

Ground-level ozone (O₃)



Liveability | Air quality

South Australia's environmental trend and condition report cards 2023



Trend
Stable



Condition
Very good

Reliability
Very good

STATE

Trend

Ground-level ozone (O₃) concentrations have been stable in metropolitan Adelaide since 2007.

This assessment is of annual average and 8-hour average ground-level O₃ concentrations measured at 6 air quality monitoring stations around metropolitan Adelaide (top figure). Not all stations were operating for the entire assessment period.

Levels of O₃ in metropolitan Adelaide have been stable since 2007, as shown by the annual average and 95th percentile 8-hour rolling average. However, short-term peak concentrations can vary from year to year as shown by the maximum 8-hour averages (bottom figure).

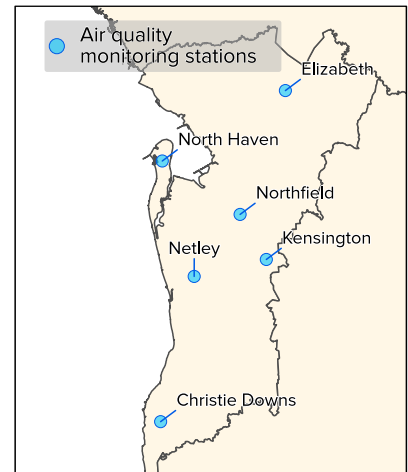
O₃ levels are influenced by factors such as the levels of nitrogen oxides and volatile organic compounds (VOCs) present in the air, and weather conditions. Warm and sunny weather facilitates the formation of O₃. Significant emissions events such as bushfires can lead to higher than normal levels of O₃, as occurred in the summer of 2019–20.

Condition

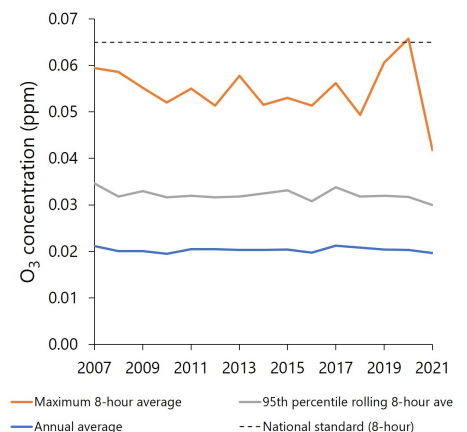
Air quality is rated as very good based on measured ground-level O₃. Levels are generally low and meet the national standard.

Australia has a national standard for ground-level O₃ of 0.065 parts per million (ppm) over an 8-hour averaging period. In 2021, maximum 8-hour average O₃ concentrations varied from 0.039 ppm to 0.045 ppm across sites in metropolitan Adelaide. The national standard was met at all sites in 2021.

The frequency of very good ratings varied from site to site, however 8-hour O₃ levels met this condition rating most of the time at all sites, resulting in an overall condition rating of very good.



Ground-level ozone concentrations in South Australia are stable and meet the national standard.



Why is managing ground-level ozone important?

O₃ is a highly reactive gas and at ground level can be harmful to human health. Health effects can include irritation and inflammation of the eyes, nose, throat and lungs, coughing, breathing difficulties, chest pain, increased risk of respiratory infections, and aggravation of existing lung diseases. Children, the elderly, people with lung disease and people who are active outdoors are the most sensitive to the effects of O₃.

Elevated levels of O₃ can also impact sensitive vegetation and ecosystems.

What are the pressures?

Ground-level O₃ is a secondary pollutant, as it is not emitted directly to air. It is formed by chemical reactions between nitrogen oxides and VOCs in the presence of heat and sunlight. The highest concentrations tend to occur in summer on warm, sunny days.

The main sources of nitrogen oxides and VOC emissions are vehicles, industries that burn fossil fuels (e.g. power stations, those with industrial boilers), that use or produce organic chemicals, and smoke from bushfires and other sources.

What is being done?

The Environment Protection Authority monitors ground-level O₃, regulates industrial emissions, and ensures air quality is considered within the state planning assessment process. Australia has a national standard for O₃, which was updated in 2021 to reflect the latest knowledge about health impacts from air pollution. Vehicle emission limits in the Australian Design Rules, and the promotion of alternative modes of transport such as cycling, public transport and low emission vehicles are also important for reducing emissions that lead to the formation of ground-level O₃.

For further information see: [technical information](#)



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Government of South Australia