



**A Citizen's Guide
to Air Quality Management in Garfield County**



**195 W. 14th Street
Rifle, CO 81650
970-625-5200**

Dear Garfield County Residents,

Clean air contributes to good health and a high quality of life. With our active population and scenic vistas, clean air is more important than ever in Garfield County. Garfield County Public Health is committed to addressing concerns about activities in the community that affect air quality in our county.

Oil and gas exploration and production in this region has developed significantly over the last decade, contributing to the rapid growth of local communities. There is now concern that the increase in pollution from this growth, and the increase in pollution from oil and gas operations, are adversely affecting air quality in our area.

Since 2005, the county has significantly expanded air quality monitoring, emissions analysis, and compliance enforcement of air quality regulations. Along with this, there have been significant developments at the state and regional levels that will benefit air quality in Garfield County into the future.

But, to successfully keep our air clean, we need YOU! The county's ongoing efforts include the development of a comprehensive, community-based Air Quality Management Plan. A successful plan to manage air quality in Garfield County will rely on collaboration with state and local jurisdictions, industry, businesses, and YOU. In this booklet you will find information about air quality in Garfield County, what we are doing to keep our air clean, and what you can do to help.

Sincerely,

Garfield County Public Health

What are air quality concerns in Garfield County?

Increasingly, landowners and residents of oil and gas field communities are reporting health concerns that they believe are associated with the energy development activities in their area. In addition, concerns about odor, dust, and the environment have been on the rise with industry and community growth.

What types of air pollutants can be measured?

Regulated Air Pollutants

Some pollutants are regulated by the U.S. Environmental Protection Agency (EPA) because they have been found to be harmful to human health and the environment. The EPA sets standards (National Ambient Air Quality Standards) for six pollutants based on their effects on health. More on these standards can be found at www.epa.gov/air/criteria.html. The regulated pollutants are:

- nitrogen dioxide (NO₂)
- sulfur dioxide (SO₂)
- lead (Pb)
- carbon monoxide (CO)
- ground-level ozone (O₃)
- particulate matter (PM)

As levels approach standards established by the EPA, these pollutants may cause adverse health effects, especially in people with heart or lung disease, older adults, and children.

Non-Regulated Air Pollutants

Additional Hazardous Air Pollutants (HAPs) are also of concern in Garfield County. These are a group of many hundreds of pollutants that are suspected or known to cause cancer or other serious health problems. There are no standards for HAPs, but the EPA has developed guidelines to better evaluate exposures to HAPs. More information about HAPs can be found at www.epa.gov/ttn/atw/allabout.html.

Did you know...?

The Oil & Gas Department serves as a liaison between citizens and the energy industry. The county does not regulate oil and gas drilling, but does serve as the local government designee to the Colorado Oil and Gas Conservation Commission (COGCC), which issues drilling permits.

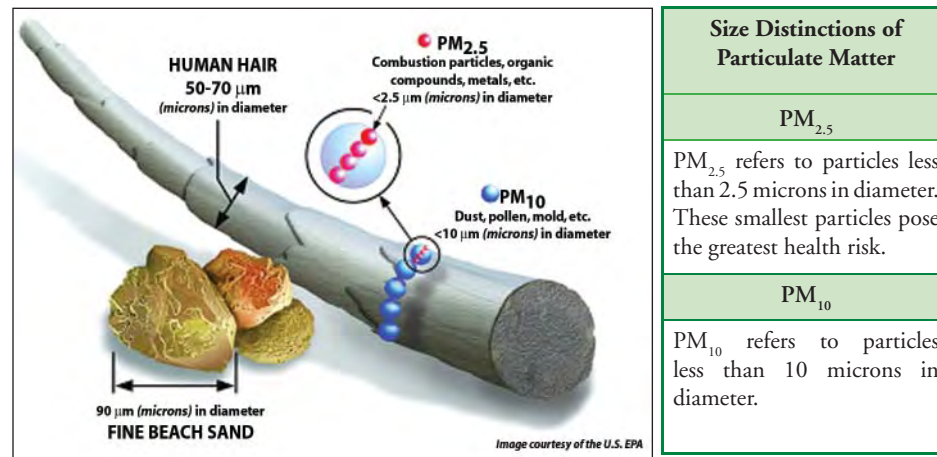
If you are a citizen of Garfield County and you have a concern about oil and gas activities, please contact the Garfield County Oil & Gas Department at 970-625-5915.

What are the major sources of air pollution in Garfield County?

By examining pollutant data we can better understand the sources of air pollution in Garfield County. Emissions estimates for Garfield County are updated annually by the Colorado Department of Health & Environment. While emissions estimates can give a good idea of sources that affect the county, it is important to note that they do not account for emissions that are transported from areas outside of Garfield County. More information about sources of air pollution in Garfield County can be found at www.GarfieldCountyAQ.net.

Sources of Particulate Matter

Particulate matter (PM) is made up of solid particles and liquid droplets that are small enough to be inhaled. Particulate matter has the potential to cause health problems, especially because it can get lodged deep into the lungs.

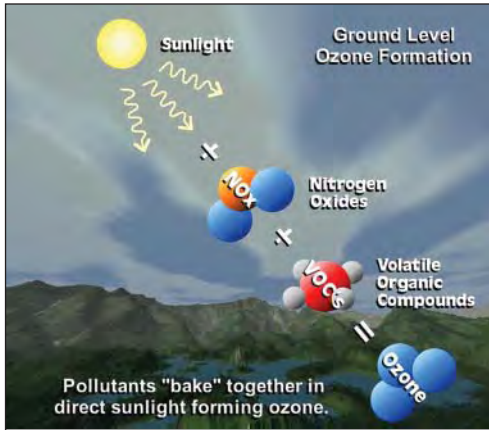


Size characteristics of particulate matter

In Garfield County, the majority of particulate matter sources are estimated to come from road dust, oil and gas activities, construction, and wood-burning. Natural emissions like forest fires also contribute to levels of particulate matter. Particulate emissions have increased with increased natural gas development activities which may include grading and leveling of well pads, construction of facilities, construction of access roads to well pads, and subsequent vehicle traffic.

Sources of Ground-Level Ozone

Ozone is a pollutant formed through chemical reactions from the interaction of sunlight, oxides of nitrogen (NO_x) and volatile organic compounds (VOC).

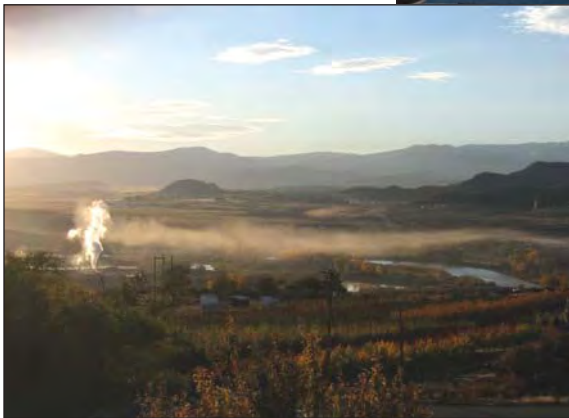


Source: NASA

Ground-level ozone formation

In Garfield County, oil and gas operations and on-road vehicles contribute to the majority of nitrogen oxide (NO_x) sources. VOC emissions include oil and gas sources, on-road vehicles, and substantial emissions from natural sources including trees, shrubs, and prescribed and natural fires. Tightened fuel standards and controls contributed to decreasing NO_x and VOC emissions prior to 2005. More recent inventories have shown increasing emissions from sources related to oil and gas activities.

Pollutants from stationary sources in Garfield County



Sources of Hazardous Air Pollutants

The EPA has designated approximately 190 compounds as Hazardous Air Pollutants (HAPs) including benzene, toluene, ethyl-benzene and xylenes (also known as the BTEX compounds). These compounds are emitted by some natural gas wells and production equipment, and by vehicle sources, including personal vehicles, traffic along I-70, and heavy-duty vehicles that service natural gas operations. Benzene emissions are tracked in Garfield County. Similar to NO_x and VOCs, benzene emissions were decreasing prior to 2005, but sources related to oil and gas activities have shown increasing trends.



Dust from natural events (wind) in Garfield County



Dust from construction sources in Garfield County



Idling on-road vehicles in Garfield County

Open burning in Garfield County



What types of air pollutants are being measured in Garfield County?

As of 2009, pollutants monitored in Garfield County include particulate matter (PM), ozone (O₃) and Volatile Organic Compounds (VOCs), including some Hazardous Air Pollutants (HAPs). Air quality monitoring sites also track meteorological conditions (temperature, relative humidity, barometric pressure, winds, and precipitation) associated with pollutant levels.

Hourly real-time results of air quality monitoring as well as regularly updated photos (every 15 minutes) of downtown Rifle, Colorado, are available on the Garfield County Air Quality Monitoring Web site at www.GarfieldCountyAQ.net. Also available on the site:



Air monitoring equipment in Rifle, Colorado

- 7-day timelines of pollutants and meteorology
- Image archives
- Additional Outdoor Air Quality Information, including:
 - Air monitoring reports (quarterly and annual)
 - Summary and assessment reports from special projects

The Air Quality Index (AQI) for the regulated air pollutants monitored is also available on the site. The AQI is a tool developed by the EPA intended to alert the public of possible precautions to take during poor air quality periods. AQI health advisory levels are listed below.

Air Quality Health Advisory Levels

Air Quality	Cautionary Statements
Good	None.
Moderate	People who are unusually sensitive to air pollution should consider limiting prolonged or heavy exertion outdoors.
Unhealthy for Sensitive Groups	Active children and adults, and people with lung disease, such as asthma, should reduce prolonged or heavy exertion outdoors.
Unhealthy	Active children and adults, and people with lung disease, such as asthma, should reduce prolonged or heavy exertion outdoors. Everyone else, especially children, should reduce prolonged or heavy exertion outdoors.
Very Unhealthy	Active children and adults, and people with lung disease, such as asthma, should reduce prolonged or heavy exertion outdoors. Everyone else, especially children, should reduce prolonged or heavy exertion outdoors.
Hazardous	Everyone should avoid all physical activity outdoors.

Did you know....

Local real-time AQI health advisory levels, pollutant levels, and visual conditions are available at www.GarfieldCountyAQ.net (see below).

National real-time AQI health advisory levels are available on the EPA AIRNow Web site: www.airnow.gov.

Garfield County Air Quality Monitoring Web site

The screenshot shows the Garfield County Air Quality Monitoring Web site interface. At the top, it says "Garfield County, Colorado" and "HOME". The main heading is "RIFLE, COLORADO: REAL-TIME AIR QUALITY INFORMATION". On the left, there is a "NAVIGATION" menu with links like "Real Time Image and Data", "7-Day Timeline Plots", "About These Data", "Health Effects Information", "Environmental Health Information", "Outdoor Air Quality Information", "Colorado Department of Health and Environment - Air Division", and "Questions and Suggestions for the Site". The central part of the page features a large "Real Time Image and Data" section with a live camera feed of Rifle, Colorado, dated "10/19/2009 2:45:00 PM MDT". To the right of the image is a "Meteorology" section showing "Data Last Updated 10/19/2009 2:00 PM", "Temperature 72 F", "Humidity 18 %", "Wind Speed 8 mph", "Wind Direction W", and "Precipitation". Below the image are "Landmarks" and "Image" options: "Save Image", "Current Image", and "Archived Images". The "Ideal Image" section shows a smaller camera feed. To the right of the "Ideal Image" is a "Pollutant Standards" table:

Pollutant	Average Time	U.S. EPA Standard
Ozone	8-Hour	0.075 ppm (75 ppb)
PM _{2.5}	24-hour	35 ug/m ³
PM ₁₀	24-hour	150 ug/m ³

Below the standards table is a "Data Disclaimer" and an "Air Quality Index (AQI)" section. The AQI section explains that the AQI is an index for reporting daily air quality, ranging from 0 to 500, and provides a color-coded scale: Good (green), Moderate (yellow), Unhealthy for Sensitive Groups (orange), Unhealthy (red), Very Unhealthy (purple), and Hazardous (brown). The current AQI is displayed as "09456". To the right of the AQI section are two "Particulate Matter" sections: "Particulate Matter PM_{2.5}" showing a "Current Average" of 7 ug/m³ and a "24 Hour Rolling Average" of 5 ug/m³; and "Particulate Matter PM₁₀" showing a "Current Average" of 31 ug/m³ and a "24 Hour Rolling Average" of 21 ug/m³. Both sections include color-coded scales and timestamps of "10/19/2009 2:00:00 PM".

What are we doing about air quality in Garfield County?

Air Quality Management

Efforts in Garfield County are intended to support the development of a comprehensive, community-based Air Quality Management Plan. Garfield County has undertaken extensive monitoring efforts, performed risk analysis assessments, and participated in a number of EPA funded programs to assess air quality in the area. Goals of a Garfield County Air Quality Management Plan may include:

- Further characterization of air quality in Garfield County
- Increased public awareness of air quality issues
- Increased community involvement in air quality planning
- Promotion of environmentally friendly behaviors and business practices
- Implementation of community-wide emissions reducing strategies
- Cleaner air!

Did you know....



Garfield County is working to reduce emissions from public vehicles. In 2009, in cooperation with the Colorado Department of Public Health & Environment under the EPA-funded Colorado Clean Diesel Program, school buses in Garfield County were retrofitted with emissions reduction technology.

Regulatory Efforts

Of great importance in Garfield County is the need to consider environmental and social impacts of oil and gas development. Recent regulations to address these impacts include:

- In 2006 and 2008, the Colorado Air Quality Control Commission (AQCC) approved statewide emissions controls on many oil and gas volatile organic compound sources (Air Quality Control Commission Regulation No.7). Details of these regulations are available on the APCD Web site: www.cdphe.state.co.us/regulations/airregs/.
- In 2009, the state of Colorado Oil and Gas Conservation Commission (COGCC) adopted a number of progressive regulations specific to oil and gas sources. Details of these rules are available on the COGCC Web site: cogcc.state.co.us/.
- Also, effective in 2011, the EPA may, for the first time, require oil and gas sources to begin collecting greenhouse gas (GHG) emissions data under a new reporting system.

Voluntary Efforts

In addition, emissions from vehicles and industry can be lowered not only by changes in regulations, but also by proactive voluntary activities that go beyond regulations. As new technologies continue to make the exploration and production of natural gas more efficient, safe, and environmentally friendly, Garfield County will continue to work with industry to promote use of the most state of the art pollution controls.

Open Burning in Garfield County



The State of Colorado regulates open burning to help protect public health and the environment. Open burning requirements (including trash burning), permit requirements, and smoke management information is available on the Garfield County Web site at www.GarfieldCountyAQ.net.

You can help!

Garfield County wants its citizens to play an active role in shaping the county's Air Quality Management Plan!

Stay informed!

Learn more about what Garfield County is doing to protect and improve air quality. Check the Web site regularly at www.GarfieldCountyAQ.net to learn about projects, issues, and resources.

Get involved!

Your support of strong, effective air pollution control helps drive progress in our county. Share your concerns with your county officials. Attend meetings and public forums, join advisory and action groups, and assist in community efforts.

Reduce your own air quality impact!

The impact of lifestyle choices on air quality should not be underestimated. Some examples of what you can do include:

- **Tune your car.** A well maintained car conserves energy resources by using less gas.
- **Reduce idling.** Idling wastes fuel and money and impacts the environment. In the winter, the best way to warm up a vehicle is to drive it.
- **Drive less.** Try alternative forms of transportation like riding the bus, carpooling, or biking.
- **Avoid burning.** Avoid burning leaves or other yard waste, garbage, or other materials that may contain chemicals. Compost or use trash collection instead. Be sure to always comply with state open burning regulations. These are outlined at www.cdphe.state.co.us/ap/fireinfo.html.
- **Replace your wood stove.** Replace wood-burning stoves with more efficient fuel stoves. Wood-burning stoves are a large wintertime source of particle pollution. For more information go to: www.epa.gov/burnwise/.
- **Conserve energy.** The less energy you use, the more money you save, and the less pollution is created. Optimize your home's energy efficiency, cut back on heating and air conditioning, and turn off the lights when you leave a room.
- **Limit your use of volatile chemicals.** Avoid using oil-based paints, solvents, cleaners, varnishes, or other household and personal products that emit harmful volatile organic compounds.

FOR MORE INFORMATION

For air quality related planning, monitoring or research, please contact:

Garfield County Public Health, Rifle Office:

195 W. 14th Street

Rifle, CO 81650

Tel: 970-625-5200

Fax: 970-625-4804

News and information: www.garfield-county.com/

Real-time air quality data: www.garfieldcountyaq.net/

To file oil and gas related concerns, please contact:

Oil & Gas Department of Garfield County

0375 County Road 352, Building 2060

Rifle, CO 81650

(970) 625-5915 Phone

(970) 625-5939 Fax

Other Information:

Colorado Oil and Gas Conservation Commission (COGCC) NW Field Office

Phone: 970-625-2497

Toll Free Complaint Line: 888-235-1101

www.cogcc.state.co.us

Colorado Air Pollution Control Division (APCD)

4300 Cherry Creek Drive South

Denver, Colorado 80246-1530

303-692-3100 or 1-800-886-7689 (In Colorado)

www.cdphe.state.co.us/



Roan Plateau

This booklet was funded by the U.S. Environmental Protection Agency Region 8 Regional Geographic Initiatives Grant Program

Garfield County Public Health
195 W 14th Street
Rifle CO 81650

TO:

Important air quality information

