

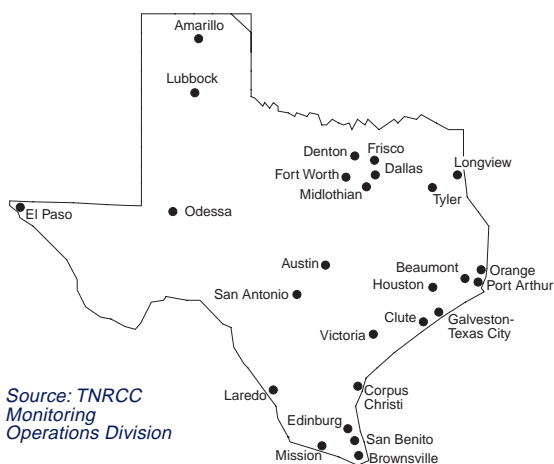
# Air Quality in TEXAS

The Texas Natural Resource Conservation Commission (TNRCC) operates a state-wide network of stations that monitor air quality for air pollutants in accordance with federal regulations and state initiatives. The air

The standards are set to prevent public exposure to harmful amounts of air pollution. Based on extensive data from animal and human studies, the standards have a built-in margin of safety and are designed to protect the most vulnerable groups in the population: children, the elderly, pregnant women, and people with health problems.

formation about air quality is also collected by the agency's short-term, mobile monitoring program. This allows for intensive, pollution source oriented monitoring trips that can capture maximum exposure conditions downwind of industrial facilities. The program responds to a variety of citizen complaints through requests from the TNRCC's regional offices.

**Texas Communities with TNRCC Air Monitoring Stations**



Source: TNRCC Monitoring Operations Division

pollutant data collected from these stations are compared to national standards to determine the ambient, or outdoor, air quality in the state.

The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards for the six principal air pollutants in this country: ozone, sulfur dioxide, nitrogen dioxide, carbon monoxide, respirable particulate matter, and lead.

When pollutant levels in an area are high enough to exceed a national standard a number of times, the area violates the standard for that pollutant. The EPA then imposes federal regulations to reduce air pollution and sets a deadline for the area to achieve the standard. In Texas, four areas have been designated by the EPA as violating the national ozone standard: Beaumont-Port Arthur, El Paso, Dallas-Fort Worth, and Houston-Galveston-Brazoria.

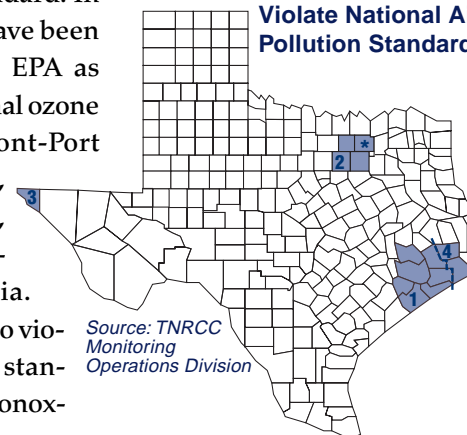
The El Paso area also violates the national standards for carbon monoxide and respirable particulate matter.

Although most of the TNRCC's air monitoring is done by permanent sampling networks, in-

## Ozone

In Texas, the Houston-Galveston-Brazoria area has the most prevalent ozone pollution problem. This area and the Beaumont-Port Arthur, El Paso,

**Texas Communities that Violate National Air Pollution Standards**



Source: TNRCC Monitoring Operations Division

- 1 Houston-Galveston-Brazoria — ozone
- 2 Dallas-Fort Worth — ozone
- \* Frisco - lead
- 3 El Paso — ozone, carbon monoxide, and respirable particulate matter
- 4 Beaumont-Port Arthur — ozone



and Dallas-Fort Worth areas do not meet the national ozone standard.

Ozone is a form of oxygen with three atoms, instead of the usual two. High in the stratosphere surrounding the earth, a layer of ozone gas forms an important and effective protective barrier against the sun's ultraviolet rays. However, high concentrations of ozone near the ground in the air we breathe can cause respiratory problems and can damage plants and some materials such as rubber. This ozone is the most pervasive air pollution problem in Texas and across the nation.

Ozone is the main component of smog. It is mainly a daytime problem during warmer months because sunlight plays a primary role in its formation. The process starts with sources of nitrogen oxides and volatile organic compounds, which are known as the chief "precursors" of ozone, or com-

pounds that react in the presence of sunlight to produce ozone. These sources include cars, trucks, power plants and factories, or wherever natural gas, gasoline, diesel fuel, kerosene, and oil are combusted. Significant quantities of ozone precursors also come from the day-to-day activities of people, and include sources such as lawn-mowers and motor boats, consumer products, gasoline stations, and numerous small businesses. These gaseous compounds mix like a thin soup in the ambient air, and when they interact with sunlight, ozone is formed. Large industrialized areas and cities with heavy summer traffic are the main contributors to ozone formation.

### Sulfur Dioxide

No areas in Texas violate the national standard for sulfur dioxide, although several areas in the state, such as in Big Bend National Park, experience lim-

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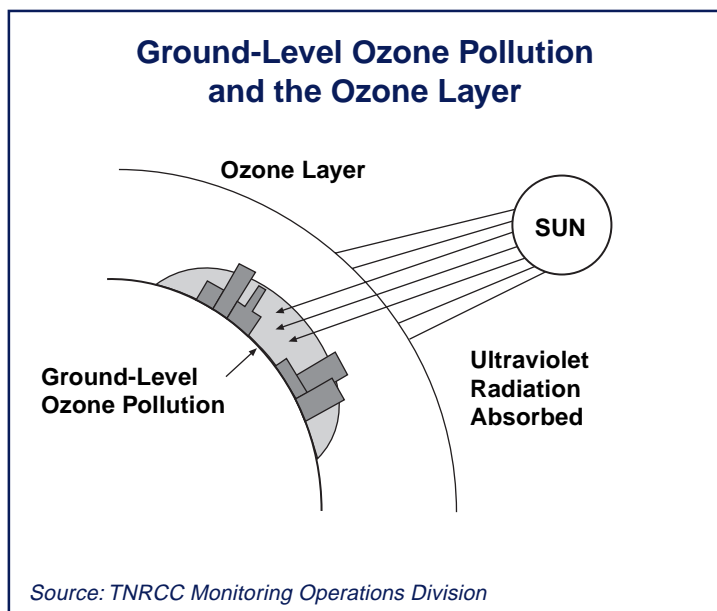
*In July 1997, the EPA announced new standards for ozone and particulate matter. For the new ozone standard, the EPA will redesignate areas as attainment, nonattainment, or transitional beginning in 2000. For the new particulate matter standard, the EPA will begin redesignating areas after more data is gathered, probably in 2002.*

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ited visibility due to it. This pollutant is primarily produced through the combustion of sulfur-bearing fuels, the smelting of sulfur-bearing metal ores, and industrial processes. Major sources of sulfur dioxide emissions are power plants, refineries, some chemical plants, metal smelters, and cement plants. This pollutant reacts in the atmosphere to form other compounds such as sulfuric acid, sulfates, and sulfites. These can be transported long distances through the atmosphere before being deposited as rain or dust, and can contribute to acid rain and impair visibility.

### Nitrogen Dioxide

No areas in Texas violate the national standard for nitrogen dioxide. It is formed both by the combustion of nitrogen and the reaction of nitric oxide with oxygen in the atmosphere. Nitrogen dioxide emissions result almost entirely from fuel combustion by industry, energy production, and motor vehicles. In addition to contributing to ozone formation, oxides of nitrogen react chemically in the atmosphere to form nitrates. Nitrates also can be transported long dis-



tances in the atmosphere before being deposited and can contribute to acid rain and impair visibility.

## **Carbon Monoxide**

El Paso is the only city in Texas that does not meet the national standard for carbon monoxide. This air pollutant is produced by the incomplete combustion of carbon in fuels. The majority of carbon monoxide emissions comes from transportation sources,

principally cars and trucks. Stricter automobile emission standards and mandatory vehicle inspection and maintenance programs have reduced the amount of carbon monoxide emissions in parts of Texas and across the nation.

## **Respirable Particulate Matter**

El Paso is the only area in the state that does not meet the national standard for respirable particulate mat-

ter. These tiny particles in the atmosphere can be solid or liquid (except for water and ice) and are produced by a wide variety of natural and manmade sources. These include factories, power plants, refuse incinerators, motor vehicles, construction activity, fires, and natural windblown dust. These particles are below 10 microns in size (about seven times smaller than the width of a human hair), and are likely to lodge deep in the lungs and cause respiratory problems.

# ***Effects of Air Pollution***

## **Ozone**

Elevated levels above the national standard may cause lung and respiratory disorders. Short-term exposure can result in shortness of breath, coughing, chest tightness, or irritation of nose and throat. Individuals exercising outdoors, children, and people with pre-existing respiratory illnesses are particularly susceptible.

## **Sulfur Dioxide**

Becomes sulfuric acid once it comes in contact with moist mucous membranes. At levels above the national standards, it irritates the respiratory tract, causing restricted air flow and breathing difficulty. Individuals with pre-existing pulmonary disease are particularly susceptible to these effects.

## **Nitrogen Dioxide**

Can harm humans at elevated levels above the national standard. Nitrogen dioxide can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. For asthmatics, can cause increased breathing difficulty.

## **Respirable Particulate Matter**

Elevated levels above the national standards are thought to potentially cause or worsen lung and respiratory disorders, including causing severe chest pain, gasping, coughing and shortness of breath. The elderly, children, and individuals with pre-existing respiratory or heart problems (people with asthma, bronchitis, emphysema, etc.) are thought to be particularly susceptible.

## **Carbon Monoxide**

Reduces the blood's ability to deliver oxygen to vital tissues, affecting primarily the cardiovascular and nervous systems. Lower concentrations have been shown to adversely affect individuals with heart disease and to decrease maximal exercise performance in young people. Higher concentrations above the national standards can cause symptoms such as dizziness, headaches, and fatigue.

## **Lead**

Elevated levels above the national standard may adversely affect the brain and nervous system, the blood, the digestive system, and the reproductive system. Young children are most at risk since their bodies and brains are still developing.

## Lead

Frisco is considered in violation of the national standard for lead. But lead measurements in that community have not exceeded the standard since 1990, and it may soon be reclassified as attaining the standard.

Although lead levels in El Paso have exceeded the national standard in the past, TNRCC monitors have recorded no exceedances in El Paso since 1986. Emissions from lead smelters, battery recycling plants, and automobiles burning gasoline

with lead additives have been the primary sources of lead air pollution in Texas and the nation. Air lead levels have steadily declined overall in Texas because of use of unleaded gasoline in automobiles and additional controls placed on industrial sources.

**Additional information is available on the air quality of: El Paso, Houston-Galveston-Brazoria, Dallas-Ft. Worth, Corpus Christi, Beaumont-Port Arthur, San Antonio, Austin, and Longview-Tyler-Marshall. Contact TNRCC Publications at 512/239-0028.**

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