Glossary

**Acclimation.** (1) Steady-state compensatory adjustments by an organism to the alteration of environmental conditions. Adjustments can be behavioral, physiological, or biochemical. (2) Referring to the time period prior to the initiation of a toxicity test in which organisms are maintained in untreated, toxicant-free dilution water or soil with physical and chemical characteristics, e.g., temperature, pH, hardness, similar to those to be used during the toxicity test.

**Acute.** Involving a stimulus severe enough to rapidly induce a response; in toxicity tests, a response observed in 96 hours or less typically is considered an acute one. An acute effect is not always measured in the terms of lethality; it can measure a variety of effects. Note that acute means short, not mortality.

**Acute-Chronic Ratio (ACR).** The ratio of the acute toxicity (expressed as an LC50) of an effluent or a toxicant to its chronic toxicity (expressed as an NOEL). Used as a factor for estimating chronic toxicity on the basis of acute toxicity data.

**Additivity.** The characteristic property of a mixture of toxicants that exhibits a cumulative toxic effect equal to the arithmetic sum of the effects of the individual toxicants.

**Anoxic.** Without oxygen.

**Antagonism.** The property of a mixture of toxicants that exhibits a less-than-additive cumulative toxic effect.

**Aquatic Community.** An association of interacting populations of aquatic organisms in a given water body or habitat.

**Bioaccumulation.** Uptake and retention of environmental substances by an organism from all sources.

**Bioavailability.** The property of a toxicant that governs its effect on exposed organisms. A reduced bioavailability would have a reduced toxic effect.

**Bioconcentration.** Uptake and retention of environmental substances by an organism from water. A bioconcentration factor (BCF) can be calculated as the quotient of the concentration of chemical in the tissue (or whole) of an aquatic organism divided by the concentration in the water in which the organism resides.

**Biological Assessment.** An evaluation of the biological condition of a water body using biological surveys and other direct measurements of resident biota in surface waters.

**Biological Criteria (biocriteria).** Numerical values of narrative expressions that describe the reference biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use.

**Biological Integrity.** The condition of the aquatic community inhabiting unimpaired water bodies of a specified habitat as measured by community structure and function.

**Biological Monitoring.** The use of a biological entity as a detector and its response as a measure to determine environmental conditions. Toxicity tests and biological surveys are common biomonitoring methods.

**Biological Survey (biosurvey).** Consists of collecting, processing, and analyzing representative portions of a resident aquatic community structure and function.

**Chronic.** Involving a stimulus that lingers or continues for a relatively long period of time, often 1/10 the life span or more. Chronic should be considered a relative term depending on the life span of an organism. A chronic effect can be lethality, growth, reduced reproduction, etc. Chronic means long term.

**Community Component.** Any portion of a biological community. The community component may pertain to the taxonomic group (fish, invertebrates, algae), the taxonomic category (phylum, order, family, genus, species), the feeding strategy (herbivore, omnivore, carnivore), or organizational level (individual, population, community association) of a biological entity within the aquatic community.
Conservative Pollutant. A pollutant that is persistent and not subject to decay or transformation.

Control. A treatment in a toxicity test that duplicates all the conditions of the exposure treatments but contains no test material. The control is used to determine the absence of toxicity of basic test conditions, e.g., health of test organisms, quality of dilution water.

Criteria (water quality). An estimate of the concentration of a chemical or other constituent in water which if not exceeded, will protect an organism, an organismal community, or a prescribed water use or quality with an adequate degree of safety.

Criteria Continuous Concentration (CCC). The U.S. EPA national water quality criteria recommendation for the highest in-stream concentration of a toxicant or an effluent to which organisms can be exposed indefinitely without causing unacceptable effect.

Criteria Maximum Concentration (CMC). The U.S. EPA national water quality criteria recommendation for the highest in-stream concentration of a toxicant or an effluent to which organisms can be exposed for a brief period of time without causing mortality.

Critical Life Stage. The period of time in an organism’s life span when it is the most susceptible to adverse effect caused by exposure to toxicants, usually during early development (egg, embryo, larvae). Chronic toxicity tests are often run on critical life stages to replace long-duration, life cycle tests since the toxic effect occurs during the critical life stage.

Designated Uses. Those uses specified in water quality standards for each water body or segment whether or not they are being attained.

Dilution of Water. Water used to dilute the test material in an aquatic toxicity test in order to prepare either different concentrations of a test chemical or different percentages of an aqueous sample for the various test treatments. The water (negative) control in a test is prepared with dilution water only.

Disturbance. An event that causes a significant change from the “normal pattern” in an ecological system.

Diversity. The number and abundance of species in a specified location.

Ecological Assessment. An evaluation of the condition of a water body using water quality and physical habitat assessment methods.

Ecotone. A zone of transition between adjacent ecological systems having a set of characteristics uniquely defined by space and time scales and by the strength of interaction between adjacent ecological systems.

Effluent. A complex waste material, e.g., liquid industrial discharge or sewage, which is discharged into the environment.

Elutriate (extract). A sample of water obtained by mixing a solid sample with a specified weight ratio of solvent, usually water, for a specified time and then separating from the solid phase by settling, centrifugation, and/or filtration.

Impact. A change in the chemical, physical, or biological quality or condition of a water body caused by external sources.

Impairment. A detrimental effect on the biological integrity of a water body caused by an impact that prevents attainment of the designated use.

Macroinvertebrates. Large invertebrate organisms, sometimes arbitrarily defined as those retained by sieves with 0.425- to 1.0-mm mesh screens.

Median Lethal Concentration (LC50). The concentration of material to which test organisms are exposed that is estimated to be lethal to 50% of the test organisms. The LC50 is usually expressed as a time-dependent value, e.g., 24-hour or 96-hour LC50; the concentration estimated to be lethal to 50% of the test organisms after 24 or 96 hours of exposure. The LC50 may be derived by observation (50% of the test organisms may be observed to be dead in one test material concentration), by interpolation (mortality of more than 50% of the test organisms occurred at one test concentration and mortality of fewer than 50% of the test organisms died at a lower test concentration; the LC50 is estimated by interpolation between these two data points), or by calculation (the LC50 is statistically derived by analysis of mortality data from all test concentrations).

No Observed Effect Level (NOEL). The highest measured continuous concentration of an effluent or a toxicant which causes no observed effect on a test organism.

Patches (adjacent to ecotones in fluvial systems). Spatial units (e.g., biological communities and ecosystems) determined by patch characteristics and their interactions over various scales. Topography, substrate conditions, organisms, and disturbance influence patch composition, size, location, and shape.
Persistence. That property of a toxicant or an effluent which is a measurement of the duration of its effect. A persistent toxicant or toxicity maintains effects after mixing, degrading slowly. A nonpersistent toxicant or toxicity may have a quickly reduced effect after mixing, as degradation processes such as volatilization, photolysis, etc. transform the chemical.

Population. An aggregate of interbreeding individuals of a biological species within a specified location.

Quality Assurance (QA). A program organized and designed to provide accurate and precise results. Included are selection of proper technical methods, tests, or laboratory procedures; sample collection and preservation; selection of limits; evaluation of data; quality control; and qualifications and training of personnel.

Quality Control (QC). Specific actions required to provide information for the quality assurance program. Included are standardizations, calibrations, replicates, and control and check samples suitable for statistical estimates of the confidence of the data.

Reference Controls. Tests using natural water or sediment samples collected from unimpacted areas of the site environs.

Regions of Ecological Similarity. Describe a relatively homogeneous area by similarity of climate, landform, soil, potential natural vegetation, hydrology, or other ecologically relevant variable. Regions of ecological similarity help define the potential for designated use classifications of specific water bodies.

7Q10. The discharge at the 10-year recurrence interval taken from a frequency curve of annual values of the lowest mean discharge for 7 consecutive days.

Static. Describing toxicity tests in which test materials are not renewed.

Sublethal. Involving a stimulus below the level that causes death.

Synergism. The characteristic property of a mixture of toxicants which exhibits a greater than additive cumulative toxic effect.

Total Maximum Daily Load (TMDL). The total allowable pollutant load to a receiving water such that any additional loading will produce a violation of water quality standards.

Toxic Acute Chronic (TC). The reciprocal of the effluent dilution that causes no unacceptable effect on the test organisms by the end of the acute exposure period.

Toxic Endpoints. Measurements of an acute or chronic toxicity for toxic substances, including exposure duration, concentration, and observed effects.

Toxic Unit Acute (TU). The reciprocal of the effluent dilution that causes 50% of the test organisms to die by the end of the acute exposure period.

Toxicant. An agent or material capable of producing an adverse response (effect) in a biological system, adversely impacting structure or function or producing death.

Toxicity. The inherent potential or capacity of a material to cause adverse effects in a living organism.

Uncertainty Factors. Factors used in the adjustment of toxicity data to account for unknown variations. Where toxicity is measured on only one test species, other species may exhibit more sensitivity to that effluent. An uncertainty factor would adjust measured toxicity upward and downward to cover the sensitivity range of other, potentially more or less sensitive species.

Water Quality Assessment. An evaluation of the condition of a water body using biological surveys, chemical-specific analyses of pollutants in water bodies, and toxicity tests.