

GLOSSARY

Areal extent—Fraction (or percentage) of the source area that is affected by the control measure.

Aerodynamic particle size—Diameter of a sphere of unit density, which behaves aerodynamically as a particle with different sizes, shapes, and densities.

Aggregate material—Mineral particles, such as sand or stone, typically derived from a mechanical process.

Agricultural tilling—Mechanical disturbance of agricultural soil by discing, shaping, chiseling, and leveling using a tractor or implement.

Annual interest rate—The yearly cost of borrowing money, expressed as a percentage of the amount borrowed.

Annualized cost of control—Average yearly costs of a control system including annual operating costs such as labor, materials, utilities and maintenance items, and annualized costs of the capital costs of purchase and installation. Annualized costs are dependent on the interest rate paid on borrowed money or collectable by the plant as interest (if available capital is used), the useful life of the control equipment, and depreciation rates of the equipment.

AP-42—Abbreviation for the U.S. EPA’s publication “Compilation of Air Pollutant Emission Factors.”

BACM—Abbreviation for Best Available Control Measures—techniques that achieve the maximum degree of emissions reduction from a source, as determined on a case-by-case basis considering technological and economic feasibility.

Bare soil adjustment—Adjustment to windblown emissions for the planted acreage on which plants do not establish.

Base year—Year for which the pre-control emissions inventory was performed.

Baseline Emissions—Emissions (total or source) in the base year.

Batch drop—Materials handling process involving free fall of aggregate, as from a bucket.

Border adjustment—Adjustment to windblown emissions for the nonplanted regions of the acreage dedicated to a given crop that separate it from surrounding regions.

CAPCOA—Acronym for California Air Pollution Control Officers’ Association.

Capital recovery factor—Amount of money per dollar of machinery investment required to pay annual interest costs on unrecovered investment and to recover the costs of the investment within a specified number of years at the given interest rate.

Chemical wetting agent—Compound added to water in order to enhance the penetration of water into dusty material and prevent dust emissions.

Clay—Cohesive soil with individual particles not visible to the unaided human eye (less than 0.002 mm in diameter). Clay can be molded into a ball that will not crumble.

Climatic factor “C,” annual—Parameter used to estimate the effects of climate on soil erodibility. Garden City, Kansas is set to 1.0 and temperature, wind, and precipitation are used to adjust the factor.

Climatic factor “C,” monthly—Parameter used to modify the annual “C” factor equation for a particular month of the year. The U.S. EPA uses mean monthly wind speed in place of the annual wind speed. The ARB methodology uses the month-as-a-year method.

Cloddiness—Level of relatively stable agglomerations in soil caused by exposure to water cohort (maturation class).

Compliance tool—Means for checking whether a facility is meeting legal requirements for control of a pollutant. Compliance tools include record keeping logs, databases, and site inspection methods.

Continuous drop—Materials handling process involving continual release of aggregate, such as from a conveyor.

Control application rate/frequency—Amount of pollutant suppressant applied over a particular area and the number of times per period that the suppressant is applied.

Control efficiency—Degree (e.g., percentage) to which a control measure is effective in limiting the release of a pollutant.

Control efficiency decay rate—Decrease in control efficiency for a control measure with a limited life span.

Control extent—Fraction of emissions from a source category that will be affected by a control method.

Control measure—Procedure or course of action taken to reduce air pollution. Preventive measures reduce source extent or incorporate process modifications or adjust work practices to reduce the amount of pollutants. Mitigative measures involve the periodic removal of pollutant causing materials, such as the cleanup of

spillage on travel surfaces and cleanup of material spillage at conveyor transfer points.

Controlled emissions—Estimated emissions (total or by source category) after application of control measures, i.e., remaining emissions.

Cost effectiveness—Control cost divided by the mass of emissions reduced (most typically expressed in terms of “dollars per ton”).

Crop calendar—Temporal distribution of agricultural activities (e.g., planting and harvesting dates).

Crop canopy cover factor—Adjustment to windblown emissions based on the crop canopy cover.

Crop canopy cover—Fraction of land sheltered by vegetation, as viewed directly from above.

Crust—The hard outer surface of soil (or other dust producing material) that inhibits the wind erosion of underlying fine particles.

Cut and fill—The activities of earthmoving equipment where soil or rock is removed from one area (cut) and deposited elsewhere on shallow ground (fill).

***De Minimis* source**—Facility or operation with emissions that are below a certain threshold, classifying them as insignificant sources of emissions; refer to 40 CFR, Part 52 for more details.

Demonstrated control technique—A control measure that is supported by verifiable tests as to the control efficiency the measure will achieve.

Deposition—Accumulation of airborne particles on ground-level surfaces through gravitational settling and other physical phenomena.

Disturbance—Destabilization of a land surface from its undisturbed natural condition thereby increasing the potential for fugitive dust emissions.

Dunes—Ridges or mounds of loose, wind-blown material, usually sand.

Dust—Fine, dry particles of matter able to be suspended in the air.

Dust Control Plan—Legally mandated plan for a geographical area or dust-producing operation that identifies how emissions will be controlled to attain the requirements of the Clean Air Act and Amendments.

Dust suppressants—Water, hygroscopic materials, solution of water and chemical surfactant, foam, or non-toxic chemical/ organic stabilizers not prohibited for use by the U.S. Environmental Protection Agency or any applicable law, rule or regulation, as a treatment material to reduce fugitive dust emissions.

Economic Life—Length of time during which a product or piece of property may be put to profitable use. (Usually less than its physical life)

Emission activity level—A numerical measure of the intensity of a process that emits pollutants (e.g., miles traveled by a vehicle, tons of transferred material). Also referred to as source extent or process rate.

Emission factor—A representative value that relates the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. These factors are usually expressed as the weight of pollutant divided by a unit weight, volume, distance, or duration of the activity emitting the pollutant.

Emission parameters—Values that affect pollutant emissions, such as moisture level and silt content of the emitting material.

Emission reduction—Amount (mass or percent) of emissions eliminated by control application.

Enforcement/Compliance costs—Expenses associated with enforcing control measures, including government agency and source facility expenditures.

Erosion potential—Value representing the potential for suspension of surface dust by wind erosion. Depending on the presence of a surface crust or surface disturbance, particle size distribution, and moisture content, a site is characterized as having 1) unlimited erosion potential, 2) limited erosion potential, or 3) no erosion potential.

Fastest mile of wind—The highest wind speed over a specified period (usually the 24-hour observational day) of any “mile” of wind. The fastest mile of wind is the reciprocal of the shortest interval (in 24 hours) that it takes one mile of air to pass a given point.

Fetch—Distance over which soil is eroded by a wind having a relatively constant direction and speed.

Friction velocity—Measure of shear stress of the wind on the exposed surface of soil or other aggregate material, causing loose particles to be lifted from the surface.

Fugitive dust source—Emitter of airborne particles where the particulate emissions cannot reasonably be passed through a stack, chimney, vent, or other functionally equivalent opening. Fugitive dust sources include roadways, construction

(earthmoving and demolition), material handling operations, soil tillage, and wind erosion.

Gravel—Soil particles ranging from 1/5 inch to 3 inches in diameter.

Grid counting method—Method used to estimate areas contained between contour lines on maps.

Ground inventory—A measurement of the amount of dust suppressant applied to an unpaved surface, usually expressed as gallons of suppressant per square yard of road surface.

Growing canopy fraction (GCF)—The proportion of the acreage that will have the crop canopy cover factor applied to it.

Half life of control—The time required for control efficiency to fall to half its initial value.

Irrigation factor (wetness)—Adjustment to the erodibility due to surface wetness from irrigation.

Long-term irrigation-based erodibility adjustment—Adjustment that takes into account changes in cloddiness of the soil, based upon differences between irrigated and nonirrigated soils.

Material throughput—Output rate of processed material.

Mitigative control—Control measure that periodically removes exposed dust-producing material.

MOBILE model—Software tool developed by EPA to predict gram per mile emissions of hydrocarbons, carbon monoxide, oxides of nitrogen, carbon dioxide, particulate matter, and toxics from cars, trucks, and motorcycles under various conditions.

Mode—The most frequent value in a group of values. The approximate mode of a particle size distribution (i.e., particle size diameter) can be found by sieving a surface material sample to find the threshold friction velocity using a modification to W.S. Chepil's method.

Moisture content—A measurement, usually expressed as a percent, of the mass of water in a material sample. Moisture content is obtained by weighing the original sample and then drying the sample to obtain the mass of vaporized water.

Month-as-a-year—Term used by California Air Resources Board (ARB) staff to describe method of calculating the climatic "C" factor profile by assuming that each month's data for a given site describes a unique annual climatic regime.

Most cost-effective—Having the lowest cost per mass of PM emissions reduced.

Most efficient—Having the highest control efficiency (note that preventive controls are usually addressed before mitigative controls).

Mulch—Any material used to cover a soil surface to conserve soil moisture and prevent erosion.

Nonattainment area—Geographic area that is not in compliance with federal health-based air quality standards for an air pollutant (e.g., PM-10).

Nonerodible material—Objects larger than 1 centimeter in diameter that are not susceptible to movement even on windy days (e.g., gravel, hard-packed soil clods).

Operating/Maintenance costs—Expenses associated with personnel, materials, consumables, equipment repair, and other types of continuing expenses.

Overhead costs—A broad category of costs associated with administration.

Pan evaporation rate—The rate of evaporation from a US Class-A pan that is filled with water, with daily measurements made of the water level to compute the resulting daily water loss.

Peak wind gust—A maximum wind speed defined by U.S. weather observing practice, with gusts reported when the peak wind speed reaches at least 16 knots and the variation in wind speed between the peaks and lulls is at least 9 knots. The duration of a gust is usually less than 20 seconds.

Plant/harvest date pair—Methodology that uses planting cohorts split between harvest months, using the fraction of the total crop planted in a given month with the fraction of the total crop harvested in a given month.

PM_x—Airborne particulate matter with aerodynamic diameters equal to or less than x μm (e.g. PM₁₀, PM_{2.5})

Portable wind tunnel—Moveable air channel with an open bottom through which air is drawn at different velocities. This type of wind tunnel with a backend sampling system is used to investigate particle emissions by wind erosion, as a function of wind speed.

Postharvest soil cover factor—Adjustment to windblown emissions based on the fraction of land covered after harvest when viewed directly from above.

- Precipitation effectiveness (PE)**—See “Thornthwaite’s precipitation-evaporation index”; the sum of 12 monthly values (ratios of precipitation to actual evapotranspiration).
- Preventive control**—Control measure that inhibits or minimizes the accumulation of exposed dust-producing material.
- Prewatering**—Application of water during construction and earthmoving operations to excavation areas and borrow pits before earth is excavated. The areas to be excavated are moistened to the full depth from the surface to the bottom of the excavation to achieve an optimum moisture content for fugitive dust control.
- Quality rating**—An assessment level of A through E as assigned by EPA to each emission factor in AP-42, with A being the best. A factor's rating is a general indication of the reliability, or robustness, of that factor.
- Replant-to-different-crop factor**—Adjustment to windblown emissions for harvested acreages that are quickly replanted to a different crop.
- Reservoir**—Amount of surface particles available for sustaining wind erosion. Surface soil properties determine the duration of dust events, and limited reservoirs will emit dust for a shorter duration of time (i.e., minutes) than unlimited reservoirs (i.e., days).
- Revegetation**—Vegetative cover that has been established on previously disturbed ground, such as a construction site.
- Revised Wind Erosion Equation (RWEQ)**—Model that is intermediate in complexity between the wind erosion equation (WEQ) and the wind erosion prediction system (WEPS).
- Rock**—Soil particles greater than 3 inches in diameter.
- Roughness height**—Height above ground level where the wind speed is theoretically reduced to zero because of surface obstructions; a measure of surface protrusion into the boundary layer wind flow.
- Sand**—Soil particles ranging from 0.05 to 2.0 mm in diameter; individual particles are visible to the unaided human eye.
- Senescence**—Process of plant aging and dying that is characterized by decreasing growth rates, chlorophyll breakdown, and mobilization of nitrogen out of leaves and into other plant organs.
- Sheltering elements**—Blockages to wind that inhibit wind erosion of soil. Examples include wind fences and trees.

SIC code—Abbreviation for Standard Industrial Classification code. A numbering system established by the Office of Management and Budget that identifies companies by industry.

Sieving—Process of passing a material through a series of woven square meshes of decreasing size to separate particles into different particle size classes. For agricultural soil classification, wet sieving disperses the material in a liquid before passing the suspension through one or more sieves. Dry sieving is used to characterize material dustiness levels and can be performed either by a mechanical sieve shaker or by rotational hand sieving.

Silt content—Percentage of particles less than 74 μm in physical diameter (i.e., fraction passing a standard 200-mesh sieve).

Silt—Noncohesive soil whose individual particles are not visible to the unaided human eye (0.002 to 0.05 mm). Silt will crumble when rolled into a ball.

Soil classes (types)—Classifications used by soil scientists: representative erodibilities have been measured, which allow soil maps to be used to estimate erodibilities for agricultural land.

Soil cover deterioration—Reduction in postharvest soil cover due to the effects of weather, sunlight, insects, microbes, etc.

Soil loss ratio (SLR)—The ratio of the soil loss for a soil of a given cover divided by the soil loss from bare soil.

Soil texture—The relative proportions of clay, silt, and sand in soil.

Soil—Surface material consisting of disintegrated rock and organic material.

Source Extent—See “Emission activity level.”

State Geographic Data Base (STATSGO)—Database of soil data produced and maintained by the NRCS.

Stepwise linear regression—Process of determining best-fit polynomials for a predictive mathematical model. The procedure involves least squares regression analysis in a forward stepping procedure

Surface disturbance—See “Disturbance.”

Surface loading—Mass of loose material per paved road surface area. Total surface loading is measured by vacuuming a known area of paved road surface to obtain all material regardless of particle size. Silt surface loading is obtained by sieving the

total surface loading and refers only to particles with physical diameters less than 74 μm .

Surface stabilization/treatment/improvement—The paving, graveling, chemical stabilization, or watering of a dust-emitting surface to prevent dust emissions due to mechanical disturbance and wind erosion.

Thornthwaite’s precipitation-evaporation index—A measure of soil aridity, calculated as the ratio of precipitation to evapotranspiration.

Threshold friction velocity—Friction velocity that closely corresponds to the threshold wind speed for wind erosion of a specific surface. See “Friction velocity.”

Threshold source size—An emission level below which a facility or dust-emitting activity is not regulated.

Threshold wind speed—Wind speed (measured at a reference height of 10 m) below which wind erosion does not occur from the exposed surface being considered.

Tillage—Practice of producing a soil surface to maintain surface residue, prepare a seed bed, conserve soil moisture, and reduce wind erosion.

Trackout—Accumulation of mud/dirt on paved roads, as deposited by vehicles that exit unpaved sites such as construction areas, agricultural fields, quarries, dumps, or batch plants.

Traffic volume—Measure of the number of vehicles traveling over a road segment. Vehicle miles traveled (VMT) on a road equals the average daily traffic (ADT) times the roadway length.

Uncontrolled emissions—Total emissions before application of any control measures.

Unit-operation emission factors—Emission factors that represent sub-processes or separate activities associated with an emission source.

Vegetative cover/residue—Organic matter, either growing or dead, that protects the soil surface from the erosive force of wind.

Visible dust—For regulatory purposes, means airborne particles that obscure an observer’s view to a degree equal to or greater than a specified opacity limit.

Wet stabilization/watering—See “Surface stabilization.”

Wind barrier/Wind sheltering—See “Sheltering element.”

Wind erosion equation (WEQ)—Methodology originally developed to estimate wind erosion from agricultural lands. Later modified by U.S. EPA to use for estimating PM emissions.

Wind Erosion Prediction System (WEPS)—Detailed simulation model to predict wind erosion emissions; currently in development. May be useful in future, especially for episodic modeling.

Wind erosion—Removal of dry soil particles from the ground surface by wind, causing airborne particulate matter downwind of the emitting soil area.

Wind shear—Force of wind parallel to a surface that can remove loose particles, as opposed to wind directly impacting the surface.

Worst-case emissions—See “Uncontrolled emissions.”