GLOSSARY

ACRONYMS AND ABBREVIATIONS

AAS	Atomic absorption spectroscopy
AC	Automated colorimeter
AIM	Aerosol Inorganic Model
AIRS	U.S. Aerometric Information Retrieval System for ambient air quality observations
ASOS	Automated surface observing system
AURAMS	A Unified Regional Air-quality Modeling System developed by Meteorological Service of Canada, Environment Canada
AUSPEX	Atmospheric Utility Signatures, Predictions, and Experiments
AWOS	Automated weather observing system
BC	Black carbon
BEIS	Biogenic Emission Inventory System
CAC	Canadian Common Air Contaminants emission inventory
CAAA	(U.S.) Clean Air Act and its Amendments
CAPMoN	Canadian Acid Precipitation Monitoring Network
CARB	California Air Resources Board
CASTNet	(U.S.) Clean Air Status and Trends Network
CEM	Continuous emission monitor
CEPA	Canadian Environmental Protection Act
CEPS	Canadian emission processing systems
CMAQ	Comprehensive Multi-scale Air Quality model (CTM) with detailed aerosol chemistry
CMB	Chemical mass balance
CPI	Carbon Preference Index
CRPAQS	California Regional PM Air Quality Study
CTM	Chemical-transport model
CWS	Canada Wide Standard
EC	Elemental carbon
EIIP	(U.S.) Emission inventory improvement program
EKMA	Empirical kinetic modeling approach
EPA	(U.S.) Environmental Protection Agency
EPS	Emission processing system
ER	Emission reduction factor
FRM	(U.S.) Federal Reference Method
GATOR	Gas, Aerosol, Transport and Radiation Model
GAViM	Guelph Aerosol and Visibility Monitoring program sponsored by Environment Canada
GC-MS	Gas chromatograph - mass spectroscopy
GR	Gas ratio
HAP	Hazardous air pollutant
IC	Ion chromatography
ICP-MS	Inductively coupled plasma combined with mass spectroscopy

IMPROVE	Interagency Monitoring of PROtected Environments
INAA	Instrumental neutron activation analysis
INE	Instituto Nacional de Ecologia - Mexico
IMP	Instituto Mexicano del Petroleo - Mexico
LAC	Light-absorbing carbon
LC-MS	Liquid chromatography and mass spectroscopy
LPI	Low pressure impactor
MSC	Meteorological Service of Canada, Environment Canada
NAAQS	(U.S.) National Ambient Air Quality Standards
NAPS	Canadian National Air Pollution Surveillance network
NARSTO	A tri-national cooperative research entity for policy-relevant study of tropospheric ozone and PM phenomena
NATA	(U.S.) National Air Toxics Assessment
NEI	(U.S.) National Emission Inventory
NIOSH	(U.S.) National Institute of Occupational Safety and Health
NOM	Normas Oficiales Mexicanes – Environmental quality guidelines for Mexico.
NPRI	Canadian National Pollutant Release Inventory
OC	Organic carbon
PAH	Polycyclic aromatic hydrocarbon
PAN	Peroxyacetyl nitrate
PEMB	Piezoelectric microbalance
PIXE	Proton Induced X-ray Emission spectroscopy
PM	Particulate matter
PMF	Positive matrix factorization
QA/QC	Quality assurance / quality control
RADM	Regional Acid Deposition Model
RH	Relative humidity
SCAQMD	South Coast Air Quality Management District
SCAQS	Southern California Air Quality Study
SEM	Scanning electron microscope
SEM/XRF	Scanning electron microscope combined with x-ray fluorescence
SIP	(U.S.) State implementation plans
SJVAQS	San Joaquin Valley Air Quality Study
SMOKE	An emission processing model used to provide inputs to chemical transport models.
SOA	Secondary organic aerosol
SRM	Source-receptor matrix
TEOM®	Tapered Element Oscillating Microbalance
TOMS	Total ozone mapping spectrometer
TOR	Thermal/optical reflectance
TOT	Thermal/optical transmission
TSEM	Tagged Species Engineering Model
TSP	Total suspended particles
UAM-AERO	Urban Airshed Model version IV with aerosol chemistry
UV	Ultraviolet light or energy
VMT	Vehicle miles traveled

VKT	Vehicle kilometers traveled
VOC	Volatile organic compounds
WQC	Windsor-Quebec City Corridor
XAD	An adsorption material used to coat denuder tubes and remove gas-phase organic compounds from an air sample.
XRF	X-ray fluorescence spectroscopy

DEFINITIONS

Activity factors Emission characterization factors derived for consumption or use rates and source operating conditions that are used to estimate emission rates for specific source categories.

Aerosol A mixture of suspended particulate matter and its gaseous suspending medium.

Airshed A geographic region defined by topographical features that result in near-uniform atmospheric transport influences throughout. The airshed may be as small as an isolated mountain valley or as large as an atmospheric transport corridor, for example northeastern North America.

Anthropogenic emissions Emissions resulting from human activities, which are either directly emitted as particles, or are particles formed in the atmosphere from pollutant precursor gases.

Black carbon (BC) and Elemental Carbon (EC) Light-absorbing carbonaceous material in atmospheric particles. These terms,as well as "soot" and "graphitic carbon" sometimes are used interchangeably. BC and EC often are used to indicate optical and thermal measurement methods, respectively. In this Assessment, we use BC generically and use other terms only when required by context

Chemical mass balance A receptor-based model used to estimate PM source apportionment based on a material balance of chemical components in ambient air compared with the chemical components in sources.

Conceptual description The best available qualitative compilation of the physical and chemical processes that govern the formation of PM for a given airshed.

Conceptual model The qualitative compilation which, to the extent possible, is supported by quantitative information of atmospheric processes that affect spatial and temporal distribution of particles and the degree to which different precursors and processes limit or enhance particle formation varies for a given airshed, season, or meteorological condition.

Deciview An index of atmospheric haziness based on the logarithm of the light extinction coefficient. A given change in deciviews is assumed to be perceived approximately the same by a human observer, independent of the absolute level of the haziness.

Dosage (Dose) The relationship between the concentration of pollutants encountering an exposed individual and the amount of time the individual experiences the concentration.

Emission factor The average rate per unit process input of a specific source category, which to the extent possible takes into consideration many variables such as process parameters, effluent temperature, ambient temperature, wind speed, and soil moisture.

Emission processing systems Computer models used to refine a national annual aggregate emission information into spatially gridded, time-resolved data required as inputs by the chemical transport models.

Emission reduction factor A number that accounts the impact of emission controls employed on a source including 1) various effluent exit devices such as bag-house filters, or electrostatic precipitators for removal of particles, 2) scrubbers for SO_2 removal, 3) low NO_x combustors in boilers or selective NO_x reduction technologies, and 4) VOC absorbers or effluent gas combustors.

Epidemiology The empirical, statistics-based study of the relationships between exposure to a human stress and the human physiological or disease-based response.

Enrichment factor A term used in a type of receptor model that accounts for increases in ratios of chemical concentration in the atmosphere relative to the same ratios in a reference material associated with a source.

Exposure The concentration of gas or particles breathed by a human over a period of time, determined from ambient air, indoor air combination, in combination with individual activity patterns.

Extinction coefficient A measure of the fraction of light (b_{ext}) that is lost from a beam of light as it traverses a unit distance through a uniform atmosphere.

Gas ratio For example, $[NH_3]^F$ / $[HNO_3]^T$ where $[NH_3]^F$ is the "free" ammonia, that is ammonia not associated with sulfate nor nitrate, and $[HNO_3]^T$ is the total nitrate (gas and aerosol).

Gravimetric filter-based system The accepted method for determining an estimate of particle mass concentration in the troposphere.

Hazardous air pollutants Toxic air pollutants including heavy metals and persistent organic pollutants defined for regulatory purposes by the U.S. Clean Air Act Amendments.

Integrated denuder system A sampling system for aerosol particles that provides for removal of reactive gases prior to filtration which may interfere with the gravimetric estimates of PM mass concentration.

Linearity In the context of source-receptor relationships, linearity implies that given reductions in emissions will result directly in proportionate changes in ambient concentration over a general area, taking into account the presence of a baseline or background level which is assumed to be irreducible.

Manageable emissions Emissions that can readily be identified with industrial sources, commercial operations, power plants, residential dwellings, and transportation as well as certain fugitive sources such as dust from roadways, slash burning of vegetation, etc.

Organic carbon (OC) Organic material in particles. OC includes both primary emissions and secondary organic particles produced in the atmosphere by chemical transformation of volatile organic compounds (VOC). Primary OC emissions include directly emitted particles as well as those formed by nucleation or condensation of high-molecular-weight organic vapors in the immediate vicinity of the source.

Particulate matter Any non-gaseous material (liquid or solid) which, owing to its small gravitational settling rate, remains suspended in the atmosphere for appreciable time periods.

Plume blight Impairment of visibility by a discernible plume. When a plume is viewed against the sky, plume blight is reflected by discoloration of part of the sky. When a terrestrial object is viewed through the plume, plume blight impairs the ability to see that object. Plume blight is distinguished from "regional haze."

Positive matrix factorization A receptor modeling technique relying on a statistical analysis of the chemical composition of particles compared with expectations from sources.

Primary particles Particles that enter the atmosphere via direct injection from a source or in-situ formation from the gas phase (nucleation).

Proportionality In the context of source-receptor relationships, a proportional relationship between emission change and ambient concentration is rarely observed at a single site because of the influence of random variations associated with meteorological fluctuations.

Radiative balance The net energy flux into or out of a system, in this context, Earth's atmosphere. Specifically, the equilibrium between the visible and infrared radiation that reaches the earth from the sun and the similar radiation that is emitted from the earth into space. The balance between incoming and outgoing radiation governs the temperature of the earth.

Receptor models Receptor models or receptor-based techniques use the differences in chemical composition, particle size, and concentration patterns in space and time to identify source types and to quantify source contributions that affect particle mass concentrations, light extinction, or deposition. They provide a theoretical and mathematical framework for quantifying source contributions.

Reconstructed mass Estimation of bulk PM mass from the sum of individual chemical component species mass, often after the components are adjusted for missing elements, e.g., oxygen in iron oxide, or oxygen and hydrogen in organic material.

Regional haze A regulatory term, defined in terms of impairment of visibility that is distributed over such a large area (tens or hundreds of kilometers) that it appears to be relatively uniform to an observer within that area. Regional haze is distinguished from "plume blight."

Respiratory system The human anatomical system that facilitates breathing and absorption of oxygen.

Secondary particles The solid or liquid particles that form as a result of chemical transformations of precursor gases (SO_2, NH_3, NO_x, VOCs) in the atmosphere.

Semivolatile species Species found in the troposphere that partition at equilibrium between the vapor and condensed phase, including NO_3^- and certain VOCs.

Single-particle property A physical or chemical property of single aerosol particles that depends, for example, on size, crystalline nature, or the nature of chemical mixing of the condensed phase.

Source apportionment identifies semi-quantitatively general source types or categories (e.g., vehicle exhaust, industrial processes, power plants, or fugitive dust) responsible for the observed PM.

Source attribution Estimates the PM sources contributing to a given PM sample(s); essentially the same as the source apportionment.

Source-based air quality models Source-oriented or chemical transport models combine source emission rates with meteorological transport and chemical changes to estimate PM concentrations and composition at a receptor site.

Source profiles The chemical composition and particle size distribution information for particles emitted from specific sources.

Speciation/speciate The identification of component chemical species making up the particle mass.

Standard reference material A chemical that provides a reference composition which can be used to calibrate PM instrumentation.

Total suspended particles Typically refers to the mass concentration to all tropospheric aerosol particles less than 30 to 40 μm aerodynamic diameter, as measured by a gravimetric method**.**

Toxicological response The response of humans creating a pre-disease or disease condition that is attributable to a n exposure or dose of a chemical.

Trajectory models Use grid-point fields of meteorological variables to compute air mass transport associated with horizontal winds either ending at a "receptor," or originating from a source.

Ultraviolet Radiation beyond the visible spectral range having a wavelength shorter than visible light and longer than those of X-rays.

Unmanageable emissions Emissions that result from volcanic eruptions, windblown sea spray, dust storms from remote arid areas, and forest or brush fires initiated by lightning strikes or spontaneous combustion. Other unmanageable emissions are gases and vapors that react in the atmosphere to produce particles, including sulfur gases from terrestrial and marine sources, nitrogen oxides from soil respiration and lightning strikes, and organic vapors from vegetation.

Valley of Mexico The region immediately surrounding Mexico City.

Visibility The ability to see through the atmosphere. Visibility also represents the quality of that seeing, as reflected in the color and contrast of objects in the view, and in the visual appearance of the atmosphere itself. The term "visibility" is sometimes used to indicate the distance one can see. (See "visual range.")

Visual range When looking horizontally through the atmosphere, the greatest distance at which one can discern a dark object against the horizon sky.

Volatile organic compounds Organic compounds found primarily in the vapor phase at ambient temperature and pressure, which participate in atmospheric photochemical reactions forming oxidants or PM.

Windsor-Quebec City Corridor The geographic region extending along the southern edges of Ontario and Quebec between the cities of Windsor and Quebec City.