What are the Major Pollutants Affecting the Denver Metro/Front Range Area?

GROUND-LEVEL OZONE: THE AREA'S BIGGEST AIR QUALITY CONCERN

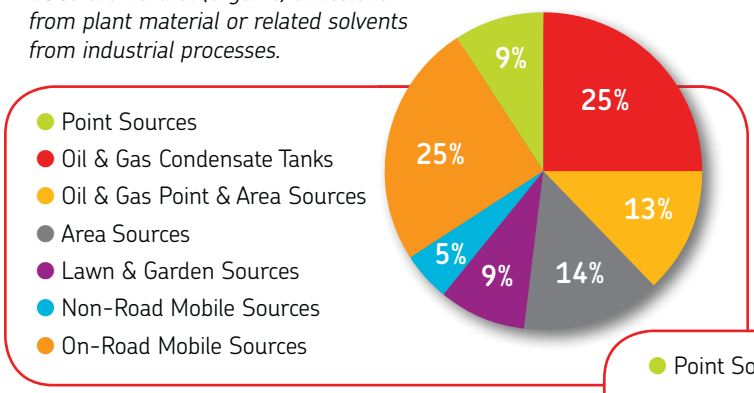
What is it? Ground-level ozone is formed when Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NOx) combine and "cook" in the heat and sunlight. The highest ozone levels are usually recorded in summer months on hot, stagnant days with little wind.

Why is it bad? Unlike the good, protective ozone layer in the stratosphere, ground-level ozone is a harmful air pollutant that affects all of us – particularly the young and elderly. Those who are active and exercising outdoors may experience breathing difficulties and eye irritation. Prolonged exposure may result in reduced resistance to lung infections and colds. Ozone can also trigger attacks and symptoms in individuals with pre-existing conditions such as asthma, or other respiratory diseases like chronic bronchitis and Chronic Obstructive Pulmonary Disease (COPD).

Pollutant Status: *The nine-county Denver Metro/Front Range Area is out of compliance with federal air quality standards for ozone. RAQC-sponsored projects such as Every Trip Counts, Clean Air Fleets and the OzoneAware campaign aim to reduce ozone-causing emissions.*

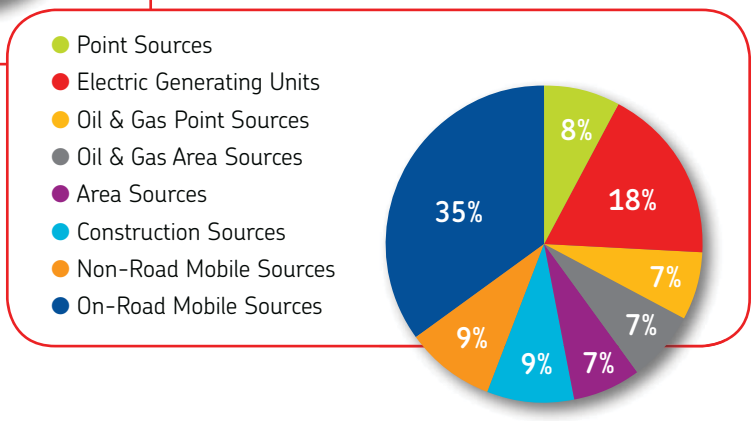
Volatile Organic Compounds (VOCs)

VOCs are natural (organic) emissions from plant material or related solvents from industrial processes.



Nitrogen Oxides (NOx)

A mix of nitric oxide and nitrogen dioxide, NOx are highly reactive gases primarily formed by high-temperature combustion processes such as those occurring in automobiles and power plants.



More Major Pollutants.

CARBON MONOXIDE (CO)

What is it? Carbon Monoxide is a colorless, odorless gas that is formed from the incomplete burning of fuel (combustion). It is emitted directly into the air from vehicle exhaust pipes and typically occurs when vehicles are first started up or when they are not properly started.

Why is it bad? Carbon Monoxide reduces oxygen delivery to the body's organs and tissues.

Pollutant status: *While the region is not in violation of CO standards, the RAQC has several programs in place to help reduce vehicle emissions and keep this pollutant in check.*

PARTICULATE MATTER (PM)

What is it? Particulate matter (PM) consists of airborne particles that can be inhaled by humans. PM comes in sizes ranging from 2.5 to 10 micrometers in diameter.

Why is it bad? Recent Environmental Protection Agency (EPA) studies suggest that PM is harmful to human health because small particles less than 10 micrometers in diameter are too small to be filtered by the nose and lungs and can get deep into the lungs and into the bloodstream. Particle pollution exposure has been linked to serious health problems involving the lungs and heart.

PM 2.5 – PM 2.5 is fine particulate matter measuring only 2.5 micrometers. It is so small that it can be detected only with an electron microscope. PM 2.5 is created from combustion processes, including those from motor vehicles, power generation, residential wood burning, forest fires, agricultural processes and some industrial processes.

Pollutant status: *The Denver metro region is currently in compliance with PM 2.5 standards. The RAQC's Clean Air Fleets program aims to reduce PM 2.5 levels in the region.*

PM 10 – PM 10 is coarse particulate matter measuring between 2.5 micrometers and 10 micrometers. PM 10 is created from windblown dust, unpaved roads, street sand, and crushing and grinding operations.

Pollutant status: *The Denver metro region has been in compliance with PM 10 standards since 1993. RAQC-sponsored projects such as wood-burning fireplace/stove change out and street sweeping programs have helped the region to lessen PM 10 and, therefore, reduce the amount of particles contributing to the "Brown Cloud" in the winter.*

What Causes Air Pollution?

THE SOURCES OF AIR POLLUTION

A number of sources – activities that cause pollution to be emitted into the air – contribute to poor air quality and ground-level ozone formation. Human-generated sources are categorized as follows:

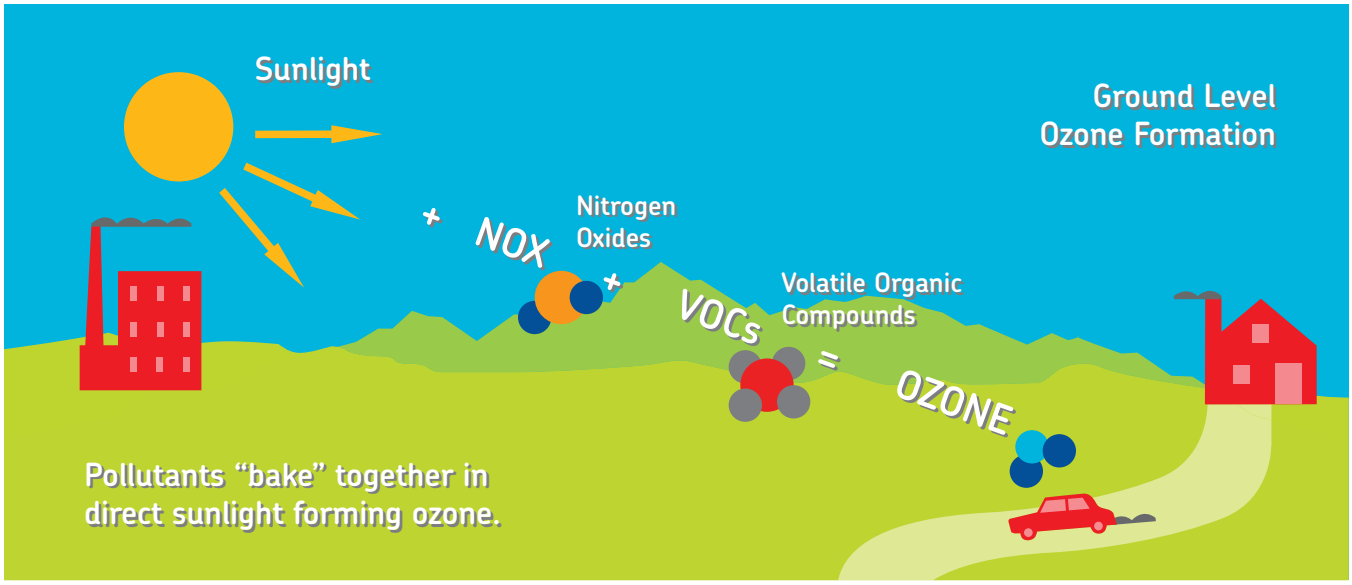
STATIONARY/POINT SOURCES: Stationary sources are fixed-site producers of pollution such as power plants, chemical plants, oil refineries, manufacturing facilities, small industrial processes, and other industrial operations. Large sources that have specific locations and release pollutants in quantities above a certain threshold are known as point sources. The State of Colorado requires that the producers of these sources file an Air Pollution Emission Notice (APEN) with the Colorado Department of Public Health and Environment, which maintains a Stationary Source Emissions Inventory.

AREA SOURCES: Area sources are smaller emissions sources that collectively account for a significant portion of air pollution. These include producers such as lawn mowers, certain types of trees, home and personal care products, after-market auto care products, paints and solvents, residential and commercial heating, and breweries and other small production businesses, among others.

MOBILE SOURCES: Mobile sources are classified as on-road and non-road vehicle sources. On-road sources include vehicles traveling on roads to transport passengers or freight. Non-road sources include gas and diesel powered vehicles, engines and other equipment used for aircraft, construction, agriculture, recreation, and more.

PEOPLE: Nearly two-thirds of ozone-causing emissions come from the direct actions of people who live and work in the region and the services they require.

HOW GROUND-LEVEL OZONE FORMS



REGIONAL AIR QUALITY COUNCIL

LET'S TAKE CARE OF OUR SUMMER AIR.
OzoneAware.org

ABOUT THE REGIONAL AIR QUALITY COUNCIL

The Regional Air Quality Council (RAQC) is the lead air quality planning organization for the seven-county Denver Metro Area. The mission of the Regional Air Quality Council is to develop and propose effective and cost-efficient air quality planning initiatives with input from government agencies, the private sector, stakeholder groups, and citizens of the Denver metropolitan region. The primary function of the RAQC is to prepare air quality improvement plans that demonstrate and ensure long-term compliance with state and federal air quality standards and provide acceptable public health and environmental protections to those residing in the Denver metropolitan area. Additionally, the RAQC is charged with developing and administering public education programs regarding air quality and air pollution control and prevention in the Denver area. Learn more at www.RAQC.org

ABOUT OZONEAWARE

OzoneAware is a RAQC-sponsored public outreach and education program designed to increase awareness about Ground-Level Ozone Pollution – the Denver Metro Area's biggest air quality concern. The campaign aims to educate the public about the causes and health effects of Ground-Level Ozone and what individuals can do to help reduce the harmful air pollutant. The metro area is currently out of compliance with federal standards for Ground-Level Ozone. In an effort to reduce Ozone levels during Denver's Ozone season, the RAQC works with meteorologists at the Colorado Department of Public Health and Environment to issue "Ozone Action Alerts" from June 1 through August 31. These alerts notify the public when Ozone levels could potentially reach unhealthy levels. On Ozone Action Alert days, citizens are asked to take simple actions such as the following to reduce emissions:

>keep your car well maintained
>refuel after 5 p.m. on hot, sunny days
>stop at the click – don't overfill gas tanks
>walk to lunch and run errands after work
>take the bus at least once a week
>use gas-powered lawn equipment after 5 p.m. on hot, sunny days
>avoid painting and staining projects in the heat of the day
>tightly cap solvents; store in a cool place

The OzoneAware campaign includes television, radio, print and outdoor advertising elements, in addition to presence at community events and outreach to students, media and local governments. Learn more at www.OzoneAware.org

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