Air Quality Glossary

Abatement – the elimination or reduction in degree or intensity of pollution. Abatement devices are also known as control technologies.

Acceptance criteria – address the adequacy of existing information proposed for inclusion into the project. These criteria often apply to data drawn from existing sources ("secondary" data). See also: performance criteria.

Accuracy – a term that has been frequently used to represent closeness to truth and includes a combination of precision and bias uncertainty components. This term has been used throughout the CFR. In general, we will follow the conventions of the NIST and, more recently, of EPA (ref. NIST Report 1297 and EPA G-9) and will ***not*** use the term accuracy, but will describe measurement uncertainties as precision, bias, and total uncertainty (total uncertainty is the combination of both precision and bias).

Acid deposition – a term for the conversion of sulfur oxide and nitrogen oxide emissions into acidic compounds (sulfuric acid and nitric acid, respectively) which precipitate in rain, snow, fog, or dry particles. (see also wet & dry deposition)

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

Activated Carbon (Charcoal) – see Granular Activated Carbon

Actual minor source – a stationary source that is a minor source because its actual and potential emissions are below the relevant major source threshold(s) without the application of enforceable controls that limit its potential to emit (see also Minor source, Synthetic minor source, and Potential to emit)

Adverse health effects – health effects from exposure to air contaminants that may range from relatively mild temporary conditions, such as minor eye or throat irritation, shortness of breath, or headaches, to permanent and serious conditions such as birth defects, cancer, or damage to lungs, nerves, liver, heart, or other organs.

AIRS – Aerometric Information Retrieval System. See Air Quality System (AQS)

Aerosol – a combination of microscopic particles of solid or liquid matter that can remain suspended in the air (or other gaseous medium) because of its small size (generally under one micrometer). Smoke, haze and fog are aerosol examples.

Affected State – any state (or tribe that is eligible to be treated as a state (see Treatment as a State)) (1) whose air quality may be affected and that is contiguous to a state or part of Indian country for which there is a Part 70 or Part 71 permit that has been proposed, or (2) that is within 50 miles of a permitted source. (see also Title V)

Afterburner – an air pollution abatement device that removes undesirable organic gases through incineration.

Air basins – areas defined by geographical or administrative boundaries; used for air pollution control programs. (see also Airshed)

Air monitoring – sampling for, and measurement or analysis of, pollutants present in the atmosphere.

Air pollutant – an unwanted chemical or other material found in the air.

Air pollution – the presence of polluting gases and suspended particles in the atmosphere.

Air quality criteria – the varying amounts of pollution and lengths of exposure at which specific adverse effects to health and comfort take place.

Air Quality Index (AQI) – a system developed by the US EPA used for public announcements (radio, TV, newspapers, etc.) to inform the public about daily air quality conditions in an area. The AQI focuses on the human health effects of five criteria pollutants (excludes lead). The AQI uses six levels to categorize air quality (0 to 500) with levels below 100 being satisfactory and levels above 300 being hazardous to human health.

Air Quality Management District (AQMD) – local agency charged with controlling air pollution and attaining air quality standards.

Air Quality Plan (AQP) – a plan developed to attain and maintain an air quality standard.

Air Quality Related Value (AQRV) – a resource, as identified for one or more Federal areas, that may be adversely affected by a change in air quality. The resource may include visibility in general, or a specific scenic, cultural, physical, biological, ecological, or recreational resource identified for a particular area.

Air Quality Glossary

Air quality standard – the prescribed level of a pollutant in the outside (ambient) air that should not be exceeded during a specific time period, to protect public health and welfare. Established by both federal and state governments. (see also National Ambient Air Quality Standards (NAAQS))

Air Quality System (AQS) – formerly known as the Aerometric Information Retrieval System (AIRS), AQS is a computer-based repository ambient air pollution data collected by various air pollution control agencies which also contains meteorological data, descriptive information about each monitoring station, and data quality assurance/quality control information. AQS information is managed by the US EPA's Office of Air Quality Planning and Standards (OAQPS) and is used for a number of political and regulatory purposes as mandated by the Clean Air Act.

Air Toxics – see Hazardous Air Pollutants.

Air – "pure" air is a mixture of gases containing about 78 percent nitrogen; 21 percent oxygen; less than 1% of carbon dioxide, argon, and other inert gases; and varying amounts of water vapor.

Airshed – a geographical area that, because of topography, meteorology, and climate, shares the same air (see also Air Basins).

Allowance – A tradeable permit to emit a specific amount of a pollutant. For example, under the Acid Rain Program, one allowance permits the emissions of one ton of sulfur dioxide (SO2). (see also Market-based trading and Offset)

Alternative Fuel – An alternative fuel is any fuel other than gasoline and diesel fuels, such as methanol, ethanol, compressed natural gas, and other gaseous fuels. Generally, alternative fuels burn more cleanly and result in less air pollution.

Ambient air – outside air; any portion of the atmosphere not confined by walls and a roof.

American National Standard ANSI/ASQC E4-1994 – Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs: a national consensus standard authorized by the American National Standards Institute (ANSI) and developed by the American Society for Quality Control (ASQC). Consistent with ISO standards. EPA Guidance for Quality Assurance Project Plans: EPA QA/G-5 is based on E4.

Anemometer – an instrument for measuring wind speed. There are two common types: rotating cup and propeller anemometers. Rotating cup anemometers are often used for horizontal wind speed measurement, and propeller anemometers are often used for vertical wind speed measurement.

Annual Arithmetic Mean – the mean (average) of a set of values of a variable (such as pollutant concentration or meteorological parameter) over a calendar year. The arithmetic mean is equal to the sum of all the readings divided by the number of readings.

Annual Geometric Mean – the geometric average of a set of values of a variable (such as pollutant concentration or meteorological parameter) over a calendar year. The geometric mean is the nth root of the product of n readings, usually calculated as the antilogarithm of the average of the logarithms of the data points.

Anthropogenic – produced by or resulting from human activities

AP-42 – a guidance document written by the US EPA that provides detailed information on emissions and emission factors from numerous sources of air pollution.

Area source – any non-natural source of air pollution that may have multiple sources in one specific area. Quantifiable emissions are not concentrated from one source (i.e. point source). Examples of area sources can be refueling stations (when several are considered in one area), agricultural processes, or combination sources, such as a casino complex.

Aromatic – a hydrocarbon that contains one or more six-carbon rings typical of benzene and related compounds.

Asbestos – a mineral fiber that can pollute air or water and cause cancer or asbestosis when inhaled. EPA has banned or severely restricted its use in manufacturing and construction.

ASCII – American Standard Code for Information Interchange, a protocol, ANSI Standard X3.4-1968, for transmitting text data that encodes teletype characters (typewriter characters and control codes), in seven bits (binary digits), that is as numbers from 0 to 127. International standard character sets, such as ISO Latin-1 (ISO 8859/1, the character set used for this HTML document) and Unicode, include the printable characters and some of the control characters of ASCII as a subset. Some air monitoring equipment and/or dataloggers and the AQS use ASCII characters to represent data.

Air Quality Glossary

Assessment – the evaluation process used to measure the performance or effectiveness of a system and its elements. Assessment is an all-inclusive term used to denote any of the following: audit, performance evaluation, management review, peer review, inspection, or surveillance.

Asthma – a medical condition characterized by abnormal restriction of breathing, especially in response to allergens or air contaminants.

Atmosphere – (1) the layer of life-supporting gases (air) that surrounds the earth that is approximately 60 to 80 km in height. The lower portion of the atmosphere (up to 8 to 16 km) is called the troposphere; the upper portion of the atmosphere (from 8-16 to 60-80 km) is called the stratosphere.; (2) A unit of pressure equal to the average atmospheric pressure at sea level. 1 atm = 101 kPa = 760 mm Hg (torr).

Atmospheric extinction – the reduction of light due to scattering ad absorption as it passes through the atmosphere.

Attainment – a designation used when a geographic area meets an air quality standard (air pollution levels are below the limits of the standards) for a particular criteria pollutant. (see also National Ambient Air Quality Standards and Non-attainment)

Audit – a systematic and independent examination to determine whether QA/QC activities and related results comply with planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve objectives. Audits can be qualitative, in which they assess procedures against the QAPP and applicable regulations, check that SOPs are current and are being followed, etc., or quantitative, in which some measurement (flow rate or concentration) is made with an outside piece of equipment and compares results with the routine and standard measurements.

Background concentration – contributions to outdoor air toxics concentrations resulting from natural sources, persistence in the environment of past years' emissions and long-range transport from distant sources. Background concentration levels may be estimated by modeling and/or by monitoring.

Baghouse – an air pollution abatement device that traps particulates (dust) by forcing gas streams through large permeable bags usually made of glass fibers or synthetics such as Orlon or Nylon.

Barometric Pressure – ambient atmospheric pressure (see also atmosphere)

Baseline concentration – The ambient concentration level of a criteria pollutant existing in the baseline area at the time of the applicable baseline date (as defined in Title 40CFR Part 51.166(14).)

Best Available Control Technology (BACT) – an emission limitation based on using the most up-to-date methods, systems, techniques, and/or production processes available to achieve the greatest feasible emission reductions. These are the most stringent requirements for new or modified sources in attainment areas and are determined on a case-by-case basis as part of the Prevention of Significant Deterioration (PSD) program (CAA, Title I).

Beta Attenuation Monitor (BAM) – a continuous ("real-time") air monitor for particulate matter. Considered Federal Equivalency Method (FEM) for PM monitoring by US EPA. A beta ray transmission is measured across a clean section of filter tape. That section of tape is advanced to the sampling inlet. Particulate matter is drawn into the sample inlet and deposited on the filter paper. The filter tape is returned to its original location and the beta ray transmission is re-measured. The difference between the two measurements is used to determine the particulate concentration.

Best Available Retrofit Control Technology (BARCT) – an emission limitation based on the maximum degree of reduction achievable for existing sources taking into account environmental, energy, and economic impact.

Bias – a systematic or persistent distortion of a measurement process that causes error in one direction in a set of data. An unbiased measurement is close to the true value. Bias is estimated by the signed difference of an observed value from a reference value, as a percentage of the reference value. (see also Accuracy and Precision.)

Bioaccumulation – The build-A48up of a pollutant within the tissues of a living organism to concentrations much higher than the surrounding environment. This usually occurs as predators eat large numbers of prey each having a small amount of a pollutant in their body.

Biogenic – produced by non-human processes. Examples of biogenic sources of air pollution are pollen and VOCs released from forests, or hydrogen sulfide released from natural springs or seeps.

Biological Contaminants – Agents derived from or that are living organisms (e.g., viruses, bacteria, fungi, and mammal and bird antigens) that can be inhaled and can cause many types of health effects including allergic reactions, respiratory disorders, hypersensitivity diseases, and infectious diseases. Typically used in reference to indoor air contaminants. Also referred to as “microbiologicals” or “microbials.”

Air Quality Glossary

Blank – see Field blank.

British Thermal Unit (BTU) – a unit of heat used to describe the capacity of boilers and furnaces. One BTU equals the amount of heat required to raise the temperature of one pound of water one degree Fahrenheit at sea level.

Calibration – the process of ascertaining the outputs from a device for a set of known inputs. A calibration process compares a measurement standard, instrument, or item with a standard or instrument of accepted accuracy to detect and quantify inaccuracies in order to report or eliminate those inaccuracies by making necessary adjustments. If an instrument is checked and found to be operating within limits and does not have to be adjusted, it is not called a calibration but rather is a verification.

Cap-and-Trade – see Market-Based Trading

Carbon Dioxide (CO2) – a colorless, odorless, non-poisonous gas that results from fossil fuel combustion and is a normal constituent of ambient air at low concentrations. Carbon dioxide is required for the process of photosynthesis in plants.

Carbon Monoxide (CO) – a colorless, odorless, toxic gas produced by the incomplete combustion of fossil fuels. One of the criteria air pollutants, it is emitted in large quantities by exhaust from gasoline-powered engines.

Carbon Offset – see Emission Offset

Carcinogen – any substance that can cause, or contribute to the production of, cancer.

Catalytic converter – an air pollution abatement device used on motor vehicles and other gasoline-powered pollution sources. It removes organic contaminants by oxidizing them into carbon dioxide and water through chemical reaction. It may also convert nitrogen dioxide to nitrogen and oxygen or promote other similar reactions.

Celsius – an alternative metric scale of temperature, also known as centigrade; temperatures in degrees Celsius are symbolized by ºC after the number; differences in temperature in Celsius degrees are symbolized by Cº after the number. The Celsius scale has the same units as the Kelvin scale (1 Cº increase would be the same as a 1 K increase), but its zero point is at the freezing point of water (at a pressure of one atmosphere): 0 ºC = 273 K; 100 ºC = 373 K is the boiling point of water (at 1 atm). In comparison with the Fahrenheit scale, 0 ºC = 32 ºF and 100 ºC = 212 ºF.

Chain of custody – an unbroken "trail" (or chain) of accountability that documents and ensures the physical security of measurements, data, and records.

Check standard – a standard prepared independently of the calibration standards and analyzed exactly like the measurements. Check standard results are used to estimate analytical precision and to indicate the presence of bias due to the calibration of the analytical system.

Chemical Abstract Services (CAS) Number – a number assigned to each of the 188 hazardous air pollutants (HAPs) or air toxics.

Chemiluminescence – the emission of light (luminescence) as the result of a chemical reaction.

Chlorofluorocarbons (CFCs) – a family of inert, nontoxic, and easily liquified chemicals used in refrigeration, air conditioning, packaging, insulation, or as solvents and aerosol propellants. Because CFCs are not destroyed in the lower atmosphere they drift into the upper atmosphere where their chlorine components destroy the ozone layer.

Class I airshed – defined as pristine under the Prevention of Significant Deterioration (PSD) program; includes all designated Wilderness Areas, National Parks (over 6,000 acres) and Monuments (over 5,000 acres) and some Tribal Reservation lands.

Class II airshed – defined as allowing moderate emissions growth under the Prevention of Significant Deterioration (PSD) program. A Class II area is in attainment for the criteria pollutants under the NAAQS.

Class III airshed – defined as allowing maximum emissions growth under the Prevention of Significant Deterioration (PSD) program. A Class III area is in attainment for the criteria pollutants under the NAAQS.

Clean Air Act (CAA) – long-standing federal legislation that is the legal basis for national clean air programs; first passed in 1970, last amended in 1990 (also referred to as the CAAA, or Clean Air Act Amendments).

Clean fuels – low-pollution fuels that can replace ordinary gasoline, including compressed natural gas, gasohol (gasoline-alcohol mixtures), liquefied petroleum gas (LPG), and electricity. The 1990 Clean Air Act Amendments encourage development and sale of clean fuels. Also known as "alternative" fuels.

Air Quality Glossary

Code of Federal Regulations (CFR) – is a codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the Federal Government. The CFR is divided into 50 titles representing broad areas subject to Federal regulation. Each title is divided into chapters which; each chapter is further subdivided into parts covering specific regulatory areas. Regulations relating to air pollution are found in Title 40 of the CFR, sections 50-99.

Coefficient of Haze (COH) – a measurement of the quantity of dust and smoke in the atmosphere in a theoretical 1000 linear feet of air. A COH of less than 1 is considered clean air and more than 3 is considered dirty air.

Collocate – to site two (or more) monitors measuring the same pollutant or other parameter at the same location. The exact separation allowed varies by the parameter monitored and the sampling method, but is generally 1-5 meters. These can be either identical sampling (or sampling and analysis) systems juxtaposed for determination of the precision of a measurement system, or two different systems put side by side to measure the relative bias between the two methods. If used for measuring precision, measurements are considered to be identical field replicates and should be identified as such.

Combustion – burning, that is, the production of heat and light energy through chemical change, such as the oxidation of hydrocarbon fuel.

Comparability – A data quality indicator, comparability is the degree to which different methods, data sets, and/or decisions agree or are similar.

Completeness – A data quality indicator that is generally expressed as a percentage, completeness is the amount of valid data collected compared to the amount of data planned.

Compliance – Conformity with environmental laws and regulations. In air quality, it can be determined by inspection procedures, monitoring and/or source testing.

Computer modeling – see Modeling

Concentration – The amount of a given substance in a stated unit of measure. Common methods of stating concentration are percent by weight or by volume, mass (weight) per unit volume, normality, etc.

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

Continuous analyzers – take measurements continuously. One minute, five minute, and one hour averages are calculated by regularly sampling (once per second or more often) the output of the analyzer.

Continuous Emission Monitor (CEM) – a type of air emission monitoring device installed to operate continuously inside of a smoke stack or other emission source.

Continuous Opacity Monitoring System (COMS) – a set of instruments and a data acquisition system for continuous instrumental measurement of the opacity of the emission from a smoke stack, etc. of a stationary source.

Control technology – equipment, processes or actions used to reduce air pollution.

Corrective action – any measures taken to rectify conditions adverse to quality and, where possible, to prevent recurrence.

Criteria air pollutants – as required by the Clean Air Act, the EPA identifies and set standards to protect human health and welfare for six pollutants: ozone (O3), carbon monoxide (CO), particulate matter (PM10 and PM2.5), sulfur dioxide (SO2), lead (Pb), and nitrogen oxides (NOx). The term "criteria pollutants" derives from the requirement that the EPA must describe the characteristics and potential health and welfare effects of these pollutants. EPA periodically reviews new scientific data and may propose revisions to the standards as a result.

Cumulative Exposure Project (CEP) – an EPA program examining how much toxic contamination Americans are exposed to cumulatively through air, food, and drinking water. The study attempts to estimate exposure levels for different communities and demographic groups nationwide, and help identify important pollutants and sources for further analysis.

Cyclone – an air pollution abatement device that removes heavy particles from an air stream through centrifugal force.

Data Acquisition System (DAS) – products and/or processes used to collect information to document or analyze some parameter or process. In the simplest form, DAS can mean logging data on a piece of paper. Often, it refers to an entire system of electronic equipment, ranging from simple recorders to sophisticated computer systems, that are capable of tying together a wide variety of products, such as sensors that indicate temperature, flow, and pressure. A datalogger is often part of a DAS.

Air Quality Glossary

Datalogger (also Data Logger) – an electronic instrument (or specialized computing device in some cases) that records digital, analog, frequency or smart-protocol based measurements over time. Some dataloggers are small, battery-powered devices, equipped with a microprocessor, data storage and even a sensor. Others are general-purpose devices that are designed to connect to a wide range of voltages and sensor types.

Data Quality Objective (DQO) – a goal or target for the quality of data to be obtained in a measurement process or project. DQOs are qualitative and quantitative statements that clarify the technical and quality objectives of the project, define the appropriate type of data, and specify tolerable levels of potential errors that will be used as the basis for establishing the quality and quantity of data needed to support decision-making. DQOs include indicators such as accuracy, precision, representativeness, comparability and completeness.

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.

Degreaser – equipment that removes grease, dirt or unwanted materials from any part or product. Degreasers typically use solvents, as liquid baths or condensing vapors, to remove such material.

Density – The mass per unit volume of a substance. For example, lead is much more dense than aluminum.

Design value – a number used by EPA to determine whether a site or area attains the standard or by how much it exceeds the standard for a particular pollutant.

Detectability – how well a pollutant or parameter can be reliably measured with the equipment in use (see also Method Detection Limit)

Dew point – the temperature at which droplets of water condense from air (dependent on the prevailing humidity).

Dew point – the temperature at which droplets of water condense from air (dependent on the prevailing humidity).

Diesel engine – a type of internal-combustion engine that uses low-volatility petroleum fuel and fuel injectors and initiates combustion using compression ignition (as opposed to spark ignition, which is used with gasoline engines).

Diesel Particulate Matter (DPM) – refers to the particulate components of diesel exhaust, which include diesel soot and solid aerosols such as ash particulates, metallic abrasion particles, sulfates, and silicates. Because of their small size, inhaled particles may easily penetrate deep into the lungs. The surface-rich morphology of these particles facilitates binding with other toxins in the environment, thus increasing the hazards of particle inhalation. DPM is considered one of the 33 Urban Air Toxics by the US EPA.

Diesel – a specific fractional distillate of fuel oil (mostly petroleum) that is used as fuel in a diesel engine. Diesel engine emissions are typically lower in carbon monoxide content than regular gasoline, but contain much higher levels of sulfur dioxide, hydrocarbons and particulate matter.

Diffusion – the characteristic movement of molecules or particles from an area of high concentration to an area of lower concentration until equilibrium is reached.

Dioxin – persistent chemicals that are the result of incomplete combustion and the manufacture of pesticides and other chlorinated substances.

Dispersion model – A computerized set of mathematical equations that uses emissions and meteorological information to simulate the behavior and movement of air pollutants in the atmosphere. The results of a dispersion model are estimated outdoor concentrations of individual air pollutants at specified locations.

Dry adiabatic laps rate (DALR) – is the theoretical rate at which a rising parcel of unsaturated air will lose temperature. Unsaturated air has less than 100% relative humidity, i.e. its temperature is above its dew point. The term 'adiabatic' means that no heat will be gained or lost from outside the parcel. The DALR is a constant 9.78 °C/km (3 °C/1000 ft, or 5.37 °F/1000 ft). The DALR is used in meteorological predictions. See also Inversion.

Dry deposition – delivery of acidic air pollutants in the gaseous or particulate form to the Earth's surfaces.

Dust – solid particulate matter that can become airborne.

Ecology – the interrelationship of organisms and their environment and the science that is concerned with that interrelationship.

Electrostatic Precipitator (ESP) – an air pollution abatement device that removes particulate matter from a gas stream by imparting an electrical charge to the particles for mechanical collection on an electrode.

Air Quality Glossary

Emission Factor (EF) – the relationship between the amount of pollution produced and the amount of raw material processed or burned. By using the emission factor of a pollutant and specific data regarding quantities of material used by a given source, it is possible to compute emissions for the source. Specific guidelines on emission factors can be obtained from the US EPA's AP-42 guidance document.

Emission Limit – a requirement in a permit or rule to limit the emissions of air pollutants. Emission limitations may be generally applicable to all sources in a jurisdictional area, or applied to a category of sources or one particular source or pollutant.

Emission Offset – (also known as an emission-trade-off.) A rule-making concept whereby approval of a new or modified stationary source of air pollution is conditional on the reduction of emissions from other existing stationary sources of air pollution, and ensures compliance with the NAAQS and PSD requirements. These reductions are required in addition to reductions required by BACT. See also Market-based trading

Emission standard – the maximum amount of pollution that is permitted to be discharged from a polluting source, for example, the number of pounds of dust that may be emitted per hour from an industrial process.

Emissions – the release of pollutants into the air from a source.

Emissions Inventory (EI) – a detailed list of air pollutants emitted into an area's atmosphere in amounts (commonly tons) per day or year, by type of source. Information from a Source Identification is compiled into a comprehensive report of sources, activities and pollutants.

Emissions Trading – see Market-Based Trading and Emission Offset.

Equivalent opacity – the application of the Ringelmann system to the evaluation of the density of other than black smoke.

Ethanol (ethyl alcohol) – a volatile alcohol containing two carbons (CH3CH2OH). For fuel use, it can be produced by fermentation of corn or other plant products.

Evaporation – the physical transformation of a liquid to a gas at any temperature below its boiling point.

Exceedance – a measured level of an air pollutant higher than the national or state ambient air quality standard.

Extension – see File Extension

Fahrenheit – a temperature scale used in the US (for purposes other than science). Temperatures in degrees Fahrenheit are symbolized by ºF after the number; differences in temperature in Fahrenheit degrees are symbolized by Fº after the number. In comparison with metric temperature scales (see Kelvin and Celsius), 0 ºF = 255.37 K = -17.78 ºC; 100 ºF = 310.93 K = 37.78 ºC

Federal Equivalent Method (FEM) – in ambient monitoring, the US EPA standard method of monitoring for a particular pollutant or other parameter using a method that has been deemed "equivalent" to the Federal Reference Methods (40CFR Part 53).

Federal Implementation Plan (FIP) – a federally (EPA) implemented plan to achieve attainment of air quality standards; used when a state or tribe is unable to develop an adequate plan. (see also State Implementation Plan, Tribal Implementation Plan)

Federal Reference Method (FRM) – in ambient monitoring, the EPA standard method of monitoring for a particular pollutant or other parameter. The FRM may be specified by technique or by design (40CFR Part 50 App. J), and typically involves manual methods for filter changes be part of the design.

Federal Register – Publication of U.S. government documents officially promulgated under the law, documents whose validity depends upon such publication. It is published on each day following a government working day. It is, in effect, the daily supplement to the Code of Federal Regulations, CFR.

Fenceline Monitor – also called "Perimeter" monitor, a fenceline monitor is an ambient air quality monitor sited on or near the fenceline or perimeter of a facility. The Occupational Safety and Health Association (OSHA) requires fenceline monitoring to determine compliance with permissible exposure limitations on those within the facility. The EPA has specific requirements for siting and data usage based on pollutant and regulatory program.

Field Blank – a "clean" sample that is otherwise treated as other samples taken in the field except that the field blank is not actually run through to the sampling process. Field blanks are used for quality control purposes and are submitted to the lab for analysis to detect any contaminants that may be introduced during the sample collection, storage, analysis or transport. Laboratories also use lab blanks for similar purposes.

Air Quality Glossary

File extension – a two-or three-letter identifier for specific computer file types that follows the file name and is separated by a "." (dot). The file extension indicates to the computer the program or application that will open the file, but may not necessarily be visible to the user (this setting can be adjusted in the computer's system). For example, "Money.xls" indicates that the file "Money" is an spreadsheet that will open in Microsoft Excel.

File type – refers to the format in which the file was saved and often refers to the application that created the file. File type can be identified by the icon adjacent to the file name or the extension (in some PC environments, this extension is not always visible).

Files – A file, in general, is a collection of data in a certain format (file type) referred to as a unit by a given name.

Flat-file databases – a database where information are stored in rows and columns, similar to a Microsoft Excel spreadsheet, however the data in an individual spreadsheet is not related to information in other spreadsheets by means of data relationships (see also Relational database system)

Fossil fuels – coal, oil, and natural gas; so-called because they are the remains of ancient plant and animal life.

Fugitive emissions – pollutants emitted from diffuse or ill-defined conditions, e.g. other than a stack or chimney.

Fume – solid particles under 1 micron in diameter, formed as vapors condense or as chemical reactions take place.

Gaseous pollutant – air pollutants that are typically in gaseous forms. Examples are ozone, carbon monoxide, sulfur dioxide, and nitrogen oxides.

Gas – state of matter in which the material has very low density and viscosity; can expand and contract greatly in response to changes in temperature and pressure; easily diffuses into other gases; readily and uniformly distributes itself throughout any container. A gas can be changed to the liquid or solid state only by the combined effect of increased pressure and decreased temperature. Examples of gases include carbon dioxide, helium, hydrogen sulfide, etc.

Gaussian – term describing (1) a type of data distribution describing density that is "normal" or "bell-shaped" when plotted graphically; data are distributed so that concentrations at the center of the curve are more concentrated than those at the extremities; (2) a type of computer modeling used for predicting the dispersion of continuous, buoyant air pollution plumes originating from ground-level or elevated sources of air pollution. Gaussian models may also be used for predicting the dispersion of non-continuous air pollution plumes (called "puff" models)

Granular Activated Carbon (GAC) – also called activated charcoal is an amorphous form of carbon formed by burning wood, nutshells, animal bones, and other carbonaceous materials. Charcoal becomes activated by heating it with steam to 800-900 degrees Celsius. During this treatment, a porous, submicroscopic internal structure is formed which gives it an extensive internal surface area. Activated carbon is commonly used as a gas or vapor adsorbent in air-purifying mechanisms and as a solid sorbent in air-sampling. Activated carbon may have a surface area in excess of 400 sq. meters/gram, with 1500 sq. meters/gram being readily achievable. For comparison, a tennis court is about 260 sq. meters.

Greenhouse effect – the natural warming of the earth's atmosphere that occurs as atmospheric gases (water vapor, carbon dioxide, and others) trap some of the energy from the sun.

Ground Level Monitor (GLM) – a type of air pollution monitoring device located around major industrial facilities to measure ambient levels of certain pollutants.

Halogen – a family of chemical elements that includes fluorine, chlorine, bromine, and iodine.

Halogenated Organic Compounds – organic compounds containing one or more atoms of a halogen. These compounds are typically stable and non-reactive, and therefore have low smog-producing potential.

Halons – Bromine-containing compounds with long atmospheric lifetimes whose breakdown in the stratosphere causes depletion of ozone. Halons are used in fire-fighting.

Hazardous Air Pollutants (HAPs) – pollutants not regulated by the National Ambient Air Quality Standards but which may contribute to irreversible illness and death; also known as toxic air pollutants or Air Toxics. EPA has documented a list of 187 that are addressed in Title III of the CAA. Examples include: asbestos, benzene, dioxin, formaldehyde, mercury, radionuclides, and vinyl chloride. (See also MACT)

Health risk assessment – a document that identifies the risks and quantities of possible adverse health effects that may result from exposure to emissions of toxic air contaminants. A health risk assessment cannot predict specific health effects; it only describes the increased possibility of adverse health effects based on the best scientific information available.

Air Quality Glossary

Health risk – the probability that exposure to a given set of toxic air contaminants will result in an adverse health effect. The health risk is affected by several factors: the amount and toxicity of emissions; the weather; how far sources are from people; the distance between sources; and the age, health and lifestyle of the people living and working at the receptor location. The term "risk" usually refers to the increased chance of contracting cancer as a result of an exposure and is expressed as a probability, e.g., chances-in-a-million.

Hi-Vol – a high-volume particulate matter air sampler used to capture PM10 or total suspended particulates (TSP). A Hi-Vol sampler collects air through a Venturi inlet with a vacuum pump that has a flow rating of approximately 40 cubic feet per minute. Hi-Vol samplers require 8x10-inch quarts fiber filters.

Hot Spot – a location where emissions from specific sources may expose individuals and population groups to elevated risks of adverse health effects, including but not limited to cancer, and contribute to the cumulative health risks of emissions from other sources in the area.

Hydrocarbon (HC) – any of a vast number of compounds containing carbon and hydrogen in various combinations found especially in fossil fuels. Some hydrocarbon compounds are major air pollutants; they may be active participants in the photochemical process that forms smog and may affect human health directly. Examples: methane, benzene, hexane.

Hydrogen Sulfide (H2S) – a gas characterized by a "rotten egg" smell and often produced by, and found in the vicinity of, oil refineries, chemical plants and sewage treatment plants; toxic in heavy concentrations.

Hydrogen Sulfide (H2S) – a gas characterized by a "rotten egg" smell and often produced by, and found in the vicinity of, oil refineries, chemical plants and sewage treatment plants; toxic in heavy concentrations.

Implementation Plan – see Federal Implementation Plan, State Implementation Plan, Tribal Implementation Plan

IMPROVE – Interagency Monitoring of PROtected Visual Environments; a collaborative monitoring program (EPA, National Park Service, States/Tribes) to establish present visibility levels and trends, and identify sources of man-made impairment through particulate speciation.

Incineration – the burning of waste in a combustion chamber.

Increment – the maximum increases in ambient pollutant concentrations allowed above the baseline concentrations in an attainment area. (also called “PSD increment”)

Independent assessment – often used when referring to audits. An independent assessment is performed by a qualified individual, group or organization that is not part of the entity directly performing and accountable for the work being assessed.

Inert gas – a gas such as helium, neon, or argon that does not react with other substances under ordinary conditions.

Inorganic gaseous pollutant – a gaseous pollutant that does not contain carbon. Examples are: sulfur dioxide, hydrogen sulfide and nitrogen oxides.

Inspection and maintenance program (I/M program) – Auto inspection programs are required for some polluted areas. These periodic inspections, usually done once a year or once every two years, check whether a car is being maintained to keep pollution down and whether emission control systems are working properly.

Internal Combustion Engine – an engine in which both the heat energy and the ensuing mechanical energy are produced inside the engine.

Inversion – the phenomenon where a layer of warm air “presses down” on and “traps” cooler air below it as the air temperature increases with altitude+A109. Inversions prevent the natural dispersion and dilution of air contaminants. Inversions are characteristic of geographic areas such as basins, valleys & canyons.

Kelvin – the standard metric unit of temperature, (symbol K). A temperature given in Kelvins is an absolute temperature; 273 K = 0 ºC = 32 ºF.

Lowest Achievable Emission Rate (LAER) – under the Clean Air Act (Title I, NSR), the rate of emissions that reflects (a) the most stringent emissions limitation in the state implementation plan identified for a source unless the owner or operator demonstrates such limitations are not achievable or (b) the most stringent emissions limitation achieved in practice, whichever is more stringent.

Lo-Vol (also Low Vol) – alternate term for PM2.5 monitor that has a flow rate of 16.7 Liters/minute.

Air Quality Glossary

Major source – a stationary source, or group of contiguous stationary sources under common ownership, that emits or has the potential-to-emit more than 100 tons per year of any pollutant regulated under the federal Clean Air Act (250 tons per year for some types of facilities), more than 10 tons per year of a single hazardous air pollutant, or 25 tons per year of a combination of hazardous air pollutants. (see also Title V, Potential-to-emit)

Management Systems Review (MSR) – the qualitative assessment of a data collection operation and/or organization(s) to establish whether the prevailing quality management structure, policies, practices, and procedures are adequate for ensuring that the type and quality of data needed are obtained.

Market-Based Trading (also called Cap-and-Trade) – an administrative approach used to reduce the cost of pollution control by providing economic incentives for achieving reductions in the emissions of pollutants. In such a plan, a central authority, such as an air pollution control district or a government agency sets limits or "caps" on each pollutant, recognizing that clean air is a common-pool resource. Groups that intend to exceed the limits may buy emissions credits from entities that are able to stay below their designated limits. This transfer is normally referred to as a trade. In some emission trading systems a portion of the traded credits are required to be retired. By retiring some of the credits the system achieves a net reduction in emissions, as well as cost reduction, from each trade. Most authorities agree that emissions trading is an effective strategy if properly designed and administered.

Maximum Achievable Control Technology (MACT) – EPA standards mandated by the 1990 Clean Air Act Amendments for the control of toxic emissions (HAPs) from various industries ranging from dry cleaners to petroleum refineries.

Measurement Quality Objectives (MQOs) – the individual performance or acceptance goals for the individual data quality indicators such as precision or bias.

Mercury – see Methylmercury

Metadata – information (data) that describes the data and the quality criteria associated with their generation. Data about sites/samplers is considered metadata related to monitoring values.

Methane – a simple hydrocarbon (CH4), also called natural gas, produced by anaerobic decomposition of organic material; methane is also a greenhouse gas.

Methanol – a single carbon alcohol, generally produced from natural gas (methane).

Method Detection Limit (MDL) – the lowest concentration that can reasonably be measured by the equipment and proved to be greater than the background level concentration (for instance, of a certain pollutant). MDLs are used to indicate that an actual amount has been measured and is not just part of the normal variability of the background levels of contaminants or instrument variability, etc. MDLs are dictated by background variability and are instrument-and/or method-specific.

Methylmercury – a highly toxic form of mercury found in the environment; CH3-Hg. Mercury deposited in the environment may be converted to methyl mercury by microorganisms or chemical processes. Methylmercury is very toxic and can accumulate in the tissues of animals and humans.

Metropolitan Area (MA) – a geographic area, consisting of one or more counties (or equivalent units or county divisions in New England) including a core city and developed areas closely integrated with that city, as determined by the US Census Bureau. An MA is classified as either a metropolitan statistical area (MSA) or a consolidated metropolitan statistical area (CMSA) composed of two or more primary metropolitan statistical areas (PMSAs).

Metropolitan Statistical Area (MSA) – a metropolitan area that is not closely associated with other metropolitan areas.

Micro – a prefix meaning 1/1000000 (one one-millionth); abbreviated as the Greek letter µ.

Micrometer – a unit of length equal to one one-thousandth of a millimeter, or one one-millionth of a meter, or about 1/25000 of an inch. Micrometers are used to measure particle size.

Micron – a unit of length equal to one one-thousandth of a millimeter, or one one-millionth of a meter, or about 1/25000 of an inch. Microns are used to measure wavelength size.

Milli – a prefix meaning 1/1000 (one one-thousandth); abbreviated as a lower case m.

MiniVol – a small, affordable, battery-operated, and portable air sampler designed to draw air at a rate of 5 liters/minute. MiniVols are not used for determining compliance with the NAAQS, but are often used for gathering baseline air quality data or for special monitoring projects.

Minor source – A stationary source that emits or has the potential to emit less than the relevant major source amount of any pollutant regulated under the federal Clean Air Act. (See also: Synthetic minor source, Actual minor source, and Potential to Emit)

Air Quality Glossary

Mist – liquid particles up to 100 microns in diameter.

Mixing height – the expanse in which air rises from the earth and mixes with the air above it until it meets air of equal or warmer temperature.

mm Hg – millimeters of mercury, a unit of pressure also called a torr, used to measure barometric pressure; the amount of (atmospheric or gas) pressure that can support 1 mm of mercury; 1 mm Hg = 133 Pa = 0.0394 in. Hg = 0.0193 lb/in^2 (psi).

Mobile source – a moving source of air pollution; includes cars, trucks, motorcycles, ships, trains airplanes, and gas-powered lawnmowers.

Modeling – the use of computer models that process meteorological and other data (chemical, photochemical, physical, etc.) or information about air pollution emissions to predict air quality scenarios for an area. There are many different types of models for different purposes. (See also Gaussian, Dispersion Model)

Monitoring Planning area (MPA) – a geographic area, usually represented by a single air monitoring reporting organization, within which ambient air quality monitors are to be sited.

National Air Monitoring Station (NAMS) – a SLAMS site that has been selected by the US EPA as part of a national network. A NAMS site must meet more stringent criteria for monitor siting, equipment type, and quality assurance. NAMS monitors also must submit detailed quarterly and annual monitoring results to the EPA. As part of EPA's new National Monitoring Strategy, NAMS and SLAMS sites are being reevaluated for efficiency and will eventually be replaced by NCore sites. (See also SLAMS, NCore)

National Ambient Air Quality Standards (NAAQS) – pollutant concentration limits that apply to ambient (outdoor) air, established by EPA to protect human health and public welfare. The NAAQS are divided into primary and secondary standards. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including visibility, animals, crops, vegetation, and buildings. (see also Criteria Pollutants)

National Atmospheric Deposition Program (NADP) – a series of environmental monitoring programs within the National Park Service including the National Trends Network (NTN), Mercury Deposition Network (MDN), and Atmospheric Integrated Research Monitoring Network (AIRMoN). These networks collect and assess data on the chemistry of precipitation for monitoring of geographical and temporal long-term trends.

National Core Monitoring Network (NCore) – an updated approach by US EPA (part of the 2002 National Monitoring Strategy) to improve efficient use of equipment and resources by eliminating SLAMS/NAMS sites that are producing redundant or invaluable air pollution data with the goal of moving from loosely tied single-pollutant networks to coordinated, highly leveraged multi-pollutant networks with real time reporting capability.

National Emissions Inventory (NEI) – a national database of air emissions information from numerous air quality agencies that contains information on stationary and mobile sources that emit criteria air pollutants and their precursors, as well as hazardous air pollutants (HAPs). Data from the NEI are used for air dispersion modeling, risk assessment and tracking trends in emissions over time. For emission inventories prior to 1999, criteria pollutant emission estimates were maintained in the National Emission Trends Inventory (NETI) database and HAP emission estimates were maintained in the National Toxics Inventory (NTI) database.

National Emissions Standards for Hazardous Air Pollutants (NESHAPs) – federal limits on the amounts of toxic air pollutants it is acceptable for a source to emit.

National Emissions Trends Inventory (NETI) – see National Emissions Inventory (NEI)

National Institute of Standards and Technology – a non-regulatory federal agency within the U.S. Commerce Department's Technology Administration. NIST's mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.

National Monitoring Strategy – collaboratively-drafted strategy of the US EPA and States, Tribes, and others to streamline and make more effective national air monitoring efforts. The strategy recommends a move towards capturing real-time air monitoring data as well as eliminating monitoring sites that are not producing interesting data and, through inter-agency collaboration or intra-agency streamlining, employ monitoring sites for as many pollutants/parameters as possible.

National Toxics Inventory (NTI) – see National Emissions Inventory (NEI)

Nephelometer – an instrument that measures the amount of light scattered.

Air Quality Glossary

New Source Performance Standards (NSPS) – pollutant emission limits for newly constructed or modified existing sources.

New Source Review (NSR) – a permitting procedure for new or modified stationary sources. NSR applies if the emissions from the new source are above a trigger level.

New Source – Any stationary source built or modified after publication of final or proposed regulations that prescribe a given standard of performance.

Nitrates – gases and aerosols that have origins in the conversion of nitrogen oxides.

Nitric Oxide (NO) – precursor of ozone, nitrogen dioxide (NO2), and nitrate; usually emitted from combustion processes (i.e internal combustion engines). NO is a colorless, flammable gas with a slight odor. Converted to NO2 in the atmosphere, it then becomes involved in particulate formation or the photochemical process of smog formation.

Nitrogen Dioxide (NO2) – a highly toxic gas that can be damaging to lung tissue and is a precursor to nitric acid formation (leads to acid deposition) and major precursor to the formation of smog (ground-level ozone). NO2 has a reddish-brown color and strong odor, but is not flammable.

Nitrogen Oxides (NOx) – gases formed in great part from atmospheric nitrogen and oxygen when combustion takes place under conditions of high temperature and high pressure; considered a major air pollutant (one of the criteria pollutants) and a precursor of ozone.

Non-Attainment – a classification for an airshed that denotes it exceeds one or more of the national ambient air quality standards (NAAQS) for the criteria pollutants based on a calculation of hourly and/or annual average concentrations.

Non-Methane Organic Compound (NMOC) – include such compounds as propane, butane, and ethane are emitted primarily from transportation, industrial processes, and non-industrial consumption of organic solvents.

Nonroad mobile sources – A category of mobile sources of air pollution that are not passenger vehicles. Typically nonroad engines are specific to a task, such as lawnmowers, tractors, snowmobiles, etc.

North American Industry Classification System (NAICS) – a system developed jointly by the US, Canada and Mexico, for classifying industries and other businesses. NAICS replaced the Standard Industrial Classification (SIC). The system assigns two-digit numbers to broad categories and adds more digits for increasingly finer classes within those categories.

Offset – a method used in the 1990 CAAA to give companies that own or operate large (major) sources in non-attainment areas flexibility in meeting overall pollution reduction requirements when changing production processes. If the owner or operator of the source wishes to increase release of a criteria air pollutant, an offset (reduction of a somewhat greater amount of the same pollutant) must be obtained either at the same plant or by purchasing offsets from another company. See also Market-based Trading.

Opacity – refers to the fraction of transmitted light obscured by the substance. For air pollution purposes, as in testing the smoke from a stack or the exhaust of a vehicle, opacity is usually measured as a percent, where 0% opacity means completely transparent and 100% opacity means completely opaque.

Open burning – the uncontrolled burning of waste materials in the open, in outdoor incinerators, or in an open dump, either intentionally or accidentally.

Open path – refers to ambient air analyzers that measure pollutant concentrations along the path of a beam of infrared, visible or ultraviolet light, as opposed to sampling analyzers, which pull air through a probe line or inlet into an analysis system.

Organic compounds – a large group of chemical compounds that contain mostly carbon, hydrogen, oxygen and nitrogen. All living organisms are made up of organic compounds. Some types of organic gases, including olefins, substituted aromatics and aldehydes, are highly reactive and thus have high ozone-producing potential.

Outlier – an extreme observation or data point that is shown to have a low probability of belonging to a specified data population.

Oxidant – an air pollutant containing oxygen that can react chemically with other substances. Nitrogen compounds and ozone are examples of oxidants.

Oxidation Catalyst – A type of catalyst which chemically converts (catalytic converter) hydrocarbons (HC) and carbon monoxide (CO) to water vapor (H20) and carbon dioxide (CO2).

Air Quality Glossary

Ozone (O3) – a pungent, colorless, toxic gas. Close to the earth's surface it is produced photochemically from hydrocarbons, oxides of nitrogen and sunlight and is a major component of smog (tropospheric ozone). At very high altitudes (10-30 miles above the earth's surface), it protects the earth from harmful ultraviolet (UV) radiation (stratospheric ozone). Ozone is the only criteria pollutant that is not emitted from a source, but is formed from other pollutants (e.g. VOCs and NOx)

Ozone Depletion – destruction of the stratospheric ozone layer, which shields the earth from harmful levels of ultraviolet (UV) radiation. This destruction is caused by the breakdown of certain chlorine and/or bromine-containing compounds (chlorofluorocarbons or halons) that catalytically destroy ozone molecules in the stratosphere.

Ozone Layer – A layer in the stratosphere (10-30 miles above the earth's surface) which helps to protect the earth from harmful ultraviolet (UV) radiation from the sun. Also called stratospheric ozone (or "good" ozone).

Part 70 – Title V permits issued by State and Local permit programs. Details are found in the Code of Federal Regulations at 40 CFR part 70.

Part 71 – Title V permits issued by EPA to sources in Indian country and in other situations, as needed. Details are found in the Code of Federal Regulations at 40 CFR part 71.

Particulate – a particle of solid or liquid matter: soot, dust, aerosols, fumes and mists.

Parts per million (ppm) – the number of parts of a given pollutant in a million parts of air.

Percentile – any one of the points dividing a distribution of values into parts each of which contain 1/100 of the values. For example, the 75th percentile is a value such that 75 percent of the values are less than or equal to it.

Performance criteria – address the adequacy of information that is to be collected for the project. These criteria often apply to new data collected for a specific use ("primary" data). See also: acceptance criteria.

Performance evaluation (PE) – A measurement that mimics actual measurements in all possible aspects, except that its composition is known to the auditor and unknown to the auditee. PE measurements are provided to test whether a measurement system can produce analytical results within specified performance goals.

Performance Evaluation Program (PEP) – an audit program for PM2.5 measurements in which the quantitative data generated in a measurement system are obtained independently and compared with routinely obtained data to evaluate the proficiency of an analyst or laboratory. The FRM Performance Evaluation Program (PEP) is a quality assurance activity which will be used to evaluate measurement system bias of the PM2.5 monitoring network. The pertinent regulations for this performance evaluation are found in 40 CFR Part 58, Appendix A, section 3.5.3.

Permit – a legally enforceable document that details how a facility or entity will operate in order to meet specific requirements of the Clean Air Act in regards to air pollutant emissions, control mechanisms, etc. Permits are used to enforce emission limits, predict total emissions, and determine compliance with local air quality regulations or requirements as specified in the SIP, TIP or FIP. Permits are issued by the permitting authority, or whoever has regulatory jurisdiction over the source. (See also New Source Review, Prevention of Significant Deterioration, Title V, Part 70, Part 71)

Permit shield – a permit provision stating that compliance with the conditions of the permit shall be deemed compliance with any applicable requirement, thus allowing a source to be shielded from enforcement action

Persistent Organic Pollutants (POPs) – synthetic (man-made) chemicals that resist the normal processes of degradation in nature. These chemicals are common constituents to pesticides and various industrial oils. Chemicals are considered POPs based on their persistence, bioaccumulation, toxicity, and potential for long-range transport. POPs are considered highly toxic to animals, humans and the environment. The 12 most notorious POPs are: DDT, heptachlor, toxaphene, mirex, aldrin, endrin, dieldrin, chlordane, hexachlorobenzene, PCBs, dioxins, and furans.

Photochemical Assessment Monitoring Station (PAMS) – a monitoring site that continuously monitors for various VOCs, as well as ozone and NOx. "Serious" ozone non-attainment areas are required to have PAMS.

Photochemical process – the process by which sunlight acts upon various compounds, causing a chemical reaction to occur.

Photochemical smog – produced when hydrocarbons and oxides of nitrogen combine in the presence of sunlight to form ozone.

Phytotoxic – poisonous to plants

Plume – a visible or measurable discharge of a contaminant from a given point of origin that can be measured according to the Ringelmann scale.

Air Quality Glossary

PM10 (Particulate Matter less than 10 micrometers in diameter) – tiny solid or liquid particles of soot, dust, smoke, and aerosols also known as PM "coarse." The size of the particles (10 micrometers or smaller, about 0.0004 inches) allows them to easily enter the passageways of the lungs where they may be deposited, resulting in adverse health effects. PM10 particles are responsible for aggravating a variety of respiratory disorders (asthma, bronchitis, etc.), but can be dislodged from the human body by coughing, etc. PM10 also causes visibility reduction.

PM2.5 (Particulate Matter less than 2.5 micrometers in diameter) – tiny solid or liquid particles, generally soot and aerosols also known as PM "fine." The size of the particles (2.5 micrometers or smaller, about 0.0001 inches) allows them to easily enter the alveoli (air sacs deep in the lungs) where they can cause adverse health effects. PM2.5 particles are not easily dislodged from the human body and may even enter into the bloodstream. PM2.5 also causes visibility reduction.

Point source – a source of pollution that is well-defined, such as a smokestack or vent in a large industrial facility.

Polychlorinated Biphenyls (PCBs) – mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. PCBs are either oily liquids or solids that are colorless to light yellow. Some PCBs can exist as a vapor in air. PCBs have no known smell or taste. Many commercial PCB mixtures exist and are used as coolants and lubricants.

Polycyclic Aromatic Hydrocarbons (PAHs) – see Polycyclic Organic Matter (POM)

Polycyclic Organic Matter (POM) – consists of over 100 identified compounds with more than one benzene ring. POM compounds are toxic chemicals formed primarily from combustion and are present in the atmosphere in particulate form. Sources of air emissions are diverse and include cigarette smoke, vehicle exhaust, home heating, laying tar, and grilling meat. POMs include Polycyclic Aromatic Hydrocarbons (PAHs) and are Hazardous Air Pollutants (HAPs).

Population – in statistics, a population consists of all possible elements that are being studied. Since typically, all possible elements cannot be studied, a sample is used to try to suggest trends, percentages, and other representative data. See also Representativeness and Sample.

Potential to Emit (PTE) – the maximum capacity of a stationary source to emit based on its physical and operational design. Any physical or operational limitation on the source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation, or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design.

Precipitators – any number of devices using mechanical, electrical, or chemical means to collect particulates. Used to measure, analyze, or control particulates. (see also electrostatic precipitator)

Precision – the level of agreement or variability among repeated measurements that can also be used to determine the reproducibility of an analysis system for quality assurance purposes. Precision is usually expressed as a standard deviation of the values when multiple measurements can be made; the relative percent difference represents precision when only two measurements are compared. (see also accuracy, bias, standard deviation, and relative percent difference)

Precursor emissions – emissions from emission sources that transform into pollutants with varied chemical properties. SO2, NOx and VOCs are precursors to ozone formation.

Prevention of Significant Deterioration (PSD) – an EPA program in which state and/or federal pre-construction permits are required in order to restrict or limit emissions in areas where air quality already meets (falls below) primary and secondary ambient air quality standards for criteria pollutants.

Primary standard – see National Ambient Air Quality Standards (NAAQS)

Probability Density Function (PDF) – for air pollution purposes, a mathematical function that describes the number of suspended particles at given times and points in space with specified chemical composition and particle size.

Quality Assurance (QA) – an integrated system of management activities involving planning, implementation, documentation, assessment, reporting, and quality improvement to ensure that a process is of the type and quality needed and expected by the customer. Good QA is good management. QA incorporates quality control.

Quality Assurance Manager – the individual designated as the principal manager within the organization having management oversight and responsibility for planning, documenting, coordinating, and assessing the effectiveness of the quality system for the organization.

Air Quality Glossary

Quality Assurance Project Plan (QAPP) – a document describing in comprehensive detail the necessary QA, QC and other technical activities that must be implemented to ensure that the results of the work performed will satisfy the stated performance criteria.

Quality Control (QC) – the overall system of technical activities that measures the attributes and performance of a process against defined standards to verify that they meet the stated requirements established by the customer; operational techniques and activities that are used to fulfill requirements for quality. QC is part of QA.

Quality Management Plan (QMP) – a document that describes the quality system in terms of the organizational structure, policy and procedures, functional responsibilities of management and staff, lines of authority, and required interfaces for those planning, implementing, documenting, and assessing all activities conducted.

Quality Management – that aspect of the overall management system of an organization that determines and implements the quality policy. Quality management includes strategic planning, allocation of resources, and other systematic activities (e.g., planning, implementation, documentation, and assessment) pertaining to the quality system.

Quality system – a structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization for ensuring quality in its work processes, products (items), and services. The quality system provides the framework for planning, implementing, documenting, and assessing work performed by the organization and for carrying out required QA and QC activities.

Quality – the totality of features and characteristics of a product or service that bears on its ability to meet the stated or implied needs and expectations of the user.

Radon – a colorless, naturally occurring, radioactive, inert gaseous element formed by the radioactive decay of radium atoms in soil or rocks. Radon is a common issue for indoor air quality concerns.

Reactive Organic Gases (ROG) – classes of organic compounds, such as olefins and aldehydes, that react more rapidly in the atmosphere to form photochemical smog or ozone.

Readiness review – a systematic, documented review of the readiness for the start-up or continued use of a facility, process, or activity. Readiness reviews are typically conducted before proceeding beyond project milestones and prior to initiation of a major phase of work.

Reasonable Further Progress (RFP) – specified rate of progress towards meeting an air quality standard, as set forth in law or in a plan.

Reasonably Available Control Technology (RACT) – air pollution abatement equipment that is both technologically feasible and cost effective; usually applied to existing major sources in non-attainment areas. RACT standards are less strict than LAER.

Reformulated gasoline (RFG) – specially refined gasoline with low levels of smog-forming chemicals.

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

Regional haze – a cloud of aerosols extending across a large region and causing noticeably hazy conditions.

Reid Vapor Pressure (RVP) – a measurement of the stabilized pressure exerted by a volume of liquid pressure at 100º F (often used to measure the volatility of liquid fuels such as gasoline). Fuels with a low RVP are used as a fuel control measure during high ozone seasons (typically summer) to reduce VOC levels in exhaust emissions.

Relative humidity – the ratio of the amount of moisture in the air to the amount of moisture in saturated air at the same temperature, pressure, and volume.

Relative Percent Difference (RPD) – an alternative to standard deviation, RPD is expressed as a percentage and used to determine precision when only two measurement values are available. RPD can be calculated with measurements from two collocated samplers and/or from a sampler value and an audit value.

Representativeness – A data quality indicator, representativeness is the degree to which data can accurately and precisely represent the actual environmental condition measured.

Air Quality Glossary

Retrofit – An engine "retrofit" includes (but is not limited to) any activity that results in the addition of new/better pollution control after treatment equipment or upgrades to certified engines or the conversion of any engine to a cleaner fuel and/or emission reducing fuel additive.

Risk Assessment – An evaluation of risk which estimates the relationship between exposure to a harmful substance and the likelihood that harm will result from that exposure. Risk assessments are generally expressed as the estimated chance per million that a person, exposed over some period of time (e.g., a 70 year lifetime) and some specified concentration of exposure, will experience a certain effect.

Risk Management – An evaluation of the need for and feasibility of reducing risk. It includes consideration of magnitude of risk, available control technologies, and economic feasibility.

Runtime – actual time as a percentage of possible time for a process, such as ambient air monitoring. For ambient air monitoring and CEMS, calibrations, verifications, checks, audits, and malfunctions are not considered runtime; therefore, 100% runtime is usually not possible for continuous monitoring systems.

Sample – in statistics, a subset of a population. Sample can also refer to a measurement taken that represents the larger environment; particulate matter captured on a filter is an example of a sample of air pollution for the area associated with the monitor.

Sampling And Analysis Plan (SAP) – a detailed document describing the procedures used to collect, preserve, handle, ship, and analyze measurements for detection or assessment monitoring parameters. The plan should detail all chain-of-custody and QA and QC measures that will be implemented to ensure that measurement collection, analysis, and data presentation activities meet the prescribed requirements.

Saturated Hydrocarbon – an organic compound consisting of only carbon and hydrogen atoms with no double or triple bonds. Examples are ethane, methane and propane. They are relatively unreactive, (i.e., do not form photochemical smog as rapidly as other organics).

Scrubber – a device that uses a high energy liquid spray to remove aerosol and gaseous pollutants from an air stream. The gases are removed either by absorption or chemical reaction.

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

Secondary standard – see National Ambient Air Quality Standards (NAAQS)

Sensitivity – the capability of a method or instrument to discriminate between measurement responses representing different levels of a variable of interest.

Significant Emission Rate (SER) – defined in tons per year (tpy) for each regulated pollutant, is used to determine whether the emissions increase from any proposed source or modification can be excluded from review on the grounds that the increase of any particular pollutant is *de minimis* (too small to consider). An emission increase for a particular pollutant that is greater than the SER defined in the NSR regulations for that pollutant is considered to be a significant increase.

Significant Impact Level (SIL) – expressed as an ambient pollutant concentration (micrograms per cubic meter (µg/m3)), is used to determine whether the ambient impact of a particular pollutant (once it is determined to be emitted in significant amounts) is significant enough to warrant a complete source impact analysis involving modeling the collective impacts of the proposed project and emissions from other existing sources.

Significant Monitoring Concentration (SMC) – The PSD regulations generally require each PSD applicant to collect one year of continuous air quality monitoring data for any pollutant determined to be subject to preconstruction review as part of complete PSD permit application. Using the SMC as a screening tool, expressed as an ambient pollutant concentration (µg/m3), sources may be able to demonstrate that the modeled air quality impact of emissions from the new source or modification, or the existing air quality level in the area where the source would construct, is less than the SMC, i.e., *de minimis* (too small to consider), and may be allowed to forego the preconstruction monitoring requirement for a particular pollutant at the discretion of the reviewing authority.

Smog – a term used to describe many air pollution problems. The word smog is a contraction of smoke and fog; often it describes the irritating stagnant haze, much of which is usually ground-level (tropospheric) ozone that results from the sun's effect on pollutants in the air. (see also photochemical smog and ozone)

Soot – very fine carbon particles that appear black when visible.

Span Gas – Span gas is air with a known high concentration of pollutant that is used to verify/calibrate a gaseous analyzer's accuracy. The analyzer should output a reading that is within 10% of the known concentration. If it does not, then the analyzer must be calibrated.

Air Quality Glossary

Spatial scale (or scale of representativeness) – a pre-determined area size used for ambient air monitoring network design to depict the area that the monitoring data represents; collocated (1-10 m), micro (10-100 m), middle (100-1,0 m), neighborhood (1-10 km), urban (10-100 km), regional (100-1,000 km), continental (1000-10,000 km), global (>10,000 km).

Special Purpose Monitor (SPM) – SPMs, or "other sites," are ambient air monitoring sites that are not SLAMS. An SPM may or may not be used to determine compliance. Their purpose is to understand the nature and causes of excessive concentrations measured at population-oriented compliance sites. They are not subject to the same siting criteria as SLAMS.

Speciation (also Speciation analysis) – used to indicate the analytical activity of identifying the quantities of one or more chemical species and measuring their distribution and/or concentration.

Spectrophotometry – involves the use of a spectrophotometer. A spectrophotometer is a photometer (a device for measuring light intensity) that can measure intensity as a function of the color, or more specifically, the wavelength of light.

Stable air mass – an air mass that has little to no vertical mixing. (see also inversion)

Standard Deviation – Used in the determination of precision where multiple measurements are available, standard deviation is the most common calculation used to measure the range of variation among repeated measurements. The standard deviation of a set of measurements is expressed by the positive square root of the variance of the measurements.

Standard Industrial Classification (SIC) – previous federal system of classifying industries and other businesses. The system assigned two-digit numbers to broad categories and 4-digit numbers beginning with those 2-digit numbers to finer classes within those categories. SIC has been replaced by NAICS, but SIC numbers are still in common use. (see also NAICS)

Standard Operating Procedures (SOPs) – An SOP is a written document that details the method for an operation, analysis, or action with thoroughly prescribed techniques and steps; a procedure that is officially approved as the method for performing certain routine tasks that should be conducted the same way every time they are done. SOPs are included in a quality assurance project plan.

Standard – see Air Quality Standard

State and Local Air Monitoring Station (SLAMS) – an ambient monitoring station designed and operated by a state or local air pollution control agency to meet its SIP requirements. Only population-oriented SLAMS acquire data for determining compliance with standards. All SLAMS must meet monitor siting criteria and be operated under quality-assurance requirements specified by the US EPA. (See also NAMS).

State Implementation Plan (SIP) – A plan prepared by states and submitted to U.S. EPA describing how each area will attain and maintain national ambient air quality standards. SIPs include the technical foundation for understanding the air quality (e.g., emission inventories and air quality monitoring), control measures and strategies, and enforcement mechanisms. (see also Tribal Implementation Plan and Federal Implementation Plan)

Stationary source – a fixed, non-mobile producer of pollution, usually industrial or commercial facilities.

Stratosphere – the portion of the atmosphere that is 10 to 30 miles above the earth's surface. (see also troposphere and ozone)

Sulfur Oxides (SOx) – pungent, colorless gases formed primarily by the combustion of sulfur-containing fossil fuels, especially coal and oil. Considered major air pollutants that can easily convert to aerosols, sulfur oxides may impact human health, damage vegetation, and contribute to acid deposition.

Supplemental Environmental Project (SEP) – a SEP must improve, protect, or reduce risks to public health or the environment; be undertaken in settlement of an enforcement action; and must be a project that the alleged violator is not otherwise legally required to perform.

Surveillance – monitoring the conduct of a source or a program and the analysis of records to ensure that specified requirements are being fulfilled.

Synthetic minor source – a stationary source that is a minor source due to the application of enforceable controls that limit its potential to emit to below the relevant major source threshold(s). (see also Minor source, Actual minor source, and Potential to emit)

Tapered Element Oscillating Microbalance (TEOM) – a continuous ("real-time") air quality monitor for particulate matter. It measures the mass collected on an exchangeable filter cartridge by monitoring the corresponding frequency changes of a tapered element. The sample flow passes through the filter, where particulate matter collects, and then continues through the hollow tapered element on its way to an electronic flow control system and vacuum

pump. As more mass collects on the exchangeable filter, the tube's natural frequency of oscillation decreases. A direct relationship exists between the tube's change in frequency and mass on the filter.

Technical assessment – a systematic and objective examination of a project to determine whether environmental data collection activities and related results comply with the project's QA Project Plan, whether the activities are implemented effectively, and whether they are sufficient and adequate to achieve the QA Project Plan's data quality goals. Technical assessments document the implementation of the QA Project Plan.

Technical Systems Audit (TSA) – a thorough, systematic, on-site, qualitative audit of facilities, equipment, personnel, training, procedures, record keeping, data validation, data management, and reporting aspects of a system.

Title I – a section of the 1990 amendments to the federal Clean Air Act that deals with stationary sources, attainment, non-attainment and Prevention of Significant Deterioration.

Title II – a section of the 1990 amendments to the federal Clean Air Act that deals with mobile sources.

Title III – a section of the 1990 amendments to the federal Clean Air Act that deals with the control of Hazardous Air Pollutants (HAPs).

Title IV – a section of the 1990 amendments to the federal Clean Air Act that deals with acid deposition.

Title V – a section of the 1990 amendments to the federal Clean Air Act that deals with operating permits for major sources of air pollution.

Title VI – a section of the 1990 amendments to the federal Clean Air Act that deals with stratospheric ozone protection.

Total Organic Gases (TOG) – gaseous organic compounds, including reactive organic gases and relatively unreactive organic gases such as methane.

Total Suspended Particulates (TSP) – particles of solid or liquid matter suspended in a sample of ambient air. TSP is collected on filtration media and analyzed by weight only. Particle sizes represented by the method are up to 100 micrometers (mm) in aerodynamic diameter.

Toxic Best Available Control Technology (TBACT) – similar to BACT standards but applies to sources of toxic emissions. In many cases, it is the same as BACT. The standards are based on using the most up-to-date methods, systems, techniques, and production processes available to achieve the greatest feasible emission reductions. These are the most stringent requirements for new or modified sources and are determined on a case-by-case basis.

Toxic Release Inventory (TRI) – The Toxics Release Inventory (TRI) is a publicly available EPA database that contains information on toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities.

Treatment as a State (TAS) – (also known as "eligibility determination" or "treatment in a manner similar to States") Because the Clean Air Act, like many other environmental statutes, is specifically designed for state implementation, before EPA can approve a tribal CAA program a tribe must first be determined eligible by EPA to be treated as a state for that program. The process is outlined in the TAR: to be determined eligible, tribes must demonstrate (1) federal recognition, (2) an adequate governing body, (3) jurisdictional authority, and (4) capability to effectively administer the CAA program for which the tribe is seeking approval.

Tribal Authority Rule (TAR) – 40 CFR Part 49, Subpart A of the CAAA of 1990. The TAR provides tribes with the authority to implement the CAA and instructs EPA to promulgate regulations specifying the CAA provisions for which it is appropriate to treat tribes as states. The TAR also provides for flexibility in tribal air program development, a reduced match requirement for air program grants and federal implementation as necessary and appropriate to protect tribal air quality. The TAR was promulgated on February 12, 1998 and was upheld by the U.S. Supreme Court in April 2001.

Tribal Implementation Plan (TIP) – an EPA-approved tribal plan for attaining and maintaining national ambient air quality standards. (see also State Implementation Plan).

Troposphere – the layer of the atmosphere nearest the earth's surface. The troposphere extends outward about 5 miles at the poles and about 10 miles at the equator.

Ultraviolet (UV) radiation – radiation emitted from the sun (more specifically known as UV-B) that can adversely affect human and ecosystem health when found at elevated levels in the earth's troposphere. UV radiation is typically filtered out by the earth's stratosphere. (see also greenhouse effect, troposphere, stratosphere and ozone).

Underground Storage Tank (UST) – a tank located completely or partially under ground that is designed to hold gasoline or other petroleum products or chemical solutions.

Air Quality Glossary

Unstable air mass – an air mass that is vertically well-mixed. (see also inversion)

Validation – a process that extends the evaluation of data beyond method, procedural or contractual compliance (i.e. data verification) to determine the analytical quality of a specific data set.

Variance – A statistical term used in the calculation of standard deviation, variance is the sum of the squares of the difference between the individual values of a set and the arithmetic mean of the set, divided by one less than the numbers in the set. (see also Standard Deviation)

Vehicle Miles Traveled (VMT) – a number used in calculating emissions from roadways. For small-scale emissions inventories, the VMT can be calculated by multiplying the number of miles of road by the number of vehicles per day. In large-scale EIs, the number is a result of a complex calculation (called fuels-based method) based on tax revenue data and demographic statistics, on-road fuel consumption data, and refueling losses and control measures.

Verification – a process of checking a measurement instrument or standard in order to verify its accuracy against an instrument of accepted accuracy. Verifications are similar to calibrations except that verifications do not involve any adjustments to the instrument or standard (instrument or standard is operating within acceptable range).

Visibility impairment – any humanly perceptible change in visibility (visual range, contrast, coloration) from that which would have existed under natural conditions.

Volatile Organic Compounds (VOCs) – also called Volatile Organic Carbons, VOCs are organic (carbon-containing) compounds that evaporate (or volatilize) readily at typical atmospheric temperatures. Most VOCs appear on EPA's list of Hazardous Air Pollutants. VOCs are a major precursor of ground-level ozone formation.

Wet deposition – delivery of air pollutants in the gaseous or liquid form to the Earth's surfaces. (see also Dry deposition and Acid deposition)

Zero Air – pure air, used for calibrating air monitoring instruments. The US EPA requires zero air to have less than 0.1 ppm of hydrocarbons.

Zero/span – part of the QA/QC process for many of continuous analyzers is the daily zero/span cycle. Each day, the normal sample port is closed to the analyzer and zero air is fed to the analyzer. If the analyzer does not read zero, then the data is adjusted by a corresponding amount. This common procedure is known as baseline correction. After the zero air comes the span gas. Span gas is air with a known high concentration of pollutant. The analyzer should output a reading that is within ten percent of the known concentration. If it does not, then the analyzer must be calibrated. (see also Zero Air and Span Gas)

Adapted and Compiled by:
Institute for Tribal Environmental Professionals (ITEP) at Northern Arizona University

Sources:

1. *Bay Area Air Quality Management District (http://www.baaqmd.gov/pie/aqgloss.htm)*
2. *National Park Service (http://www2.nature.nps.gov/ard/glossary.htm)*
3. *Occupational Health and Safety Association (http://www.osha.gov/)*
4. *US Environmental Protection Agency (http://www.epa.gov/)*