

Addressing Microbial Pollution in Coastal Waters A Reference for Local Governments

Appendix II: Glossary

ADENOVIRUSES: Any virus of the Adenoviridae family; associated with various respiratory and eye diseases of humans and animals.

ANTIBIOTIC: A chemical substance that is important in the treatment of infectious diseases, produced either by a microorganism or semi-synthetically, that has the capacity in dilute solutions to either kill or inhibit the growth of certain other harmful microorganisms. Antibiotics are widely used and include penicillin, streptomycin, and tetracycline.

ANTIBIOTIC RESISTANCE: Describes the condition of bacteria whose growth and reproduction is unaffected by particular antibiotics. Bacteria have a variety of mechanisms for evading the toxic effects of antibiotics. In some cases, the bacterial cell membranes are altered so that an antibiotic cannot enter the cell. In other cases, resistant bacteria actively pump the antibiotic out of the cell as soon as it enters. Still other resistant bacteria make an enzyme that degrades an antibiotic as soon as it enters the cell. There are also other mechanisms for antibiotic resistance.

BACTERIUM (BACTERIA is plural): A single-celled or colonial prokaryotic organism (non-nucleus containing cell) that is not a member of the domain *Archaea*.

BACTERIAL INDICATORS: Bacteria that are usually associated with pathogens transmitted by fecal contamination but are typically easier to sample and measure. They are assumed to indicate the presence of human pathogenic organisms. Examples of these are *Enterococcus* and *E. coli*.

BACTERIOPHAGES: Viruses (phages) that infect bacteria. A given phage strain may be able to grow inside several strains of bacteria.

BEST MANAGEMENT PRACTICE (BMP), NON-STRUCTURAL: Strategies implemented to control stormwater runoff that focus on pollution prevention such as alternative site design, zoning and ordinances, education, and good housekeeping measures.

BEST MANAGEMENT PRACTICE (BMP), STRUCTURAL: Engineered devices implemented to control, treat, or prevent stormwater runoff pollution. Includes pervious pavements, stormwater wetlands, vegetated buffers, and stormwater detention ponds

CAFFEINE: A white, bitter, crystallizable substance, obtained mainly from coffee and tea leaves. Has been proposed as an indicator of human fecal pollution due to excretion of the compound in feces and urine.

CLOSTRIDIUM PERFRINGENS: Anaerobic (does not require oxygen) bacteria that are found in the gastrointestinal tract of warm-blooded animals. *C. perfringens* has been suggested as an alternative bacterial indicator of fecal pollution because it is primarily associated with human wastes and is widely distributed in microbial contaminated waters.

COMMENSAL: Relation between two kinds of organisms in which one obtains food or other benefits from the other without damaging or benefiting it.

COLIOPHAGE: A virus that specifically infects and replicates in the bacterium *E. coli*.

DNA: A double-stranded, helical molecule, which encodes genetic information about an organism. DNA controls cellular replication and codes for protein synthesis that is carried out by RNA.

DNA PROBE (GENE PROBE): A small segment of DNA labeled with a visible marker used to detect the presence of a particular type of organism by selective hybridization to a known, specific DNA.

ENTEROCOCCUS: Group of anaerobic, gram-positive cocci that produce lactic acid upon fermentation, subgroup of 'fecal streptococcus'.

ENTERIC PATHOGEN: Disease causing agent that resides in the gut of an animal or human.

ENTEROVIRUSES: Family of viruses that includes Coxsackie virus, echovirus, and poliovirus. Single-stranded RNA viruses that generally cause gastrointestinal distress, myocarditis, and upper respiratory tract infections.

ESCHERICHIA COLI (E. coli): Bacteria that are present in the gastrointestinal tract and feces of warm-blooded animals. Are members of the fecal coliform group of indicator bacteria.

FECAL COLIFORM: A subgroup of total coliform bacteria, with *E. coli* as the most common single species within the group. Gram-negative rod-shaped bacteria that are found in the gastrointestinal tract of warm-blooded animals and are distinguished from total coliform bacteria by their ability to grow at 95 degrees Fahrenheit and ferment lactose.

FECAL STREPTOCOCCUS: Gram-negative, cocci bacteria that are found in the gastrointestinal tract of warm-blooded animals and are ubiquitous in the environment.

F-SPECIFIC (F+OR FRNA) COLIPHAGE: FRNA coliphages are pathogens of *E. coli* and infect male *E. coli* strains. There are four distinct groups of FRNA coliphages, and those predominating in humans differ from those predominating in animals.

GENOME: A complete set of the genetic material present in an organism.

GRASSED SWALE: Minor channels that are lined with erosion resistant and flood tolerant grasses, and are used to transport stormwater runoff into less developed areas.

HEPATITIS A VIRUS: Single stranded RNA virus that is carried in water and causes Infectious Hepatitis. A viral disease of the liver, symptoms may include fever, fatigue, and nausea.

HUMAN ADENOVIRUSES: Subset of the adenoviridae that is associated with respiratory and eye diseases, the most common being Acute Respiratory Disease (ARD).

IMPERVIOUS SURFACE: Hard ground cover that increases stormwater runoff, such as asphalt, concrete, and rooftops.

MICROBE: Any microscopic life form, especially considered as a cause of infection or disease.

MICROBIAL SOURCE TRACKING (MST) METHODS: Methods that determine the sources of fecal contamination of environmental samples (e.g. from human, livestock, or wildlife origins).

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4): A publicly owned conveyance or system of conveyances that discharges to waters of the US and is designed or used for collecting or conveying stormwater, is not a combined sewer, and is not part of a publicly owned treatment works (POTW).

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES): Two-phased surface water quality program authorized by Congress as part of the 1987 Clean Water Act.

NORWALK-LIKE VIRUS (NOROVIRUS): Group of RNA viruses that cause infectious intestinal illness that often occurs in large outbreaks, and is one of the leading causes of food borne disease in the US. It is part of a family of unclassified, small, round-structured viruses. Shellfish is the food most often associated with its outbreak. Water is the most common source of outbreaks and may include water from municipal supplies, recreational lakes, swimming pools and wells.

PATHOGEN: Any virus, microorganism, or other substance that causes disease or death.

RNA: A single-stranded molecule that is similar to DNA in chemical structure. RNA carries out instructions from DNA including cellular replication and protein synthesis.

SAND FILTER: A system primarily used to treat stormwater runoff from large buildings, access roads, and parking lots in highly impervious areas. This practice was originally used for the treatment of wastewater and drinking water. Sand filters work by filtering stormwater through a bed of sand.

SEROLOGY (SEROLOGICAL): The study of the presence of antibodies and antigens in microorganisms.

STEROLS: Constituents of the fatty acids in cell walls and membranes.

STORMWATER RUNOFF (OR NONPOINT SOURCE POLLUTION): Unlike pollution from industrial and sewage treatment plants, stormwater runoff comes from many diffuse sources. It is caused by rainfall or snowmelt moving over the ground. As this runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even our underground sources of drinking water.

STORMWATER WETLAND: Wetland systems designed to maximize the removal of pollutants from stormwater runoff through wetland vegetation uptake, retention and settling. Stormwater wetlands typically consist of a forebay (or micropool) that supports conditions suitable for the growth of wetland plants. They are designed similarly to wet ponds, except they are much shallower.

TOTAL MAXIMUM DAILY LOAD (TMDL): The maximum allowable loading of a pollutant that a designated water body can assimilate and still meet numeric and narrative water quality standards.

VEGETATED BUFFER: A naturally vegetated transitional zone between both differing land uses and the land/water interface that function as a barrier to and filter of surface water runoff. They are variable in width and help remove pollutants from stormwater runoff through uptake by vegetation. They also help prevent erosion of shorelines and river and stream banks.

WATERSHED: Geographical area that drains to a specified waterbody. All the water that falls within this area flows to the waterbodies as surface runoff, in tributary streams, or as groundwater.

WET POND: A stormwater retention impoundment created by either constructing an embankment or excavating a pit, which retains a permanent pool of water used for improving the quality of stormwater runoff.

