

Outdoor air quality: Sulphur dioxide (SO₂)

How is air quality determined?

Air quality is determined by the concentrations of pollutants in the air. Air quality can vary greatly from one area or community to the next and from one hour to the next. This is because air quality is influenced by several things:

- The types and amounts of pollutants released into the air
- Weather conditions, such as wind, temperature and rainfall
- Natural geographical features such as mountains or bodies of water. For example, air pollution can get trapped in mountain valleys, especially when temperatures are cooler

The amount of common air pollutants, including sulphur dioxide, are monitored at fixed locations throughout B.C. They are reported online as hourly average concentrations.

Air quality is also reported in the form of the Air Quality Health Index (AQHI). The AQHI provides information about current air quality. It is also used to communicate forecasts of air quality for the next 36 hours. The level of health risk is provided on a scale of 1 to 10 or higher. The health risk is also labeled “low”, “moderate”, “high” or “very high”. The AQHI also provides advice on how to minimize health risks. To check the current and AQHI forecast, visit BC Air Quality at www.env.gov.bc.ca/epd/bcairquality/data/aqhi-table.html.

Please note that the AQHI measures fine particulate matter, ozone and nitrogen dioxide. The AQHI only provides information on sulphur dioxide in B.C. communities with large, industrial sources.

What is sulphur dioxide (SO₂)?

Sulphur dioxide is a highly reactive, colourless gas. It has an odour like the smell of a struck match. When released into outdoor air, sulphur dioxide can react with other pollutants in the air to form fine particulate matter. This is made up of small solid or liquid particles floating in the air. For more information on particulate matter, please visit [HealthLinkBC File #65e Particulate matter and outdoor air pollution](#).

What are the sources of sulphur dioxide in outside air?

In B.C., several industrial sources contribute to sulphur dioxide emissions in the air. The main emission sources are:

- Oil and gas industry
- Metal smelting
- Pipeline operations
- Pulp and paper production

Other emission sources of sulphur dioxide include:

- Large ships and off-road equipment that burn high sulphur-containing fuels
- Natural sources such as volcanic eruptions and forest fires

Who is at the highest risk of sulphur dioxide exposure?

Workers in industrial facilities where sulphur dioxide is used or is a by-product have the greatest exposure. People who live near these industries and other point sources can also be exposed to higher levels of sulphur dioxide.

What are the health concerns when sulphur dioxide levels are high outside?

Short-term exposure to higher levels of sulphur dioxide in the outdoor air of our communities can cause health concerns. People with asthma or Chronic Obstructive Pulmonary Disease (COPD) are at greater risk. Young children and older adults are also at risk.

Symptoms may include:

- Constriction or tightening of the airways in the lungs
- Coughing
- Wheezing
- Shortness of breath
- Irritation of the nasal passage, throat and eyes

Symptoms may be worse in cold weather, which can also cause the airways to tighten. If you are very sensitive to sulphur dioxide, you may need to seek medical care.

Long-term exposure to particles produced when sulphur dioxide reacts with other compounds in the air can also affect your health. These particles penetrate deeply into the lungs. This can cause irritation and inflammation that can damage the lining of the lungs and affect other parts of the body. Particles can worsen existing heart and respiratory diseases, including emphysema and bronchitis. Children who live in areas with higher sulphur dioxide concentrations may be more likely to have breathing problems as they get older.

How can I reduce the risk of exposure to sulphur dioxide?

- When outdoor concentrations of sulphur dioxide are high, stay indoors with the doors and windows closed to lower the rate of sulphur dioxide coming inside

- Try to exercise when concentrations of air pollution are lower
- Avoid exercising outdoors near large sources of sulphur dioxide, such as industrial facilities and shipping docks
- Reduce indoor sources of sulphur dioxide, including tobacco smoke, gas stoves and matches
- If you have medical conditions, such as asthma, COPD or heart disease, follow a management plan developed with your health care provider
- If you have symptoms such as coughing wheezing or shortness of breath, seek medical attention

For more information

For more information about sulphur dioxide in your area, contact your local Ministry of Environment and Climate Change Strategy office www2.gov.bc.ca/gov/content/environment/air-land-water/land/regional-environment-contacts or visit:

- B. C. Ministry of Environment and Climate Change Strategy: Air www2.gov.bc.ca/gov/content/environment/air-land-water/air
- Government of Canada: National Pollutant Release Inventory: sulphur dioxide www.canada.ca/en/environment-climate-change/services/national-pollutant-release-inventory/tools-resources-data/sulphur-dioxide.html
- BC Lung Foundation: Air Quality <https://bclung.ca/lung-health/air-quality/air-quality> or call toll-free 1-800-665-LUNG (5864)



BC Centre for Disease Control
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