

Defining DIRTY AIR

Air

■ **Smog** is the general term used to describe a variety of air pollutants, including ground-level ozone (smog's main ingredient), particulate matter, carbon monoxide and nitrogen oxides. It refers to air pollution that is formed when gases from many sources are released into the air and chemically react with each other in sunlight.

Ocean breezes sweep the smog inland toward the mountains where an inversion layer of warm air pushes it down, trapping the smog close to the ground where we live and breathe.

■ **Ground-level ozone** (O_3) is a colorless, odorless pollutant formed by a chemical reaction between volatile organic compounds (VOCs) and oxides of nitrogen (NO_x) in the presence of sunlight. The primary source of VOCs and NO_x is mobile sources, including cars, trucks, buses, plus agricultural and construction equipment. In contrast, stratospheric ozone in our upper atmosphere, better known as the ozone layer, shields the earth from the sun's harmful ultraviolet rays.

■ **Particulate matter** (PM) is the term used for a mixture of solid particles and liquid droplets found in the air. It originates from a variety of sources, including motor vehicles, power plants, construction activities, soil dust, soot and industrial processes. Coarse particles (PM10) are generally emitted from sources such as windblown dust, vehicles traveling on unpaved roads, and crushing and grinding operations. Fine particles (PM2.5) can come from fuel combustion (motor vehicles, power generation, industrial facilities) and fugitive dust. PM2.5 is formed primarily in the atmosphere from gases such as sulfur oxides, NO_x , and VOCs.

■ **Carbon monoxide** (CO) is a colorless, odorless gas by-product of combustion produced primarily by motor vehicles. Burned wood and charcoal also emit carbon monoxide.

How Specific Pollutants Can Affect You

Ground-level Ozone

Ozone is a strong irritant that can constrict the airways, forcing the respiratory system to work harder to provide oxygen. It also can cause:

- Aggravated respiratory diseases such as emphysema, bronchitis and asthma
- Damage to deep portions of the lungs, even after symptoms such as coughing or a sore throat disappear
- Wheezing, chest pain, dry throat, headache, or nausea
- Reduced resistance to infection and increased fatigue

Particulate Matter

A series of scientific studies has linked particulate matter, especially fine particles, with a variety of significant health problems:

- Aggravated asthma, heart, or lung disease
- Respiratory-related hospital admissions and emergency room visits
- Acute respiratory symptoms, including severe chest pain, gasping, and aggravated coughing
- Decreased lung function which can be experienced as shortness of breath
- Chronic bronchitis
- Premature death

Carbon Monoxide

Carbon monoxide replaces oxygen in the body's red blood cells. People with heart disease are more susceptible to developing chest pains when exposed to low levels of carbon monoxide. Exposure to high levels of carbon monoxide can:

- Slow reflexes and cause confusion and drowsiness
- Result in death in confined spaces (i.e., an enclosed garage) at very high concentrations



When to Blow the Whistle on Outdoor Youth Activities

According to medical experts, children are at risk from air pollution in two ways. First, they have greater exposure: they breathe more air in relation to their body weight and lung size and they play outside more, with higher breathing rates. Second, children have greater vulnerability: their bodies are still developing and are more susceptible to irritation and illness.

To protect our youth, it's a good idea for everyone to be aware of air quality, especially anyone who supervises children or teenagers. AQMD advises school officials to avoid vigorous outdoor activities, like running, soccer, football, etc., when unhealthy air quality conditions are forecast. If a health advisory occurs during the day, teachers, coaches and others should take immediate steps to reduce children's exposure to air pollution, for example, substituting indoor activities for more strenuous outdoor exercise. Teachers should discuss air pollution and its effects on our health and make the air quality forecast a part of the class routine.