the *eutrophication* of waterbodies. It is the keystone pollutant in determining pollutant removal efficiencies for various *best management practices* as defined by the Virginia Stormwater Management Regulations. *Total Phosphorus* refers to all phosphorus compounds forms: orthophosphorus and both dissolved and particulate organic and inorganic phosphorus.

Plunge Pool: A small pond located at either a stormwater outfall or an inflow to a stormwater pond, designed to dissipate the energy of high-speed flows.

Pollutant: Any substance introduced to water that degrades its physical, chemical, or biological quality.

Pollutant Loading: The rate at which a pollutant enters a surface water or *groundwater* system. This is typically determined by water quality modeling and expressed in terms such as pounds per acre, per year.

Pollution Prevention: Any activity intended to reduce or eliminate stormwater pollution by reducing the amount of runoff, or by reducing the opportunity for stormwater to wash off and transport pollutants downstream.

Pool: The reach of a stream between two *riffles*; a small and relatively deep body of quiet water in a stream or river. Natural streams often consist of a succession of pools and riffles.

Post-Development: Refers to conditions that exist after completion of a land development activity on a specific site or tract of land.

Pre-Development: Refers to the conditions that exist at the time that plans for land development of a tract of land are approved by the plan approval authority.

Pre-Treatment: A smaller stormwater treatment system located upstream of another system, designed to reduce sediment or other pollutants that would make the downstream system less effective over time.

Q

Quantity Control: *Stormwater management facilities* designed to reduce *post-development peak discharge* to the *peak discharge* that occurred in the *pre-development* conditions, or to reduce the amount of runoff.

Quality Controls: *Stormwater management facilities* designed to remove *pollutants* from *runoff* and improve water quality.

R

Rain Barrel: A storage container connected to a roof downspout, typically including a hose attachment to allow for reuse of rooftop runoff.

Reach: General term used to describe a length of stream.

Recharge: The downward movement of water through the soil into *groundwater*, for example, rainfall that seeps into a groundwater aquifer.

Redevelopment: The substantial alteration, rehabilitation, or rebuilding of a property for residential, commercial, industrial, or other purposes.

Regional Ponds: Larger stormwater management facilities designed to treat the runoff from drainage areas of 100 to 300 acres.

Regrade: A stream restoration technique for incised or over-widened channels which involves excavation and fill to change the cross-section of the stream banks from an easily eroded, usually vertical, form, to a more stable, usually sloping, shape.

Resource Management Area (RMA): CBPA areas not adjacent to streams and shorelines where development may cause an impact to aquatic resources. May include steep slopes, erodible soils, or other areas designated by the locality.

Resource Protection Area (RPA): CBPA lands at or near shorelines or streams that have an intrinsic water quality value due to the ecological and biological processes they perform.

Retention Basin: A stormwater management pond that permanently stores water for the purpose of improving water quality. It is normally wet, even during periods without rainfall. Also called a *Wet Pond*.

Retrofit: The modification of stormwater management systems to improve water quality or to change characteristics of peak discharge control by adding storage, changing outflow characteristics, or adding water quality treatments such as pools, meanders, wetland plantings, or other features.

Riparian Buffer: Strips of grass, shrubs, and/or trees along the banks of rivers and streams that filter polluted runoff. These buffers provide a transition zone between water and human land use. Buffers are also complex ecosystems that provide habitat and improve the stream communities they shelter.

Riprap: A protective layer of large stones placed on a streambank to prevent erosion.

Riffle: A reach of stream that is characterized by shallow, fast-moving water broken by the presence of rocks and boulders.

Riffle/Run: Streams that are generally characterized by a high slope (gradient), and a mixture of riffle and run habitat.

Riser: A pipe or structure used to control the discharge rate from a stormwater management pond.

Runoff: The portion of precipitation, snowmelt, or irrigation water that flows off the land into surface waters instead of *infiltrating*.

Run: A segment of stream length that is characterized by moderate depths, smooth flowing water at a moderate pace. A run is intermediate between a *riffle* and a *pool*.

S

Sand Filter: A stormwater management facility consisting of a large, flat area which collects stormwater in a shallow pond and allows it to slowly percolate through a sand bed to remove sediment and pollutants. Usually has an underdrain to collect and convey the filtered stormwater.

Sanitary Sewer: The pipe network that carries domestic or industrial wastewater to a treatment plant. Some systems in older cities and towns may also convey stormwater; these are known as combined sewer systems.

Scour: Removal of sediment from the streambed and banks caused by fast moving water. See also *Erosion*.

Sedimentation (Treatment): In a water treatment context, sedimentation refers to a pollutant removal method in which pollutants are removed by gravity as sediment settles out of the water column. An example of a *best management practice* using sedimentation is a *detention pond/wet pond*.

Sedimentation (Streams): See Deposition

Sheet Flow: Runoff that flows over the ground surface as a thin, even layer, not concentrated in a channel.

Sinuuous: Sinuosity describes how a stream or river turns back and forth across the land as it flows downstream. A stream with many tight meanders for its length is more sinuous than one with shallow bends.

Stakeholder: Stakeholders include groups of people within the watershed (e.g., residents, industry, local government, agencies, and community groups), as well as those who work in the *watershed*.

Storm Drain: See *Storm Sewer*.

Storm Sewer: A man-made drainage system that carries only surface runoff, street wash, and snow melt from the land. In a separate storm sewer system, storm sewers are completely separate from sanitary sewers that carry wastewater. In a combined sewer, a single conveyance system carries both stormwater and wastewater.

Stormwater: Surface water flow that results from rainfall.

Stormwater Management (SWM) Facility: A structure, such as a pond, that controls the quantity and quality of stormwater runoff.

Stormwater Outfall: A single location, pipe discharge, or outlet structure that releases stormwater into a stream, river, or pond.

Stormwater Ponds: A depression or dammed area with an outlet device that controls stormwater outflow. Stormwater ponds retain water from upstream areas, thereby reducing peak flows downstream. In Fairfax County, stormwater ponds are either dry (*dry pond*) or contain a permanent pool of water (*wet pond*) and are typically designed to control the peak runoff rate for selected storm events.

Stormwater Wetlands: Areas intentionally designed to emulate the water quality improvement function of wetlands for the primary purpose of removing pollutants from stormwater.

Stream Restoration: The reestablishment of the structure and function of a stream, as closely as possible to its pre-existing condition.

Substrate: The material forming the bottom of a stream channel. Channel materials are generally broken into categories (listed smallest to largest) such as clay, silt, sand, gravel, cobble and boulder.

Subwatershed: A smaller subsection of a larger *watershed*, often delineated to describe a particular tributary to a larger waterbody.

Suspended solids: Particles that are suspended in and carried by the water. The term includes sand, mud, and clay particles as well as solids in wastewater.

Swale: A natural depression or wide shallow ditch used to temporarily store, route, or filter runoff.

T

Toe Protection (Streams): A stream restoration technique to provide erosion protection for the the bottom of the streambank. Typically constructed of stone and tied into a regraded and revegetated bank.

Transpiration: The process by which water vapor escapes from living plants and enters the atmosphere. Studies have shown that about 10 percent of the moisture found in the atmosphere is released by plants through transpiration. **Tree Canopy Cover:** The area directly beneath the crown and within the drip line of a tree.

Turbidity: The amount of solid particles that are suspended in water, making it cloudy or even opaque in extreme cases.

U

Underdrain: A series of perforated pipes installed under a filtration treatment system which collects filtered water and conveys it to a storm sewer or stream. May be installed in infiltration systems to divert high flows.

W

Watershed: An area of land that drains directly, or through tributary streams, into a particular river or waterbody. A watershed includes its associated groundwater. Elevated landforms, such as ridges or even roads can serve as watershed divides.

Weir: A section of a riser which limits the discharge from a stormwater pond to the level determined by the design.

Wetlands: Areas where the soil or substrate is saturated with water during at least a part of the growing season. These saturated conditions determine the types of plants and animals that live in these areas.

Wet Pond: See *Retention Basin*

Acronyms

BMP	Best Management Practice
BPJ	Best Professional Judgment
BRAC	Base Realignment and Closure
CBA	Cost Benefit Analysis
CEM	Channel Evolution Model
DCIA	Disconnected Impervious Area
DEQ	(Virginia) Department of Environmental Quality
DO	Dissolved Oxygen
DPWES	Fairfax County Department of Public Works and Environmental Services
EPA	Environmental Protection Agency
FCPA	Fairfax County Park Authority
FCPS	Fairfax County Public Schools
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
GIS	Geographic Information System
HEC-RAS	Hydrologic Engineering Center River Analysis System
HOA	Homeowners Association
HSI	Hotspot Site Investigation
IBI	Index of Biological Integrity
LID	Low Impact Development
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
NSA	Neighborhood Source Assessment
NVSWCD	Northern Virginia Soil and Water Conservation District
NWI	National Wetland Inventory
RPA	Resource Protection Area
SPA	Stream Physical Assessment
SPS	Stream Protection Strategy
STEPL	Spreadsheet Tool for Estimating Pollutant Load
SWM	Stormwater Management
SWMM	Stormwater Management Model
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
USACE	U.S. Army Corps of Engineers
USLE	Universal Soil Loss Equation
VDOT	Virginia Department of Transportation
VPDES	Virginia Pollutant Discharge Elimination System

VWPP	Virginia Water Protection Permit
WAG	Watershed Advisory Group
WMA	Watershed Management Area

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