

Provincial and Federal Ambient Air Quality Criteria/Standards for Common Air Pollutants

Provincial Ambient Air Quality Criteria versus Federal Canadian Ambient Air Quality Standards

Ambient Air Quality Criteria (AAQC) are non-regulatory, ambient air quality values that are set based on either human health or environmental effects at concentrations of a contaminant in air below which adverse effects are not likely to occur.

The ministry first sets AAQCs (non-regulatory) and uses them to establish air quality standards (regulatory) based on health and environmental impacts without consideration of technology or economic issues. AAQCs are used to assess air quality from all sources whereas air standards are used to assess the performance of regulated facilities under the local air quality regulation.

In developing AAQCs, toxicological information from peer-reviewed studies (clinical, animal, occupational, epidemiological) are reviewed by ministry experts to identify the contaminant's critical effect (e.g., cancer, irritation, odour).

Canadian Ambient Air Quality Standard (CAAQS) are non-regulatory, ambient air quality values set based on the consideration of factors including health and environmental effects, current standard levels in other jurisdictions, projected trends in ambient concentrations across Canada, and elements of achievability. They are intended to be used as indicators to help manage area-based air quality and drive the improvement of air quality across the country. CAAQC are achievable targets for Air Quality as part of a risk management framework.

The federal CAAQS was developed by the Canadian Council of Ministers of the Environment (CCME). The CAAQS are non-regulatory and are intended to be used as indicators to help manage area-based air quality and drive the improvement of air quality across the country. CAAQS are achievable targets for Air Quality as part of a risk management framework.

Example: Sulphur Dioxide 1-Hour AAQC/CAAQS

Provincial Sulphur Dioxide (SO₂) AAQC

In the case of the SO₂ AAQCs, health effects from exposure are well documented from credible clinical (human) studies. People with compromised respiratory function (e.g. those with asthma, lung conditions or respiratory diseases) are the most sensitive to SO₂ health effects.

For the 1-hour SO₂ AAQC, the ministry relied on Health Canada's science assessment used when developing the CAAQS. The Health Canada assessment supported a 10-minute AAQC which was converted to a 1-hour AAQC of 40 ppb as protective of all members of the population, including sensitive individuals. This AAQC was developed with extensive public, stakeholder and Indigenous consultation

Federal Sulphur Dioxide (SO₂) CAAQS

When developing the CAAQS for SO₂, Health Canada noted:

- If the 1-hour CAAQS were set at 40 ppb, all members of the population, including sensitive subgroups such as individuals with asthma, would be expected to be protected if 40 ppb were not exceeded.
- If the 1-hour CAAQS were set at 70 ppb, the general population would be expected to be protected but there would be times when sensitive subgroups such as individuals with asthma may not be protected, even if the 70 ppb were not exceeded.

The 70 ppb CAAQS (2020) and 65 ppb CAAQS (2025) are used as part of an air zone management framework. Even if the CAAQS is met in a given air zone, it still indicates a need for risk management actions in the air zone to prevent exceedance of the CAAQS threshold (see below).

Management level	Management levels for the 1-hour CAAQS for SO ₂ (ppb)	
	Effective 2020	Effective 2025
Red To ensure that CAAQS are not exceeded through advanced air management actions	> 70 (CAAQS)	> 65 (CAAQS)
Orange To improve air quality through active air management and prevent exceedance of the CAAQS	>50 to ≤70	> 50 to ≤ 65
Yellow To improve air quality using early and ongoing actions for continuous improvement	> 30 to ≤ 50	
Green To maintain good air quality through proactive air management measures to keep clean areas clean	≤ 30	

← Federal CAAQS 70 ppb

← Ontario AAQC 40 ppb

Current Provincial and Federal Ambient Air Quality Criteria/Standards for Common Air Pollutants

Pollutant	Averaging Time	CANADA				United States
		Ontario AAQCS	Federal CAAQS			NAAQS
			2015	2020	2025	
Ozone	1h	165 µg/m ³ (80 ppb)	-	-	-	-
	8h	-	63 ppb ⁽¹⁾	62 ppb ⁽¹⁾	60 ppb ⁽¹⁾	0.070 ppm ⁽¹⁾
PM _{2.5}	24h	27 µg/m ³⁽²⁾	28 µg/m ³⁽²⁾	27 µg/m ³⁽²⁾	-	35 µg/m ³⁽²⁾
	Annual	8.8 µg/m ³⁽³⁾	10.0 µg/m ³⁽³⁾	8.8 µg/m ³⁽³⁾	-	12 µg/m ³⁽⁴⁾
NO ₂	1h	400 µg/m ³ (200 ppb)	-	60 ppb ⁽⁵⁾	42 ppb ⁽⁵⁾	100 ppb ⁽⁵⁾
	24h	200 µg/m ³ (100 ppb)	-	-	-	-
	Annual	-	-	17.0 ppb ⁽⁶⁾	12.0 ppb ⁽⁶⁾	53 ppb ⁽⁶⁾
SO ₂	10 min	(180 µg/m ³) 67 ppb	-	-	-	-
	1h	(100 µg/m ³) 40 ppb	-	70 ppb ⁽⁷⁾	65 ppb ⁽⁷⁾	75 ppb ⁽⁷⁾
	Annual	(10 µg/m ³) 4 ppb	-	5.0 ppb ⁽⁶⁾	4.0 ppb ⁽⁶⁾	-

Notes:

1. Based on the 3y average of the 4th highest 8h running average concentration in a year.
2. Ontario has adopted the CAAQS for PM_{2.5} in the absence of an AAQC. Based on the 3y average of the 98th percentile 24h average concentration in a year. (Re AAQC, this value could also be used “as is” for comparison to the 24- hour measurement of air quality data).
3. Ontario has adopted the CAAQS for PM_{2.5} in the absence of an AAQC. Based on the 3y average of the annual mean. (Re AAQC, this value could also be used “as is” for comparison to a single annual averaging of air quality data).
4. Based on the 3y average of the weighted annual mean.
5. Based on the 3y average of the 98th percentile of the yearly distribution of 1h daily maximum concentrations.
6. The average over a single calendar year of all the 1h average concentrations.
7. Based on the 3y average of the 99th percentile of the highest daily maximum 1h average concentration in a year.