

## Chapter Ten

## Glossary

**100-year flood.** The flood having a one percent chance of being equaled or exceeded in magnitude in any given year. Contrary to popular belief, it is not a flood occurring once every 100 years.

**Abatement.** Reducing the degree or intensity of, or eliminating, pollution.

**Air contaminant.** Any particulate matter, gas or combination thereof, other than water vapor. (See “air pollutant”).

**Air emissions.** Gas emitted into the air from industrial and chemical processes, such as ozone, carbon monoxide, nitrogen oxide, nitrogen dioxide, sulfur dioxide and others.

**Air pollutant.** Any substance in air that could, in high enough concentration, harm man, other animals, vegetation or material. Pollutants may include almost any natural or artificial composition of airborne matter capable of being airborne. They may be in the form of solid particles, liquid droplets, gases or in combination thereof. Generally, they fall into two main groups: 1) those emitted directly from identifiable sources; and 2) those produced in the air by interaction between two or more primary pollutants, or by reaction with normal atmospheric constituents, with or without photoactivation. Exclusive of pollen, fog and dust, which are of natural origin, about 100 contaminants have been identified and fall into the following categories: solids; sulfur compounds, volatile organic chemicals; nitrogen compounds; oxygen compounds; halogen compounds; radioactive compounds; and odors.

**Air quality standards.** The level of pollutants prescribed by regulations that may not be exceeded during a given time in a defined area.

**Air toxics.** Any air pollutant for which a national ambient air quality standard (NAAQS) does not exist (i.e., excluding ozone, carbon monoxide, PM<sub>10</sub>, sulfur, dioxide, nitrogen oxide) that may reasonably be anticipated to cause

cancer, developmental effects, reproductive dysfunctions, neurological disorders, heritable gene mutations, or other serious or irreversible chronic or acute health effects in humans.

**Airborne particulates.** Total suspended particulate matter found in the atmosphere as solid particles or liquid droplets. Chemical composition of particulates varies widely, depending on location and time of year. Airborne particulates include: windblown dust; emissions from industrial processes; smoke from the burning of wood and coal; and motor vehicle or non-road engine exhausts.

**Ambient air.** Any unconfined portion of the atmosphere: open air; surrounding air.

**Ambient air quality standards.** (See “Criteria Pollutants” and “National Ambient Air Quality Standards”).

**Ambient temperature.** Temperature of the surrounding air (or other medium).

**Attainment area.** An area considered to have air quality as good as or better than the national ambient air quality standards as defined in the Clean Air Act. An area may be an attainment area for one pollutant and a non-attainment area for others.

**Attenuation.** The process by which a compound is reduced in concentration over time, through absorption, adsorption, degradation, dilution and/or transformation.

**Average sound level.** (See “L<sub>eq</sub>”).

**A-weight.** A standard frequency weighting to stimulate the response of the human ear.

**Best available control technology (BACT).** The application of the most advanced methods, systems and techniques for eliminating or minimizing discharges and emissions on a case-by-case basis as determined by the EPA. BACT represents an emission limit based on the

maximum degree of reduction of each pollutant as described in regulations under the Clean Air Act (CAA). The determination of BACT takes into account energy, environmental, economic effects and other costs.

**Best management practices (BMPs).** Methods that have been determined to be the most effective, practical means of preventing or reducing pollution from non-point sources.

**Calibration.** Adjustment of the system so that the measured sound level agrees with a reference sound source.

**Capacity.** The maximum sustained traffic flow of a transportation facility, expressed in passenger cars per hour per lane, under prevailing traffic and roadway conditions in a specified direction.

**Carbon dioxide.** A colorless, odorless gas produced by burning fossil fuels, sometimes referred to as a green house gas because it contributes to earth warming.

**Carbon monoxide (CO).** A colorless, odorless, poisonous gas produced by incomplete fossil fuel combustion.

**Concentration.** The relative amount of a substance mixed with another substance. An example is five parts per million of carbon monoxide in air or 1 milligram/liter of iron in water.

**Congestion.** A condition characterized by unstable traffic flows that prohibit movement on a transportation facility at optimal legal speeds. Recurring congestion is caused by constant excess volume compared with capacity. Nonrecurring congestion is caused by unusual or unpredictable events such as traffic accidents.

**Continuity.** Continuity is the uninterrupted flow of pattern elements, maintenance of visual relationships between immediately connected or related landscape components or features.

**Criteria pollutants.** The 1970 amendments to the Clean Air Act required the EPA to set

National Ambient Air Quality Standards for certain pollutants known to be hazardous to human health. The EPA has identified and set standards to protect human health and welfare for six pollutants: ozone; carbon monoxide; total suspended particulates, sulfur dioxide; lead; and nitrogen oxide. The term “criteria pollutants” derives from the requirement that the EPA must describe the characteristics, and potential health and welfare effects of these pollutants. It is on the basis of these criteria that standards are set or revised.

**Cultural significance.** Specific landscape settings may be significant because of cultural values; the setting must be at least briefly examined in its regional and national contexts to determine if it is culturally significant. Three general criteria are: uniqueness; commemoration; and designation.

**Cumulative effect.** The effects on the environment that result from the incremental consequences of an action when added to other past, present and reasonably foreseeable future actions.

**Degradation.** Chemical or biological breakdown of a complex compound into simpler compounds.

**Direct impact.** The impact on the environment that is caused by an action and occurs at the same time and place.

**Dispersion.** The process by which a substance or chemical spreads and dilutes in water or gas.

**Dispersion model.** A mathematical prediction of how pollutants from a discharge or emission source will be distributed in the surrounding environment under given conditions of wind, temperature, humidity or other environmental factors.

**Ecological Connectivity.** This refers to the ability of organisms to move freely within their natural range. In addition, ecological connectivity refers to the physical processes important in the environment, such as the movement of water from wetlands on one side

of the highway to the other, or the passage of gravel and large floating trees down a stream channel. For additional information on ecological connectivity, see Section 1.3 and Chapter 3.

**Emission.** Pollution discharged into the atmosphere from smokestacks, other vents and surface areas of commercial or industrial facilities, and from residential and mobile sources.

**Emission factor.** The relationship between the amount of pollution produced and the amount of raw material processed. For example, an emission factor for a blast furnace making iron would be the number of pounds of particulates per ton of raw materials.

**Emission standard.** The maximum amount of air polluting discharge legally allowed from a single source, mobile or stationary.

**Environment.** The sum of all external conditions affecting the life, development and survival of an organism.

**Environmental impact statement (EIS).** A document that identifies and analyzes, in detail, environmental impacts of a proposed action. As a tool for decision-making, the EIS describes positive and negative effects, and lists alternatives for an undertaking.

**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.

**Exposure.** The amount of radiation, noise or other pollutant present in a given environment that represents a potential health threat to living organisms.

**FEMA floodway.** The channel of a river or other watercourse and the adjacent land areas

that must be unconfined or unobstructed, either vertically or horizontally, to provide for the discharge of the base-year flood (usually 100 year).

**Floodplains.** Lowlands that are relatively flat, which are subject to flooding in any given year.

**Fossil fuel.** Fuel derived from ancient organic remains, i.e., peat, coal, crude oil and natural gas.

**Freeboard.** The vertical distance from the material surface to the top of the sides in a truck.

**Fuel efficiency.** The proportion of the energy released on combustion of a fuel that is converted into useful energy.

**Fugitive emissions.** Air pollutants released to the air other than those from stacks or vents; typically, small releases from leaks in plant equipment such as valves, pump seals, flanges, sampling connections, etc.

**Geographic Information System (GIS).** Digital computer mapping, overlays and spatial data analysis.

**Growth Management Act (GMA).** Washington State legislation passed in 1990 and subsequently amended that requires long-range comprehensive plans prepared by cities and counties to be balanced with supporting transportation infrastructure (RCW 36.70A).

**Hydric soil.** Soils that are formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part.

**Hydrocarbons (HC).** Chemical compounds that consist entirely of carbon and hydrogen. Hydrocarbons contribute to air pollution problems, like smog.

**Hydrologic connectivity zones.** Hydrologic connectivity zones are locations in the project area where moving water under the roadway is important. The hydrologic connectivity zones are typically located adjacent to wetlands, seeps,

springs, or other visible signs of water. These areas are not necessarily located at stream crossings.

**Hyporheic Flow.** The flow of water through permeable soils under and beside the stream channel between the water table and surface water flow.

**Impervious cover.** Surfaces through which water cannot percolate.

**Intactness.** The integrity of visual order in the natural and man-built landscape, and the extent to which the landscape is free from visual encroachment.

**Inversion.** An atmospheric condition caused by increasing temperature with elevation, resulting in a layer of warm air preventing the rise of cooler air trapped beneath. This condition prevents the rise of pollutants that might otherwise be dispersed. Trapping pollutants near the ground increases ozone to harmful levels.

**Jurisdiction.** A municipal government agency, such as a city or county. As appropriate, the term “jurisdiction” also includes federal and state agencies, and federally recognized tribes.

**Landscape unit.** An area or volume of distinct landscape character that forms a spatially enclosed unit at ground level; it may include more than one landscape type; outdoor room.

**$L_{eq}$ .** Equivalent sound level. The level of a constant sound which, in a given time period, has the same energy as does in a time-varying sound.

**Logarithm.** The exponent that indicates the power to which a number must be raised to produce a given number. For example, if  $B^2 = N$ , the  $^2$  is the logarithm of  $N$  (to the base of  $B$ ), or  $10^2 = 100$ , and  $\log_{10} 100 = 2$ . Also abbreviated to “log”.

**Level of service (LOS).** A gauge for evaluating system performance for roadways, non-motorized and other transportation modes. For

example, roadway measures of level of service often assign criteria based on volume-to-capacity ratios.

**$L_{max}$ .** Maximum sound level, in decibels. It is the maximum value of the noise level which occurs during the single event.

**$L_{min}$ .** Minimum sound level, in decibels. It is the minimum value of the noise level which occurs during the single event.

**Mitigation measures.** Actions taken to reduce adverse effects on the environment, usually implemented under the State Environmental Policy Act (SEPA) and/or the National Environmental Policy Act (NEPA).

**Mobile source.** Any non-stationary source of air pollution, such as cars, trucks, motorcycles, buses, airplanes, locomotives.

**Mode.** A particular form of travel. Typically, transportation modes include driving alone (single-occupancy vehicle), carpooling (high-occupancy vehicle) or non-motorized (walking, jogging, biking).

**Modeling.** Use of mathematical equation to simulate and predict real events and processes.

**Monitoring.** Periodic or continuous surveillance or testing to determine the level of compliance with statutory requirements and/or pollutant levels in various media or in humans, plants and animals.

**Multi-modal.** Concerning or involving more than one transportation mode.

**National Ambient Air Quality Standards (NAAQS).** Standards established by the USEPA that apply to outside air quality throughout the country.

**National Wetland Inventory (NWI).** A series of maps developed by the USFWS, mapping wetlands nationwide.

**Nitrogen oxide (NO).** A gas formed by combustion under high temperature and high

pressure in an internal combustion engine. Changes in nitrogen dioxide in the ambient air contributes to photochemical smog.

**Nitrogen dioxide (NO<sub>2</sub>).** The result of nitric oxide combining with oxygen in the atmosphere. Major component of photochemical smog.

**Nitrogen Oxide (NO<sub>x</sub>).** Product of combustion from transportation and stationary sources, and a major contributor to the formation of ozone in the troposphere and to acid deposition

**Non-attainment area.** Area that does not meet one or more of the National Ambient Air Quality Standards for the criteria pollutants designated in the Clean Air Act.

**Opportunity cost.** The value of resources that would otherwise be productively employed, including time.

**Organic compounds.** Animal or plant-produced substances containing mainly carbon, hydrogen, nitrogen and oxygen.

**Ozone (O<sub>3</sub>).** A form of oxygen found in two layers of the atmosphere, the troposphere and the stratosphere. In the troposphere (the layer extending up 7-10 miles from the earth's surface), ozone is a chemical oxidant and major component of photochemical smog. In the stratosphere (the atmospheric layer 7-10 miles or more above the earth's surface), ozone is a natural form of oxygen that provides a protective layer shielding the earth from ultraviolet radiation. It can seriously impair the respiratory system and is one of the most widespread of all the criteria pollutants for which the Clean Air Act required the EPA to set standards. Ozone in the troposphere is produced through complex chemical reactions of nitrogen oxides (which are among the primary pollutants emitted by combustion sources), hydrocarbons released into the atmosphere through the combustion, handling and processing of petroleum products and sunlight.

**Parts per million (ppm).** A measurement of concentration on a weight or volume basis. This term is equivalent to milligrams per liter (mg/L).

**Particulate.** A very small solid suspended in air or water which can vary widely in size, shape, density and electrical charge.

**Peak hour.** The period of the day during which the maximum amount of travel occurs.

**Persistence.** Refers to the length of time a compound stays in the environment once introduced. Persistence can range from less than a second to indefinitely.

**Photochemical oxidants.** Air pollutants formed by the action of sunlight on oxides of nitrogen and hydrocarbons.

**PM<sub>2.5</sub>.** A new standard for measuring the amount of solid or liquid matter suspended in the atmosphere, i.e., the amount of particulate matter less than 2.5 micrometers in diameter (see also PM<sub>10</sub>).

**PM<sub>10</sub>.** A standard for measuring the amount of solid or liquid matter suspended in the atmosphere, i.e., the amount of particulate matter less than 10 micrometers in diameter; smaller PM<sub>10</sub> particles penetrate to the deeper portions of the lung, affecting sensitive population groups, such as children and individuals with respiratory ailments.

**Pollutant.** Generally, any substance introduced into the environment that adversely affects the usefulness of a resource.

**Pollution.** Any substance in water, soil or air that degrades the natural quality of the environment, offends the senses of sight, taste or smell, or causes a health hazard. The usefulness of the natural resource is usually impaired by the presence of pollutants and contaminants.

**Precursor.** In photochemistry, a compound antecedent to a volatile organic compound (VOC). Precursors react in sunlight to form ozone or other photochemical oxidants.

**Receptor.** An organism that receives, may receive or has received environmental exposure to a chemical.

**Record of Decision (ROD).** A document prepared by a federal agency presenting the basis for the decision reached after completion of the final EIS, summarizing any mitigation measures that will be incorporated into the project and documenting any required Section 4(f) approval.

**Scale.** Visual scale is the apparent size relationships between landscape components or features and their surroundings.

**Secondary impact.** The impact on the environment that is caused by an action and occurs later in time or is farther removed in distance, but is still reasonably foreseeable. Generally, these impacts are induced by the initial action.

**Section 106.** National Historic Preservation Act, Section 106. (See Appendix C.)

**Section 4(f).** Department of Transportation Act [23 USC, Section 138 - formerly 49 USC 1653(f)]. (See Appendix C.)

**Shorelines.** All of the water areas of the state, including reservoirs, and their associated wetlands, together with the lands underlying them, except shorelines:

- of state-wide significance;
- on segments of streams upstream of a point where the mean annual flow is 20 cubic feet per second or less, and the wetlands associated with such upstream segments; and
- on lakes less than 20 acres in size, and wetlands associated with such small lakes.

**Slope.** An area of landform surface differentiated from other areas by its degree of slope. It is a component of landforms but not limited in place or extent. Examples: cliff, gentle slope, flat plain.

**Smog.** Dust, smoke or chemical fumes that pollute the air and make hazy, unhealthy conditions (literally, the word is a blend of “smoke” and “fog”). Automobile, truck, and

other vehicle exhausts and particulates are usually trapped close to the ground, obscuring visibility and contributing to a number of respiratory problems.

**Stable atmosphere.** A motionless mass of air that holds, instead of dispersing, pollutants.

**State Environmental Policy Act (SEPA).** State legislation passed in 1974, which establishes an environmental review process for all development projects and major planning studies prior to taking any action on these projects. SEPA permits early coordination to identify and mitigate any significant issues or impacts that may result from a project or study.

**Standards.** Limits on the amount of pollutants or emissions produced. The EPA establishes minimum standards, but states are allowed to be stricter.

**Stratosphere.** The portion of the atmosphere 10-25 miles above the earth’s surface.

**Total suspended particles (TSP).** A method of monitoring particulate matter by total weight.

**Toxic chemical.** Any chemical listed in US EPA rules as “Toxic Chemicals Subject to Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986”.

**Transportation Demand Management (TDM).** Behavioral changes to commuters’ travel habits that result in fewer vehicles during peak hours. Examples would be Carpooling/Vanpooling, Employee Trip Reduction Programs, Compressed Work Weeks, Telecommuting, Flex-Time, and Employer Incentives.

**Transportation System Management (TSM).** Management to make the existing transportation system as efficient as possible. Examples would be Park and Ride Lots, Ridesharing, High Occupancy Vehicle Facilities, Traffic Signal Coordination, and Intersection Improvements.

**Troposphere.** The layer of the atmosphere closest to the earth’s surface.

**Unclassifiable area.** An area where there is no relevant air monitoring data, in which case the area has the same regulatory status as “attainment.”

**Unity.** The degree to which the visual resources of the landscape join together to form a coherent, harmonious visual pattern. Unity refers to the compositional harmony or intercompatibility between landscape elements.

**Vehicle miles traveled (VMT).** A measure of the extent of motor vehicle operation; the total number of vehicle miles traveled within a specific geographic area over a given period of time.

**View.** A scene observed from a given vantage point.

**Viewshed.** The area that would be visible from a viewpoint based on landform alone, without the screening effects of vegetation and structures.

**Visual character.** The visual character of a landscape is formed by the order of the patterns composing it. The elements of these patterns are the form, color, line and texture of the landscape’s visual resources. Their interrelationships can be objectively described in terms of dominance, diversity, continuity and so on.

**Visual corridor.** A continuous succession of visually and spatially distinct experiences.

**Visual impact.** The degree of change in visual resources and viewer response to those resources caused by highway development and impact.

**Visual quality.** While many factors contribute to a landscape’s visual quality, they can ultimately be grouped under three headings: vividness; intactness; and unity.

**Visual resources.** The appearance of the features that make up the visible landscape. Includes the land, water, vegetation, animal and other features.

**Vividness.** The memorability of the visual impression received from contrasting landscape elements as they combine to form a striking and distinctive visual pattern.

**Volatile organic compounds (VOC).** Any organic compound that evaporates readily to the atmosphere. VOCs contribute significantly to photochemical smog production and certain health problems.

**Wetland.** Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that, under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions.

**Wetland buffer.** The upland area surrounding wetlands that serves to moderate biological and physical alteration of the wetland. The buffer widths are determined by the local agency with jurisdiction.

**Wetland rating.** A ranking of wetlands, typically one through four, by the wetland functions and values. Ranking systems vary by jurisdiction. The highest ranking wetlands are Category One, while the lowest are Category Four.

**Wetland function.** The physical and biological support roles wetlands provide, such as stormwater peak flow attenuation, groundwater recharge, etc.

**Wetland mitigation.** Creation, enhancement or restoration of wetlands to compensate for wetland alterations.

**Wetland value.** Societal worth placed on wetland attributes and qualities, i.e., the value of flood water storage relative to other means of controlling floods.

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