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Outdoor air quality sulphur dioxide (SO_2)

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 and weather conditions such as wind and temperature affect air quality. It is also influenced by natural geographical features such as mountains or bodies of water. For example, valleys can prevent mixing of air. This can then trap pollutants close to the ground where people can inhale them.

Concentrations of common air pollutants, including sulphur dioxide, are continually monitored at fixed locations in many communities in B.C. They are reported on-line as hourly average concentrations.

Air quality is also reported in the form of an Air Quality Health Index (AQHI). The AQHI provides information about current air quality. It also provides a forecast 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". It also provides advice on how to minimize health risks. To check the current and forecast AQHI, visit BC Air Quality www.env.gov.bc.ca/epd/bcairquality/data/aqhi-table.html.

Please note that the AQHI measures of fine particulate matter, ozone and nitrogen dioxide. The AQHI does not provide information on sulphur dioxide levels.

What is sulphur dioxide?

Sulphur dioxide is a highly reactive, colourless gas. It has an odour like the smell of a struck match. When released, 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 suspended in air. For more information on particulate matter, see 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
- Pipeline operations
- Marine operations
- Metal smelting
- 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 may also release sulphur dioxide. In low quantities, forest fires may release it as well.

Who is at the highest risk of sulphur dioxide exposure?

Workers in industrial facilities where sulphur dioxide is used or is a by-product of industrial processes 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 of sulphur dioxide inhalation?

If you breathe air that contains sulphur dioxide, you may absorb it into your body through your nose and lungs. Sulphur dioxide can be life-threatening if you

are exposed to very high levels. These life-threatening levels rarely occur in community settings. They are mainly seen in work settings where sulphur dioxide is used or directly generated.

Short-term exposure to elevated concentrations of sulphur dioxide in the community can cause health concerns. People with asthma or chronic obstructive pulmonary disease (COPD) are at greater risk. Young children and the elderly are also at risk. Symptoms may include constriction or tightening of the airways in the lungs, coughing, wheezing and shortness of breath. It may also irritate the nasal passage, throat and eyes. If you are sensitive to sulphur dioxide, exposure may increase emergency room visits and hospital admissions for respiratory illnesses.

Long-term exposure to the particles produced by the reaction of sulphur dioxide 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 disease, including emphysema and bronchitis. Because of this, children who live in areas with elevated sulphur dioxide concentrations may develop more breathing problems as they get older.

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

You should limit your exposure during times of elevated concentrations of air pollution. Try to exercise when concentrations of air pollution is lower. Avoid outdoor sources of sulphur dioxide and stay indoors with windows closed. Also reduce indoor sources of sulphur dioxide, including tobacco smoke, matches and unvented gas stoves.

People with medical conditions, such as asthma, chronic respiratory disease (COPD) or heart disease, should continue to follow a management plan developed with their 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 & Climate Change Strategy office www2.gov.bc.ca/gov/content/environment/air-land-water/land/regional-environment-contacts or visit:

- BC Air Quality www2.gov.bc.ca/gov/content/environment/air-land-water/air
- BC Lung Association https://bc.lung.ca/protect-your-lungs/air-quality-lung-health/bc-state-air-report

BC Centre for Disease Control
Provincial Health Services Authority