

## 10.3 Air quality

### Why this measure is included

Air quality can have impacts on the short and long-term health of children and young people. Exposure to certain pollutants can exacerbate respiratory conditions, while others can affect birth weight or fetal growth.<sup>558</sup> Children are often more susceptible to pollutants than adults, as they inhale more pollutants for weight than adults. Their developing organs may be more vulnerable at certain points of development.<sup>559</sup>

Australia has national standards on ambient air quality, developed by the National Environment Protection Council. These are regularly monitored by each state and territory. Overall, air quality in Australian cities is considered good by international standards.<sup>560</sup>

**Table 10.5: Days where various pollutants exceeded the standard, Perth, Western Australia, 2008 to 2012**

Pollutant	Time	Standard	2008	2009	2010	2011	2012
Carbon Monoxide (3)	8 hour	9.0 ppm	0	0	0	0	0
Nitrogen Dioxide (7)	1 hour	0.12 ppm	0	0	0	0	0
	1 year	0.03 ppm	0	0	0	0	0
Ozone (6)	1 hour	0.10 ppm	0	2(2)	0	0	3(3)
	4 hour	0.08 ppm	0	3(2)	0	0	6(4)
Sulfur Dioxide (3)	1 hour	0.20 ppm	0	0	0	0	0
	24 hour	0.08 ppm	0	0	0	0	0
	1 year	0.02 ppm	0	0	0	0	0
Particles PM10 (3)	24 hour	50 micrograms/m <sup>3</sup>	1(1)	0	5(2)	3(3)	8(3)
Particles PM2.5 (4)	24 hour	25 micrograms/m <sup>3</sup>	4(4)	10(4)	11(4)	5(4)	14(4)

Source: Department of Environmental Regulation (WA), Air Quality Monitoring Reports, by year

Note: Numbers in brackets next to a pollutant indicate the number of stations where that pollutant is monitored. Numbers in brackets in the year column indicate the number of stations where that pollutant exceeded the standard.

ppm: parts per million

**Table 10.6: Days where Particles (PM10 and PM2.5) exceeded the standard, regions, 2008 to 2012**

Station/Pollutant	Time	Standard	2008	2009	2010	2011	2012
Albany PM10	24 hour	50 micrograms/m <sup>3</sup>	2	0	1	0	0
Bunbury PM10	24 hour	50 micrograms/m <sup>3</sup>	0	1	2	2	2
Bunbury PM2.5	24 hour	25 micrograms/m <sup>3</sup>	2	7	7	5	7
Busselton PM2.5	24 hour	25 micrograms/m <sup>3</sup>	3	12	7	6	5
Collie PM10	24 hour	50 micrograms/m <sup>3</sup>	7	3	16	4	6
Geraldton PM10	24 hour	50 micrograms/m <sup>3</sup>	10	14	4	3	3

Source: Department of Environmental Regulation (WA), Air Quality Monitoring Reports, by Year

Note: Particles are the only pollutants monitored by the Department of Environmental Regulation outside the metropolitan area.

---

## What is this measure?

This measure indicates the number of days per year that air quality at various locations in Western Australia (WA) exceeded guidelines for the various listed pollutants.

Air quality in Australia is guided by the National Environment Protection (Ambient Air Quality) Measure, first established in 1998 and varied in 2003. This document sets the threshold for each of the pollutants listed in Table 10.5 above. As a party to the agreement, WA collects data and reports on pollution as set out in the national standard.

Air quality in WA is monitored by the Department of Environmental Regulation at eight sites in the metropolitan area and at Albany, Bunbury, Busselton, Collie, and Geraldton. Specific pollutants are monitored depending on the location of the station – sulfur dioxide, for example, is only measured at three locations in the south of Perth near the Kwinana industrial area, the main source of sulfur dioxide.<sup>561</sup>

The pollutants tested for in WA are:

- Carbon monoxide: Associated with adverse birth outcomes, such as low birth weight, as well as hospital admissions and cardiovascular disease.<sup>562</sup> In WA carbon monoxide is created primarily by prescribed burning and wildfires. In the Perth metropolitan area most carbon monoxide comes from motor vehicle emissions.<sup>563</sup>
- Nitrogen dioxide: Short-term exposure is associated with increased asthma symptoms.<sup>564</sup> Primary sources in WA are bush fires and natural decay of plants, while in the Perth metropolitan area the main sources are motor vehicle emissions and electricity generation.<sup>565</sup>
- Sulfur dioxide: Short-term exposure is associated with irritant responses and respiratory problems, particularly for people with asthma.<sup>566</sup> Sulfur dioxide in WA mostly comes from non-ferrous metal manufacture and processing, while in the metropolitan area the main sources are electricity generation, and petroleum and coal manufacturing.<sup>567</sup>
- Ozone: Short-term exposure is associated with higher hospital admissions for respiratory causes and linked to adverse respiratory outcomes.<sup>568</sup> Ozone in the lower atmosphere (that is, close to the earth's surface) can react with other pollutants to form photochemical smog, and so is measured to indicate smog concentration.<sup>569</sup>
- Particles (PM10 and PM2.5): Particles are associated with cardiovascular disease and some respiratory symptoms, and long-term effects related to lung growth and asthma development.<sup>570</sup> Across WA, major sources of particles are fires, metal ore mining, and windblown dust, while in Perth major sources are solid fuel burning, fires and motor vehicles.<sup>571</sup> PM10 refers to particles of 10 microns or less in diameter, while PM2.5 refers to particles of 2.5 microns or less in diameter.<sup>572</sup>

## Commentary

Air quality in Perth is generally good, with few days where the national standards are exceeded. However, there are a number of air pollutants that are approaching the national standards. The standards that have been exceeded are particles and ozone. These standards are exceeded most often as a result of smoke haze from bushfires.<sup>573</sup>

Research suggests that health effects can be observed even where emissions are below national standards, particularly for children and young people.<sup>574</sup>

When the standards for pollution were originally developed in 1998, it was considered that these represented a threshold below which pollutants would have no real effect.<sup>575</sup> These standards were based on contemporary overseas evidence on the links between certain levels of air pollution and adverse health effects.

---

More recent work has provided evidence of health effects that can be attributed to the current levels of air pollution, which are largely below the standards set in the NEPM.<sup>576</sup>

Some studies have shown a correlation between air pollution and health, particularly on lung function, respiratory symptoms and use of medication for asthma.<sup>577 578</sup>

## Strategies

### Perth Air Quality Management Plan (released 2000)

This 30-year management plan was launched in 2000 to ensure that the Perth metropolitan area achieves and maintains clean air. An associated Implementation Strategy was released in 2002.

The plan is a whole-of-government initiative, including programs and projects run by a variety of agencies with the aim of ensuring clean air. Development and implementation of the plan is overseen by the Air Quality Coordinating Committee, which includes members from relevant government agencies, environmental and community groups and industry.

The management plan and reviews and progress reports on the implementation of the plan are available from [www.dec.wa.gov.au/pollution-prevention/air-quality/perth-air-quality-management-plan.html](http://www.dec.wa.gov.au/pollution-prevention/air-quality/perth-air-quality-management-plan.html)

## Want to know more?

### Data on air quality

The Department of Environment Regulation publishes annual reports on air quality in WA. These are available at [www.der.wa.gov.au/your-environment/air](http://www.der.wa.gov.au/your-environment/air)

### Research, Reports and Articles

The Telethon Institute for Child Health Research published the results of a study into the respiratory health of children in Kwinana. Research findings indicated that children in Kwinana did not appear to demonstrate any more respiratory problems than children in other parts of Perth. The study report is available at <http://telethonkids.org.au/our-research/projects-index/k/kwinana-childrens-respiratory-health-study/>

In 2013 the Senate Community Affairs Reference Committee of the Commonwealth Parliament published a report, *Impacts on health of air quality in Australia*. This report focussed on particles in air, and made recommendations to address these. The report is available at [www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Community\\_Affairs/Completed\\_inquiries/2010-13/airquality/index](http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Community_Affairs/Completed_inquiries/2010-13/airquality/index)

In 2003 the University of the Sunshine Coast produced a report, *Air quality and child health – Current evidence and priorities for Australia*, which focussed on long-term effects of major outdoor pollutants on the health of children. The report is available at [www.environment.gov.au/resource/air-quality-and-child-health-current-evidence-and-priorities-australia](http://www.environment.gov.au/resource/air-quality-and-child-health-current-evidence-and-priorities-australia)

### More information about air quality

The Commonwealth Government will be developing a National Plan for Clean Air by the end of 2014. This plan is intended to be a national plan to reduce risks of health impacts of air pollution. More information on air quality in WA is available at [www.der.wa.gov.au/your-environment/air](http://www.der.wa.gov.au/your-environment/air)

