NSW air quality report 2022

National Environment Protection (Ambient Air Quality) Measure

Department of Climate Change, Energy, the Environment and Water

NSW GOVERNMENT

Acknowledgement of Country

Department of Climate Change, Energy, the Environment and Water acknowledges the Traditional Custodians of the lands where we work and live.

We pay our respects to Elders past, present and emerging.

This resource may contain images or names of deceased persons in photographs or historical content.

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Acronyms, abbreviations and glossary

The following is a list of acronyms, abbreviations and terms used in this report.

Term	Meaning
AAQ NEPM	*National Environment Protection (Ambient Air Quality) Measure*
ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AEST	Australian Eastern Standard Time
Amdt	Amendment
AS/NZ(S)	Australian Standards/New Zealand Standard
BAM	beta attenuation monitor
BOM	Australian Bureau of Meteorology
C	compliant (with AAQ NEPM standards and goals)
CAM	Clean Air Metric
CBD	central business district
CO	carbon monoxide
COVID-19	Coronavirus disease caused by the SARS-CoV-2 virus
DCCEEW	Department of Climate Change, Energy, the Environment and Water, NSW
DPE	Department of Planning and Environment, NSW – former name for DCCEEW
EPA	Environment Protection Authority
EU	European Union
Exceed.	short for 'exceedance' – used in table headers throughout the report
FDMS	filter dynamics measurement system
FRM	Federal Reference Method, USEPA
GMR	Greater Metropolitan Region – covers Sydney, the Illawarra, Lower Hunter, Central Coast and Lake Macquarie air quality regions
ISO 17025	standard of competency for testing and calibration laboratories
km	kilometre
m	metre
MODIS	Moderate Resolution Imaging Spectroradiometer are imaging instruments on board NASA's Terra and Aqua satellites
NASA	National Aeronautics and Space Administration
NATA	National Association of Testing Authorities
N-C	not compliant (with AAQ NEPM standards and goals)

Term	Meaning
ND	not demonstrated – this means that 75% availability of data in at least one yearly quarter was not demonstrated as this monitoring station
NEED	non-exceptional event day
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
NSW	New South Wales
OEH	Office of Environment and Heritage
O_3	ozone
PM2.5	particulate matter with an aerodynamic diameter of 2.5 micrometres or less
PM10	particulate matter with an aerodynamic diameter of 10 micrometres or less
POEO Act	*Protection of the Environment Operations Act 1997*
ppm	parts per million – parts of a chemical compound per million parts of air by volume
pphm	parts per hundred million – parts of a chemical compound per hundred million parts of air by volume
SO_2	sulfur dioxide
TEOM	tapered element oscillating microbalance
USEPA	United States Environmental Protection Agency
$\mu g/m^3$	microgram of pollutant (1 millionth of a gram) per cubic metre of air, referenced to temperature of 0 °C (273.15 °K) and absolute pressure of 101.325 kilopascals (kPa)
VOCs	volatile organic compounds – chemical species that have high enough vapour pressure to exist at least partially as a gas at standard atmospheric temperature and pressure

1. Summary

The *National Environment Protection (Ambient Air Quality) Measure* (AAQ NEPM or NEPM), amended May 2021, is the Commonwealth legislation that sets out the national standards and goals for air quality in Australia. This measure is implemented in New South Wales (NSW) under the *Protection of the Environment Operations Act 1997* (POEO Act), the Protection of the Environment Operations (Clean Air) Regulation 2022 and the Protection of the Environment Operations (General) Regulation 2021. This annual compliance report is required under clause 18 of the AAQ NEPM. It presents NSW air quality monitoring data for 2022, assessed against the standards and requirements of the AAQ NEPM.

The AAQ NEPM (May 2021 amendment) sets requirements for the monitoring and reporting of air pollutants with reference to:

- air quality standards, as concentrations of pollutants against which air quality can be assessed
- describing circumstances that led to the exceedance of standards and the extent to which these exceedance events are exceptional or not for particles as PM10, as PM2.5 and photochemical oxidants (ozone, O_3)
- population exposures for PM2.5, nitrogen dioxide (NO_2) and ozone.

The NSW AAQ NEPM Compliance Monitoring Network (the network) is a part of the NSW Government's broader ambient air quality monitoring network described in Section A. The NSW Government operates the network in accordance with the NSW Air Quality Monitoring Plan 2021–2025 (DPIE 2020a), the AAQ NEPM legislation and associated technical papers (National Environment Protection Council, various years, see the 'Reference' section for more information), and the Department of Climate Change, Energy, the Environment and Water's (DCCEEW) accreditation by the National Association of Testing Authorities (NATA).

In 2022, the AAQ NEPM network comprised 44 air quality monitoring stations across NSW until the Chullora station was decommissioned in November 2022, ending the year with 43 monitoring stations.

New South Wales monitors 6 of the 7 criteria pollutants covered by the AAQ NEPM. Ambient lead monitoring in NSW ceased in 2004 as ambient concentrations fell consistently below the AAQ NEPM standard following the introduction of unleaded motor fuel.

1.1 Approach to AAQ NEPM compliance assessment

Air quality monitoring stations are compliant with NEPM standards if the following conditions are met:

- at least 75% of each quarter's data is valid during a calendar year for:
  - 1-hour data for gaseous parameters and
  - 24-hour data for particles as PM10 and PM2.5, and

- the NEPM standards relating to hourly averages for nitrogen dioxide and sulfur dioxide (SO_2), 8-hour rolling average for carbon monoxide (CO), 24-hour average for sulfur dioxide and annual standard for nitrogen dioxide are not exceeded
- the NEPM standards relating to the 8-hour rolling average for ozone or the 24-hour averages for PM10 and PM2.5 are exceeded only due to events deemed to be exceptional in nature as defined in the AAQ NEPM legislation.

1.2 Network changes

Chullora was decommissioned on 3 November 2022. Its replacement station – Lidcombe – has been operating since April 2020.

Campaign monitoring (see section 2.2.3 for the definition) at Tamworth, Albury and Wagga Wagga North was extended to include nitrogen dioxide during the warmer months.

The AAQ NEPM Compliance Network was expanded in 2022 to include the following stations:

- Alexandria in Sydney East
- Bradfield Highway in Sydney East
- Coffs Harbour in the Mid North Coast
- Port Macquarie in the Mid North Coast.

1.3 Compliance assessment (2022)

The 2022 compliance status for all criteria pollutants at all stations in the network are summarised in Table 1.

1.3.1 Carbon monoxide

Sixteen of 21 stations monitoring carbon monoxide in 2022 complied with the quarterly 75% valid data availability criterion. No exceedances were observed, resulting in those 16 stations complying with the 8-hour rolling average of 9.0 ppm.

Five stations did not meet the quarterly 75% data availability criterion. The compliance of those stations was assessed as ‘not demonstrated’.

1.3.2 Nitrogen dioxide

Thirty-two of 36 stations monitoring nitrogen dioxide in 2022 complied with the quarterly 75% valid data availability criterion. No exceedances were observed, resulting in those 32 stations complying with the 1-hour average standard of 0.080 ppm and the annual average standard of 0.015 ppm.

Three stations did not meet the quarterly 75% valid data availability criterion, and their compliance was assessed as ‘not demonstrated’.

1.3.3 Sulfur dioxide

Twenty-five of 28 stations monitoring sulfur dioxide in 2022 complied with the quarterly 75% valid data availability criterion. Morisset exceeded the 1-hour average standard

(0.100 ppm). Twenty-four stations complied with the 1-hour average standard and 25 complied with the 24-hour average standard of 0.020 ppm.

Three stations did not meet the quarterly 75% valid data availability criterion. The status of these stations was assessed as 'not demonstrated'.

1.3.4 Ozone

Thirty of 34 stations monitoring ozone in 2022 complied with the quarterly 75% valid data availability criterion. No exceedances were observed, resulting in those 30 stations complying with the 8-hour rolling average standard of 9.0 ppm.

Four stations did not meet the quarterly 75% data availability criterion, resulting in the compliance status of these stations to be assessed as 'not demonstrated'.

1.3.5 Particles as PM10 and PM2.5

There were 16 days during 2022 where either one or both daily particle standards (PM10 or PM2.5) were exceeded in NSW. Fifteen were attributed to wood smoke from domestic wood heaters, while one day was attributed to agricultural burning. All were attributed to non-exceptional events.

Particles as PM10

Thirty-nine of 44 stations monitoring PM10 in 2022 complied with the quarterly 75% valid data availability criterion. Armidale exceeded the 24-hour average standard of 50.0 µg/m^3 due to wood smoke – a non-exceptional event. Thirty-eight stations complied with the 24-hour standard, while 39 stations complied with the annual average standard of 25.0 µg/m^3.

Five stations did not meet the quarterly 75% valid data availability criterion, resulting in the compliance status of these stations being assessed as 'not demonstrated'

Particles as PM2.5

Thirty-eight of 43 stations monitoring PM2.5 in 2022 complied with the quarterly 75% valid data availability criterion. Armidale (11 days), Orange (5 days) and Gunnedah (4 days) recorded exceedances of the 24-hour average standard of 25.0 µg/m^3 due to wood smoke – all non-exceptional events. Wagga Wagga North recorded an exceedance of the 24-hour standard due to agricultural burning, which is also a non-exceptional event. Thirty-five stations complied with the 24-hour average standard, while all 38 stations complied with the annual average standard of 8.0 µg/m^3.

Five stations did not meet the quarterly 75% valid availability criterion, resulting in the compliance status of these stations being assessed as 'not demonstrated'.

1.4 Population exposure analysis

There is currently no agreed national method among participating jurisdictions regarding evaluation and reporting of population exposure, as mandated by the AAQ NEPM. Population exposure analysis was introduced in 2018 for PM2.5 and in 2021 for nitrogen dioxide and ozone.

The Clean Air Metric (CAM) accounts for population exposure when assessing changes to average air quality. The CAM index is calculated by dividing the 2022 population weighted concentrations for PM2.5, nitrogen dioxide and ozone by the respective AAQ NEPM standards. Section E of this report outlines the department's approach to evaluating population exposure to particles as PM2.5, nitrogen dioxide, and ozone.

Results show that regions characterised by elevated PM2.5 and nitrogen dioxide exposure in 2022 generally aligned with populated areas concentrated along transport corridors in the Greater Sydney region, while ozone exposure in 2022 had the largest spatial extent of the 3 pollutants analysed. Results also showed that 2022 had the lowest PM2.5 population weighted concentration during the 1996 to 2022 period analysed. This is likely due to successive La Niña events reducing hazard reduction burning and bush fire events.

For the Greater Sydney Region and the NSW Greater Metropolitan Region (GMR), the CAM-PM2.5 values were 51 and 52 respectively, 32 and 31 respectively for the CAM-NO_2 values, and 68 and 73 respectively for the CAM-O_3 values. The overall CAM index is determined by the pollutant that has the maximum CAM value for the Greater Sydney Region and the NSW GMR. For 2022, the CAM-ozone index was highest for both regions, at 68 and 73 respectively.

1.5 Compliance summary table (2022)

Table 1 Summary of compliance with AAQ NEPM goal for particles and gases (2022)

Region/station[1]		CO 8-hour	NO_2 1-hour	NO_2 1-year	SO_2 1-hour	SO_2 1-day	O_3 8-hour	PM10 1-day	PM10 1-year	PM2.5 1-day	PM2.5 1-year
East Sydney											
1	Alexandria	ND	C	C	C	C	ND	ND	ND	ND	ND
2	Bradfield Highway	ND	ND	ND	ND	ND	ND	C	C	C	C
3	Cook and Phillip	ND	C	C	C	C	C	C	C	C	C
4	Earlwood	–	C	C	–	–	C	C	C	C	C
5	Macquarie Park	C	C	C	C	C	C	C	C	C	C
6	Randwick	–	C	C	C	C	C	C	C	C	C
7	Rozelle	C	C	C	C	C	C	C	C	C	C
Central West Sydney											
8	Chullora	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9	Lidcombe	C	C	C	C	C	C	C	C	C	C
10	Parramatta North	C	C	C	C	C	C	C	C	C	C
11	Prospect	C	C	C	C	C	C	ND	ND	ND	ND
12	Rouse Hill	C	C	C	C	C	C	C	C	C	C
South West Sydney											
13	Bargo	–	C	C	C	C	C	C	C	C	C
14	Bringelly	–	C	C	C	C	C	C	C	C	C
15	Camden	C	C	C	–	–	C	C	C	C	C
16	Campbelltown West	C	C	C	C	C	C	C	C	C	C
17	Liverpool	ND	C	C	C	C	C	C	C	C	C
18	Oakdale	–	C	C	–	–	C	C	C	C	C

Region/station[1]		CO 8-hour	NO_2 1-hour	NO_2 1-year	SO_2 1-hour	SO_2 1-day	O_3 8-hour	PM10 1-day	PM10 1-year	PM2.5 1-day	PM2.5 1-year
North West Sydney											
19	Penrith	C	C	C	C	C	C	C	C	C	C
20	Richmond	–	C	C	C	C	C	C	C	C	C
21	St Marys	–	C	C	–	–	C	C	C	C	C
Illawarra											
22	Albion Park South	–	C	C	C	C	C	C	C	C	C
23	Kembla Grange	–	C	C	–	–	C	C	C	C	C
24	Wollongong	C	C	C	C	C	C	C	C	C	C
Central Coast											
25	Wyong	C	C	C	C	C	C	C	C	C	C
Lake Macquarie											
26	Morisset	C	C	C	N-C	C	C	C	C	C	C
Lower Hunter											
27	Beresfield	–	C	C	C	C	C	C	C	C	C
28	Newcastle	C	C	C	C	C	C	C	C	C	C
29	Wallsend	–	C	C	C	C	C	C	C	C	C
Upper Hunter											
30	Aberdeen	–	–	–	–	–	–	C	C	–	–
31	Merriwa	C	C	C	C	C	C	C	C	C	C
32	Muswellbrook	–	ND	ND	ND	ND	–	C	C	C	C
33	Singleton	–	C	C	C	C	–	C	C	C	C
Central Tablelands											
34	Bathurst	–	–	–	–	–	–	C	C	C	C
35	Orange	–	–	–	–	–	–	C	C	N-C	C
North West Slopes											

Region/station[1]		CO 8-hour	NO_2 1-hour	NO_2 1-year	SO_2 1-hour	SO_2 1-day	O_3 8-hour	PM10 1-day	PM10 1-year	PM2.5 1-day	PM2.5 1-year
36	Gunnedah	–	C	C	–	–	C	ND	ND	N-C	ND
37	Narrabri	–	–	–	–	–	–	ND	ND	ND	ND
38	Tamworth	–	–	–	–	–	–	C	C	C	C
Northern Tablelands											
39	Armidale	–	–	–	–	–	–	N-C	C	N-C	C
Mid North Coast											
40	Coffs Harbour	C	C	C	–	–	C	C	C	C	C
41	Port Macquarie	C	C	C	C	C	C	C	C	C	C
South West Slopes											
42	Albury	–	–	–	–	–	–	C	C	C	C
43	Wagga Wagga North	–	–	–	–	–	–	C	C	N-C	C
Southern Tablelands											
44	Goulburn	–	ND	ND	–	–	ND	C	C	C	C
	Summary										
	Standard	CO 8-hour	NO_2 1-hour	NO_2 1-year	SO_2 1-hour	SO_2 24-hour	O_3 8-hour	PM10 24-hour	PM10 1-year	PM2.5 24-hour	PM2.5 1-year
	Total stations	21	36	36	28	28	34	44	44	43	43
	Total compliant	16	32	32	24	25	30	38	39	35	38
	Total non-compliant	0	0	0	1	0	0	1	0	4	0
	Total not demonstrated	5	4	4	3	3	4	5	5	4	5

Notes:

CO = carbon monoxide; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; O_3 = ozone; PM10 = particulate matter with an aerodynamic diameter of 10 micrometres or less; PM2.5 = particulate matter with an aerodynamic diameter of 2.5 micrometres or less; C = compliant; N-C = not compliant; ND = not demonstrated; '–' indicates the parameter is not monitored at this station.

2. Section A: monitoring summary

2.1 Overview of air quality monitoring in New South Wales

During 2022, the NSW Government operated a network of up to 96 long-term air quality monitoring stations. With the decommissioning of the Chullora station in East Sydney in November 2022, the Government operated a network of 95 long term stations as of 31 December 2022. The network comprised:

- 57 stations that are ISO 17025 accredited by NATA and are located in metropolitan and regional centres throughout NSW:
  - 29 stations in the NSW GMR:
    - 7 stations in the East Sydney region
    - 5 stations in the Central West Sydney region
    - 6 stations in the South West Sydney region
    - 3 stations in the North West Sydney region
    - 3 stations in the Lower Hunter region
    - 3 stations in the Illawarra region
    - 1 station in the Central Coast region
    - 1 station in the Lake Macquarie region.
  - 9 stations in NSW regional centres:
    - 2 stations in the Central Tablelands region
    - 2 stations in the Mid North Coast region
    - 2 stations in the South West Slopes region
    - 1 station in the Northern Tablelands region
    - 1 station in the North West Slopes region
    - 1 station in the Southern Tablelands region.
  - 19 industry-funded, Government-operated stations:
    - 14 stations in the Upper Hunter Air Quality Monitoring Network monitor air quality affected by coal mining and coal-fired power generation
    - 3 stations in the Newcastle Local Air Quality Monitoring Network monitor air quality affected by industrial activity around the Port of Newcastle.
    - 2 stations in the North West Slopes Air Quality Monitoring Network monitor air quality affected by coal mining.
- 39 indicative monitoring stations in rural sites monitor the impact of dust and smoke in rural and remote areas of NSW. Six stations are located in Victoria (4) and South Australia (2), to primarily monitor major sources of dust near those stations that are known to impact air quality in NSW.

2.2 The NSW AAQ NEPM Compliance Monitoring Network

The AAQ NEPM requires the NSW Government to report annually on compliance against the Schedule 2 standards for air quality measured at performance monitoring stations to assess the exposure of the public to air pollution.

2.2.1 Monitoring stations and maps

Of the 57 monitoring stations accredited by NATA that are listed above, 44 are assessed for compliance against the AAQ NEPM standards for the 2022 calendar year. These are mapped in Figure 1 and Figure 2. A full list of stations, criteria pollutants monitored at each station and their classifications is provided in Table 2.

These stations include:

- 29 stations in the NSW GMR (Figure 1):
  - 21 stations in Greater Sydney:
    - 7 stations in the East Sydney region
    - 5 stations in the Central West Sydney region
    - 6 stations in the South West Sydney region
    - 3 stations in the North West Sydney region.
  - 3 stations in the Lower Hunter region
  - 3 stations in the Illawarra region
  - 1 station in the Central Coast region
  - 1 station in the Lake Macquarie region.
- 15 stations in regional centres, including industry-funded stations (Figure 2):
  - 4 stations in the industry-funded Upper Hunter region
  - 3 stations in the North West Slopes, including 2 industry-funded stations
  - 2 stations in the Central Tablelands region
  - 2 stations in the Mid North Coast region
  - 2 stations in the South West Slopes region
  - 1 station in the Northern Tablelands
  - 1 station in the Southern Tablelands.

Stations monitor air quality within their air quality regions, which are shown on the NSW Air Quality website. While each station represents air quality that is typical of the urban area and NEPM region they are located in, stations, particularly in regional NSW, do not always reflect the air quality in the broader region due to localised events. Given the larger population, concentration of monitoring stations and pollutant patterns, Greater Sydney is divided into 4 subregions. These are shown on the NSW Air Quality website. For the purposes of NEPM compliance, all stations in Sydney, irrespective of their subregion, are considered part of Greater Sydney.

The purpose of the NSW AAQ NEPM Compliance Monitoring Network is to measure air quality experienced by the NSW public and to capture air quality events that will impact

population centres. As such, the location of monitoring stations in each region is selected to optimise both population coverage and representation of the occurrences of higher pollutant concentrations. Identification and selection of appropriate locations for long-term performance monitoring is hindered by additional factors including security, accessibility and long-term availability.

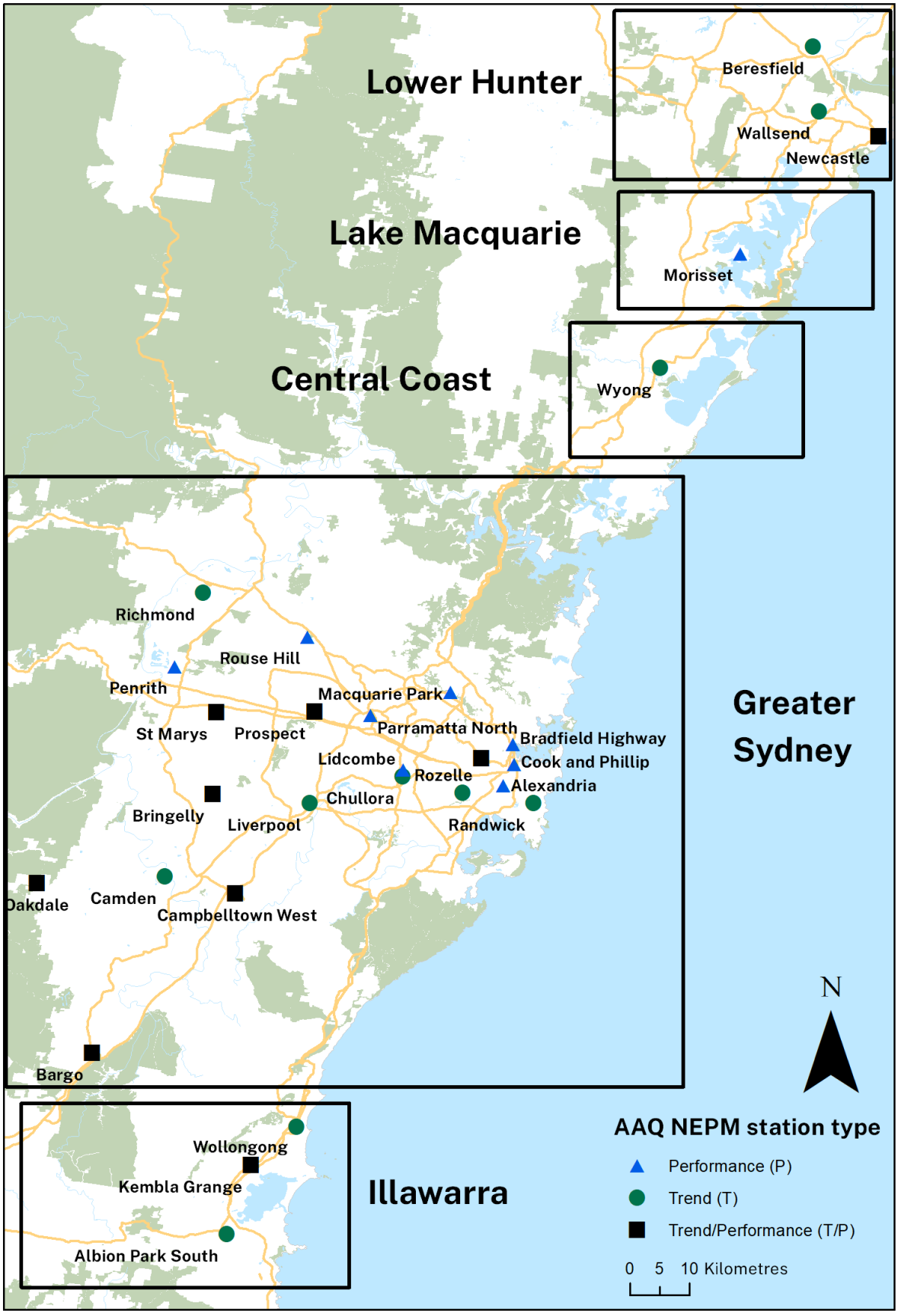

Figure 1 **NSW AAQ NEPM Compliance Monitoring Network in the NSW Greater Metropolitan Region, including Greater Sydney (Sydney), Illawarra, Central Coast, Lake Macquarie and Lower Hunter regions**

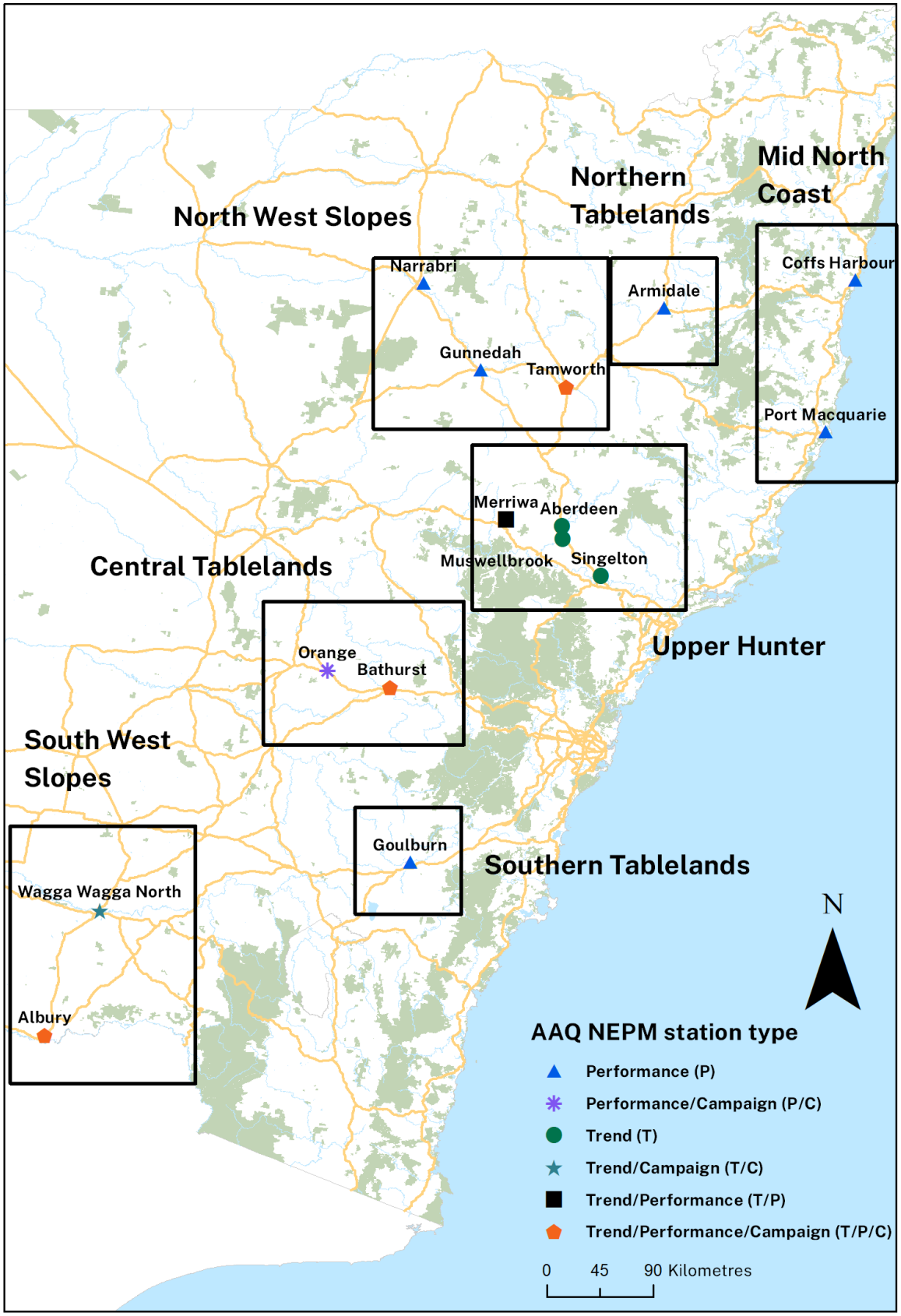

Figure 2 NSW AAQ NEPM Compliance Monitoring Network in NSW regional centres, including the Upper Hunter, Mid North Coast, Northern Tablelands, North West Slopes, Central Tablelands, Southern Tablelands and South West Slopes regions

2.2.2 Changes to the network and campaign monitoring in 2022

Decommissioned stations

The Chullora air quality monitoring station was decommissioned on 3 November 2022 due to changes in the owner's use of the land. Classified as a performance station, Chullora was commissioned in January 2003. The replacement station, Lidcombe, was commissioned on 6 April 2020 and was run simultaneously with Chullora until the decommissioning in November. Lidcombe station is located approximately 1,100 m north of the old Chullora station site.

Additions to the AAQ NEPM Compliance Network

Four new stations were incorporated into the compliance network during 2022.

Two stations from East Sydney have been included:

- Bradfield Highway: roadside monitoring station, commissioned on 9 October 2018.
- Alexandria: commissioned on 8 October 2021.

Two stations from the Mid North Coast region that were commissioned during the 2019–20 bushfire season and later incorporated into the long-term monitoring network in April 2020 have also been included:

- Port Macquarie: commissioned on 29 July 2019. Originally commissioned as a bushfire emergency station and incorporated into the monitoring network in April 2020.
- Coffs Harbour: commissioned on 22 November 2019. Originally commissioned as a bushfire emergency station and incorporated into the monitoring network in April 2020.

Campaign monitoring

Campaign monitoring (see section 2.2.3) during the warmer months was extended to include nitrogen dioxide at Tamworth, Albury and Wagga Wagga North during 2022.

2.2.3 Station classifications

The NSW Government assesses the air quality to which the public is exposed in a given region by monitoring AAQ NEPM pollutants across a network of 44 stations. Station classifications are based on pollutant classifications, which are determined by the length of time a pollutant has been monitored at a station and the purpose for which the monitoring is being undertaken. The network is a mixture of trend (T), performance (P), campaign (C) and mixed (T/P, T/C, P/C and T/P/C) air quality monitoring stations, as summarised in Table 2.

- **Trend (T):** classification denotes a pollutant that has been operating at a station – or suitable, equivalent nearby location – continuously for a decade or more and captures most pollution events that occur across that station's region.
- **Performance (P):** classification signals one or more of the following:

  - a pollutant or station that has been monitoring continuously for less than a decade
  - where a criteria pollutant is not monitored at a trend station in the region
  - a station's location that is designed to monitor pollutants at the upper bounds of the concentrations likely to be experienced in a region.
- **Campaign (C):** is a temporary classification is used when monitoring at a station, or of a particular pollutant, has been undertaken for short periods of time, such as:
  - assessing the possibility of an exceedance of a criteria pollutant at a particular station
  - monitoring for specific pollution sources
  - monitoring at temporary locations.

Table 2 Stations reported as part of the NSW AAQ NEPM Compliance Monitoring Network (2022)

Region/station		Start year	Overall[1]	PM10	PM2.5	O_3	NO_2	CO	SO_2
East Sydney									
1	Alexandria[2]	2021	P	P	P	P	P	P	P
2	Bradfield Highway[3]	2018	P	P	P	P	P	P	P
3	Cook and Philip[4]	2019	P	P	P	P	P	P	P
4	Earlwood	1978	T	T	T	T	T	–	–
5	Macquarie Park[5]	2017	P	P	P	P	P	P	P
6	Randwick	1994	T	T	T	T	T	–	T
7	Rozelle	1976	T/P	T	P	T	T	T	T
Central West Sydney									
8	Chullora[6]	2003	T	T	T	T	T	T	T
9	Lidcombe[7]	2020	P	P	P	P	P	P	P
10	Parramatta North[8]	2017	P	P	P	P	P	P	P
11	Prospect	2007	T/P	T	P	T	T	T	T
12	Rouse Hill[9]	2019	P	P	P	P	P	P	P
North West Sydney									
13	Penrith[10]	2020	P	P	P	P	P	P	P
14	Richmond	1992	T	T	T	T	T	–	T
15	St Marys	1992	T/P	T	P	T	T	–	–
South West Sydney									
16	Bargo	1996	T/P	T	P	T	T	–	T
17	Bringelly	1992	T/P	T	P	T	T	–	T
18	Camden	2012	T	T	T	T	T	T	–
19	Campbelltown West[11]	2012	T/P	T	P	T	T	T	T
20	Liverpool	1990	T	T	T	T	T	T	T
21	Oakdale	1996	T/P	T	P	T	T	–	–

Region/station		Start year	Overall[1]	PM10	PM2.5	O_3	NO_2	CO	SO_2
Illawarra									
22	Albion Park South	2005	T	T	T	T	T	–	T
23	Kembla Grange	1994	T/P	T	P	T	T	–	–
24	Wollongong	1993	T	T	T	T	T	T	T
Central Coast									
25	Wyong	2012	T	T	T	T	T	–	–
Lake Macquarie									
26	Morisset[12]	2020	P	P	P	P	P	–	–
Lower Hunter									
27	Beresfield	1993	T	T	T	T	T	–	T
28	Newcastle	1992	T/P	T	P	T	T	T	T
29	Wallsend	1992	T	T	T	T	T	–	T
Upper Hunter[13]									
30	Aberdeen	2011	T	T	–	–	–	–	–
31	Merriwa	2012	T/P	T	P	P	P	P	P
32	Muswellbrook	2010	T	T	T	–	T	–	T
33	Singleton	2010	T	T	T	–	T	–	T
Central Tablelands									
34	Bathurst	2000	T/P/C	T	P	C	–	–	–
35	Orange[14]	2018	P/C	P	P	C	–	–	–
North West Slopes									
36	Gunnedah	2017	P	P	P	P	P	–	–
37	Narrabri	2017	P	P	P	–	–	–	–
38	Tamworth	2000	T/P/C	T	P	C	–	–	–
Northern Tablelands									
39	Armidale	2018	P	P	P	–	–	–	–
Mid North Coast									
40	Coffs Harbour[15]	2019	P	P	P	P	P	P	–
41	Port Macquarie[16]	2019	P	P	P	P	P	P	P
South West Slopes									
42	Albury	2000	T/P/C	T	P	C	C	–	–
43	Wagga Wagga North[17]	2011	T/C	T	T	C	C	–	–
Southern Tablelands									
44	Goulburn[18]	2019	P	P	P	P	P	–	–

Notes:

1. 'Overall' describes the classification status for each station derived from the classifications of each parameter monitored at a station. Stations may be a performance (P), trend (T), campaign (C) or a mix (T/P, T/P/C, T/C, P/C) if some pollutants have been monitored for more than 10 years, while others for less. '-' indicates the parameter is not monitored at this station.

2. Alexandria was commissioned in October 2021 but was included in the AAQ NEPM Compliance Network from 2022.
3. Bradfield Highway was commissioned in October 2018 as a roadside monitoring station and was included in the AAQ NEPM Compliance Network from 2022.
4. Cook and Philip was commissioned in September 2019.
5. Macquarie Park was commissioned in August 2017 and replaced Lindfield (1994–2019).
6. Chullora was decommissioned in November 2022.
7. Lidcombe was commissioned in April 2020 and replaced Chullora (2003–2022).
8. Parramatta North was established on the old Westmead station (1980–2004) site and commissioned in December 2017.
9. Rouse Hill was commissioned in May 2019 and replaced Vineyard (1994–2016).
10. Penrith was commissioned in November 2020.
11. Campbelltown West was commissioned in September 2012 and replaced Macarthur (2004–2012).
12. Morisset was commissioned in November 2020.
13. Upper Hunter stations included in the AAQ NEPM Compliance Network represent general population locations in the Upper Hunter Air Quality Monitoring Network. These stations, along with the rest of the Upper Hunter stations, began operation in 2010–2012.
14. Orange was commissioned in January 2019.
15. Coffs Harbour was commissioned in November 2019 as a bushfire emergency response monitoring station. It has been retained as a monitoring station by DCCEEW and was included in the AAQ NEPM Compliance Network from 2022.
16. Port Macquarie was commissioned in July 2019 as a bushfire emergency response monitoring station. It has been retained as a monitoring station by DCCEEW and was included in the AAQ NEPM Compliance Network from 2022.
17. Wagga Wagga North was commissioned in July 2011 and replaced Wagga Wagga (2000–2011).
18. Goulburn was commissioned in November 2019.

2.2.4 Non-conforming stations

Most stations in the network meet the AAQ NEPM siting and exposure criteria, stipulated as AS/NZS 3580.1.1:2016 in clause 13 of the AAQ NEPM. Those that do not comply with clause 13 are listed in Table 3 below.

Table 3 Stations that did not comply with all siting criteria (2022)

Station	Siting criteria not met	Comments	Period
Alexandria	Distance to road > 50 m	Site < 15 m from road	2021 – now
Armidale	Distance to road > 50 m	Site < 15 m from road	2018 – now
Bradfield Highway	Distance to road > 50 m Clear sky angle >120° Unrestricted airflow > 270°	Site adjacent to Bradfield Highway/Cahill Expressway	2018 – now
Coffs Harbour	Distance to road > 50 m Distance to tree > 10 m	Site < 15 m from road and < 10 m from tree	2019 – now
Cook and Phillip	Distance to road > 50 m	Site < 15 m from road	2019 – now
Earlwood	Distance to road > 50 m	Sited in a carpark and 35 m from road	2011 – now
Goulburn	Distance to road > 50 m Distance to tree < 10 m	Site < 25 m from road Site < 10 m from trees	2019 – now
Gunnedah	Distance to road > 50 m	Site < 10 m from a suburban road and < 50m from a highway	2017 – now
Lidcombe	Distance to tree > 10 m	Trees < 10 m east of the site	2020 – now
Morisset	Distance to road > 50 m	Site < 50 m from road	2020 – now
Muswellbrook	Distance to road > 50 m Distance to trees < 10 m	Site < 15 m from road Site < 10 m from trees	2011 – now
Penrith	Distance to road > 50 m	Site < 20 m from road	2020 – now
Port Macquarie	Distance to road and tree < 20 m	Site < 20 m from road and trees	2019 – now
Rozelle	Clear sky angle > 120° Unrestricted airflow > 270°	Established trees in a heritage area	2011 – now

2.2.5 NATA accreditation

The NSW air quality monitoring network is accredited by NATA for the measurement of all AAQ NEPM parameters, as required under clause 12 of the AAQ NEPM (accreditation number: 14209).

For the purposes of this report, the last assessment of the Air Quality Monitoring laboratory and associated monitoring stations by NATA was completed in May 2022. At the time of publishing this report (2025), the most recent NATA surveillance assessment was completed in February 2024.

2.2.6 Monitoring methods

The network uses instruments in accordance with relevant Australian Standards, which are specified in Schedule 3 of the AAQ NEPM and are shown in Table 4.

Table 4 Australian Standards methods and instrumentation currently used in the NSW AAQ NEPM Compliance Monitoring Network

Pollutant	Standard	Title	Instrumentation method
Carbon monoxide	AS 3580.7.1:2011/ Amdt 1-2012	Determination of Carbon Monoxide – Direct Reading Instrumental Method	Gas filter correlation/infrared
Nitrogen dioxide	AS 3580.5.1-2011	Determination of Oxides of Nitrogen-Chemiluminescence Method	Gas-phase chemiluminescence
Photochemical oxidants (as ozone)	AS 3580.6.1-2016	Determination of Ozone – Direct Reading Instrumental Method	Non-dispersive ultraviolet
Sulfur dioxide	AS 3580.4.1-2008 REC:2018	Determination of Sulfur Dioxide – Direct Reading Instrumental Method	Pulsed fluorescence
Particles as PM10	AS 3580.9.8-2008 REC:2018	Determination of Suspended Particulate Matter – PM10 continuous direct mass method using a tapered element oscillating microbalance monitor	Tapered element oscillating microbalance (TEOM)
	AS/NZS 3580.9.16:2016	Determination of Suspended Particulate Matter – PM2.5 continuous direct mass method using a tapered element oscillating microbalance monitor	TEOM-FDMS
Particles as PM2.5	AS 3580.9.10:2017	Determination of Suspended Particulate Matter – PM2.5 low volume sampler – Gravimetric Method	USEPA Federal Reference Method (FRM) sampler
	AS/NZS 3580.9.12:2013	Determination of Suspended Particulate Matter – PM2.5 beta attenuation monitors	Beta attenuation monitor (BAM)
	AS/NZS 3580.9.13:2013	Determination of Suspended Particulate Matter – PM2.5 continuous direct mass method using a tapered element oscillating microbalance monitor	TEOM-FDMS

Notes:

1. AS = Australian standard
2. NZS = New Zealand standard
3. USEPA = United States Environmental Protection Agency
4. TEOM-FDMS = tapered element oscillating microbalance filter dynamics measurement system. Simultaneously measure PM10 and PM2.5. Instrument in use at Alexandria, Armidale, Bradfield Highway, Coffs Harbour, Cook and Phillip, Goulburn, Gunnedah, Narrabri, Orange and Port Macquarie.

3. Section B: assessment of compliance with standards and goals

Data describing the compliance status of the 44 stations that constitute the AAQ NEPM Compliance Monitoring Network for the 2022 calendar year are presented in this section.

All pollutants at each of these stations are assessed against the national standards as outlined in Schedule 2 of the National Environment Protection (Ambient Air Quality) Measure from May 2021, which are given in Table 5. This section also discusses the treatment of exceptional air quality events and the calculation and reporting methodologies necessary for NEPM compliance.

Table 6 identifies the stations and pollutants that did not comply with the 75% data availability criterion, while Table 7 to 12 present the following summary statistics for each pollutant monitored in 2022 in the network:

- quarterly and annual data availability rates
- annual mean concentration for nitrogen dioxide and particles as PM10 and PM2.5
- number of exceedance days and the number of non-exceptional event days for ozone and particles as PM10 and PM2.5
- assessment of compliance; compliant (met), not compliant (not met) or not demonstrated (ND) against all standards for the 6 of 7 criteria pollutants monitored in NSW during 2022 as given in Table 5. Lead is no longer monitored in NSW.

3.1 Compliance assessment requirements

3.1.1 Air NEPM Standards

Air quality data for 2022 is assessed against the standards specified in Schedule 2 of the AAQ NEPM, amended 18 May 2021. The goal of the AAQ NEPM is to achieve the standards presented in Table 5. There are no maximum allowable exceedances for any pollutant. There are exceptions for exceptional events that applies to the 8-hour rolling averaging period for ozone and daily averages for particles as PM10 and PM2.5.

Table 5 Air quality standards in Schedule 2 of the AAQ NEPM (May 2021)

Pollutant	Averaging period	Maximum concentration standard
Carbon monoxide	8-hour rolling average	9.0 ppm
Nitrogen dioxide	1-hour average	0.080 ppm
	1-year average	0.015 ppm
Photochemical oxidants – as ozone	8-hour rolling average	0.065 ppm
Sulfur dioxide	1-hour average	0.100 ppm
	1-day average	0.020 ppm
Particles as PM10	1-day average	50 µg/m^3
	1-year average	25 µg/m^3
Particles as PM2.5	1-day average	25 µg/m^3
	1-year average	8 µg/m^3
Lead	1-year	0.50 µg/m^3

3.1.2 Air NEPM goal

Clause 6 of the AAQ NEPM defines the goal of the AAQ NEPM as achieving the standards given in Schedule 2. For the purposes of this report, the AAQ NEPM goal is to achieve the standards given in Table 5.

3.1.3 Exceptional event days for particles and ozone

Clause 2(3) of the AAQ NEPM defines an exceptional event as 'a fire or dust occurrence that adversely affects air quality at a particular location' such that it causes an exceedance of one or more of the daily averages for particles as PM10 and PM2.5 and 8-hour rolling averages for ozone. In order for an event to be classified as exceptional, these air quality events must be directly related to bushfire, jurisdiction-authorised hazard reduction burning or continental-scale windblown dust events.

For the purposes of this report, exceedances attributed to the following pollution sources are classified as non-exceptional events:

- daily PM10: local and regional sources of dust and wood smoke.
- daily PM2.5: wood smoke.
- 8-hour ozone: wood smoke and photochemistry.

Exceptional event days are not counted towards the AAQ NEPM goal of no maximum allowable exceedances for the daily averages of PM10 and PM2.5 and the 8-hour rolling average for ozone – see tables 10 to 12 and tables 27 to 29 (clause 18(3C)). However, exceptional event days are included for assessing compliance against the PM10 and PM2.5 annual standards – see tables 11 and 12 and tables 28 and 29 (clause 19(3D)). In addition, clause 19(3A) requires exceptional events to be identified and described – see Table 19.

3.1.4 Calculation and reporting methods

The calculation and reporting methods used in this report comply with the AAQ NEPM requirements as described in the *National Environment Protection (Ambient Air Quality) Measure technical paper no. 8, annual reports* (AAQ NEPM technical paper no. 8) (NEPC Peer Review Committee 2002).

Daily averages

Daily averages are calculated from hourly averages, as described in *National Environment Protection (Ambient Air Quality) Measure technical paper no. 5, data collection and handling* (AAQ NEPM technical paper no. 5) (NEPC Peer Review Committee 2001).

Correction factors for particles

For particulate matter as PM10, an internal correction factor for United States Environmental Protection Agency (USEPA) equivalency has been applied to PM10 data collected using the tapered element oscillating microbalance (TEOM) method. However, there has been no subsequent treatment or temperature adjustment.
PM2.5 measurements were taken using the beta attenuation monitor (BAM) or TEOM-FDMS (filter dynamics measurement system) instrument.

PM2.5 data collected pre-2012 by using TEOMs do not include the internal correction factor for USEPA equivalency or any subsequent treatment or adjustment for temperature.

PM2.5 measurements using the USEPA Federal Reference Method (FRM) are reported for the Chullora and Lidcombe monitoring stations.

Data availability rates

Before data can be assessed for compliance against AAQ NEPM standards, a data availability floor of at least 75% of valid data must be met for each of the following periods:

- every quarter, as well as over the full year.
- data averaging periods that correspond to relevant NEPM standards such that at least 75% of the data available is valid for every valid 1-hour, 8-hour rolling, 24-hour and annual average to be made.

For example, if annual data availability for a pollutant is 92.6%, but for one of the year's quarters only 72.2% of data is valid, this pollutant does not meet the 75% data availability requirement and cannot be assessed for compliance. With respect to data averaging periods, the carbon monoxide and ozone AAQ NEPM standards are based on an 8-hour rolling average. To calculate a valid 8-hour rolling average, at least 6 of the last 8 (i.e. 75%) 1-hour averages must be valid.

In this report, data availability rates are calculated using:

- 1-hour data for gaseous criteria pollutants, and
- 24-hour data for particles as PM10 and PM2.5.

Presenting data availability rates

In this report, data availability rates are presented as:

- percentages of quarterly and annual valid data (Section B, Tables 7 to 12 and Appendix A, Tables 24 to 29) and
- numbers of valid days (Section C, tables 14 to 18 and Table 20).

The number of valid days is the sum of all days for which at least 18 out of 24 hours (75%) of data is valid.

Calibration hour

For gaseous pollutants, the calibration hour – which occurs between 2 am and 3 am Australian eastern standard time (AEST) – is included in the calculation of the data availability rates. The department undertakes daily automated instrument calibration checks during the early morning for the following NEPM criteria pollutants:

- carbon monoxide
- nitrogen dioxide
- sulfur dioxide
- ozone.

Hourly data obtained during the calibration period is considered invalid for reporting purposes. As a result, the maximum number of valid hours in each day for the gaseous pollutants is 23, meaning a maximum annual data availability rate for 1-hour data of 96% for gaseous species.

Data availability for pollutants reported against more than one sub-annual standard

Since the May 2021 amendment to the AAQ NEPM, only sulfur dioxide is assessed against 2 sub-annual standards: a 1-hour standard and a 24-hour standard. As the calibration hour is accounted for in the data availability calculations, only the 1-hour data availability rate is impacted, with an annual maximum data availability rate of 96%. However, if 96% of 1-hour data is valid for all days of the year, then the data availability rate for the 24-hour standard is said to be 100%.

3.1.5 Categories used to assess compliance

Air quality compliance with the AAQ NEPM requirements in tables 7 to 12 below is shown using 3 categorisation statuses as follows:

- **Met (compliant, C):** the station **is NEPM-compliant** if there are no exceedances of the standards specified in Schedule 2 of the AAQ NEPM are classified as non-exceptional events and 75% annual data availability as given in AAQ NEPM technical paper no. 8.
- **Not met (not compliant, N-C):** the station **is not NEPM-compliant** if at least one exceedance of the standards specified in Schedule 2 of the AAQ NEPM is classified as a non-exceptional event is measured and identified.
- **Not demonstrated (ND):** the station **has not met** the data availability rate requirement of at least 75% of data available for any quarter of a calendar year,

unless an exceedance assessed as a non-exceptional event is recorded. In this case, compliance is assessed as not compliant (N-C) instead.

3.2 Data availability requirements (2022)

Of the 44 monitoring stations in the compliance network, pollutants at 10 stations did not meet the requirement for at least 75% data availability in each quarter (Table 6).

Table 6 Stations that did not meet the data availability criterion (2022)

Station	Criteria of at least 75% data availability requirement not met	Comments
Alexandria	CO (Q1 and Q4), O_3 (Q2) PM10 and PM2.5 (Q1, Q2 and Q4) due to instrument problems	CO data in Q1 and Q4 and O_3 data in Q2 were invalidated due to an instrumentation issue. PM10 and PM2.5 data in Q1 and Q2 were invalidated due to the instrument failing a zero-noise test on 8/06/2022.
Bradfield Highway	CO, NO_2, SO_2, O_3 (all Q2) due to instrument sample blower failure	Gaseous species data for 29/03/2022 to 10/05/2022 were invalidated due to a failure in the sample blower.
Cook and Phillip	CO (Q1) due to instrument issues	Data invalidated during Q1 of 2022 due to issues with the instrument
Chullora	CO, NO_2, SO_2, O_3, PM10, PM2.5 (all Q4) due to station decommissioning	Chullora station was decommissioned on 2/11/2022. Prior to decommissioning, PM2.5 was down on 28/09/2022 due to instrument issues.
Liverpool	CO (Q1) due to instrument pump problems	During maintenance on 21/04/2022, a faulty pump on the instrument was replaced. This likely caused invalid observations during Q1.
Muswellbrook	NO_2, SO_2 (both Q1) due to manifold issues	Station maintenance on 23/02/2022 noted issues with the gaseous manifold. Data up to 23/02/2022 were invalidated.
Goulburn	O_3, NO_2 (both Q2) due to the blower motor being off	Blower motor switch was found to be off during site maintenance and was corrected on 5/05/2022. Data for 13/04/2022 to 5/05/2022 were subsequently invalidated.
Prospect	PM10, PM2.5 (both Q4) due to issues with both instruments' inlets	Issues with both instruments' inlets were discovered during maintenance. Data for 28/10/2022 to 1/12/2022 were invalidated.
Gunnedah	PM10, PM2.5 (both Q3) due to flow audit failure	The FDMS failed a flow audit at the site. Data invalidated for 26/07/2022 to 27/10/2022.

Station	Criteria of at least 75% data availability requirement not met	Comments
Narrabri	PM10, PM2.5 (both Q1) due to flow audit failure	The FDMS failed a flow audit at the site. Data invalidated for 01/01/2022 to 25/01/2022.

3.3 Compliance summaries (2022)

Compliance with the AAQ NEPM standards for 2022 is summarised in tables 7 to 12 for each of the criteria pollutants.

Bolded entries in the following tables are assigned a performance status of 'not met'. These stations have been assessed as being not compliant with NEPM standards due to exceedances of the standard, or because in the case of particles as PM10 and PM2.5 and ozone, those exceedances were not exceptional events. In tables 7 to 12, bolded entries are also assigned a dagger symbol (†) to signify that station has not met NEPM standards.

Where the font is *italicised*, station performance is assessed as 'ND' (not demonstrated), indicating the stations that failed to comply with the 75% quarterly data availability requirement. Stations with data availability for any pollutant below 75% for any quarter, do not have enough valid data to adequately assess its compliance against the NEPM standard and are assigned a hash symbol (#).

Exceptions occur when a station records a valid exceedance, or when a non-exceptional event is observed for ozone and particles as PM10 and PM2.5. In these cases, compliance is assessed as 'not met'. In these cases, entries are assigned both a dagger (†) and hash (#) symbol.

For ozone and particles as PM10 and PM2.5 (tables 10 to 12), the number of non-exceptional event days (if any) are written in brackets next to the total number of exceedances. For these tables, non-exceptional event days are expressed in the column heading as 'NEED'.

For tables 10 to 12, where both numbers are in bold, for example, '**1(1)**', this indicates that the station recorded one exceedance represented as '1', which was due to a non-exceptional even written as '(1)'. Any exceedances due to non-exceptional events are not compliant with the AAQ NEPM, and the performance status of stations that record non-exceptional events is given as 'not met'.

3.3.1 Carbon monoxide

Table 7 2022 compliance summary for carbon monoxide

Region/station	Data availability rate (% of hours)					Number of exceedance days	Performance against standard and goal
	Q1	Q2	Q3	Q4	Year		
East Sydney							
Alexandria#	*19.3*	*75.0*	*95.1*	*72.6*	*65.7*	*0*	*ND*
Bradfield Highway#	*92.0*	*54.0*	*94.7*	*93.6*	*83.6*	*0*	*ND*
Cook and Phillip#	*32.3*	*87.8*	*93.7*	*93.1*	*76.9*	*0*	*ND*
Macquarie Park	95.3	93.8	92.8	94.7	94.1	0	Met
Rozelle	95.4	91.7	89.5	94.6	92.8	0	Met
Central West Sydney							
Chullora#	*93.3*	*94.2*	*88.7*	*34.0*	*77.4*	*0*	*ND*
Lidcombe	95.6	93.6	94.7	94.1	94.5	0	Met
Parramatta North	92.3	95.8	93.8	91.8	93.4	0	Met
Prospect	94.9	95.0	89.4	95.3	93.6	0	Met
Rouse Hill	94.9	93.9	95.2	94.9	94.7	0	Met
South West Sydney							
Camden	95.5	94.0	94.4	93.6	94.3	0	Met
Campbelltown West	92.6	89.3	93.1	93.1	92.0	0	Met
Liverpool#	*74.2*	*89.1*	*93.8*	*95.0*	*88.1*	*0*	*ND*
North West Sydney							
Penrith	93.9	84.7	93.1	94.7	91.6	0	Met
Illawarra							
Wollongong	93.0	95.6	93.3	95.2	94.3	0	Met
Central Coast							
Wyong	95.3	89.4	86.2	93.2	91.0	0	Met
Lake Macquarie							
Morisset	94.7	95.2	95.2	93.1	94.5	0	Met
Lower Hunter							
Newcastle	93.9	95.4	93.3	95.4	94.5	0	Met
Upper Hunter							
Merriwa	90.2	90.9	87.3	94.6	90.8	0	Met
Mid North Coast							
Coffs Harbour	95.2	90.0	94.6	93.8	93.4	0	Met
Port Macquarie	91.4	98.4	93.8	97.8	95.4	0	Met

Of the 21 stations that monitored carbon monoxide in 2022, 16 complied with the quarterly 75% valid data availability criterion.

As no exceedances were observed, all 16 stations complied with the 8-hour rolling average standard for carbon monoxide (9.0 ppm).

Five stations did not meet the 75% valid quarterly data availability criterion. Compliance of these stations is assessed as 'not demonstrated'. These 5 stations were Alexandria (Q1 and Q4), Bradfield Highway (Q2), Cook and Philip (Q1), Chullora (Q4) and Liverpool (Q1).

No carbon monoxide exceedances have been recorded since 2 were observed at Port Macquarie in 2019 during the 2019–20 bushfire period.

3.3.2 Nitrogen dioxide

Table 8 2022 compliance summary for nitrogen dioxide

Region/station	Data availability rate (% of hours)					Number of exceedance days	Annual mean (ppm)	Performance against standards and goals	
	Q1	Q2	Q3	Q4	Year			1-hour	Annual
East Sydney									
Alexandria	95.5	80.3	94.2	87.9	89.4	0	0.009	Met	Met
Bradfield Highway#	*92.3*	*54.0*	*93.9*	*93.5*	*83.5*	*0*	*0.018*	*ND*	*ND*
Cook and Phillip	93.5	92.4	93.7	95.1	93.7	0	0.011	Met	Met
Earlwood	88.0	95.5	92.8	95.3	92.9	0	0.008	Met	Met
Macquarie Park	95.2	95.2	91.9	93.3	93.9	0	0.003	Met	Met
Randwick	88.8	94.0	93.8	95.0	92.9	0	0.006	Met	Met
Rozelle	94.3	92.6	89.7	94.6	92.8	0	0.006	Met	Met
Central West Sydney									
Chullora#	*93.7*	*94.1*	*86.7*	*34.4*	*77.1*	*0*	*0.010*	*ND*	*ND*
Lidcombe	95.6	93.6	94.8	94.0	94.5	0	0.010	Met	Met
Parramatta North	92.7	95.8	89.7	90.2	92.1	0	0.007	Met	Met
Prospect	95.3	95.0	92.3	93.8	94.1	0	0.006	Met	Met
Rouse Hill	95.5	94.0	94.2	93.9	94.4	0	0.005	Met	Met
South West Sydney									
Bargo	83.4	91.4	80.0	85.8	85.1	0	0.002	Met	Met
Bringelly	90.0	92.2	93.7	93.7	92.4	0	0.003	Met	Met
Camden	95.5	94.0	94.3	93.5	94.3	0	0.003	Met	Met
Campbelltown West	91.9	89.2	93.2	94.4	92.2	0	0.007	Met	Met
Liverpool	94.0	95.5	93.8	95.3	94.6	0	0.008	Met	Met
Oakdale	90.7	95.4	94.7	93.8	93.7	0	0.001	Met	Met

Region/station	Data availability rate (% of hours)					Number of exceedance days	Annual mean (ppm)	Performance against standards and goals	
	Q1	Q2	Q3	Q4	Year			1-hour	Annual
North West Sydney									
Penrith	93.4	93.3	91.1	95.1	93.2	0	0.005	Met	Met
Richmond	95.6	94.2	89.4	89.4	92.1	0	0.001	Met	Met
St Marys	95.6	91.7	95.5	91.2	93.5	0	0.004	Met	Met
Illawarra									
Albion Park South	93.0	94.0	95.7	95.3	94.5	0	0.003	Met	Met
Kembla Grange	84.2	91.6	92.8	91.3	90.0	0	0.002	Met	Met
Wollongong	92.1	95.4	93.2	94.1	93.7	0	0.004	Met	Met
Central Coast									
Wyong	90.2	84.0	90.1	90.5	88.7	0	0.002	Met	Met
Lake Macquarie									
Morisset	93.7	94.8	95.2	93.1	94.2	0	0.002	Met	Met
Lower Hunter									
Beresfield	94.9	90.0	92.7	89.5	91.8	0	0.006	Met	Met
Newcastle	87.7	93.7	92.5	94.3	92.1	0	0.004	Met	Met
Wallsend	95.3	93.1	95.5	91.0	93.7	0	0.005	Met	Met
Upper Hunter									
Merriwa	90.8	90.0	86.3	93.7	90.2	0	0.003	Met	Met
Muswellbrook[#]	*39.6*	*95.2*	*93.9*	*94.9*	*81.1*	*0*	*0.007*	*ND*	*ND*
Singleton	85.8	92.9	94.5	89.1	90.6	0	0.004	Met	Met
North West Slopes									
Gunnedah	87.8	93.7	92.1	94.2	92.0	0	0.002	Met	Met
Mid North Coast									
Coffs Harbour	84.5	91.2	94.2	93.8	91.0	0	0.003	Met	Met
Port Macquarie	95.5	98.3	96.2	98.4	97.1	0	0.002	Met	Met
Southern Tablelands									
Goulburn[#]	*95.4*	*72.4*	*95.4*	*87.3*	*87.6*	*0*	*0.002*	*ND*	*ND*

Of the 36 stations that monitored nitrogen dioxide in 2022, 32 complied with the quarterly 75% valid data availability criterion.

As no exceedances were observed, all 32 stations complied with both the 1-hour average (0.080 ppm) and annual average (0.015 ppm) standards for nitrogen dioxide.

Three stations, Bradfield Highway (Q2), Chullora (Q4) and Muswellbrook (Q1), did not meet the 75% quarterly data availability criterion and compliance was therefore 'not demonstrated'.

Cook and Phillip recorded the highest annual average for nitrogen dioxide in 2022, with 0.011 ppm. This is the lowest annual average for nitrogen dioxide at Cook and Phillip since the station was introduced in 2019. Richmond and Oakdale recorded the lowest annual averages in 2022 (0.001 ppm).

3.3.3 Sulfur dioxide

Table 9 2022 compliance summary for sulfur dioxide

Region/station	Data availability rate (% of hours)					Number of exceedance days		Performance against standards and goals	
	Q1	Q2	Q3	Q4	Year	1-hour	24-hour	1-hour	24-hour
East Sydney									
Alexandria	95.6	84.6	95.2	93.2	92.1	0	0	Met	Met
Bradfield Highway#	*92.4*	*54.0*	*93.2*	*93.6*	*83.3*	*0*	*0*	*ND*	*ND*
Cook and Phillip	92.2	90.1	92.1	95.2	92.4	0	0	Met	Met
Macquarie Park	86.8	95.2	92.8	94.7	92.4	0	0	Met	Met
Randwick	92.9	93.0	94.9	90.4	92.8	0	0	Met	Met
Rozelle	95.4	92.7	90.1	94.0	93.0	0	0	Met	Met
Central West Sydney									
Chullora#	*93.7*	*94.2*	*88.8*	*34.4*	*77.6*	*0*	*0*	*ND*	*ND*
Lidcombe	95.6	87.5	94.8	94.1	93.0	0	0	Met	Met
Parramatta North	93.8	95.8	93.7	95.0	94.6	0	0	Met	Met
Prospect	95.2	94.9	92.3	95.3	94.5	0	0	Met	Met
Rouse Hill	95.5	92.7	95.2	95.1	94.6	0	0	Met	Met
South West Sydney									
Bargo	93.5	95.3	92.1	95.5	94.1	0	0	Met	Met
Bringelly	91.5	94.8	93.9	95.2	93.9	0	0	Met	Met
Campbelltown West	87.4	89.3	93.2	92.7	90.7	0	0	Met	Met
Liverpool	93.7	94.3	93.8	95.3	94.3	0	0	Met	Met
North West Sydney									
Penrith	93.9	94.6	93.9	95.0	94.4	0	0	Met	Met
Richmond	95.6	94.1	90.2	92.6	93.1	0	0	Met	Met
Illawarra									
Albion Park South	93.0	94.0	95.6	95.3	94.5	0	0	Met	Met
Wollongong	93.0	95.7	93.3	95.2	94.3	0	0	Met	Met
Central Coast									
Wyong	82.5	89.0	86.1	91.5	87.3	0	0	Met	Met

Region/station	Data availability rate (% of hours)					Number of exceedance days		Performance against standards and goals	
	Q1	Q2	Q3	Q4	Year	1-hour	24-hour	1-hour	24-hour
Lake Macquarie									
Morisset†	84.9	95.2	95.3	92.7	92.1	**1**	0	**Not met**	Met
Lower Hunter									
Beresfield	94.9	94.0	93.5	92.5	93.7	0	0	Met	Met
Newcastle	93.1	95.4	88.7	95.4	93.2	0	0	Met	Met
Wallsend	95.6	93.0	95.4	91.0	93.8	0	0	Met	Met
Upper Hunter									
Merriwa	90.8	91.0	81.2	94.7	89.4	0	0	Met	Met
Muswellbrook#	*39.8*	*95.3*	*94.0*	*95.2*	*81.2*	*0*	*0*	*ND*	*ND*
Singleton	93.5	95.5	95.4	93.7	94.5	0	0	Met	Met
Mid North Coast									
Port Macquarie	82.2	98.1	92.8	96.3	92.4	0	0	Met	Met

Of the 28 stations that monitored sulfur dioxide in 2022, 25 complied with the quarterly 75% valid data availability criterion.

Twenty-four of 25 stations complied with the 1-hour average standard (0.100 ppm). Morisset was the only station to exceed the 1-hour standard in 2022. This was the first sulfur dioxide exceedance observed at Morisset since the station was commissioned in 2020. An exceedance of the 24-hour standard has not been recorded in the network since a 2019 exceedance at Muswellbrook. As there were no exceedances of the 24-hour average standard (0.020 ppm), all 25 stations complied with this standard.

Three of 28 stations, Bradfield Highway (Q2), Chullora (Q4) and Muswellbrook (Q1), did not meet the 75% valid data availability criterion. The compliance of these stations was assessed as 'not demonstrated'.

3.3.4 Ozone

Table 10 2022 compliance summary for ozone

Region/station	Data availability rate (% of hours)					Number of exceedance days (NEED)	Performance against rolling 8-hour standard and goal
	Q1	Q2	Q3	Q4	Year		
East Sydney							
Alexandria#	*90.3*	*67.9*	*79.9*	*84.9*	*80.7*	*0*	*ND*
Bradfield Highway#	*92.2*	*54.0*	*94.4*	*94.7*	*83.9*	*0*	*ND*
Cook and Phillip	91.9	86.9	91.1	95.0	91.3	0	Met
Earlwood	88.0	90.9	95.0	95.3	92.3	0	Met
Macquarie Park	95.3	95.1	94.7	94.7	95.0	0	Met
Randwick	94.9	94.0	94.7	95.1	94.7	0	Met
Rozelle	95.4	92.8	90.2	94.5	93.2	0	Met
Central West Sydney							
Chullora#	*93.4*	*95.3*	*88.9*	*34.3*	*77.8*	*0*	*ND*
Lidcombe	93.2	93.4	94.3	94.9	94.0	0	Met
Parramatta North	95.2	95.8	93.8	95.0	95.0	0	Met
Prospect	95.1	94.9	92.3	95.2	94.4	0	Met
Rouse Hill	95.6	93.5	86.5	95.0	92.6	0	Met
South West Sydney							
Bargo	95.0	95.2	93.3	95.4	94.7	0	Met
Bringelly	94.8	95.2	93.8	95.2	94.7	0	Met
Camden	95.4	95.1	94.4	94.7	94.9	0	Met
Campbelltown West	93.5	89.3	94.3	92.9	92.5	0	Met
Liverpool	94.0	87.4	92.0	95.2	92.2	0	Met
Oakdale	95.3	95.5	94.7	92.0	94.4	0	Met
North West Sydney							
Penrith	95.2	94.6	94.9	95.2	95.0	0	Met
Richmond	95.6	81.5	89.9	85.1	88.0	0	Met
St Marys	95.6	93.8	95.3	90.3	93.7	0	Met
Illawarra							
Albion Park South	81.8	89.1	90.9	95.3	89.3	0	Met
Kembla Grange	95.5	92.5	94.8	93.3	94.0	0	Met
Wollongong	91.5	95.6	91.2	95.2	93.4	0	Met
Central Coast							
Wyong	95.3	90.8	91.5	94.7	93.1	0	Met
Lake Macquarie							
Morisset	91.3	91.8	93.5	94.1	92.7	0	Met
Lower Hunter							

Region/station	Data availability rate (% of hours)					Number of exceedance days (NEED)	Performance against rolling 8-hour standard and goal
	Q1	Q2	Q3	Q4	Year		
Beresfield	94.9	90.3	92.6	92.6	92.6	0	Met
Newcastle	93.9	95.3	92.8	95.4	94.4	0	Met
Wallsend	90.0	89.0	95.4	82.4	89.2	0	Met
Upper Hunter							
Merriwa	90.7	90.9	87.4	94.6	90.9	0	Met
North West Slopes							
Gunnedah	94.1	88.4	93.8	95.2	92.9	0	Met
Mid North Coast							
Coffs Harbour	95.1	91.3	94.7	93.8	93.7	0	Met
Port Macquarie	92.7	97.8	96.5	96.6	95.9	0	Met
Southern Tablelands							
Goulburn[#]	*95.4*	*72.4*	*95.4*	*88.5*	*87.9*	*0*	*ND*

Of the 34 stations that monitored ozone in 2022, 30 complied with the quarterly 75% data availability criterion.

As no exceedances were observed, all 30 stations complied with the 8-hour rolling average standard (6.5 ppm).

Four stations, Alexandria (Q2), Bradfield Highway (Q2), Chullora (Q4) and Goulburn (Q2), did not meet the 75% quarterly valid data availability criterion. The compliance of these stations was assessed as 'not demonstrated'.

3.3.5 Particles as PM10

Table 11 2022 compliance summary for particles as PM10

Region/station	Data availability rate (% of days)					Number of exceed-ance days (NEED)	Annual mean (µg/m³)	Performance against standards and goals	
	Q1	Q2	Q3	Q4	Year			24-hour	Annual
East Sydney									
Alexandria[#]	*0.0*	*24.2*	*98.9*	*71.7*	*49.0*	*0*	*10.7*	*ND*	*ND*
Bradfield Highway	87.8	100	97.8	100	96.4	0	12.6	Met	Met
Cook and Phillip	97.8	95.6	98.9	91.3	95.9	0	9.9	Met	Met
Earlwood	93.3	100	100	100	98.4	0	12.9	Met	Met
Macquarie Park	95.6	96.7	97.8	93.5	95.9	0	11.4	Met	Met
Randwick	100	100	96.7	100	99.2	0	14.6	Met	Met

Region/station	Data availability rate (% of days)					Number of exceed-ance days (NEED)	Annual mean (µg/m³)	Performance against standards and goals	
	Q1	Q2	Q3	Q4	Year			24-hour	Annual
Rozelle	100	95.6	85.9	98.9	95.1	0	12.9	Met	Met
Central West Sydney									
Chullora[#]	*94.4*	*100*	*100*	*35.9*	*82.5*	*0*	*13.6*	*ND*	*ND*
Lidcombe	100	100	98.9	97.8	99.2	0	13.3	Met	Met
Parramatta North	100	97.8	98.9	100	99.2	0	14.1	Met	Met
Prospect[#]	*100*	*98.9*	*97.8*	*60.9*	*89.3*	*0*	*13.4*	*ND*	*ND*
Rouse Hill	100	100	100	97.8	99.5	0	11.8	Met	Met
South West Sydney									
Bargo	100	97.8	96.7	100	98.6	0	9.9	Met	Met
Bringelly	100	100	100	93.5	98.4	0	12.1	Met	Met
Camden	100	96.7	97.8	100	98.6	0	10.1	Met	Met
Campbelltown West	98.9	90.1	98.9	97.8	96.4	0	11.3	Met	Met
Liverpool	100	100	100	94.6	98.6	0	14.6	Met	Met
Oakdale	100	100	95.7	100	98.9	0	8.8	Met	Met
North West Sydney									
Penrith	100	100	100	96.7	99.2	0	13.8	Met	Met
Richmond	100	92.3	95.7	100	97.0	0	10.3	Met	Met
St Marys	100	97.8	96.7	96.7	97.8	0	12.0	Met	Met
Illawarra									
Albion Park South	96.7	97.8	100	100	98.6	0	10.9	Met	Met
Kembla Grange	100	100	100	95.7	98.9	0	14.5	Met	Met
Wollongong	91.1	100	98.9	100	97.5	0	14.3	Met	Met
Central Coast									
Wyong	97.8	91.2	92.4	100	95.3	0	11.7	Met	Met
Lake Macquarie									
Morisset	97.8	95.6	100	85.9	94.8	0	7.9	Met	Met
Lower Hunter									
Beresfield	100	97.8	98.9	96.7	98.4	0	14.3	Met	Met
Newcastle	100	100	100	95.7	98.9	0	17.5	Met	Met
Wallsend	100	97.8	97.8	95.7	97.8	0	12.7	Met	Met
Upper Hunter									
Aberdeen	100	97.8	100	93.5	97.8	0	12.3	Met	Met
Merriwa	94.4	91.2	89.1	97.8	93.2	0	11.2	Met	Met
Muswellbrook	100	96.7	100	97.8	98.6	0	16.6	Met	Met

Region/station	Data availability rate (% of days)					Number of exceed-ance days (NEED)	Annual mean (µg/m³)	Performance against standards and goals	
	Q1	Q2	Q3	Q4	Year			24-hour	Annual
Singleton	98.9	100	97.8	100	99.2	0	14.5	Met	Met
Central Tablelands									
Bathurst	100	100	100	96.7	99.2	0	8.8	Met	Met
Orange	97.8	100	94.6	98.9	97.8	0	8.6	Met	Met
North West Slopes									
Gunnedah[#]	*97.8*	*97.8*	*27.2*	*69.6*	*72.9*	*0*	*11.2*	*ND*	*ND*
Narrabri[#]	*72.2*	*97.8*	*100*	*100*	*92.6*	*0*	*6.7*	*ND*	*ND*
Tamworth	100	100	100	97.8	99.5	0	10.6	Met	Met
Northern Tablelands									
Armidale[†]	100	97.8	98.9	97.8	98.6	**1 (1)**	9.7	**Not met**	Met
Mid North Coast									
Coffs Harbour	84.4	91.2	97.8	97.8	92.9	0	9.3	Met	Met
Port Macquarie	91.1	97.8	89.1	87.0	91.2	0	9.1	Met	Met
South West Slopes									
Albury	94.4	83.5	100	96.7	93.7	0	11.7	Met	Met
Wagga Wagga North	97.8	100	97.8	100	98.9	0	13.1	Met	Met
Southern Tablelands									
Goulburn	100	97.8	100	91.3	97.3	0	7.2	Met	Met

Of the 44 stations that monitored PM10 in 2022, 39 complied with the quarterly 75% valid data availability criterion.

Thirty-eight of those 39 stations complied with the 24-hour average standard of 50.0 µg/m³. Armidale was the only station recording an exceedance of the 24-hour standard during 2022, which was due to a non-exceptional event. All 39 stations complied with the annual average standard of 25.0 µg/m³.

Five of 44 stations, Alexandria (Q1, Q2 and Q4), Chullora (Q4), Prospect (Q4), Gunnedah (Q3 and Q4) and Narrabri (Q1), did not meet the 75% valid quarterly data availability criterion. The compliance of these stations was assessed as 'not demonstrated' in 2022.

This is the lowest number of PM10 exceedances in NSW since the introduction of the NEPM and is the first time since the introduction of the exceptional events requirement in AAQ NEPM in 2016 that no PM10 exceedances not attributable to exceptional events have been recorded. 2022 is also the first time since 2017 that no exceedance of the annual PM10 standard has been observed. The network comprised 22 stations in 2017, compared to 44 in 2022.

3.3.6 Particles as PM2.5

Table 12 2022 compliance summary for particles as PM2.5

Region/station	Data availability rate (% of days)					Number of exceedance days (NEED)	Annual mean (µg/m³)	Performance against standards and goals	
	Q1	Q2	Q3	Q4	Year			24-hour	Annual
East Sydney									
Alexandria#	*0.0*	*24.2*	*98.9*	*71.7*	*48.7*	*0*	*4.7*	*ND*	*ND*
Bradfield Highway	87.8	100	97.8	100	96.4	0	5.4	Met	Met
Cook and Phillip	97.8	95.6	98.9	91.3	95.9	0	4.3	Met	Met
Earlwood	93.3	100	100	100	98.4	0	5.2	Met	Met
Macquarie Park	100	100	100	92.4	98.1	0	4.4	Met	Met
Randwick	90.0	100	94.6	100	96.2	0	4.9	Met	Met
Rozelle	100	97.8	90.2	98.9	96.7	0	4.6	Met	Met
Central West Sydney									
Chullora#	*93.3*	*100*	*96.7*	*0.0*	*72.5*	*0*	*5.6*	*ND*	*ND*
Lidcombe	100	98.9	98.9	97.8	98.9	0	4.7	Met	Met
Parramatta North	100	97.8	98.9	100	99.2	0	5.2	Met	Met
Prospect#	*100*	*98.9*	*97.8*	*60.9*	*89.3*	*0*	*5.3*	*ND*	*ND*
Rouse Hill	100	100	100	97.8	99.5	0	4.6	Met	Met
South West Sydney									
Bargo	100	96.7	96.7	88.0	95.3	0	3.7	Met	Met
Bringelly	100	100	100	96.7	99.2	0	5.1	Met	Met
Camden	97.8	94.5	96.7	100	97.3	0	4.4	Met	Met
Campbelltown West	96.7	85.7	97.8	97.8	94.5	0	4.6	Met	Met
Liverpool	100	97.8	100	97.8	98.9	0	5.5	Met	Met
Oakdale	98.9	100	95.7	100	98.6	0	3.5	Met	Met
North West Sydney									
Penrith	100	98.9	100	96.7	98.9	0	5.8	Met	Met
Richmond	98.9	92.3	93.5	96.7	95.3	0	4.8	Met	Met
St Marys	100	97.8	96.7	97.8	98.1	0	3.9	Met	Met
Illawarra									
Albion Park South	96.7	97.8	100	100	98.6	0	3.8	Met	Met
Kembla Grange	100	100	100	88.0	97.0	0	4.0	Met	Met
Wollongong	94.4	100	98.9	100	98.4	0	4.7	Met	Met

Region/station	Data availability rate (% of days)					Number of exceedance days (NEED)	Annual mean (µg/m³)	Performance against standards and goals	
	Q1	Q2	Q3	Q4	Year			24-hour	Annual
Central Coast									
Wyong	97.8	91.2	91.3	100	95.1	0	4.0	Met	Met
Lake Macquarie									
Morisset	97.8	95.6	100	85.9	94.8	0	2.7	Met	Met
Lower Hunter									
Beresfield	100	97.8	97.8	96.7	98.1	0	5.0	Met	Met
Newcastle	100	98.9	100	95.7	98.6	0	5.5	Met	Met
Wallsend	96.7	97.8	96.7	95.7	96.7	0	5.1	Met	Met
Upper Hunter									
Merriwa	87.8	91.2	89.1	97.8	91.5	0	3.4	Met	Met
Muswellbrook	100	96.7	100	100	99.2	0	6.2	Met	Met
Singleton	98.9	97.8	96.7	97.8	97.8	0	5.1	Met	Met
Central Tablelands									
Bathurst	87.8	100	100	92.4	95.1	0	4.1	Met	Met
Orange†	97.8	100	94.6	98.9	97.8	**5 (5)**	5.2	**Not met**	Met
North West Slopes									
Gunnedah#†	*97.8*	*97.8*	*27.2*	*69.6*	*72.9*	***4 (4)***	*6.4*	***Not met***	*ND*
Narrabri#	*72.2*	*97.8*	*100*	*100*	*92.6*	*0*	*3.6*	*ND*	*ND*
Tamworth	100	98.9	98.9	87.0	96.2	0	4.7	Met	Met
Northern Tablelands									
Armidale†	100	97.8	98.9	97.8	98.6	**11 (11)**	7.1	**Not met**	Met
Mid North Coast									
Coffs Harbour	84.4	91.2	97.8	97.8	92.9	0	3.2	Met	Met
Port Macquarie	91.1	97.8	89.1	87.0	91.2	0	3.3	Met	Met
South West Slopes									
Albury	94.4	92.3	97.8	94.6	94.8	0	5.6	Met	Met
Wagga Wagga North†	97.8	100	96.7	100	98.6	**1 (1)**	5.3	**Not met**	Met
Southern Tablelands									
Goulburn	100	97.8	100	91.3	97.3	0	4.1	Met	Met

Of the 43 station that monitored PM2.5 in 2022, 38 complied with the quarterly 75% valid data availability criterion.

35 stations complied with the 24-hour average standard of 25.0 µg/m³ as 4 stations recorded exceedances during 2022. Eleven were recorded at Armidale, with a maximum

concentration of 44.8 µg/m^3 on 20 June; 5 exceedances were observed at Orange with a maximum value of 38.9 µg/m^3 on 15 June; 4 were observed at Gunnedah, with a maximum value of 28.2 µg/m^3 on 24 June; and one at Wagga Wagga North, with a maximum value of 27.1 µg/m^3 on 5 April. All exceedances at Armidale, Orange and Gunnedah were attributed to wood smoke emissions from domestic wood heaters. The Wagga Wagga North exceedance was attributed to smoke from agricultural burning. All 38 stations complied with the annual average standard of 8.0 µg/m^3.

Five stations did not meet the 75% valid quarterly data availability criterion, including Narrabri (Q1), Prospect (Q4), Chullora (Q4) and Alexandria (Q1, Q2 and Q4). Compliance of these stations was assessed as 'not demonstrated'. Four stations did not record sufficient data (at least 75% valid data each quarter) for assessment against the annual (8.0 µg/m^3). The fifth station – Gunnedah – recorded 4 daily PM2.5 exceedances of non-exceptional status, resulting in an assessment of 'not met' for the 24-hour standard, and 'not demonstrated' for the annual standard.

Monitoring and reporting using USEPA Federal Reference Method for PM2.5

The compliance summary determined using the USEPA Federal Reference Method (FRM) for 2022 is shown in Table 13.

A background to PM2.5 monitoring and the reporting of USEPA FRM data in NSW is provided in the *New South Wales annual compliance report 2018* (DPIE 2020b).

Lidcombe met the annual average standard for PM2.5 (8.0 µg/m^3) and no exceedance days were recorded at either Lidcombe or Chullora during 2022.

Due to the Chullora station being decommissioned on 3 November 2022, the 75% quarterly data availability criterion was not met and compliance was subsequently assessed as 'not demonstrated'.

After FRM monitoring of PM2.5 began at Lidcombe in mid-2020, 2022 was the first year the station satisfied the data availability requirements. This was due to COVID-19 lockdown restrictions in Sydney during the third quarter of 2021 resulted in insufficient data being collected.

Table 13 2022 PM2.5 compliance summary, USEPA Federal Reference Method

Region/station	Data availability rate[1] (% of days)					Number of exceedance days	Annual mean (µg/m^3)	Performance against standards and goals	
	Q1	Q2	Q3	Q4	Year			24-hour	Annual
East Sydney									
Chullora[#]	*80.0*	*82.4*	*97.8*	*35.9*	*74.0*	*0*	*4.8*	*ND*	*ND*
Lidcombe	90.0	85.7	97.8	88.0	90.4	0	4.6	Met	Met

Notes:
Data availability rates are based on a 1-day-in-3 sampling regime.

4. Section C: analysis of air quality

This section summarises the highest concentrations recorded for each parameter at every station in the network during 2022.

Italicised entries (also assigned a hash, #) highlight stations that failed to comply with the 75% quarterly data availability criterion, while **bold** entries (also assigned a dagger, †) indicate an exceedance of a NEPM standard, whether or not the exceedance was due to an exceptional or non-exceptional event.

Tables 14 to 22 show data availability as a count of days during 2022 with valid data, the highest value and the date (and time for sub-daily standards) these concentrations occurred.

The formats used for the dates and time stamps are:

- **Date, hour (dd Mmm, hh):** for averaging periods less than 24 hours show the date and hour in 24-hour time. For example, 3 am on 8 July 2022 is given below as 08 Jul, 03.
- **Date (dd Mmm):** for 24-hour standards shows the date only. For example, 11 October 2022 is given as 11 Oct.

All times in this section are given as Australian Eastern Standard Time (AEST).

AAQ NEPM technical paper no. 8, annual reports (NEPC Peer Review Committee, 2002) requires standards with averaging periods of less than 24 hours to report the daily maxima irrespective of the number of valid hours in a day. For example, the maximum 1-hour sulfur dioxide during the year may have occurred at a station that reached less than 75% valid data during that day.

4.1 Carbon monoxide

Table 14 Summary for CO: daily maximum rolling 8-hour average concentrations (2022)

Region/station	Number of valid days	Daily maximum rolling 8-hour average (ppm)	
		Highest	Date, hour (dd Mmm, hh)
East Sydney			
Alexandria#	*213*	*1.0*	*16 Jul, 02*
Bradfield Highway#	*314*	*0.9*	*16 Feb, 09*
Cook and Phillip#	*277*	*0.4*	*13 Jul, 02*
Macquarie Park	354	0.7	14 Jun, 04
Rozelle	343	0.8	22 May, 00
Central West Sydney			
Chullora#	*289*	*0.9*	*16 Jul, 03*
Lidcombe	356	0.7	28 Aug, 09
Parramatta North	350	0.8	16 Jul, 03

Region/station	Number of valid days	Daily maximum rolling 8-hour average (ppm)	
		Highest	Date, hour (dd Mmm, hh)
Prospect	353	0.9	16 Jul, 02
Rouse Hill	357	0.6	18 Feb, 22
South West Sydney			
Camden	353	0.5	18 Aug, 23
Campbelltown West	341	0.4	17 Jul, 00
Liverpool[#]	*312*	*1.1*	*16 Jun, 02*
North West Sydney			
Penrith	341	0.6	31 Jul, 05
Illawarra			
Wollongong	355	0.7	20 Jan, 14
Central Coast			
Wyong	340	0.3	19 Aug, 02
Lake Macquarie			
Morisset	356	0.3	06 Nov, 08
Lower Hunter			
Newcastle	356	0.9	14 Jun, 02
Upper Hunter			
Merriwa	338	0.1	07 Oct, 09
Mid North Coast			
Coffs Harbour	347	0.3	02 Feb, 14
Port Macquarie	345	0.3	29 Apr, 22

There were no recorded days above the 8-hour rolling average standard for carbon monoxide during 2022. Maximum values for carbon monoxide ranged from 1.1 ppm at Liverpool at 0200 16 June 2022, to 0.1 ppm at Merriwa at 0900 7 October 2022.

The 1.1 ppm maximum concentration recorded at Liverpool is the lowest annual maximum in NSW since the introduction of the NEPM.

Four Sydney stations recorded their highest 8-hour rolling average for carbon monoxide on 16 July, with 3 of those stations recording their annual maximum at 0200.

4.2 Nitrogen dioxide

Table 15 Summary for NO_2: maximum 1-hour average concentrations (2022)

Region/station	Number of valid days	Daily maximum 1-hour average (ppm)	
		Highest	Date, hour (dd Mmm, hh)
East Sydney			
Alexandria	337	0.042	12 Sep, 21
Bradfield Highway[#]	*316*	*0.066*	*10 Feb, 16*
Cook and Phillip	355	0.040	11 Sep, 18

Region/station	Number of valid days	Daily maximum 1-hour average (ppm)	
		Highest	Date, hour (dd Mmm, hh)
Earlwood	351	0.033	04 May, 19
Macquarie Park	355	0.023	21 Jul, 11
Randwick	353	0.032	11 Aug, 10
Rozelle	347	0.031	18 Aug, 19
Central West Sydney			
Chullora[#]	*293*	*0.045*	*04 Apr, 21*
Lidcombe	359	0.040	19 Sep, 07
Parramatta North	350	0.034	08 Sep, 07
Prospect	355	0.042	04 May, 19
Rouse Hill	358	0.033	19 May, 19
South West Sydney			
Bargo	305	0.034	22 Mar, 23
Bringelly	351	0.022	11 May, 21
Camden	358	0.022	12 May, 20
Campbelltown West	347	0.042	02 Aug, 19
Liverpool	360	0.036	22 Jun, 08
Oakdale	356	0.012	19 May, 17
North West Sydney			
Penrith	354	0.028	22 Jul, 08
Richmond	349	0.018	28 Jun, 19
St Marys	354	0.030	05 May, 19
Illawarra			
Albion Park South	359	0.031	29 Apr, 18
Kembla Grange	337	0.027	12 Jul, 09
Wollongong	355	0.029	19 Sep, 07
Central Coast			
Wyong	331	0.031	23 Dec, 20
Lake Macquarie			
Morisset	359	0.025	19 Oct, 11
Lower Hunter			
Beresfield	348	0.029	18 Aug, 19
Newcastle	344	0.038	21 Jun, 19
Wallsend	356	0.028	05 Apr, 20
Upper Hunter			
Merriwa	335	0.028	28 Aug, 18
Muswellbrook[#]	*306*	*0.030*	*04 Oct, 20*
Singleton	332	0.027	05 Dec, 22
North West Slopes			
Gunnedah	345	0.026	30 Jul, 20

Region/station	Number of valid days	Daily maximum 1-hour average (ppm)	
		Highest	Date, hour (dd Mmm, hh)
Mid North Coast			
Coffs Harbour	344	0.025	22 Jun, 19
Port Macquarie	358	0.031	02 Sep, 13
Southern Tablelands			
Goulburn	332	0.027	11 Jul, 18

There were no recorded exceedances of the 1-hour nitrogen dioxide standard of 0.080 ppm during 2022. Maximum 1-hour values for nitrogen dioxide ranged from 0.066 ppm, recorded at Bradfield Highway at 1600 10 February 2022, to 0.018 ppm at Richmond at 1900 28 June 2022.

4.3 Sulfur dioxide

Table 16 Summary for SO_2: daily maximum 1-hour average and maximum daily (24-hour) concentrations (2022)

Region/station	Number of valid days	Daily maximum 1-hour average (ppm)		Annual maximum 24-hour average (ppm)	
		Highest	Date hour (dd Mmm, hh)	Highest	Date (dd Mmm)
East Sydney					
Alexandria	350	0.017	11 Nov, 08	0.003	11 Nov
Bradfield Highway[#]	*316*	*0.019*	*11 Nov, 08*	*0.004*	*11 Nov*
Cook and Phillip	350	0.013	18 Mar, 10	0.004	18 Mar
Macquarie Park	351	0.031	25 Jul, 14	0.003	11 Dec
Randwick	351	0.028	07 Oct, 10	0.004	07 Oct
Rozelle	348	0.029	19 Nov, 23	0.004	05 Dec
Central West Sydney					
Chullora[#]	*295*	*0.013*	*26 May, 14*	*0.002*	*26 May*
Lidcombe	353	0.025	25 Jul, 15	0.003	25 Jul
Parramatta North	359	0.015	27 Dec, 10	0.003	11 Dec
Prospect	356	0.017	19 Nov, 22	0.003	19 Nov
Rouse Hill	358	0.021	27 Nov, 01	0.003	27 Nov
South West Sydney					
Bargo	356	0.012	22 Dec, 09	0.003	30 Aug
Bringelly	356	0.010	19 Nov, 10	0.002	22 Dec
Campbelltown West	341	0.010	08 Sep, 09	0.003	22 Dec
Liverpool	358	0.013	20 Feb, 10	0.002	08 Sep

Region/station	Number of valid days	Daily maximum 1-hour average (ppm)		Annual maximum 24-hour average (ppm)	
		Highest	Date hour (dd Mmm, hh)	Highest	Date (dd Mmm)
North West Sydney					
Penrith	360	0.011	04 Jul, 23	0.005	05 Jul
Richmond	352	0.012	15 Feb, 10	0.003	13 Oct
Illawarra					
Albion Park South	359	0.016	05 Dec, 15	0.005	22 Oct
Wollongong	357	0.017	08 Jan, 21	0.004	19 Jan
Central Coast					
Wyong	328	0.045	21 Oct, 15	0.007	21 Oct
Lake Macquarie					
Morisset†	349	**0.183**	19 Oct, 11	0.018	19 Oct
Lower Hunter					
Beresfield	356	0.024	01 Feb, 13	0.006	01 Jul
Newcastle	354	0.049	03 May, 10	0.005	19 Oct
Wallsend	354	0.030	29 Aug, 21	0.006	28 Jun
Upper Hunter					
Merriwa	333	0.041	28 Aug, 18	0.009	13 Jan
Muswellbrook#	*309*	*0.100*	*17 Mar, 16*	*0.016*	*17 Mar*
Singleton	359	0.050	04 Oct, 11	0.010	22 Mar
Mid North Coast					
Port Macquarie	338	0.006	11 Apr, 15	0.001	23 Jan

One exceedance of the 1-hour sulfur dioxide standard (0.100 ppm) occurred during 2022 and no days above the 24-hour standard (0.020 ppm) were recorded.

The maximum 1-hour sulfur dioxide concentration was recorded at Morisset at 1100 19 October 2022 (0.183 ppm). While below the 24-hour standard, Morisset also recorded the maximum 24-hour sulfur dioxide concentration for 2022 on this day, with 0.018 ppm observed. Morisset is located between 2 coal-fired power stations in the Lake Macquarie region.

Morisset and Port Macquarie recorded highest and lowest values respectively for both the 1-hour and 24-hour average concentrations in 2022. The 1-hour maximums ranged from 0.183 ppm at Morisset (11:00 19 October 2022) to 0.006 ppm at Port Macquarie (15:00 11 April 2022). The 24-hour maximums ranged from 0.018 ppm (Morisset, 19 October) to 0.001 ppm (Port Macquarie, 23 January).

The 0.100 ppm 1-hour concentration recorded at Muswellbrook at 1600 17 March 2022 is not considered an exceedance. AAQ NEPM Technical Paper No. 5 requires data for most gases, including sulfur dioxide, to be recorded to 3 decimal places. The Technical Paper further notes that for an exceedance to be recorded, the observed concentration or average must exceed the standard. As a result, because the Muswellbrook observation

is 0.100 ppm and does not exceed the 1-hour 0.100 ppm standard at 3 decimal places, it is not considered an exceedance.

Eleven of the 36 stations recorded their highest 24-hour average for the year on the same day that they recorded their highest 1-hour average for 2022.

4.4 Ozone

Table 17 Summary for ozone: daily maximum rolling 8-hour average concentrations (2022)

Region/station	Number of valid days	Daily maximum rolling 8-hour average (ppm)	
		Highest	Date, hour (dd Mmm, hh)
East Sydney			
Alexandria[#]	*258*	*0.046*	*01 Feb, 19*
Bradfield Highway[#]	*315*	*0.037*	*24 Dec, 20*
Cook and Phillip	330	0.045	24 Dec, 20
Earlwood	345	0.056	24 Dec, 18
Macquarie Park	357	0.059	24 Dec, 18
Randwick	357	0.055	24 Dec, 20
Rozelle	346	0.052	24 Dec, 20
Central West Sydney			
Chullora[#]	*292*	*0.049*	*01 Feb, 18*
Lidcombe	350	0.057	24 Dec, 18
Parramatta North	359	0.056	24 Dec, 17
Prospect	356	0.052	17 Jan, 18
Rouse Hill	346	0.053	24 Dec, 18
South West Sydney			
Bargo	356	0.059	25 Dec, 18
Bringelly	358	0.057	17 Jan, 18
Camden	355	0.056	25 Dec, 18
Campbelltown West	341	0.060	25 Dec, 18
Liverpool	346	0.056	17 Jan, 18
Oakdale	358	0.053	25 Dec, 19
North West Sydney			
Penrith	357	0.052	10 Feb, 19
Richmond	324	0.053	18 Feb, 18
St Marys	352	0.051	17 Jan, 19
Illawarra			
Albion Park South	336	0.065	10 Feb, 17
Kembla Grange	352	0.059	10 Feb, 18
Wollongong	348	0.060	10 Feb, 18

Region/station	Number of valid days	Daily maximum rolling 8-hour average (ppm)	
		Highest	Date, hour (dd Mmm, hh)
Central Coast			
Wyong	350	0.062	10 Feb, 18
Lake Macquarie			
Morisset	343	0.062	10 Feb, 17
Lower Hunter			
Beresfield	345	0.051	18 Feb, 19
Newcastle	354	0.047	18 Feb, 20
Wallsend	323	0.050	18 Feb, 19
Upper Hunter			
Merriwa	339	0.050	25 Dec, 20
North West Slopes			
Gunnedah	346	0.045	12 Jan, 21
Mid North Coast			
Coffs Harbour	350	0.038	25 Oct, 19
Port Macquarie	345	0.041	24 Nov, 19
Southern Tablelands			
Goulburn[#]	*331*	*0.046*	*26 Dec, 18*

There were no exceedances of the 8-hour rolling ozone standard (0.065 ppm) during 2022. Maximum 8-hour rolling averages in 2022 ranged from 0.065 ppm Albion Park South at 1700 10 February 2022 to 0.037 ppm at Bradfield Highway at 2000 24 December 2022.

According to AAQ NEPM National Environment Protection (Ambient Air Quality) Measure technical paper no. 5 – data collection and handling (technical paper no. 5) (NEPC Peer Review Committee, 2001) stipulates that an observation is considered to be an exceedance when the observation is higher than the standard to 3 decimal places. As the 8-hour rolling ozone average at Albion Park South on 10 February 2022 is equal to the standard (0.065 ppm) and not exceeding it, the 0.065 ppm observation is not considered an exceedance.

Nine Sydney stations recorded their maximum 8-hour concentration during 2022 on 24 December, with 4 Sydney stations and Merriwa in the Upper Hunter recording their highest on 25 December.

Although Bradfield Highway recorded the lowest maximum 8-hour rolling average during 2022, the 0.037 ppm observation was the station's highest 8-hour rolling ozone concentration recorded since its commissioning in 2018.

4.5 Particles as PM10

Table 18 Summary for PM10: maximum daily (24-hour) average concentrations (2022)

Region/station	Number of valid days	Daily maximum 24-hour average (µg/m³)	
		Highest	Date (dd Mmm)
East Sydney			
Alexandria[#]	*179*	*21.3*	*21 Sep*
Bradfield Highway	352	31.4	18 Feb
Cook and Phillip	350	24.5	10 Feb
Earlwood	359	25.8	06 Jan
Macquarie Park	350	25.9	19 Dec
Randwick	362	37.4	06 Jan
Rozelle	347	28.5	06 Jan
Central West Sydney			
Chullora[#]	*301*	*29.6*	*10 Feb*
Lidcombe	362	27.9	19 Dec
Parramatta North	362	42.7	23 Mar
Prospect[#]	*326*	*29.2*	*17 Jan*
Rouse Hill	363	23.8	23 Mar
South West Sydney			
Bargo	360	25.4	19 Dec
Bringelly	359	28.7	17 Jan
Camden	360	24.2	17 Jan
Campbelltown West	352	30.2	03 Dec
Liverpool	360	36.1	15 Jun
Oakdale	361	22.8	19 Dec
North West Sydney			
Penrith	362	30.5	10 Feb
Richmond	354	24.5	25 Dec
St Marys	357	29.7	23 Mar
Illawarra			
Albion Park South	360	29.9	22 Oct
Kembla Grange	361	43.8	15 Aug
Wollongong	356	45.4	17 Jan
Central Coast			
Wyong	348	27.4	17 Jan
Lake Macquarie			
Morisset	346	21.2	06 Jan
Lower Hunter			
Beresfield	359	26.2	16 Jan
Newcastle	361	43.7	17 Jan

Region/station	Number of valid days	Daily maximum 24-hour average (µg/m³)	
		Highest	Date (dd Mmm)
Wallsend	357	27.0	06 Jan
Upper Hunter			
Aberdeen	357	32.1	17 Jan
Merriwa	340	27.4	29 Dec
Muswellbrook	360	37.1	17 Jan
Singleton	362	34.5	05 Dec
Central Tablelands			
Bathurst	362	23.2	17 Feb
Orange	357	43.1	15 Jun
North West Slopes			
Gunnedah[#]	*266*	*36.4*	*15 Jun*
Narrabri[#]	*338*	*17.0*	*27 Nov*
Tamworth	363	23.3	17 Jun
Northern Tablelands			
Armidale[†]	360	**50.6**	20 Jun
Mid North Coast			
Coffs Harbour	339	32.1	19 Dec
Port Macquarie	333	31.5	13 May
South West Slopes			
Albury	342	46.7	01 Apr
Wagga Wagga North	361	46.8	05 Apr
Southern Tablelands			
Goulburn	355	19.6	01 Dec

One exceedance of the 24-hour standard (50.0 µg/m³) was recorded at Armidale. Maximum 24-hour PM10 concentrations in 2022 ranged from 50.6 µg/m³ at Armidale on 20 June 2022 to 19.6 µg/m³ at Goulburn on 1 December 2022. The 50.6 µg/m³ at Armidale is the lowest annual maximum 24-hour PM10 concentration since the AAQ NEPM was introduced.

17 January 2022 saw the highest number of stations record their maximum 24-hour PM10 average for 2022, with 8 stations on that day.

4.5.1 Days above daily PM10 standard

One day exceeded the 24-hour PM10 standard at Armidale due to wood smoke (Table 19). This compares to 18 days in 2021, 87 days in 2020 and 129 days in 2019. 2022 had the fewest PM10 exceedances since 1999. No exceptional events for PM10 were observed during 2022 – the first time no exceptional events have been recorded in NSW since the introduction of the exceptional events rule in the AAQ NEPM in 2016.

Table 19 Days exceeding the 24-hour AAQ NEPM PM10 standard (50.0 µg/m³) (2022)

Date (dd Mmm)	Region	Stations exceeding 24-hour average PM10 standard concentration (µg/m³)	Event classification
20 Jun	Northern Tablelands	Armidale (50.6)	Non-exceptional – wood smoke

4.6 Particles as PM2.5

Table 20 Summary for PM2.5: maximum daily (24-hour) average concentrations (2022)

Region/station	Number of valid days	Daily maximum 24-hour average (µg/m³)	
		Highest	Date (dd Mmm)
East Sydney			
Alexandria#	*179*	*13.3*	*24 Dec*
Bradfield Highway	352	16.1	01 Feb
Cook and Phillip	350	14.0	10 Feb
Earlwood	359	17.2	26 Jun
Macquarie Park	358	17.6	06 Nov
Randwick	351	14.6	01 Feb
Rozelle	353	12.7	26 Jun
Central West Sydney			
Chullora#	*264*	*13.1*	*26 Jun*
Lidcombe	361	14.0	16 Jul
Parramatta North	362	16.9	14 Jun
Prospect#	*326*	*18.2*	*14 Jun*
Rouse Hill	363	14.8	14 Jun
South West Sydney			
Bargo	348	11.8	25 Dec
Bringelly	362	17.8	15 Jun
Camden	355	16.1	25 Dec
Campbelltown West	345	23.2	03 Dec
Liverpool	361	21.9	26 Jun
Oakdale	360	16.6	19 May
North West Sydney			
Penrith	361	22.2	26 Jun
Richmond	348	15.7	14 Jun
St Marys	358	12.6	25 Dec
Illawarra			
Albion Park South	360	13.6	25 Dec
Kembla Grange	354	12.2	25 Dec
Wollongong	359	13.2	10 Feb

Region/station	Number of valid days	Daily maximum 24-hour average (µg/m³)	
		Highest	Date (dd Mmm)
Central Coast			
Wyong	347	11.5	10 Feb
Lake Macquarie			
Morisset	346	11.2	25 Dec
Lower Hunter			
Beresfield	358	12.3	14 Jun
Newcastle	360	18.7	21 Feb
Wallsend	353	18.7	26 Jun
Upper Hunter			
Merriwa	334	13.6	17 Jan
Muswellbrook	362	16.3	15 Jun
Singleton	357	18.1	31 Jul
Central Tablelands			
Bathurst	347	11.3	19 Jun
Orange†	357	**38.9**	15 Jun
North West Slopes			
Gunnedah#†	*266*	***28.2***	*24 Jun*
Narrabri#	*338*	*8.9*	*15 Sep*
Tamworth	351	20.2	17 Jun
Northern Tablelands			
Armidale†	360	**44.8**	20 Jun
Mid North Coast			
Coffs Harbour	339	9.7	04 Aug
Port Macquarie	333	9.4	07 Jan
South West Slopes			
Albury	346	15.3	19 Jun
Wagga Wagga North†	360	**27.1**	05 Apr
Southern Tablelands			
Goulburn	355	15.0	16 Jul

Maximum 24-hour PM2.5 averages for 2022 ranged from 44.8 µg/m³ at Armidale on 20 June 2022 to 9.4 µg/m³ at Port Macquarie on 7 January 2022.

Table 21 **Summary for PM2.5 by USEPA Federal Reference Method: maximum daily average concentrations (2022)**

Region/station	Number of valid samples[1]	Daily maximum 24-hour average (µg/m^3)	
		Highest	Date (dd Mmm)
East Sydney			
Chullora[#]	*86*	*13.8*	*11 Aug*
Lidcombe	103	10.8	13 Apr

Notes:

Data availability rates are based on a 1-day-in-3 sampling regime.

4.6.1 Days above daily PM2.5 standard

There were 16 days above the PM2.5 24-hour standard (25.0 µg/m^3) in 2022 compared to 23 in 2021, 59 in 2020 and 116 in 2019. The 16 PM2.5 exceedance days in 2022 is the lowest since 2016, when 7 exceedance days were recorded.

These exceedances occurred at 4 stations (Table 22). All 16 exceedance days were due to non-exceptional events. One was attributable to smoke from agricultural burning at Wagga Wagga North, which observed a 24-hour average of 27.1 µg/m^3 on 5 April. The remaining 15 days were attributable to wood smoke from domestic wood heating and all occurred during the winter of 2022. Twelve exceedance days occurred at a single station, while on 3 days exceedances were observed at 2 or more stations.

Armidale observed 11 PM2.5 exceedance days due to wood smoke, with 5 in Orange and 4 in Gunnedah. The highest 24-hour PM2.5 concentrations recorded at Armidale was 44.8 µg/m^3, 38.9 µg/m^3 at Orange and 28.2 µg/m^3 at Gunnedah, all of which occurred in June.

More PM2.5 exceedance days due to wood smoke occurred in 2022, with 15 compared to 5 in 2021. In 2021, 3 wood smoke exceedances occurred in Armidale and 2 in Orange, while both 2019 and 2020 saw more than 20 exceedance days due to wood smoke.

Table 22 Days exceeding the 24-hour AAQ NEPM PM2.5 standard (µg/m^3) (2022)

Date (dd Mmm)	Region	Stations exceeding 24-hour average PM2.5 standard concentration (µg/m^3)	Event classification
05 Apr	South West Slopes	Wagga Wagga North (27.1)	Non-exceptional– agricultural burning
14 Jun	Northern Tablelands	Armidale (31.3)	Non-exceptional – wood smoke
15 Jun	Northern Tablelands	Armidale (33.5)	Non-exceptional – wood smoke
15 Jun	Central Tablelands	Orange (38.9)	Non-exceptional – wood smoke
15 Jun	North West Slopes	Gunnedah (25.9)	Non-exceptional – wood smoke
20 Jun	Northern Tablelands	Armidale (44.9)	Non-exceptional – wood smoke
21 Jun	Northern Tablelands	Armidale (27.3)	Non-exceptional – wood smoke
22 Jun	Northern Tablelands	Armidale (29.4)	Non-exceptional – wood smoke
24 Jun	North West Slopes	Gunnedah (28.2)	Non-exceptional – wood smoke
25 Jun	Central Tablelands	Orange (34.0)	Non-exceptional – wood smoke
25 Jun	North West Slopes	Gunnedah (25.4)	Non-exceptional – wood smoke
26 Jun	Northern Tablelands	Armidale (26.8)	Non-exceptional – wood smoke
26 Jun	Central Tablelands	Orange (25.8)	Non-exceptional – wood smoke
26 Jun	North West Slopes	Gunnedah (25.8)	Non-exceptional – wood smoke
30 Jun	Northern Tablelands	Armidale (28.9)	Non-exceptional – wood smoke
16 Jul	Central Tablelands	Orange (27.3)	Non-exceptional – wood smoke
25 Jul	Northern Tablelands	Armidale (34.8)	Non-exceptional – wood smoke
30 Jul	Northern Tablelands	Armidale (25.9)	Non-exceptional – wood smoke
02 Aug	Central Tablelands	Orange (26.7)	Non-exceptional – wood smoke
03 Aug	Northern Tablelands	Armidale (40.2)	Non-exceptional – wood smoke
04 Aug	Northern Tablelands	Armidale (33.1)	Non-exceptional – wood smoke

5. Section D: assessment of progress toward achieving the goal

In 2022, the *National Environment Protection (Ambient Air Quality) Measure* (NEPM or AAQ NEPM) was implemented under the *Protection of the Environment Operations Act 1997* (POEO Act), the Protection of the Environment Operations (Clean Air) Regulation 2022 (Clean Air Regulation), the Protection of the Environment Operations (General) Regulation 2022 (General Regulation), and the NSW Clean Air Strategy 2021–2030 (DPE 2022) to achieve the goal of AAQ NEPM in clause 6.

The POEO Act sets the statutory framework for managing air quality in NSW. The Clean Air Regulation provides measures to control emissions from industry, motor vehicles and fuels, domestic solid fuel heaters (e.g., wood heaters) and open burning. The General Regulation establishes the licensing scheme for major industrial premises and economic incentives for licensed businesses and industry to reduce pollution, including emissions to air. The Clean Air Strategy presents a cohesive set of priorities and actions to support liveable communities, healthy environments and the NSW economy by reducing the adverse effects of air pollution on NSW communities.

In NSW, the Department of Climate Change, Energy, the Environment and Water (the department) and the NSW Environment Protection Authority (EPA) work together to reduce the impacts of air pollution. The department develops policies and programs to improve compliance with NEPM goals and protect public health, operates a comprehensive air quality monitoring network and undertakes air quality forecasting to provide timely information so people can reduce their risk of exposure. The NSW EPA develops and implements regulation, conducts compliance activities and provides expert technical advice on air quality issues. Both agencies work closely with stakeholders to inform, educate and involve stakeholders in improving air quality management.

5.1 Air quality management in the Greater Metropolitan Region and regional New South Wales

The department and the EPA deliver numerous actions that target the pollutants of most concern in NSW, namely particles in the GMR and some regional centres and ground-level ozone, by targeting precursor emissions. These actions are designed to improve knowledge about air emissions, air quality and the impacts of air pollution; inform and engage the community and other stakeholders; and reduce air quality impacts from industry, vehicles and commercial and domestic activities.

At 31 December 2022, the department operated 95 long-term monitoring stations in the NSW air quality monitoring network (see Section A). Air quality data and information are made publicly available on the department's Air Quality website, updated hourly. Automated text messages and emails are sent to subscribers when air quality is measured to exceed national air quality standards for gases, or national reporting levels

for particles. A daily forecast for the Greater Sydney region is also sent to subscribers and is published on the department's website. The department also collaborates with the EPA, other agencies and science partners to deliver research to inform air policies and programs.

The following outlines the key mechanisms for managing air quality and the activities implemented in 2022.

5.2 Policy and legislation

5.2.1 Clean Air Strategy 2021–2030

The NSW Clean Air Strategy 2021–2030 presents a whole of NSW Government approach to improving air quality, reducing emissions and protecting communities. The strategy was released in February 2022 following public consultation in 2021. It presents a cohesive set of priorities and actions to support liveable communities, healthy environments and the NSW economy by reducing the adverse effects of air pollution on NSW communities. It sets out actions under 5 priority areas where the biggest gains for air quality and health can be made: better preparedness for pollution events; cleaner industry; cleaner transport, engines, and fuels; healthier homes; and better places.

The strategy integrates and builds on other key initiatives that tackle some of the state's biggest air pollution sources, including the Net Zero Plan, the NSW Electricity Infrastructure Roadmap, the Electric Vehicles Strategy, the Future Transport Strategy and the Hydrogen Strategy. Agencies across the NSW Government are working to deliver strategy actions. More information on the strategy is available on the department's Clean Air Strategy webpage.

5.2.2 Remake of the Clean Air Regulation

The Clean Air Regulation was remade in December 2022. The department and the EPA undertook a comprehensive review of the Regulation based on the latest environment and health research, current technologies, environmental practice and emission standards, as well as evolving community and stakeholder concerns.

A new draft Regulation was developed and the draft Regulation and associated regulatory impact statement were released for public consultation from 6 May to 3 June 2022. There was significant public response to the consultation, with submissions from community, industry, environment and health groups and other stakeholders. The key changes to the Regulation are summarised on the EPA website.

5.3 Air quality monitoring

In 2022 the department's network of long-term air quality monitoring stations was reduced by one, with the decommissioning of the Chullora station in East Sydney in November 2022. It was replaced with a new station nearby at Lidcombe, which was commissioned in March 2020. The 95 air quality monitoring stations in NSW that made up the network at 31 December 2022, consisting of 56 NATA-accredited stations plus

39 indicative rural monitoring sites. The network provides detailed air quality information that is available on the web and updated hourly. Detailed hourly air quality information, as well as historical data, is also available on the recently established dedicated NSW Air Quality website.

Information about the network can be found on the department's Air quality monitoring network webpage.

The NSW Air Quality Monitoring Plan webpage describes how air quality monitoring in NSW aims to meet the objectives of the AAQ NEPM.

5.4 Air emissions and health impacts research

5.4.1 Broken Hill environmental lead study

The Broken Hill community lead monitoring program continued in 2022. A 1-day-in-6 sampling schedule at 4 locations monitored against the NEPM standard for lead in ambient air. The averages across 2022 at the 4 stations ranged from 0.034 to 0.087 µg/m^3. These are well under the NEPM health standard of 0.50 µg/m^3 but are higher than the 0.02 µg/m^3 lead level measured in the GMR in 2004, which was the last year of monitoring after the phase-out of leaded petrol. Further monitoring and analysis continue to provide a better understanding of the sources and averages expected across Broken Hill.

5.4.2 Sydney Air Quality Study

This multi-year study commenced in 2016 to improve understanding of air quality and the impacts of air pollution in the greater Sydney region. The study supports evidence-based air policies and programs by identifying persistent and emerging issues and highlighting opportunities to improve air quality and realise public health and economic benefits.

The first phase of the study (2017 to 2019) was released in November 2020; see Sydney Air Quality Study (DPIE 2020c). The Sydney Air Quality Study Stage 2 (2020 to 2022), published in January 2023, was carried out in collaboration with NSW Health and the EPA (DPE 2023). The project quantifies the contribution of major emission sources to air pollution and its potential impacts on health and the economy.

Stage 2 of the study showed that natural and human-made sources contributed 52% and 48% respectively to the population weighted annual average PM2.5 concentrations (DPE 2023). The total quantified health impacts (costs) from different sources were valued around AUD $4–5 billion (2021 rates) annually.

The study ranked the health impact and associated cost of anthropogenic sources of air pollution as (from highest to lowest): wood heaters, industry, on-road mobile (exhaust), power stations, domestic-commercial, non-road diesel and marine, and on-road mobile (non-exhaust).

5.4.3 Warringah Freeway upgrade: air quality monitoring

In early 2022, the department established a compliance monitoring station at Cammeray Park near North Sydney. This was commissioned on behalf of the EPA to monitor air quality around the Warringah Freeway Upgrade/Western Harbour Tunnel over a 2-year period, starting before major construction and monitoring during construction.

This monitoring project includes a research monitoring station at Cammeray, with hourly data reported on the new NSW Air quality website, and a network of 10 particle sensors located along a line from Wollstonecraft to Middle Harbour. Details of this monitoring project including quarterly data reports are available on the EPA website.

5.4.4 Incident air quality monitoring in 2022

A campaign at Bowral between December 2021 and March 2022 monitored air quality following complaints from residents regarding odours from a local waste facility. Additional monitoring was carried out using low-cost indicative sensors. Live data were available on the department's website within days of deployment.

5.5 Enhancing air quality forecasting in New South Wales

This program was established to progressively expand the scope of and enhance air quality forecasting capabilities in NSW. The department issues a daily air quality forecast for the Greater Sydney region. The department is working towards more accurately forecasting air quality for Greater Sydney and its subregions and is progressively expanding forecasting to the whole of the NSW GMR.

To improve the accuracy of the forecasting system, the department is developing and testing new methods based on artificial neural network models and machine learning.

5.6 Industry emissions

In 2022 the EPA continued to implement its regulatory responsibilities, including licensing scheduled industry activities and conducting compliance and enforcement programs. The POEO Act, the Clean Air Regulation and the General Regulation set the framework for managing air pollution from major industries in NSW in 2022.

5.6.1 Load-based licensing

The EPA's load-based licensing scheme requires some environment protection licensees to pay part of their annual licence fees based on the load of certain air and water pollutants their activities release to the environment. By tying the fees payable to pollutant loads, the scheme aims to provide an ongoing economic incentive for licensees to improve their environmental performance beyond the levels required by regulation or licence conditions alone. In 2022 the EPA continued to progress a review of the load-based licensing scheme, with the aim of improving the scheme's efficiency and effectiveness.

5.6.2 Coal-fired power stations

In 2022 the EPA continued to regulate NSW coal-fired power stations under the POEO Act, the Clean Air Regulation and individual environment protection licences which contain specific requirements for each facility.

Through licence variations, the EPA has progressed the investigation and installation of in-stack real-time continuous particulate monitoring systems of all operational NSW coal fired power stations. The changes will strengthen monitoring and reporting accuracy and assist in the efficient operation of the power station boilers. The EPA's POEO public register webpage contains information about each individual licence.

5.6.3 Update of approved methods for air quality sampling and modelling documents

In 2022 the EPA released updated versions of both the *Approved methods for the sampling and analysis of air pollutants in NSW* and the *Approved methods for the modelling and assessment of air pollutants in NSW* (NSW EPA 2022a).

The *Approved methods for the sampling and analysis of air pollutants* lists the methods that NSW industries and commercial premises must use to ensure they comply with NSW air quality regulations by sampling and analysing their emissions of air pollutants. The *Approved methods for the modelling and assessment of air pollutants* (NSW EPA 2022b) lists the statutory methods to be used for modelling and assessing emissions of air pollutants in NSW.

5.6.4 Hunter region coalmines dust management

Wetter weather conditions due to the La Niña climatic conditions helped manage dust emissions from coalmines during 2022. Due to extended wet weather, targeted dust compliance campaigns were not conducted during the 2021–22 or 2022–23 spring and summer seasons. Individual regulation of coalmines continued as part of the EPA's risk-based licensing inspection program.

5.7 Non-road diesel and marine emissions

5.7.1 National Clean Air Agreement – Evaluating the potential for a national approach to non-road diesel engine emissions

Under the National Clean Air Agreement, in 2022 the department and the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) continued to evaluate the potential for a national approach to manage non-road diesel engine emissions in Australia.

Non-road diesel engines are used in a wide range of industries and applications, including construction, mining, manufacturing, airport services, agriculture, and marine sectors. Diesel engine exhaust contains high levels of pollutants, including fine particles (PM2.5) and NOx, and has been declared as carcinogenic by the World Health Organisation's International Agency for Research on Cancer. It contributes to premature deaths and health-related problems such as cardiovascular, cardiopulmonary and respiratory diseases and lung cancer.

Unlike other countries and regions (including the United States, the European Union, China, India, Brazil and Japan), and in contrast to on-road (passenger) vehicles in Australia, there are currently no national standards or approaches to manage emissions from non-road diesel engines in Australia.

In 2022 the department continued to work with DCCEEW on a cost-benefit analysis examining the impact of options to manage emissions from non-road diesel engines. Further information on the project can be found on the National Clean Air Agreement website.

5.7.2 Government Resource Efficiency Policy

In 2022 the department's Sustainable Government team continued to administer the NSW Government Resource Efficiency Policy (OEH 2019). The policy includes requirements to address non-road diesel engine emissions through government procurement and contracts.

For non-road diesel engines, government agencies must continue to comply with European Union (EU) or USEPA standards when purchasing or leasing such equipment. Agencies must also consider air emissions from contractor-supplied equipment in tender processes for construction projects over $10 million. The tender selection process incorporates either a weighting for air emission standards in conjunction with other environmental considerations, or a statement by contractors on how they will reduce emissions from their equipment accompanied by their equipment's air emissions data.

5.7.3 Locomotives

Amendments to the POEO Act to regulate railway rolling stock operations, in addition to railway infrastructure operators, came into effect in July 2019. The amendments mean that rolling stock operators are required to hold an environment protection licence and are directly accountable for their environmental performance, including managing air emissions.

The EPA issued the new rolling stock operator licences in 2020. The requirements in the licence are for new locomotives to meet US Tier 2 particulate matter emissions. There are no air emission limits for locomotives already operating on the rail network. The licences, however, include operating conditions and pollution studies that seek to minimise impacts on air quality through idling. In 2022 the EPA continued to work with the rail industry to progressively reduce locomotive air emissions.

5.8 Vehicle and fuel emissions

5.8.1 Regulation of motorway tunnel ventilation stacks

In July 2019 the POEO Act was amended to include changes to the way road tunnel ventilation stacks are regulated. From March 2020 motorway tunnel ventilation stack environment protection licences place strict operating requirements on air emissions from ventilation stacks. The licences also require air quality monitoring of tunnel ventilation stacks, and that monitoring data be made publicly available through the

tunnel operators' websites and provided to the EPA for review. In 2022 the EPA continued to regulate tunnel ventilation stacks under licences. The EPA undertook compliance activities such as monitoring reviews, site inspections and pollution studies to ensure ventilation stacks are operated according to licence conditions.

5.8.2 Smoky vehicles program

In NSW it is an offence for a vehicle to emit excessive air impurities for a continuous period of more than 10 seconds. Penalty notices may be issued to the registered owners of vehicles emitting excessive air impurities. The public can also report smoky vehicles via the EPA's Environment Line website or mobile phone application.

Program data is available by financial year. In 2021–22 the EPA issued 675 advisory letters based on public reports, of which 566 were to diesel vehicle owners. An average of 172 smoky vehicle reports were received each month from the public (more than 2,000 public reports over the year), indicating a high level of awareness in the community of the unacceptability of excessive visible emissions.

Eight defective vehicle notices were issued in the 2021–22 financial year, 7 of which were for diesel vehicles. A defective vehicle notice requires the vehicle owner to carry out any necessary repairs so that the vehicle no longer emits excessive smoke and to provide evidence to the EPA that those repairs were carried out. Failure to provide evidence that the vehicle is no longer emitting excessive smoke may result in the vehicle's registration being suspended.

5.8.3 Vapour recovery at service stations

Vapour recovery stage 1 technology captures displaced vapours from storage tanks when a tanker delivers fuel to a service station, and vapour recovery stage 2 technology captures vapours displaced at the bowser when a motorist refuels.

In 2022, the NSW Vapour Recovery Compliance Program continued to be implemented under the Clean Air Regulation by local councils at service stations across the Sydney, Wollongong, Newcastle and Central Coast metropolitan areas, as well as the Lower Hunter and Illawarra Regions. Implementation of vapour recovery at these service stations has reduced emissions of volatile organic compounds (VOCs) by an estimated 8,600 tonnes per year.

5.8.4 Summer low-volatility petrol

In 2022 the EPA continued to implement the summer low-volatility petrol program. To manage ozone formation in the Sydney region, regulatory requirements limit petrol volatility to 62 kilopascals (a measure of vapour pressure) over the summer period from 15 November to 15 March each year. Petrol importers and blenders must test and report to the EPA on batch volatility. The petrol volatility limits reduce VOC emissions in the Sydney region by an estimated 2,100 tonnes each summer.

5.8.5 National vehicle and fuel standards

The Australian Government is responsible for fuel quality and vehicle emission standards for new on-road vehicles. These standards are being reviewed.

The NSW Government has consistently supported harmonisation of national vehicle emission standards with Euro standards, together with tightening of fuel standards to enable adoption of control technologies to meet the tighter vehicle standards. Over 2022, the department continued to support early adoption of the Euro 6/VI emissions standards for diesel vehicles and enabling changes to fuel quality standards. In 2022 departmental staff represented the state of NSW on the national Fuel Standards Consultative Committee.

5.9 Wood smoke management

Reducing wood smoke and fine particle pollution is a priority action in the NSW Clean Air Strategy 2021–2030. Under the Strategy, the NSW Government is committed to further research to inform the development of future actions on wood heaters.

The EPA also supports local councils across NSW in managing wood smoke through periodic wood smoke reduction programs and providing community education materials for use by councils. Previous social research undertaken for the EPA identified the lack of awareness of wood smoke impacts on health as the key barrier to changing people's wood heater use.

In 2022 the EPA continued to provide a range of educational materials for councils to raise public awareness about wood smoke impacts and the correct operation of wood heaters. The materials are available in English and 5 community languages: Arabic, Cantonese, Hindi, Mandarin and Vietnamese. The local community education campaign materials are available on the EPA's *Council resource kit* webpage.

The EPA also regulates the sale of wood heaters. All appliances must meet minimum emission and efficiency standards as set out in the Clean Air Regulation.

6. Section E: population exposure analysis

This section addresses clause 17(2A) of the AAQ NEPM, which requires that:

> Each participating jurisdiction must evaluate and report population exposures to:
>
> a. particles as PM2.5 from June 2018
>
> b. nitrogen dioxide and photochemical oxidants (as ozone) from June 2021.
>
> Note: To ensure national consistency, evaluation and reporting shall be undertaken in accordance with any procedures or methods agreed by participating jurisdictions.

6.1 Assessing population exposure

This section sets out the approach adopted by NSW for assessing PM2.5, nitrogen dioxide and ozone population exposure and those results for 2022. At the time of this report, there is no agreed approach between participating jurisdictions on the procedures or methods to ensure nationally consistent evaluation and reporting. The inter-jurisdictional Expert Working Group advising the AAQ NEPM review has endorsed the NSW approach to reporting population exposure for PM2.5, pending the finalisation of a more detailed assessment method.

The methodology previously developed for population exposure to PM2.5 has been extended to determine the population exposure to nitrogen dioxide and ozone in order to meet the requirement in the amended NEPM.

6.1.1 New South Wales approach to exposure assessment

The NSW Government has developed a method to account for population exposure when tracking changes in pollutant concentrations. The approach was described in the background paper, Clean Air Metric (NSW Government 2017), published for the NSW Clean Air Summit in June 2017.

The method involves 2 main steps:

1. estimate the population exposure
2. calculate the Clean Air Metric (CAM).

Estimate the population exposure

Population exposure is estimated using the following steps:

- Download the Australian Bureau of Statistics (ABS) 2022 Australian population grid data (1-km resolution) (ABS 2022). The population density for the NSW GMR was plotted for 2022, as illustrated in Figure 3.
- The 2022 annual average PM2.5 concentrations at all AAQ NEPM monitoring stations across NSW are collated and spatially interpolated onto 1-km grids to coincide with the ABS 1-km gridded population data using the kriging method. Results from the kriging method show the spatial distribution of annual average PM2.5 (Figure 4).

  - Kriging estimates variable values over a continuous spatial field, using a small set of sampled data points. In general, the accuracy of kriging interpolation is limited when the number of observations collected is small, the spatial extent of the data is limited, or the data are not sufficiently spatially correlated. Kriging assumes stationarity (that the joint probability distribution does not change within the study space and the same variogram model is assumed to be valid across the study area) and isotropy (uniformity in all directions).
- The spatially interpolated pollution concentrations in Figure 4 are then multiplied by the population (Figure 3) in each 1-km grid to generate the population-weighted pollution exposure. The population-weighted pollution exposure is then normalised by the maximum value in NSW GMR domain. The resulting values are multiplied by 10 to produce the final population exposure maps (scaled from 0 to 10), resulting in the PM2.5 exposure seen in Figure 5.

The steps above are repeated for the calculation of:

- nitrogen dioxide annual average spatial distribution, using nitrogen dioxide annual average concentrations for 2022 (Figure 6) and nitrogen dioxide annual population exposure for 2022 (Figure 7)
- ozone annual 8-hour maximum spatial distribution, using ozone hourly 8-hour rolling average concentrations for 2022 (Figure 8). To evaluate ozone exposures, a similar approach that used by State of Global Air (2023) was followed, which used the population-weighted annual maximum 8-hour ozone concentrations. The ozone population exposure map is at Figure 9.

Calculate the Clean Air Metric (CAM)

The Clean Air Metric (CAM) is calculated by following steps:

- Results from population-weighted pollution exposure maps (which is the product of multiplying the air pollution concentration by the population in each 1-km grid) are summed across all grid points in the selected region (Greater Sydney or the NSW GMR) and then divided by the total regional population.
- The resulting CAM can be represented in 2 ways: (1) population-weighted pollutant concentrations or (2) CAM index, which is obtained by dividing population-weighted pollutant concentration by the AAQ NEPM standard for individual pollutant. The individual CAM values (i.e. CAM-PM2.5, CAM-nitrogen dioxide and CAM-ozone) are derived in this way.
- The overall CAM index for 2022 was determined by taking the maximum CAM value of the 3 pollutant indices; CAM-PM2.5, CAM-nitrogen dioxide and CAM-ozone.

Further information on the original CAM methodology, see Riley et al. (2017) and NSW Government (2017).

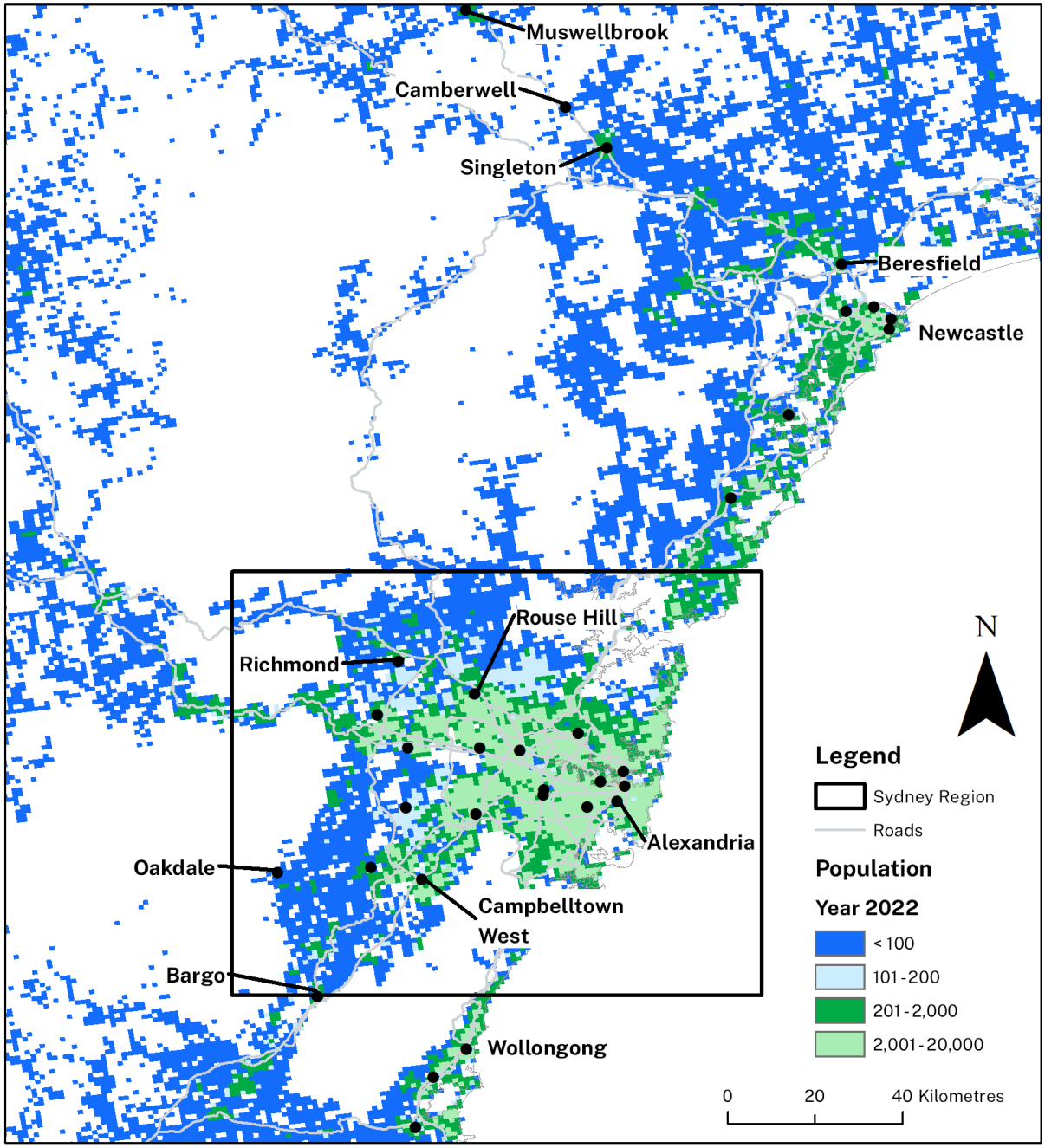

Figure 3 **Population density (population/km^2) for NSW GMR, including the Greater Sydney Region (inset) in 2022. The AAQ NEPM stations monitoring PM2.5 in 2022 are identified by black dots**

6.1.2 Exposure assessment for particles as PM2.5

The spatial distribution of annual average PM2.5 concentrations in the NSW GMR for 2022 (Figure 4) illustrates that much of the populated area in Greater Sydney had an annual average PM2.5 concentrations in the range of 4.01–6.0 µg/m^3.

Figure 5 shows that the regions characterised by the most elevated PM2.5 exposure in 2022 (shaded in green) align with the populated areas concentrated along major transport corridors in Greater Sydney. Exposure to PM2.5 is lower in the Illawarra, Central Coast and Lower Hunter regions (shaded in blue to green).

The Sydney Air Quality Study findings show anthropogenic sources account for 48% of the overall long-term PM2.5 exposure in the GMR (DPE 2023b). Among the anthropogenic sources, wood heaters, industry and on-road motor vehicles are the top 3 contributors to PM2.5 exposure in Sydney.

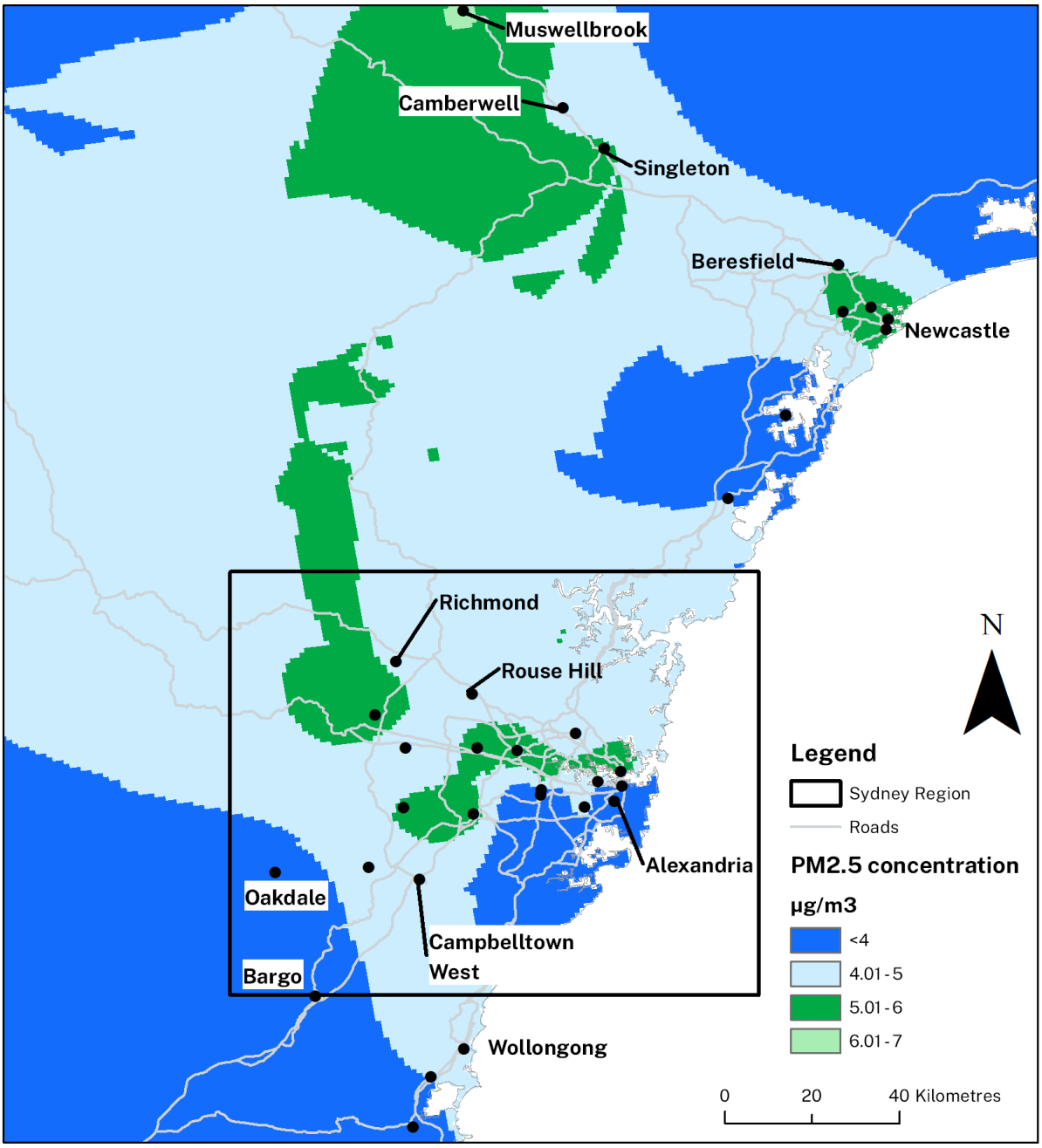

Figure 4 **Spatial distribution of PM2.5 annual average concentrations in the NSW GMR, including the Greater Sydney Region (inset) in 2022. The AAQ NEPM stations monitoring PM2.5 in 2022 are identified by black dots**

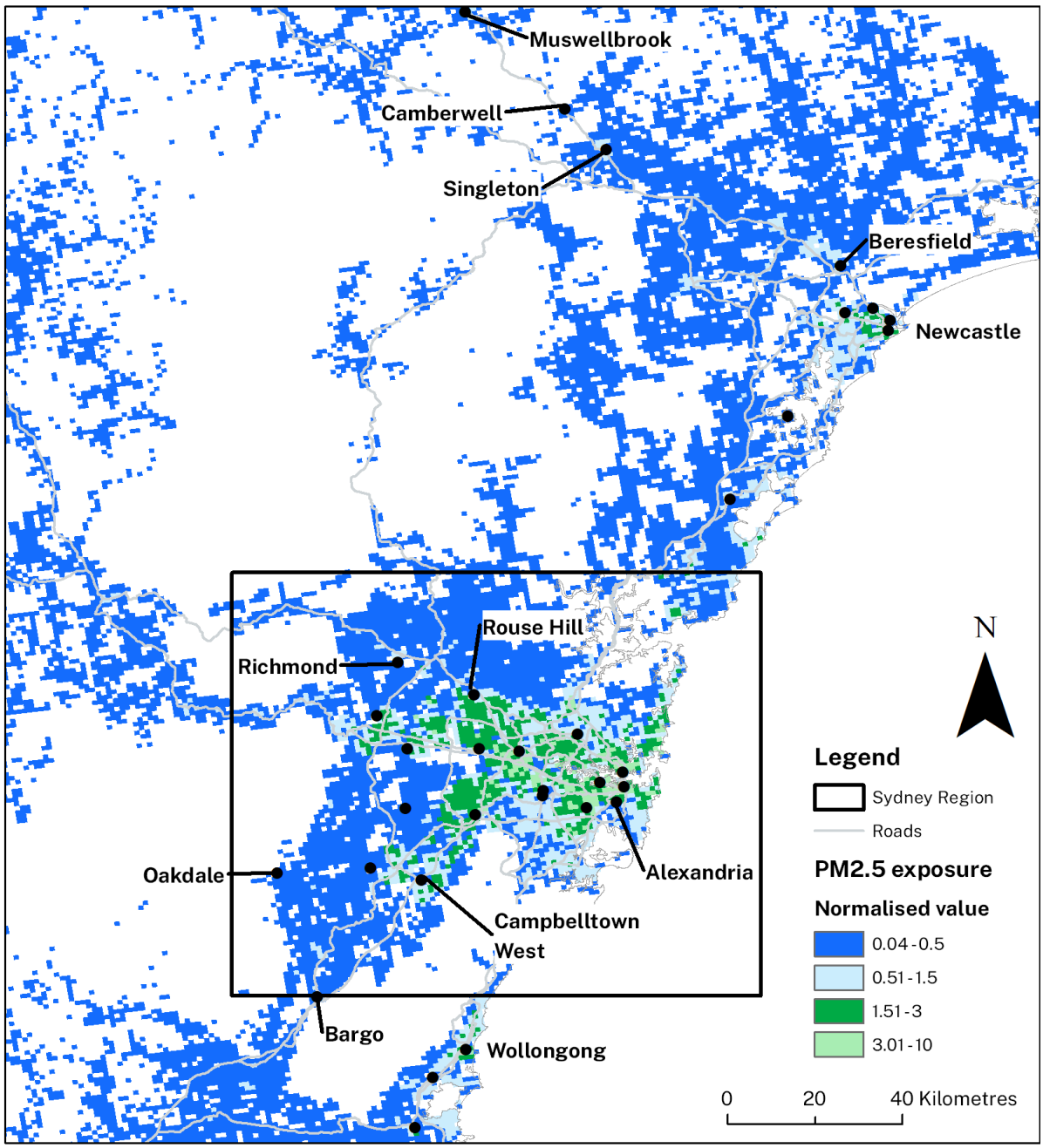

Figure 5 **PM2.5 exposure in the NSW GMR and the Greater Sydney Region (inset) in 2022**

6.1.3 Exposure assessment for nitrogen dioxide

Figure 6 presents the spatial distribution of annual average nitrogen dioxide concentrations in the NSW GMR for 2022. Annual average nitrogen dioxide levels in parts of Greater Sydney and Hunter regions ranged between 0.25 and 1.0 pphm (parts per hundred million) (shaded blue to green) and remained below the AAQ NEPM standard of 1.5 pphm for annual average nitrogen dioxide concentration. The highest recorded annual average nitrogen dioxide concentration of 1.1 pphm was observed at Cook and Phillip station situated in the Sydney central business district (CBD).

Regions characterised by higher nitrogen dioxide exposure in 2022 generally coincided with major transport corridors in the Greater Sydney region (Figure 7, shaded green). Exposures were lower in the north west, south west and south east of Sydney, as well as in the Illawarra region (shaded blue). Anthropogenic sources are the major contributors to oxides of nitrogen (NOx) emissions in the NSW GMR, including industrial (60%), off-road mobile (22%) and on-road mobile (17%) sources, which make up over 98% of human-made emissions (NSW EPA, 2019).

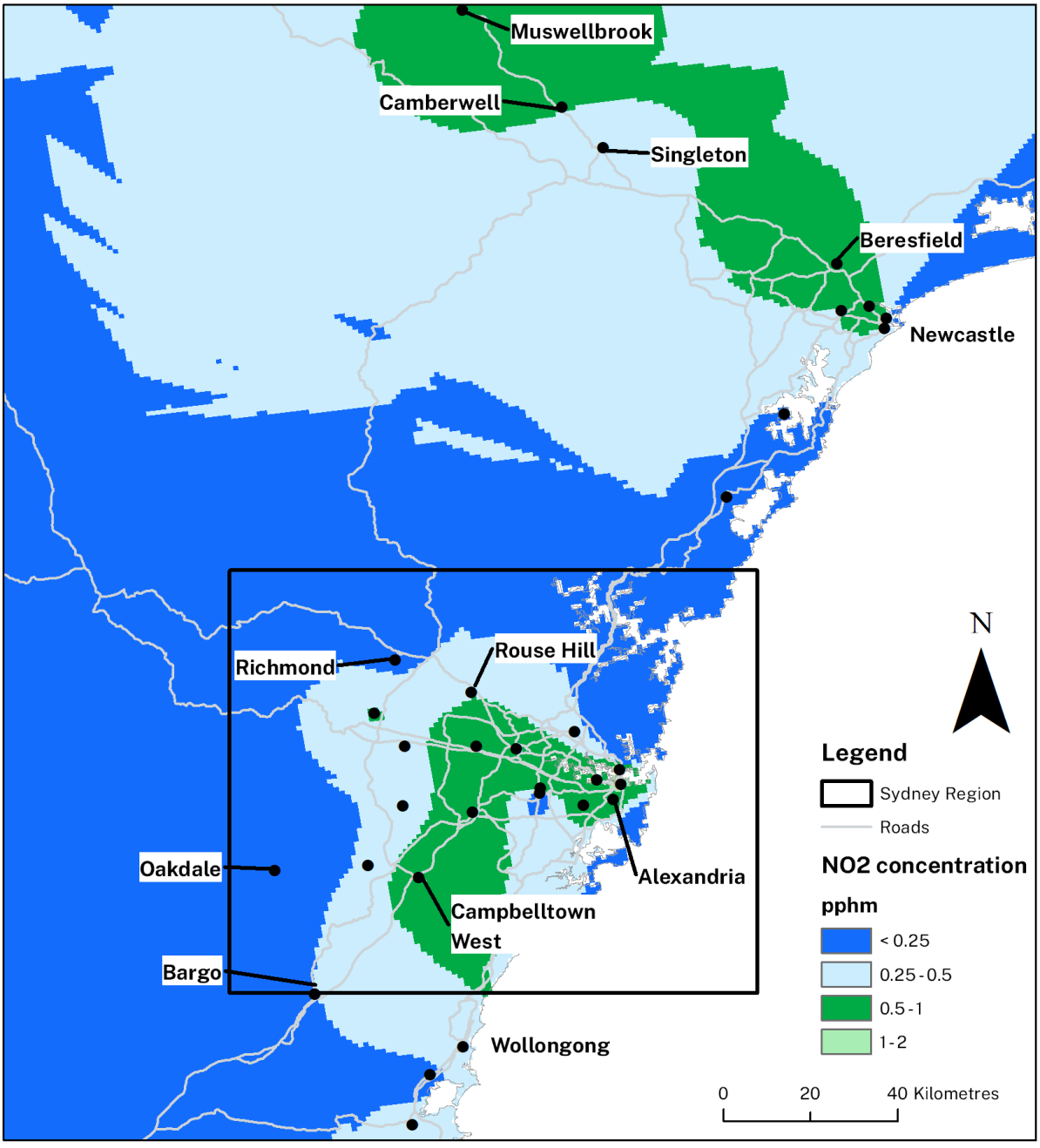

Figure 6 **Spatial distribution of nitrogen dioxide (NO_2) annual average concentrations in the NSW GMR, including the Greater Sydney Region (inset) in 2022. The AAQ NEPM stations monitoring nitrogen dioxide in 2022 are identified by black dots**

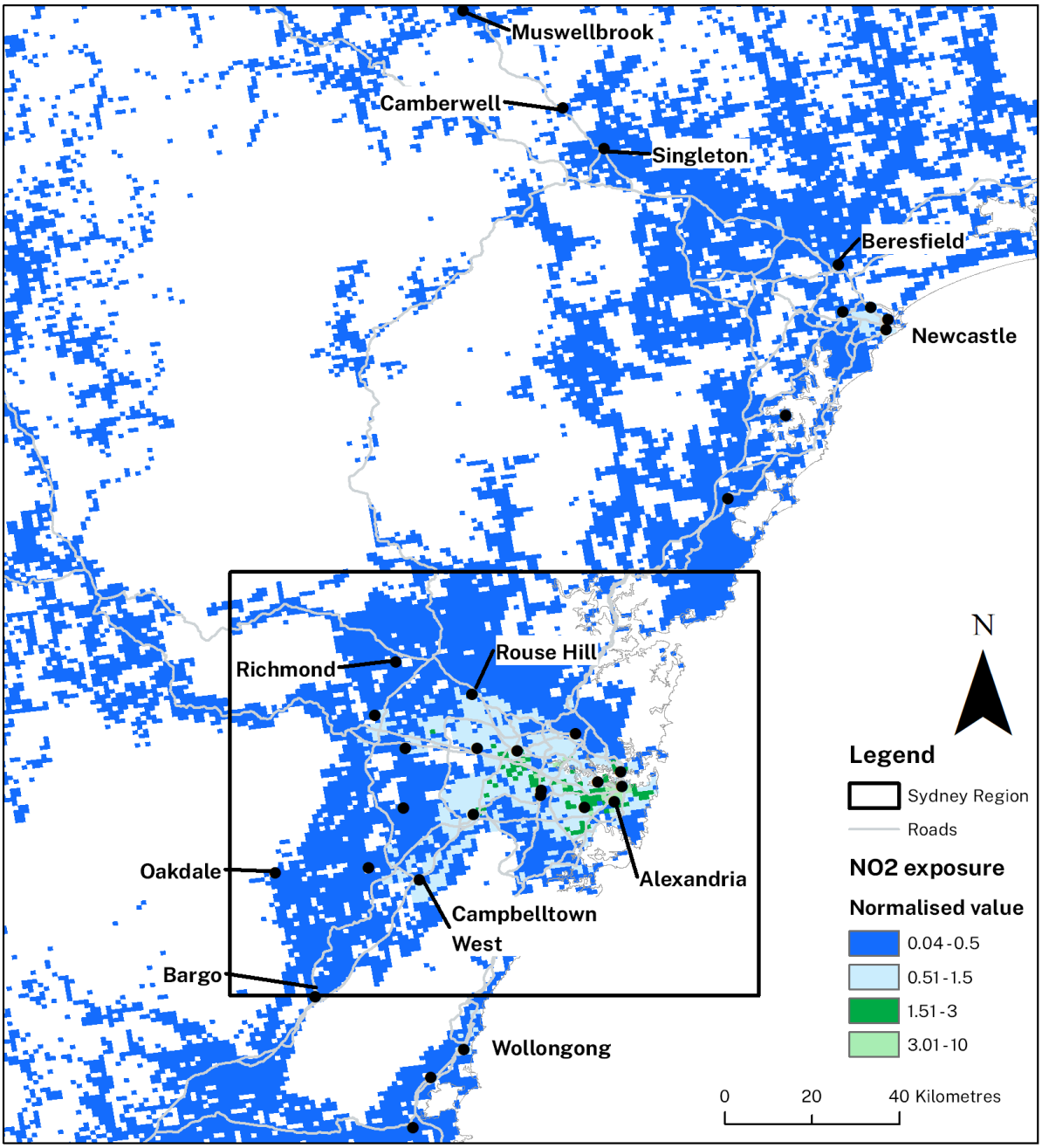

Figure 7 **Nitrogen dioxide (NO_2) exposure in the NSW GMR and Greater Sydney Region (inset) during 2022**

6.1.4 Exposure assessment for ozone

Figure 8 presents the spatial distribution of annual maximum 8-hour ozone concentrations in the NSW GMR for 2022, showing that areas in north Sydney and south west Sydney were characterised by the highest 8-hour ozone levels (light green). The highest 8-hour ozone concentration across NSW GMR in 2022 was 6.5 pphm recorded at Albion Park South, which did not exceed the AAQ NEPM standard of 6.5 pphm; see Section C.

Figure 9 shows ozone exposure across the GMR during 2022, with regions experiencing greatest ozone exposure (shaded in green) along transport corridors and areas of industrial activity. The ozone exposure map exhibits a notably larger spatial extent within the Sydney GMR compared with exposure maps for PM2.5 and nitrogen dioxide (see Figure 5 and Figure 7 respectively). Whereas PM2.5 and nitrogen dioxide exposures are mostly distributed along the transport corridors, ozone exposure is distributed more broadly across the Greater Sydney Region.

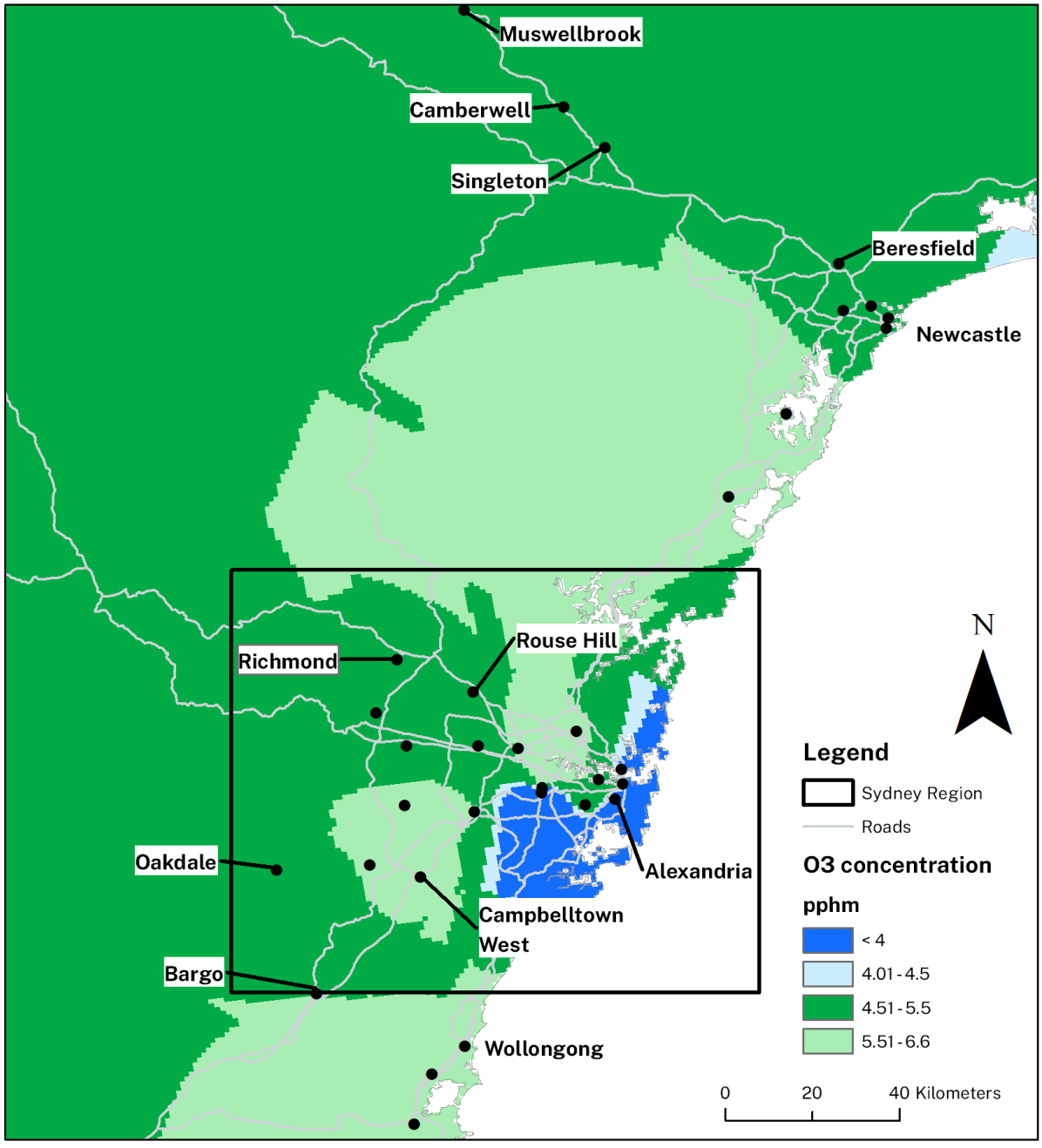

Figure 8 **Spatial distribution of annual maximum 8-hour ozone (O_3) concentrations in the NSW GMR, including the Greater Sydney Region in 2022. The AAQ NEPM stations monitoring ozone in 2022 are identified by black dots**

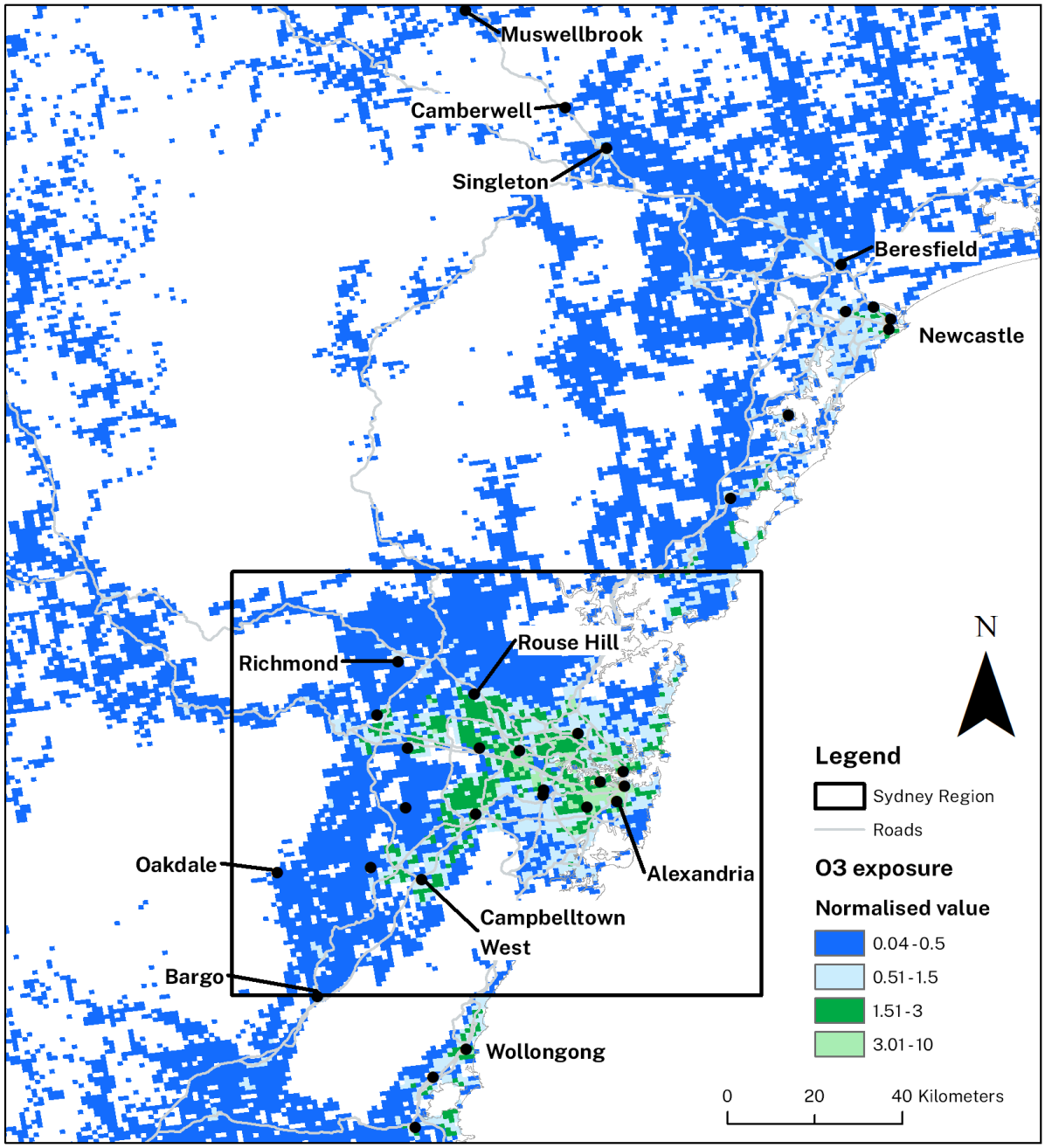

Figure 9 **Ozone (O_3) exposure in the NSW GMR and Greater Sydney Region (inset) during 2022**

6.1.5 Clean Air Metric

The Clean Air Metric (CAM) accounts for population exposure when assessing changes to average air quality. Table 22 shows the 2022 CAM calculations for 2 domains, the Greater Sydney Region and the NSW GMR. The CAM is presented in 2 ways:

1. population-weighted PM2.5, nitrogen dioxide and ozone concentrations
2. CAM index, obtained by dividing population-weighted PM2.5, NO_2 and O_3 concentrations by the AAQ NEPM standard for each pollutant.

Table 23 **2022 population-weighted pollutant concentration, CAM index and Overall-CAM index for Greater Sydney Region and NSW GMR**

Region	2022 population	2022 population-weighted pollutant concentration			2022 CAM index			2022 overall – CAM index
		PM2.5 (µg/m^3)	NO_2 (pphm)	O_3 (pphm)	PM2.5 index	NO_2 index	O_3 index	
Sydney	5,054,212	4.05	0.48	4.45	51	32	68	68
GMR	6,228,951	4.15	0.46	4.72	52	31	73	73

Notes:

CAM index figures indicate population exposure to each pollutant as a percentage of the AAQ NEPM standard.

- The 2022 population-weighted PM2.5 concentrations for the Greater Sydney Region and the NSW GMR are 4.05 and 4.15 µg/m^3 respectively. CAM index values derived from PM2.5 (CAM-PM2.5) are 51 and 52, which indicate that the Greater Sydney Region and NSW GMR PM2.5 exposures are 51% and 52% of the AAQ NEPM annual PM2.5 standard of 8 µg/m^3.
- The 2022 population-weighted nitrogen dioxide concentrations for the Greater Sydney Region and the NSW GMR are 0.48 and 0.46 pphm respectively. The CAM-nitrogen dioxide values indicate that nitrogen dioxide exposures in the Greater Sydney Region and NSW GMR are 32% and 31% of the AAQ NEPM annual NO_2 standard of 1.5 pphm.
- The 2022 population-weighted 8-hour ozone concentrations for the Greater Sydney Region and the NSW GMR are 4.45 and 4.72 pphm respectively. The CAM index values are 68 and 73 respectively, indicating the Greater Sydney Region and NSW GMR ozone exposures are 68% and 73% of the AAQS NEPM standard.
- For the Greater Sydney Region and the NSW GMR, the 2022 overall CAM index value is 68 and 73 respectively, driven by the CAM index value calculated for ozone.

6.1.6 Trends in CAM-PM2.5

Trend analysis allows for assessing sources contributing to poor air quality. This is because air quality can vary significantly from year to year due to exceptional events such as bushfires, dust storms and climatological events like El Niño and La Niña. Before 2022, calculations for the CAM index were only based on PM2.5, and the trends analysis is therefore not extended to NO_2 and ozone. Trends in CAM-PM2.5 in the Greater Sydney and the NSW GMR for the years 1996 to 2022 are shown at figures 10 and 11 respectively.

- The highest CAM-PM2.5 of 132 was observed in 2019, primarily due to smoke impacts of the 2019–20 bushfire season, after which CAM-PM2.5 values decreased to the lowest values during the analysis period in 2022.
- Figure 12 shows annual active fire counts observed in NSW from NASA's Terra satellite since 2001 (NASA, 2024). The data reveal that bushfire activity reached its highest point in past 2 decades in 2019.

- CAM-PM2.5 values were significantly lower for 2022 than in 2019 and 2020 and were the lowest CAM values for the 1996 to 2022 period analysed. This was primarily due to increased rainfall associated with prevailing La Niña conditions during 2020 to 2022, resulting in fewer smoke events from bushfires and hazard reduction burns, as well as lower dust storm activity. Figure 13 shows the annual rainfall received in NSW in 2022 (720.6 mm) was 30% above the 1961 to 1990 average, and the highest in the 1996 to 2022 period analysed. COVID-related lockdowns in 2020 and 2021 likely also led to reduced emissions from transportation and industrial processes.

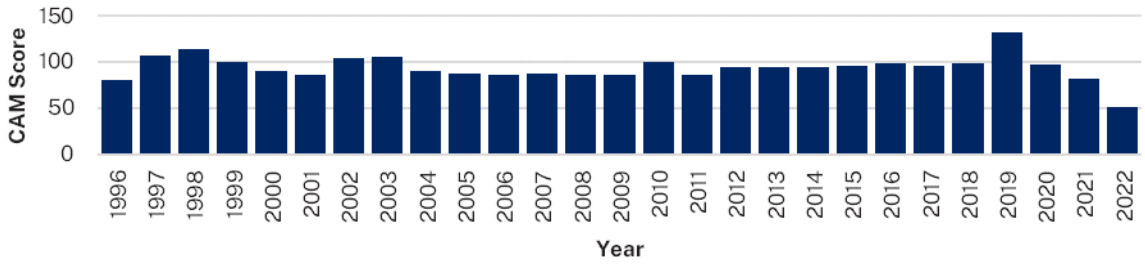

Figure 10 **CAM-PM2.5 population-weighted time series for Greater Sydney Region, 1996 to 2022**

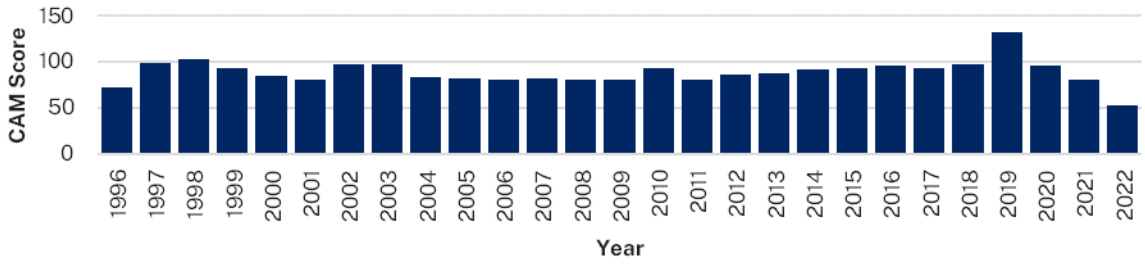

Figure 11 **CAM-PM2.5 population-weighted time series for the NSW Greater Metropolitan Region, 1996 to 2022**

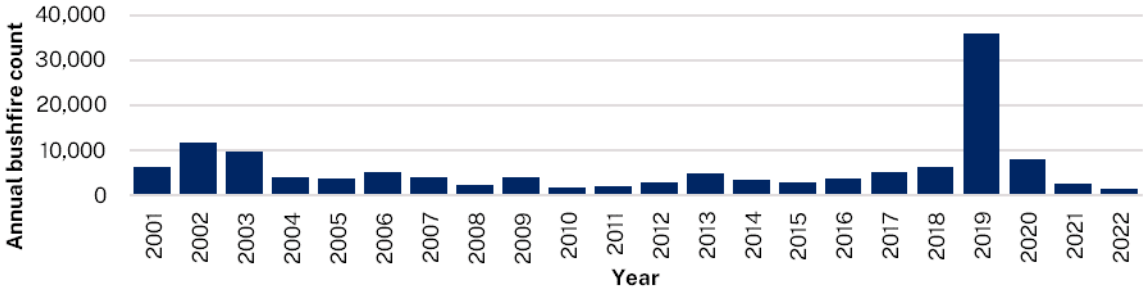

Figure 12 **Annual active fire count in NSW observed through MODIS Terra satellite, 2001 to 2022**

Source: Fire Information for Resource Management Systems, NASA MODIS Terra satellite (NASA FIRMS 2024)

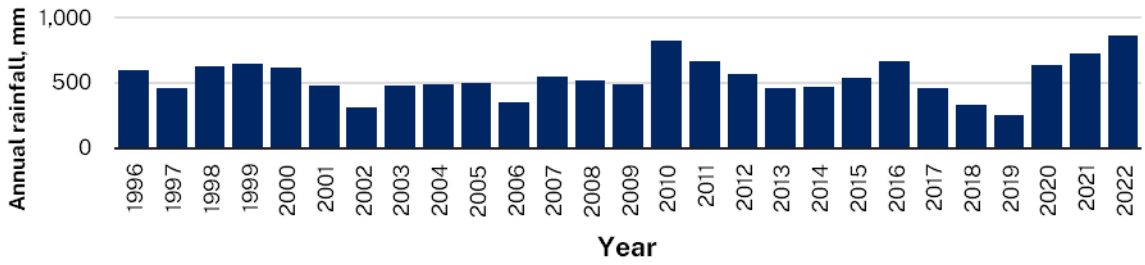

Figure 13 **Annual rainfall (mm) in NSW/ACT, 1996 to 2022**

Source: BOM 2023

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Legislation

- National Environment Protection (Ambient Air Quality) Measure (Cth) February 2016 amendment
- National Environment Protection (Ambient Air Quality) Measure (Cth) May 2021 amendment
- Protection of the Environment Operations Act 1997
- Protection of the Environment Operations (Clean Air) Regulation 2022
- Protection of the Environment Operations (Clean Air) Regulation 2010 (repealed)
- Protection of the Environment Operations (Clean Air) Regulation 2021 (repealed)
- Protection of the Environment Operations (General) Regulation 2022
- Protection of the Environment Operations (General) Regulation 2021 (repealed)

More Information

- Air quality concentration data – NSW Government webpage
- Air quality monitoring network – NSW Government webpage
- Air quality special statement spring–summer 2019–20 – NSW Environment and Heritage webpage
- Ambient air quality NEPM technical papers, National Environment Protection Council, all content archived (previously Environment Protection and Heritage Council) – Federal Government webpage
- Approved methods for the modelling and assessment of air pollutants in NSW – NSW EPA webpage
- Approved methods for the sampling and analysis of air pollutants in NSW – NSW EPA webpage
- Council resource kit – NSW EPA webpage
- Draft NSW Clean Air Strategy: public consultation –NSW Environment and Heritage webpage
- POEO public register – NSW EPA webpage
- NASA Worldview – National Aeronautics and Space Administration (NASA) Worldview application website

- FIRMS NASA satellite data, country yearly summary data for 2022 – Fire Information for Resource Management Systems webpage
- National Clean Air Agreement Noxious Emissions from Non-Road Diesel Engines – Federal DCCEEW webpage
- NSW Air Quality – NSW Government website
- NSW Air Quality Monitoring Network – NSW Environment and Heritage webpage
- NSW Air Quality Monitoring Plan 2021–2025 – NSW Environment and Heritage webpage
- NSW Clean Air Strategy – NSW Environment and Heritage website
- NSW Government's Clean Air Summit – NSW EPA webpage
- NSW Government Resource Efficiency Policy (GREP) – NSW Goverment webpage
- Protection of the Environment Operations (Clean Air) Regulation 2022 – NSW EPA webpage
- Sydney Air Quality Study – NSW Environment and Heritage webpage
- Sydney Air Quality Study – Stage 2 – NSW Environment and Heritage webpage
- Warringah freeway upgrade: air quality monitoring – NSW EPA webpage
- World Health Organization International Agency for Research on Cancer (PDF 186 KB) – World Health Organization document

Appendix A: 5-year trends analysis

This section presents air pollutant trends for each active AAQ NEPM station monitoring the pollutant from 2018 to 2022 inclusive. The following statistics are presented for each pollutant at each station for all AAQ NEPM standards:

- 5-year trends in data availability for each pollutant based on hourly data for gaseous pollutants and 24-hour data for PM10 and PM2.5.
- 5-year trends in annual maximum concentrations and the 99th, 98th, 95th, 90th, 75th and 50th percentiles for each standard with an averaging period of less than a year for each pollutant.
- 5-year trends in annual means for relevant pollutants and standards.

General notes on tabulated data

- ppm – parts per million.
- *Italicised* entries denote data availability for a year that is between 15% and 75%. Note that for this trend analysis, quarterly availability figures below 75% are not considered – only the annual figure is assessed. These entries are marked by a hash (#).
- All **bold** entries indicate the national standard was exceeded. These entries are marked by a dagger (†).
- Entries with data availability less than 15% are included only if a national standard was exceeded.
- Entries with less than 15% of data available where exceedances did not occur are indicated with a '*' next to the station name for the relevant year.

The following abbreviations are used on occasion in Table 24 to 29:

- CW: Central West
- SW: South West
- NW: North West
- Hwy: Highway
- W: West
- C: Central
- Macq.: Macquarie
- L: Lower
- U: Upper
- Nth: North
- Sth: South
- S: Southern
- N: Northern
- Avail.: availability

- Exceed.: exceedance
- Max.: maximum
- Ave.: average
- Conc.: concentration.

Carbon monoxide

Table 24 **Statistical summary trend (5-year) by station for the carbon monoxide maximum 8-hour rolling average standard (9.0 ppm) (2018 to 2022)**

Region	Station	Year	Data avail. (%)	Exceed. days	Max. 8-hour rolling average (ppm) (9.0 ppm)	Percentiles (ppm)					
						99th	98th	95th	90th	75th	50th
East Sydney	Alexandria	2018	–	–	–	–	–	–	–	–	–
East Sydney	Alexandria	2019	–	–	–	–	–	–	–	–	–
East Sydney	Alexandria	2020	–	–	–	–	–	–	–	–	–
East Sydney	*Alexandria[#]*	*2021*	*19.3*	*0*	*0.2*	*0.2*	*0.1*	*0.0*	*0.0*	*0.0*	*-0.1*
East Sydney	*Alexandria[#]*	*2022*	*65.7*	*0*	*1.0*	*0.9*	*0.8*	*0.5*	*0.4*	*0.1*	*0.0*
East Sydney	*Bradfield Highway[#]*	*2018*	*21.8*	*0*	*0.8*	*0.8*	*0.8*	*0.7*	*0.7*	*0.6*	*0.4*
East Sydney	Bradfield Highway	2019	91.3	0	2.4	1.2	1.0	0.9	0.8	0.6	0.5
East Sydney	Bradfield Highway	2020	89.2	0	2.6	0.9	0.7	0.6	0.5	0.4	0.3
East Sydney	Bradfield Highway	2021	88.7	0	1.1	0.9	0.9	0.7	0.5	0.4	0.3
East Sydney	Bradfield Highway	2022	83.6	0	0.9	0.7	0.7	0.6	0.5	0.4	0.3
East Sydney	Cook and Phillip	2018	–	–	–	–	–	–	–	–	–
East Sydney	*Cook and Phillip[#]*	*2019*	*29.0*	*0*	*1.8*	*1.8*	*1.4*	*0.9*	*0.6*	*0.3*	*0.2*
East Sydney	Cook and Phillip	2020	89.3	0	2.8	0.7	0.6	0.5	0.4	0.3	0.2
East Sydney	Cook and Phillip	2021	91.7	0	0.7	0.6	0.6	0.5	0.4	0.3	0.2
East Sydney	Cook and Phillip	2022	76.9	0	0.4	0.4	0.4	0.3	0.2	0.1	0.1
East Sydney	Macquarie Park	2018	88.7	0	2.5	0.7	0.6	0.5	0.4	0.3	0.2
East Sydney	Macquarie Park	2019	93.1	0	3.5	1.2	1.0	0.6	0.5	0.4	0.3
East Sydney	Macquarie Park	2020	95.1	0	2.4	0.9	0.8	0.6	0.5	0.4	0.3
East Sydney	Macquarie Park	2021	92.9	0	5.1	1.7	0.7	0.6	0.5	0.4	0.3

Region	Station	Year	Data avail. (%)	Exceed. days	Max. 8-hour rolling average (ppm) (9.0 ppm)	Percentiles (ppm)					
						99th	98th	95th	90th	75th	50th
East Sydney	Macquarie Park	2022	94.1	0	0.7	0.6	0.5	0.5	0.4	0.4	0.3
East Sydney	*Rozelle#*	*2018*	*65.0*	*0*	*0.7*	*0.6*	*0.6*	*0.5*	*0.4*	*0.3*	*0.2*
East Sydney	Rozelle	2019	93.9	0	2.2	1.0	0.8	0.7	0.6	0.4	0.3
East Sydney	Rozelle	2020	94.4	0	2.6	1.0	0.8	0.7	0.5	0.4	0.3
East Sydney	Rozelle	2021	94.4	0	1.3	0.8	0.7	0.6	0.5	0.3	0.2
East Sydney	Rozelle	2022	92.8	0	0.8	0.7	0.6	0.5	0.4	0.3	0.2
CW Sydney	Chullora	2018	91.7	0	3.4	1.2	1.0	0.8	0.7	0.5	0.3
CW Sydney	Chullora	2019	94.9	0	1.4	1.1	0.9	0.6	0.5	0.3	0.1
CW Sydney	Chullora	2020	92.5	0	1.9	0.8	0.7	0.6	0.5	0.3	0.2
CW Sydney	Chullora	2021	91.6	0	0.8	0.7	0.7	0.5	0.4	0.2	0.1
CW Sydney	Chullora	2022	77.4	0	0.9	0.7	0.6	0.4	0.3	0.2	0.1
CW Sydney	Lidcombe	2018	–	–	–	–	–	–	–	–	–
CW Sydney	Lidcombe	2019	–	–	–	–	–	–	–	–	–
CW Sydney	*Lidcombe#*	*2020*	*62.7*	*0*	*0.9*	*0.9*	*0.8*	*0.7*	*0.6*	*0.4*	*0.3*
CW Sydney	Lidcombe	2021	93.7	0	0.9	0.7	0.7	0.6	0.5	0.4	0.2
CW Sydney	Lidcombe	2022	94.5	0	0.7	0.6	0.6	0.5	0.4	0.3	0.2
CW Sydney	Parramatta North	2018	92.9	0	1.1	1.0	0.9	0.8	0.7	0.4	0.3
CW Sydney	Parramatta North	2019	94.6	0	3.2	1.2	0.9	0.8	0.7	0.5	0.3
CW Sydney	Parramatta North	2020	94.6	0	2.0	1.1	0.9	0.8	0.7	0.4	0.3
CW Sydney	Parramatta North	2021	95.0	0	0.9	0.9	0.8	0.7	0.6	0.4	0.3
CW Sydney	Parramatta North	2022	93.4	0	0.8	0.8	0.7	0.6	0.6	0.4	0.3
CW Sydney	Prospect	2018	87.2	0	1.1	0.9	0.8	0.6	0.5	0.3	0.1
CW Sydney	Prospect	2019	94.9	0	2.8	1.3	0.9	0.7	0.6	0.3	0.2
CW Sydney	Prospect	2020	94.8	0	1.8	1.0	0.9	0.6	0.5	0.3	0.1

Region	Station	Year	Data avail. (%)	Exceed. days	Max. 8-hour rolling average (ppm) (9.0 ppm)	Percentiles (ppm)					
						99th	98th	95th	90th	75th	50th
CW Sydney	Prospect	2021	93.5	0	1.0	0.8	0.7	0.6	0.4	0.2	0.1
CW Sydney	Prospect	2022	93.6	0	0.9	0.7	0.6	0.5	0.4	0.2	0.1
CW Sydney	Rouse Hill	2018	–	–	–	–	–	–	–	–	–
CW Sydney	*Rouse Hill[#]*	*2019*	*55.2*	*0*	*3.6*	*3.1*	*1.6*	*0.9*	*0.6*	*0.3*	*0.2*
CW Sydney	Rouse Hill	2020	94.6	0	1.9	0.8	0.7	0.6	0.5	0.3	0.2
CW Sydney	Rouse Hill	2021	93.4	0	1.5	0.9	0.6	0.4	0.4	0.3	0.2
CW Sydney	Rouse Hill	2022	94.7	0	0.6	0.5	0.4	0.3	0.3	0.3	0.2
SW Sydney	Camden	2018	90.4	0	0.7	0.5	0.5	0.4	0.3	0.2	0.2
SW Sydney	Camden	2019	92.8	0	2.0	1.5	1.2	0.7	0.4	0.3	0.2
SW Sydney	Camden	2020	94.0	0	2.6	1.1	0.7	0.4	0.3	0.3	0.2
SW Sydney	Camden	2021	94.6	0	1.5	0.5	0.4	0.3	0.3	0.2	0.2
SW Sydney	Camden	2022	94.3	0	0.5	0.5	0.4	0.3	0.3	0.2	0.2
SW Sydney	Campbelltown West	2018	94.0	0	1.5	1.1	0.8	0.6	0.5	0.4	0.3
SW Sydney	Campbelltown West	2019	94.4	0	2.9	1.6	1.2	0.8	0.6	0.4	0.4
SW Sydney	Campbelltown West	2020	94.3	0	2.3	1.0	0.8	0.7	0.5	0.4	0.3
SW Sydney	Campbelltown West	2021	94.6	0	1.9	0.9	0.4	0.3	0.2	0.2	0.1
SW Sydney	Campbelltown West	2022	92.0	0	0.4	0.4	0.3	0.3	0.2	0.0	0.0
SW Sydney	Liverpool	2018	94.3	0	1.9	1.6	1.4	1.2	1.0	0.6	0.4
SW Sydney	Liverpool	2019	93.6	0	1.8	1.4	1.2	1.0	0.8	0.5	0.3
SW Sydney	Liverpool	2020	92.2	0	2.1	1.3	1.2	0.9	0.7	0.5	0.2
SW Sydney	Liverpool	2021	93.4	0	1.2	1.0	0.9	0.7	0.5	0.2	0.1
SW Sydney	Liverpool	2022	88.1	0	1.1	0.8	0.7	0.5	0.4	0.1	-0.1
SW Sydney	Penrith	2018	–	–	–	–	–	–	–	–	–
NW Sydney	Penrith	2019	–	–	–	–	–	–	–	–	–

Region	Station	Year	Data avail. (%)	Exceed. days	Max. 8-hour rolling average (ppm) (9.0 ppm)	Percentiles (ppm)					
						99th	98th	95th	90th	75th	50th
NW Sydney	*Penrith#*	*2020*	*47.1*	*0*	*0.8*	*0.7*	*0.7*	*0.6*	*0.5*	*0.3*	*0.2*
NW Sydney	Penrith	2021	94.7	0	0.8	0.7	0.7	0.6	0.5	0.3	0.2
NW Sydney	Penrith	2022	91.6	0	0.6	0.6	0.6	0.4	0.3	0.2	0.1
Illawarra	Wollongong	2018	93.6	0	0.9	0.8	0.7	0.6	0.5	0.4	0.3
Illawarra	Wollongong	2019	94.0	0	2.3	1.7	0.9	0.6	0.5	0.4	0.3
Illawarra	Wollongong	2020	93.5	0	3.3	1.0	0.8	0.5	0.5	0.4	0.2
Illawarra	Wollongong	2021	93.8	0	0.7	0.6	0.6	0.5	0.4	0.3	0.2
Illawarra	Wollongong	2022	94.3	0	0.7	0.6	0.5	0.4	0.4	0.3	0.2
Central Coast	Wyong	2018	94.6	0	0.9	0.3	0.3	0.3	0.2	0.2	0.2
Central Coast	Wyong	2019	94.4	0	2.4	1.1	0.7	0.4	0.3	0.2	0.2
Central Coast	Wyong	2020	92.6	0	1.7	0.7	0.5	0.4	0.3	0.3	0.2
Central Coast	Wyong	2021	93.8	0	0.4	0.3	0.3	0.3	0.2	0.2	0.1
Central Coast	Wyong	2022	91.0	0	0.3	0.1	0.1	0.1	0.0	0.0	-0.1
Lake Macquarie	Morisset	2018	–	–	–	–	–	–	–	–	–
Lake Macquarie	Morisset	2019	–	–	–	–	–	–	–	–	–
Lake Macquarie	Morisset*	2020	–	–	–	–	–	–	–	–	–
Lake Macquarie	Morisset	2021	91.3	0	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Lake Macquarie	Morisset	2022	94.5	0	0.3	0.2	0.2	0.1	0.1	0.1	0.0
Lower Hunter	Newcastle	2018	92.7	0	1.0	0.9	0.8	0.7	0.6	0.4	0.3
Lower Hunter	Newcastle	2019	92.3	0	1.5	1.1	0.9	0.7	0.6	0.4	0.3
Lower Hunter	Newcastle	2020	92.6	0	2.6	1.1	0.8	0.7	0.5	0.4	0.3
Lower Hunter	Newcastle	2021	93.9	0	0.9	0.8	0.8	0.6	0.5	0.3	0.2
Lower Hunter	Newcastle	2022	94.5	0	0.9	0.8	0.7	0.6	0.4	0.3	0.2
Upper Hunter	Merriwa	2018	–	–	–	–	–	–	–	–	–

Region	Station	Year	Data avail. (%)	Exceed. days	Max. 8-hour rolling average (ppm) (9.0 ppm)	Percentiles (ppm)					
						99th	98th	95th	90th	75th	50th
Upper Hunter	Merriwa	2019	–	–	–	–	–	–	–	–	–
Upper Hunter	*Merriwa#*	*2020*	*39.9*	*0*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.0*	*0.0*
Upper Hunter	Merriwa	2021	88.6	0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Upper Hunter	Merriwa	2022	90.8	0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Mid North Coast	Coffs Harbour	2018	–	–	–	–	–	–	–	–	–
Mid North Coast	Coffs Harbour*†	2019	–	–	–	–	–	–	–	–	–
Mid North Coast	Coffs Harbour	2020	94.8	0	0.8	0.5	0.5	0.4	0.3	0.3	0.2
Mid North Coast	Coffs Harbour	2021	88.5	0	0.7	0.4	0.3	0.3	0.3	0.2	0.2
Mid North Coast	Coffs Harbour	2022	93.4	0	0.3	0.3	0.3	0.2	0.2	0.2	0.2
Mid North Coast	Port Macquarie#†	2018	–	–	–	–	–	–	–	–	–
Mid North Coast	*Port Macquarie#*	*2019*	*41.7*	***2***	***9.6***	*4.0*	*2.6*	*1.3*	*0.7*	*0.3*	*0.1*
Mid North Coast	Port Macquarie	2020	82.8	0	2.3	0.8	0.5	0.4	0.3	0.3	0.2
Mid North Coast	Port Macquarie	2021	93.3	0	0.5	0.4	0.4	0.3	0.2	0.2	0.1
Mid North Coast	Port Macquarie	2022	95.4	0	0.3	0.3	0.3	0.2	0.2	0.1	0.1

Nitrogen dioxide

Table 25 **Statistical summary trend (5-year) by station for the nitrogen dioxide maximum 1-hour rolling average AAQ NEPM standard (0.080 ppm) and annual average AAQ NEPM standard (0.015 ppm) from 2018 to 2022**

Region	Station	Year	Data avail. (%)	Exceed. days	Max. 1-hour ave. (ppm) (0.080 ppm)	Percentiles (ppm)						Annual mean (ppm) (0.015 ppm)
						99th	98th	95th	90th	75th	50th	
East Sydney	Alexandria	2018	–	–	–	–	–	–	–	–	–	–
East Sydney	Alexandria	2019	–	–	–	–	–	–	–	–	–	–
East Sydney	Alexandria	2020	–	–	–	–	–	–	–	–	–	–
East Sydney	*Alexandria*[#]	*2021*	*22.0*	*0*	*0.035*	*0.035*	*0.035*	*0.029*	*0.026*	*0.020*	*0.016*	*0.007*
East Sydney	Alexandria	2022	89.4	0	0.042	0.038	0.034	0.031	0.029	0.024	0.019	0.009
East Sydney	*Bradfield Hwy*[#†]	*2018*	*21.8*	***1***	***0.086***	***0.081***	*0.064*	*0.060*	*0.056*	*0.051*	*0.044*	*0.023*
East Sydney	Bradfield Hwy[†]	2019	88.1	**9**	**0.153**	**0.102**	**0.086**	0.066	0.059	0.051	0.043	**0.025**
East Sydney	Bradfield Hwy	2020	90.8	0	0.068	0.061	0.056	0.052	0.047	0.042	0.037	**0.022**
East Sydney	Bradfield Hwy	2021	94.4	0	0.065	0.061	0.058	0.050	0.045	0.039	0.033	**0.019**
East Sydney	Bradfield Hwy	2022	83.5	0	0.066	0.053	0.050	0.047	0.044	0.038	0.031	**0.018**
East Sydney	Cook and Phillip	2018	–	–	–	–	–	–	–	–	–	–
East Sydney	*Cook and Phillip*[#†]	*2019*	*29.7*	***1***	***0.110***	***0.088***	*0.065*	*0.047*	*0.039*	*0.029*	*0.024*	*0.012*
East Sydney	Cook and Phillip	2020	88.1	0	0.046	0.044	0.041	0.035	0.033	0.028	0.023	0.013
East Sydney	Cook and Phillip	2021	88.8	0	0.047	0.038	0.036	0.035	0.033	0.027	0.022	0.012
East Sydney	Cook and Phillip	2022	93.7	0	0.040	0.037	0.035	0.032	0.031	0.026	0.021	0.011
East Sydney	Earlwood	2018	94.3	0	0.050	0.042	0.037	0.035	0.033	0.028	0.021	0.010
East Sydney	Earlwood	2019	93.3	0	0.061	0.040	0.038	0.035	0.032	0.027	0.022	0.010
East Sydney	Earlwood	2020	93.0	0	0.040	0.036	0.035	0.030	0.027	0.024	0.019	0.009

Region	Station	Year	Data avail. (%)	Exceed. days	Max. 1-hour ave. (ppm) (0.080 ppm)	Percentiles (ppm)						Annual mean (ppm) (0.015 ppm)
						99th	98th	95th	90th	75th	50th	
East Sydney	Earlwood	2021	93.3	0	0.039	0.033	0.031	0.028	0.026	0.023	0.018	0.009
East Sydney	Earlwood	2022	92.9	0	0.033	0.030	0.029	0.027	0.026	0.022	0.017	0.008
East Sydney	Macquarie Park	2018	93.4	0	0.030	0.028	0.026	0.024	0.022	0.018	0.013	0.006
East Sydney	Macquarie Park	2019	93.1	0	0.026	0.024	0.024	0.022	0.019	0.017	0.013	0.005
East Sydney	Macquarie Park	2020	94.9	0	0.030	0.026	0.023	0.020	0.018	0.015	0.011	0.004
East Sydney	Macquarie Park	2021	93.4	0	0.073	0.023	0.021	0.018	0.016	0.012	0.010	0.004
East Sydney	Macquarie Park	2022	93.9	0	0.023	0.022	0.021	0.018	0.016	0.013	0.009	0.003
East Sydney	Randwick	2018	92.5	0	0.040	0.037	0.034	0.032	0.030	0.025	0.017	0.007
East Sydney	Randwick	2019	93.7	0	0.051	0.034	0.033	0.031	0.028	0.024	0.019	0.007
East Sydney	Randwick	2020	93.9	0	0.037	0.031	0.028	0.025	0.023	0.021	0.015	0.005
East Sydney	Randwick	2021	92.7	0	0.029	0.027	0.026	0.025	0.023	0.020	0.015	0.005
East Sydney	Randwick	2022	92.9	0	0.032	0.030	0.029	0.027	0.026	0.023	0.016	0.006
East Sydney	*Rozelle*[#]	*2018*	*67.7*	*0*	*0.057*	*0.045*	*0.039*	*0.036*	*0.034*	*0.028*	*0.022*	*0.010*
East Sydney	Rozelle[†]	2019	93.7	**1**	**0.090**	0.044	0.040	0.036	0.033	0.027	0.021	0.010
East Sydney	Rozelle	2020	94.8	0	0.043	0.037	0.035	0.032	0.029	0.024	0.018	0.008
East Sydney	Rozelle	2021	92.5	0	0.035	0.031	0.030	0.029	0.027	0.022	0.016	0.007
East Sydney	Rozelle	2022	92.8	0	0.031	0.029	0.028	0.026	0.024	0.020	0.014	0.006
CW Sydney	Chullora	2018	94.7	0	0.057	0.044	0.041	0.039	0.035	0.030	0.023	0.012
CW Sydney	Chullora	2019	94.9	0	0.070	0.052	0.045	0.038	0.035	0.029	0.024	0.012
CW Sydney	Chullora	2020	93.9	0	0.052	0.047	0.039	0.035	0.032	0.026	0.021	0.009
CW Sydney	Chullora	2021	94.1	0	0.056	0.041	0.038	0.035	0.031	0.026	0.020	0.009
CW Sydney	Chullora	2022	77.1	0	0.045	0.039	0.034	0.032	0.028	0.025	0.020	0.010

Region	Station	Year	Data avail. (%)	Exceed. days	Max. 1-hour ave. (ppm) (0.080 ppm)	Percentiles (ppm)						Annual mean (ppm) (0.015 ppm)
						99th	98th	95th	90th	75th	50th	
CW Sydney	Lidcombe	2018	–	–	–	–	–	–	–	–	–	–
CW Sydney	Lidcombe	2019	–	–	–	–	–	–	–	–	–	–
CW Sydney	*Lidcombe[#]*	*2020*	*71.0*	*0*	*0.050*	*0.047*	*0.041*	*0.038*	*0.033*	*0.027*	*0.022*	*0.010*
CW Sydney	Lidcombe	2021	94.9	0	0.050	0.045	0.040	0.035	0.031	0.025	0.020	0.009
CW Sydney	Lidcombe	2022	94.5	0	0.040	0.037	0.035	0.032	0.030	0.025	0.020	0.010
CW Sydney	Parramatta Nth	2018	92.7	0	0.064	0.051	0.043	0.038	0.034	0.030	0.023	0.011
CW Sydney	Parramatta Nth	2019	92.2	0	0.070	0.048	0.043	0.037	0.033	0.028	0.023	0.010
CW Sydney	Parramatta Nth	2020	94.1	0	0.037	0.036	0.034	0.029	0.026	0.023	0.018	0.007
CW Sydney	Parramatta Nth	2021	94.7	0	0.047	0.033	0.030	0.028	0.025	0.022	0.018	0.007
CW Sydney	Parramatta Nth	2022	92.1	0	0.034	0.030	0.029	0.027	0.025	0.020	0.016	0.007
CW Sydney	Prospect	2018	87.2	0	0.051	0.043	0.040	0.037	0.035	0.028	0.020	0.009
CW Sydney	Prospect	2019	94.5	0	0.049	0.039	0.037	0.035	0.032	0.027	0.021	0.009
CW Sydney	Prospect	2020	94.5	0	0.043	0.039	0.036	0.032	0.029	0.024	0.018	0.007
CW Sydney	Prospect	2021	93.0	0	0.043	0.037	0.035	0.033	0.028	0.023	0.018	0.007
CW Sydney	Prospect	2022	94.1	0	0.042	0.031	0.030	0.028	0.026	0.021	0.016	0.006
CW Sydney	Rouse Hill	2018	–	–	–	–	–	–	–	–	–	–
CW Sydney	*Rouse Hill[#]*	*2019*	*56.1*	*0*	*0.050*	*0.036*	*0.035*	*0.030*	*0.028*	*0.023*	*0.015*	*0.006*
CW Sydney	Rouse Hill	2020	95.0	0	0.034	0.032	0.031	0.026	0.023	0.017	0.012	0.005
CW Sydney	Rouse Hill	2021	95.0	0	0.034	0.030	0.029	0.026	0.021	0.017	0.012	0.005
CW Sydney	Rouse Hill	2022	94.4	0	0.033	0.027	0.026	0.024	0.021	0.016	0.012	0.005
SW Sydney	Bargo	2018	94.2	0	0.048	0.041	0.038	0.034	0.031	0.025	0.017	0.006
SW Sydney	Bargo	2019	93.8	0	0.066	0.056	0.049	0.036	0.030	0.024	0.017	0.006

Region	Station	Year	Data avail. (%)	Exceed. days	Max. 1-hour ave. (ppm) (0.080 ppm)	Percentiles (ppm)						Annual mean (ppm) (0.015 ppm)
						99th	98th	95th	90th	75th	50th	
SW Sydney	Bargo	2020	93.9	0	0.045	0.039	0.034	0.030	0.026	0.021	0.015	0.005
SW Sydney	Bargo	2021	89.8	0	0.053	0.033	0.028	0.025	0.023	0.017	0.012	0.004
SW Sydney	Bargo	2022	85.1	0	0.034	0.026	0.024	0.021	0.019	0.014	0.010	0.002
SW Sydney	Bringelly	2018	94.6	0	0.036	0.030	0.025	0.023	0.020	0.016	0.012	0.006
SW Sydney	Bringelly	2019	93.5	0	0.034	0.028	0.024	0.022	0.019	0.015	0.012	0.005
SW Sydney	Bringelly	2020	83.0	0	0.030	0.022	0.020	0.018	0.015	0.012	0.008	0.003
SW Sydney	Bringelly	2021	92.8	0	0.024	0.022	0.021	0.018	0.015	0.012	0.008	0.003
SW Sydney	Bringelly	2022	92.4	0	0.022	0.018	0.017	0.015	0.013	0.010	0.006	0.003
SW Sydney	Camden	2018	90.7	0	0.029	0.026	0.025	0.021	0.020	0.016	0.012	0.005
SW Sydney	Camden	2019	93.1	0	0.030	0.026	0.024	0.020	0.018	0.015	0.011	0.005
SW Sydney	Camden	2020	93.9	0	0.037	0.026	0.020	0.017	0.015	0.012	0.008	0.004
SW Sydney	Camden	2021	94.6	0	0.026	0.022	0.020	0.016	0.013	0.010	0.008	0.004
SW Sydney	Camden	2022	94.3	0	0.022	0.016	0.016	0.014	0.012	0.009	0.006	0.003
SW Sydney	Campbelltown W	2018	94.1	0	0.054	0.051	0.044	0.040	0.037	0.031	0.023	0.011
SW Sydney	Campbelltown W	2019	94.1	0	0.059	0.049	0.047	0.040	0.036	0.030	0.025	0.011
SW Sydney	Campbelltown W	2020	93.8	0	0.051	0.041	0.039	0.036	0.033	0.027	0.022	0.009
SW Sydney	Campbelltown W	2021	94.6	0	0.055	0.041	0.037	0.033	0.030	0.025	0.020	0.008
SW Sydney	Campbelltown W	2022	92.2	0	0.042	0.035	0.033	0.030	0.027	0.023	0.018	0.007
SW Sydney	Liverpool	2018	94.1	0	0.062	0.046	0.044	0.041	0.037	0.032	0.025	0.012
SW Sydney	Liverpool	2019	94.6	0	0.050	0.048	0.042	0.037	0.035	0.031	0.025	0.012
SW Sydney	Liverpool	2020	91.3	0	0.048	0.038	0.037	0.035	0.033	0.027	0.023	0.011
SW Sydney	Liverpool	2021	94.9	0	0.042	0.037	0.035	0.032	0.030	0.026	0.021	0.010
SW Sydney	Liverpool	2022	94.6	0	0.036	0.032	0.030	0.029	0.026	0.022	0.017	0.008

Region	Station	Year	Data avail. (%)	Exceed. days	Max. 1-hour ave. (ppm) (0.080 ppm)	Percentiles (ppm)						Annual mean (ppm) (0.015 ppm)
						99th	98th	95th	90th	75th	50th	
SW Sydney	Oakdale	2018	94.3	0	0.029	0.015	0.014	0.011	0.009	0.006	0.004	0.002
SW Sydney	Oakdale	2019	92.6	0	0.028	0.023	0.021	0.015	0.011	0.007	0.004	0.002
SW Sydney	Oakdale	2020	94.8	0	0.055	0.020	0.013	0.009	0.008	0.005	0.003	0.001
SW Sydney	Oakdale	2021	94.0	0	0.068	0.014	0.011	0.008	0.006	0.004	0.002	0.001
SW Sydney	Oakdale	2022	93.7	0	0.012	0.010	0.009	0.008	0.006	0.004	0.002	0.001
NW Sydney	Penrith	2018	–	–	–	–	–	–	–	–	–	–
NW Sydney	Penrith	2019	–	–	–	–	–	–	–	–	–	–
NW Sydney	*Penrith[#]*	*2020*	*46.7*	*0*	*0.032*	*0.030*	*0.026*	*0.025*	*0.022*	*0.018*	*0.013*	*0.005*
NW Sydney	Penrith	2021	94.4	0	0.030	0.025	0.023	0.021	0.020	0.016	0.012	0.005
NW Sydney	Penrith	2022	93.2	0	0.028	0.026	0.025	0.023	0.020	0.016	0.012	0.005
NW Sydney	Richmond	2018	92.4	0	0.030	0.027	0.026	0.023	0.020	0.016	0.011	0.005
NW Sydney	Richmond	2019	94.1	0	0.030	0.025	0.023	0.022	0.019	0.014	0.010	0.005
NW Sydney	Richmond	2020	93.1	0	0.035	0.025	0.021	0.017	0.015	0.012	0.007	0.003
NW Sydney	Richmond	2021	93.7	0	0.029	0.019	0.017	0.015	0.013	0.009	0.006	0.002
NW Sydney	Richmond	2022	92.1	0	0.018	0.016	0.015	0.013	0.011	0.008	0.005	0.001
NW Sydney	St Marys	2018	93.4	0	0.037	0.031	0.030	0.028	0.024	0.018	0.012	0.005
NW Sydney	St Marys	2019	93.9	0	0.033	0.029	0.027	0.024	0.021	0.016	0.011	0.004
NW Sydney	St Marys	2020	94.2	0	0.034	0.030	0.025	0.020	0.018	0.015	0.011	0.004
NW Sydney	St Marys	2021	93.2	0	0.033	0.024	0.023	0.021	0.018	0.014	0.011	0.004
NW Sydney	St Marys	2022	93.5	0	0.030	0.025	0.022	0.019	0.017	0.014	0.010	0.004
Illawarra	Albion Park Sth	2018	94.7	0	0.039	0.035	0.032	0.026	0.022	0.016	0.010	0.004
Illawarra	Albion Park Sth	2019	94.7	0	0.041	0.031	0.029	0.025	0.022	0.016	0.010	0.004

Region	Station	Year	Data avail. (%)	Exceed. days	Max. 1-hour ave. (ppm) (0.080 ppm)	Percentiles (ppm)						Annual mean (ppm) (0.015 ppm)
						99th	98th	95th	90th	75th	50th	
Illawarra	Albion Park Sth	2020	94.8	0	0.039	0.030	0.027	0.023	0.018	0.013	0.008	0.003
Illawarra	Albion Park Sth	2021	93.9	0	0.032	0.027	0.023	0.018	0.015	0.012	0.007	0.002
Illawarra	Albion Park Sth	2022	94.5	0	0.031	0.024	0.023	0.021	0.018	0.013	0.008	0.003
Illawarra	Kembla Grange	2018	91.6	0	0.037	0.033	0.031	0.027	0.023	0.017	0.012	0.005
Illawarra	Kembla Grange	2019	93.5	0	0.042	0.029	0.028	0.025	0.022	0.017	0.013	0.005
Illawarra	Kembla Grange	2020	92.1	0	0.038	0.030	0.028	0.023	0.020	0.015	0.010	0.004
Illawarra	Kembla Grange	2021	93.0	0	0.028	0.024	0.022	0.020	0.018	0.013	0.008	0.003
Illawarra	Kembla Grange	2022	90.0	0	0.027	0.023	0.021	0.018	0.015	0.011	0.007	0.002
Illawarra	Wollongong	2018	93.2	0	0.043	0.036	0.035	0.033	0.030	0.025	0.017	0.007
Illawarra	Wollongong	2019	93.1	0	0.040	0.038	0.036	0.032	0.029	0.022	0.017	0.006
Illawarra	Wollongong	2020	92.8	0	0.041	0.036	0.035	0.032	0.029	0.023	0.017	0.006
Illawarra	Wollongong	2021	94.1	0	0.042	0.032	0.031	0.028	0.024	0.020	0.014	0.005
Illawarra	Wollongong	2022	93.7	0	0.029	0.027	0.026	0.025	0.023	0.019	0.013	0.004
C Coast	Wyong	2018	93.6	0	0.035	0.028	0.026	0.024	0.021	0.017	0.011	0.004
C Coast	Wyong	2019	94.0	0	0.036	0.030	0.027	0.023	0.020	0.016	0.012	0.004
C Coast	Wyong	2020	93.3	0	0.035	0.026	0.025	0.022	0.019	0.015	0.011	0.003
C Coast	Wyong	2021	93.1	0	0.028	0.023	0.021	0.020	0.018	0.014	0.010	0.003
C Coast	Wyong	2022	88.7	0	0.031	0.021	0.019	0.017	0.016	0.013	0.009	0.002
Lake Macq.	Morisset	2018	–	–	–	–	–	–	–	–	–	–
Lake Macq.	Morisset	2019	–	–	–	–	–	–	–	–	–	–
Lake Macq.	Morisset*	2020	–	–	–	–	–	–	–	–	–	–
Lake Macq.	Morisset	2021	93.4	0	0.026	0.024	0.022	0.017	0.015	0.012	0.008	0.003

Region	Station	Year	Data avail. (%)	Exceed. days	Max. 1-hour ave. (ppm) (0.080 ppm)	Percentiles (ppm)						Annual mean (ppm) (0.015 ppm)
						99th	98th	95th	90th	75th	50th	
Lake Macq.	Morisset	2022	94.2	0	0.025	0.022	0.019	0.015	0.013	0.009	0.007	0.002
L Hunter	Beresfield	2018	92.7	0	0.040	0.037	0.034	0.032	0.029	0.024	0.018	0.009
L Hunter	Beresfield	2019	89.9	0	0.056	0.038	0.032	0.029	0.026	0.023	0.018	0.008
L Hunter	Beresfield	2020	91.2	0	0.035	0.031	0.030	0.026	0.025	0.020	0.016	0.007
L Hunter	Beresfield	2021	94.1	0	0.034	0.031	0.028	0.026	0.023	0.020	0.016	0.006
L Hunter	Beresfield	2022	91.8	0	0.029	0.028	0.027	0.025	0.023	0.019	0.015	0.006
L Hunter	Newcastle	2018	94.3	0	0.045	0.037	0.035	0.032	0.029	0.023	0.015	0.007
L Hunter	Newcastle	2019	94.5	0	0.044	0.039	0.036	0.033	0.031	0.026	0.018	0.008
L Hunter	Newcastle	2020	92.1	0	0.034	0.031	0.030	0.028	0.025	0.021	0.015	0.005
L Hunter	Newcastle	2021	92.6	0	0.035	0.030	0.029	0.027	0.025	0.021	0.014	0.005
L Hunter	Newcastle	2022	92.1	0	0.038	0.029	0.027	0.024	0.022	0.017	0.011	0.004
L Hunter	Wallsend	2018	93.7	0	0.035	0.033	0.032	0.028	0.026	0.020	0.015	0.007
L Hunter	Wallsend	2019	92.6	0	0.042	0.035	0.032	0.029	0.026	0.020	0.015	0.007
L Hunter	Wallsend	2020	94.6	0	0.029	0.027	0.027	0.024	0.023	0.018	0.013	0.006
L Hunter	Wallsend	2021	94.8	0	0.033	0.026	0.025	0.024	0.021	0.017	0.012	0.005
L Hunter	Wallsend	2022	93.7	0	0.028	0.025	0.023	0.021	0.020	0.016	0.011	0.005
U Hunter	Merriwa	2018	–	–	–	–	–	–	–	–	–	–
U Hunter	Merriwa	2019	–	–	–	–	–	–	–	–	–	–
U Hunter	*Merriwa*[#]	*2020*	*39.9*	*0*	*0.034*	*0.034*	*0.027*	*0.025*	*0.019*	*0.016*	*0.010*	*0.003*
U Hunter	Merriwa	2021	88.8	0	0.032	0.029	0.026	0.023	0.019	0.014	0.008	0.003
U Hunter	Merriwa	2022	90.2	0	0.028	0.025	0.023	0.019	0.017	0.014	0.009	0.003
U Hunter	Muswellbrook	2018	94.3	0	0.047	0.040	0.038	0.035	0.033	0.028	0.023	0.010

Region	Station	Year	Data avail. (%)	Exceed. days	Max. 1-hour ave. (ppm) (0.080 ppm)	Percentiles (ppm)						Annual mean (ppm) (0.015 ppm)
						99th	98th	95th	90th	75th	50th	
U Hunter	Muswellbrook	2019	93.5	0	0.058	0.043	0.039	0.036	0.033	0.028	0.023	0.010
U Hunter	Muswellbrook	2020	89.3	0	0.039	0.035	0.032	0.029	0.027	0.023	0.019	0.008
U Hunter	Muswellbrook	2021	92.3	0	0.032	0.031	0.029	0.027	0.025	0.022	0.018	0.008
U Hunter	Muswellbrook	2022	81.1	0	0.030	0.027	0.026	0.025	0.023	0.020	0.017	0.007
U Hunter	Singleton	2018	93.7	0	0.035	0.034	0.032	0.028	0.026	0.023	0.018	0.008
U Hunter	Singleton	2019	93.8	0	0.037	0.034	0.032	0.028	0.026	0.022	0.018	0.007
U Hunter	Singleton	2020	92.1	0	0.033	0.031	0.028	0.026	0.023	0.019	0.015	0.006
U Hunter	Singleton	2021	91.3	0	0.032	0.030	0.028	0.024	0.022	0.019	0.015	0.005
U Hunter	Singleton	2022	90.6	0	0.027	0.024	0.023	0.021	0.020	0.017	0.013	0.004
NW Slopes	Gunnedah	2018	78.3	0	0.034	0.031	0.029	0.026	0.025	0.019	0.013	0.005
NW Slopes	Gunnedah	2019	94.6	0	0.036	0.029	0.027	0.025	0.023	0.018	0.013	0.005
NW Slopes	Gunnedah	2020	94.4	0	0.028	0.025	0.024	0.022	0.019	0.015	0.010	0.003
NW Slopes	Gunnedah	2021	95.2	0	0.051	0.023	0.022	0.020	0.018	0.014	0.009	0.003
NW Slopes	Gunnedah	2022	92.0	0	0.026	0.024	0.021	0.018	0.015	0.011	0.007	0.002
Mid Nth Coast	Coffs Harbour	2018	–	–	–	–	–	–	–	–	–	–
Mid Nth Coast	Coffs Harbour*	2019	–	–	–	–	–	–	–	–	–	–
Mid Nth Coast	Coffs Harbour	2020	94.8	0	0.042	0.027	0.025	0.021	0.018	0.012	0.008	0.003
Mid Nth Coast	Coffs Harbour	2021	92.9	0	0.049	0.024	0.021	0.019	0.017	0.013	0.009	0.003
Mid Nth Coast	Coffs Harbour	2022	91.0	0	0.025	0.017	0.014	0.010	0.008	0.004	0.002	0.003
Mid Nth Coast	Port Macquarie	2018	–	–	–	–	–	–	–	–	–	–
Mid Nth Coast	*Port Macquarie#*	*2019*	*41.7*	*0*	*0.038*	*0.023*	*0.018*	*0.012*	*0.008*	*0.005*	*0.003*	*0.004*
Mid Nth Coast	Port Macquarie	2020	94.3	0	0.034	0.033	0.031	0.025	0.021	0.011	0.007	0.003

Region	Station	Year	Data avail. (%)	Exceed. days	Max. 1-hour ave. (ppm) (0.080 ppm)	Percentiles (ppm)						Annual mean (ppm) (0.015 ppm)
						99th	98th	95th	90th	75th	50th	
Mid Nth Coast	Port Macquarie	2021	94.6	0	0.030	0.026	0.024	0.020	0.017	0.012	0.008	0.003
Mid Nth Coast	Port Macquarie	2022	97.1	0	0.031	0.018	0.017	0.014	0.013	0.010	0.007	0.002
S Tablelands	Goulburn	2018	–	–	–	–	–	–	–	–	–	–
S Tablelands	*Goulburn*[#†]	*2019*	*13.8*	***2***	***0.161***	***0.161***	***0.142***	*0.027*	*0.021*	*0.015*	*0.008*	*0.004*
S Tablelands	Goulburn[†]	2020	93.1	**2**	**0.099**	0.030	0.028	0.025	0.021	0.014	0.009	0.003
S Tablelands	Goulburn	2021	93.4	0	0.029	0.026	0.024	0.021	0.019	0.013	0.008	0.003
S Tablelands	Goulburn	2022	87.6	0	0.027	0.025	0.023	0.019	0.015	0.009	0.005	0.002

Sulfur dioxide

Table 26 **Statistical summary trend (5-year) by station for the sulfur dioxide maximum 1-hour average AAQ NEPM standard (0.100 ppm) and 24-hour average AAQ NEPM standard (0.020 ppm) from 2018 to 2022**

Region	Station	Averaging period	Year	Data avail. (%)	Exceed. days	Max. conc. (ppm) 1-hour (0.100 ppm), 24-hour (0.020 ppm)	Percentiles (ppm)					
							99th	98th	95th	90th	75th	50th
East Sydney	Alexandria	1-hour	2018	–	–	–	–	–	–	–	–	–
East Sydney	Alexandria	1-hour	2019	–	–	–	–	–	–	–	–	–
East Sydney	Alexandria	1-hour	2020	–	–	–	–	–	–	–	–	–
East Sydney	*Alexandria*[#]	*1-hour*	*2021*	*22.4*	*0*	*0.011*	*0.011*	*0.008*	*0.006*	*0.004*	*0.002*	*0.001*
East Sydney	Alexandria	1-hour	2022	92.1	0	0.017	0.009	0.007	0.005	0.003	0.001	0.001
East Sydney	Alexandria	24-hour	2018	–	–	–	–	–	–	–	–	–

Region	Station	Averaging period	Year	Data avail. (%)	Exceed. days	Max. conc. (ppm) 1-hour (0.100 ppm), 24-hour (0.020 ppm)	Percentiles (ppm)					
							99th	98th	95th	90th	75th	50th
East Sydney	Alexandria	24-hour	2019	–	–	–	–	–	–	–	–	–
East Sydney	Alexandria	24-hour	2020	–	–	–	–	–	–	–	–	–
East Sydney	*Alexandria#*	*24-hour*	*2021*	*23.3*	*0*	*0.002*	*0.002*	*0.002*	*0.001*	*0.001*	*0.000*	*0.000*
East Sydney	Alexandria	24-hour	2022	95.9	0	0.003	0.002	0.002	0.001	0.001	0.000	0.000
East Sydney	*Bradfield Hwy#*	*1-hour*	*2018*	*21.2*	*0*	*0.018*	*0.018*	*0.015*	*0.009*	*0.007*	*0.004*	*0.003*
East Sydney	*Bradfield Hwy#*	*1-hour*	*2019*	*73.0*	*0*	*0.023*	*0.014*	*0.013*	*0.009*	*0.007*	*0.004*	*0.003*
East Sydney	Bradfield Hwy	1-hour	2020	86.6	0	0.012	0.009	0.007	0.004	0.003	0.002	0.002
East Sydney	Bradfield Hwy	1-hour	2021	93.0	0	0.015	0.012	0.011	0.007	0.005	0.003	0.002
East Sydney	Bradfield Hwy	1-hour	2022	83.3	0	0.019	0.012	0.008	0.006	0.004	0.003	0.002
East Sydney	*Bradfield Hwy#*	*24-hour*	*2018*	*21.9*	*0*	*0.004*	*0.004*	*0.004*	*0.003*	*0.002*	*0.002*	*0.001*
East Sydney	Bradfield Hwy	24-hour	2019	76.2	0	0.006	0.005	0.004	0.003	0.002	0.002	0.001
East Sydney	Bradfield Hwy	24-hour	2020	90.2	0	0.003	0.003	0.002	0.002	0.001	0.001	0.001
East Sydney	Bradfield Hwy	24-hour	2021	96.2	0	0.003	0.003	0.003	0.002	0.002	0.001	0.001
East Sydney	Bradfield Hwy	24-hour	2022	86.6	0	0.004	0.003	0.002	0.002	0.002	0.001	0.001
East Sydney	Cook and Phillip	1-hour	2018	–	–	–	–	–	–	–	–	–
East Sydney	*Cook and Phillip#*	*1-hour*	*2019*	*30.0*	*0*	*0.018*	*0.016*	*0.013*	*0.011*	*0.007*	*0.004*	*0.002*
East Sydney	Cook and Phillip	1-hour	2020	86.2	0	0.019	0.013	0.01	0.006	0.004	0.002	0.001
East Sydney	Cook and Phillip	1-hour	2021	91.5	0	0.016	0.013	0.012	0.007	0.005	0.002	0.001
East Sydney	Cook and Phillip	1-hour	2022	92.4	0	0.013	0.010	0.009	0.005	0.004	0.001	0.001
East Sydney	Cook and Phillip	24-hour	2018	–	–	–	–	–	–	–	–	–
East Sydney	*Cook and Phillip#*	*24-hour*	*2019*	*31.0*	*0*	*0.003*	*0.003*	*0.002*	*0.002*	*0.001*	*0.001*	*0.001*
East Sydney	Cook and Phillip	24-hour	2020	89.1	0	0.003	0.003	0.002	0.001	0.001	0.001	0.000

Region	Station	Averaging period	Year	Data avail. (%)	Exceed. days	Max. conc. (ppm) 1-hour (0.100 ppm), 24-hour (0.020 ppm)	Percentiles (ppm)					
							99th	98th	95th	90th	75th	50th
East Sydney	Cook and Phillip	24-hour	2021	97.3	0	0.003	0.003	0.002	0.002	0.001	0.001	0.000
East Sydney	Cook and Phillip	24-hour	2022	95.9	0	0.004	0.002	0.002	0.001	0.001	0.000	0.000
East Sydney	Macquarie Park	1-hour	2018	93.9	0	0.044	0.018	0.014	0.009	0.006	0.003	0.001
East Sydney	Macquarie Park	1-hour	2019	92.1	0	0.029	0.019	0.015	0.009	0.007	0.003	0.001
East Sydney	Macquarie Park	1-hour	2020	95.1	0	0.035	0.020	0.016	0.010	0.006	0.002	0.001
East Sydney	Macquarie Park	1-hour	2021	93.5	0	0.034	0.016	0.012	0.008	0.005	0.002	0.001
East Sydney	Macquarie Park	1-hour	2022	92.4	0	0.031	0.013	0.012	0.007	0.004	0.001	0.001
East Sydney	Macquarie Park	24-hour	2018	97.8	0	0.007	0.003	0.003	0.002	0.002	0.001	0.000
East Sydney	Macquarie Park	24-hour	2019	95.3	0	0.004	0.003	0.003	0.002	0.001	0.001	0.000
East Sydney	Macquarie Park	24-hour	2020	99.2	0	0.004	0.003	0.002	0.002	0.001	0.000	0.000
East Sydney	Macquarie Park	24-hour	2021	97.3	0	0.006	0.003	0.002	0.002	0.001	0.000	0.000
East Sydney	Macquarie Park	24-hour	2022	96.2	0	0.003	0.003	0.002	0.001	0.001	0.000	0.000
East Sydney	Randwick	1-hour	2018	93.3	0	0.021	0.019	0.017	0.011	0.009	0.006	0.003
East Sydney	Randwick	1-hour	2019	93.0	0	0.029	0.022	0.015	0.013	0.008	0.005	0.003
East Sydney	Randwick	1-hour	2020	94.9	0	0.014	0.011	0.010	0.007	0.005	0.003	0.002
East Sydney	Randwick	1-hour	2021	92.6	0	0.022	0.015	0.013	0.009	0.007	0.004	0.002
East Sydney	Randwick	1-hour	2022	92.8	0	0.028	0.016	0.012	0.008	0.006	0.003	0.002
East Sydney	Randwick	24-hour	2018	96.2	0	0.004	0.004	0.003	0.003	0.002	0.001	0.001
East Sydney	Randwick	24-hour	2019	96.2	0	0.005	0.004	0.003	0.002	0.002	0.001	0.001
East Sydney	Randwick	24-hour	2020	98.9	0	0.004	0.003	0.003	0.002	0.002	0.001	0.001
East Sydney	Randwick	24-hour	2021	95.9	0	0.005	0.003	0.003	0.002	0.002	0.001	0.001
East Sydney	Randwick	24-hour	2022	96.2	0	0.004	0.004	0.003	0.002	0.002	0.001	0.001

Region	Station	Averaging period	Year	Data avail. (%)	Exceed. days	Max. conc. (ppm) 1-hour (0.100 ppm), 24-hour (0.020 ppm)	Percentiles (ppm)					
							99th	98th	95th	90th	75th	50th
East Sydney	*Rozelle#*	*1-hour*	*2018*	*67.0*	*0*	*0.030*	*0.023*	*0.019*	*0.014*	*0.008*	*0.004*	*0.002*
East Sydney	Rozelle	1-hour	2019	94.0	0	0.032	0.016	0.015	0.011	0.008	0.004	0.002
East Sydney	Rozelle	1-hour	2020	94.8	0	0.016	0.009	0.009	0.007	0.005	0.002	0.001
East Sydney	Rozelle	1-hour	2021	90.9	0	0.020	0.012	0.010	0.007	0.005	0.002	0.001
East Sydney	Rozelle	1-hour	2022	93.0	0	0.029	0.012	0.010	0.007	0.005	0.001	0.001
East Sydney	*Rozelle#*	*24-hour*	*2018*	*69.9*	*0*	*0.005*	*0.004*	*0.003*	*0.003*	*0.002*	*0.001*	*0.001*
East Sydney	Rozelle	24-hour	2019	97.5	0	0.005	0.004	0.004	0.003	0.002	0.001	0.001
East Sydney	Rozelle	24-hour	2020	98.6	0	0.003	0.002	0.002	0.002	0.001	0.001	0.000
East Sydney	Rozelle	24-hour	2021	94.2	0	0.004	0.003	0.003	0.002	0.001	0.001	0.000
East Sydney	Rozelle	24-hour	2022	95.3	0	0.004	0.003	0.003	0.002	0.001	0.000	0.000
CW Sydney	Chullora	1-hour	2018	95.0	0	0.021	0.012	0.010	0.007	0.006	0.003	0.002
CW Sydney	Chullora	1-hour	2019	93.4	0	0.026	0.016	0.012	0.009	0.006	0.003	0.002
CW Sydney	Chullora	1-hour	2020	93.7	0	0.015	0.012	0.011	0.007	0.004	0.002	0.001
CW Sydney	Chullora	1-hour	2021	93.3	0	0.017	0.010	0.009	0.006	0.004	0.002	0.001
CW Sydney	Chullora	1-hour	2022	77.6	0	0.013	0.009	0.008	0.004	0.003	0.002	0.001
CW Sydney	Chullora	24-hour	2018	99.2	0	0.003	0.003	0.002	0.002	0.002	0.001	0.000
CW Sydney	Chullora	24-hour	2019	97.0	0	0.004	0.003	0.003	0.002	0.002	0.001	0.000
CW Sydney	Chullora	24-hour	2020	97.3	0	0.004	0.003	0.002	0.002	0.001	0.001	0.000
CW Sydney	Chullora	24-hour	2021	97.0	0	0.004	0.002	0.002	0.002	0.001	0.001	0.000
CW Sydney	Chullora	24-hour	2022	80.8	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000
CW Sydney	Lidcombe	1-hour	2018	–	–	–	–	–	–	–	–	–
CW Sydney	Lidcombe	1-hour	2019	–	–	–	–	–	–	–	–	–

Region	Station	Averaging period	Year	Data avail. (%)	Exceed. days	Max. conc. (ppm) 1-hour (0.100 ppm), 24-hour (0.020 ppm)	Percentiles (ppm)					
							99th	98th	95th	90th	75th	50th
CW Sydney	*Lidcombe#*	*1-hour*	*2020*	*69.1*	*0*	*0.017*	*0.013*	*0.011*	*0.005*	*0.004*	*0.002*	*0.001*
CW Sydney	Lidcombe	1-hour	2021	94.7	0	0.016	0.011	0.010	0.006	0.004	0.002	0.001
CW Sydney	Lidcombe	1-hour	2022	93.0	0	0.025	0.013	0.009	0.006	0.004	0.002	0.001
CW Sydney	Lidcombe	24-hour	2018	–	–	–	–	–	–	–	–	–
CW Sydney	Lidcombe	24-hour	2019	–	–	–	–	–	–	–	–	–
CW Sydney	*Lidcombe#*	*24-hour*	*2020*	*71.3*	*0*	*0.003*	*0.003*	*0.002*	*0.002*	*0.001*	*0.001*	*0.000*
CW Sydney	Lidcombe	24-hour	2021	98.6	0	0.004	0.003	0.002	0.002	0.001	0.001	0.000
CW Sydney	Lidcombe	24-hour	2022	96.7	0	0.003	0.002	0.002	0.001	0.001	0.000	0.000
CW Sydney	Parramatta North	1-hour	2018	91.6	0	0.021	0.015	0.012	0.008	0.006	0.003	0.002
CW Sydney	Parramatta North	1-hour	2019	94.9	0	0.030	0.018	0.015	0.010	0.006	0.004	0.002
CW Sydney	Parramatta North	1-hour	2020	94.8	0	0.020	0.013	0.009	0.007	0.005	0.003	0.001
CW Sydney	Parramatta North	1-hour	2021	94.9	0	0.015	0.013	0.009	0.006	0.004	0.002	0.001
CW Sydney	Parramatta North	1-hour	2022	94.6	0	0.015	0.011	0.008	0.005	0.004	0.002	0.001
CW Sydney	Parramatta North	24-hour	2018	94.2	0	0.005	0.003	0.002	0.002	0.002	0.001	0.000
CW Sydney	Parramatta North	24-hour	2019	98.6	0	0.006	0.004	0.003	0.002	0.002	0.001	0.001
CW Sydney	Parramatta North	24-hour	2020	98.4	0	0.005	0.003	0.002	0.002	0.001	0.001	0.001
CW Sydney	Parramatta North	24-hour	2021	98.6	0	0.003	0.003	0.002	0.002	0.001	0.001	0.000
CW Sydney	Parramatta North	24-hour	2022	98.4	0	0.003	0.002	0.002	0.001	0.001	0.001	0.000
CW Sydney	Prospect	1-hour	2018	86.6	0	0.025	0.013	0.011	0.009	0.006	0.003	0.002
CW Sydney	Prospect	1-hour	2019	94.7	0	0.021	0.017	0.014	0.010	0.006	0.003	0.002
CW Sydney	Prospect	1-hour	2020	94.1	0	0.018	0.014	0.011	0.007	0.005	0.002	0.001
CW Sydney	Prospect	1-hour	2021	93.5	0	0.015	0.012	0.010	0.006	0.004	0.002	0.001

Region	Station	Averaging period	Year	Data avail. (%)	Exceed. days	Max. conc. (ppm) 1-hour (0.100 ppm), 24-hour (0.020 ppm)	Percentiles (ppm)					
							99th	98th	95th	90th	75th	50th
CW Sydney	Prospect	1-hour	2022	94.5	0	0.017	0.012	0.011	0.007	0.005	0.002	0.001
CW Sydney	Prospect	24-hour	2018	89.9	0	0.005	0.004	0.003	0.002	0.002	0.001	0.001
CW Sydney	Prospect	24-hour	2019	98.4	0	0.004	0.003	0.003	0.002	0.002	0.001	0.001
CW Sydney	Prospect	24-hour	2020	98.1	0	0.004	0.003	0.002	0.002	0.001	0.001	0.000
CW Sydney	Prospect	24-hour	2021	97.0	0	0.003	0.003	0.002	0.002	0.001	0.001	0.000
CW Sydney	Prospect	24-hour	2022	97.5	0	0.003	0.002	0.002	0.002	0.001	0.001	0.000
CW Sydney	Rouse Hill	1-hour	2018	–	–	–	–	–	–	–	–	–
CW Sydney	*Rouse Hill#*	*1-hour*	*2019*	*55.2*	*0*	*0.033*	*0.015*	*0.012*	*0.009*	*0.005*	*0.003*	*0.001*
CW Sydney	Rouse Hill	1-hour	2020	95.0	0	0.019	0.016	0.011	0.007	0.005	0.002	0.001
CW Sydney	Rouse Hill	1-hour	2021	94.9	0	0.018	0.012	0.009	0.007	0.005	0.002	0.001
CW Sydney	Rouse Hill	1-hour	2022	94.6	0	0.021	0.013	0.010	0.006	0.004	0.002	0.001
CW Sydney	Rouse Hill	24-hour	2018	–	–	–	–	–	–	–	–	–
CW Sydney	*Rouse Hill#*	*24-hour*	*2019*	*57.3*	*0*	*0.005*	*0.004*	*0.003*	*0.003*	*0.002*	*0.001*	*0.000*
CW Sydney	Rouse Hill	24-hour	2020	98.6	0	0.005	0.003	0.002	0.002	0.001	0.001	0.000
CW Sydney	Rouse Hill	24-hour	2021	98.9	0	0.003	0.003	0.002	0.002	0.001	0.001	0.000
CW Sydney	Rouse Hill	24-hour	2022	98.1	0	0.003	0.003	0.002	0.002	0.001	0.001	0.000
SW Sydney	Bargo	1-hour	2018	94.1	0	0.010	0.007	0.006	0.004	0.003	0.002	0.001
SW Sydney	Bargo	1-hour	2019	93.7	0	0.02	0.008	0.007	0.005	0.003	0.002	0.001
SW Sydney	Bargo	1-hour	2020	94.6	0	0.012	0.008	0.006	0.003	0.002	0.001	0.001
SW Sydney	Bargo	1-hour	2021	91.4	0	0.009	0.006	0.005	0.003	0.002	0.001	0.001
SW Sydney	Bargo	1-hour	2022	94.1	0	0.012	0.007	0.006	0.004	0.003	0.002	0.001
SW Sydney	Bargo	24-hour	2018	97.5	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000

Region	Station	Averaging period	Year	Data avail. (%)	Exceed. days	Max. conc. (ppm) 1-hour (0.100 ppm), 24-hour (0.020 ppm)	Percentiles (ppm)					
							99th	98th	95th	90th	75th	50th
SW Sydney	Bargo	24-hour	2019	97.0	0	0.006	0.003	0.002	0.002	0.001	0.001	0.000
SW Sydney	Bargo	24-hour	2020	98.1	0	0.003	0.002	0.001	0.001	0.001	0.000	0.000
SW Sydney	Bargo	24-hour	2021	94.0	0	0.002	0.002	0.002	0.001	0.001	0.000	0.000
SW Sydney	Bargo	24-hour	2022	97.5	0	0.003	0.002	0.002	0.001	0.001	0.000	0.000
SW Sydney	Bringelly	1-hour	2018	94.3	0	0.011	0.008	0.007	0.005	0.004	0.002	0.001
SW Sydney	Bringelly	1-hour	2019	93.4	0	0.028	0.010	0.009	0.007	0.005	0.002	0.001
SW Sydney	Bringelly	1-hour	2020	87.2	0	0.022	0.006	0.005	0.004	0.003	0.002	0.001
SW Sydney	Bringelly	1-hour	2021	93.4	0	0.009	0.006	0.005	0.004	0.002	0.001	0.001
SW Sydney	Bringelly	1-hour	2022	93.9	0	0.010	0.007	0.006	0.004	0.003	0.001	0.001
SW Sydney	Bringelly	24-hour	2018	97.8	0	0.003	0.002	0.002	0.001	0.001	0.001	0.000
SW Sydney	Bringelly	24-hour	2019	97.8	0	0.004	0.002	0.002	0.002	0.001	0.001	0.000
SW Sydney	Bringelly	24-hour	2020	91.0	0	0.003	0.002	0.001	0.001	0.001	0.001	0.000
SW Sydney	Bringelly	24-hour	2021	97.3	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000
SW Sydney	Bringelly	24-hour	2022	97.5	0	0.002	0.002	0.001	0.001	0.001	0.001	0.000
SW Sydney	Campbelltown W	1-hour	2018	93.5	0	0.016	0.009	0.009	0.007	0.005	0.003	0.002
SW Sydney	Campbelltown W	1-hour	2019	87.1	0	0.020	0.012	0.010	0.007	0.005	0.002	0.001
SW Sydney	Campbelltown W	1-hour	2020	94.7	0	0.012	0.007	0.006	0.004	0.003	0.002	0.001
SW Sydney	Campbelltown W	1-hour	2021	94.6	0	0.014	0.006	0.005	0.004	0.003	0.002	0.001
SW Sydney	Campbelltown W	1-hour	2022	90.7	0	0.010	0.008	0.006	0.005	0.004	0.002	0.001
SW Sydney	Campbelltown W	24-hour	2018	96.7	0	0.004	0.003	0.003	0.002	0.002	0.001	0.001
SW Sydney	Campbelltown W	24-hour	2019	90.4	0	0.004	0.003	0.003	0.002	0.002	0.001	0.000
SW Sydney	Campbelltown W	24-hour	2020	98.9	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000
SW Sydney	Campbelltown W	24-hour	2021	98.4	0	0.002	0.002	0.001	0.001	0.001	0.001	0.000

Region	Station	Averaging period	Year	Data avail. (%)	Exceed. days	Max. conc. (ppm) 1-hour (0.100 ppm), 24-hour (0.020 ppm)	Percentiles (ppm)					
							99th	98th	95th	90th	75th	50th
SW Sydney	Campbelltown W	24-hour	2022	93.4	0	0.003	0.002	0.002	0.001	0.001	0.001	0.000
SW Sydney	Liverpool	1-hour	2018	94.1	0	0.020	0.011	0.009	0.007	0.005	0.003	0.002
SW Sydney	Liverpool	1-hour	2019	94.6	0	0.016	0.014	0.011	0.008	0.005	0.003	0.002
SW Sydney	Liverpool	1-hour	2020	92.4	0	0.015	0.010	0.008	0.005	0.004	0.002	0.001
SW Sydney	Liverpool	1-hour	2021	94.3	0	0.017	0.010	0.008	0.005	0.004	0.002	0.001
SW Sydney	Liverpool	1-hour	2022	94.3	0	0.013	0.009	0.008	0.006	0.004	0.002	0.001
SW Sydney	Liverpool	24-hour	2018	97.5	0	0.004	0.003	0.003	0.002	0.002	0.001	0.001
SW Sydney	Liverpool	24-hour	2019	98.1	0	0.004	0.003	0.002	0.002	0.002	0.001	0.001
SW Sydney	Liverpool	24-hour	2020	95.6	0	0.003	0.002	0.002	0.001	0.001	0.001	0.000
SW Sydney	Liverpool	24-hour	2021	98.1	0	0.003	0.002	0.002	0.002	0.001	0.001	0.000
SW Sydney	Liverpool	24-hour	2022	98.1	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000
NW Sydney	Penrith	1-hour	2018	–	–	–	–	–	–	–	–	–
NW Sydney	Penrith	1-hour	2019	–	–	–	–	–	–	–	–	–
NW Sydney	*Penrith*[#]	*1-hour*	*2020*	*47.1*	*0*	*0.020*	*0.010*	*0.010*	*0.007*	*0.006*	*0.004*	*0.002*
NW Sydney	Penrith	1-hour	2021	94.9	0	0.010	0.009	0.007	0.006	0.005	0.003	0.002
NW Sydney	Penrith	1-hour	2022	94.4	0	0.011	0.010	0.009	0.007	0.006	0.004	0.002
NW Sydney	Penrith	24-hour	2018	–	–	–	–	–	–	–	–	–
NW Sydney	Penrith	24-hour	2019	–	–	–	–	–	–	–	–	–
NW Sydney	*Penrith*[#]	*24-hour*	*2020*	*49.2*	*0*	*0.003*	*0.003*	*0.002*	*0.002*	*0.001*	*0.001*	*0.000*
NW Sydney	Penrith	24-hour	2021	98.9	0	0.003	0.002	0.002	0.002	0.001	0.001	0.001
NW Sydney	Penrith	24-hour	2022	98.6	0	0.005	0.003	0.003	0.002	0.002	0.001	0.001
NW Sydney	Richmond	1-hour	2018	93.3	0	0.017	0.009	0.008	0.005	0.004	0.002	0.001

Region	Station	Averaging period	Year	Data avail. (%)	Exceed. days	Max. conc. (ppm) 1-hour (0.100 ppm), 24-hour (0.020 ppm)	Percentiles (ppm)					
							99th	98th	95th	90th	75th	50th
NW Sydney	Richmond	1-hour	2019	93.4	0	0.023	0.013	0.009	0.006	0.004	0.002	0.001
NW Sydney	Richmond	1-hour	2020	92.5	0	0.012	0.010	0.006	0.004	0.003	0.001	0.001
NW Sydney	Richmond	1-hour	2021	94.1	0	0.012	0.007	0.006	0.004	0.003	0.001	0.001
NW Sydney	Richmond	1-hour	2022	93.1	0	0.012	0.008	0.007	0.005	0.003	0.001	0.001
NW Sydney	Richmond	24-hour	2018	96.4	0	0.005	0.003	0.002	0.001	0.001	0.001	0.000
NW Sydney	Richmond	24-hour	2019	96.7	0	0.004	0.003	0.002	0.002	0.001	0.001	0.000
NW Sydney	Richmond	24-hour	2020	95.6	0	0.003	0.002	0.002	0.001	0.001	0.000	0.000
NW Sydney	Richmond	24-hour	2021	97.3	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000
NW Sydney	Richmond	24-hour	2022	96.4	0	0.003	0.002	0.002	0.001	0.001	0.001	0.000
Illawarra	Albion Park Sth	1-hour	2018	94.8	0	0.031	0.021	0.019	0.017	0.013	0.006	0.001
Illawarra	Albion Park Sth	1-hour	2019	94.0	0	0.025	0.020	0.017	0.015	0.012	0.006	0.001
Illawarra	Albion Park Sth	1-hour	2020	93.4	0	0.022	0.016	0.015	0.012	0.009	0.003	0.000
Illawarra	Albion Park Sth	1-hour	2021	93.9	0	0.020	0.016	0.015	0.010	0.007	0.003	0.000
Illawarra	Albion Park Sth	1-hour	2022	94.5	0	0.016	0.013	0.010	0.008	0.006	0.002	0.001
Illawarra	Albion Park Sth	24-hour	2018	98.4	0	0.008	0.006	0.005	0.004	0.003	0.001	0.000
Illawarra	Albion Park Sth	24-hour	2019	97.5	0	0.008	0.007	0.006	0.004	0.003	0.001	0.000
Illawarra	Albion Park Sth	24-hour	2020	97.0	0	0.005	0.005	0.004	0.003	0.002	0.000	0.000
Illawarra	Albion Park Sth	24-hour	2021	97.5	0	0.006	0.005	0.004	0.003	0.001	0.000	0.000
Illawarra	Albion Park Sth	24-hour	2022	98.4	0	0.005	0.004	0.003	0.002	0.001	0.001	0.000
Illawarra	Wollongong	1-hour	2018	92.2	0	0.039	0.018	0.017	0.015	0.011	0.008	0.004
Illawarra	Wollongong	1-hour	2019	92.1	0	0.034	0.025	0.018	0.013	0.011	0.007	0.004
Illawarra	Wollongong	1-hour	2020	92.4	0	0.020	0.015	0.014	0.011	0.008	0.006	0.002
Illawarra	Wollongong	1-hour	2021	92.8	0	0.021	0.015	0.015	0.012	0.009	0.005	0.002

Region	Station	Averaging period	Year	Data avail. (%)	Exceed. days	Max. conc. (ppm) 1-hour (0.100 ppm), 24-hour (0.020 ppm)	Percentiles (ppm)					
							99th	98th	95th	90th	75th	50th
Illawarra	Wollongong	1-hour	2022	94.3	0	0.017	0.013	0.012	0.009	0.008	0.005	0.002
Illawarra	Wollongong	24-hour	2018	95.9	0	0.009	0.005	0.004	0.003	0.002	0.001	0.001
Illawarra	Wollongong	24-hour	2019	95.3	0	0.006	0.005	0.004	0.003	0.002	0.001	0.001
Illawarra	Wollongong	24-hour	2020	95.4	0	0.004	0.004	0.003	0.002	0.002	0.001	0.000
Illawarra	Wollongong	24-hour	2021	95.9	0	0.006	0.005	0.004	0.003	0.002	0.001	0.000
Illawarra	Wollongong	24-hour	2022	97.8	0	0.004	0.003	0.002	0.002	0.001	0.001	0.000
C Coast	Wyong	1-hour	2018	94.2	0	0.062	0.038	0.034	0.021	0.013	0.005	0.001
C Coast	Wyong	1-hour	2019	94.4	0	0.061	0.043	0.034	0.023	0.015	0.005	0.001
C Coast	Wyong	1-hour	2020	93.7	0	0.069	0.038	0.028	0.017	0.009	0.004	0.001
C Coast	Wyong	1-hour	2021	87.6	0	0.030	0.025	0.022	0.016	0.010	0.004	0.001
C Coast	Wyong	1-hour	2022	87.3	0	0.045	0.026	0.024	0.018	0.010	0.003	0.001
C Coast	Wyong	24-hour	2018	97.8	0	0.008	0.005	0.004	0.003	0.002	0.001	0.000
C Coast	Wyong	24-hour	2019	97.8	0	0.006	0.005	0.005	0.003	0.002	0.001	0.000
C Coast	Wyong	24-hour	2020	97.8	0	0.008	0.005	0.004	0.003	0.002	0.001	0.000
C Coast	Wyong	24-hour	2021	91.2	0	0.005	0.004	0.003	0.002	0.002	0.001	0.000
C Coast	Wyong	24-hour	2022	89.9	0	0.007	0.005	0.004	0.002	0.002	0.001	0.000
Lake Macq.	Morisset	1-hour	2018	–	–	–	–	–	–	–	–	–
Lake Macq.	Morisset	1-hour	2019	–	–	–	–	–	–	–	–	–
Lake Macq.	Morisset*	1-hour	2020	–	–	–	–	–	–	–	–	–
Lake Macq.	Morisset	1-hour	2021	93.4	0	0.071	0.067	0.045	0.026	0.019	0.011	0.005
Lake Macq.	Morisset†	1-hour	2022	92.1	**1**	**0.183**	0.061	0.040	0.023	0.018	0.008	0.003
Lake Macq.	Morisset	24-hour	2018	–	–	–	–	–	–	–	–	–

Region	Station	Averaging period	Year	Data avail. (%)	Exceed. days	Max. conc. (ppm) 1-hour (0.100 ppm), 24-hour (0.020 ppm)	Percentiles (ppm)					
							99th	98th	95th	90th	75th	50th
Lake Macq.	Morisset	24-hour	2019	–	–	–	–	–	–	–	–	–
Lake Macq.	Morisset*	24-hour	2020	–	–	–	–	–	–	–	–	–
Lake Macq.	Morisset	24-hour	2021	96.7	0	0.016	0.009	0.007	0.004	0.003	0.002	0.001
Lake Macq.	Morisset	24-hour	2022	95.6	0	0.018	0.008	0.007	0.004	0.002	0.001	0.001
L Hunter	Beresfield	1-hour	2018	94.1	0	0.070	0.038	0.029	0.022	0.016	0.010	0.006
L Hunter	Beresfield	1-hour	2019	94.5	0	0.068	0.027	0.025	0.019	0.017	0.012	0.007
L Hunter	Beresfield	1-hour	2020	94.1	0	0.038	0.026	0.023	0.017	0.014	0.009	0.005
L Hunter	Beresfield	1-hour	2021	94.6	0	0.027	0.022	0.020	0.015	0.013	0.009	0.005
L Hunter	Beresfield	1-hour	2022	93.7	0	0.024	0.020	0.018	0.015	0.012	0.008	0.004
L Hunter	Beresfield	24-hour	2018	98.6	0	0.007	0.007	0.005	0.004	0.003	0.002	0.001
L Hunter	Beresfield	24-hour	2019	98.9	0	0.009	0.007	0.006	0.004	0.003	0.002	0.001
L Hunter	Beresfield	24-hour	2020	98.1	0	0.008	0.006	0.005	0.004	0.003	0.002	0.001
L Hunter	Beresfield	24-hour	2021	98.9	0	0.005	0.005	0.004	0.003	0.003	0.002	0.001
L Hunter	Beresfield	24-hour	2022	97.5	0	0.006	0.005	0.004	0.003	0.002	0.002	0.001
L Hunter	Newcastle	1-hour	2018	92.8	0	0.039	0.032	0.025	0.018	0.015	0.009	0.005
L Hunter	Newcastle	1-hour	2019	94.7	0	0.046	0.024	0.023	0.016	0.013	0.009	0.005
L Hunter	Newcastle	1-hour	2020	93.4	0	0.040	0.027	0.022	0.015	0.011	0.006	0.003
L Hunter	Newcastle	1-hour	2021	92.6	0	0.037	0.026	0.021	0.018	0.013	0.006	0.003
L Hunter	Newcastle	1-hour	2022	93.2	0	0.049	0.026	0.022	0.013	0.010	0.006	0.002
L Hunter	Newcastle	24-hour	2018	96.2	0	0.007	0.006	0.005	0.004	0.003	0.002	0.001
L Hunter	Newcastle	24-hour	2019	98.4	0	0.006	0.005	0.004	0.004	0.003	0.002	0.001
L Hunter	Newcastle	24-hour	2020	97.0	0	0.007	0.005	0.004	0.003	0.002	0.001	0.001

Region	Station	Averaging period	Year	Data avail. (%)	Exceed. days	Max. conc. (ppm) 1-hour (0.100 ppm), 24-hour (0.020 ppm)	Percentiles (ppm)					
							99th	98th	95th	90th	75th	50th
L Hunter	Newcastle	24-hour	2021	95.6	0	0.006	0.005	0.004	0.003	0.003	0.002	0.001
L Hunter	Newcastle	24-hour	2022	97.0	0	0.005	0.004	0.004	0.003	0.002	0.001	0.001
L Hunter	Wallsend	1-hour	2018	93.4	0	0.079	0.030	0.028	0.021	0.015	0.009	0.004
L Hunter	Wallsend	1-hour	2019	90.6	0	0.050	0.032	0.029	0.023	0.018	0.011	0.006
L Hunter	Wallsend	1-hour	2020	93.8	0	0.040	0.033	0.026	0.020	0.014	0.010	0.005
L Hunter	Wallsend	1-hour	2021	93.3	0	0.042	0.028	0.026	0.018	0.015	0.007	0.003
L Hunter	Wallsend	1-hour	2022	93.8	0	0.030	0.025	0.022	0.017	0.013	0.007	0.003
L Hunter	Wallsend	24-hour	2018	96.4	0	0.008	0.006	0.005	0.004	0.003	0.002	0.001
L Hunter	Wallsend	24-hour	2019	93.4	0	0.009	0.006	0.006	0.004	0.003	0.002	0.001
L Hunter	Wallsend	24-hour	2020	97.5	0	0.010	0.007	0.006	0.004	0.003	0.002	0.001
L Hunter	Wallsend	24-hour	2021	95.9	0	0.007	0.005	0.005	0.003	0.002	0.001	0.001
L Hunter	Wallsend	24-hour	2022	97.0	0	0.006	0.004	0.004	0.003	0.002	0.001	0.001
U Hunter	Merriwa	1-hour	2018	–	–	–	–	–	–	–	–	–
U Hunter	Merriwa	1-hour	2019	–	–	–	–	–	–	–	–	–
U Hunter	*Merriwa[#]*	*1-hour*	*2020*	*32.9*	*0*	*0.032*	*0.029*	*0.023*	*0.019*	*0.016*	*0.010*	*0.004*
U Hunter	Merriwa	1-hour	2021	88.8	0	0.034	0.029	0.025	0.020	0.017	0.010	0.003
U Hunter	Merriwa	1-hour	2022	89.4	0	0.041	0.031	0.028	0.020	0.016	0.011	0.005
U Hunter	Merriwa	24-hour	2018	–	–	–	–	–	–	–	–	–
U Hunter	Merriwa	24-hour	2019	–	–	–	–	–	–	–	–	–
U Hunter	*Merriwa[#]*	*24-hour*	*2020*	*33.9*	*0*	*0.009*	*0.009*	*0.008*	*0.006*	*0.004*	*0.003*	*0.001*
U Hunter	Merriwa	24-hour	2021	89.6	0	0.008	0.007	0.007	0.006	0.005	0.003	0.001
U Hunter	Merriwa	24-hour	2022	91.2	0	0.009	0.008	0.006	0.005	0.005	0.003	0.001

Region	Station	Averaging period	Year	Data avail. (%)	Exceed. days	Max. conc. (ppm) 1-hour (0.100 ppm), 24-hour (0.020 ppm)	Percentiles (ppm)					
							99th	98th	95th	90th	75th	50th
U Hunter	Muswellbrook†	1-hour	2018	92.8	**3**	**0.120**	0.096	0.074	0.063	0.042	0.023	0.009
U Hunter	Muswellbrook†	1-hour	2019	93.3	**5**	**0.130**	0.107	0.092	0.072	0.045	0.027	0.008
U Hunter	Muswellbrook†	1-hour	2020	89.2	**2**	**0.135**	0.072	0.069	0.048	0.031	0.018	0.006
U Hunter	Muswellbrook†	1-hour	2021	92.3	**1**	**0.123**	0.081	0.066	0.047	0.034	0.018	0.004
U Hunter	Muswellbrook	1-hour	2022	81.2	0	0.100	0.074	0.062	0.047	0.032	0.015	0.005
U Hunter	Muswellbrook†	24-hour	2018	96.7	**1**	**0.021**	0.015	0.014	0.009	0.007	0.004	0.001
U Hunter	Muswellbrook†	24-hour	2019	97.0	**1**	**0.024**	0.018	0.017	0.012	0.009	0.004	0.002
U Hunter	Muswellbrook	24-hour	2020	92.1	0	0.015	0.013	0.010	0.008	0.006	0.004	0.001
U Hunter	Muswellbrook	24-hour	2021	95.9	0	0.016	0.012	0.011	0.008	0.006	0.003	0.001
U Hunter	Muswellbrook	24-hour	2022	84.7	0	0.016	0.014	0.011	0.008	0.006	0.003	0.001
U Hunter	Singleton	1-hour	2018	94.6	0	0.067	0.048	0.042	0.031	0.023	0.013	0.005
U Hunter	Singleton	1-hour	2019	95.1	0	0.096	0.048	0.044	0.036	0.028	0.015	0.006
U Hunter	Singleton	1-hour	2020	94.6	0	0.055	0.045	0.039	0.030	0.024	0.012	0.005
U Hunter	Singleton	1-hour	2021	94.6	0	0.067	0.055	0.048	0.035	0.023	0.011	0.004
U Hunter	Singleton	1-hour	2022	94.5	0	0.050	0.039	0.036	0.022	0.016	0.007	0.003
U Hunter	Singleton	24-hour	2018	98.4	0	0.013	0.008	0.007	0.005	0.004	0.002	0.001
U Hunter	Singleton	24-hour	2019	98.9	0	0.012	0.008	0.007	0.005	0.004	0.003	0.001
U Hunter	Singleton	24-hour	2020	98.4	0	0.011	0.010	0.008	0.006	0.004	0.002	0.001
U Hunter	Singleton	24-hour	2021	98.6	0	0.011	0.009	0.008	0.005	0.004	0.002	0.001
U Hunter	Singleton	24-hour	2022	98.4	0	0.010	0.008	0.005	0.004	0.003	0.001	0.001
Mid Nth Coast	Port Macquarie	1-hour	2018	–	–	–	–	–	–	–	–	–
Mid Nth Coast	*Port Macquarie#*	*1-hour*	*2019*	*41.8*	*0*	*0.081*	*0.013*	*0.010*	*0.005*	*0.002*	*0.001*	*0.000*

Region	Station	Averaging period	Year	Data avail. (%)	Exceed. days	Max. conc. (ppm) 1-hour (0.100 ppm), 24-hour (0.020 ppm)	Percentiles (ppm)					
							99th	98th	95th	90th	75th	50th
Mid Nth Coast	Port Macquarie	1-hour	2020	94.1	0	0.039	0.010	0.006	0.003	0.002	0.001	0.000
Mid Nth Coast	Port Macquarie	1-hour	2021	91.6	0	0.003	0.002	0.002	0.001	0.001	0.001	0.000
Mid Nth Coast	Port Macquarie	1-hour	2022	92.4	0	0.006	0.003	0.002	0.002	0.001	0.001	0.000
Mid Nth Coast	Port Macquarie	24-hour	2018	–	–	–	–	–	–	–	–	–
Mid Nth Coast	*Port Macquarie*[#]	*24-hour*	*2019*	*42.5*	*0*	*0.015*	*0.015*	*0.005*	*0.004*	*0.003*	*0.001*	*0.001*
Mid Nth Coast	Port Macquarie	24-hour	2020	93.4	0	0.004	0.002	0.002	0.001	0.000	0.000	0.000
Mid Nth Coast	Port Macquarie	24-hour	2021	92.3	0	0.001	0.001	0.001	0.001	0.000	0.000	0.000
Mid Nth Coast	Port Macquarie	24-hour	2022	92.6	0	0.001	0.001	0.001	0.001	0.000	0.000	0.000

Ozone

This section presents a 5-year statistical trend summary by station for the AAQ NEPM rolling 8-hour average ozone standard (0.065 ppm).

Exceptional event rule for ozone

Exceedances of the AAQ NEPM standard are classified into 2 event categories:

- Non-exceptional events (exceedances caused by photochemical smog).
- Exceptional events (exceedances caused by bushfires and jurisdiction authorised hazard reduction burning).

Event days that are deemed exceptional are allowable under the AAQ NEPM goal, while non-exceptional days are not allowed.

The exceptional event rule is **not applied** to ozone exceedances prior to 2021. The update to AAQ NEPM in 2021 required jurisdictions to identify any exceptional events relating to ozone, in addition to PM10 and PM2.5, and therefore exclude these event days from compliance assessments against the NEPM standard.

Table 26 below presents the 5-year statistical trend summary for the 0.065 ppm 8-hour rolling average for ozone from 2018 to 2022. Note that:

- Where shown, the smaller number in brackets () next to the overall ozone exceedance total is the number of non-exceptional event days recorded at that station during a particular year. Both numbers are given in bold. For example, **7 (3)** indicates there were 7 total exceedance days at that station, while 3 of these were non-exceptional events. As non-exceptional events were observed, the station did not meet the ozone standard for that year, and these numbers are written in bold as a result. These entries are marked with a dagger (†).
- Exceedance days that are not written in bold and have a 0 in brackets (0) next to the total indicate all exceedances were considered exceptional events, meaning the station met the ozone standard for that year.
- Stations whose entries are italicised indicate less than 75% of data was available for that year, and are marked with a hash (#).
- Exceedances will be in bold if non-exceptional events were observed at that station, or if the maximum average exceeds the 0.065 pphm standard. These entries are marked with a dagger (†).
- While stations with less than 15% of data availability are usually excluded, stations that recorded both less than 15% of data and at least one exceedance are reported below. These entries are marked with an asterisk (*).

Table 27 **Statistical summary trend (5-year) by station for the maximum ozone 8-hour rolling average AAQ NEPM standard (0.065 ppm) from 2018 to 2022**

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. 8-hour rolling average (ppm) (0.065 ppm)	Percentiles (ppm)					
						99th	98th	95th	90th	75th	50th
East Sydney	Alexandria	2018	–	–	–	–	–	–	–	–	–
East Sydney	Alexandria	2019	–	–	–	–	–	–	–	–	–
East Sydney	Alexandria	2020	–	–	–	–	–	–	–	–	–
East Sydney	*Alexandria*[#]	*2021*	*22.4*	*0*	*0.048*	*0.046*	*0.038*	*0.034*	*0.031*	*0.027*	*0.024*
East Sydney	Alexandria	2022	80.7	0	0.046	0.043	0.036	0.030	0.026	0.022	0.018
East Sydney	*Bradfield Hwy*[#]	*2018*	*22.1*	*0*	*0.032*	*0.032*	*0.031*	*0.027*	*0.020*	*0.018*	*0.013*
East Sydney	Bradfield Hwy	2019	88.8	0	0.035	0.029	0.028	0.024	0.022	0.017	0.012
East Sydney	Bradfield Hwy	2020	88.4	0	0.033	0.029	0.027	0.024	0.022	0.018	0.014
East Sydney	Bradfield Hwy	2021	92.0	0	0.034	0.028	0.025	0.023	0.022	0.017	0.013
East Sydney	Bradfield Hwy	2022	83.9	0	0.037	0.027	0.023	0.021	0.019	0.016	0.012
East Sydney	Cook and Phillip	2018	–	–	–	–	–	–	–	–	–
East Sydney	*Cook and Phillip*[#]	*2019*	*28.4*	*0*	*0.057*	*0.056*	*0.055*	*0.047*	*0.033*	*0.027*	*0.023*
East Sydney	Cook and Phillip	2020	87.0	0	0.046	0.037	0.035	0.031	0.027	0.023	0.019
East Sydney	Cook and Phillip	2021	82.5	0	0.046	0.035	0.033	0.029	0.027	0.022	0.018
East Sydney	Cook and Phillip	2022	91.3	0	0.045	0.039	0.033	0.028	0.025	0.022	0.017
East Sydney	Earlwood	2018	94.8	0	0.063	0.052	0.047	0.039	0.033	0.029	0.025
East Sydney	Earlwood[†]	2019	93.9	**5**	**0.089**	**0.072**	0.061	0.047	0.040	0.030	0.025
East Sydney	Earlwood[†]	2020	94.1	**2**	**0.081**	0.058	0.048	0.043	0.037	0.031	0.025
East Sydney	Earlwood	2021	93.5	0	0.059	0.052	0.044	0.038	0.035	0.030	0.025
East Sydney	Earlwood	2022	92.3	0	0.056	0.048	0.042	0.034	0.030	0.027	0.023
East Sydney	Macquarie Park[†]	2018	93.9	**2**	**0.072**	0.061	0.059	0.048	0.041	0.034	0.029

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. 8-hour rolling average (ppm) (0.065 ppm)	Percentiles (ppm)					
						99th	98th	95th	90th	75th	50th
East Sydney	Macquarie Park†	2019	91.8	**8**	**0.090**	**0.072**	**0.067**	0.056	0.047	0.034	0.027
East Sydney	Macquarie Park†	2020	92.2	**1**	**0.075**	0.059	0.055	0.048	0.042	0.034	0.026
East Sydney	Macquarie Park†	2021	94.0	1 (0)	**0.066**	0.057	0.050	0.043	0.038	0.032	0.027
East Sydney	Macquarie Park	2022	95.0	0	0.059	0.049	0.045	0.036	0.033	0.028	0.024
East Sydney	Randwick	2018	94.1	0	0.063	0.052	0.045	0.041	0.036	0.033	0.029
East Sydney	Randwick†	2019	94.4	**5**	**0.090**	**0.071**	0.059	0.045	0.039	0.032	0.028
East Sydney	Randwick†	2020	95.0	**2**	**0.078**	0.058	0.052	0.044	0.039	0.033	0.028
East Sydney	Randwick	2021	92.8	0	0.063	0.044	0.043	0.039	0.035	0.032	0.027
East Sydney	Randwick	2022	94.7	0	0.055	0.051	0.044	0.036	0.034	0.030	0.025
East Sydney	*Rozelle#*	*2018*	*67.7*	*0*	*0.061*	*0.047*	*0.041*	*0.036*	*0.033*	*0.030*	*0.027*
East Sydney	Rozelle†	2019	94.1	**4**	**0.102**	**0.066**	**0.054**	0.043	0.036	0.030	0.026
East Sydney	Rozelle	2020	94.8	0	**0.071**	0.062	0.050	0.043	0.037	0.031	0.026
East Sydney	Rozelle	2021	94.6	0	0.054	0.045	0.043	0.038	0.034	0.030	0.025
East Sydney	Rozelle	2022	93.2	0	0.052	0.044	0.039	0.035	0.033	0.030	0.024
CW Sydney	Chullora†	2018	95.0	**2**	**0.074**	0.062	0.055	0.044	0.037	0.030	0.025
CW Sydney	Chullora†	2019	95.2	**7**	**0.084**	**0.068**	**0.066**	0.053	0.044	0.031	0.025
CW Sydney	Chullora†	2020	94.6	**2**	**0.083**	0.058	0.051	0.045	0.040	0.030	0.025
CW Sydney	Chullora†	2021	94.6	**1 (1)**	**0.068**	0.054	0.046	0.041	0.034	0.028	0.023
CW Sydney	Chullora	2022	77.8	0	0.049	0.046	0.041	0.033	0.031	0.027	0.022
CW Sydney	Lidcombe	2018	–	–	–	–	–	–	–	–	–
CW Sydney	Lidcombe	2019	–	–	–	–	–	–	–	–	–
CW Sydney	*Lidcombe#*	*2020*	*71.3*	*0*	*0.055*	*0.051*	*0.048*	*0.042*	*0.037*	*0.031*	*0.026*
CW Sydney	Lidcombe†	2021	94.1	**1 (1)**	**0.071**	0.057	0.050	0.042	0.036	0.030	0.025

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. 8-hour rolling average (ppm) (0.065 ppm)	Percentiles (ppm)					
						99th	98th	95th	90th	75th	50th
CW Sydney	Lidcombe	2022	94.0	0	0.057	0.050	0.048	0.036	0.031	0.027	0.023
CW Sydney	Parramatta Nth†	2018	92.7	**5**	**0.084**	**0.066**	0.057	0.049	0.041	0.032	0.027
CW Sydney	Parramatta Nth†	2019	94.9	**15**	**0.100**	**0.075**	**0.070**	0.063	0.053	0.036	0.029
CW Sydney	Parramatta Nth†	2020	95.1	**3**	**0.080**	0.065	0.061	0.051	0.044	0.033	0.027
CW Sydney	Parramatta Nth†	2021	95.3	**2 (2)**	**0.072**	0.056	0.053	0.043	0.037	0.031	0.026
CW Sydney	Parramatta Nth	2022	95.0	0	0.056	0.051	0.046	0.037	0.032	0.028	0.023
CW Sydney	Prospect†	2018	85.9	**5**	**0.081**	**0.068**	0.063	0.051	0.045	0.034	0.028
CW Sydney	Prospect†	2019	94.3	**20**	**0.101**	**0.079**	**0.071**	**0.066**	0.051	0.036	0.029
CW Sydney	Prospect†	2020	94.8	**3**	**0.079**	0.065	0.060	0.053	0.044	0.034	0.028
CW Sydney	Prospect†	2021	94.3	**2 (2)**	**0.067**	0.058	0.052	0.043	0.039	0.032	0.027
CW Sydney	Prospect	2022	94.4	0	0.052	0.052	0.047	0.039	0.033	0.029	0.025
CW Sydney	Rouse Hill	2018	–	–	–	–	–	–	–	–	–
CW Sydney	*Rouse Hill#†*	*2019*	*57.0*	***9***	***0.085***	***0.082***	***0.069***	*0.065*	*0.053*	*0.037*	*0.031*
CW Sydney	Rouse Hill†	2020	94.7	**3**	**0.071**	0.063	0.058	0.051	0.042	0.034	0.028
CW Sydney	Rouse Hill†	2021	92.7	**1 (1)**	**0.066**	0.053	0.047	0.043	0.037	0.032	0.027
CW Sydney	Rouse Hill	2022	92.6	0	0.053	0.048	0.045	0.037	0.033	0.029	0.025
SW Sydney	Bargo†	2018	92.8	**5**	**0.076**	**0.069**	0.061	0.054	0.046	0.037	0.031
SW Sydney	Bargo†	2019	93.9	**21**	**0.107**	**0.083**	**0.078**	**0.069**	0.052	0.038	0.030
SW Sydney	Bargo†	2020	93.7	**4**	**0.090**	0.066	0.061	0.049	0.043	0.034	0.028
SW Sydney	Bargo†	2021	93.5	**1 (1)**	**0.074**	0.053	0.047	0.041	0.037	0.032	0.028
SW Sydney	Bargo	2022	94.7	0	0.059	0.045	0.042	0.037	0.033	0.029	0.026
SW Sydney	Bringelly†	2018	94.1	**9**	**0.087**	**0.073**	**0.066**	0.052	0.046	0.034	0.029
SW Sydney	Bringelly†	2019	93.2	**20**	**0.094**	**0.079**	**0.074**	**0.068**	0.053	0.036	0.030

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. 8-hour rolling average (ppm) (0.065 ppm)	Percentiles (ppm)					
						99th	98th	95th	90th	75th	50th
SW Sydney	Bringelly†	2020	87.7	**3**	**0.079**	0.064	0.061	0.053	0.044	0.034	0.028
SW Sydney	Bringelly†	2021	94.8	**2 (2)**	**0.076**	0.060	0.055	0.044	0.041	0.032	0.027
SW Sydney	Bringelly	2022	94.7	0	0.057	0.049	0.044	0.039	0.035	0.029	0.025
SW Sydney	Camden†	2018	90.0	**7**	**0.082**	**0.071**	**0.067**	0.054	0.046	0.037	0.030
SW Sydney	Camden†	2019	93.2	**20**	**0.102**	**0.083**	**0.078**	**0.068**	0.058	0.036	0.030
SW Sydney	Camden†	2020	94.5	**3**	**0.077**	0.065	0.060	0.053	0.044	0.035	0.029
SW Sydney	Camden†	2021	94.6	**2 (2)**	**0.076**	0.057	0.052	0.043	0.038	0.031	0.027
SW Sydney	Camden	2022	94.9	0	0.056	0.047	0.042	0.038	0.033	0.029	0.025
SW Sydney	Campbelltown W†	2018	93.7	**7**	**0.088**	**0.073**	0.065	0.051	0.043	0.032	0.028
SW Sydney	Campbelltown W†	2019	91.4	**21**	**0.095**	**0.082**	**0.076**	**0.068**	0.053	0.035	0.028
SW Sydney	Campbelltown W†	2020	95.1	**4**	**0.080**	**0.069**	0.059	0.052	0.042	0.031	0.026
SW Sydney	Campbelltown W†	2021	93.2	**2 (2)**	**0.074**	0.058	0.054	0.042	0.037	0.031	0.026
SW Sydney	Campbelltown W	2022	92.5	0	0.060	0.044	0.042	0.037	0.034	0.029	0.024
SW Sydney	Liverpool†	2018	93.5	**5**	**0.088**	**0.070**	0.061	0.048	0.041	0.033	0.027
SW Sydney	Liverpool†	2019	94.1	**11**	**0.081**	**0.075**	**0.073**	0.061	0.051	0.034	0.027
SW Sydney	Liverpool†	2020	92.6	**1**	**0.066**	0.059	0.055	0.047	0.041	0.031	0.026
SW Sydney	Liverpool†	2021	94.8	**2 (2)**	**0.070**	0.064	0.054	0.044	0.039	0.031	0.025
SW Sydney	Liverpool	2022	92.2	0	0.056	0.051	0.046	0.038	0.032	0.028	0.023
SW Sydney	Oakdale†	2018	93.8	**4**	**0.071**	**0.067**	0.060	0.054	0.048	0.038	0.032
SW Sydney	Oakdale†	2019	92.3	**18**	**0.106**	**0.085**	**0.080**	**0.066**	0.055	0.038	0.031

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. 8-hour rolling average (ppm) (0.065 ppm)	Percentiles (ppm)					
						99th	98th	95th	90th	75th	50th
SW Sydney	Oakdale†	2020	94.9	**3**	**0.084**	0.064	0.061	0.051	0.045	0.037	0.031
SW Sydney	Oakdale†	2021	93.4	**2 (2)**	**0.068**	0.049	0.046	0.042	0.039	0.032	0.028
SW Sydney	Oakdale	2022	94.4	0	0.053	0.045	0.042	0.038	0.034	0.030	0.027
NW Sydney	Penrith	2018	–	–	–	–	–	–	–	–	–
NW Sydney	Penrith	2019	–	–	–	–	–	–	–	–	–
NW Sydney	*Penrith#*	*2020*	*47.1*	*0*	*0.062*	*0.056*	*0.049*	*0.046*	*0.040*	*0.034*	*0.029*
NW Sydney	Penrith†	2021	95.0	**1 (1)**	**0.077**	0.055	0.048	0.044	0.038	0.032	0.026
NW Sydney	Penrith	2022	95.0	0	0.052	0.048	0.047	0.038	0.034	0.028	0.024
NW Sydney	Richmond†	2018	94.2	**3**	**0.073**	**0.065**	0.061	0.054	0.046	0.037	0.031
NW Sydney	Richmond†	2019	94.1	**13**	**0.100**	**0.083**	**0.073**	0.060	0.051	0.037	0.030
NW Sydney	Richmond†	2020	92.8	**2**	**0.074**	0.063	0.058	0.053	0.043	0.035	0.029
NW Sydney	Richmond†	2021	92.1	**1 (1)**	**0.076**	0.052	0.049	0.043	0.038	0.032	0.027
NW Sydney	Richmond	2022	88.0	0	0.053	0.047	0.044	0.038	0.034	0.029	0.026
NW Sydney	St Marys†	2018	93.9	**6**	**0.085**	**0.070**	0.064	0.054	0.049	0.038	0.032
NW Sydney	St Marys†	2019	94.4	**19**	**0.097**	**0.085**	**0.080**	**0.067**	0.053	0.037	0.031
NW Sydney	St Marys†	2020	94.9	**3**	**0.085**	0.063	0.059	0.051	0.042	0.033	0.027
NW Sydney	St Marys	2021	90.1	0	0.060	0.051	0.048	0.042	0.037	0.031	0.026
NW Sydney	St Marys	2022	93.7	0	0.051	0.049	0.045	0.040	0.034	0.029	0.025
Illawarra	Albion Park Sth	2018	94.1	0	0.061	0.049	0.043	0.037	0.033	0.030	0.027
Illawarra	Albion Park Sth	2019	94.3	0	0.061	0.058	0.057	0.043	0.038	0.031	0.028
Illawarra	Albion Park Sth†	2020	92.3	**2**	**0.068**	0.054	0.046	0.042	0.036	0.031	0.027
Illawarra	Albion Park Sth	2021	92.8	0	0.055	0.046	0.043	0.037	0.033	0.030	0.026
Illawarra	Albion Park Sth	2022	89.3	0	0.065	0.053	0.038	0.034	0.032	0.029	0.025

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. 8-hour rolling average (ppm) (0.065 ppm)	Percentiles (ppm)					
						99th	98th	95th	90th	75th	50th
Illawarra	Kembla Grange	2018	92.9	0	0.052	0.047	0.044	0.040	0.034	0.031	0.028
Illawarra	Kembla Grange†	2019	94.1	**3**	**0.076**	0.063	0.054	0.045	0.039	0.031	0.028
Illawarra	Kembla Grange†	2020	92.5	**2**	**0.070**	0.057	0.048	0.042	0.037	0.031	0.027
Illawarra	Kembla Grange	2021	92.3	0	0.058	0.044	0.041	0.038	0.033	0.029	0.026
Illawarra	Kembla Grange	2022	94.0	0	0.059	0.046	0.040	0.035	0.032	0.029	0.026
Illawarra	Wollongong	2018	93.8	0	0.053	0.049	0.046	0.040	0.036	0.031	0.027
Illawarra	Wollongong†	2019	94.5	**2**	**0.078**	0.065	0.059	0.046	0.039	0.032	0.028
Illawarra	Wollongong†	2020	93.1	**1**	**0.066**	0.052	0.047	0.043	0.037	0.031	0.027
Illawarra	Wollongong	2021	94.0	0	0.048	0.043	0.039	0.037	0.031	0.029	0.025
Illawarra	Wollongong	2022	93.4	0	0.060	0.048	0.040	0.033	0.031	0.028	0.025
C Coast	Wyong	2018	91.8	0	0.056	0.052	0.048	0.040	0.036	0.031	0.028
C Coast	Wyong†	2019	93.3	**5**	**0.080**	**0.067**	0.058	0.045	0.040	0.032	0.028
C Coast	Wyong†	2020	93.9	**1**	**0.082**	0.055	0.050	0.044	0.039	0.032	0.028
C Coast	Wyong	2021	92.8	0	0.050	0.047	0.043	0.039	0.035	0.030	0.026
C Coast	Wyong	2022	93.1	0	0.062	0.049	0.043	0.035	0.032	0.029	0.024
Lake Macq.	Morisset	2018	–	–	–	–	–	–	–	–	–
Lake Macq.	Morisset	2019	–	–	–	–	–	–	–	–	–
Lake Macq.	Morisset*	2020	–	–	–	–	–	–	–	–	–
Lake Macq.	Morisset	2021	93.6	0	0.058	0.046	0.044	0.040	0.037	0.032	0.028
Lake Macq.	Morisset	2022	92.7	0	0.062	0.053	0.046	0.036	0.034	0.030	0.027
L Hunter	Beresfield†	2018	93.8	**1**	**0.071**	0.054	0.050	0.042	0.036	0.030	0.026
L Hunter	Beresfield†	2019	94.3	**7**	**0.079**	**0.073**	0.065	0.052	0.045	0.034	0.027
L Hunter	Beresfield†	2020	93.1	**1**	**0.071**	0.056	0.053	0.044	0.038	0.031	0.025
L Hunter	Beresfield	2021	94.2	0	0.053	0.047	0.043	0.038	0.034	0.028	0.024

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. 8-hour rolling average (ppm) (0.065 ppm)	Percentiles (ppm)					
						99th	98th	95th	90th	75th	50th
L Hunter	Beresfield	2022	92.6	0	0.051	0.045	0.041	0.034	0.031	0.028	0.023
L Hunter	Newcastle	2018	93.4	0	0.054	0.050	0.044	0.037	0.034	0.030	0.026
L Hunter	Newcastle†	2019	94.6	**3**	**0.075**	0.060	0.054	0.044	0.038	0.032	0.027
L Hunter	Newcastle†	2020	94.0	**2**	**0.070**	0.056	0.050	0.040	0.036	0.032	0.027
L Hunter	Newcastle	2021	93.7	0	0.048	0.045	0.040	0.037	0.034	0.030	0.025
L Hunter	Newcastle	2022	94.4	0	0.047	0.041	0.038	0.034	0.032	0.029	0.024
L Hunter	Wallsend	2018	93.8	0	0.056	0.053	0.051	0.041	0.036	0.031	0.027
L Hunter	Wallsend†	2019	92.7	**5**	**0.084**	**0.069**	0.060	0.052	0.042	0.033	0.027
L Hunter	Wallsend†	2020	93.1	**1**	**0.078**	0.058	0.054	0.043	0.037	0.032	0.026
L Hunter	Wallsend	2021	94.3	0	0.052	0.046	0.044	0.038	0.034	0.029	0.025
L Hunter	Wallsend	2022	89.2	0	0.050	0.044	0.041	0.034	0.031	0.028	0.023
U Hunter	Merriwa	2018	–	–	–	–	–	–	–	–	–
U Hunter	Merriwa	2019	–	–	–	–	–	–	–	–	–
U Hunter	*Merriwa#*	*2020*	*35.5*	*0*	*0.055*	*0.050*	*0.047*	*0.045*	*0.041*	*0.036*	*0.032*
U Hunter	Merriwa	2021	88.9	0	0.049	0.044	0.043	0.040	0.036	0.032	0.028
U Hunter	Merriwa	2022	90.9	0	0.050	0.044	0.041	0.037	0.033	0.030	0.027
NW Slopes	Gunnedah	2018	78.9	0	0.056	0.052	0.051	0.047	0.045	0.039	0.032
NW Slopes	Gunnedah†	2019	94.7	**6**	**0.087**	**0.070**	0.065	0.058	0.051	0.042	0.033
NW Slopes	Gunnedah†	2020	93.0	**3**	**0.074**	0.063	0.059	0.052	0.046	0.038	0.031
NW Slopes	Gunnedah	2021	92.5	0	0.047	0.043	0.042	0.040	0.037	0.032	0.028
NW Slopes	Gunnedah	2022	92.9	0	0.045	0.041	0.038	0.035	0.032	0.029	0.026
Mid Nth Coast	Coffs Harbour	2018	–	–	–	–	–	–	–	–	–
Mid Nth Coast	*Coffs Harbour#†*	*2019*	*10.3*	***2***	***0.095***	***0.095***	***0.093***	***0.068***	*0.045*	*0.036*	*0.031*
Mid Nth Coast	Coffs Harbour	2020	90.4	0	0.044	0.042	0.042	0.039	0.036	0.032	0.028

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. 8-hour rolling average (ppm) (0.065 ppm)	Percentiles (ppm)					
						99th	98th	95th	90th	75th	50th
Mid Nth Coast	Coffs Harbour	2021	93.3	0	0.043	0.039	0.036	0.034	0.032	0.029	0.025
Mid Nth Coast	Coffs Harbour	2022	93.7	0	0.038	0.036	0.035	0.032	0.031	0.028	0.023
Mid Nth Coast	Port Macquarie	2018	–	–	–	–	–	–	–	–	–
Mid Nth Coast	*Port Macquarie*[#†]	*2019*	*41.3*	***3***	***0.085***	*0.054*	*0.045*	*0.037*	*0.033*	*0.028*	*0.022*
Mid Nth Coast	Port Macquarie	2020	83.6	0	0.048	0.042	0.038	0.036	0.034	0.030	0.025
Mid Nth Coast	Port Macquarie	2021	93.0	0	0.039	0.038	0.034	0.033	0.031	0.027	0.022
Mid Nth Coast	Port Macquarie	2022	95.9	0	0.041	0.034	0.032	0.029	0.028	0.025	0.021
S Tablelands	Goulburn	2018	–	–	–	–	–	–	–	–	–
S Tablelands	*Goulburn*[#†]	*2019*	*14.4*	***7***	***0.116***	***0.116***	***0.101***	***0.080***	***0.068***	*0.058*	*0.038*
S Tablelands	Goulburn[†]	2020	95.0	**6**	**0.082**	**0.071**	0.063	0.050	0.042	0.034	0.029
S Tablelands	Goulburn	2021	94.9	0	0.051	0.044	0.043	0.038	0.034	0.030	0.026
S Tablelands	Goulburn	2022	87.9	0	0.046	0.041	0.039	0.036	0.033	0.029	0.026

Particles as PM10

This section presents a 5-year statistical trend summary by station for the following AAQ NEPM standards applicable to PM10:

- 24-hour PM10 standard (50.0 µg/m^3).
- Annual PM10 standard (25.0 µg/m^3).

Exceptional event rule for PM10

Exceedances of the AAQ NEPM PM10 24-hour standard are classified into one of two event categories:

- Non-exceptional events (exceedances caused by local or regional dust events, or wood smoke from domestic wood heaters).
- Exceptional events (exceedances caused by continental-scale dust events, bushfires and jurisdiction authorised hazard reduction burning).

Event days that are deemed exceptional are allowable under the AAQ NEPM goal, while non-exceptional days are not allowed.

Table 27 below presents the 5-year statistical trend summary for the 24-hour and annual PM10 standards for 2018 to 2022. Note that:

- Where shown, the smaller number in brackets () next to the overall ozone exceedance total is the number of non-exceptional event days recorded at that station during a particular year. Both numbers are given in bold. For example, **7 (3)** indicates there were 7 total exceedance days at that station, while 3 of these were non-exceptional events. As non-exceptional events were observed, the station did not meet the PM10 1-day standard for that year, and these numbers are written in bold as a result. These entries are marked with a dagger (†).
- Exceedance days that are not written in bold and have a 0 in brackets (0) next to the total indicate all exceedances were considered exceptional events, meaning the station met the PM10 1-day standard for that year.
- Stations whose entries are italicised indicate less than 75% of data was available for that year, and are marked with a hash (#).
- Exceedances will be in bold if maximum 1-day average exceeds the standard, irrespective of whether the exceedance is exceptional or non-exceptional in nature. Entries where the 1-year average exceeds the standard are also given in bold. These are marked with a dagger (†).
- While stations with less than 15% of data availability are usually excluded, stations that recorded both less than 15% of data and at least one exceedance are reported below. These entries are marked with an asterisk (*).

Table 28 **Statistical summary trend (5-year) by station for the maximum PM10 daily average AAQ NEPM standard (50.0 µg/m³) and annual average (25.0 µg/m³) from 2018 to 2022**

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (50.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (25.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
East Sydney	Alexandria	2018	–	–	–	–	–	–	–	–	–	–
East Sydney	Alexandria	2019	–	–	–	–	–	–	–	–	–	–
East Sydney	Alexandria	2020	–	–	–	–	–	–	–	–	–	–
East Sydney	*Alexandria#*	*2021*	*17.0*	*0*	*30.6*	*30.6*	*30.4*	*28.1*	*24.1*	*18.0*	*14.0*	*14.9*
East Sydney	*Alexandria#*	*2022*	*49.0*	*0*	*21.3*	*19.9*	*19.8*	*17.9*	*16.3*	*13.4*	*10.1*	*10.7*
East Sydney	*Bradfield Hwy#†*	*2018*	*21.4*	*2 (0)*	***68.5***	***67.8***	***63.4***	*35.1*	*32.6*	*29.3*	*23.0*	*23.9*
East Sydney	Bradfield Hwy†	2019	95.1	17 (0)	**170.3**	**95.8**	**84.0**	49.8	35.2	26.2	20.6	24.0
East Sydney	Bradfield Hwy†	2020	92.6	4 (0)	126.3	53.1	47.0	35.9	29.4	21.1	16.3	18.3
East Sydney	Bradfield Hwy	2021	97.5	0	46.0	35.3	31.6	25.5	22.4	18.3	14.0	14.6
East Sydney	Bradfield Hwy	2022	96.4	0	31.4	24.6	23.9	21.9	19.2	15.5	12.2	12.6
East Sydney	Cook and Phillip	2018	–	–	–	–	–	–	–	–	–	–
East Sydney	*Cook and Phillip#†*	*2019*	*24.9*	*13 (0)*	***116.8***	***113.9***	***104.9***	***84.3***	***66.8***	*35.0*	*22.0*	***29.6***
East Sydney	Cook and Phillip†	2020	86.9	4 (0)	**130.8**	**50.5**	39.2	30.5	25.1	18.0	14.0	15.7
East Sydney	Cook and Phillip	2021	84.7	0	36.9	30.1	29.4	24.4	20.0	16.6	12.9	13.4
East Sydney	Cook and Phillip	2022	95.9	0	24.5	21.4	19.8	18.1	15.8	12.7	9.3	9.9
East Sydney	Earlwood†	2018	98.6	5 (0)	**86.5**	**54.5**	39.5	34.0	29.4	23.5	18.4	19.8
East Sydney	Earlwood†	2019	98.4	17 (0)	**129.4**	**100.1**	**79.7**	48.9	36.6	26.5	19.2	23.0
East Sydney	Earlwood†	2020	99.5	9 (0)	**116.7**	**67.8**	**53.4**	34.7	29.4	21.8	15.8	18.5
East Sydney	Earlwood	2021	97.8	0	37.6	32.7	30.8	26.3	23.5	18.8	14.8	15.4

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (50.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (25.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
East Sydney	Earlwood	2022	98.4	0	25.8	24.1	22.9	20.6	18.0	15.6	12.7	12.9
East Sydney	Macq. Park†	2018	98.4	4 (0)	**85.6**	**52.8**	44.5	29.9	27.1	20.7	15.3	17.2
East Sydney	Macq. Park†	2019	98.6	16 (0)	**187.3**	**94.1**	**78.1**	46.2	32.9	22.7	15.1	19.9
East Sydney	Macq. Park†	2020	98.9	7 (0)	**146.7**	**62.0**	**51.2**	33.5	24.9	17.0	13.3	15.7
East Sydney	Macq. Park†	2021	96.4	2 (0)	**125.2**	29.5	27.0	22.2	19.5	15.3	12.3	13.2
East Sydney	Macq. Park	2022	95.9	0	25.9	23.8	22.0	18.5	16.6	13.3	10.9	11.4
East Sydney	Randwick†	2018	98.4	5 (0)	**95.5**	60.1	44.8	36.0	32.1	25.0	19.7	21.2
East Sydney	Randwick†	2019	97.5	19 (0)	**127.7**	**89.7**	**79.2**	**52.8**	38.6	28.3	20.1	24.1
East Sydney	Randwick†	2020	99.2	9 (0)	**137.3**	**67.0**	**59.2**	37.5	30.9	22.9	16.6	19.5
East Sydney	Randwick	2021	97.5	0	37.6	32.5	31.1	27.4	24.8	19.9	15.8	16.3
East Sydney	Randwick	2022	99.2	0	37.4	30.1	28.6	24.7	21.8	17.5	13.8	14.6
East Sydney	*Rozelle#†*	*2018*	*70.4*	*2 (0)*	***88.3***	*49.9*	*34.4*	*31.3*	*27.5*	*22.5*	*16.8*	*18.4*
East Sydney	Rozelle†	2019	96.7	18 (0)	**142.7**	**89.7**	**76.7**	**50.1**	35.9	26.5	18.6	22.7
East Sydney	Rozelle†	2020	97.8	7 (0)	**113.5**	**67.7**	**50.9**	34.4	28.6	21.0	15.9	18.1
East Sydney	Rozelle†	2021	98.6	1 (0)	**52.6**	33.3	30.6	26.8	24.0	18.9	14.7	15.5
East Sydney	Rozelle	2022	95.1	0	28.5	25.8	24.6	21.3	18.3	15.6	12.1	12.9
CW Sydney	Chullora†	2018	98.1	7 (0)	**90.7**	**60.5**	**50.6**	40.3	32.5	26.0	20.3	21.9
CW Sydney	Chullora†	2019	98.4	20 (0)	**140.4**	**103.1**	**89.7**	**53.4**	39.5	27.4	20.3	24.6
CW Sydney	Chullora†	2020	98.6	7 (0)	**167.9**	**66.9**	**52.8**	37.7	31.8	23.9	17.6	20.5
CW Sydney	Chullora	2021	98.1	0	40.3	37.2	33.3	28.3	24.2	19.5	15.3	16.5
CW Sydney	Chullora	2022	82.5	0	29.6	26.9	24.4	22.6	19.2	16.1	13.1	13.6
CW Sydney	Lidcombe	2018	–	–	–	–	–	–	–	–	–	–

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (50.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (25.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
CW Sydney	Lidcombe	2019	–	–	–	–	–	–	–	–	–	–
CW Sydney	Lidcombe	2020	76.0	0	42.0	38.9	33.5	28.6	24.9	19.7	15.5	16.1
CW Sydney	Lidcombe	2021	98.6	0	39.2	36.2	32.5	27.2	24.6	18.8	14.6	15.7
CW Sydney	Lidcombe	2022	99.2	0	27.9	27.3	25.2	21.7	18.8	15.7	12.7	13.3
CW Sydney	Parramatta Nth†	2018	97.3	8 (0)	**107.4**	**63.8**	**52.2**	39.2	33.1	26.2	20.1	21.6
CW Sydney	Parramatta Nth†	2019	99.5	22 (0)	**195.3**	**126.1**	**92.8**	**59.3**	40.9	29.6	20.3	**25.5**
CW Sydney	Parramatta Nth†	2020	99.5	9 (0)	**188.9**	**71.8**	**54.6**	37.7	30.4	21.8	16.5	19.3
CW Sydney	Parramatta Nth	2021	99.5	0	42.5	38.3	37.0	32.0	26.8	21.0	15.5	17.1
CW Sydney	Parramatta Nth	2022	99.2	0	42.7	27.5	25.8	22.5	20.2	16.9	13.6	14.1
CW Sydney	Prospect†	2018	99.5	8 (0)	**113.3**	**62.0**	**54.9**	37.5	33.4	25.8	20.2	21.9
CW Sydney	Prospect†	2019	99.2	25 (0)	**182.8**	**129.1**	**93.4**	**63.5**	41.1	29.9	20.4	26.0
CW Sydney	Prospect†	2020	99.5	10 (0)	**245.8**	**81.5**	**59.4**	40.3	31.7	23.0	16.8	20.2
CW Sydney	Prospect	2021	99.2	0	44.6	41.2	37.4	32.3	28.1	21.1	16.0	17.2
CW Sydney	Prospect	2022	89.3	0	29.2	26.6	25.3	22.9	19.9	16.1	13.3	13.4
CW Sydney	Rouse Hill	2018	–	–	–	–	–	–	–	–	–	–
CW Sydney	*Rouse Hill#†*	*2019*	*59.5*	*24 (0)*	***216.2***	***165.2***	***125.7***	***86.3***	***59.2***	*31.0*	*18.2*	***27.3***
CW Sydney	Rouse Hill†	2020	98.6	**10 (1)**	**220.3**	**80.2**	**55.3**	36.2	29.1	20.6	14.8	18.3
CW Sydney	Rouse Hill†	2021	98.4	**1 (1)**	**51.6**	40.9	33.7	27.0	23.0	18.8	13.9	15.0
CW Sydney	Rouse Hill	2022	99.5	0	23.8	22.5	21.9	19.3	16.9	14.3	11.2	11.8
SW Sydney	Bargo†	2018	98.1	4 (0)	**60.8**	**53.7**	47.5	33.6	28.0	21.3	14.5	16.9
SW Sydney	Bargo†	2019	98.1	21 (0)	**188.9**	**129.5**	**96.5**	**54.4**	36.3	23.9	15.4	21.2
SW Sydney	Bargo†	2020	97.3	6 (0)	**265.7**	**135.2**	47.3	31.5	25.3	17.6	12.2	16.0

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (50.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (25.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
SW Sydney	Bargo†	2021	98.1	1 (0)	**63.9**	30.3	24.7	21.5	18.9	14.7	10.9	11.8
SW Sydney	Bargo	2022	98.6	0	25.4	20.3	18.7	16.7	15.2	12.0	9.3	9.9
SW Sydney	Bringelly†	2018	98.4	8 (0)	**92.9**	**62.2**	**56.5**	38.1	32.7	26.5	19.5	21.3
SW Sydney	Bringelly†	2019	98.6	24 (0)	**134.0**	**112.3**	**87.7**	**63.9**	39.9	27.5	18.8	23.6
SW Sydney	Bringelly†	2020	98.9	11 (0)	**241.8**	**82.3**	**63.1**	37.7	30.8	21.6	14.6	18.3
SW Sydney	Bringelly†	2021	98.4	1 (0)	**69.0**	33.7	30.8	27.3	24.5	19.4	14.2	15.3
SW Sydney	Bringelly	2022	98.4	0	28.7	26.4	23.9	21.1	18.8	14.9	11.4	12.1
SW Sydney	Camden†	2018	99.5	6 (0)	**68.1**	**54.9**	45.6	31.5	27.6	22.5	15.3	17.5
SW Sydney	Camden†	2019	97.0	27 (0)	**139.2**	**120.2**	**108.6**	**68.7**	41.0	25.1	16.0	22.5
SW Sydney	Camden†	2020	97.0	9 (0)	**268.6**	**88.4**	**64.7**	35.1	26.0	18.0	12.8	16.6
SW Sydney	Camden†	2021	99.5	1 (0)	**66.2**	29.1	27.6	24.2	20.4	15.9	12.1	13.0
SW Sydney	Camden	2022	98.6	0	24.2	20.9	19.4	17.4	15.2	12.6	9.3	10.1
SW Sydney	Campbelltown W†	2018	97.8	3 (0)	**72.3**	49.4	44.1	31.6	28.8	22.5	15.8	17.9
SW Sydney	Campbelltown W†	2019	98.1	24 (0)	**132.0**	**116.6**	**94.0**	**60.5**	37.5	25.4	16.9	22.3
SW Sydney	Campbelltown W†	2020	99.5	10 (0)	**249.7**	**85.1**	**60.3**	33.9	27.4	18.9	13.4	17.0
SW Sydney	Campbelltown W†	2021	98.9	3 (0)	**111.9**	36.0	29.2	24.1	20.2	16.3	12.6	13.8
SW Sydney	Campbelltown W	2022	96.4	0	30.2	22.0	21.5	18.6	16.2	13.6	10.6	11.3
SW Sydney	Liverpool†	2018	98.4	**13 (2)**	**101.5**	**61.9**	**58.0**	43.7	37.5	29.3	23.2	24.2

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (50.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (25.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
SW Sydney	Liverpool†	2019	98.9	**28 (1)**	**178.9**	**128.5**	**93.0**	**61.0**	43.9	31.4	23.2	**27.7**
SW Sydney	Liverpool†	2020	96.2	**7 (2)**	**195.1**	**71.3**	**51.1**	38.6	32.7	24.7	18.3	20.8
SW Sydney	Liverpool†	2021	99.5	**4 (1)**	**82.8**	**51.1**	40.2	32.8	27.9	21.9	16.7	18.1
SW Sydney	Liverpool	2022	98.6	0	36.1	28.8	26.9	24.4	21.8	17.5	14.0	14.6
SW Sydney	Oakdale†	2018	99.2	**5 (1)**	**105.1**	**53.4**	42.9	28.1	25.4	19.4	12.8	15.4
SW Sydney	Oakdale†	2019	97.0	**28 (1)**	**216.8**	**168.3**	**143.1**	**81.5**	39.5	22.4	12.9	22.4
SW Sydney	Oakdale†	2020	99.2	10 (0)	**248.9**	**85.1**	**74.0**	32.2	22.6	15.3	9.9	14.4
SW Sydney	Oakdale†	2021	97.5	1 (0)	**73.2**	26.1	22.3	20.2	17.8	13.0	9.6	10.6
SW Sydney	Oakdale	2022	98.9	0	22.8	19.4	18.0	16.1	14.1	10.6	7.9	8.8
NW Sydney	Penrith	2018	–	–	–	–	–	–	–	–	–	–
NW Sydney	Penrith	2019	–	–	–	–	–	–	–	–	–	–
NW Sydney	*Penrith#*	*2020*	*48.6*	*0*	*38.1*	*38.0*	*37.5*	*30.2*	*25.7*	*20.6*	*15.2*	*15.9*
NW Sydney	Penrith†	2021	95.6	2 (0)	**73.5**	38.2	32.8	29.2	25.7	20.6	15.5	16.7
NW Sydney	Penrith	2022	99.2	0	30.5	28.1	24.0	22.3	19.7	16.5	13.5	13.8
NW Sydney	Richmond†	2018	96.2	8 (0)	**116.3**	**64.7**	**52.7**	34.7	29.0	22.7	16.6	18.7
NW Sydney	Richmond†	2019	98.1	28 (0)	**193.4**	**123.2**	**101.5**	**65.4**	43.8	26.8	17.4	24.2
NW Sydney	Richmond†	2020	93.7	9 (0)	**237.7**	**79.9**	**60.9**	35.6	26.8	18.4	13.3	17.0
NW Sydney	Richmond†	2021	95.6	1 (0)	**54.0**	30.3	27.3	23.8	21.5	17.1	12.5	13.6
NW Sydney	Richmond	2022	97.0	0	24.5	20.9	19.9	17.4	15.4	12.2	9.9	10.3
NW Sydney	St Marys†	2018	78.1	2 (0)	**100.5**	46.1	37.1	34.1	29.8	23.8	18.0	19.4
NW Sydney	St Marys†	2019	98.4	26 (0)	**159.8**	**119.8**	**90.2**	**65.2**	43.3	29.7	19.5	24.6

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (50.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (25.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
NW Sydney	St Marys†	2020	99.2	11 (0)	**260.3**	**89.6**	**66.4**	39.4	31.0	21.3	14.6	18.9
NW Sydney	St Marys†	2021	96.2	1 (0)	**54.9**	36.1	35.5	31.6	26.5	20.2	14.5	16.2
NW Sydney	St Marys	2022	97.8	0	29.7	26.6	23.8	20.7	18.0	14.8	11.7	12.0
Illawarra	Albion Park Sth†	2018	98.9	2 (0)	**94.4**	49.8	43.5	35.0	30.3	21.8	15.6	17.8
Illawarra	Albion Park Sth†	2019	92.9	14 (0)	**104.3**	**73.9**	**65.1**	44.1	35.9	23.3	16.1	19.5
Illawarra	Albion Park Sth†	2020	98.1	10 (0)	**153.3**	**90.8**	**64.8**	35.4	28.2	19.8	13.7	17.1
Illawarra	Albion Park Sth	2021	98.1	0	39.4	33.1	28.0	23.4	20.6	16.1	12.1	13.1
Illawarra	Albion Park Sth	2022	98.6	0	29.9	25.5	23.0	21.1	17.6	13.4	9.9	10.9
Illawarra	Kembla Grange†	2018	96.7	**10 (3)**	**71.8**	**64.9**	**54.1**	44.9	39.2	28.9	20.3	22.7
Illawarra	Kembla Grange†	2019	93.4	**21 (10)**	**115.8**	**89.4**	**78.2**	**55.1**	44.8	32.5	21.1	**25.5**
Illawarra	Kembla Grange†	2020	97.3	**19 (7)**	**187.7**	**94.6**	**73.4**	**52.0**	37.7	25.6	16.3	21.5
Illawarra	Kembla Grange†	2021	98.4	1 (0)	**62.3**	40.6	38.4	34.5	29.5	21.6	15.9	17.6
Illawarra	Kembla Grange	2022	98.9	0	43.8	37.7	30.8	25.6	22.5	18.0	13.5	14.5
Illawarra	Wollongong†	2018	98.1	5 (0)	**59.7**	**53.2**	46.4	39.7	32.6	24.4	17.8	19.8
Illawarra	Wollongong†	2019	88.5	17 (0)	**117.6**	**91.2**	**75.8**	**51.7**	40.7	27.0	17.5	22.6
Illawarra	Wollongong†	2020	95.9	11 (0)	**121.6**	**82.5**	**63.6**	39.2	33.1	22.2	15.0	18.8
Illawarra	Wollongong	2021	98.4	0	43.2	40.2	32.8	26.8	23.8	19.7	13.7	15.1
Illawarra	Wollongong	2022	97.5	0	45.4	31.8	30.1	26.1	23.4	18.4	12.8	14.3
C Coast	Wyong†	2018	98.9	6 (0)	**138.3**	**66.9**	48.0	30.9	27.1	21.7	16.0	18.0
C Coast	Wyong†	2019	97.5	19 (0)	**128.4**	**99.8**	**85.6**	**52.8**	35.6	24.4	16.1	21.1
C Coast	Wyong†	2020	99.2	5 (0)	**90.5**	**59.8**	46.8	36.2	28.4	18.6	13.3	15.9

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (50.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (25.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
C Coast	Wyong	2021	98.4	0	44.9	34.6	28.5	23.7	21.5	16.9	12.2	13.5
C Coast	Wyong	2022	95.3	0	27.4	26.1	23.2	19.9	17.5	14.4	11.0	11.7
Lake Macq.	Morisset	2018	–	–	–	–	–	–	–	–	–	–
Lake Macq.	Morisset	2019	–	–	–	–	–	–	–	–	–	–
Lake Macq.	Morisset*	2020	–	–	–	–	–	–	–	–	–	–
Lake Macq.	Morisset	2021	96.2	0	28.5	23.6	21.2	17.4	16.2	12.3	8.8	9.6
Lake Macq.	Morisset	2022	94.8	0	21.2	19.1	18.0	15.2	13.0	10.2	7.5	7.9
L Hunter	Beresfield†	2018	99.5	8 (0)	**149.1**	**65.2**	**54.5**	37.6	32.8	25.3	19.5	21.6
L Hunter	Beresfield†	2019	98.6	30 (0)	**136.7**	**106.2**	**84.1**	**63.7**	40.7	29.6	21.0	**25.9**
L Hunter	Beresfield†	2020	99.2	6 (0)	**77.7**	**55.0**	46.7	37.1	29.7	22.2	16.3	18.5
L Hunter	Beresfield	2021	99.5	0	36.3	31.8	30.4	26.9	23.6	19.4	15.4	15.9
L Hunter	Beresfield	2022	98.4	0	26.2	25.2	23.8	21.4	19.9	17.2	14.0	14.3
L Hunter	Newcastle†	2018	98.6	8 (0)	**146.0**	**62.9**	**51.8**	41.7	35.1	28.2	23.1	24.5
L Hunter	Newcastle†	2019	98.4	29 (0)	**125.8**	**107.0**	**86.1**	**62.7**	46.3	33.9	23.7	**28.4**
L Hunter	Newcastle†	2020	97.8	9 (0)	**116.2**	**75.3**	**52.2**	43.4	34.1	27.1	20.5	22.4
L Hunter	Newcastle	2021	98.4	0	44.3	38.1	36.0	29.6	27.5	23.8	18.7	19.2
L Hunter	Newcastle	2022	98.9	0	43.7	36.4	34.7	30.2	26.0	21.6	16.6	17.5
L Hunter	Wallsend†	2018	94.8	5 (0)	**136.5**	**57.2**	45.3	33.8	28.6	21.9	17.8	19.4
L Hunter	Wallsend†	2019	95.3	21 (0)	**127.9**	**86.4**	**74.8**	**55.5**	38.3	26.3	18.7	22.9
L Hunter	Wallsend†	2020	99.2	6 (0)	**77.9**	**65.4**	44.0	34.7	28.7	20.5	15.5	17.7
L Hunter	Wallsend	2021	96.7	0	33.0	27.8	25.9	22.9	21.2	17.9	14.3	14.7
L Hunter	Wallsend	2022	97.8	0	27.0	25.6	23.4	19.3	17.5	14.7	12.2	12.7

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (50.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (25.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
U Hunter	Aberdeen†	2018	99.5	7 (0)	**178.9**	**63.2**	49.2	38.6	34.1	26.9	20.0	22.3
U Hunter	Aberdeen†	2019	99.5	**51 (2)**	**246.7**	**105.1**	**100.9**	**73.2**	**57.1**	32.7	22.7	**29.5**
U Hunter	Aberdeen†	2020	99.5	8 (0)	**267.7**	**78.0**	**53.5**	38.6	31.5	19.8	14.3	17.8
U Hunter	Aberdeen	2021	99.2	0	33.2	28.5	25.7	21.4	19.5	15.9	12.2	12.9
U Hunter	Aberdeen	2022	97.8	0	32.1	24.0	22.3	19.5	18.3	14.9	11.7	12.3
U Hunter	Merriwa†	2018	98.6	6 (0)	**197.1**	**65.5**	49.3	36.6	30.9	22.8	16.3	19.2
U Hunter	Merriwa†	2019	97.3	47 (0)	**302.1**	**131.6**	**114.0**	**86.5**	**59.4**	30.0	18.4	**27.9**
U Hunter	Merriwa†	2020	97.5	12 (0)	**620.7**	**85.6**	**71.8**	44.2	31.3	18.7	12.5	18.2
U Hunter	Merriwa	2021	95.6	0	35.4	30.8	27.3	22.2	18.5	15.0	10.6	11.7
U Hunter	Merriwa	2022	93.2	0	27.4	23.4	22.1	19.5	18.1	14.1	10.4	11.2
U Hunter	Muswellbrook†	2018	98.1	**13 (4)**	**185.9**	**71.7**	**56.7**	48.5	40.7	32.3	24.5	**27.2**
U Hunter	Muswellbrook†	2019	99.2	**58 (3)**	**231.3**	**114.3**	**108.8**	**84.3**	**60.2**	39.6	28.7	**34.4**
U Hunter	Muswellbrook†	2020	98.9	**15 (1)**	**181.0**	**83.0**	**58.2**	44.7	35.4	25.7	19.3	22.5
U Hunter	Muswellbrook	2021	99.2	0	43.5	37.3	33.3	30.2	26.3	22.4	17.6	18.2
U Hunter	Muswellbrook	2022	98.6	0	37.1	29.0	27.8	26.2	24.3	20.2	15.9	16.6
U Hunter	Singleton†	2018	99.2	10 (0)	**198.0**	**71.7**	**58.7**	43.9	37.1	29.5	21.5	24.0
U Hunter	Singleton†	2019	98.9	**40 (3)**	**206.1**	**117.5**	**103.8**	**78.3**	**52.9**	34.6	24.5	**30.1**
U Hunter	Singleton†	2020	99.5	**10 (1)**	**82.4**	**65.3**	**55.7**	42.6	34.3	25.8	17.7	20.5
U Hunter	Singleton†	2021	99.2	1 (0)	**58.2**	36.9	35.8	31.0	27.4	21.4	16.5	17.5
U Hunter	Singleton	2022	99.2	0	34.5	29.4	27.3	23.7	21.6	17.9	13.6	14.5
C Tablelands	Bathurst†	2018	98.4	8 (0)	**274.1**	**86.1**	**66.4**	38.9	32.6	21.7	15.1	18.8

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (50.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (25.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
C Tablelands	Bathurst†	2019	99.2	40 (0)	**296.6**	**201.0**	**159.0**	**103.0**	**51.7**	26.0	16.0	**27.4**
C Tablelands	Bathurst†	2020	98.4	14 (0)	**320.4**	**185.2**	**76.9**	45.1	26.7	16.2	11.0	17.0
C Tablelands	Bathurst	2021	96.4	0	29.2	28.1	27.4	21.9	18.5	13.7	10.1	11.3
C Tablelands	Bathurst	2022	99.2	0	23.2	18.9	16.0	14.5	12.4	10.6	8.3	8.8
C Tablelands	Orange	2018	–	–	–	–	–	–	–	–	–	–
C Tablelands	Orange†	2019	94.0	**35 (1)**	**423.7**	**236.1**	**174.6**	**90.8**	**50.8**	27.4	18.4	**28.3**
C Tablelands	Orange†	2020	97.0	12 (0)	**291.8**	**130.3**	**75.1**	42.7	29.7	20.1	12.8	17.9
C Tablelands	Orange	2021	99.2	0	46.3	32.0	30.1	25.6	20.9	15.1	10.1	11.4
C Tablelands	Orange	2022	97.8	0	43.1	31.0	24.8	17.9	14.4	10.8	7.4	8.6
NW Slopes	Gunnedah†	2018	98.1	10 (0)	**234.9**	**92.4**	**70.2**	37.7	32.2	21.9	14.5	18.9
NW Slopes	Gunnedah†	2019	91.8	30 (0)	**205.2**	**123.6**	**102.5**	**72.5**	41.8	27.6	18.9	24.8
NW Slopes	Gunnedah†	2020	95.1	3 (0)	**101.2**	**52.8**	38.5	28.0	23.8	17.5	12.0	13.9
NW Slopes	Gunnedah	2021	86.8	0	42.7	26.5	24.6	21.1	18.6	13.8	10.3	11.2
NW Slopes	*Gunnedah#*	*2022*	*72.9*	*0*	*36.4*	*32.3*	*28.8*	*24.3*	*17.8*	*12.7*	*10.2*	*11.2*
NW Slopes	Narrabri†	2018	98.9	10 (0)	**221.7**	**103.3**	**65.5**	26.9	21.7	14.9	11.0	14.3
NW Slopes	Narrabri†	2019	98.6	31 (0)	**232.6**	**156.4**	**128.8**	**79.5**	46.2	23.6	13.9	23.2
NW Slopes	Narrabri†	2020	98.1	8 (0)	**119.6**	**80.3**	**65.3**	30.9	20.5	13.0	9.1	12.4
NW Slopes	Narrabri	2021	84.4	0	36.4	20.6	16.0	12.3	11.0	8.6	6.7	7.0
NW Slopes	Narrabri	2022	92.6	0	17.0	14.7	13.3	11.5	10.1	8.2	6.2	6.7
NW Slopes	Tamworth†	2018	99.2	9 (0)	**145.4**	**95.2**	**61.1**	37.7	31.2	23.8	17.0	20.1
NW Slopes	Tamworth†	2019	98.9	52 (0)	**240.2**	**199.1**	**169.2**	**111.1**	**67.7**	33.2	22.7	**33.7**
NW Slopes	Tamworth†	2020	98.6	8 (0)	**178.0**	**99.8**	**53.3**	34.6	24.8	18.6	13.4	16.8

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (50.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (25.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
NW Slopes	Tamworth	2021	99.2	0	36.4	25.1	23.6	20.8	19.0	15.8	12.1	12.7
NW Slopes	Tamworth	2022	99.5	0	23.3	19.9	19.2	17.8	15.7	12.5	10.1	10.6
N Tablelands	*Armidale*#†	*2018*	*70.7*	*3 (0)*	***157.5***	***95.9***	*44.8*	*39.6*	*35.4*	*24.2*	*13.4*	*17.6*
N Tablelands	Armidale†	2019	92.3	41 (0)	**309.7**	**187.1**	**134.2**	**106.0**	**58.9**	31.0	17.3	**27.9**
N Tablelands	Armidale†	2020	99.2	**4 (1)**	**112.5**	**50.5**	42.5	34.7	28.3	17.8	10.5	13.7
N Tablelands	Armidale	2021	99.5	0	41.0	27.2	26.9	22.8	21.0	14.6	8.4	10.4
N Tablelands	Armidale†	2022	98.6	**1 (1)**	**50.6**	38.7	34.9	24.3	18.8	11.3	7.6	9.7
Mid Nth Coast	Coffs Harbour	2018	–	–	–	–	–	–	–	–	–	–
Mid Nth Coast	*Coffs Harbour*#†	*2019*	*10.7*	*11 (0)*	***134.3***	***134.3***	***133.6***	***125.8***	***96.2***	***54.2***	*34.3*	***42.6***
Mid Nth Coast	Coffs Harbour†	2020	96.4	2 (0)	**65.2**	32.4	28.4	24.0	19.1	14.4	10.1	11.9
Mid Nth Coast	Coffs Harbour	2021	92.9	0	26.0	23.9	22.0	18.0	15.0	11.7	9.5	10.0
Mid Nth Coast	Coffs Harbour	2022	92.9	0	32.1	20.1	17.6	15.1	13.4	11.0	8.9	9.3
Mid Nth Coast	Port Macq.	2018	–	–	–	–	–	–	–	–	–	–
Mid Nth Coast	*Port Macq.*#†	*2019*	*40.3*	*45 (0)*	***480.5***	***374.6***	***249.5***	***151.1***	***85.7***	***54.0***	*31.0*	***47.8***
Mid Nth Coast	Port Macq.†	2020	92.1	5 (0)	**249.9**	**66.8**	39.6	28.4	23.7	16.9	11.5	14.4
Mid Nth Coast	Port Macq.	2021	92.9	0	31.9	24.8	21.6	19.0	16.3	13.4	10.1	10.8
Mid Nth Coast	Port Macq.	2022	91.2	0	31.5	24.3	20.0	17.8	15.8	11.1	8.0	9.1
SW Slopes	Albury†	2018	95.6	**7 (1)**	**107.8**	**61.6**	50.0	40.8	33.6	24.3	16.4	19.8
SW Slopes	Albury†	2019	98.6	**25 (2)**	**222.4**	**134.1**	**83.1**	**56.3**	43.0	26.1	16.5	23.4
SW Slopes	Albury†	2020	97.5	**19 (1)**	**298.3**	**181.1**	**116.4**	**51.2**	27.1	18.9	14.0	20.1
SW Slopes	Albury†	2021	98.6	**1 (1)**	**52.3**	35.8	32.1	28.8	25.0	17.3	13.0	14.3
SW Slopes	Albury	2022	93.7	0	46.7	28.5	26.2	21.0	17.7	14.2	10.6	11.7

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (50.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (25.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
SW Slopes	Wagga Wagga Nth†	2018	97.0	**34 (22)**	**127.2**	**110.8**	**82.2**	**59.8**	49.1	36.4	22.5	**27.4**
SW Slopes	Wagga Wagga Nth†	2019	94.8	**63 (24)**	**251.7**	**206.4**	**142.5**	**103.2**	69.3	42.9	24.4	**35.3**
SW Slopes	Wagga Wagga Nth†	2020	98.4	**25 (5)**	**295.3**	**140.4**	**96.3**	**59.5**	41.6	24.8	16.8	23.2
SW Slopes	Wagga Wagga Nth†	2021	98.4	**7 (7)**	**69.1**	**59.5**	**50.2**	38.3	32.5	23.2	14.5	17.7
SW Slopes	Wagga Wagga Nth	2022	98.9	0	46.8	39.2	32.1	27.3	21.5	15.5	11.3	13.1
S Tablelands	Goulburn	2018	–	–	–	–	–	–	–	–	–	–
S Tablelands	*Goulburn#†*	*2019*	*14.8*	*24 (0)*	***494.1***	***494.1***	***424.5***	***318.6***	***252.7***	***103.0***	*43.0*	***83.4***
S Tablelands	Goulburn†	2020	97.3	18 (0)	**556.7**	**263.9**	**139.1**	**50.2**	22.1	15.5	10.6	19.2
S Tablelands	Goulburn	2021	98.9	0	30.1	23.6	20.8	17.2	15.3	12.4	8.3	9.2
S Tablelands	Goulburn	2022	97.3	0	19.6	17.0	16.3	13.6	11.8	9.4	6.6	7.2

Particles as PM2.5

This section presents a 5-year statistical trend summary by station for the following AAQ NEPM standards applicable to PM2.5:

- 24-hour PM2.5 standard (25.0 µg/m^3).
- Annual PM2.5 standard (8.0 µg/m^3).

Exceptional event rule for PM2.5

Exceedances of the AAQ NEPM PM2.5 24-hour standard are classified into one of two event categories:

- Non-exceptional events (exceedances caused by local or regional dust events, or wood smoke from domestic wood heaters).
- Exceptional events (exceedances caused by continental-scale dust events, bushfires and jurisdiction authorised hazard reduction burning).

Event days that are deemed exceptional are allowable under the AAQ NEPM goal, while non-exceptional days are not allowed.

Table 28 below presents the 5-year statistical trend summary for the 24-hour and annual PM2.5 standards from 2018 to 2022. Note that:

- Where shown, the number in brackets () next to the overall PM2.5 exceedance total is the number of non-exceptional event days recorded at that station during a particular year. Both numbers are given in bold. For example, **7 (3)** indicates there were 7 total exceedance days at that station, while 3 of these were non-exceptional events. As non-exceptional events were observed, the station did not meet the PM2.5 1-day standard for that year, and these numbers are written in bold as a result. These entries are marked with a dagger (†).
- Exceedance days that are not written in bold and have a 0 in brackets (0) next to the total indicate all exceedances were considered exceptional events, meaning the station met the PM2.5 1-day standard for that year.
- Stations whose entries are italicised indicate less than 75% of data was available for that year and are marked with a hash (#).
- Exceedances will be in bold if the maximum 1-day average exceeds the standard, irrespective of whether the exceedance is exceptional or non-exceptional in nature. Entries where the 1-year average exceeds the standard are also given in bold. These entries are marked with a dagger (†).
- While stations with less than 15% of data availability are usually excluded, stations that recorded both less than 15% of data and at least one exceedance are reported below. These entries are marked with an asterisk (*).

A note on PM2.5 monitoring methods

The current USEPA-approved (United States Environmental Protection Agency) method for PM2.5 compliance monitoring (also known as the Federal Reference Method, or FRM) is a non-continuous, one-day-in-three technique that requires pre- and post-

laboratory weighing. As this involves a substantial delay in acquiring and reporting data, the NSW Government uses continuous monitoring techniques (e.g. TEOM or BAM monitors) for near-real-time reporting of air quality. The latest AAQ NEPM update (2021) requires the reporting of all PM2.5 data measured using all relevant methods, including the compliance method (FRM) and the continuous monitoring technique used.

During 2012, NSW commenced a staggered phasing-out of continuous TEOM PM2.5 monitors, replacing them with the USEPA-equivalent method for PM2.5 continuous monitoring, namely beta attenuation monitors (BAMs). The BAM method differs from the TEOM in terms of sample treatment by using higher temperatures intermittently to reduce moisture levels in the sample stream. This technique is intended to promote less retention of volatile components absorbed into the fine particulate matter.

Table 29 **Statistical summary trend (5-year) by station for the maximum PM2.5 daily average AAQ NEPM standard (25.0 µg/m³) and annual average (8.0 µg/m³) from 2018 to 2022**

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (25.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (8.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
East Sydney	Alexandria	2018	–	–	–	–	–	–	–	–	–	–
East Sydney	Alexandria	2019	–	–	–	–	–	–	–	–	–	–
East Sydney	Alexandria	2020	–	–	–	–	–	–	–	–	–	–
East Sydney	*Alexandria*	*2021*	*17.0*	*0*	*19.2*	*19.2*	*16.7*	*13.1*	*11.3*	*8.1*	*6.1*	*6.6*
East Sydney	*Alexandria*	*2022*	*49.0*	*0*	*13.3*	*12.8*	*11.3*	*9.6*	*8.2*	*5.9*	*4.5*	*4.7*
East Sydney	*Bradfield Hwy#†*	*2018*	*21.1*	*1 (0)*	***26.3***	***26.1***	*24.8*	*20.7*	*18.9*	*15.8*	*12.1*	***12.9***
East Sydney	Bradfield Hwy†	2019	95.1	25 (0)	**145.8**	**66.4**	**52.8**	**33.4**	22.4	13.7	10.6	**13.2**
East Sydney	Bradfield Hwy†	2020	92.6	6 (0)	**109.1**	**37.4**	24.2	19.0	15.1	10.6	7.7	**9.1**
East Sydney	Bradfield Hwy†	2021	97.5	4 (0)	**40.7**	**26.5**	20.2	14.2	11.1	8.4	5.9	6.7
East Sydney	Bradfield Hwy	2022	96.4	0	16.1	14.8	12.5	10.4	8.8	7.0	5.2	5.4
East Sydney	Cook and Phillip	2018	–	–	–	–	–	–	–	–	–	–
East Sydney	*Cook and Phillip#†*	*2019*	*24.7*	*19 (0)*	***96.5***	***93.9***	***83.4***	***58.8***	***36.3***	*15.3*	*8.0*	***15.6***
East Sydney	Cook and Phillip†	2020	86.9	7 (0)	**112.5**	**35.2**	**25.8**	16.9	13.7	9.5	6.3	7.8
East Sydney	Cook and Phillip†	2021	84.1	1 (0)	**29.5**	19.5	16.5	13.0	10.9	8.3	6.0	6.4
East Sydney	Cook and Phillip	2022	95.9	0	14.0	12.0	9.8	8.2	7.3	5.4	3.9	4.3
East Sydney	Earlwood†	2018	97.0	1 (0)	**28.5**	21.9	19.1	16.0	13.2	9.8	7.0	7.8
East Sydney	Earlwood†	2019	95.6	22 (0)	**86.2**	**68.3**	**47.2**	**29.6**	17.5	11.5	7.7	**10.5**
East Sydney	Earlwood†	2020	97.3	9 (0)	**85.1**	**32.3**	**27.4**	18.8	14.7	9.5	6.1	8.0
East Sydney	Earlwood†	2021	96.7	3 (0)	**31.0**	**25.1**	20.6	14.6	11.2	7.6	5.5	6.6

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (25.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (8.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
East Sydney	Earlwood	2022	98.4	0	17.2	14.0	12.1	10.0	7.9	6.1	4.7	5.2
East Sydney	Macquarie Park†	2018	98.4	4 (0)	**58.4**	**27.8**	17.4	12.7	11.0	8.5	6.1	7.0
East Sydney	Macquarie Park†	2019	98.6	18 (0)	**152.0**	**61.9**	**42.7**	25.0	15.3	9.7	6.2	**9.2**
East Sydney	Macquarie Park†	2020	98.9	8 (0)	**77.8**	**34.4**	**29.6**	16.2	12.4	8.1	5.5	7.1
East Sydney	Macquarie Park†	2021	97.8	5 (0)	**213.1**	**70.3**	19.3	13.5	10.4	7.3	5.1	7.3
East Sydney	Macquarie Park	2022	98.1	0	17.6	11.3	9.2	7.8	6.8	5.4	4.2	4.4
East Sydney	Randwick†	2018	92.3	1 (0)	**31.8**	20.4	17.0	13.9	12.4	9.3	7.0	7.6
East Sydney	Randwick†	2019	91.0	18 (0)	**95.2**	**53.8**	**42.8**	**27.5**	16.7	11.1	8.6	**10.8**
East Sydney	Randwick†	2020	92.1	8 (0)	**114.8**	**36.2**	**27.7**	16.1	12.3	8.6	6.0	7.6
East Sydney	Randwick†	2021	95.9	1 (0)	**31.2**	19.6	16.6	12.7	9.6	7.6	5.9	6.4
East Sydney	Randwick	2022	96.2	0	14.6	11.2	10.1	8.8	7.5	6.0	4.6	4.9
East Sydney	*Rozelle#*	*2018*	*70.7*	*0*	*19.2*	*17.2*	*16.4*	*13.8*	*11.5*	*8.8*	*6.6*	*7.3*
East Sydney	Rozelle†	2019	95.6	21 (0)	**101.8**	**53.5**	**50.6**	**28.3**	16.4	11.2	7.8	**10.3**
East Sydney	Rozelle†	2020	98.4	8 (0)	**87.3**	**33.7**	**27.9**	18.0	13.6	8.8	5.9	7.5
East Sydney	Rozelle†	2021	98.6	3 (0)	**61.7**	24.8	19.3	13.4	10.1	7.3	5.4	6.3
East Sydney	Rozelle	2022	96.7	0	12.7	11.2	9.8	8.7	7.5	5.7	4.2	4.6
CW Sydney	Chullora†	2018	97.8	3 (0)	**29.1**	23.5	21.5	16.6	13.6	10.5	7.8	**8.6**
CW Sydney	Chullora†	2019	81.4	18 (0)	**97.6**	**71.5**	**53.6**	31.4	18.5	12.1	9.0	**11.7**
CW Sydney	Chullora†	2020	97.8	9 (0)	**86.2**	**36.2**	**30.3**	19.6	15.4	9.9	6.9	**8.8**
CW Sydney	Chullora†	2021	97.0	6 (0)	**33.7**	**30.0**	19.0	14.3	11.4	8.3	6.0	7.2
CW Sydney	*Chullora#*	*2022*	*72.3*	*0*	*13.1*	*12.2*	*11.6*	*9.6*	*8.5*	*6.8*	*5.2*	*5.6*

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (25.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (8.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
CW Sydney	Lidcombe	2018	–	–	–	–	–	–	–	–	–	–
CW Sydney	Lidcombe	2019	–	–	–	–	–	–	–	–	–	–
CW Sydney	*Lidcombe#*	*2020*	*69.1*	*0*	*22.9*	*19.6*	*18.1*	*15.0*	*12.4*	*8.4*	*6.0*	*6.9*
CW Sydney	Lidcombe†	2021	97.5	3 (0)	**31.5**	24.9	18.5	13.4	10.2	7.1	5.1	6.1
CW Sydney	Lidcombe	2022	98.9	0	14.0	11.0	10.3	8.8	7.3	5.8	4.5	4.7
CW Sydney	Parramatta Nth†	2018	95.1	4 (0)	**42.1**	**27.1**	22.0	17.6	14.4	10.8	8.3	**9.2**
CW Sydney	Parramatta Nth†	2019	99.5	21 (0)	**130.1**	**66.6**	**41.5**	**26.7**	17.5	11.3	7.5	**10.5**
CW Sydney	Parramatta Nth†	2020	96.2	10 (0)	**72.9**	**36.0**	**29.8**	20.7	14.7	9.3	6.5	**8.2**
CW Sydney	Parramatta Nth†	2021	98.9	3 (0)	**27.4**	23.2	18.9	14.6	12.2	7.9	5.4	6.6
CW Sydney	Parramatta Nth	2022	99.2	0	16.9	13.9	11.9	10.2	8.5	6.3	4.8	5.2
CW Sydney	Prospect†	2018	96.4	4 (0)	**47.5**	**27.0**	20.3	16.2	13.9	10.4	7.3	**8.5**
CW Sydney	Prospect†	2019	92.3	25 (0)	**134.1**	**72.7**	**51.5**	**33.9**	19.2	13.2	8.5	**11.9**
CW Sydney	Prospect†	2020	97.5	**13 (2)**	**70.8**	**37.9**	**30.9**	21.2	15.4	9.5	7.0	**8.6**
CW Sydney	Prospect†	2021	98.9	2 (0)	**37.3**	21.7	20.4	15.6	11.9	8.1	5.8	6.9
CW Sydney	Prospect	2022	89.3	0	18.2	13.0	11.7	10.2	8.3	6.5	5.0	5.3
CW Sydney	Rouse Hill	2018	–	–	–	–	–	–	–	–	–	–
CW Sydney	*Rouse Hill#†*	*2019*	*58.9*	*24 (0)*	***183.5***	***108.0***	***69.3***	***44.1***	***29.8***	*12.2*	*6.8*	***12.7***
CW Sydney	Rouse Hill†	2020	97.5	10 (0)	**61.3**	**37.4**	**26.9**	19.2	13.6	8.1	5.4	7.1
CW Sydney	Rouse Hill†	2021	98.1	4 (0)	**40.5**	**26.8**	17.1	13.2	10.3	7.0	5.0	5.9
CW Sydney	Rouse Hill	2022	99.5	0	14.8	12.2	9.6	8.2	7.2	5.7	4.3	4.6
SW Sydney	Bargo†	2018	97.3	2 (0)	**38.1**	20.7	16.1	12.2	10.6	8.4	6.0	6.8

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (25.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (8.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
SW Sydney	Bargo†	2019	95.3	21 (0)	**170.7**	**107.4**	**69.3**	**28.5**	16.0	9.7	6.4	**10.4**
SW Sydney	Bargo†	2020	94.8	14 (0)	**121.9**	**68.0**	**54.4**	19.2	11.2	8.0	5.0	7.8
SW Sydney	Bargo†	2021	97.0	4 (0)	**65.3**	**28.2**	14.5	9.8	7.9	6.3	4.5	5.3
SW Sydney	Bargo	2022	95.3	0	11.8	8.7	8.1	7.3	6.2	4.7	3.4	3.7
SW Sydney	Bringelly†	2018	98.9	4 (0)	**55.6**	**26.4**	18.5	15.5	13.0	9.8	7.2	8.0
SW Sydney	Bringelly†	2019	98.1	27 (0)	**178.0**	**67.2**	**55.2**	**35.4**	19.0	11.9	7.5	**11.3**
SW Sydney	Bringelly†	2020	95.9	12 (0)	**78.1**	**47.7**	**32.3**	20.7	14.3	10.2	6.8	**8.5**
SW Sydney	Bringelly†	2021	98.9	3 (0)	**57.4**	23.0	17.3	15.3	12.6	8.8	6.1	7.2
SW Sydney	Bringelly	2022	99.2	0	17.8	14.6	12.4	10.4	8.3	6.4	4.6	5.1
SW Sydney	Camden†	2018	98.6	2 (0)	**37.0**	20.6	19.0	14.2	11.4	8.9	6.6	7.2
SW Sydney	Camden†	2019	95.3	28 (0)	**155.3**	**111.6**	**66.9**	**41.6**	20.1	11.2	7.1	**11.8**
SW Sydney	Camden†	2020	97.8	11 (0)	**149.3**	**46.1**	**35.8**	18.5	12.9	8.2	5.5	7.7
SW Sydney	Camden†	2021	96.4	3 (0)	**66.7**	23.9	14.8	11.7	10.0	7.6	5.3	6.1
SW Sydney	Camden	2022	97.3	0	16.1	12.3	11.0	8.9	7.2	5.6	4.1	4.4
SW Sydney	Campbelltown W†	2018	93.4	2 (0)	**45.4**	21.5	18.2	15.3	13.6	10.2	7.5	**8.4**
SW Sydney	Campbelltown W†	2019	89.3	27 (0)	**106.0**	**82.2**	**63.9**	**38.1**	21.4	11.9	8.0	**11.8**
SW Sydney	Campbelltown W†	2020	98.4	12 (0)	**69.0**	**47.9**	**36.1**	17.4	13.1	8.6	5.4	7.5
SW Sydney	Campbelltown W†	2021	98.6	5 (0)	**99.9**	**31.6**	16.6	11.9	9.1	6.8	5.2	6.3

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (25.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (8.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
SW Sydney	Campbelltown W	2022	94.5	0	23.2	13.5	9.9	8.8	7.5	5.8	4.3	4.6
SW Sydney	Liverpool†	2018	97.3	8 (0)	**45.4**	**30.1**	**26.5**	18.6	16.7	12.9	9.1	**10.1**
SW Sydney	Liverpool†	2019	96.2	**32 (1)**	**156.0**	**84.4**	**60.9**	**34.0**	21.4	13.6	9.4	**12.8**
SW Sydney	Liverpool†	2020	94.8	**7 (1)**	**73.6**	**33.1**	**25.4**	20.8	16.8	11.2	7.5	**9.1**
SW Sydney	Liverpool†	2021	98.9	**6 (1)**	**52.2**	**32.7**	24.3	17.2	14.3	9.0	6.3	7.9
SW Sydney	Liverpool	2022	98.9	0	21.9	15.1	13.2	10.4	9.4	7.0	4.8	5.5
SW Sydney	Oakdale†	2018	95.3	2 (0)	**75.4**	20.6	16.6	12.5	10.6	8.1	6.0	6.9
SW Sydney	Oakdale†	2019	95.9	28 (0)	**250.2**	**158.6**	**124.0**	**55.5**	18.2	9.8	5.7	**13.2**
SW Sydney	Oakdale†	2020	97.3	11 (0)	**161.6**	**60.7**	**41.8**	16.2	9.7	6.4	4.6	6.7
SW Sydney	Oakdale†	2021	97.8	1 (0)	**100.0**	14.3	10.9	7.8	6.8	5.2	3.8	4.5
SW Sydney	Oakdale	2022	98.6	0	16.6	9.0	8.3	6.4	5.6	4.3	3.3	3.5
NW Sydney	Penrith	2018	–	–	–	–	–	–	–	–	–	–
NW Sydney	Penrith	2019	–	–	–	–	–	–	–	–	–	–
NW Sydney	*Penrith#*	*2020*	*45.4*	*0*	*24.2*	*19.3*	*17.5*	*15.1*	*12.9*	*9.7*	*6.7*	*7.4*
NW Sydney	Penrith†	2021	99.5	4 (0)	**72.5**	**26.0**	20.7	17.2	14.9	9.3	6.6	7.9
NW Sydney	Penrith	2022	98.9	0	22.2	20.8	13.9	10.7	9.2	7.2	5.3	5.8
NW Sydney	Richmond†	2018	95.1	4 (0)	**123.9**	**38.4**	19.7	14.9	12.6	9.5	6.8	**8.1**
NW Sydney	Richmond†	2019	86.6	32 (0)	**141.2**	**83.8**	**61.4**	**43.7**	**26.2**	12.9	8.7	**13.1**
NW Sydney	Richmond†	2020	91.5	9 (0)	**93.0**	**45.7**	**29.3**	19.9	13.9	10.2	6.8	**8.4**
NW Sydney	Richmond†	2021	98.4	4 (0)	**44.1**	**25.5**	18.1	15.1	12.3	8.2	5.7	6.8
NW Sydney	Richmond	2022	95.3	0	15.7	13.9	11.5	9.3	7.8	6.1	4.4	4.8

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (25.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (8.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
NW Sydney	St Marys†	2018	93.7	3 (0)	**80.5**	25.0	15.9	13.3	11.3	9.3	7.2	7.8
NW Sydney	St Marys†	2019	97.3	21 (0)	**88.3**	**64.8**	**40.9**	**29.2**	16.4	10.8	7.2	**9.8**
NW Sydney	St Marys†	2020	89.1	9 (0)	**82.5**	**39.0**	**27.2**	16.3	11.1	8.8	6.2	7.6
NW Sydney	St Marys†	2021	95.6	1 (0)	**40.3**	19.3	14.8	12.3	9.5	7.0	5.1	5.8
NW Sydney	St Marys	2022	98.1	0	12.6	10.6	8.7	7.7	6.3	4.8	3.6	3.9
Illawarra	Albion Park Sth†	2018	95.9	1 (0)	**29.4**	18.4	16.2	13.6	11.0	8.2	6.1	6.8
Illawarra	Albion Park Sth†	2019	92.9	12 (0)	**49.4**	**39.1**	**33.6**	20.2	15.0	10.0	6.9	**8.6**
Illawarra	Albion Park Sth†	2020	99.2	10 (0)	**96.3**	**51.5**	**36.0**	16.8	10.7	7.3	4.9	6.8
Illawarra	Albion Park Sth	2021	97.5	0	23.3	12.7	12.1	8.9	7.8	6.0	4.2	4.8
Illawarra	Albion Park Sth	2022	98.6	0	13.6	9.8	8.9	7.8	6.3	4.7	3.5	3.8
Illawarra	Kembla Grange	2018	97.3	0	21.9	17.8	15.8	13.4	11.3	8.6	6.7	7.0
Illawarra	Kembla Grange†	2019	95.9	12 (0)	**70.1**	**47.7**	**38.9**	21.8	15.3	9.9	6.4	**8.8**
Illawarra	Kembla Grange†	2020	95.9	11 (0)	**100.4**	**47.1**	**40.1**	17.6	11.7	7.1	4.9	7.0
Illawarra	Kembla Grange	2021	98.6	0	23.5	16.0	11.4	9.8	8.1	6.3	4.6	5.1
Illawarra	Kembla Grange	2022	97.0	0	12.2	10.1	9.4	7.5	6.4	5.0	3.5	4.0
Illawarra	Wollongong†	2018	96.2	3 (0)	**47.6**	22.3	16.6	13.6	11.9	8.9	6.5	7.3
Illawarra	Wollongong†	2019	97.8	14 (0)	**81.5**	**50.9**	**36.5**	22.9	15.5	10.1	6.6	**9.0**
Illawarra	Wollongong†	2020	84.4	10 (0)	**100.9**	**46.8**	**40.9**	17.1	13.1	8.3	5.9	7.8
Illawarra	Wollongong	2021	96.4	0	23.4	13.9	13.0	10.5	8.9	7.2	5.3	5.7
Illawarra	Wollongong	2022	98.4	0	13.2	10.8	10.5	8.9	7.7	6.0	4.2	4.7
C Coast	Wyong	2018	91.5	0	18.1	16.5	14.3	12.0	10.5	8.2	6.3	6.8
C Coast	Wyong†	2019	92.9	23 (0)	**202.1**	**72.5**	**51.8**	**27.2**	15.4	10.0	7.3	**10.5**

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (25.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (8.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
C Coast	Wyong†	2020	95.6	3 (0)	**63.9**	23.2	19.4	12.8	10.2	6.4	4.6	5.6
C Coast	Wyong	2021	98.4	0	14.8	12.0	10.7	8.7	7.7	6.1	4.5	4.7
C Coast	Wyong	2022	95.1	0	11.5	10.4	8.5	7.2	6.2	5.0	3.8	4.0
Lake Macq.	Morisset	2018	–	–	–	–	–	–	–	–	–	–
Lake Macq.	Morisset	2019	–	–	–	–	–	–	–	–	–	–
Lake Macq.	Morisset*	2020	–	–	–	–	–	–	–	–	–	–
Lake Macq.	Morisset	2021	96.2	0	11.7	10.9	10.1	8.3	6.6	5.3	3.6	3.9
Lake Macq.	Morisset	2022	94.8	0	11.2	9.1	6.9	5.9	4.8	3.6	2.2	2.7
L Hunter	Beresfield	2018	95.3	0	24.9	17.1	16.7	15.4	13.4	10.9	8.3	**8.7**
L Hunter	Beresfield†	2019	96.2	23 (0)	**100.5**	**61.5**	**51.8**	**32.4**	18.9	13.1	9.2	**12.1**
L Hunter	Beresfield†	2020	96.7	8 (0)	**49.7**	**35.7**	**27.5**	16.4	13.4	9.3	6.4	7.7
L Hunter	Beresfield	2021	99.2	0	18.9	15.0	14.1	11.5	10.1	7.5	5.4	5.9
L Hunter	Beresfield	2022	98.1	0	12.3	11.1	10.5	8.8	7.6	6.1	4.7	5.0
L Hunter	Newcastle	2018	98.6	0	20.2	17.3	15.9	14.4	12.3	9.8	7.2	7.8
L Hunter	Newcastle†	2019	98.6	26 (0)	**95.5**	**62.5**	**53.6**	**31.2**	17.0	11.7	8.0	**10.9**
L Hunter	*Newcastle#†*	*2020*	*73.8*	***5 (1)***	***78.5***	***32.7***	*25.0*	*20.0*	*13.4*	*9.4*	*6.6*	***8.1***
L Hunter	Newcastle	2021	97.3	0	21.1	14.8	14.2	12.3	9.8	7.9	5.7	6.3
L Hunter	Newcastle	2022	98.6	0	18.7	13.9	12.4	10.1	8.5	6.7	5.1	5.5
L Hunter	Wallsend	2018	97.8	0	20.2	16.3	15.7	14.1	12.1	9.6	6.8	7.5
L Hunter	Wallsend†	2019	95.6	19 (0)	**108.3**	**65.9**	**45.5**	**30.1**	16.9	11.3	7.6	**10.4**
L Hunter	Wallsend†	2020	98.6	5 (0)	**56.8**	**32.9**	21.8	16.9	12.8	8.6	6.1	7.3
L Hunter	Wallsend	2021	98.4	0	21.4	17.1	14.9	13.0	10.2	7.6	5.5	6.1

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (25.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (8.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
L Hunter	Wallsend	2022	96.7	0	18.7	12.7	11.1	9.7	8.1	6.3	4.7	5.1
U Hunter	Merriwa	2018	–	–	–	–	–	–	–	–	–	–
U Hunter	Merriwa	2019	–	–	–	–	–	–	–	–	–	–
U Hunter	*Merriwa#*	*2020*	*41.0*	*0*	*15.1*	*14.6*	*12.6*	*9.8*	*7.9*	*6.3*	*4.8*	*5.0*
U Hunter	Merriwa	2021	94.2	0	14.7	10.1	9.4	7.7	6.8	5.1	3.9	4.2
U Hunter	Merriwa	2022	91.5	0	13.6	8.5	7.3	6.6	5.7	4.2	3.1	3.4
U Hunter	Muswellbrook†	2018	97.8	**2 (1)**	**26.5**	24.1	20.6	18.6	16.9	11.7	8.3	**9.4**
U Hunter	Muswellbrook†	2019	95.1	**27 (2)**	**77.4**	**57.5**	**48.1**	**28.9**	21.6	14.3	9.8	**12.2**
U Hunter	Muswellbrook†	2020	97.8	**9 (2)**	**49.1**	**33.3**	**28.5**	19.3	17.4	11.8	8.2	**9.3**
U Hunter	Muswellbrook	2021	99.2	0	19.7	17.7	16.7	15.1	12.6	9.3	6.5	7.3
U Hunter	Muswellbrook	2022	99.2	0	16.3	15.1	14.1	11.8	10.4	7.6	5.7	6.2
U Hunter	Singleton	2018	95.9	0	19.2	18.3	17.4	15.1	13.4	10.3	7.4	**8.1**
U Hunter	Singleton†	2019	97.5	**22 (1)**	**69.3**	**67.2**	**52.5**	**28.2**	18.8	12.4	8.3	**10.9**
U Hunter	Singleton†	2020	98.1	**6 (1)**	**46.0**	**28.0**	24.2	18.5	15.1	10.4	7.0	**8.4**
U Hunter	Singleton	2021	96.7	0	18.0	16.1	14.9	13.4	11.0	7.9	5.9	6.3
U Hunter	Singleton	2022	97.8	0	18.1	13.5	12.5	10.1	8.6	6.4	4.8	5.1
C Tablelands	Bathurst†	2018	98.6	2 (0)	**40.5**	21.7	19.0	13.0	11.3	8.2	6.2	7.0
C Tablelands	Bathurst†	2019	98.6	24 (0)	**199.5**	**126.9**	**83.7**	**42.1**	14.6	9.0	6.3	**11.3**
C Tablelands	Bathurst†	2020	98.6	13 (0)	**207.3**	**34.5**	**30.2**	18.5	11.6	8.0	5.3	7.6
C Tablelands	Bathurst	2021	99.5	0	13.8	12.9	11.4	10.0	8.8	6.5	4.7	5.1
C Tablelands	Bathurst	2022	95.1	0	11.3	9.2	8.7	7.5	6.7	5.2	3.8	4.1
C Tablelands	Orange	2018	–	–	–	–	–	–	–	–	–	–

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (25.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (8.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
C Tablelands	Orange†	2019	94.0	**31 (4)**	**387.4**	**186.5**	**113.3**	**42.2**	23.8	14.7	7.7	**15.8**
C Tablelands	Orange†	2020	97.0	**15 (1)**	**92.3**	**43.7**	**34.3**	23.2	17.4	11.4	6.4	**9.1**
C Tablelands	Orange†	2021	99.2	**3 (1)**	**32.3**	24.2	22.4	17.3	13.6	8.2	5.2	6.6
C Tablelands	Orange†	2022	97.8	**5 (5)**	**38.9**	**26.8**	19.2	13.2	9.8	6.3	4.2	5.2
NW Slopes	Gunnedah†	2018	98.1	**5 (4)**	**50.7**	**29.3**	23.8	22.1	18.1	10.6	7.3	**9.0**
NW Slopes	Gunnedah†	2019	94.2	**24 (2)**	**94.1**	**83.4**	**58.9**	**29.0**	22.1	13.5	7.4	**11.2**
NW Slopes	Gunnedah†	2020	98.6	6 (0)	**34.7**	**28.1**	23.6	20.0	16.7	9.5	5.9	7.7
NW Slopes	Gunnedah	2021	86.8	0	23.9	22.0	19.8	15.9	12.3	8.0	5.4	6.5
NW Slopes	*Gunnedah#†*	*2022*	*72.9*	***4 (4)***	***28.2***	***25.8***	*23.4*	*17.1*	*11.1*	*7.7*	*5.3*	*6.4*
NW Slopes	Narrabri†	2018	97.8	1 (0)	**26.3**	17.5	13.7	9.3	7.6	5.6	4.3	4.9
NW Slopes	Narrabri†	2019	98.6	20 (0)	**87.7**	**69.4**	**39.0**	**25.7**	16.4	7.3	4.6	7.8
NW Slopes	Narrabri†	2020	98.1	1 (0)	**42.4**	19.7	17.0	11.6	9.2	6.7	4.7	5.5
NW Slopes	Narrabri	2021	84.4	0	11.8	7.8	6.7	6.1	5.6	4.4	3.1	3.1
NW Slopes	Narrabri	2022	92.6	0	8.9	7.5	7.2	6.8	5.8	4.4	3.5	3.6
NW Slopes	Tamworth	2018	92.1	0	24.2	19.9	19.2	16.9	14.1	10.3	7.5	**8.3**
NW Slopes	Tamworth†	2019	97.8	32 (0)	**164.2**	**122.7**	**97.4**	**43.5**	24.5	13.4	9.0	**14.4**
NW Slopes	Tamworth†	2020	97.8	4 (0)	**52.6**	**26.5**	21.4	15.9	11.6	8.5	5.7	6.8
NW Slopes	Tamworth	2021	95.9	0	15.5	13.1	12.6	10.8	9.1	6.6	4.7	5.1
NW Slopes	Tamworth	2022	96.2	0	20.2	14.0	13.0	10.9	8.3	5.7	4.0	4.7
N Tablelands	Armidale†	2018	69.3	**31 (31)**	**40.0**	**36.4**	**33.9**	**31.0**	**27.3**	18.8	8.4	**11.6**
N Tablelands	Armidale†	2019	95.9	**60 (24)**	**267.3**	**144.3**	**111.5**	**63.5**	**31.4**	21.0	9.6	**17.2**

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (25.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (8.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
N Tablelands	Armidale†	2020	99.2	**27 (23)**	**53.7**	**37.4**	**33.4**	**28.1**	**23.1**	11.7	5.8	**9.2**
N Tablelands	Armidale†	2021	99.5	**3 (3)**	**35.0**	**25.1**	22.4	19.0	16.2	10.8	4.8	7.2
N Tablelands	Armidale†	2022	98.6	**11 (11)**	**44.8**	**33.6**	**29.1**	20.2	15.8	8.6	4.6	7.1
Mid Nth Coast	Coffs Harbour	2018	–	–	–	–	–	–	–	–	–	–
Mid Nth Coast	*Coffs Harbour#†*	*2019*	*10.7*	*14 (0)*	***114.1***	***114.1***	***112.8***	***96.0***	***59.4***	***30.0***	*15.5*	***25.0***
Mid Nth Coast	Coffs Harbour†	2020	96.4	1 (0)	**44.9**	17.0	14.0	10.8	8.7	6.3	4.6	5.3
Mid Nth Coast	Coffs Harbour	2021	92.9	0	12.6	10.3	9.7	8.1	7.1	4.8	3.5	3.9
Mid Nth Coast	Coffs Harbour	2022	92.9	0	9.7	7.6	6.7	5.7	4.9	4.0	3.0	3.2
Mid Nth Coast	Port Macquarie	2018	–	–	–	–	–	–	–	–	–	–
Mid Nth Coast	*Port Macquarie#†*	*2019*	*40.3*	*56 (0)*	***442.7***	***341.0***	***204.7***	***114.0***	***60.2***	***34.6***	*16.1*	***31.3***
Mid Nth Coast	Port Macquarie†	2020	92.1	3 (0)	**220.5**	**30.4**	20.0	13.5	9.7	6.9	4.7	6.5
Mid Nth Coast	Port Macquarie	2021	92.9	0	14.7	13.6	10.6	8.8	7.4	5.7	4.1	4.6
Mid Nth Coast	Port Macquarie	2022	91.2	0	9.4	8.1	7.1	6.1	5.3	4.2	3.0	3.3
SW Slopes	Albury†	2018	96.2	**2 (2)**	**30.4**	22.4	18.7	14.8	11.9	8.9	6.6	7.3
SW Slopes	Albury†	2019	99.2	19 (0)	**167.1**	**89.4**	**51.9**	**25.1**	14.6	10.2	7.1	**10.1**
SW Slopes	Albury†	2020	93.2	16 (0)	**275.2**	**155.7**	**84.3**	23.6	14.7	9.9	6.6	**11.1**
SW Slopes	Albury	2021	94.2	0	24.6	20.9	18.5	16.0	13.6	9.0	6.1	7.3
SW Slopes	Albury	2022	94.8	0	15.3	14.2	13.1	11.7	10.2	7.6	5.1	5.6
SW Slopes	Wagga Wagga Nth	2018	95.3	0	21.6	20.7	19.7	16.3	14.5	10.5	7.6	**8.4**
SW Slopes	Wagga Wagga Nth†	2019	94.8	17 (0)	**239.6**	**90.8**	**57.3**	**25.5**	15.9	11.4	7.6	**11.3**

Region	Station	Year	Data avail. (%)	Exceed. days (NEED)	Max. daily average (µg/m³) 24-hour standard (25.0 µg/m³)	Percentiles (ppm)						Annual mean (µg/m³) annual standard (8.0 µg/m³)
						99th	98th	95th	90th	75th	50th	
SW Slopes	Wagga Wagga Nth†	2020	98.4	13 (0)	**559.5**	**69.9**	**43.2**	21.1	16.0	9.8	6.1	**10.7**
SW Slopes	Wagga Wagga Nth†	2021	95.6	**1 (1)**	**25.4**	19.8	18.2	14.2	10.9	7.7	5.6	6.3
SW Slopes	Wagga Wagga Nth†	2022	98.6	**1 (1)**	**27.1**	17.4	14.7	12.6	9.8	6.6	4.5	5.3
S Tablelands	Goulburn	2018	–	–	–	–	–	–	–	–	–	–
S Tablelands	*Goulburn#†*	*2019*	*14.8*	*28 (0)*	***333.7***	***333.7***	***320.5***	***253.2***	***226.7***	***82.0***	***26.1***	***60.4***
S Tablelands	Goulburn†	2020	97.3	16 (0)	**516.1**	**168.2**	**89.0**	23.7	14.1	9.2	5.3	11.8
S Tablelands	Goulburn†	2021	99.2	1 (0)	**25.4**	19.2	16.6	13.3	11.3	7.0	4.6	5.6
S Tablelands	Goulburn	2022	97.3	0	15.0	12.7	11.3	9.0	7.5	5.3	3.6	4.1