# Attachment 6: Useful Terms and Definitions for Explaining Risk

*This document was developed for OSWER staff who interface with communities. The definitions included here are not official Agency definitions and this information is not intended to be a standalone document. Instead, we envision staff would adopt definitions in this document to meet their communication needs (e.g., on fact sheets, in risk communication conversations, and other communication methods). The goal of creating this document is to aid field staff in their risk communication efforts and continually build community capacity to engage with EPA.*

*The term "contaminant" is consistently used throughout the document to mean hazardous substances, pollutants, pollution, and chemicals, unless a legal definition uses another term.

**Acute:** Occurring over a short period of time.

**Acute Exposure:** Exposure to a contaminant within a short time period (24 hours to a few days). During acute exposures, which may occur as a result of an accident or emergency, contaminant concentrations are typically higher than during regular or continuous exposures.

**Acute Risk:** Health risks associated with exposure to a contaminant within a short time period (acute exposure). Acute risk typically occurs in occupational settings where workers are using chemicals as part of their job. Health effects are often reversible. However, exposure may also result in harmful effects to major organs, depending upon the contaminant and its concentration.

**Acute Toxicity:** The ability of a contaminant to cause harmful health effects (sometimes death) soon after exposure within a short time period.

**Acceptable Exposure Level:** This is a legal term defined in the National Contingency Plan (NCP), which is the regulation that promulgates CERCLA (see below for definition). An acceptable exposure level is the "concentration level of a contaminant to which the human population, including sensitive subgroups, may be exposed without adverse effect during a lifetime or part of a lifetime..." For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent lifetime cancer risk to an individual of between $10^{-4}$ (1 in 10,000) and $10^{-6}$ (1 in 1,000,000) using information on the relationship between the dose and response. The $10^{-6}$ risk level shall be used as the point of departure for determining remediation goals for alternatives when Applicable or Relevant and Appropriate Requirements (ARARs) are not available or are not sufficiently protective because of the presence of multiple contaminants at a site or multiple pathways of exposure." Sometimes this is referred to as the acceptable risk range (Source: National Oil and Hazardous Substances Pollution Contingency Plan).

Sometimes "acceptable exposure level" is referred to as "acceptable risk."

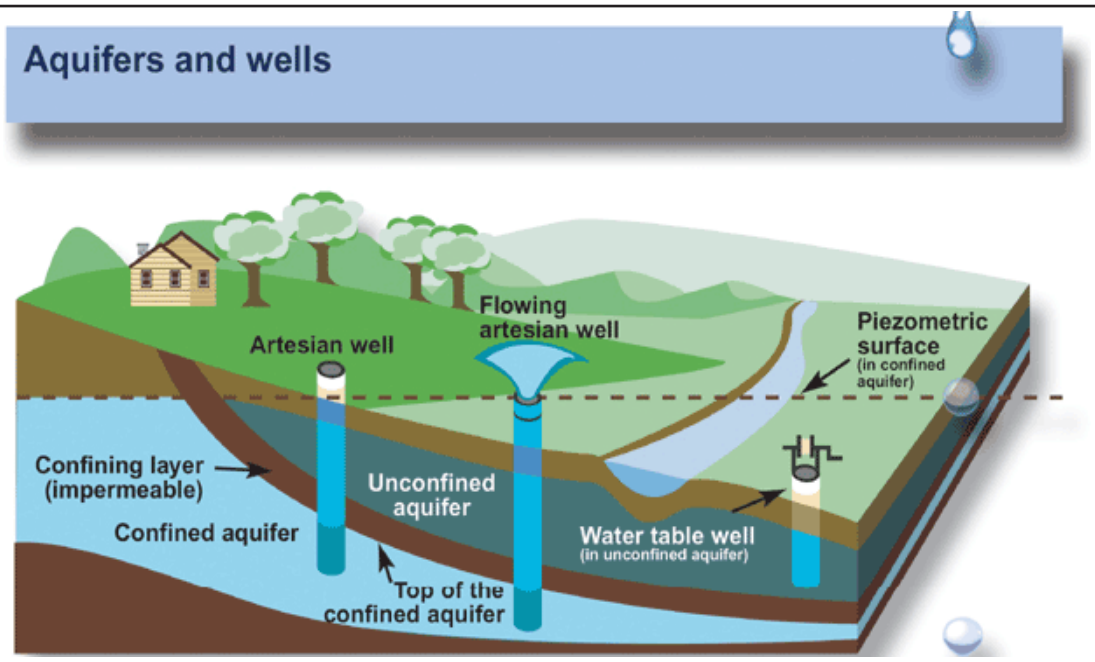
*Alternative definition: An "acceptable" risk level (or range) of a contaminant, defined by law, that EPA uses to make cleanup decisions at Superfund sites. This is a risk level (or range) that people can be exposed to, including sensitive populations, without health problems. For carcinogens, the acceptable risk range is between $10^{-4}$ (1 in 10,000) and $10^{-6}$ (1 in 1,000,000).*

**Additive Risk Assessment:** A process that considers the aggregate (i.e., additive) ecologic or health risk to a target organ caused by the accumulation of risk from multiple stressors (any physical, chemical, or biological entity that can induce a harmful response) and multiple pathways of exposure.

**Adverse/Harmful Health Effect:** A change in body function (e.g., organ function or cell structure) that might lead to disease or health problems.

**All Appropriate Inquiry (AAI):** A process for the Brownfields Program of evaluating a property's environmental conditions and assessing the likelihood of any contamination. It is required for those purchasing or acquiring property to assert a defense against CERCLA liability and must comply with ASTM E-1527-05. A Phase I Environmental Site Assessment (ESA) examines historical property records, interviews neighbors, and includes a site inspection but doesn't generally include sampling. Phase II ESA and subsequent phases involve soil sampling and data analysis.

**Aquifer:** An underground geological formation, or group of formations, containing water. Aquifers are sources of groundwater for wells and springs.




The attributes of an aquifer.

Source: Environment Canada

**Asbestosis:** A disease associated with inhalation of asbestos fibers. The disease makes breathing progressively more difficult and can be fatal.

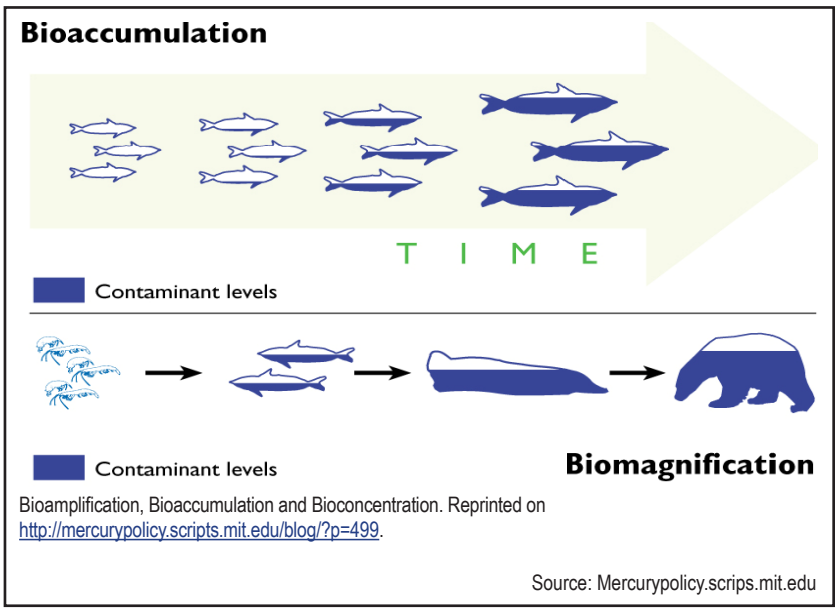
**Background:** According to EPA Guidance, "refers to constituents or locations that are not influenced by the releases from a site, and is usually described as naturally occurring or anthropogenic: 1) Anthropogenic – natural and human-made substances present in the environment as a result of human activities (not specifically related to the CERCLA release in question); and 2) Naturally occurring – substances present in the environment in forms that have not been influenced by human activity" (Source: Role of Background in the CERCLA Cleanup Program, 2002).

*Alternative definition: Contamination that is not influenced by the site and may occur naturally (e.g., arsenic in soil and water) or is present in the environment as a result of human activities unrelated to the site (e.g., arsenic from pesticide applications).*

*Alternative explanation: You can find contaminants everywhere. Many of the same contaminants that are part of a Superfund site may not be influenced by the site. Therefore, EPA collects samples in areas that are uncontaminated by the site to determine local background concentrations.*

**Bioaccumulation:** A process in which contaminants are retained in an organism's body and increase in concentration over time because the substance is very slowly metabolized or excreted. For example, fish accumulate methylmercury in muscle over time; therefore, older fish have higher concentrations of methylmercury in their muscle tissues.

**Bioavailability:** The amount of a contaminant that is absorbed into the body following skin contact, ingestion, or inhalation. The less bioavailable the contaminant, the less toxic its effects are on an organism. For example, when people ingest vitamins, only a portion of the ingested dose is absorbed into the body; the rest passes through the body.




Bioamplification, Bioaccumulation and Bioconcentration. Reprinted on http://mercurypolicy.scripts.mit.edu/blog/?p=499.

Source: Mercurypolicy.scrips.mit.edu

**Bioconcentration:** The accumulation of a chemical in tissues of a fish or other organism to levels greater than in the surrounding aquatic environment. For example, fish accumulate methylmercury in muscle at higher levels than the methylmercury levels in water they live in.

**Biologically Effective Dose:** The amount of a contaminant in the body reaching the cells or target organs where a harmful health effect occurs.

**Biomagnification:** The increase in concentration of a contaminant in the tissue of organisms higher in the natural food chain (i.e., predator-prey associations), primarily through the mechanism of dietary accumulation. For example, a shark will accumulate methylmercury over time at higher concentrations than the fish they eat.

**Brownfields:** Real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. A brownfield, by statute, cannot be a Superfund site, a Federal facility, or have ongoing active enforcement actions. Common brownfield examples include abandoned gas stations or low-risk petroleum contaminated sites, areas of mine-scarred land, clandestine drug labs or older residential, commercial, or industrial properties where contaminants are known to be present or suspected to be found. EPA's Brownfields Program provides direct funding for brownfields assessment, cleanup, revolving loan funds, and environmental workforce development and job training; collaborates with other EPA programs, other federal partners, and state agencies to identify and make available resources for brownfields activities; and provides technical information on brownfields financing matters.

**Carcinogen:** Any contaminant that can cause cancer.

**Carcinogenesis:** The origin or production of a benign or a malignant tumor.

**CERCLA:** Comprehensive Environmental Response, Compensation, and Liability Act. According to EPA guidance, "The Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA, or "Superfund"), establishes a national program for responding to releases of hazardous substances into the environment" (Source: EPA Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), 1989).

*Alternative definition: The law passed by Congress that established the Superfund program.*

**Chronic:** Occurring over a long period of time.

**Chronic Exposure:** Exposure to a contaminant that occurs over a long period of time, or a significant fraction of the individual's lifetime (usually seven years to a lifetime).

**Chronic Risk:** Long-term health risk. Chronic risk usually occurs at lower doses and may occur in residential or commercial (e.g., office) settings. Health effects associated with chronic exposures may not become apparent for many years.

**Chronic Toxicity:** The ability of a contaminant to cause harmful health effects resulting from long-term (chronic) exposure.

**Cohort:** In epidemiology (study of the disease in human populations), a group of people sharing one or more characteristics. A birth cohort consists of all persons born within a certain time period, usually a year. A group of people exposed to similar levels of a contaminant during a similar period is a cohort.

**Cohort Study:** An epidemiologic (human population) study that follows subjects in different exposure groups (exposed versus no exposure) and compares the difference in disease rate or incidence of symptoms. Although study subjects ordinarily are followed over time, a cohort study can sometimes be carried out retrospectively, using historical data.

**Congenital:** Existing at birth (particularly birth deformities or anomalies). Congenital anomalies may originate from genetic, infectious, or environmental origins, although in most cases, it is difficult to identify their cause.

**Contaminant:** According to EPA regulations, "any element, substance, compound, or mixture, including disease-causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation in to any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in such organisms or their offspring. The term does not include petroleum…" (Source: National Oil and Hazardous Substances Pollution Contingency Plan).

*Alternative definition: Any physical, chemical, biological, or radiological substance or matter found in air, water, soil, or biological matter that has a harmful effect on human health or the environment.*

**Contaminant of Concern (COC):** A site-related contaminant that EPA has determined, at the conclusion of a baseline risk assessment, to pose an unacceptable risk to human health and/or the environment. In the Superfund program, COCs are the drivers of (i.e., determine) cleanup actions on the site evaluated in a feasibility study.

**Contaminant of Potential Concern (COPCs):** Also called "chemicals of potential concern" in EPA guidance, are defined as "chemicals that are potentially site-related and where data are sufficient quality for use in the quantitative risk assessment" (Source: EPA Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), 1989).

*Alternative definition: A potentially site-related contaminant that has been shown through scientific research to pose possible harmful effects to human health or the environment. In the Superfund program, a thorough remedial investigation investigates all COPCs to determine which ones rise to be COCs.*

**Cumulative Risk Assessment:** According to EPA guidelines, an analysis, characterization and possible quantification of the combined risks to health and/or the environment from multiple agents or stressors (including non-chemical stressors and the concepts of individual or population vulnerability) (Source: EPA Framework on Cumulative Risk Assessment, 2003).

*Alternative definition: An examination of the combined harmful effects on human health or the environment from multiple stressors, including biological, chemical, and physical factors, such as individual health status.*

**Developmental Toxicity:** Structural abnormality, altered growth, functional deficiency, death, or other harmful health effect that may be a result of exposure to contaminants prior to conception (in either parent), during prenatal development, or after birth up to the time of sexual maturation.

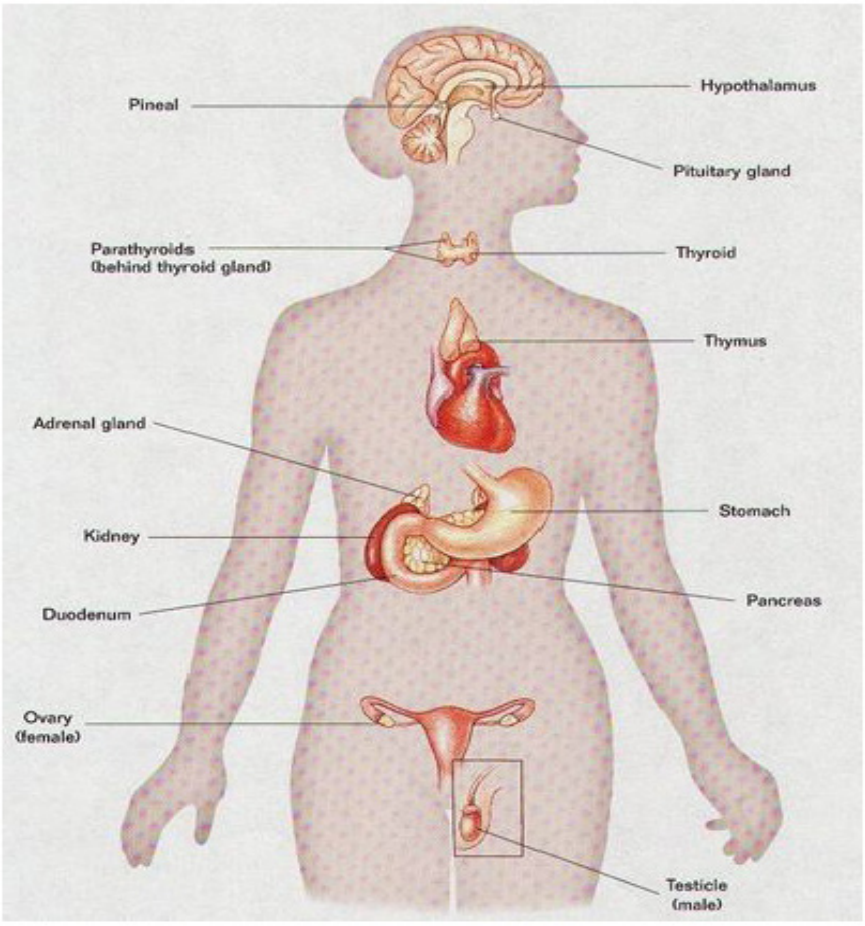
**Dose:** The amount of a contaminant an organism is exposed to (e.g., through ingestion or inhalation) over a period of time.

- An "**exposure dose**" is the amount of a contaminant that is encountered in the environment.
- An "**absorbed dose**," according to EPA guidance, is "the amount of a substance penetrating the exchange boundaries of an organism after contact. Absorbed dose is calculated from the intake and the absorption efficiency. It is usually expressed as mass of a substance absorbed into the body weight per unit time (e.g., mg/kg-day)" (Source: EPA Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), 1989).
- An "**effective dose**" is the contaminant concentration present at the site(s) of toxic action (e.g., specific organ) and which is responsible for causing an adverse effect.

**Dose Response Relationship:** The measurable relationship between exposure to a contaminant and the harmful health effect. The severity of the health effect shifts as the amount of exposure to the contaminant changes. For example, a small dose of carbon monoxide may cause drowsiness; a large dose can be deadly.

**Ecology:** The study of the relationship of living things to one another and their environment

**Endocrine Disruptors:** Synthetic chemicals that disrupt normal endocrine system functions in humans and wildlife by blocking or mimicking hormones (e.g., PCBs, dioxins). The endocrine system is made up of glands located throughout the body. Hormones are made by the glands and released into the bloodstream or the fluid surrounding cells; receptors in various organs and tissues recognize and respond to hormones.




The human endocrine system.

**Endpoint:** An observable health effect (e.g., a certain concentration of a contaminant causing liver damage).

**Epidemiology:** Study of the distribution of disease, or other health-related events in human populations.

**Excess Cancer Risk:** The additional risk of cancer from exposure to a contaminant beyond an individual's risk of cancer from everyday life. Excess cancer risk is described in terms of the probability that an exposed individual will develop cancer because of that exposure by age 70. At a Superfund site, excess cancer risks are summed across all contaminants of concern, or COCs, and exposure pathways that contribute to exposure. In general, EPA considers excess cancer risks that are below about 1 chance in 1,000,000 ($1\times10^{-6}$ or 1E-06) to be so small as to be negligible, and risks above 1 in 1,000 ($1\times10^{-4}$ or 1E-04) to be sufficiently large that some sort of remediation is desirable. Excess cancer risks that range between 1E-06 and 1E-04 are generally considered to be "acceptable".

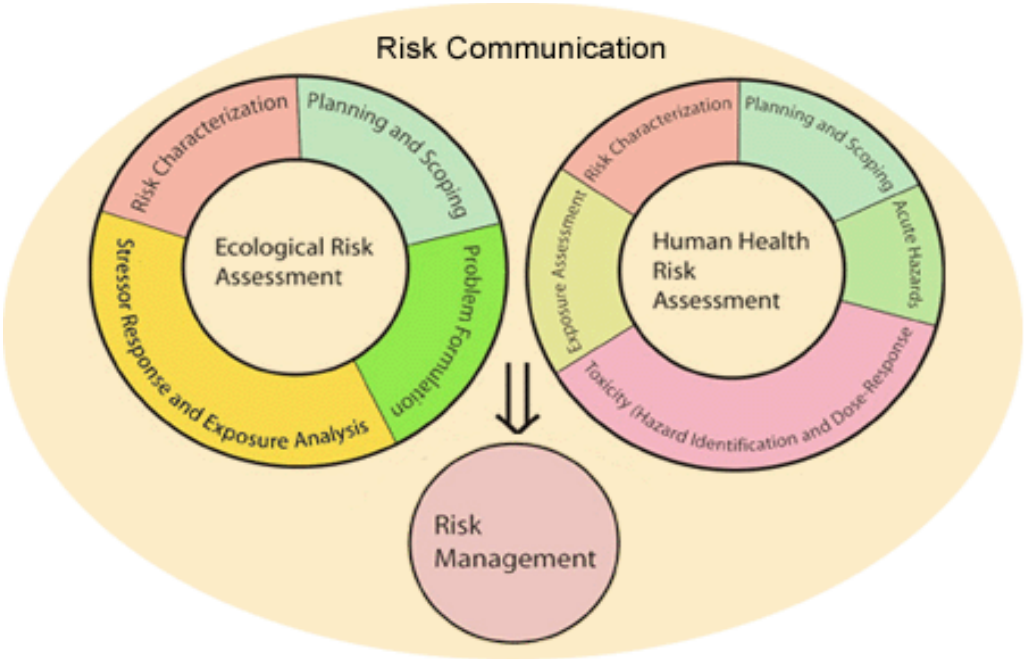
*Alternative definition: The probability that an individual will contract cancer over a lifetime above and beyond the probability of the general population.*

**Exposure:** According to EPA guidance, "contact of an organism with a chemical or physical agent. Exposure is quantified as the amount of the agent available at the exchange boundaries of the organism (e.g., skin, lungs, gut) and available for absorption" (Source: EPA Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), 1989).

*Alternative definition: Contact with a contaminant by swallowing, breathing, or touching the skin or eyes. Exposure may be short-term (acute) or long-term (chronic).*

**Exposure Assessment:** According to EPA guidance, "the determination or estimation (qualitative or quantitative) of the magnitude, frequency, duration, and route of exposure" (Source: EPA Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), 1989).

*Alternative definition: The process of finding out how people come into contact with contaminants; how often and for how long; and how much they are in contact with.*




Exposure assessments are components of the Superfund human health risk assessment process. Risk assessments may proceed in a straightforward, linear fashion, but often repeat stages depending on sampling and analytical results and on decisions made by risk assessors and risk managers.

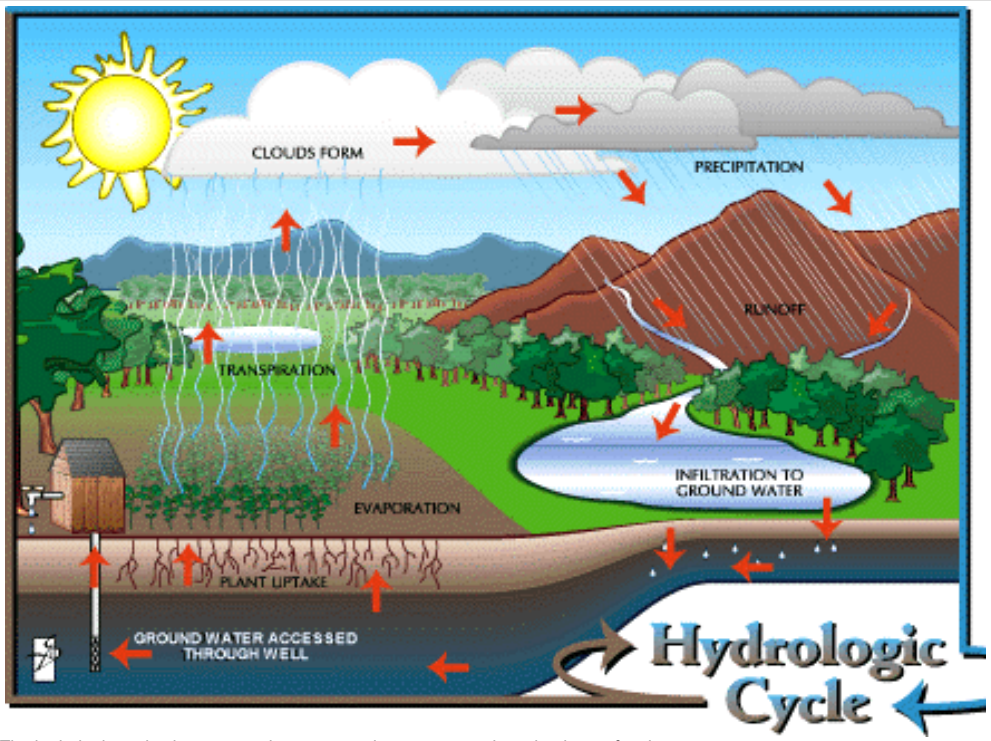
Source: EPA Superfund Program

**Exposure Route:** The way a contaminant comes in contact with an organism (i.e., by ingestion, inhalation, or skin contact). For example, a person may become exposed to lead in paint through eating paint chips (ingestion), inhaling dust contaminated with paint (inhalation), or having paint on their skin (dermal contact).

**Federal Facility:** Any building, installation, structure, land, public work, equipment, aircraft, vessel, or other vehicle and property, owned by, or constructed or manufactured for the purpose of leasing to, the federal government.

**Fence Line Property:** Property located at the property boundary of another (e.g., a house next to a Superfund site).

**Groundwater:** Fresh water found beneath the earth's surface, usually in aquifers, which supply wells and springs.




The hydrologic cycle shows groundwater extraction sources and mechanisms of recharge.

Source: EPA

**Hazard Ranking System (HRS):** The principal screening tool used by EPA's Superfund program to evaluate risks to public health and the environment associated with abandoned or uncontrolled hazardous waste sites. HRS calculates a score based on the potential of hazardous substances spreading from the site through the air, surface water, or groundwater, and on other factors such as density and proximity of human populations. This score is one of the factors used in deciding if the site should be listed on the National Priorities List.

**Hazardous Waste:** A subset of solid wastes that can pose a substantial or potential hazard to human health or the environment, and meet any of the following criteria: 1) specifically listed as a hazardous waste by EPA's Resource Conservation and Recovery Act (RCRA) program; 2) generated by the treatment of hazardous waste or is contained in a hazardous waste; or 3) exhibits at least one of four characteristics: ignitability, corrosivity, reactivity, or toxicity.

**Health Advisory:** An EPA document that provides guidance and information on contaminants that can affect human health and that may occur in drinking water. According to EPA guidance, "health advisory values are concentrations of contaminants in drinking water at which harmful health effects would not be expected to occur for an exposure of the specified duration" (Source: EPA Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), 1989).

**Hot Spot:** According to EPA guidance, "an area of very high contaminant concentrations relative to other areas of the site" (Source: EPA Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), 1989).

**Incidence:** The number of new cases of a disease (or health condition) that develop within a specified population over a specified period of time (i.e., the rate of occurrence of a disease or health condition). For example, the incidence rate of lung cancer in the USA is typically expressed as the number of cases per 100,000 people per year.

**Institutional Controls:** Legal and administrative tools to minimize exposure to contaminants and/or protect the integrity of a response action in order to protect human health and the environment (e.g., zoning, notices and warnings, easements, and restrictive covenants).

**Malignant:** Describing a tumor that produces cells that can migrate to new sites in the body where additional tumors can subsequently develop.

**Maximum Contaminant Level (MCL):** Maximum level of a contaminant in drinking water delivered to any user of a public water system allowed by EPA. MCLs are enforceable. EPA sets MCLs at levels that are economically and technologically feasible. Sometimes state MCLs are stricter than EPA's.

**Maximum Contaminant Level Goal (MCLG):** A non-enforceable level of a contaminant in drinking water, set at the level at which no known or anticipated harmful effects on human health occur. MCLGs are ideal, health-based goals which are set in the National Primary Drinking Water Standards developed by EPA and are usually the starting point for determining the regulated Maximum Contaminant Level. For chemicals believed to cause cancer, the MCLGs are set at zero.

**Metastasis:** The spread of cancer from one part of the body to another. For example, a secondary growth of a tumor at a part of the body distant from the primary tumor.

**Mitigation:** Actions taken to lessen the actual or foreseen negative environmental impact of a project or activity.

**Mg/Kg (milligrams per kilogram):** A unit of measure commonly used to report concentrations of a contaminant. A concentration of 1 mg/kg is equal to 1 part per million (ppm). For example, a concentration of arsenic in the soil is 15 mg/kg, or 15 milligrams of arsenic per kilogram of soil.

**National Contingency Plan (NCP):** The National Oil and Hazardous Substances Pollution Contingency Plan, more commonly called the National Contingency Plan, or NCP, is the federal government's blueprint for responding to both oil spills and hazardous substance releases. According to EPA guidance, "the National Oil and Hazardous Substances Pollution Contingency Plan is the regulation that implements CERCLA. Among other things, the NCP establishes the overall approach for determining appropriate remedial actions at Superfund sites" (Source: EPA Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), 1989).

*Alternative definition: The regulation developed by federal agencies to implement CERCLA and respond to oil spills and hazardous substance releases to the environment.*

**National Priorities List (NPL):** EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under CERCLA, or the Superfund Program. Sites listed on the NPL are typically referred to as Superfund sites.

**Naturally Occurring Background Levels:** According to EPA guidance, "ambient concentrations of chemicals that are present in the environment and have not been influenced by humans (e.g., aluminum, manganese)" (Source: EPA Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), 1989).

*Alternative definition: Concentrations of contaminants in the environment that occur naturally. For example, arsenic occurs naturally in soil and minerals and it is possible to ingest small amounts of naturally occurring arsenic in food and water.*

**Polycyclic Aromatic Hydrocarbon (PAH):** PAHs are a group of more than 100 organic chemicals found naturally in crude oil and coal, and in their products, including diesel, jet fuel, asphalt, and coal tar. They enter the environment mostly as releases to air from volcanoes, forest fires, residential wood burning, and exhaust from automobiles and trucks. PAHs also can form during incomplete combustion of fossil fuels, garbage, or other organic substances like tobacco or charbroiled meat. A few PAHs are used in medicines and to make dyes, plastics, and pesticides.

**Parts per Million (ppm):** A unit of measure commonly used to report very small amounts of a contaminant. 1 ppm is equal to 1 mg/L (1 milligram of that contaminant in a liter of liquid media); 1 ppm is also equal to 1 mg/kg (1 milligram of the contaminant in kilogram of solid media); 1 ppm is also equal to 1,000 parts per billion.

1 part per million (ppm) is equivalent to:

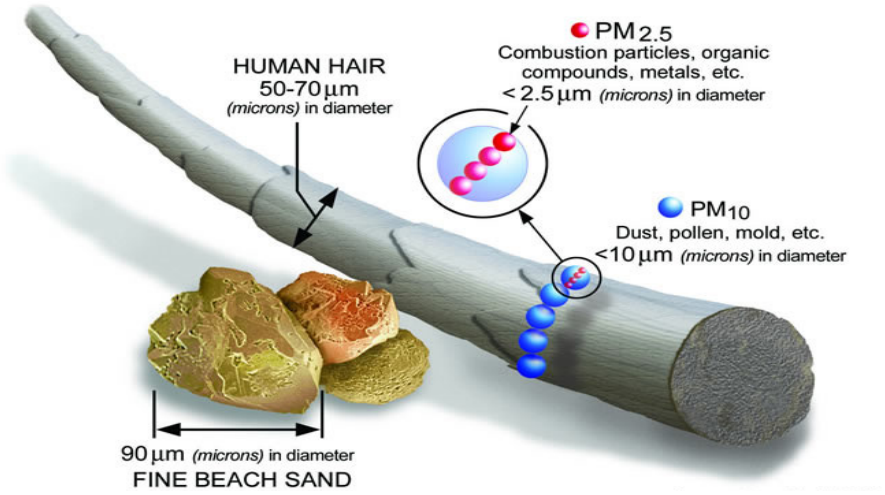
- 1 milligram in a kilogram (mg/kg)
- 1 inch in 16 miles
- 1 minute in 2 years
- 4 drops of ink in 55 gallons of water

**Parts per Billion (ppb):** A unit of measure commonly used to report extremely small amounts of a contaminant; 1 ppb is equal to 1 µg/L (1 microgram of that contaminant in a liter of liquid media) or 1 µg/kg (1 microgram of that contaminant in a kilogram of solid media).

1 part per billion (ppb) is equivalent to:

- 1 microgram in a kilogram (µg/kg)
- 1 second in almost 32 years
- 1 drop of ink in a large fuel tanker truck

**Particulate Matter (PM):** Fine liquid or solid particles such as dust, smoke, mist, fumes, or smog, found in air or emissions. Common measures are $PM_{10}$ for particulate matter below 10 micrometers, and $PM_{2.5}$ for particulate matter below 2.5 micrometers. Larger inhaled particles can be trapped in the nose or upper airways. The smaller the size of particulate matter, the more likely the particle can travel farther in the lungs where particles, and contaminants adhering to particles, can be transferred to the blood stream.




Size of particulate matter in relation to common objects and relative sizes of $PM_{10}$ and $PM_{2.5}$

Source: EPA

**Pathogens:** Microorganisms, such as bacteria, viruses, or parasites that can cause disease in other organisms (i.e., humans, animals, and plants). Pathogens can be found in sewage, urban runoff, runoff from farms or rural areas populated with domestic and wild animals, and in water used for swimming. Fish and shellfish contaminated by pathogens, or the contaminated water itself, can cause serious illness (e.g., "red tide," or harmful algal bloom, results from large concentrations of aquatic microorganisms).

**Plume:** A measurable or visible discharge of a contaminant from a given point of origin. A plume can be found visible in the air (e.g., a plume of smoke) or in surface and groundwater, where it may or may not be visible.

A plume of smoke from a prescribed fire.

Source: National Park Service

**Potentially Responsible Party (PRP):** Any individual or company—including owners, operators, transporters, or generators—potentially responsible for, or contributing to a spill or other contamination at a Superfund site. Whenever possible, through administrative and legal actions, EPA requires PRPs to clean up hazardous sites they have contaminated.

**Preliminary Remediation Goal (PRG):** The concentration of a contaminant that provides a reference point for establishing site-specific cleanup levels. A PRG may be based on Federal or State drinking water standards or risk-based concentrations.

**Prevalence:** The cumulative number of existing disease cases (or health conditions) in a defined population during a specific time period.

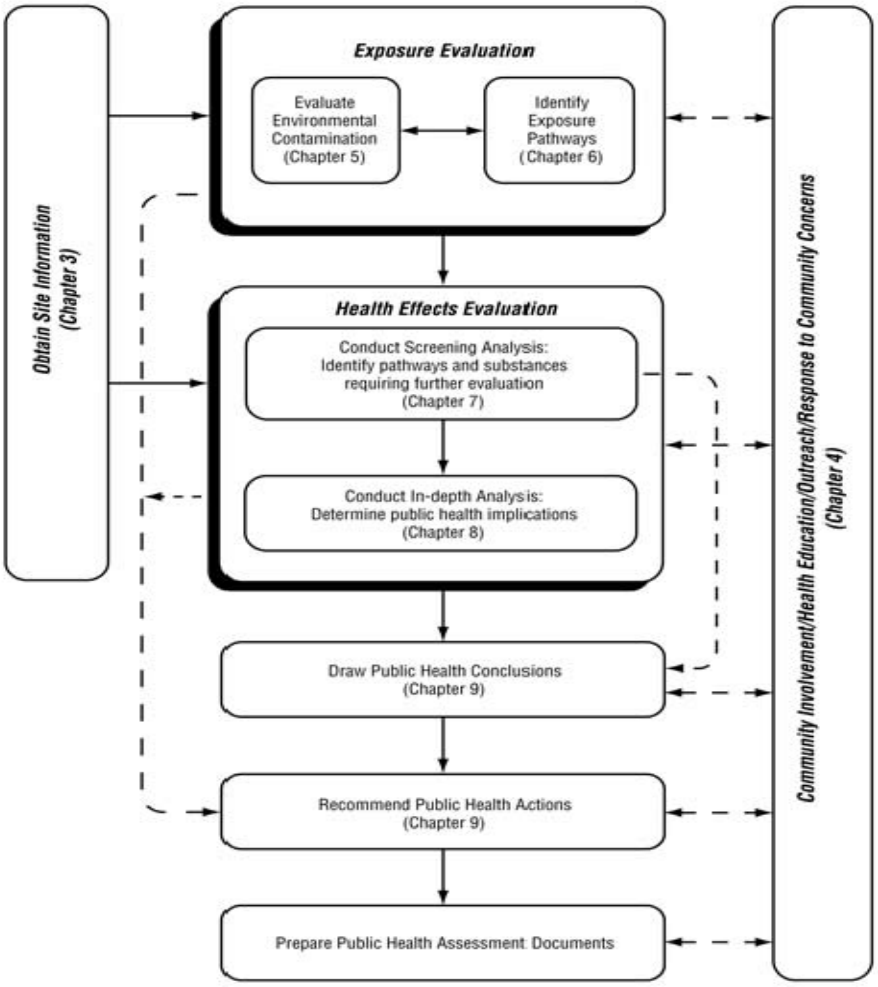
**Public Health Assessment:** A review of available information about contaminants at a hazardous waste site or facility and evaluation of whether exposure to them might cause harm to residents in the surrounding community. The Agency for Toxic Substances and Disease Registry (ATSDR) or a state public health department, through a cooperative agreement with the ATSDR, conducts public health assessments. A public health assessment is required by law to be conducted for every site on the National Priorities List. If appropriate, ATSDR also conducts public health assessments when petitioned by concerned individuals.

**Public Health Consultation:** Generally, a document that addresses a particular public health concern or exposure scenario and is more limited in scope than a public health assessment. The document describes any hazards at a hazardous waste site or facility and contains a public health action plan that recommends ways to stop or reduce exposure.

**Public Health Advisory:** A notice sent directly from the Agency for Toxic Substances and Disease Registry administrator to EPA's administrator that alerts EPA to a public health threat. Other government agencies, such as state and local health and environmental agencies, also are notified about the problem. A Public Health Advisory reports available information about a release of toxic material, whether people might be exposed to it, and what harm exposure might cause.

**Reference Dose (RfD):** According to EPA guidance, "the Agency's preferred toxicity value for evaluating noncarcinogenic effects resulting from exposures at Superfund sites" (Source: EPA Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), 1989).

*Alternative definition: A daily oral exposure level to a contaminant that is not expected to cause any harmful health effects throughout a lifetime of exposure. RfDs generally are calculated for non-cancer health effects.*




Overview of the public health assessment process.

Source: ATSDR

**Reference Concentration (RfC):** A daily inhalation exposure level to a contaminant that is not expected to cause any harmful health effects throughout a lifetime of exposure. RfCs generally are calculated for non-cancer health effects.

**RCRA:** The Resource Conservation and Recovery Act, which was enacted by Congress in 1976. RCRA's primary goals are to protect human health and the environment from the potential hazards of waste disposal, conserve energy and natural resources, reduce the amount of waste generated, and ensure that wastes are managed in an environmentally sound manner. The RCRA Corrective Action Program which is run by EPA and 43 authorized states and territories, addresses releases of contaminants into soil, groundwater, surface water, and air by facilities that house hazardous wastes.

**Relative Risk:** The relative measure of the difference in risk between the exposed and unexposed populations. For example, a relative risk of "2" means that the population exposed to a contaminant has twice the risk of harmful health effects compared to the unexposed group.

**Regional Screening Levels (RSLs):** Risk-based concentrations derived from standardized equations used to support screening level decisions early in the Superfund cleanup process. RSLs are not cleanup standards. EPA considers RSLs to be protective for humans, including sensitive groups, over a lifetime.

**Regional Removal Management Levels (RMLs):** Risk-based concentrations derived from standardized equations used to support the decision for EPA to undertake a removal action under CERCLA. RMLs are calculated without site-specific information, but may be re-calculated using site-specific data.

**Risk:** A measure of the probability that damage to life, health, property, and/or the environment will occur as a result of a given hazard. At Superfund sites, risk is the chance that contaminants from a site will cause health and ecological problems.

**Risk Assessment:** The process by which the nature and magnitude of risks are identified. Major steps may include:

- **Data collection and evaluation:** Involves gathering and analyzing site data relevant to the human health evaluation and identifying the substances present at the site that are the focus of the risk assessment process.
- **Exposure assessment:** An exposure assessment is conducted to estimate the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by which humans are potentially exposed.
- **Toxicity assessment:** Considers (1) the types of harmful health effects associated with chemical exposures; (2) the relationship between the magnitude of exposure and harmful health effects; and (3) related uncertainties such as the weight of evidence of a particular chemical's carcinogenicity in humans.
- **Risk characterization:** Summarizes and combines outputs of the exposure and toxicity assessments to characterize baseline risk, both in quantitative expressions and qualitative statements.

**Risk Factor:** A characteristic (e.g., race, sex, age) or variable (e.g., smoking, occupational exposure level) associated with increased probability of a harmful health effect.

**Risk Management:** The process of determining whether or how much to reduce risk through action (i.e., evaluating and selecting alternative regulatory and non-regulatory responses to risk). The selection process necessarily requires the consideration of legal, economic, and societal factors. A risk manager is an individual or group who serves as the primary decision-maker for a site. Generally, the decisions involve regional Superfund management in consultation with members of the site team and technical staff.

**Slope Factor:** According to EPA guidance, "a plausible upper-bound estimate of the probability of a response per unit intake of a chemical over a lifetime. The slope factor is used to estimate an upper-bound probability of an individual developing cancer as a result of a lifetime of exposure to a particular level of a potential carcinogen" (Source: EPA Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), 1989).

*Alternative definition: Toxicity value for a carcinogen.*

**Smelter:** A facility that melts or fuses ore, often with an accompanying chemical change, to separate its metal content. Emissions cause pollution. "Smelting" is the process involved.

**Solvent:** A solvent is a liquid that is capable of dissolving another substance to make a new solution. For example, paint remover is a solvent.

Anaconda Company Smelter Superfund Site

Source: EPA Region 8

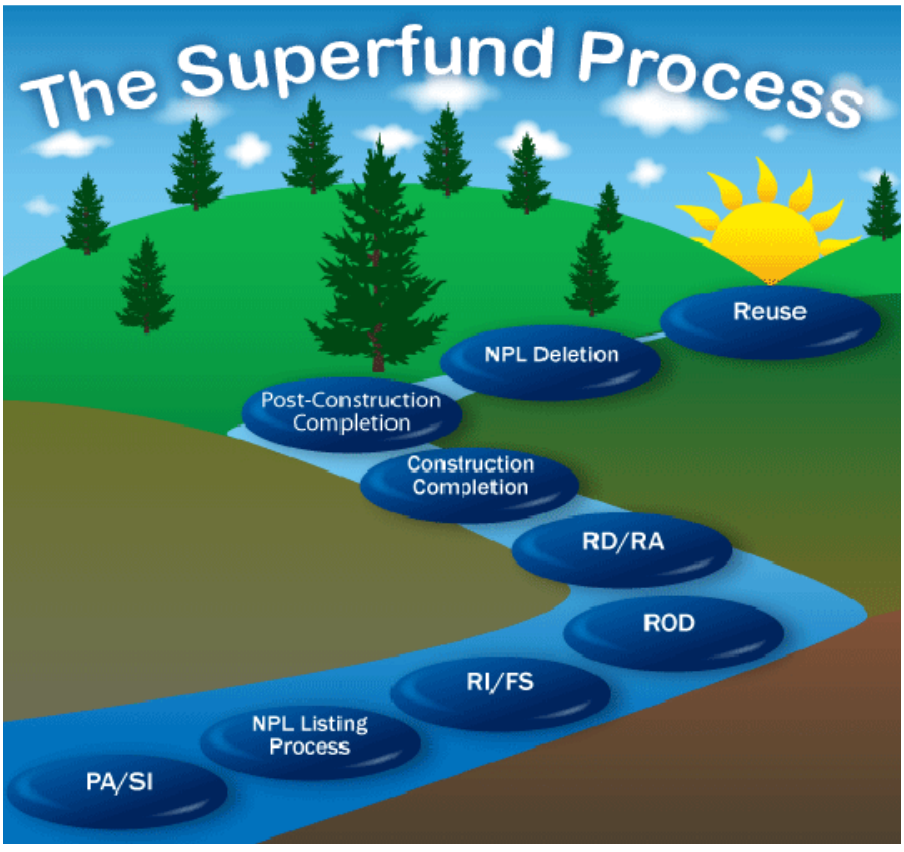
**Superfund:** The program operated under the legislative authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA) that funds and carries out EPA emergency and long-term removal and remedial activities. These activities include establishing the National Priorities List, investigating sites for inclusion on the list, determining their priority, and conducting and/or supervising cleanup and other remedial actions.

**The Three Superfund Response Actions**

**Emergency Response:** An emergency response is a short-term, emergency action that may be necessary to address a release or threat of release of a hazardous substance into the environment. EPA's emergency response program responds to chemical, oil, biological, and radiological releases and large-scale national emergencies, including homeland security incidents.

**Removal Response:** A removal response generally is a short-term action that may be necessary to address a release or threat of release of a hazardous substance into the environment. Removal responses are common at Superfund sites when the contamination poses an immediate threat to human health and the environment. Removals are classified as either time-critical or non-time-critical depending on the extent and type of contamination.

**Remedial Response:** A remedial response generally addresses long-term threats to human health and the environment caused by more persistent contamination sources. Remedial actions permanently and significantly reduce the risks associated with releases or threats of releases of hazardous substances that are serious but lack the time-criticality of a removal action.




The Superfund Process. Interactive graphic available at http://www.epa.gov/superfund/community/process.htm

Source: EPA

**Surface Water:** All water naturally open to the atmosphere (rivers, lakes, reservoirs, ponds, streams, impoundments, seas, estuaries, and others).

**Toxicity:** The degree to which a contaminant or mixture of contaminants can harm living organisms.

**Toxicology:** The study of the harmful effects of contaminants on living organisms.

**Vapor Intrusion:** The migration of volatile (readily evaporating) chemicals from contaminated groundwater or soil into an overlying building.

**Volatile:** Any substance that evaporates readily.

Other glossaries to explore for additional terms:

- **EPA Superfund Glossary** - http://www.epa.gov/superfund/programs/reforms/glossary.htm
- **ATSDR Glossary of Terms** - http://www.atsdr.cdc.gov/glossary.html
- **EPA Report on the Environment (ROE)** - http://www.epa.gov/roe/glossary.htm
- **EPA's Terminology Services** - http://ofmpub.epa.gov/sor_internet/registry/termreg/home/overview/home.do
- **International Union of Pure and Applied Chemistry (IUPAC)**, Chemistry and Human Health Division Glossary (2007) - http://sis.nlm.nih.gov/enviro/iupacglossary/frontmatter.html.