



AIR

Air is essential for sustaining life. The composition of air is the result of the co-evolution of the atmosphere, geosphere and biosphere over billions of years. Air is comprised of nitrogen (78%), and oxygen (21%). Good air quality means that the air is clean, clear and unpolluted. Clean air is essential for humans, other animals, vegetation, water and soil. Poor air quality is usually due to pollutant emissions into the air, either from human or other sources. If pollutants reach high enough concentrations they can endanger human health and the environment.

Measuring air quality

In the 2015 State of the Environment Report for the Australian Capital Territory (ACT), air quality refers to the quality of the ambient air. This is defined by the *National Environment Protection (Ambient Air Quality) Measure* (Ambient Air Quality NEPM): 'Ambient air means the external air environment, it does not include the air environment inside buildings or structures'.

The NEPM prescribes targets for levels of emissions of pollutants in ambient air, as well as the methods that should be used to monitor the pollutants. The ACT monitors and reports annually on four of these:

- Carbon monoxide (CO)
- Nitrogen dioxide (NO₂)
- Ozone pollution level
- Particulate matter less than 10 micrometres in size (PM₁₀)

The ACT chooses to also report on the advisory reporting standard for particulate matter less than 2.5 micrometres in size (PM_{2.5}).

Levels of these pollutants are monitored by ACT Government stations in Monash (pictured) and Florey. The Monash and Florey stations meet the NEPM standards for monitoring air quality however a third station at Civic does not monitor all pollutants covered by the NEPM.



NEPM Monitoring station at Monash
Photo: ACT Government



MAIN FINDINGS

State and trends

During the reporting period most indicators of air pollution were well within compliance ranges established by the Ambient Air Quality NEPM, indicating that air quality was good. Table 1 summarises the results for each pollution indicator.

Table 1: Results Ambient Air Quality NEPM by pollution indicator 1 July 2011 to 30 June 2015

Air pollutant	NEPM standard maximum concentration	NEPM Standard Exceedances	Trend in pollution level
Carbon monoxide (CO)	9.00 ppm over 8 hours	No exceedances	Stable, well within NEPM compliance range
Nitrogen dioxide (NO₂)	0.12 ppm over 1 hour	No exceedances	Stable, well within NEPM compliance range
Ozone	0.10 ppm over 1 hour	No exceedances	Stable, well within NEPM compliance range
	0.08 ppm over 4 hours	No exceedances	Stable, well within NEPM compliance range
Particulate matter - PM₁₀	50.00 ug/m ³ over 1 day	No exceedances	Declining
Particulate matter - PM_{2.5}	25.00 ug/m ³ over 1 day 8 ug/m ³ over 1 year (advisory standards)	Exceedances on 17 days	Steady but the pollution level can peak due to wood heaters and fire activity

Despite occasional increases in CO pollution during the reporting period only particulate matter pollution exceeded the maximum concentration allowed under the NEPM. Of the 17 days where exceedances occurred, 12 were in winter months and attributable to wood heater emissions and three in other months were attributable to fire hazard reduction burns. Figure 1 shows this for 2014.

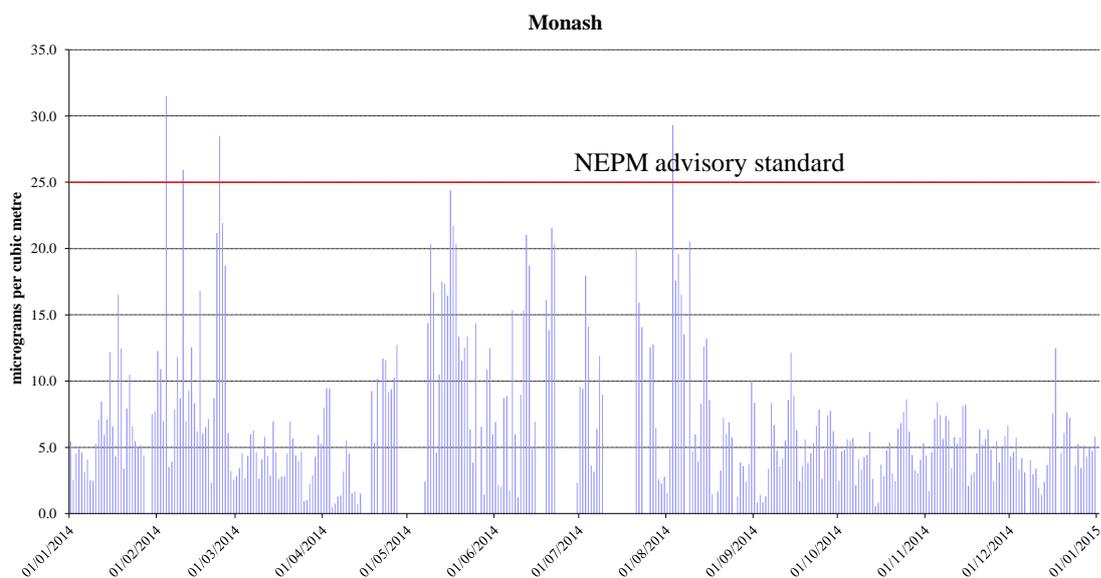


Figure 1: Level of particulate matter pollution (PM 2.5) levels during 2014 measured at Monash



Bushfires and controlled burns can contribute to air pollution

Photo: ACT Government

Pressures

To a large extent air quality in the ACT is determined by activities and conditions within our urban areas. The main pressure on ACT air quality is emissions to the airshed, which affects air quality and causes health impacts. Figure 2 shows the sources of air contaminant emissions over 2011 -2014.

The main pressures of concern are for small but widespread emissions of pollutants, particularly:

Carbon monoxide - motor vehicles emissions are the main pressure followed by solid fuel burning for domestic heating.

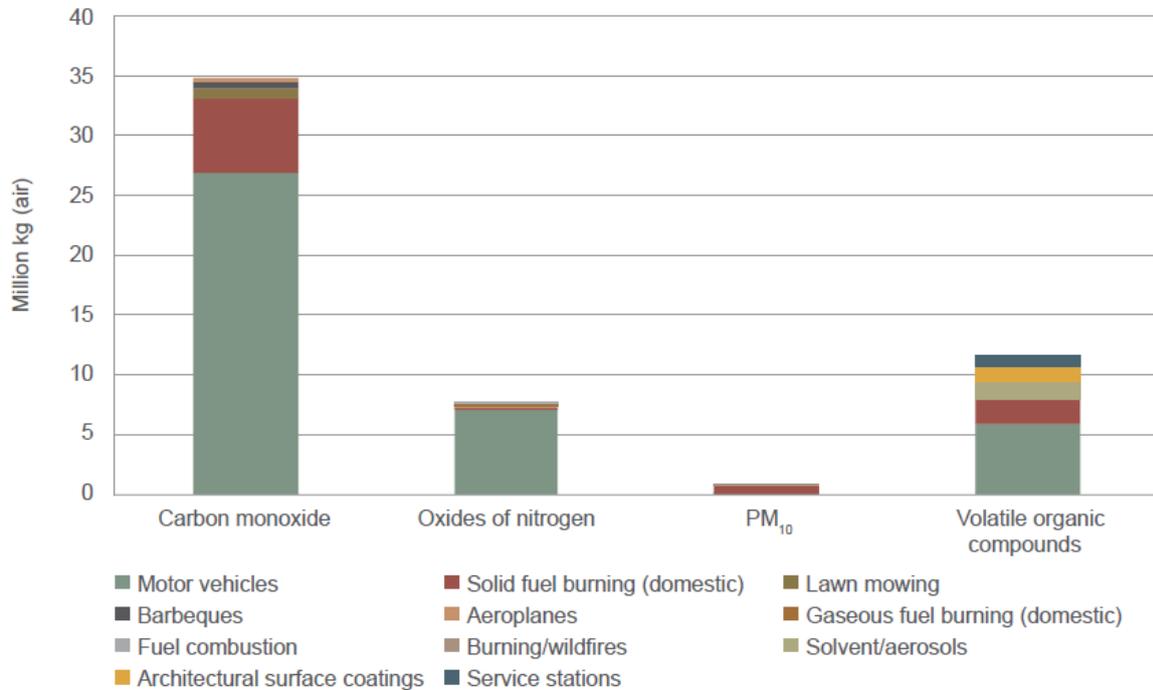
Nitrogen dioxide - motor vehicle emissions are the main source of emissions.

Ozone - motor vehicle emissions are the main pressure, followed by solid fuel burning for domestic heating.

PM10 - solid fuel burning for domestic heating is the main source of emissions.

PM2.5 - sources of emissions varied between construction material, mining and water supply, sewerage and drainage services.

Point source emissions of some substances emitted from industrial facilities also measured and regulated by the ACT Government. There are several industrial facilities that must report on their total point source emission each year. All facilities have been reported as compliant during the reporting period.



kg = kilogram; PM₁₀ = particulate matter less than 10 micrometres
Source: Data provided by the National Pollutant Inventory

Figure 2: Sources and volumes of ACT air contaminant emissions 2011 – 2014

Source Data provided by National Pollutant Inventory

Response

In the ACT, the *Environment Protection Act 1997* and the *Environment Protection Regulation 2005* provide the legal framework for the protection of air quality. The EPA enforces the legislation and relevant regulations. The ACT Government is working to reduce particulate matter from wood smoke attributed to heating in the winter months through a wood heater replacement program funded by ActewAGL Pty Ltd. Also, the environment impact statement process controls development where air quality is considered as an issue. For example, in new developments where topography is a likely factor in reduced air quality with wood heater use, their installation is restricted.

During the reporting period, a comprehensive air quality assessment was undertaken for the Molonglo Valley development and wood heaters were banned. The ACT Government is also working to reduce vehicle emissions and reliance on cars as the main transport method in the ACT.

More information on air quality is available in Chapter 4 (Air) of the 2015 *ACT State of the Environment Report*. Available at <http://reports.envcomm.act.gov.au/actsoe2015>