

## FAQs for Kitimat SO<sub>2</sub> Alert System

Q: What is SO<sub>2</sub>?

A: SO<sub>2</sub> refers to sulphur dioxide – a colourless gas with a strong odour at higher concentrations.

Q: Where does SO<sub>2</sub> come from?

A: SO<sub>2</sub> is produced during the combustion of sulphur-containing fuels and industrial operations involving sulphur-containing materials. Major sources of SO<sub>2</sub> in BC include: the upstream oil and gas sector, metal smelting facilities, the pulp and paper sector and marine vessels.

Q: How does SO<sub>2</sub> affect my health?

A: Short-term peak SO<sub>2</sub> levels can cause a temporary tightening of the airways, leading to breathing difficulties and tightening in the chest. Those most sensitive include persons with asthma, children and the elderly. Symptoms may worsen during vigorous exercise or hard physical labour. See [HealthLinkBC](#) for summary health recommendations. For more detailed information, see Health Canada's [Human Health Risk Assessment for Sulphur Dioxide](#).

Q: At what levels are such health effects expected to occur?

A: Persons with asthma may experience effects at much lower concentrations than the general public. In their [Human Health Risk Assessment for Sulphur Dioxide](#), Health Canada identified a 10-min Reference Concentration (RfC) of 67 ppb – a level that is expected to be protective of human health, including sensitive groups such as those with asthma, when exposed continuously over a lifetime. This level is comparable to a 1-hour concentration of about 35 ppb based on SO<sub>2</sub> data evaluated for Kitimat. It is expected that 1-hour SO<sub>2</sub> levels of 35 ppb and lower will pose little or no additional health risk to even sensitive individuals.

Q: What is the Canadian Ambient Air Quality Standard for SO<sub>2</sub>?

A: [Canadian Ambient Air Quality Standards \(CAAQS\) for SO<sub>2</sub>](#) were endorsed by the Canadian Council of Ministers of the Environment in 2016. These include standards based on one-hour and annually averaged data for 2020 and 2025 (see Table 1). The 1-hour CAAQS is primarily intended to protect human health, whereas the annual CAAQS is intended to protect ecosystems.

Table 1. Summary of 2020 and 2025 CAAQS for SO<sub>2</sub>.

Averaging Period	2020 CAAQS	2025 CAAQS	Statistical Form
1-hour	70 ppb	65 ppb	Annual 99 <sup>th</sup> percentile of daily 1-hour maximum, averaged over three years
Annual	5 ppb	4 ppb	Annual average over calendar year of all 1-hour values

Q: Where is SO<sub>2</sub> monitored in Kitimat?

A: SO<sub>2</sub> is monitored immediately north of the smelter, at the Haul Rd site, and at three community sites in Whitesail, Riverlodge and Kitamaat Village

Q: How high are SO<sub>2</sub> levels in Kitimat?

A: SO<sub>2</sub> levels in Kitimat are generally low, with the highest concentrations observed at the Haul Rd site located in an industrial area near the smelter. At the community sites, historical SO<sub>2</sub> levels have rarely exceeded 35 ppb.

On a seasonal basis, the highest SO<sub>2</sub> levels tend to occur in the spring through fall periods, when winds are mostly from the south. In general, SO<sub>2</sub> levels can change quickly with the weather conditions.

Q: Why was the SO<sub>2</sub> alert system developed?

A: The development of the alert system is in response to:

- Local concerns about increasing SO<sub>2</sub> emissions at a nearby aluminum smelting facility in Kitimat and
- Recommendations by the Environmental Appeal Board in their decision to uphold the [permit amendment issued to Rio Tinto Alcan](#) (now Rio Tinto Aluminium). This permit amendment allows an increase in SO<sub>2</sub> emissions from 27 to 42 tonnes per day.

Q: How was the SO<sub>2</sub> alert system developed?

A: The health guidance was developed in consultation with the BC Centre for Disease Control, the Ministry of Health and Northern Health Authority. Different sets of health advice were established for moderate (36-70 ppb), high (71-185 ppb) and very high (>185 ppb) levels of SO<sub>2</sub>. The health advice was based on guidance developed by Health Canada for the [Air Quality Health Index](#) and guidance established by the Island Health Authority in the [Health Risk Guide](#) for the James Bay Sulphur Dioxide Monitoring Program.

Q: How does the SO<sub>2</sub> alert system work?

A: SO<sub>2</sub> is reported hourly at three community-based monitoring sites in Kitimat: Kitamaat Village, Riverlodge and Whitesail. If SO<sub>2</sub> levels at any of these sites reaches moderate, high or very high levels as described above, the Ministry's data system automatically produces an alert message that is posted to the Ministry's website at: [www.gov.bc.ca/sulphur-dioxide-alerts](http://www.gov.bc.ca/sulphur-dioxide-alerts). Alternatively, members of the public can receive these alerts directly by e-mail or text message through services provided by the Bulkley Valley Lakes District Airshed Management Society (see [www.AQadvisories.ca](http://www.AQadvisories.ca)).

Q: What does an SO<sub>2</sub> alert look like?

A: As shown in Figure 1, each SO<sub>2</sub> alert describes:

- the time, location and 1-hour SO<sub>2</sub> concentration that was reached over the past hour,
- health advice appropriate for the SO<sub>2</sub> concentration, to help sensitive individuals, including persons with asthma, to adjust their activities to protect their health,
- the time that the next alert may be issued if concentrations remain elevated, and
- a weblink to additional information on the website of the BC Ministry of Environment & Climate Change Strategy.

Subject: SO<sub>2</sub> Air Quality Alert - Kitimat  
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This is an automated message from the Ministry of Environment & Climate Change Strategy.  
  
At HH:MM on DD-MMM-YYYY, 1-hour SO<sub>2</sub> levels for [STATION] reached ZZZ ppb.  
  
Persons with asthma should consider reducing or rescheduling strenuous activities outdoors if experiencing symptoms.  
  
This alert will be reissued at HH:MM on DD-MMM-YYYY if SO<sub>2</sub> levels remain elevated. For more information visit: <http://www.gov.bc.ca/sulphur-dioxide-alerts>.

Figure 1. Example of SO<sub>2</sub> alert.

Q: What are the different sets of health advice associated with specific SO<sub>2</sub> concentrations?

A: This information is provided in Table 2 below.

Table 2. Summary of health messages for specific SO<sub>2</sub> alert levels.

SO <sub>2</sub> Levels	Air Quality	SO <sub>2</sub> Alert Health Messages
0-35 ppb	Good – SO <sub>2</sub> levels pose little or no health risk.	None (no alert issued)
36-70 ppb	Moderate – Those who are unusually sensitive to SO <sub>2</sub> may experience some effects.	Persons with asthma should consider reducing or rescheduling strenuous activities outdoors if experiencing symptoms.
71-185 ppb	Unhealthy for sensitive groups such as asthmatics. General public is not likely to be affected.	Persons with asthma should reduce or reschedule strenuous activities outdoors. Others, especially children and the elderly, should reduce activity outdoors if experiencing symptoms such as coughing or throat irritation
186+ ppb	Unhealthy – Everyone may begin to experience health effects. Members of sensitive groups may experience more serious health effects.	Persons with asthma should avoid strenuous activities outdoors. Others, especially children and the elderly, should also consider avoiding outdoor physical exertion.

Q: Under what conditions are alerts NOT issued?

A: No alerts are issued as long as 1-hour SO<sub>2</sub> concentrations at any of the three community-based sites (i.e. Kitimaat Village, Riverlodge and Whitesail) remain below 36 ppb.

Q: Why is data from the Kitimat Haul Rd monitoring station excluded from the alert system?

A: The Haul Rd site is located in an industrial area immediately north of the RTA smelter. This site is considered an industrial “fenceline” site and not representative of air quality measured in the populated areas of Kitimat and Kitimaat Village.

Q: Are emissions from RTA reduced when an SO<sub>2</sub> alert is triggered?

A: The SO<sub>2</sub> alert system is a public information tool only. Emissions from RTA are regulated under a permit issued by the Ministry of Environment & Climate Change Strategy. Criteria for triggering a reduction in emissions and/or other mitigation are described in the [Environmental Effects Monitoring \(EEM\) program plan](#) that is a requirement of the permit amendment.

Q: Why are the SO<sub>2</sub> alerts automated?

A: Because periods of elevated SO<sub>2</sub> are typically of short duration (i.e. two hours or less), the focus of the alert system is on direct notification of the interested public as soon as possible. This requires an automated approach.

Q: When will this alert system be expanded province-wide?

A: The Kitimat pilot will be reviewed mid-2018 in terms of:

- How well we were able to issue alerts in a timely manner,
- How useful the public and public health found the alerts,
- Whether a better tool could/should be developed to alert the public of elevated SO<sub>2</sub> levels.

Following this review, we will) look at the possible expansion of the pilot to other communities in B.C. This will be done in cooperation with the relevant health authorities.

Q: Where can I find SO<sub>2</sub> measurements for communities outside of Kitimat?

A: Recent SO<sub>2</sub> data from all B.C. monitoring sites can be accessed through a [map-based interface](#) or [quick links](#) to specific areas of the province.