

A 2x2 grid of sky images. The top-left and bottom-right quadrants show a clear blue sky with white clouds. The top-right and bottom-left quadrants show a hazy, greyish-blue sky, suggesting air pollution. In the center of the grid is a yellow oval with a dark border containing the word "Dirty" in black text.

Dirty

THE HEALTH EFFECTS  
OF AIR POLLUTION

Air

# Air

## Dirty

*In the past decade*, air quality has improved significantly in Southern California. Some of the efforts that have helped our air quality include:

- Cleaner engines,
- Smog Check,
- Vapor recovery nozzles on gasoline dispensers,
- Regulations on solvents contained in painting products,
- Statewide regulation on the amount of solvents in consumer products, and
- Regional air quality control rules that continually reduce the emissions released from more than 26,000 businesses.

Unfortunately, poor air quality is still a real health threat in our region – which covers the urban areas of Los Angeles, Riverside and San Bernardino counties and all of Orange County. If you live or work in this area, chances are you've heard advisories of unhealthful air, seen how pollution masks the beauty of our landscape, or know someone whose health is affected by dirty air.

The U.S. Environmental Protection Agency has designated our region an extreme ground-level ozone non-attainment area. Particularly during the summer smog season we fail to meet air quality health standards and are ranked among the smoggiest areas in the nation.

About 70% of our area's smog problem is caused by vehicles and other mobile sources with internal combustion engines, including trucks, buses, agricultural equipment, construction equipment, and gas-powered lawn and garden equipment. With 15 million residents and 11 million motor vehicles, motorists in the basin drive more than 318 million miles every day. Future growth means more vehicles on our roadways adding pollution to the air we breathe.

## New AIR QUALITY LEVELS

### New Air Quality Levels

The U.S. Environmental Protection Agency has found that ground-level ozone and particulate matter affect people's health at lower levels than previously thought.

Scientific evidence shows that lung damage caused by prolonged exposure to lower levels of ozone air pollution poses the greatest health risk. Averaging ozone levels over eight hours provides a higher level of protection, especially for children and adults who spend a significant amount of time working or playing outdoors - a group that is particularly vulnerable to the effects of ozone.

The standard for airborne particles up to 10 microns in diameter (PM10) remains in effect. But now EPA says smaller particulate air pollution measuring less than 2.5 microns in diameter (PM 2.5) also is a health concern. Breathing fine particle air pollution can cause ill health effects - including premature death and an increase in respiratory illness. The South Coast Air Quality Management District, the regional air pollution control agency, now monitors and provides forecast information for these finer particles.

**New** *To better protect public health*, in 1999, EPA created the new Air Quality Index (AQI). It replaces the old Pollutant Standards Index (PSI). The most important change is the addition of a subcategory, "Unhealthy for Sensitive Groups." This subcategory was created to provide advisory information to sensitive individuals so they can take action to minimize their exposure to air pollution. The AQI also describes levels of air pollution in the air we breathe. As the amount of pollution in the air increases, so do the AQI numbers. See the AQI on page 3 for detailed cautionary information.



# Air Quality Index

## POLLUTANT SPECIFIC CAUTIONARY STATEMENTS



**POLLUTION  
AFFECTS  
EVERYONE**

*Many residents experience some kind of air pollution-related symptoms such as watery eyes, coughing, or wheezing. Even for healthy people, polluted air can cause respiratory irritation or breathing difficulties during exercise or outdoor activities. Your actual risk depends on your current health status, the pollutant type and concentration, and the length of exposure to the polluted air:*

People most susceptible to severe health problems from air pollution are:

- Individuals with heart or lung disease
- Individuals with respiratory problems such as asthma or emphysema
- Pregnant women
- Outdoor workers
- Children under age 14, whose lungs are still developing
- Elderly residents, whose immune systems are weaker
- Athletes who exercise vigorously outdoors

High air pollution levels can cause immediate health problems:

- Aggravated cardiovascular and respiratory illness
- Added stress to heart and lungs, which must work harder to supply the body with oxygen
- Damaged cells in the respiratory system

Long-term exposure to polluted air can have permanent health effects:

- Accelerated aging of the lungs and loss of lung capacity
- Decreased lung function
- Development of diseases such as asthma, bronchitis, emphysema, and possibly cancer
- Shortened life span

Health Categories	Ozone	Very Small Particles PM2.5	Small Particles PM10	Carbon Monoxide (CO)
<b>VERY UNHEALTHY (201 TO 300)</b>	Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion (participation in strenuous sports activities or exercise); everyone else, especially children, should limit outdoor exertion.	People with respiratory or heart disease, the elderly and children should avoid any outdoor activity; everyone else should avoid prolonged exertion.	People with respiratory disease, such as asthma, should avoid any outdoor activity; everyone else, especially the elderly and children, should limit outdoor exertion.	People with cardiovascular disease, such as angina, should avoid exertion and sources of CO, such as heavy traffic.
<b>UNHEALTHY (151 TO 200)</b>	Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.	People with respiratory or heart disease, the elderly and children should avoid prolonged exertion; everyone else should limit prolonged exertion.	People with respiratory disease, such as asthma, should avoid outdoor exertion; everyone else, especially the elderly and children, should limit prolonged outdoor exertion.	People with cardiovascular disease, such as angina, should limit moderate exertion and avoid sources of CO, such as heavy traffic.
<b>UNHEALTHY FOR SENSITIVE GROUPS (101 TO 150)</b>	Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.	People with respiratory or heart disease, the elderly and children should limit prolonged exertion.	People with respiratory disease, such as asthma, should limit outdoor exertion.	People with cardiovascular disease, such as angina, should limit heavy exertion and avoid sources of CO, such as heavy traffic.
<b>MODERATE (51 TO 100)</b>	Unusually sensitive people should consider limiting prolonged outdoor exertion.	None	None	None
<b>GOOD (0 TO 50)</b>	None	None	None	None

## Defining DIRTY 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.

For the latest air quality forecast  
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Para Español llame al: 1-800-876-3666

Or visit our website:  
[www.aqmd.gov](http://www.aqmd.gov)

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