



**Targamh**  
*Art Of Translation*

English ↔ Arabic ↔ French

## Air Quality Glossary

### معتصم الحارث الضوي

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**absorption:**

the process by which incident light is removed from the atmosphere and retained by a particle.

**absorption coefficient:**

a number that is proportional to the "amount" of light removed from a sight path by absorption per unit distance.

**absorption cross section:**

the amount of light absorbed by a particle divided by its physical cross section.

**acidification:**

the decrease of acid neutralizing capacity in water or base saturation in soil caused by natural or anthropogenic processes.

**acid deposition(wet):**

[air pollution](#) produced when acid chemicals are incorporated into rain, snow, fog, or mist. See also [acidic pollution in the parks](#).

**adverse impact on an [AQRV](#):**

an unacceptable effect, as identified by an FLM, that results from current, or would result from predicted, deterioration of air quality in a Federal [Class I](#) or [Class II](#) area (See also [Clean Air Act](#)). a determination of unacceptable effect shall be made on a case-by-case basis for each area taking into account existing air quality conditions. It should be based on a demonstration that the current or predicted deterioration of air quality will cause or contribute to a diminshment of the area's national significance, impairment of the structure and functioning of the area's ecosystem, or impairment of the quality of the visitor experience in the area.

**[Aerometric Information Retrieval System \(AIRS\)](#):**

a computer-based repository of US [air pollution](#) information administered by the [EPA](#) Office of Air Quality Planning and Standards

**AIRWeb:**

[Air Resources Web](#), an air quality information web site for US parks and wildlife refuges developed by the Air Resources Division of the National Park Service and the Air Quality Branch of the Fish and Wildlife Service.

**aerosol:**

a mixture of microscopic solid or liquid particles in a gaseous medium. Smoke, haze, and fog are aerosol examples.

**air parcel:**

a volume of air that tends to be transported as a single entity.

**air pollutant:**

an unwanted chemical or other material found in the air. See also [air pollution](#).

**air pollution:**

degradation of [air quality](#) resulting from unwanted chemicals or other materials occurring in the air. See also [air pollutant](#).

**air quality:**

(in context of the national parks:) the properties and degree of purity of air to which people and natural and heritage resources are exposed.

**air pollution control permitting process:**

process by which facilities are permitted to emit specified types and quantities of [air pollutants](#)

**air quality related value (AQRV):**

a resource, as identified by the [FLM](#) for one or more Federal areas, that may be adversely affected by a change in air quality. the resource may include visibility or a specific scenic, cultural, physical, biological, ecological, or recreational resource identified by the FLM for a particular area. "These values include visibility and those scenic, cultural, biological, and recreation resources of an area that are affected by [air quality](#)" (43 Fed. Reg. 15016).

**airshed:**

a geographic area that, because of topography, meteorology, and/or climate, is frequently affected by the same air mass.

**ambient air:**

air that is accessible to the public.

**anthropogenic:**

produced by human activities.

**AOT40:**

sum of all hourly average concentrations after subtracting 40 ppb from each hourly value.

**apportionment:**

to distribute or divide and assign proportionately.

**attainment area:**

a geographic area in which levels of a [criteria air pollutant](#) meet the health-based [National Ambient Air Quality Standard](#) for that specific [pollutant](#).

**attenuation:**

the diminution of quantity. In the case of visibility, attenuation or extinction refers to the loss of image-forming light as it passes from an object to the observer.

**back trajectory:**

a trace backwards in time showing where an air mass has been.

**Best Available Control Technology (BACT):**

the control level (or control measures) required for sources subject to the [Prevention of Significant Deterioration](#) program. (see 40CFR 52.21(b))

**Best Available Control Measures (BACM):**

see [BACT](#).

**bimodal distribution:**

a plot of frequency of occurrence of a variable versus the variable. A bimodal distribution exists if there are two maxima of the frequency of occurrence separated by a minimum. See *Mode*.

**budget:**

see *light extinction budget*.

**camera:**

device for recording [visual range](#) on film.

**carbon monoxide:**

a [criteria air pollutant](#) that is a colorless, odorless, poisonous gas produced by incomplete combustion; particularly, incomplete burning of carbon-based fuels e.g. gasoline, oil, and wood.

**class I area:**

as defined in the [Clean Air Act](#), the following areas that were in existence as of August 7, 1977: national parks over 6,000 acres, national wilderness areas and national memorial parks over 5,000 acres, and international parks.

**class II area:**

areas of the country protected under the [Clean Air Act](#), but identified for somewhat less stringent protection from air pollution damage than a [class I area](#), except in specified cases.

**Clean Air Act:**

Originally passed in 1963, our current national air pollution control program is based on the 1970 version of the law. Substantial revisions were made by the 1990 Clean Air Act Amendments. See also [Clean Air Act](#) pages.

**clean fuels:**

low-pollution fuels that can replace ordinary gasoline, including gasohol, and natural and LP gas.

**coagulation:**

the process by which small particles collide with and adhere to one another to form larger particles.

**condensation:**

the process by which molecules in the atmosphere collide and adhere to small particles.

**condensation nuclei:**

the small nuclei or particles which gaseous constituents in the atmosphere (e.g., water vapor) collide and adhere.

**continuous sampling device:**

an air analyzer that measures [air quality](#) components continuously. See also [monitoring, integrated sampling device](#).

**criteria:**

(in the context of [criteria pollutants](#);) information on health and/or environmental effects of pollution.

**criteria air pollutant:**

a group of very common [air pollutants](#) regulated by [EPA](#) on the basis of [criteria](#), and for which a [National Ambient Air Quality Standard](#) is established ([SO<sub>2</sub>](#), [NO<sub>2</sub>](#), [PM<sub>10</sub>](#), Pb, [CO](#), [O<sub>3</sub>](#)). See also [EPA's NAAQS page](#).

**critical load:**

the concentration of air pollution or total deposition of pollutants above which specific deleterious effects may occur.

**cumulative effect:**

the impact on an AQRV resulting from total pollutant loading from all sources including the contributing effects of new and modified sources of airpollution.

**damage:**

any reduction in the intended use or value of a biological or physical resource. For example, economic production, ecological structure or function, aesthetic value, or biological or genetic diversity that may be altered by a pollutant.

**deciview:**

a unit of visibility proportional to the logarithm of the atmospheric extinction. Under many circumstances a change in one deciview will be perceived to be the same on clear and hazy days.

**diffraction:**

modification of the behavior of a light wave resulting from limitations of its lateral extent by an obstacle. For example, the bending of light into the "shadow area" behind a particle.

**diffusion:**

a process by which substances, heat, or other properties of a medium are transferred from regions of higher concentrations to regions of lower concentration.

**dose-response:**

the relationship between the dose of a [pollutant](#) and its [effect on a biological system](#)

**dry deposition:**

delivery of air pollutants in the gaseous or particle phase to surfaces.

**ecological effects:**

studies to determine the nature or extent of [air pollution](#) and acid deposition to ecosystems. See also [ecological effects](#) pages.

**emissions:**

release of [pollutants](#) into the air from a [source](#)

**emission offset:**

a federally enforceable reduction in emissions from an existing source that mitigates the impacts on AQRV's of a proposed new or modified source, and ensures compliance with NAAQS and PSD increment.

**enforcement:**

legal methods used by [EPA](#), state, and local governments to make polluters obey the [Clean Air Act](#). In the absence of enforcement, citizens can sue [EPA](#) or the states to obtain action,

and can also sue violating [sources](#) apart from any action [EPA](#) or state or local governments have taken.

**Environmental Protection Agency (EPA):**

the federal agency responsible for regulating [air quality](#). See also [EPA web site](#).

**extinction:**

the attenuation of light due to scattering and absorption as it passes through a medium.

**extinction coefficient:**

a measure of the ability of particles or gases to absorb and scatter photons from a beam of light; a number that is proportional to the number of photons removed from the sight path per unit length. See absorption.

**extinction cross section:**

the amount of light scattered and absorbed by a particle divided by its physical cross section.

**flux:**

gaseous uptake into plant tissue.

**fugitive emission:**

pollutant emitted from diffuse or ill-defined conditions, e.g., other than a stack or chimney.

**Federal Land Manager (FLM):**

the Secretary of the Department with authority over such lands. [40 CFR 51.166(b)(24)]  
The FLM for the Department of the Interior has been delegated the Assistant Secretary for Fish and Wildlife and Parks; the FLM for the Department of Agriculture has been delegated to the Forest Service, and has been redelegated to the Regional Forester or individual Forest Supervisor.

**fine particle:**

[particulate matter](#) less than 2.5 microns in diameter.

**fugitive emission:**

pollutant emitted from diffuse or ill-defined conditions, eg., other than a stack or chimney.

**green line:**

the total pollutant loading (contributions from existing and proposed sources) below which there is a very high degree of certainty that no [AQRV](#) will be adversely affected.

**Gulf of Maine Oxidant Study (GOMOS):**

a study to investigate the sources and transport of [pollutants](#) contributing to [ozone](#) formation.

**hazardous air pollutants (HAP):**

airborne chemicals that cause serious health and environmental effects

**haze (hazy):**

an atmospheric aerosol of sufficient concentration to be visible. The particles are so small that they cannot be seen individually, but are still effective attenuating light and reducing visual range.

**homogenous nucleation:**

a process by which gases interact and combine with droplets made up of their own kind. For instance, the collision and subsequent adherence of water vapor to a water droplet is a homogenous nucleation. See [nucleation](#).

**hydrocarbons:**

compounds containing only hydrogen and carbon. Examples: methane, benzene, and decane.

**hygroscopic:**

readily absorbing moisture, as from the atmosphere.

**impairment:**

the degree to which a scenic view or distance of clear visibility is degraded by man-made [pollutants](#).

**IMPROVE:**

Interagency Monitoring of Protected Visual Environments, a collaborative [monitoring](#) program to establish present visibility levels and trends, and to identify sources of man-made impairment. See also [IMPROVE Newsletter](#).

**injury:**

any physical or biological response to pollutants, such as a change in metabolism, reduced photosynthesis, leaf necrosis, premature leaf drop, or chlorosis.

**integrated sampling device:**

an air sampling device that allows estimation of [air quality](#) components over a period of time (e.g. two weeks) through laboratory analysis of the sampler's medium.

**inversion:**

See temperature inversion.

**isopleth:**

a line drawn on a map through all points having the same numeric value.

**isotropic:**

a situation where a quantity (or its spatial derivatives) are independent of position or direction.

**isotropic scattering:**

the process of scattering light equally in all directions.

**LAER (Lowest Achievable Emissions Rate):**

the control level required of a source subject to nonattainment review. (See 40 CFR 51.165(a))

**light-absorbing carbon:**

carbon particles in the atmosphere that absorb light. Black carbon.

**light extinction budget:**

the percent of total atmospheric extinction attributed to each aerosol and gaseous component of the atmosphere.

**long path measurement:**

an atmospheric measurement process that is made over distances in excess of a few hundred meters.

**major source:**

a [stationary facility](#) that emits a regulated pollutant in an amount exceeding the threshold level (100 or 250 tons per year, depending on the type of facility). See also [source](#).

**micrometer:**

a unit of length equal to one millionth of a meter; the unit of measure for particle size.

**micron:**

a unit of length equal to one millionth of a meter; the unit of measure for wavelength.

**MIE theory:**

a complex mathematical model that allows the computation of the amount of energy (light) scattered by spherical particles.

**mobile sources:**

moving objects that release regulated air pollutants, e.g. cars, trucks, buses, planes, trains, motorcycles, and gas-powered lawn mowers. See also [source](#); [stationary source](#).

**mode:**

the maximum point in a plot of the frequency of occurrence of a variable versus the variable.

**monitoring:**

measurement of air pollution. See also [continuous sampling device](#), [integrated sampling device](#).

**N100:**

number of hourly average concentrations  $\geq 100$  ppb.

**National Ambient Air Quality Standards (NAAQS):**

permissible levels of [criteria air pollutants](#) established to protect public health and welfare. See also EPA's [NAAQS page](#).

**natural conditions:**

conditions substantially unaltered by humans or human activities. as applied in the context of visibility, natural conditions include naturally occurring phenomena that reduce visibility as measured in terms of light extinction, visual range, contrast, or coloration.

**natural visibility conditions:**

visibility conditions attributable to [Rayleigh scattering](#) and aerosol associated with natural processes.

**nephelometer:**

an instrument that measures the amount of light scattered.

**nitrate:**

those gases and aerosols that have origins in the gas-to-aerosol conversion of nitrogen oxides, e.g., NO<sub>2</sub>; of primary interest are nitric acid and ammonium nitrate. Ammonium nitrate is very [hygroscopic](#) so its contribution to visibility impairment is magnified in the presence of water vapor.

**nitrogen dioxide:**

a gas (NO<sub>2</sub>) consisting of one nitrogen and two oxygen atoms. It absorbs blue light and therefore has a reddish-brown color associated with it.

**nitrogen oxides:**

a [criteria air pollutant](#), compounds NO, NO<sub>2</sub>, NO<sub>3</sub>, N<sub>2</sub>O<sub>5</sub>, alkyl nitrates, etc. See also [NOx](#) and [NOy](#).

**nonattainment area:**

An area designated by the EPA Administrator pursuant to Section 107(d) of the Clean Air Act as having air quality which does not meet one or more [National Ambient Air Quality Standards \(NAAQS\)](#). For a list of nonattainment areas, see 40 CFR Part 81, Subpart C.

**North Atlantic Regional Experiment (NARE):**

a study to assess the contribution of continental [air pollution](#) to the North Atlantic Ocean.

**NOx:**

the sum of NO + NO<sub>2</sub>. See also [nitrogen oxides](#), [NOy](#).

**NOy:**

the sum of all oxidized nitrogen species, i.e. NO, NO<sub>2</sub>, NO<sub>3</sub>, HNO<sub>3</sub>, N<sub>2</sub>O<sub>5</sub>, alkyl nitrates, PAN, etc. Does not include NH<sub>3</sub> or N<sub>2</sub>O. See also [nitrogen oxides](#), [NOx](#).

**nucleation:**

a process by which a gas interacts and combines with droplets. See [homegenous nucleation](#).

**organic compounds:**

chemicals that contain the element carbon.

**ozone (O<sub>3</sub>):**

a gas similar to oxygen that is a [criteria air pollutant](#) and a major constituent of [smog](#). See also [reactive organic compounds](#); [volatile organic compounds](#).

**oxidant stipple:**

small brown or black interveinal necrotic lesions on the adaxial surface of leaf tissue that can be attributed to exposure to ozone.

**particle sampler:**

an instrument to measure [particulate matter](#) in [ambient air](#).

**particulate matter**

dust, soot, other tiny bits of solid materials that are released into and move around in the air. See also [fine particle](#), [PM10](#), [Visibility Research Program](#) pages.

**Perceived Visual Air Quality (PVAQ):**

an index that relates directly to how human observers perceive changes in visual air quality.

**phase shift:**

a change in the periodicity of a waveform such as light.

**photometry:**

instrumental methods, including analytical methods, employing measurement of light intensity. See telephotometer.

**photon:**

a bundle of electromagnetic energy that exhibits both wave-like and particle-like characteristics.

**phytotoxic:**

poisonous to plants.

**plume blight:**

visual impairment of air quality that manifests itself as a coherent plume.

**PM10:**

a [criteria air pollutant](#) that is [particulate matter](#) in [ambient air](#) exceeding 10 microns in diameter.

**point source:**

a source of pollution that is well defined, such as the smokestack of a coal-fired power plant or smelter.

**post-construction monitoring:**

monitoring required as a permit condition that the permitting authority considers necessary to determine the effect emissions from a stationary source may have, or are having, on the air quality or on the AQRV's of an area. Such monitoring includes both "ambient" monitoring and "AQRV" monitoring and may involve short term and long-term measurements made at locations representative of the greatest expected impacts.

**Prevention of Significant Deterioration (PSD):**

a program established by the [Clean Air Act](#) that limits the amount of additional [air pollution](#) that is allowed in [Class I](#) and [Class II](#) areas.

**PSD increments:**

the maximum increase in ambient pollution concentrations allowed over baseline concentrations. See 40 CFR 51.166 (c) for increments for specific pollutants.

**precursor emissions:**

emissions from point or regional sources that transform into pollutants with varied chemical properties.

**primary standard:**

a pollution standard based on human health effects. Primary standards are set for [criteria air pollutants](#). See also [secondary standard](#).

**RACT (Reasonably Available Control Technology):**

the lowest emissions limit that a particular source can meet by the application of control technology that is reasonably available considering technological and economic feasibility.

**R-MAP:**

Resource Management Assessment Program.

**rayleigh scattering:**

the scattering of light by particles much smaller than the wavelength of the light, e.g., molecular scattering in the natural atmosphere.

**reactive organic compounds:**

(in the context of photochemically produced [air pollution](#);) [organic compounds](#) that produce [ozone](#) in the presence of [nitrogen oxides](#) and sunlight. See also [Volatile Organic Compounds](#).

**reconstructed extinction:**

extinction estimate that results from summing up the product of the mass of each measured particle species and the appropriate absorption or extinction coefficient.

**red line:**

the total pollutant loading (contributions from existing and proposed sources) at which there is a very high degree of certainty that at least one AQRV will be adversely affected.

**reformulated gasoline:**

specialty-refined gasoline with low levels of [smog](#)-forming [volatile organic compounds](#) and low levels of [hazardous air pollutants](#).

**refraction:**

the change of direction of a ray of light in passing obliquely from one medium into another in which the speed of propagation differs.

**regional haze:**

a cloud of [aerosols](#) extending up to hundreds of miles across a region and promoting noticeably [hazy](#) conditions.

**regional haze visibility impairment:**

any humanly perceptible change in visibility (light extinction, visual range, contrast, coloration) from that which would have existed under natural conditions, caused predominately by a combination of many sources from, and occurring over, a wide geographic area.

**relative humidity:**

the ratio of the partial pressure of water to the saturation vapor pressure, also called saturation ratio; often expressed as a percentage.

**re-opener:**

a permit condition that requires the permitting authority, at a specified time after permit issuance, to review and revise, if necessary, the permit based on new information such as the findings from post-construction monitoring, updated emissions inventories, updated modeling, research, or information on air pollution effects to terrestrial, aquatic, and visibility resources.

**scattering:**

an interaction of light with an object (e.g., a fine particle) that causes the light to be redirected in its path.

**scattering angle:**

the angle between the direction of propagation of the scattered and incident light (or transmitted light).

**scattering coefficient:**

measure of the ability of particles to scatter light; measured in number proportional to the "amount" of light scattered per unit distance.

**scattering cross section:**

the amount of light scattered by a particle divided by its physical cross section.

**screening level or screening level value (SLV):**

the concentration or dose of air pollution below which estimated impacts from proposed new or modified source are considered insignificant. the SLV is dependent on existing air quality and on the condition of the AQRV of concern.

**secondary aerosols:**

aerosol formed by the interaction of two or more gas molecules and/or primary aerosols.

**secondary standard:**

an [air pollution](#) limit based on environmental effects, e.g. damage to property, plants, visibility, etc. Secondary standards are set for [criteria air pollutants](#). See also [primary standard](#).

**sensitive receptor:**

the aqrv, or part thereof, that is the most responsive to, or the most easily affected by the type of air pollution in question. For example, at Great Smoky Mountains National Park, spruce-fir forest is a sensitive receptor indicator.

**sensitive receptor indicator:**

a measurable physical, chemical, biological, or social (e.g., odor) characteristic of a sensitive receptor. For example, for the sensitive receptor, crater Lake, water clarity is a sensitive receptor indicator.

**smog:**

a mixture of [air pollutants](#), principally ground-level [ozone](#), produced by chemical reactions involving smog-forming chemicals. See also [haze](#).

**Southern Oxidant Study (SOS):**

a study to assess the sources and transport of [air pollutants](#) contributing to [ozone](#) formation.

**source:**

any place or object from which [air pollutants](#) are released. Sources that are fixed in space are [stationary sources](#); sources that move are [mobile sources](#). See also [major source](#).

**spectral:**

an adjective implying a separation of wavelengths of light or other waves into a spectrum or separated series of wavelengths.

**State Implementation Plan (SIP):**

a collection of regulations used by the state to carry out its responsibilities under the [Clean Air Act](#).

**stable air mass:**

an air mass which has little vertical mixing. See temperature inversion.

**stagnant:**

referring to meteorological conditions that are not conducive to atmospheric mixing.

**stagnation periods:**

lengths of time during which little atmospheric mixing occurs over a geographical area, making the presence of layered hazes more likely. See temperature inversion.

**stationary source:**

a fixed [source](#) of regulated air pollutants (e.g. industrial facility). See also [source](#); [mobile sources](#).

**sulfates:**

those aerosols that have origins in the gas-to-aerosol conversion of sulfur dioxide; of primary interest are sulfuric acid and ammonium sulfate. Sulfuric acid and ammonium sulfate are very hygroscopic so their contribution to visibility impairment is magnified in the presence of water vapor.

**sulfur dioxide (SO<sub>2</sub>):**

a gas (SO<sub>2</sub>) consisting of one sulfur and two oxygen atoms. Of interest because sulfur dioxide converts to an aerosol.

**SUM00:**

the sum of all hourly average concentrations above 0.00 ppb.

**SUM60:**

the sum of all hourly average concentrations at or above 60 ppb.

**sun angle:**

refers to the angle of the sun above the horizon of the earth.

**target load:**

the acceptable concentration or dose of an air pollutant that provides a reasonable margin of safety below the critical load. the target load should be achievable under existing conditions.

**telephotometer:**

an instrument that measures the brightness of a specific point in either the sky or vista.

**temperature inversion:**

in meteorology, a departure from the normal decrease of temperature with increasing altitude such that the temperature is higher at a given height in the inversion layer than would be expected from the temperature below the layer. This warmer layer leads to increased stability and limited vertical mixing of air.

**toxic air pollutants:**

see [hazardous air pollutants](#).

**transmissometer:**

an instrument that measures the amount of light extinction over a fixed, specified path length.

**total suspended particulates (TSP):**

total [particulate matter](#) in a sample of [ambient air](#).

**unstable air mass:**

an air mass that is vertically well mixed. See also [stable air mass](#), [temperature inversion](#).

**UV radiation:**

Ultraviolet Radiation emitted from the sun, which can affect health and ecosystems at elevated levels.

**visibility impairment:**

any humanly perceptible change in visibility (visual range, contrast, coloration) from that which would have existed under natural conditions. [40CFR 51.301(x)]

**visual air quality:**

[air quality](#) evaluated in terms of pollutant [particles](#) and gases that affect how well one can see through the atmosphere.

**visual range:**

the distance at which a large black object would just disappear from view.

**Volatile Organic Compounds (VOC):**

[organic compounds](#) that vaporize readily and contribute to the development of [ozone](#). Many VOCs are also [hazardous air pollutants](#). See also [reactive organic compounds](#).

**wavelength:**

the distance, measured in the direction of propagation of a wave, between two successive points in the wave that are characterized by the same phase of oscillation.

**W126:**

an ozone index that multiplies each specific concentration by a sigmoidal weighted function, then sums all values.  $W_i = 1/[1 + M e^{-(A \times C_i)}]$ , where M and A are constants 4403 and 126 ppm<sup>-1</sup>, respectively, W<sub>i</sub> is the weighting factor for C<sub>i</sub>, and C<sub>i</sub> is concentration in ppm.