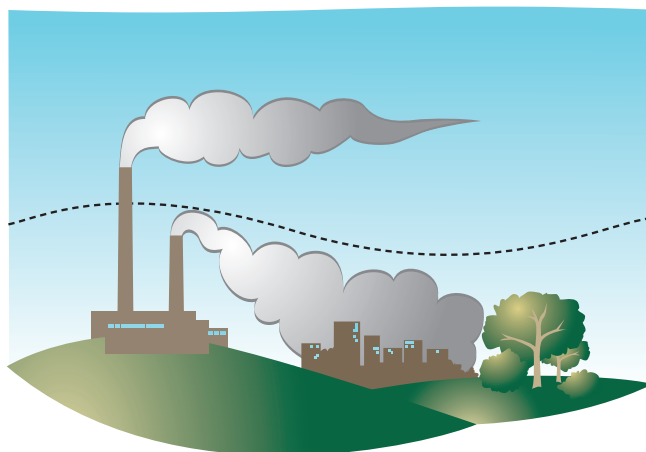


**The quality of air we breathe is an important part of our health. Over the past several years, public awareness has increased greatly on issues linked to air quality. Since the 1970s, advances in technology to reduce air pollution have led to a decline in the concentration of pollutants. However, Albertans remain concerned about the quality of air in the province and the type of pollutants being released.**

**Air pollutants** come from many sources: industrial sources such as energy and manufacturing facilities, automobile sources and residential sources. All affect the quality of our air. The ability to track the quantity and types of these pollutants in the air continues to improve. Currently, air quality in Alberta is monitored through a network of monitoring stations (refer to factsheet on How is Air Quality Monitored). Data from these stations is publicly available, and goes to the Alberta Ambient Air Data Management System (AAADMS), also known as the Clean Air Strategic Alliance Data Warehouse (CASA).

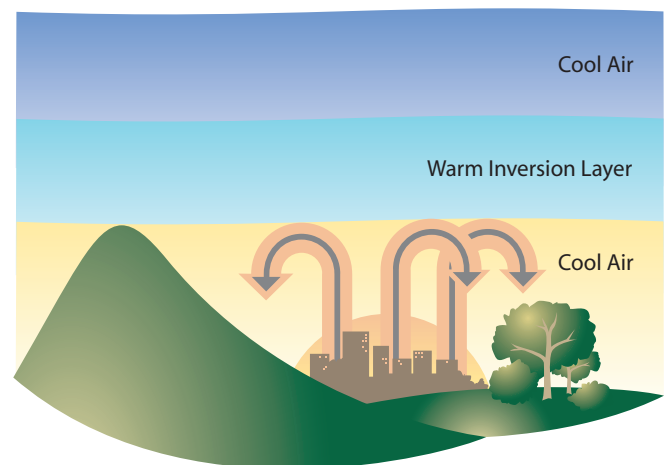
## Factors That Influence Air Quality

The quality of the air in Alberta depends on several factors. These include the number of sources of pollutants, the rate at which pollutants are sent into the atmosphere, and the ability of the atmosphere to scatter (disperse) these pollutants. The dispersal of pollutants is largely controlled by weather patterns, local topography (hills, mountains and valleys), and the height and temperature at which pollutants are emitted from their source. Source height and temperature allow the pollutant to rise higher in the atmosphere, and allow for greater dispersion of the pollutants, minimizing the ground level concentrations.



Topography plays a surprising role in dispersing pollutants. The structure and positioning of land features can influence and even control air motion. Larger terrain features such as mountains, hills and valleys affect wind speed and direction and may restrict the dispersion of pollutants.

**Temperature inversions** also influence air quality. The combination of a strong temperature inversion and light winds may lead to a layer of cold, stagnant air settling near the ground. Pollutants, such as vehicle emissions, become trapped in this layer of air. During cold spells, vehicles tend to idle longer and fuel consumption for heating buildings increases, further compounding the issue of air quality.



During hot, calm weather conditions in the summer, ground level ozone can be formed through chemical reactions of nitrogen oxides and volatile hydrocarbons in the presence of sunlight. Ground level ozone is a part of photochemical smog, and can reduce visibility and trigger breathing difficulties for some people.

## Alberta Ambient Air Quality Objectives (AAAQO)

Objectives are set for **ambient air** quality, and these are intended to protect the environment and human health as much as possible. The objectives are established based on scientific evaluation, availability of emission control/avoidance technology, natural and background levels of pollutants, and the impact on public health and ecosystems. Alberta Environment works with a variety of stakeholders, including other government departments, the scientific community, environmental organizations, industry and the general public to review and set these objectives. Currently, Alberta has objectives for 44 pollutants.

The ambient air quality objectives are primarily used as follows:

- Reporting on the state of the atmospheric environment in Alberta
- Determining whether additional industrial activity in an area should be approved
- Establishing operating conditions for approved industrial facilities
- Assessing compliance near major industrial air emission sources



## Air Quality Index (AQI)

The Air Quality Index is used as a measure of outdoor air quality. It is a rating that provides people with a meaningful measure of outdoor air quality. The pollutants

used to calculate the AQI are carbon monoxide, nitrogen dioxide, ozone, fine particulate matter (PM<sub>2.5</sub>) and sulphur dioxide.

The concentration for each of these pollutants is mathematically converted to an Air Quality Index. The highest level for any one of these indicators becomes the AQI value for that hour for that station. A rating of 0-25 indicates good air quality, 26-50 is fair, 51-100 is poor, and greater than 100 is very poor air quality.

## Definitions

**Air pollutants** - air pollutants are components of the air whose increase in concentration can deteriorate air quality.

**Ambient air** - ambient air is air that is found outside buildings or structures.

**Temperature inversion** - is an atmospheric condition that occurs when there is an increase in temperature with height. This condition will tend to suppress vertical dispersion of pollutants.

AQI Rating	Frequency in Alberta	Description
<b>Good</b> (0-25)	Almost all of the time (<99%)	Desirable range: no harmful effects to soil, water, vegetation, animals, materials, visibility or human health. The long-term goal is for air quality to be in this range all of the time in Canada
<b>Fair</b> (26 - 50)	Occasional - typical when weather conditions inhibit pollutant dispersion (<10%)	Acceptable range: adequate protection against effects to soil, water, vegetation, animals, materials, visibility and human health.
<b>Poor</b> (51 - 100)	Seldom (<1%)	Tolerable range: not all aspects of human health or the environment are adequately protected from possible adverse effects. Long-term control action may be necessary, depending on the frequency, duration and circumstances of the readings.
<b>Very Poor</b> (> than 100)	Rare	Intolerable range: in this range, continued high readings could pose a risk to public health.

Making it Clear is a series of fact sheets on air quality in Alberta developed for Fort Air Partnership with support provided by Alberta Environment. To obtain the series visit [www.fortair.org](http://www.fortair.org) or call 1-800-718-0471