



Particulate Matter Ten Microns and less (PM₁₀)

Glossary

Including AQ Acronyms and Definitions

ACRONYMS and DEFINITIONS

Air monitoring: The proof of any strategy is ultimately gauged on what is monitored. Sampling devices are placed in each community to determine if there is a pollution problem and then, if one is identified, the actual impact on an area. The data collected from the samples is also placed into the PM₁₀ control plan to complete the pollution picture for a given community.

Beta Scatter, B-scat: B-scat is the unit measurement from the Nephelometer. B-scat is an acronym for Beta Scatter that is the light scattering measurement value. B-scat is a relative measure that most closely reflects or scatters light from very fine or ultra fine particulate matter. The larger particulate matter typically does not scatter light as well as the very fine particulate matter.

Clean Air Act and Amendments (CAA): A federal rule promulgated by the Congress of the United States that identifies all the clean air standards for the nation.

Clean Air Act Deadline: The Clean Air Act Deadline in the 1990 amendment was December 31, 1994. This deadline was for those cities that were identified by the State of Oregon when the 1990 amendment was passed as nonattainment. Oregon had to develop plans identifying strategies and had roughly three years to bring each of these areas back into attainment prior to that deadline. Then, a maintenance plan would need to be developed to assure that these areas would remain in attainment for the next ten years. For new nonattainment areas identified, a new deadline is developed for each of these areas allowing about three years for attainment strategies to work.

Cubic Meter: A measurement of air volume. A cubic meter is about 35 cubic feet.

Curtailement: A community-based program designed to insure wood stove owners are not burning their wood stoves on specific days. It can be a voluntary curtailement program, or it can be a mandatory curtailement program. Generally, a community will issue an advisory forecast that predicts when air pollution will be bad in an area. The committee or local government will request of the community members not to burn their wood stove on that day.

Curtailement Compliance: Visual observations of community members homes to determine the effectiveness of the curtailement strategy. A baseline is established for those homes that burn on cold green days. When residents are requested not to burn in their wood stoves, a curtailement compliance survey will be conducted to compare against a baseline value. Once this comparison is made, committee members or a local air quality coordinator can determine the effectiveness of the curtailement program.

Degrees Centigrade or Celsius: A scientific measurement of temperature. Zero degrees Celsius is the temperature that water freezes. To change from Fahrenheit to Celsius the formula is $C = 5/9$ times $(F - 32)$.

Emission Controls: Strategies developed for each source of pollution. These controls are synonymous with strategies identified above.

Emission Inventory, E.I.: A tally of all sources of pollution for a given area and represents their relative impact on an airshed. Each source of pollution has a production of emissions and these emissions are all added together to determine the total amount of pollution in an area. These emission inventories are then placed into models to determine how the emissions will be reduced for an area.

Emission Reduction Strategies: Ideas or strategies to reduce pollution in a certain area. A local government at the recommendation of an air quality committee usually formalizes these ideas. If an area becomes nonattainment, these ideas are formalized in a PM₁₀ Control Plan or an “Attainment Plan” or a “Maintenance Plan” to present to EPA as the strategy to bring the city or area back into compliance with the standards.

Growth Management Strategies: Important strategies to prevent unbridled growth of emissions in a specific category. These strategies may or may not result in a reduction in emissions from its implementation. The strategies can be identified in an “Attainment Plan” or a “Maintenance Plan”.

Maintenance Plan: Once a nonattainment area meets the National Ambient Air Quality Standard and meets the Clean Air Act deadline, DEQ is required to develop a Maintenance Plan to show EPA that the former nonattainment area can continue to maintain air quality below the National Ambient Air Quality Standard. This plan is very similar to an Attainment Plan, in that it must use an analysis of data to show that the prior years were not an anomaly.

Meteorology: The science of weather measurements. DEQ collects temperature and windspeed data. This data to correlate pollution levels and assist in the understanding of the weather influences on pollution.

Microgram: A very small scientific measurement of weight. A microgram is one millionth of a gram. One ounce is about 28 grams.

Modeling: Used to quantify worst case situations to determine the impact of pollution on an area. Mathematical models have been developed to take actual or estimated data and analyze the impacts of various sources of pollution in an area. It has been described as putting information into a black box and out the other end comes the estimated amount of pollution a given area will have. These estimates are then used to determine the effectiveness of strategies and are used to show EPA how pollution will be reduced in an area.

NAAQS (National Ambient Air Quality Standards): Ambient (outdoor) standards for particulate matter. The 24-hour standard for PM₁₀ is 150 micrograms per cubic meter (ug/m³) from midnight to midnight. The annual average standard for PM₁₀ is 50 ug/m³. The 24-hour standard for

PM_{2.5} is 65 µg/m³ from midnight to midnight. And the annual average standard for PM_{2.5} is 15 µg/m³. All must be met to be in compliance and avoid nonattainment area status.

Nephelometer, Neph: An instrument that determines light scattering. This instrument provides hour by hour light scattering data and can be accessed by a computer modem. Light scattering is useful because it roughly correlates to the amount of fine particulate matter in the air. Once sufficient data is collected, a correlation can be made between light scattering and PM_{2.5} and PM₁₀ concentrations. The hourly light scattering data can then be used to immediately identify an estimated amount of pollution in the air over the last 24-hour period. It is also used in conjunction with weather information to predict what the pollution will be for the following evening. The advisory forecasts are based in part on this information. A person doesn't need to wait for two months for the results of a PM₁₀ or PM_{2.5} sampler to suspect if they are in violation of a standard. One caution, however, it does not necessarily give the same result as the PM_{2.5} or PM₁₀ samplers. EPA does not approve a nephelometer as a sampler to determine violations of the NAAQS.

New Source Review: Rules that spell out requirements for new and expanding industrial sources of pollution. Sources affected by these rules normally emit more than 15 tons of PM₁₀ per year, and are required to have emission control equipment and model their emissions to demonstrate compliance with standards or other thresholds established by rule.

Nonattainment: A label applied to cities or areas that do not meet the National Ambient Air Quality Standard (NAAQS). It is a formal designation, which means that EPA must identify the city as not meeting the standard and they must formally publish the results in the Federal Register. Once a city is designated nonattainment there is a similar formal process to reclassify the city back into attainment.

Public "Education", Public Awareness: An effective strategy in controlling pollution in a given area. When the public becomes aware of pollution they often respond by taking proactive steps to minimizing their sources of the pollution.

PM_{2.5}: The fine particulate matter that is 2.5 microns or less in diameter. EPA established a new standard similar to the PM₁₀ standard but at a lower level (see NAAQS).

PM₁₀: An acronym for fine particulate matter that is in the air. This particulate matter is ten microns and less in diameter. Cannot be seen with the naked eye. For reference the period at the end of this sentence is about 500 microns in diameter.

PM₁₀ or PM_{2.5} Control Plan: Referred to as an "Attainment Plan". When a city or area has data that shows it has violated the NAAQS, DEQ prepares a PM₁₀ or PM_{2.5} Control Plan. This plan is a formal document that identifies the strategies a particular city or area will use to bring it back into compliance with the standards. The strategies are formalized, and must be measurable. Each strategy is detailed and must be followed completely. The effectiveness of each strategy must be

measured. EPA holds the State and the local community responsible for implementing the strategy. DEQ must prove to EPA that the strategy is working.

PM₁₀ samplers: Air samplers that measure the amount of PM₁₀ concentration in the air. PM₁₀ samplers are normally “reference method” samplers that have specific requirements set by EPA for manufacturing and operation. Air sampling needs to be consistent nation-wide to compare one sample to another and the reference method sampler allows this comparison. It is different than a nephelometer because it measures the weight of the particulate matter by a volume of air mass over a period of time. The nephelometer only measures light scattering.

Redesignation: When a nonattainment area is formally designated as returning to attainment. It is a formal declaration by EPA that the former nonattainment area is now back into attainment. It recognizes that the strategies have been working and will continue to work to maintain clean air in a community. It does not mean that communities can go back to the old ways of doing things.

State Implementation Plan (SIP): A document which details how the state is going to implement federal requirements. EPA and DEQ reviews each element of the Plan to determine the effectiveness of DEQ’s air quality programs. The SIP is detailed and specific in its plans to keep Oregon’s air clean. Each PM₁₀ or PM_{2.5} Control Plan becomes part of the overall SIP.

Temperature Inversion: When a warm air mass traps a cold air mass next to the ground. When these situations arise, fine particulate matter pollution (particularly from woodstove smoke) increases. Typically more wood when it is cold outside; the cold air mass collects the wood smoke; and the warm air mass traps the cold air and the wood smoke and keeps the pollution next to the ground where people breath. The strength of the inversion depends upon weather conditions. During high pressure, clear skies, and typically in valleys or low lying areas, inversions can become strong and trap the pollution very close to the ground.

Wind Speed: An important measurement to make when predicting air pollution events. Typically, wood smoke pollution occurs when wind speeds are less than 3miles per hour. Any wind speed greater than 3 miles per hour usually removes pollution from an area.