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## APPENDIX A

### Glossary

- Absorbed dose** The amount of pollutant that crosses a specific absorption barrier (*e.g.*, the exchange boundaries of skin, lung, or digestive tract) through uptake processes. Absorbed dose is calculated from the intake and absorption efficiency and is usually expressed as the mass of pollutant absorbed into the body per unit time (mg/kg/d). For inhalation exposure, absorbed dose is the amount of material that passes from the lung volume into the blood. For ingestion exposure, absorbed dose is the quantity of pollutant that passes from the volume of the gastrointestinal tract across the gut wall and into the blood stream. For dermal exposure, absorbed dose is the quantity of material that passes through the stratum corneum into the living cells of the epidermis and dermis and then into the blood stream. Sometimes referred to as internal dose.
- Absorption barrier** Any of the exchange boundaries of the body (*e.g.*, the skin, lung tissue, digestive tract, gastrointestinal tract wall) that allow differential diffusion of various pollutants across the boundary.
- Activity pattern** A series of discrete events of varying time intervals describing information about an individual's lifestyle and routine. The information contained in an activity pattern typically includes the locations that the individual visited (usually described in terms of microenvironments), the amount of time spent in those locations, and a description of what the individual was doing in each location (*e.g.*, sleeping, eating, exercising). All of the information for an activity pattern is gathered during an "activity pattern survey," usually through the use of questionnaires or diaries. Each activity pattern survey is designed to collect information on activities needed for a particular study or purpose. Activity patterns are also referred to as "time/activity patterns."
- Applied dose** The amount of a pollutant given in mg/kg/d that comes in contact with the living tissue of an organism by entering into the lungs, by entering the gastrointestinal tract, and/or by crossing the stratum corneum into the living cells of the epidermis. In some experimental designs, the applied dose is referred to as the administered dose.
- Average daily dose (ADD)** Dose rate within a population averaged over body weight and an averaging time and typically expressed in terms of mg/kg/d.

- Biologically effective dose** The amount of a deposited or absorbed pollutant that reaches the cells or target site where an adverse effect occurs or where that pollutant interacts with a membrane surface.
- Breathing zone** A zone of air in the vicinity of an organism from which respired air is drawn. Personal monitors are often used to measure pollutants in the vicinity of the breathing zone.
- Cohort** A group of people within a population who are assumed to have similar exposures are taken from the same probability distribution during a specified exposure period.
- The use of cohorts is useful when modeling the exposures of a large population. Since adequate data on the exposures of each individual in a population does not exist, information about people who are expected to have similar exposures are aggregated together in order to make better use of the limited data that is available.
- Cohorts can be defined for each application or situation. In the latest pNEM/CO model, for example, cohort exposure was taken to be a function of demographic group, location of residence, location of work place, and type of cooking fuel (natural gas or other). Specifying the home and work district of each cohort provided a means of linking cohort exposure to ambient CO concentrations. Specifying the demographic group provided a means of linking cohort exposure to activity patterns which vary with age, work status, and other demographic variables. Specifying the type of cooking fuel provided a means of linking cohort exposure to proximity to a particular emission source. In some analyses, cohorts are further distinguished according to factors relating to time spent in particular microenvironments. In the pNEM analyses, the population-of-interest is divided into a set of cohorts such that each person is assigned to one and only one cohort.
- Demographic group** A group of people within a population sharing common demographic characteristics such as gender, race, household income, working status, or incidence of a particular disease or ailment. These groups can be defined differently depending on the study or application and much of this information can be gathered from the census.
- Dermal** The external skin surface of an organism.

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<b>Dermal exposure</b>	The contact between a pollutant and the external skin surface of a biological organism.
<b>Dose</b>	The quantity of energy or pollutant available for interaction with metabolic processes or biological receptors after crossing the outer boundary of an organism. See related terms: absorbed dose, applied dose, biologically effective dose, delivered dose, internal dose, and potential dose.
<b>Dose rate</b>	Dose per unit time (mg/d). Dose rate is often expressed on a per-unit-bodyweight-basis ( <i>e.g.</i> , mg/kg/d) and may be expressed as an average over a long time period ( <i>e.g.</i> , a lifetime). Also referred to as dosage.
<b>Environmental media</b>	The components of the physical environment that carry a pollutant, and through which pollutants can move and reach the organisms. The environmental media in TRIM.Expo include ambient air, ground water, surface water, surface soil, root zone soil, vadose zone soil, and several classes of vegetation.
<b>Exposure</b>	The contact between a target organism and a pollutant at the outer boundary of the organism. Exposure may be quantified as the amount of pollutant available at the boundary of the receptor organism per specified time period. As an example, inhalation exposure over a period of time may be represented by a time-dependent profile of the exposure concentrations.
<b>Exposure assessment</b>	Measurement or estimation of the magnitude, frequency, duration, and route of exposure of biological organisms to pollutants in the environment for a specified time period. An exposure assessment also describes the nature of exposure and the size and nature of the exposed populations.
<b>Exposure district</b>	A geographic location within a defined physical or political region where there is potential contact between an organism and a pollutant, and for which environmental media concentrations have been estimated either through modeling or measurement.
<b>Exposure event</b>	A human activity that results in contact with a contaminated medium within a specified microenvironment at a given geographic location.
<b>Exposure factor</b>	A normalizing or standardizing factor used in an exposure assessment as a surrogate for specific information that is not available for a particular subject, cohort, or demographic group. These factors are often drawn from a distribution or a range of data

[see for example, EPA's *Exposure Factors Handbook* (U.S. EPA 1997b)].

<b>Exposure media</b>	The part of the physical environment that surrounds or contacts organisms at the time of an exposure. The exposure media in TRIM.Expo include outdoor air, indoor air (multiple microenvironments), tap water, home-grown food, locally-produced food, prepared food, breast milk, house dust, soil, swimming pools, and other recreational surface water.
<b>Exposure pathway</b>	The physical course of a pollutant from the source to the exposed organism. An exposure pathway describes a unique mechanism by which an individual or population is exposed to pollutants or physical agents at, or originating from, a site. Each exposure pathway includes a source, or release from a source, an exposure point, and an exposure route. If the exposure point differs from the source, a transport/exposure medium (such as air) or media (in cases of intermedia transport, such as water to air) is also included.
<b>Exposure route</b>	The way a pollutant enters an organism after contact, including inhalation, ingestion, or dermal absorption.
<b>Fixed-site monitoring</b>	Sampling of an environmental or ambient medium for a pollutant's concentration at the same location continuously or repeatedly over some length of time.
<b>Ingestion</b>	An exposure route whereby pollutants enter the body by the mouth for digestion or absorption.
<b>Ingestion exposure</b>	The contact between a pollutant and the boundary in the area surrounding the mouth at the time of ingestion. The contact boundary is often defined for each particular situation or study.
<b>Inhalation</b>	An exposure route whereby air and pollutants are drawn into the lungs via the nasal or oral respiratory passages.
<b>Inhalation exposure</b>	The contact between an airborne pollutant and a human, or other animal, at the time of inhalation.
<b>Intake</b>	The process by which a pollutant crosses the outer boundary of an organism prior to passing an absorption barrier ( <i>e.g.</i> , through ingestion or inhalation).
<b>Intermedia transfer</b>	An algorithm for "linking" the environmental media with the microenvironmental media that exposed individuals occupy ( <i>e.g.</i> , air compartments) or the exposure media with which they come in

contact (*e.g.*, air, water, food, soil). An intermedia transfer algorithm relates the pollutant concentration in a microenvironmental medium to the concentration in an ambient environmental medium that provides an input to that microenvironment.

<b>Internal dose</b>	See absorbed dose.
<b>Lifetime average daily dose</b>	LADD is the average daily dose within a population when the averaging time is the expected individual lifetime and is usually expressed in terms of mg/kg/d for compounds with carcinogenic or chronic effects.
<b>Microenvironment</b>	A defined space in which human contact with an environmental pollutant takes place and which can be treated as a well-characterized, relatively homogeneous location with respect to pollutant concentrations for a specified time period.
<b>Monte Carlo technique</b>	A statistical method that uses repeated random sampling from the distribution of values for each of the parameters in a generic (exposure or dose) equation to derive an estimate of the distribution of (exposures or doses in) the population.
<b>Multipathway exposure</b>	Exposure in which the pollutant travels via more than one environmental medium from its source to the point of contact with the exposed organism. For example, a pollutant which is released into the air, but is then deposited into a water body before coming in contact with a person.
<b>Potential dose</b>	An approximation to the applied dose that is simply the amount of a pollutant in the material ingested, air inhaled, or material applied to the skin. The potential dose for inhalation and ingestion is analogous to the administered dose in a dose-response experiment. For the dermal route, the potential dose is the amount of pollutant applied or the amount of pollutant in the exposure medium applied to the skin.
<b>Risk</b>	The probability of deleterious effects that may result from an action or inaction.
<b>Risk assessment</b>	The process of evaluating the toxic properties of a pollutant and the conditions of human exposure to the pollutant in order to ascertain the likelihood that exposed humans will be adversely affected and to characterize the nature of the effects they may experience. Risk assessments historically have included the following four steps: (1) hazard identification (determination of whether or not a particular

pollutant is causally linked to a particular adverse health effect); (2) exposure assessment (determination of the amount of the pollutant that humans are exposed to and the conditions of that exposure); (3) dose-response assessment (quantification of how adverse effects change with dose); and (4) risk characterization (the final analysis that integrates the scientific findings of the previous three components to assess the overall conclusions about potential human risk including a description of the expected nature and severity of harm associated with the risk).

**Uptake**

The process in which a pollutant crosses an absorption barrier and is absorbed into the body.