

Appendix E. Glossary

A

Additive

A substance added to a product in small quantities to change or improve the product's performance or enhance its environmental stability.

Adsorption

The adhesion of atoms, ions, or molecules onto a surface due to residual surface energy from unbalanced ionic forces.

B

Best management practices (BMP)

A practice, or combination of practices, that is a proven, effective, and practicable (technological, economic, and regulatory) means of preventing or reducing impacts.

Biobased

Plastics that are derived in part or in whole from organic biological material (corn starch, cellulose, etc.).

Biodegradable

Refers to plastics that can break down into natural materials (carbon dioxide, water, organic matter) when certain physical conditions are met (for example, temperature, humidity, and presence of microorganisms).

Biofilms

Biological materials that may develop on the surfaces of MP and may be toxic.

Biomagnification

Chemical or substance transfer from lower to higher trophic levels within a food web, resulting in a higher concentration in the higher trophic levels (for example, apex predators).

Bioplastics

Plastics synthesized from organic materials, such as plants.

Biosolids

Solid material (primarily organic matter) accumulated through the wastewater treatment process and separated from the liquid waste.

C

Coagulation

The process of particle bonding through changes in electrostatic charges, or a liquid changing to a semi-solid or solid state (for example, blood coagulation).

Crystallinity

The degree of long-range structural order that makes up a crystal lattice within a (solid) material.

D

Degradation

The process of a material breaking down into smaller pieces through chemical deterioration.

Density

The intrinsic unit mass of a material, defined as the mass of one cubic meter with units of kilograms per cubic meter.

Drinking water

Water that comes from surface water bodies or the ground and may be consumed or used in the preparation of food and other beverages.

E**Egestion time**

The time required to excrete unusable or undigested material from a cell, as in the case of single-celled organisms, or from the digestive tract of multicellular animals.

Environmental justice

The fair treatment of people of all races, cultures, incomes, and educational levels with respect to the development and enforcement of environmental laws, regulations, and policies. Fair treatment implies that no population should be forced to shoulder a disproportionate share of exposure to the negative effects of pollution due to lack of political or economic strength.

E-waste

Electronic waste or e-waste refers to electronic products that have finished their useful life. Consumer electronic products include televisions and monitors, computers, computer peripherals, audio and stereo equipment, VCRs, DVD players, video cameras, telephones, fax and copying machines, cellular phones, wireless devices, and video game consoles.

F**Fiber**

Natural or human-made substance that is significantly longer than wide.

Filtration

Physical process in which solid particles are separated from a liquid or gaseous fluid through a filter media that allows the fluid through but retains the solid.

Flotation

Process for separating solids through floating or sinking of the solid based on its density relative to the fluid.

Fouling

The accumulation of material on a surface consisting of either a substance or living organism(s).

G**Glassy plastics**

Have a denser structure and present higher cohesive forces than other plastics.

Green chemistry

Design of chemical products and processes that reduce or eliminate the use or generation of hazardous substances.

H**Hazardous**

Involving or exposing one to a risk.

Hydrophobicity

The physical property of repelling water from a material or substance.

I

Incineration

The controlled burning of substances in an enclosed area.

J

K

L

Landfill

Modern landfills are well-engineered facilities designed to receive specific kinds of waste, including municipal solid waste, construction and demolition debris, and hazardous waste. Landfill facilities must be designed to protect the environment from contaminants that may be present in the solid waste disposed in the unit.

Lentic

Related to still fresh water such as lakes or ponds.

Life cycle

The MP life cycle includes every stage, from production (primary source), to use and disposal, then transportation through the environment, and final deposition or uptake into the food web. In the case where MP are generated through the degradation of larger plastic pieces (secondary source), the life cycle also includes the transportation of the plastics through the environment, and the degradation of the plastic into MP.

Lotic

Related to moving fresh water such as rivers or streams.

M

Macroplastics

Plastic particles or objects exceeding 5 mm in size.

Marine

Of, found in, or produced by the sea.

Membrane

A thin pliable sheet of material forming a barrier or lining, or a microscopic double layer of lipids and proteins that bounds cells and organelles and forms structures within cells.

Membrane/reverse osmosis

Use a process that reverses the flow of water in a natural process of osmosis so that water passes from a more concentrated solution to a more dilute solution through a semipermeable membrane. Pre- and post-filters are often incorporated along with the reverse osmosis membrane itself.

Microbead

Intentionally manufactured MP that, due to its abrasive quality, is added to goods such as health and beauty products or coatings on seeds, fertilizers, or pesticides.

Microplastics

Particles that are greater than 1 nanometer (nm) and less than 5 millimeters (mm) in their longest dimension and composed

of solid polymeric materials to which chemical additives or other substances may have been added. Polymers that are derived in nature that have not been chemically modified (other than by hydrolysis) are excluded.

Mitigation

Measures taken to avoid, minimize, or compensate for adverse effects.

N

Nanoplastics

Plastic particles produced by the fragmentation of MP particles. Measure between 1 nm and 1,000 nm in length and demonstrate a colloidal behavior.

Nonpoint source

Defined by USEPA as any source of water pollution that does not meet the legal definition of “point source” in section 502(14) of the Clean Water Act. Nonpoint sources generally include land runoff, precipitation, atmospheric deposition, drainage, seepage, or hydrologic modification.

Nurdle

Small plastic resin pellets that are designed specifically for their use in industrial and commercial applications, used to make plastic consumer products.

Nutrient prills

Individual particles of polymer-coated controlled release fertilizers. Nutrient prills consist of soluble fertilizers inside a thin plastic shell.

O

P

Particles

Aggregations of sufficiently many atoms or molecules that they can be assigned macroscopic properties, such as volume, density, pressure, and temperature.

Photodegradation

Decomposed by the presence of light, generally sunlight.

Plastic/plastics

A group of polymeric materials, either synthetic or naturally occurring, that may be shaped into various solid forms and retain their given shape.

Point source

A single identifiable source of pollution from which pollutants are discharged, such as a pipe, ditch, ship, or smokestack.

Polymer

A large molecule composed of smaller, repeating, singular molecular units called monomers that are joined chemically through covalent bonds.

PM_{2.5}

Particulate matter with an aerodynamic diameter less than 2.5 µm.

PM₁₀

Particulate matter with an aerodynamic diameter less than 10 µm.

Primary microplastics

Microplastics that are intended for use in the current form (for example, plastic pellets and beads).

Primary plastics

Items made of plastic that are designed for use in the current form (for example, water bottles, shopping bags, textiles).

Q**R****Rubbery plastics**

Exhibit larger free volume between molecules and present greater mobility and flexibility than other plastics.

S**Secondary microplastics**

Particles that result from the breakdown of larger plastics.

Secondary plastics

Particles that result from the breakdown of larger plastic items.

Shape

The form of an object or its outline, outer boundary, or outer surface.

Spumific

A functional additive that may be added to plastic or MP for its flame-retardant properties.

Stormwater

Precipitation from storms (including snow melt) that does not infiltrate due to saturated or impervious ground and flows overland and downhill.

Surface area

The total exposed area of a three-dimensional object, measured in square units (square inches, feet, centimeters, meters, etc.).

Surface water

Any body of water aboveground that is present year-round or intermittently (creeks, streams, rivers, lakes, ponds, lagoons, wetlands, reservoirs, oceans, etc.).

T**Thermoplastic**

Plastics that are formed using an addition polymerization process and that can be softened by heating and hardened by cooling.

Thermoset plastics

Plastics that are formed using a condensation polymerization process and that retain their shape after forming and hardening; they cannot be remelted.

Tire and road wear particles (TRWP)

Heteroagglomerates of tire rubber and other particles deposited on the road surface (Klöckner et al. 2020).

Tire wear particles

MP particles resulting from the breakdown or degradation of tires from the friction between tires and road surfaces.

U**V****Vector**

An agent that carries chemicals or biological products and transmits (or delivers) these constituents to biota.

W**Wastewater**

Water that has been used for residential, industrial, or other purposes and must be treated to remove harmful substances before being released back to the environment.

X**Y****Z**