DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT

New South Wales Annual Compliance Report 2018

National Environment Protection (Ambient Air Quality) Measure

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Acronyms, abbreviations and glossary

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

AAQ NEPM	National Environment Protection (Ambient Air Quality) Measure
ABS	Australian Bureau of Statistics
Ambient air	The external air environment (does not include the air environment inside buildings or structures)
AQI	Air Quality Index
AQMN	Air quality monitoring network
ARS	Advisory reporting standard
AS	Australian Standard
BAM	Beta attenuation monitor
CAM	Clean Air Metric
CO	Carbon monoxide
EPA	NSW Environment Protection Authority
DPIE	NSW Department of Planning, Industry and Environment
FRM	Federal Reference Method (USEPA)
GMR	Greater Metropolitan Region
HRB	Hazard reduction burn
ICP-AES	Inductively coupled plasma – atomic emission spectroscopy
Monitoring station	A facility for measuring the concentration of one or more pollutants in the ambient air in a region or sub-region
NATA	National Association of Testing Authorities
ND	Greater than 75% availability of data in any quarter was not demonstrated at a monitoring station
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
O_3	Ozone
Pb	Lead
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of 2.5 microns or less
PM_{10}	Particulate matter with an aerodynamic diameter of 10 microns or less
POEO Act	*Protection of the Environment Operations Act 1997*
ppm	Parts per million – parts of pollutant per million parts of air by volume
RFS	NSW Rural Fire Service
SO_2	Sulfur dioxide
TEOM	Tapered element oscillating microbalance
TSP	Total suspended particles
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 and absolute pressure of 101.325 kPa
VOCs	Volatile organic compounds – compounds that vapourise (i.e. become a gas) at normal atmospheric temperatures

Overview

The National Environment Protection (Ambient Air Quality) Measure (AAQ NEPM or NEPM) sets national standards and goals for air quality. This report is required under clause 18 of the AAQ NEPM. It presents NSW air quality monitoring data for 2018, assessed against the requirements of the AAQ NEPM. The data are available on the NSW Department of Planning, Industry and Environment public website.

The AAQ NEPM (amended, February 2016) sets requirements for the monitoring and reporting of air quality, including:

- air quality standards, as levels of pollutants against which air quality can be assessed
- goals for air pollutant levels, to achieve the air quality standards
- a description of the circumstances which led to exceedances of standards, including the influence of natural events and fire management on airborne particle matter, measured as PM_{10} (diameter less than 10 microns) and $PM_{2.5}$ (diameter less than 2.5 microns).
- a requirement to report population exposures to $PM_{2.5}$ annually from June 2018.

In 2018, the NSW AAQ NEPM Compliance Monitoring Network (the network) comprised 28 air quality monitoring stations. The network is a part of the NSW Government's ambient air quality monitoring network.

The network was operated by the NSW Government, in accordance with the NSW Air Quality Monitoring Plan, the AAQ NEPM Technical Papers and the government's accreditation by National Association of Testing Authorities (NATA).

Compliance with NEPM goals, by pollutant

Monitoring for lead (Pb) in New South Wales ceased in 2004 because ambient Pb concentrations fell to very low levels, following the introduction of unleaded motor fuel.

Compliance with NEPM goals and standards in 2018 is outlined below for the gaseous pollutants ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2) and sulfur dioxide (SO_2), and for particle matter measured as PM_{10} and $PM_{2.5}$.

Gaseous pollutants

- All stations monitoring carbon monoxide (CO), nitrogen dioxide (NO_2) and sulfur dioxide (SO_2) complied with NEPM standards and goals:
  - carbon monoxide (10 stations) (Table 5)
  - nitrogen dioxide (21 stations) (Table 6)
  - sulfur dioxide (14 stations) (Table 8).
- 18 of 21 stations met the NEPM goal for 1-hour average ozone (O_3) levels (Table 7).
- 11 of 21 stations met the NEPM goal for 4-hour average ozone levels (Table 7).
- Three of 23 stations did not demonstrate greater than 75% data availability for gaseous pollutants in any three-month period (quarter) (Tables 0.1–0.2, 6–8).

Particulate matter

- There were 28 stations monitoring PM_{10} and $PM_{2.5}$ levels in 2018.
- 21 of 26 stations met the NEPM goal for the 1-day average PM_{10} level (Table 9)

- 25 of 26 stations met the NEPM goal for the annual average PM_{10} level (Table 9)
- 24 of 27 stations met the NEPM goal for the 1-day average $PM_{2.5}$ level (Table 10)
- 17 of 27 stations met the NEPM goal for the annual average $PM_{2.5}$ level (Table 10)
- Two of 28 stations did not demonstrate greater than 75% data availability for PM_{10} in any quarter. One of 28 stations did not demonstrate greater than 75% data availability for $PM_{2.5}$ in any quarter (Tables O.1–O.2, 9–10).

Compliance with NEPM goals and standards, by region, station and pollutant

Table 0.1 presents compliance and non-compliance of stations with goals and standards, by pollutant.

Table 0.1 Summary of compliance with AAQ NEPM goals by station/region and pollutant, 2018

Count	Region/ monitoring station	Ozone 1-hour	Ozone 4-hour	PM_{10} 1-day	PM_{10} 1-year	$PM_{2.5}$ 1-day	$PM_{2.5}$ 1-year	NO_2 1-hour 1-year	CO 8-hour	SO_2 1-hour 1-day 1-year
	Sydney									
	Sydney East									
1	Chullora	C	C	C	C	N-C	N-C	C	C	C
2	Earlwood	C	C	C	C	C	C	C	--	--
3	Macquarie Park[2]	C	C	C	C	C	C	C	C	C
4	Randwick	C	C	C	C	C	C	C	--	C
5	Rozelle	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Sydney North West									
6	Parramatta North[3]	C	N-C	C	C	C	N-C	C	C	C
7	Prospect[4]	C	N-C	C	C	C	N-C	C	C	ND
8	Richmond	C	N-C	C	C	C	N-C	C	--	C
9	St Marys	C	N-C	ND	ND	C	C	C	--	--
	Sydney South West									
10	Bargo	C	N-C	C	C	C	C	C	--	C
11	Bringelly	N-C	N-C	C	C	C	C	C	--	C
12	Camden	N-C	N-C	C	C	C	C	C	C	--
13	Campbelltown West[5]	N-C	N-C	C	C	C	N-C	C	C	C
14	Liverpool	C	N-C	N-C	C	C	N-C	C	C	--
15	Oakdale	C	N-C	N-C	C	C	C	C	--	--
	Illawarra									
16	Albion Park South	C	C	C	C	C	C	C	--	C
17	Kembla Grange	C	C	N-C	C	C	C	C	--	--

Count	Region/ monitoring station	Ozone 1-hour	Ozone 4-hour	PM_{10} 1-day	PM_{10} 1-year	$PM_{2.5}$ 1-day	$PM_{2.5}$ 1-year	NO_2 1-hour 1-year	CO 8-hour	SO_2 1-hour 1-day 1-year
18	Wollongong	C	C	C	C	C	C	C	C	C
	Central Coast									
19	Wyong	C	C	C	C	C	C	C	C	C
	Lower Hunter									
20	Beresfield	C	C	C	C	C	N-C	C	--	C
21	Newcastle	C	C	C	C	C	C	C	C	C
22	Wallsend	C	C	C	C	C	C	C	--	C
	Regional NSW									
	Central Tablelands									
23	Bathurst[6]	--	--	C	C	C	C	--	--	--
	North West Slopes									
24	Gunnedah	ND	ND	C	C	N-C	N-C	ND	--	--
25	Narrabri	--	--	C	C	C	C	--	--	--
26	Tamworth	--	--	C	C	C	N-C	--	--	--
	South West Slopes									
27	Albury	--	--	N-C	C	N-C	C	--	--	--
28	Wagga Wagga North[7]	--	--	N-C	N-C	C	N-C	--	--	--

Source: Tables 5–10

Notes: the AAQ NEPM requires that jurisdictions exclude monitoring data determined as being directly associated with an exceptional event when assessing goal compliance against PM_{10} and $PM_{2.5}$ 1-day average standards.

C = compliant with goal

N-C = non-compliant with goal

'—' not monitored

ND = 75% data availability not demonstrated

[2,3,4,5,6,7]: see notes for Table 1

Compliance and non-compliance of stations with goals and standards, by pollutant is outlined briefly below.

Ozone

Ozone 1-hour standard and goal

Twenty-three stations in the NEPM network monitored 1-hour average ozone levels in 2018. Twenty-one of 23 sites reported 75% data availability or higher, with results reported below.

Ozone 1-hour standard

The 1-hour standard (0.1 ppm) was exceeded on five calendar days (Table 15).

Ten stations exceeded the 1-hour ozone standard: seven stations with one allowable exceedance day and three stations with more than one exceedance day (Table 7).

Thirteen stations recorded no exceedance days for the 1-hour standard (Table 7).

Ozone 1-hour goal

The NEPM goal for the 1-hour ozone standard allows one exceedance day per year.

Eighteen stations met the NEPM 1-hour ozone goal: 11 stations with no exceedances of the 1-hour ozone standard and seven stations with one allowable exceedance day.

Three stations did not comply with the NEPM 1-hour ozone goal (due to more than one exceedance day):

- Sydney South West region – Bringelly, Camden and Campbelltown West.

Ozone 4-hour standard and goal

Twenty-three stations in the NEPM network monitored 4-hour average ozone levels in 2018. Twenty-one of 23 sites reported 75% data availability or higher, with results reported below.

Ozone 4-hour standard

The 4-hour ozone standard (0.08 ppm) was exceeded on seven calendar days (Table 16).

Twelve stations exceeded the 4-hour ozone standard: two stations with one allowable exceedance day and ten stations with more than one exceedance day (Table 7).

Eleven stations recorded no exceedance days for the 4-hour standard (Table 7).

Ozone 4-hour goal

The NEPM goal for the 4-hour ozone standard allows one exceedance day per year for a monitoring station to comply.

Eleven stations met the NEPM 4-hour ozone goal: nine stations with no exceedances of the 4-hour standard and two stations with one allowable exceedance day.

Ten stations did not comply with the NEPM 4-hour ozone goal due to more than one exceedance day:

- Sydney region – Bargo, Bringelly, Camden, Campbelltown West, Liverpool, Oakdale, Parramatta North, Prospect, Richmond, St Marys.

Particles

An air quality monitoring station complies with NEPM goals, when either:

- no exceedances are recorded
- no exceedance days are recorded other than days defined as exceptional events (directly related to bushfire, jurisdiction-authorised hazard reduction burning or continental-scale windblown dust).

An air quality monitoring station does not comply with NEPM goals, when:

- one or more exceedance days are defined as non-exceptional events.

PM_{10} standards and goals

Twenty-eight stations in the NSW NEPM air quality monitoring network monitored PM_{10} levels in 2018. Twenty-six of 28 sites reported 75% data availability or higher, with results reported below.

PM_{10} 24-hour standard

The 24-hour PM_{10} standard (50.0 micrograms per cubic metre [$\mu g/m^3$]) was exceeded on 59 calendar days in 2018
(Table 20, Tables A.3–A.4).

- Thirty-four exceedance days were exceptional events:
  - Seven days were due to hazard reduction burning and/or bushfire
  - 27 days were due to continental-scale windblown dust.
- Twenty-one exceedance days were non-exceptional events due to a range of local particle sources (Table 20, Table A.4):
  - 16 days were due to drought-related local dust in the South West Slopes region.
  - One day was due to drought-related regional dust in the South West Slopes and in the Illawarra region.
  - One day was due to local dust at Kembla Grange (Illawarra).
  - Two days were due to local dust at Liverpool, (Sydney South West).
  - One day was due to dust from an unidentified source at Oakdale (Sydney South West).
- Four days recorded both exceptional and non-exceptional exceedance events (Table 20, Table A.4). One such day recorded an exceptional dust event in the South West Slopes and a non-exceptional local dust event in the Illawarra. Three days recorded exceptional hazard reduction burn (HRB) events in Sydney and non-exceptional local dust events in the South West Slopes.

PM_{10} 24-hour goal

Twenty-one of 26 stations with 75% data availability or higher met the NEPM 24-hour PM_{10} goal, with no exceedance days other than exceptional events (Table 9, Table 20).

Five stations did not comply with the 24-hour PM_{10} goal, due to at least one exceedance day related to a non-exceptional event:

Regional NSW – Albury and Wagga Wagga North (South West Slopes) and Kembla Grange (Illawarra) and Liverpool and Oakdale (Sydney South-west).

PM_{10} annual standard and goal

Twenty-five of 26 monitoring stations met the NEPM annual goal for PM_{10}, recording annual average concentrations below the annual standard of 25.0 µg/m^3.

One station did not comply: Wagga Wagga North (South West Slopes), with an annual average concentration of 27.4 µg/m^3.

$PM_{2.5}$ standards and goals

Twenty-eight stations in the NSW NEPM air quality monitoring network monitored $PM_{2.5}$ levels in 2018. Twenty-seven of 28 sites reported 75% data availability or higher, with results reported below.

$PM_{2.5}$ 24-hour standard

The 24-hour $PM_{2.5}$ standard (25.0 µg/m^3) was exceeded on 27 calendar days in 2018 (Table 22, Tables A3–A4):

- Twenty exceedance days were exceptional events, due to hazard reduction burning or bushfires.
- Six exceedance days were non-exceptional events, due to local particle sources.
  - One day at Albury (South West Slopes) was due to agricultural activity.
  - Three days at Gunnedah (North West Slopes) were due to domestic wood heating.
  - One day at Chullora (Sydney East) was due to industrial activity.
  - One day concurrently due to industrial activity at Chullora and wood smoke at Gunnedah.
- One day recorded both exceptional and non-exceptional exceedance events, with an exceptional event at Richmond (Sydney North West) due to hazard reduction burning and a non-exceptional event at Albury (South West Slopes) due to agricultural activity.

$PM_{2.5}$ 24-hour goal

Twenty-four stations met the NEPM 24-hour $PM_{2.5}$ goal, all stations with no exceedance days other than exceptional events (Table 10, Table 22).

Three stations did not comply with the 24-hour $PM_{2.5}$ goal, due to at least one exceedance day that was a non-exceptional event, due to local particle sources:

- two days at Chullora, (Sydney East), due to industrial activity
- two days at Albury (South West Slopes), due to agricultural activity
- four days at Gunnedah (North West Slopes), due to domestic wood smoke.

$PM_{2.5}$ annual standard and goal

Seventeen of 27 monitoring stations met the NEPM annual goal for $PM_{2.5}$, recording annual average concentration below the annual standard of 8.0 µg/m^3.

Ten stations did not comply: Chullora (8.6 µg/m^3) in Sydney East; Liverpool (10.1 µg/m^3) and Campbelltown West (8.4 µg/m^3) in Sydney South West; Parramatta North (9.2 µg/m^3), Prospect (8.5 µg/m^3) and Richmond (8.1 µg/m^3) in Sydney North West; Beresfield (8.7 µg/m^3) in Lower Hunter; Gunnedah (9.0 µg/m^3) and Tamworth (8.3 µg/m^3) in North West Slopes; and Wagga Wagga North (8.4 µg/m^3) in South West Slopes.

Also in this report

Episode analyses for air pollution events

Section E provides links to detailed episode analyses for typical air pollution events:

- An ozone exceedance analysis for Sydney, during 19–22 January 2018, demonstrated how weather and local emission sources may have affected air quality in New South Wales.
- A PM_{10} exceedance episode analysis, associated with long-range transport of windblown dust, during 20–23 November 2018, demonstrated how weather and regional particle sources may have affected air quality across New South Wales.
- A $PM_{2.5}$ pollution episode analysis for Sydney, associated with hazard reduction burning, during 26–29 May 2018, demonstrated how weather and smoke emissions may have affected air quality and visibility across the city.

Assessment of population exposures to $PM_{2.5}$

Section F provides a detailed assessment of population exposures to $PM_{2.5}$ in the NSW Greater Metropolitan Region (GMR) in 2018. Results are summarised below.

- The spatial population exposure to $PM_{2.5}$ in the NSW GMR in 2018 was greatest in the Sydney Central Business District (CBD) and along inner Sydney transport corridors, and much lower in Greater Western Sydney, the Central Coast and Lower Hunter (Figure 5).
- In the Greater Sydney Region, the population-weighted average exposure of residents to $PM_{2.5}$ was 94% of the NEPM annual $PM_{2.5}$ standard (Table 215). Compared with the previous five years, this result was slightly lower than in 2015–17 (95–98%) and slightly higher than in 2013–14 (93%) (Figure 6).
- In the NSW GMR, the population-weighted average exposure of residents to $PM_{2.5}$ in 2018 was 95% of the annual $PM_{2.5}$ standard (Table 215). Compared with the previous five years, this result was slightly lower than in 2016 (96%) and higher than in 2013–15 and 2017 (87–93%) (Figure 7).

Section A – Monitoring summary

Air quality monitoring in New South Wales

The NSW Government operated a network of 83 monitoring stations, as of 31 December 2018. This network comprised 47 air quality monitoring stations in metropolitan and regional centres, accredited by the National Association of Testing Authorities (NATA), and 36 rural indicative air quality monitoring stations:

- 22 stations in the NSW Greater Metropolitan Region (GMR)
  - 15 stations in the Greater Sydney Region
  - three stations in the Lower Hunter Region
  - three stations in the Illawarra Region
  - one station on the Central Coast
- eight stations in NSW regional centres
  - three stations in the North West Slopes
  - two stations in the South West Slopes
  - two stations in the Central Tablelands
  - one station in the Northern Tablelands
- 17 stations in NSW Government-operated, industry-funded networks, monitoring specific air pollutants generated by industry. These networks comprised:
  - 14-stations in the Upper Hunter Air Quality Monitoring Network, monitoring air quality affected by coal mining and coal-fired power generation
  - three stations in the Newcastle Local Air Quality Monitoring Network, monitoring air quality affected by industrial activity around the port of Newcastle
- 36 stations in the NSW Rural Air Quality Monitoring Network, monitoring dust and smoke levels in rural New South Wales and across state borders into South Australia and Victoria.
  - These stations provide indicative monitoring of airborne particulate matters, as PM_{10} and $PM_{2.5}$ and total suspended particles (TSP). The indicative monitoring does not comply with any Australian Standards and PM_{10} and $PM_{2.5}$ data recorded are not intended for comparison with national air quality standards for $PM_{2.5}$ or PM_{10}.

Air quality reporting in New South Wales

NSW air quality monitoring network (AQMN) data are available on the web and updated hourly:

- The NSW Air Quality Monitoring Network (metropolitan and regional centres)
- The Upper Hunter Air Quality Monitoring Network map
- The Lower Hunter and Newcastle Local Area Network map
- The Rural Air Quality Monitoring Network.

More information about the networks and current and historic data can be found at www.environment.nsw.gov.au/topics/air/monitoring-air-quality.

The NSW AAQ NEPM Compliance Monitoring Network

The AAQ NEPM requires the NSW Government to report annually on compliance with the national standards and goals for air quality measured at designated monitoring stations.

The NSW AAQ NEPM Compliance Monitoring Network comprised 28 stations for assessing the exposure of the general population to air pollution in 2018 (Table 1). This network comprised the following NATA-accredited stations:

- 22 stations in the NSW Greater Metropolitan Region (GMR) (Figure 1)
  - 15 stations in the Greater Sydney Region
  - Three stations in the Illawarra Region
  - One station on the Central Coast
  - Three stations in the Lower Hunter Region
- six stations in NSW regional centres (Figure 2)
  - one station in the Central Tablelands
  - three stations in the North West Slopes
  - two stations in the South West Slopes.

The NSW AAQ NEPM Compliance Monitoring Network is designed to measure air quality experienced by the general population and to capture pollution events which affect population centres. This means that the location of monitoring stations in each region was made to optimise both population coverage and representation of the occurrences of higher pollutant concentrations.

Monitoring mostly occurs in the densely populated NSW Greater Metropolitan Region (GMR, including Sydney, the Illawarra region, the Central Coast and the Lower Hunter), which comprises over 60% of the NSW population. Monitoring also occurs in regional population centres in the NSW North West Slopes, Central Tablelands and the South West Slopes.

Types of monitoring stations

The NSW Government assesses the air quality to which the general population is exposed in a region by monitoring all air pollutants of interest across a network of stations. The AAQ NEPM clause 14 allows for fewer monitoring stations where it can be demonstrated that pollutant levels are reasonably expected to be consistently lower than the AAQ NEPM standards. These screening criteria were used for carbon monoxide, nitrogen dioxide, ozone and sulfur dioxide at several regions in New South Wales and determined the AAQ NEPM monitoring network design. Detailed information on screening pollutants for specific regions is found in the AAQ NEPM Technical Paper No.4 (PDF 142KB).

In 2018, the 28-station NSW AAQ NEPM Compliance Monitoring Network comprised 20 trend stations and eight performance stations (Table 1). Trend stations have been operating for more than a decade and capture most pollution events that occur across the network. Performance stations may either measure criteria pollutants not monitored at trend stations or may be sited to measure pollutants at the upper bounds of the concentrations likely to be experienced in a region. This ensures that all major pollution events are captured and reported.

Figure 1 and Figure 2 show the locations of the 28 monitoring stations included in the NSW AAQ NEPM compliance reporting for 2018, with 22 stations in the GMR (Figure 1) and six stations in regional New South Wales (Figure 2).

New sites and new pollutants in 2018

The NSW Government's review of the NSW Air Quality Monitoring Plan in 2018 identified additional stations and updated the classification of station types, compared to the NSW Air Quality Monitoring Plan 2001 and the *NSW Annual Compliance Report 2017*. This report documents NEPM compliance for 28 stations, compared to the 22 stations in the 2017 NEPM Compliance Report.

The review identified six additional stations in the NSW AQMN to be included in the NSW AAQ NEPM Compliance Monitoring Network:

- Bargo in Sydney South West
- Macquarie Park and Randwick in Sydney East
- Parramatta North in Sydney North West
- Gunnedah and Narrabri in the NSW North West Slopes.

Fine particle monitoring was extended across the NSW AQMN in 2018. This monitoring supports air quality and health analysis and compliance assessments against national standards for $PM_{2.5}$.

The NSW Government commissioned two new air quality monitoring stations during 2018:

- Armidale in the NSW Northern Tablelands region (March 2018)
- Orange in the NSW Central Tablelands region (November 2018).

Data for Armidale and Orange will be reported in the NSW Annual Compliance Report 2019.

Table 1 NSW AAQ NEPM Compliance Monitoring Network 2018

Count	Region/ monitoring station	Station type[1]	Start year	No. of reporting parameters	Ozone	NO_2	PM_{10}	$PM_{2.5}$	CO	SO_2
	Sydney									
	Sydney East									
1	Chullora	T	2003	6	✓	✓	✓	✓	✓	✓
2	Earlwood	T	1998	4	✓	✓	✓	✓		
3	Macquarie Park[2]	P	2017	6	✓	✓	✓	✓	✓	✓
4	Randwick	T	1995	5	✓	✓	✓	✓		✓
5	Rozelle	T	1978	6	✓	✓	✓	✓	✓	✓
	Sydney North West									
6	Parramatta North[3]	P	2017	6	✓	✓	✓	✓	✓	✓
7	Prospect[4]	T	2007	6	✓	✓	✓	✓	✓	✓
8	Richmond	T	1992	5	✓	✓	✓	✓		✓
9	St Marys	P	1992	4	✓	✓	✓	✓		
	Sydney South West									
10	Bargo	T	1996	5	✓	✓	✓	✓		✓
11	Bringelly	T	1992	5	✓	✓	✓	✓		✓
12	Camden	P	2012	5	✓	✓	✓	✓	✓	
13	Campbelltown West[5]	T	2012	6	✓	✓	✓	✓	✓	✓
14	Liverpool	T	1990	5	✓	✓	✓	✓	✓	
15	Oakdale	P	1996	4	✓	✓	✓	✓		
	Illawarra									
16	Albion Park South	T	2005	5	✓	✓	✓	✓		✓
17	Kembla Grange	P	1994	4	✓	✓	✓	✓		
18	Wollongong	T	1993	6	✓	✓	✓	✓	✓	✓
	Central Coast									
19	Wyong	P	2012	6	✓	✓	✓	✓	✓	✓
	Lower Hunter									
20	Beresfield	T	1993	5	✓	✓	✓	✓		✓
21	Newcastle	T	1992	6	✓	✓	✓	✓	✓	✓
22	Wallsend	T	1992	5	✓	✓	✓	✓		✓
	Regional NSW									
	Central Tablelands									
23	Bathurst[6]	T	2000	2			✓	✓		
	North West Slopes									
24	Gunnedah	P	2017	4	✓	✓	✓	✓		
25	Narrabri	P	2017	2			✓	✓		

Count	Region/ monitoring station	Station type[1]	Start year	No. of reporting parameters	Ozone	NO_2	PM_{10}	$PM_{2.5}$	CO	SO_2
26	Tamworth	T	2000	2			✓	✓		
	South West Slopes									
27	Albury	T	2000	2			✓	✓		
28	Wagga Wagga North[7]	P	2011	2			✓	✓		
	Total				**23**	**23**	**28**	**28**	**11**	**16**

Notes
1 P denotes performance; T denotes trend
2 Macquarie Park replaced the Lindfield monitoring station in 2017
3 Parramatta North was commissioned in December 2017
4 Prospect replaced Blacktown station from 2007
5 Campbelltown West replaced the Macarthur trend station from September 2012
6 Bathurst ozone analyser removed on completion of ozone campaign monitoring program in August 2004
7 Wagga Wagga North replaced the Wagga Wagga station in October 2011 when the site was moved about 1 km north of the original location.

Station siting and exposure

All stations within the network, except for Chullora, Earlwood and Rozelle, meet AAQ NEPM siting and exposure criteria (see Table 2 for further details).

Table 2 Stations not complying with all siting and exposure criteria

Station	Siting criteria not met	Comments
Chullora	Clear sky angle ≥ 120° Distance to nearby tree ≥ 10 m	Trees have grown since establishment of station
Earlwood	Greater than 50 m from road	Site is in a carpark and approximately 35 m from the road
Rozelle	Clear sky angle ≥ 120° Distance to nearby tree ≥ 10 m	Established trees in a heritage area

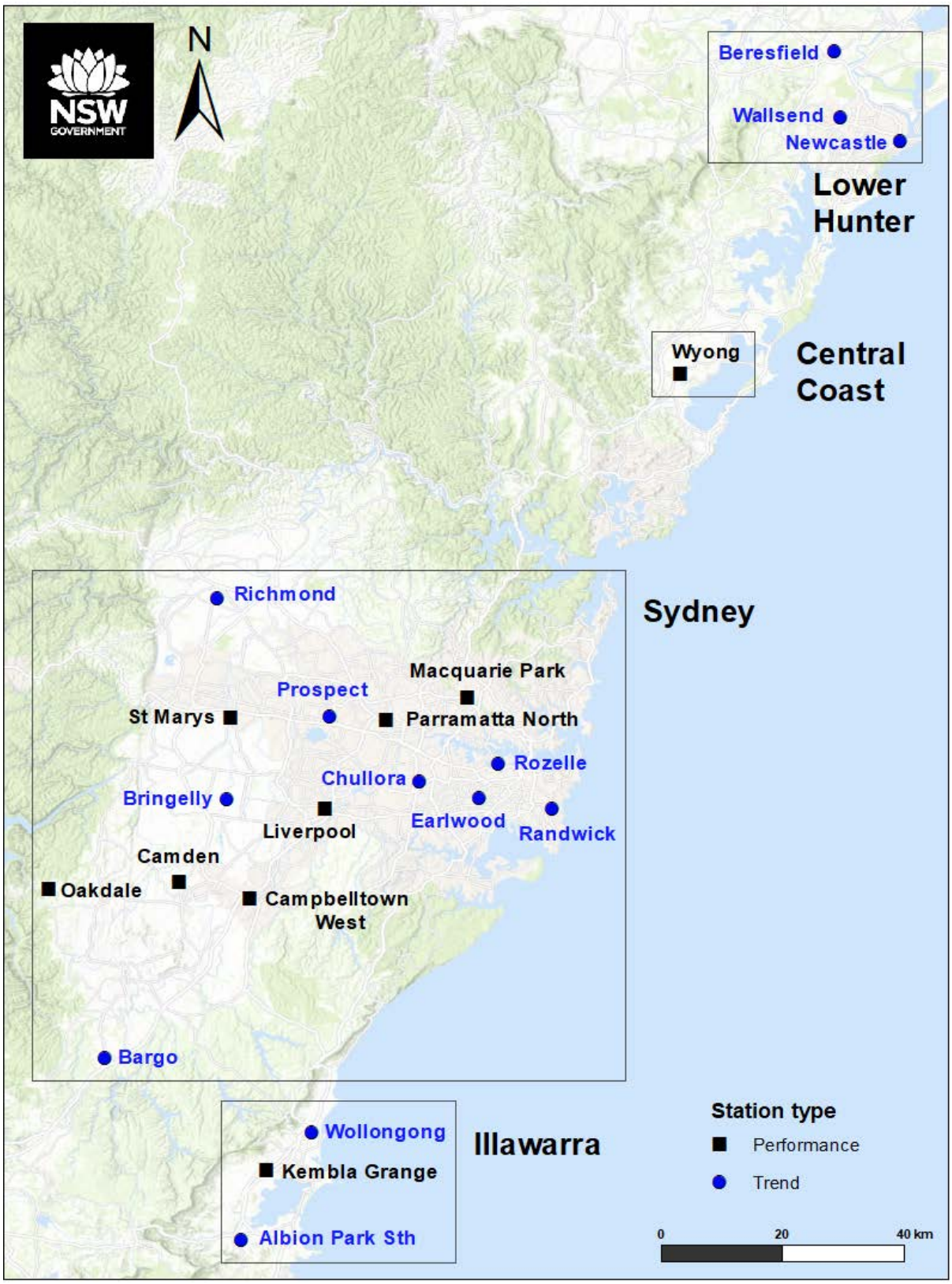

Figure 1 **NSW AAQ NEPM compliance reporting air quality monitoring stations in the NSW GMR (Sydney, Illawarra, Central Coast and Lower Hunter subregions), 2018**

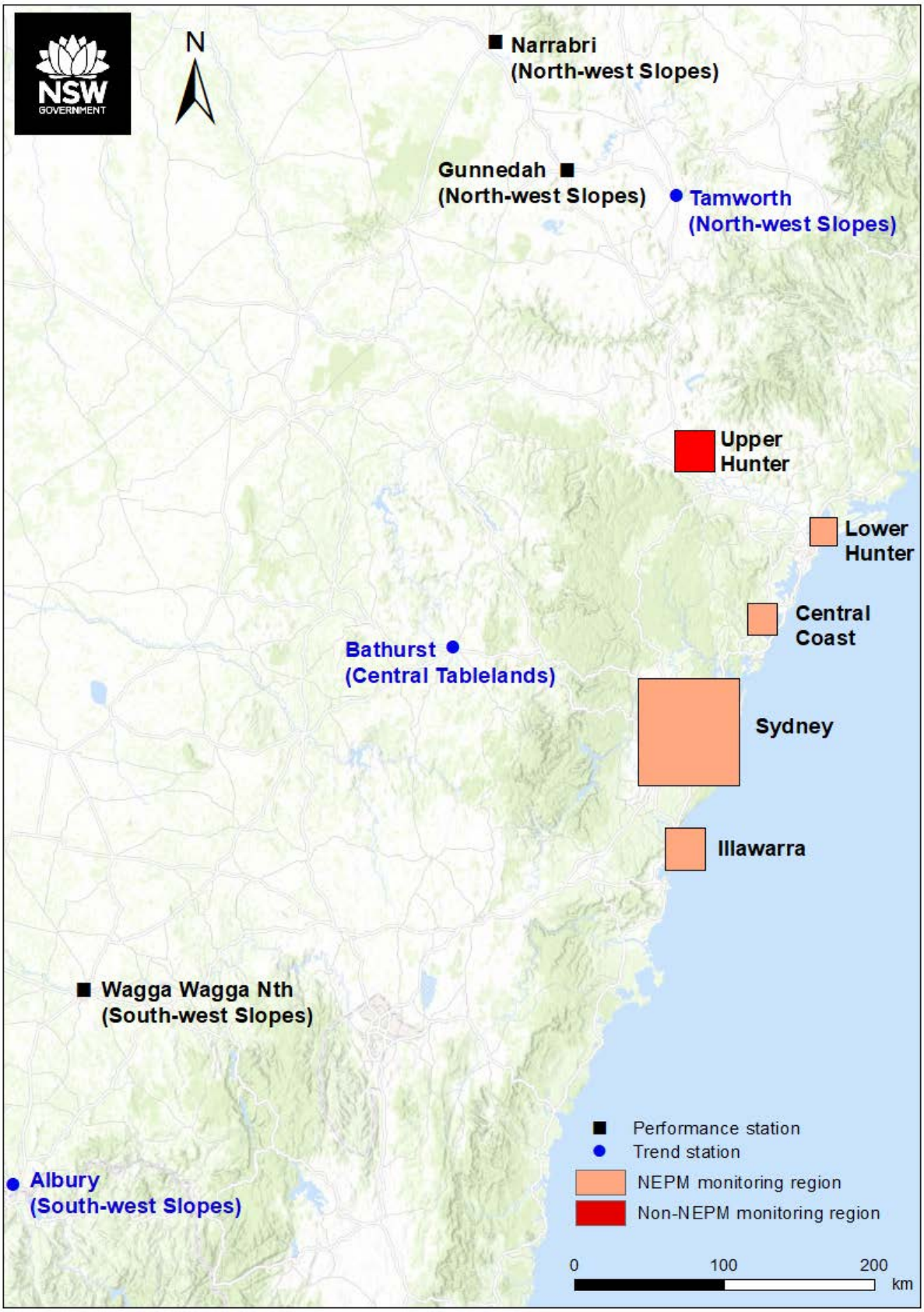

Figure 2 **NSW AAQ NEPM compliance reporting air quality monitoring stations in regional New South Wales, 2018**

Monitoring methods

The NSW AQMN uses instruments in accordance with relevant Australian Standards, specified in Schedule 3 of the AAQ NEPM (Table 3).

Table 3 Instruments used in the NSW AAQ NEPM Compliance Monitoring Network

Pollutant	Standard	Title	Method used
Carbon monoxide	AS 3580.7.1	Methods for sampling and analysis of ambient air – Method 7.1: Determination of carbon monoxide – Direct-reading instrumental method	Gas filter correlation/ infra-red
Nitrogen dioxide	AS 3580.5.1	Methods for sampling and analysis of ambient air – Method 5.1: Determination of oxides of nitrogen – Direct-reading instrumental method	Gas-phase chemiluminescence
Photochemical oxidant (ozone)	AS 3580.6.1	Methods for sampling and analysis of ambient air – Method 6.1: Determination of ozone – Direct-reading instrumental method	Non-dispersive ultraviolet
Sulfur dioxide	AS 3580.4.1	Methods for sampling and analysis of ambient air – Method 4.1: Determination of sulfur dioxide – Direct-reading instrumental method	Pulsed fluorescence
Lead[1]	AS/NZS 3580.9.15	Methods for sampling and analysis of ambient air – Method 9.15: Determination of suspended particulate matter – Particulate metals high or low volume sampler gravimetric collection – Inductively coupled plasma (ICP) spectrometric method	Atomic absorption
Particles as PM_{10}	AS 3580.9.8	Methods for sampling and analysis of ambient air – Method 9.8: Determination of suspended particulate matter – PM_{10} continuous direct mass method using a tapered element oscillating microbalance analyser	Tapered element oscillating microbalance (TEOM)[2]
	AS/NZS 3580.9.13	Methods for sampling and analysis of ambient air – Method 9.13: Determination of suspended particulate matter – $PM_{2.5}$ continuous direct mass method using a tapered element oscillating microbalance monitor	(TEOM)[3]
Particles as $PM_{2.5}$	AS/NZS 3580.9.12	Methods for sampling and analysis of ambient air – Method 9.12: Determination of suspended particulate matter – $PM_{2.5}$ beta attenuation monitors	Beta attenuation monitor (BAM)[4]
	AS/NZS 3580.9.10	Methods for sampling and analysis of ambient air – Method 9.10: Determination of suspended particulate matter – $PM_{2.5}$ low volume sampler – Gravimetric method	FRM Reference Sampler
	AS/NZS 3580.9.13	Methods for sampling and analysis of ambient air – Method 9.13: Determination of suspended particulate matter – $PM_{2.5}$ continuous direct mass method using a tapered element oscillating microbalance monitor	(TEOM)[3]

Notes

1 No longer measured for compliance purposes in New South Wales

2 Instrument output conforms to United States Environmental Protection Agency (USEPA) equivalence designation (offset 3.0, scaling factor 1.03)

3 Instrument used at Gunnedah and Narrabri from December 2017; method allows for measurement of PM_{10}

4 TEOM monitors at all sites were replaced by BAM $PM_{2.5}$ monitors (Federal Equivalent Method) during 2012. Before this, TEOMs were modified for use in the $PM_{2.5}$ Equivalence Program and at the monitoring stations, in accordance with the AAQ NEPM *Technical Paper on Monitoring for Particles as $PM_{2.5}$*

NATA accreditation

The NSW Government is accredited by NATA for the measurement of all AAQ NEPM parameters (accreditation number 14209), as required under clause 12 of the AAQ NEPM. The last reassessment of the Air Quality Monitoring Laboratory and associated monitoring stations by NATA was completed in February 2018.

Section B – Assessment of compliance with standards and goals

Overview of assessment against standards and goals

Air quality is assessed against the standards and goals as specified in Schedule 2 of the AAQ NEPM. The standards against which air quality is assessed are concentrations in parts per million (ppm) or micrograms per cubic metre (µg/m^3) (column 3, Table 4).

The goals of the AAQ NEPM are to achieve the standards, to the extent expressed as the maximum allowable number of exceedances per year (column 4, Table 4).

Table 4 Air quality standards and goals specified in Schedule 2 of the AAQ NEPM

Pollutant	Averaging period	AAQ NEPM standard (maximum concentration)	AAQ NEPM goal (maximum number of allowable exceedances)
Carbon monoxide	8-hour rolling average	9.0 ppm	1 day a year
Nitrogen dioxide	1-hour average	0.120 ppm	1 day a year
	1-year average	0.030 ppm	None
Photochemical oxidants – as ozone	1-hour average	0.100 ppm	1 day a year
	4-hour rolling average	0.080 ppm	1 day a year
Sulfur dioxide	1-hour average	0.200 ppm	1 day a year
	1-day average	0.080 ppm	1 day a year
	1-year average	0.020 ppm	None
Particles as PM_{10}	1-day average	50.0 µg/m^3	None
	1-year average	25.0 µg/m^3	None
Particles as $PM_{2.5}$	1-day average	25.0 µg/m^3	None
	1-year average	8.0 µg/m^3	None
Lead	1-year average	0.50 µg/m^3	None

Tables 5 to 10a summarise compliance with the AAQ NEPM standards and goals. The following statistics are given for each pollutant monitored at each monitoring station:

- data availability rate (quarterly and annual)
- the annual mean (where an annual standard exists)
- an assessment of compliance, including the number of days when standards were exceeded.

Categories used to assess compliance

The categories Met, Not Met and ND (not demonstrated) are used to indicate assessment of compliance in Tables 5 to 10a.

A station's performance is assessed as **complying with the NEPM (i.e. 'Met'**) if the number of exceedances is no more than the number specified in Schedule 2 of the AAQ NEPM.

The station is assessed as **not compliant with the NEPM (i.e. 'Not Met')** if there are more than the number of exceedances specified in Schedule 2 of the AAQ NEPM.

A station's performance is assessed as **'not demonstrated' (ND)** if it has data availability rates less than 75% in any quarter, even if it records no exceedances or the number of exceedance days is allowable. Data losses may be due to instrument failures, temporary closures for upgrading, or closures to allow relocation of the station.

A region demonstrates compliance with the NEPM either when all stations in the region demonstrate compliance or when the region meets approved pollutant screening criteria.

Calculation and reporting methods

The calculation and reporting methods used comply with the requirements described in the National Environment Protection (Ambient Air Quality) Measure Technical Paper No. 8: Annual Reports (NEPC Peer Review Committee 2002).

Daily averages are calculated by using hours 1 to 24, as described in National Environment Protection (Ambient Air Quality) Measure Technical Paper No. 5: Data Collection and Handling (NEPC Peer Review Committee 2001).

An internal correction factor for United States Environmental Protection Agency (USEPA) equivalency has been applied to PM_{10} TEOM data, but there has been no subsequent treatment or temperature adjustment. $PM_{2.5}$ measurements were made by using BAMs (a Federal Equivalent Method). In this report, pre-2012 $PM_{2.5}$ data collected by using TEOMs do not include the internal correction for USEPA PM_{10} equivalency or any subsequent treatment or adjustment for temperature. $PM_{2.5}$ measurements using the USEPA Federal Reference Method are reported for the Chullora monitoring station.

All days where a pollutant standard was exceeded are listed in the tables below. Also listed are the stations that recorded exceedances of the standard on each day and the number of daily averaging periods in which the standard was exceeded (for averaging periods of less than 24 hours).

Exceptional particulate events

An **exceptional event** means a fire or dust occurrence that adversely affects air quality at a particular location and causes an exceedance of 1-day average standards in excess of normal historical fluctuations and background levels and is directly related to bushfire, jurisdiction-authorised hazard reduction burning, or continental-scale windblown dust (National Environment Protection (Ambient Air Quality) Measure, February 2016, clause 2).

The AAQ NEPM clause 18 (3) requires that jurisdictions exclude monitoring data determined as being directly associated with an exceptional event when assessing goal compliance against PM_{10} and $PM_{2.5}$ 1-day average standards. However, all measured data are included when reporting compliance against 1-year average standards, including that directly associated with an exceptional event.

In this report, 1-day particulate exceedances clearly influenced by exceptional events such as natural bushfires, hazard reduction burning and widescale regional windblown dust storms are classified as exceptional events. PM_{10} 1-day exceedances influenced by local dust are classified as non-exceptional events.

A brief comment describing the cause of events is given where possible. The absence of a comment does not necessarily indicate the absence of such influences; instead, no clear information may be available. In some cases, such as at Wagga Wagga North, it is likely that there has been an influence of a dust event, however, the scale of transport of windblown dust cannot be established. Such cases have been classified as non-exceptional events, due to local dust sources.

Section E provides links to detailed air pollution episode analyses for selected exceptional PM_{10} and $PM_{2.5}$ events.

Population exposure to $PM_{2.5}$

The AAQ NEPM clause 17 (2A) requires each participating jurisdiction to evaluate and report population exposures to particles as $PM_{2.5}$ annually from June 2018. The New South Wales approach to $PM_{2.5}$ exposure mapping is included in Section E.

We note that a nationally consistent agreement between participating jurisdictions does not yet exist on the population exposure evaluation and reporting procedure or method.

Data availability during 2018

Twenty-four of 28 monitoring stations with continuous real-time monitors complied with the data coverage requirement (at least 75% per quarter [Q]).

Four monitoring stations did not meet the requirement of 75% data availability in any quarter:

- Rozelle did not meet 75% data availability, due to recommissioning of the site
  - CO and NO_2: less than 75% data available in Q1 and Q2
  - Ozone: less than 75% data available in Q1 and Q2
  - SO_2: less than 75% data available in Q1 and Q2
  - PM_{10} and $PM_{2.5}$: less than 75% data available in Q1 and Q2.
- Gunnedah did not meet 75% data availability, due to commissioning for gases in Q1
  - Ozone and NO_2: less than 75% data available in Q1.
- Prospect did not meet 75% data availability criteria, due to instrument issues
  - SO_2: did not meet 75% data available in Q2.
- St Marys did not meet 75% data availability, due to instrument issues
  - PM_{10}: less than 75% data available in Q2 and Q3.

Compliance summaries

Carbon monoxide

Table 5 2018 compliance summary for carbon monoxide

Region/ monitoring station	Data availability rate (% of hours)					Number of exceedances (days)	Performance against the standard and goal
	Q1	Q2	Q3	Q4	Annual		
Sydney							
Camden	94.5	94.1	95.3	78.0	90.4	0	Met
Campbelltown West	95.6	93.6	91.8	95.0	94.1	0	Met
Chullora	95.5	95.5	95.7	80.2	91.7	0	Met
Liverpool	94.0	95.5	92.5	95.2	94.3	0	Met
Macquarie Park	81.7	86.7	91.3	95.1	88.7	0	Met
Parramatta North	87.9	95.3	95.3	93.0	92.9	0	Met
Prospect	94.1	75.2	84.1	95.4	87.2	0	Met
Rozelle	45.8	32.6	86.2	94.6	65.0	0	ND
Central Coast							
Wyong	95.3	95.0	95.4	92.7	94.6	0	Met
Illawarra							
Wollongong	93.6	92.9	93.8	94.0	93.6	0	Met
Lower Hunter							
Newcastle	94.0	93.3	88.3	95.3	92.7	0	Met

AAQ NEPM standard and goal:

9.0 ppm (8-hour average, 1 day/year)

ND – Rozelle site performance was not assessed because greater than 75% availability of data in any quarter was not demonstrated

During 2018, compliance with the AAQ NEPM goal for carbon monoxide was demonstrated at 10 of 10 sites with 75% or higher data availability in the Sydney, Central Coast, Illawarra and Lower Hunter regions (Table 5).

Nitrogen dioxide

Table 6 2018 compliance summary for nitrogen dioxide

Region/ monitoring station	Data availability rate (% of hours)					Number of exceedances (days)	Annual mean (ppm)	Performance against standards and goals	
	Q1	Q2	Q3	Q4	Annual			1-hour	1-year
Sydney									
Bargo	93.8	95.4	95.0	92.7	94.2	0	0.006	Met	Met
Bringelly	94.3	95.0	94.0	95.0	94.6	0	0.006	Met	Met
Camden	94.4	94.0	95.2	79.3	90.7	0	0.005	Met	Met
Campbelltown West	95.6	93.7	91.9	95.3	94.1	0	0.011	Met	Met
Chullora	95.6	95.5	95.6	92.3	94.7	0	0.012	Met	Met
Earlwood	95.5	92.4	93.8	95.3	94.3	0	0.010	Met	Met
Liverpool	94.0	95.6	92.5	94.4	94.1	0	0.012	Met	Met
Macquarie Park	93.4	93.4	93.7	93.3	93.4	0	0.006	Met	Met
Oakdale	94.1	95.1	94.7	93.4	94.3	0	0.002	Met	Met
Parramatta North	89.3	95.3	93.4	92.7	92.7	0	0.011	Met	Met
Prospect	94.1	75.2	84.1	95.4	87.2	0	0.009	Met	Met
Randwick	90.4	93.3	92.2	94.0	92.5	0	0.007	Met	Met
Richmond	91.5	88.8	95.6	93.8	92.4	0	0.005	Met	Met
Rozelle	47.6	32.6	95.2	94.6	67.7	0	*0.010*	ND	ND
St Marys	92.0	93.5	94.5	93.6	93.4	0	0.005	Met	Met
Central Coast									
Wyong	95.3	94.8	92.3	92.0	93.6	0	0.004	Met	Met
Illawarra									
Albion Park South	95.6	93.1	95.2	95.1	94.7	0	0.004	Met	Met
Kembla Grange	92.5	92.9	95.5	85.5	91.6	0	0.005	Met	Met
Wollongong	93.6	92.9	93.5	93.0	93.2	0	0.007	Met	Met
Lower Hunter									
Beresfield	94.0	93.3	93.8	89.8	92.7	0	0.009	Met	Met
Newcastle	95.3	93.3	93.2	95.3	94.3	0	0.007	Met	Met
Wallsend	95.6	91.5	94.4	93.4	93.7	0	0.007	Met	Met
Regional NSW									
Gunnedah	30.7	93.4	92.8	95.3	78.3	0	*0.005*	ND	ND

AAQ NEPM standards and goals:

0.120 ppm (1-hour average, 1 day/year)

0.030 ppm (Annual average)

ND – Rozelle and Gunnedah site performance was not assessed because greater than 75% availability of data in any quarter was not demonstrated. Annual averages are provided in italics demonstrating between 15% and 75% coverage

During 2018, compliance with the AAQ NEPM goal for nitrogen dioxide was demonstrated at 21 of 21 sites with 75% or higher data availability in the Sydney, Central Coast, Illawarra and Lower Hunter regions.

Ozone

Table 7 2018 compliance summary for ozone

Region/ monitoring station	Data availability rate (% of hours)					Number of exceedances (days)		Performance against standards and goals	
	Q1	Q2	Q3	Q4	Annual	1-hour	4-hour	1-hour	4-hour
Sydney									
Bargo	92.6	92.5	93.2	92.7	92.8	1	2	Met	**Not Met**
Bringelly	94.1	95.0	93.8	93.4	94.1	2	4	**Not Met**	**Not Met**
Camden	92.7	94.0	94.0	79.3	90.0	2	4	**Not Met**	**Not Met**
Campbelltown West	95.7	93.3	90.6	95.2	93.7	3	4	**Not Met**	**Not Met**
Chullora	95.5	95.5	95.7	93.4	95.0	0	1	Met	Met
Earlwood	95.5	93.5	95	95.3	94.8	0	0	Met	Met
Liverpool	93.9	95.5	92.4	92.2	93.5	1	3	Met	**Not Met**
Macquarie Park	93.3	95.5	92.4	92.2	93.9	0	0	Met	Met
Oakdale	95.1	95.5	92.1	92.5	93.8	0	2	Met	**Not Met**
Parramatta North	89.7	95.3	92.8	92.9	92.7	1	2	Met	**Not Met**
Prospect	93.0	75.2	83.9	91.7	85.6	1	2	Met	**Not Met**
Randwick	94.8	93.3	93.5	95.0	94.2	0	0	Met	Met
Richmond	92.5	94.0	95.4	94.7	94.2	1	2	Met	**Not Met**
Rozelle	47.5	32.6	95.2	94.6	67.7	0	0	ND	ND
St Marys	91.9	93.5	95.5	94.7	93.9	1	2	Met	**Not Met**
Central Coast									
Wyong	95.3	84.3	95.2	92.3	91.8	0	0	Met	Met
Illawarra									
Albion Park South	95.5	94.1	95.1	91.5	94.0	0	0	Met	Met
Kembla Grange	94.0	95.2	95.5	87.0	92.9	0	0	Met	Met
Wollongong	93.8	92.9	93.7	95.0	93.9	0	0	Met	Met
Lower Hunter									
Beresfield	93.9	94.4	92.7	94.2	93.8	1	1	Met	Met
Newcastle	91.8	93.3	93.3	95.3	93.4	0	0	Met	Met
Wallsend	95.5	91.7	94.5	93.5	93.8	0	0	Met	Met
Regional NSW									
Gunnedah	30.7	95.3	93.4	95.3	78.9	0	0	ND	ND

AAQ NEPM standards and goals:

0.100 ppm (1-hour average, 1 day/year)

0.080 ppm (4-hour average, 1 day/year)

Bold font indicates that the AAQ NEPM goal was not met. See Table 16 for details of exceedance events

ND – Rozelle and Gunnedah site performance was not assessed because greater than 75% availability of data in any quarter was not demonstrated

During 2018, compliance with the AAQ NEPM goal for ozone was demonstrated at 18 of 21 sites, with 75% or higher data availability, for the 1-hour goal. Three stations did not meet

the 1-hour AAQ NEPM goal for ozone due to exceeding the 1-day allowance: Bringelly, Camden and Campbelltown West.

During 2018, compliance with the AAQ NEPM goal for ozone was demonstrated at 11 of 21 sites with 75% or higher data availability, for the 4-hour goal. Ten stations did not meet the 4-hour AAQ NEPM goal due to exceeding the 1-day allowance: Bargo, Bringelly, Camden, Campbelltown West, Liverpool, Oakdale, Parramatta North, Prospect, Richmond and St Marys.

Three stations failed to comply with both the 1-hour and 4-hour ozone AAQ NEPM goals: Bringelly, Camden and Campbelltown West.

Details of the individual days when the 1-hour and 4-hour ozone standards were exceeded are presented in Section C, Tables 13–16. Section E includes a link to an episode analysis for 19–22 January 2018, when the maximum 1-hour and 4-hour ozone concentrations in 2018 were recorded.

Sulfur dioxide

Table 8 2018 compliance summary for sulfur dioxide

Region/ monitoring station	Data availability rate (% of hours)					Number of Exceedances (days)		Annual mean (ppm)	Performance against standards and goals		
	Q1	Q2	Q3	Q4	Annual	1-hour	24-hour		1-hour	24-hour	1-year
Sydney											
Bargo	93.3	95.4	94.8	92.7	94.0	0	0	0.000	Met	Met	Met
Bringelly	94.3	93.9	94.1	95.0	94.3	0	0	0.000	Met	Met	Met
Campbelltown West	95.0	93.7	91.5	93.6	93.4	0	0	0.001	Met	Met	Met
Chullora	95.5	95.5	95.7	93.3	95.0	0	0	0.001	Met	Met	Met
Macquarie Park	93.4	93.6	93.2	95.2	93.8	0	0	0.001	Met	Met	Met
Parramatta North	86.9	95.2	91.6	92.6	91.6	0	0	0.001	Met	Met	Met
Prospect	94.1	73.1	84.0	95.3	86.6	0	0	*0.001*	ND	ND	ND
Randwick	94.9	91.6	92.5	94.1	93.3	0	0	0.001	Met	Met	Met
Richmond	91.4	92.8	95.4	93.7	93.3	0	0	0.000	Met	Met	Met
Rozelle	44.7	32.6	95.2	94.7	66.8	0	0	*0.001*	ND	ND	ND
Central Coast											
Wyong	95.4	93.2	95.4	92.7	94.2	0	0	0.001	Met	Met	Met
Illawarra											
Albion Park South	95.6	93.1	95.2	95.1	94.8	0	0	0.001	Met	Met	Met
Wollongong	93.7	93.0	87.8	94.2	92.2	0	0	0.001	Met	Met	Met
Lower Hunter											
Beresfield	93.7	95.0	93.8	93.8	94.1	0	0	0.002	Met	Met	Met
Newcastle	93.9	93.3	89.0	94.9	92.8	0	0	0.001	Met	Met	Met
Wallsend	95.6	91.8	92.9	93.2	93.4	0	0	0.001	Met	Met	Met

AAQ NEPM standards and goals:

0.200 ppm (1-hour average, 1 day/year)

0.080 ppm (24-hour average, 1 day/year)

0.020 ppm (1-year average)

ND – Site performance at Prospect and Rozelle was not assessed because greater than 75% availability of data in any quarter was not demonstrated. Annual averages are provided in italics demonstrating between 15% and 75% coverage

During 2018, compliance with the AAQ NEPM goals for sulfur dioxide was demonstrated at 15 of 15 sites with 75% or higher data availability in the Sydney, Illawarra, Central Coast and Lower Hunter regions.

Particles as PM_{10}

Table 9 2018 compliance summary for PM_{10}

Region/ monitoring station	Data availability rate (% of days)					Number of exceedances (days)		Annual mean (µg/m³)	Performance against standards and goals	
	Q1	Q2	Q3	Q4	Annual	Non-exceptional events	Exceptional events		24-hour	1-year
Sydney										
Bargo	97.8	97.8	100	96.7	96.1	0	4	17.2	Met	Met
Bringelly	100	96.7	98.9	97.8	98.4	0	8	21.3	Met	Met
Camden	97.9	100	100	100	99.4	0	6	17.5	Met	Met
Campbelltown West	100	97.8	93.5	100	97.8	0	3	17.9	Met	Met
Chullora	100	95.6	100	96.7	98.1	0	7	21.9	Met	Met
Earlwood	96.7	97.8	100	100	98.6	0	5	19.8	Met	Met
Liverpool	100	100	95.7	97.8	98.4	2	11	24.3	**Not Met**	Met
Macquarie Park	96.7	97.8	100	98.9	98.4	0	4	17.2	Met	Met
Oakdale	100	100	96.7	100	99.2	1	4	15.4	**Not Met**	Met
Parramatta North	93.3	97.8	100	97.8	97.2	0	8	21.6	Met	Met
Prospect	100	100	100	97.8	99.4	0	8	21.9	Met	Met
Randwick	100	98.9	94.6	100	98.4	0	5	21.2	Met	Met
Richmond	93.3	95.6	97.8	97.8	96.1	0	8	18.7	Met	Met
Rozelle	50.0	34.1	97.8	98.9	70.2	0	2	*18.4*	ND	ND
St Marys	100	48.4	68.5	95.7	78.2	0	2	*19.4*	ND	ND
Central Coast										
Wyong	100	100.0	97.8	97.8	98.9	0	6	18.0	Met	Met
Illawarra										
Albion Park South	100	95.6	100	100	98.9	0	2	17.8	Met	Met
Kembla Grange	97.8	100	100	89.1	96.7	**3**	7	22.7	**Not Met**	Met
Wollongong	95.6	96.7	100	100	98.1	0	5	19.8	Met	Met
Lower Hunter										
Beresfield	100	100.0	100	97.8	99.4	0	8	21.6	Met	Met
Newcastle	100	96.7	100	97.8	98.6	0	8	24.5	Met	Met
Wallsend	100	87.9	96.7	94.6	94.8	0	5	19.4	Met	Met
Regional NSW										
Albury	86.7	97.8	100	97.8	95.6	**1**	6	19.8	**Not Met**	Met
Bathurst	100	100	95.7	97.8	98.4	0	8	18.8	Met	Met
Gunnedah	93.3	100	98.9	100	98.0	0	10	18.9	Met	Met
Narrabri	100	97.8	100	97.8	98.9	0	10	14.3	Met	Met
Tamworth	100	100	100	96.7	99.2	0	9	20.1	Met	Met
Wagga Wagga North	97.8	100	94.6	95.7	97.0	**22**	12	**27.4**	**Not Met**	**Not Met**

AAQ NEPM standards and goal:

50.0 µg/m³ (24-hour average, 0 days/year)

25.0 µg/m^3 (Annual average)

Bold font indicates that the AAQ NEPM goal was not met. See Table 20 for details of exceptional events

ND – Rozelle and St Marys site performance was not assessed because greater than 75% availability of data in any quarter was not demonstrated. Annual averages are provided in italics demonstrating between 15% and 75% coverage

During 2018, compliance with the AAQ NEPM 24-hour goal for PM_{10} was demonstrated at 21 of 26 sites, with 75% or higher data availability. Three stations did not meet the goal due to exceedances of the 24-hour standard on one or more days, determined to be non-exceptional events, related to local particle sources: Kembla Grange, Albury and Wagga Wagga North.

Compliance with the AAQ NEPM annual goal for PM_{10} was demonstrated at 25 of 26 sites with 75% or higher data availability. Wagga Wagga North did not meet the goal due to an annual average of 27.4 µg/m^3, exceeding the standard of 25.0 µg/m^3.

Details of the individual days when the 24-hour PM_{10} standard was exceeded are presented in Section C, Tables 20 and A.6. Section E includes a link to an episode analysis for 20–23 November 2018, when elevated 24-hour PM_{10} concentrations in 2018 were recorded.

Particles as $PM_{2.5}$

Table 10 2018 compliance summary for $PM_{2.5}$

Region/ monitoring station	Data availability rate (% of days)					Number of exceedance days		Annual mean (µg/m^3)	Performance against standards and goals	
	Q1	Q2	Q3	Q4	Annual	Non-exceptional days	Exceptional days		24-hour	1-year
Sydney										
Bargo	100	97.8	100	91.3	97.3	0	2	6.8	Met	Met
Bringelly	100	97.8	100	97.8	98.9	0	4	8.0	Met	Met
Camden	95.6	100	100	98.9	98.6	0	2	7.2	Met	Met
Campbelltown West	94.4	94.5	93.5	91.3	93.4	0	2	**8.4**	Met	**Not Met**
Chullora	98.9	100	100	92.4	97.8	**1**	2	**8.6**	**Not Met**	**Not Met**
Earlwood	97.8	97.8	100	92.4	97.0	0	1	7.8	Met	Met
Liverpool	97.8	97.8	95.7	97.8	97.3	0	8	**10.1**	Met	**Not Met**
Macquarie Park	98.9	97.8	97.8	98.9	98.4	0	3	7.0	Met	Met
Oakdale	96.7	100	92.4	92.4	95.3	0	2	6.9	Met	Met
Parramatta North	86.7	95.6	100	97.8	95.1	0	4	**9.2**	Met	**Not Met**
Prospect	97.8	98.9	97.8	91.3	96.4	0	4	**8.5**	Met	**Not Met**
Randwick	97.8	96.7	75.0	100	92.3	0	1	7.6	Met	Met
Richmond	90.0	97.8	96.7	95.7	95.1	0	4	**8.1**	Met	**Not Met**
Rozelle	50.0	34.1	97.8	100	70.7	0	0	*7.3*	ND	ND
St Marys	97.8	100	96.7	80.4	93.7	0	3	7.8	Met	Met
Central Coast										
Wyong	98.9	92.3	87.0	88.0	91.5	0	0	6.8	Met	Met
Illawarra										
Albion Park South	98.9	90.1	96.7	97.8	95.9	0	1	6.8	Met	Met

Region/ monitoring station	Data availability rate (% of days)					Number of exceedance days		Annual mean (µg/m^3)	Performance against standards and goals	
	Q1	Q2	Q3	Q4	Annual	Non-exceptional days	Exceptional days		24-hour	1-year
Kembla Grange	97.8	97.8	97.8	95.7	97.3	0	0	7.0	Met	Met
Wollongong	94.4	93.4	97.8	98.9	96.2	0	3	7.3	Met	Met
Lower Hunter										
Beresfield	95.6	96.7	100	89.1	95.3	0	0	**8.7**	Met	**Not Met**
Newcastle	100	96.7	100	97.8	98.6	0	0	7.8	Met	Met
Wallsend	100	93.4	97.8	100	97.8	0	0	7.5	Met	Met
Regional NSW										
Albury	86.7	100	100	97.8	96.2	**2**	0	7.3	**Not Met**	Met
Bathurst	96.7	100	100	97.8	98.6	0	2	7.0	Met	Met
Gunnedah	93.3	100	98.9	100	98.1	**4**	1	**9.0**	**Not Met**	**Not Met**
Narrabri	100	97.8	97.8	95.7	97.8	0	1	4.9	Met	Met
Tamworth	94.4	98.9	87.0	88.0	92.1	0	0	**8.3**	Met	**Not Met**
Wagga Wagga North	95.6	100	97.8	92.4	96.4	0	0	**8.4**	Met	**Not Met**

AAQ NEPM standards and goal:

25.0 µg/m^3 (24-hour average, 0 days/year)

8.0 µg/m^3 (Annual average)

Bold font indicates that the AAQ NEPM goal was not met. See Table 21 for details of exceptional events

ND – Rozelle site performance was not assessed because greater than 75% availability of data in any quarter was not demonstrated. Annual averages are provided in italics demonstrating between 15% and 75% coverage

During 2018, compliance with the AAQ NEPM 24-hour goal for $PM_{2.5}$ was demonstrated at 24 of 27 sites, with 75% or higher data availability. Three stations did not meet the goal due to exceedances of the 24-hour standard on one or more days, determined to be non-exceptional events, related to local particle sources: Chullora, Albury and Gunnedah.

Compliance with the AAQ NEPM annual goal for $PM_{2.5}$ was demonstrated at 17 of 27 sites with 75% or higher data availability and annual average concentrations below the annual standard of 8.0 µg/m^3. Ten stations did not meet the goal due to an annual average exceeding 8.0 µg/m^3: Campbelltown West, Chullora, Liverpool, Parramatta North, Prospect, Randwick, Beresfield, Gunnedah, Tamworth and Wagga Wagga North..

Details of the individual days when the 24-hour $PM_{2,5}$ standard was exceeded are presented in Section C, Tables 22 and A.6. Section E includes a link to an episode analysis for 26–29 May 2018, when elevated 24-hour $PM_{2.5}$ concentrations in 2018 were recorded.

Table 10a presents $PM_{2.5}$ data that were measured using the USEPA Federal Reference Method (FRM), whereas data in Table 10 above were measured using either a BAM or a TEOM-FDMS instrument (refer to Table 3). The NSW Government currently performs FRM measurements at the Chullora station only. The differences in $PM_{2.5}$ annual averages between BAM and FRM reflect inter-method differences, as the FRM provides only one sample in three days whereas BAM and TEOM-FDMS monitors provide continuous data.

Table 10a shows that $PM_{2.5}$ FRM monitoring results for Chullora did not meet the 24-hour goal, due to one non-exceptional exceedance of the 24-hour standard, related to a local particle source. Chullora met the annual goal, with an annual average of 7.8 µg/m^3, below the annual standard of 8.0 µg/m^3.

Table 10a 2018 compliance summary for $PM_{2.5}$ Federal Reference Method at Chullora

Region/ monitoring station	Data availability rate (% of days)					Number of exceedance days		Annual mean (µg/m³)	Performance against standards and goals	
	Q1	Q2	Q3	Q4	Annual	Non-exceptional days	Exceptional days		24-hour	1-year
Sydney										
Chullora	80.0	95.6	75.0	88.0	84.7	1	1	7.8	**Not Met**	Met

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

Historical note on $PM_{2.5}$ monitoring and reporting using the USEPA Federal Reference Method (FRM)

A background to $PM_{2.5}$ monitoring and reporting of FRM data in New South Wales is provided below.

- In 1996, the AAQ NEPM set a standard for monitoring airborne particle matter as PM_{10}.
- In 1998, the NSW Government began continuous monitoring of $PM_{2.5}$, using the TEOM method.
- In 2003, the AAQ NEPM variation incorporated monitoring protocols and 'advisory reporting standards' for $PM_{2.5}$, in the absence of an Australian Standard method for measuring $PM_{2.5}$.
    - The National Environment Protection Council (NEPC) advised that the reference method for monitoring $PM_{2.5}$ was the manual gravimetric USEPA FRM. This method sampled one-day-in-three and required pre- and post-laboratory weighing of the particle sample. NEPC considered the data obtained using $PM_{2.5}$ TEOM monitors was not equivalent to USEPA FRM data, due to the loss of volatile components from particles in the heating of the air sample.
    - The NEPC established a National $PM_{2.5}$ Equivalence Program, to develop methods for continuous monitoring of $PM_{2.5}$ that would generate equivalent information, compared to the USEPA FRM.
- In 2003–2015, the NSW Government contributed to the $PM_{2.5}$ Equivalence Program by running co-located $PM_{2.5}$ samplers at Chullora and Richmond. These monitoring stations operated several measurement techniques, including the continuous TEOM and BAM monitors and the USEPA FRM monitors.
    - In 2003, the NSW Government commenced reporting of $PM_{2.5}$ TEOM monitoring data, compared to the advisory reporting standard, for interest only, in an appendix to the NSW AAQ NEPM annual compliance report. The $PM_{2.5}$ TEOM monitoring data were reported with PM_{10} adjustment factors applied (a USEPA Federal Equivalence Method (FEM)).
    - In 2009, the $PM_{2.5}$ Equivalence Program found that the unadjusted $PM_{2.5}$ TEOM data closely approximated $PM_{2.5}$ FRM data. This suggested that the application of the USEPA FEM PM_{10} adjustment factors was not required for $PM_{2.5}$ TEOM data.
    - In 2009–2011, the NSW AAQ NEPM annual compliance reports included unadjusted $PM_{2.5}$ TEOM data and equivalence program data for $PM_{2.5}$ FRM monitoring for Chullora and Richmond. Appending of $PM_{2.5}$ TEOM data with USEPA FEM PM_{10} adjustment factors applied ceased in 2011.
    - In 2012, the NSW Government replaced the continuous TEOM $PM_{2.5}$ monitors with the USEPA FEM Beta Attenuation Monitors (BAM), improving the measurement of volatile components in the particle sample. The 2012 NSW AAQ NEPM annual

compliance report included $PM_{2.5}$ BAM monitoring data for NSW monitoring stations, as well as FRM monitoring data for Chullora and Richmond.

- In 2013–2015, the NSW AAQ NEPM annual compliance reports continued to include $PM_{2.5}$ BAM monitoring data for NSW monitoring stations, as well as FRM monitoring data for Chullora. Reporting of FRM monitoring at Richmond ceased in 2013.

- In 2016–2018, the AAQ NEPM variation (2016) formally adopted the $PM_{2.5}$ reporting standards for formerly used as advisory standards only. The NSW AAQ NEPM annual compliance reports continued reporting $PM_{2.5}$ BAM monitoring data and $PM_{2.5}$ FRM monitoring data for Chullora.

Section C – Analysis of air quality

Data availability rates

Data availability rates are presented as either percentages of valid data or numbers of valid days.

When presented as a percentage, the value is the number of averaging periods in which the data are valid, divided by the total number of averaging periods in the year (or quarter, as appropriate).

When presented as the number of valid days, the value represents the number of days during the year when at least 75% of averaging periods during the day are valid. A valid day has at least 18 valid hours. If we hypothesize that we had exactly 18 valid hours on each day throughout the year, annual hourly data availability would be 75%. The number of valid days would be 365.

Calibration hour

For gaseous pollutants, the calibration hour is included in the calculation of data availability rates.

The Department of Planning, Industry and Environment (the Department) does daily automated instrument calibration checks for carbon monoxide, nitrogen dioxide, ozone and sulfur dioxide during the early morning. Hourly data obtained during the calibration check are considered invalid for reporting purposes. Hence for these pollutants the maximum number of valid 1-hour averages in a day is 23. However, all calculations for data availability given in this report include the invalid calibration hour (i.e. calculations assume that there are 24 possible valid hours in a day). Therefore, for gaseous pollutants, the maximum annual 1-hour data availability is 96%.

Data availability rates and reporting periods

Each reporting period (e.g. quarter) and NEPM standard averaging period has at least a 75% data availability rate.

For example, the carbon monoxide NEPM standard is based on 8-hour rolling averages. A valid 8-hour rolling average is calculated as the average of the valid 1-hour averages over the preceding 8 hours (from the time point), when at least six of those hours (75%) hold valid data.

Data availability rates for pollutants reported against more than one standard

For pollutants reported against more than one AAQ NEPM standard, data availability rates may not be the same for each standard.

For instance, when ozone is measured, one hour of each day is lost during calibration checks. This affects data availability rates for reporting against the 1-hour standard for the associated hour, but it may not affect data availability rates for reporting against the 4-hour standard. Thus, the maximum data availability rate is only 96% for the 1-hour standard, but it can be 100% for the 4-hour standard.

Daily maxima

As a NEPM requirement for standards with averaging periods of less than 24 hours, the daily maxima are reported regardless of the number of valid hours in the day.

As an example, the daily highest 1-hour average for NO_2 during a given year at a site may have occurred on a day on which the 75% data requirement was not met. In reporting percentile distributions of the daily 1-hour maxima for the site for the year, however, **at least 75% of valid hours must be available for the associated day**. If not, the subsequent day that has the highest 1-hour daily average from the year's dataset and meets the 75% data requirement will be used.

Air quality data tables

Tables 11 to 19 summarise air quality data availability and maximum concentrations recorded in 2018.

Carbon monoxide

Table 11 Summary for CO: daily maximum rolling 8-hour average concentrations (2018)

Region/ monitoring station	Data availability rate (%)	Number of valid days	Maximum values (ppm)			
			Highest	Date, time of highest	2nd highest	Date, time of 2nd highest
Sydney						
Camden	94.4	340	0.7	05/08/2018 07:00	0.6	31/07/2018 24:00
Campbelltown West	98.1	354	1.5	28/06/2018 20:00	0.8	01/08/2018 10:00
Chullora	95.6	346	3.4	27/07/2018 24:00	1.3	20/04/2018 22:00
Liverpool	98.5	357	1.9	04/07/2018 02:00	1.7	23/06/2018 02:00
Macquarie Park	92.5	330	2.5	09/08/2018 06:00	0.8	10/08/2018 05:00
Parramatta North	96.7	349	1.1	23/06/2018 03:00	1.0	15/07/2018 05:00
Prospect	90.9	329	1.1	15/07/2018 03:00	1.0	29/05/2018 02:00
Rozelle	67.8	240	0.7	27/07/2018 05:00	0.6	04/07/2018 05:00
Central Coast						
Wyong	98.8	357	0.9	19/06/2018 19:00	0.4	06/07/2018 02:00
Illawarra						
Wollongong	97.5	351	0.9	29/07/2018 02:00	0.9	07/01/2018 23:00
Lower Hunter						
Newcastle	96.7	348	1.0	20/05/2018 02:00	0.9	28/07/2018 03:00

AAQ NEPM standard: 9.0 ppm (rolling 8-hour average)

Carbon monoxide (CO) levels in all regions were below the AAQ NEPM carbon monoxide 8-hour rolling average standard (Table 11). The highest recorded reading was at Chullora (3.4 ppm) which was approximately 38% of the NEPM standard.

Nitrogen dioxide

Table 12 Summary of NO_2: daily maximum 1-hour average concentrations (2018)

Region/ monitoring station	Data availability rate (%)	Number of valid days	Maximum values (ppm)			
			Highest	Date, time of highest	2nd highest	Date, time of 2nd highest
Sydney						
Bargo	94.2	358	0.048	22/01/2018 22:00	0.047	01/11/2018 23:00
Bringelly	94.6	359	0.036	05/11/2018 19:00	0.034	28/05/2018 19:00
Camden	90.7	343	0.029	10/08/2018 19:00	0.029	28/02/2018 23:00
Campbelltown West	94.1	357	0.054	08/05/2018 21:00	0.052	12/09/2018 20:00
Chullora	94.7	361	0.057	27/07/2018 22:00	0.044	07/06/2018 11:00
Earlwood	94.3	357	0.050	08/05/2018 17:00	0.044	06/11/2018 13:00
Liverpool	94.1	356	0.062	08/05/2018 19:00	0.049	01/08/2018 09:00
Macquarie Park	93.4	356	0.030	09/02/2018 11:00	0.029	19/09/2018 10:00
Oakdale	94.3	354	0.029	01/05/2018 23:00	0.021	07/06/2018 05:00
Parramatta North	92.7	349	0.064	16/08/2018 07:00	0.057	09/08/2018 08:00
Prospect	87.2	330	0.051	14/08/2018 20:00	0.049	28/05/2018 19:00
Randwick	92.5	348	0.040	06/11/2018 10:00	0.038	08/05/2018 15:00
Richmond	92.4	349	0.030	28/05/2018 19:00	0.028	26/06/2018 19:00
Rozelle	67.7	258	0.057	06/11/2018 17:00	0.045	05/11/2018 19:00
St Marys	93.4	359	0.037	17/07/2018 07:00	0.034	05/11/2018 18:00
Central Coast						
Wyong	93.6	354	0.035	01/11/2018 17:00	0.030	28/09/2018 21:00
Illawarra						
Albion Park South	94.7	359	0.039	05/11/2018 16:00	0.036	09/05/2018 19:00
Kembla Grange	91.6	347	0.037	29/05/2018 17:00	0.035	12/09/2018 19:00
Wollongong	93.2	354	0.043	12/04/2018 20:00	0.041	09/05/2018 19:00
Lower Hunter						
Beresfield	92.7	353	0.040	18/05/2018 19:00	0.038	26/07/2018 20:00
Newcastle	94.3	358	0.045	09/04/2018 18:00	0.040	15/09/2018 20:00
Wallsend	93.7	354	0.035	23/07/2018 20:00	0.035	09/05/2018 18:00
Regional NSW						
Gunnedah	78.3	295	0.034	23/08/2018 20:00	0.032	15/08/2018 19:00

AAQ NEPM standard: 0.120 ppm (1-hour average)

Nitrogen dioxide (NO_2) levels in all regions were below the AAQ NEPM 1-hour nitrogen dioxide standard (Table 12). The highest recorded reading was 0.062 ppm at Liverpool at 19:00 hours on 8 May 2018.

Ozone

Table 13 Summary of O_3: daily maximum 1-hour average concentrations (2018)

Region/ monitoring station	Data availability rate (%)	Number of valid days	Maximum values (ppm)			
			Highest	Date, time of highest	2nd highest	Date, time of 2nd highest
Sydney						
Bargo	92.8	351	**0.102**	27/12/2018 17:00	0.097	22/01/2018 17:00
Bringelly	94.1	359	**0.110**	22/01/2018 15:00	**0.105**	28/12/2018 16:00
Camden	90.0	339	**0.112**	28/12/2018 16:00	**0.109**	19/01/2018 14:00
Campbelltown West	93.7	354	**0.110**	22/01/2018 15:00	**0.110**	19/01/2018 14:00
Chullora	95.0	362	0.092	28/12/2018 12:00	0.085	22/01/2018 12:00
Earlwood	94.8	359	0.072	07/01/2018 14:00	0.071	30/12/2018 16:00
Liverpool	93.5	351	**0.111**	22/01/2018 14:00	0.098	28/12/2018 14:00
Macquarie Park	93.9	358	0.087	22/01/2018 15:00	0.086	28/12/2018 16:00
Oakdale	93.8	353	0.097	27/12/2018 17:00	0.096	19/01/2018 15:00
Parramatta North	92.7	348	**0.102**	22/01/2018 13:00	0.100	28/12/2018 13:00
Prospect	85.9	325	**0.105**	22/01/2018 14:00	0.091	28/12/2018 15:00
Randwick	94.1	355	0.073	07/01/2018 11:00	0.066	02/04/2018 14:00
Richmond	94.2	355	**0.103**	28/12/2018 17:00	0.097	12/01/2018 17:00
Rozelle	67.7	257	0.078	07/01/2018 10:00	0.064	31/12/2018 12:00
St Marys	93.9	361	**0.105**	22/01/2018 16:00	0.096	19/01/2018 15:00
Central Coast						
Wyong	98.3	355	0.075	08/09/2017 08:00	0.073	03/09/2017 09:00
Illawarra						
Albion Park South	94.1	355	0.076	07/01/2018 13:00	0.071	12/04/2018 16:00
Kembla Grange	92.9	352	0.070	08/01/2018 15:00	0.065	29/12/2018 14:00
Wollongong	93.8	356	0.066	12/04/2018 15:00	0.065	17/03/2018 17:00
Lower Hunter						
Beresfield	93.8	360	**0.107**	31/12/2018 13:00	0.079	08/01/2018 14:00
Newcastle	93.4	355	0.067	29/12/2018 12:00	0.065	03/11/2018 15:00
Wallsend	93.8	354	0.086	28/12/2018 13:00	0.077	31/12/2018 11:00
Regional NSW						
Gunnedah	78.9	299	0.063	21/12/2018 16:00	0.062	4/11/2018 15:00

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

The maximum 1-hour average ozone level was 0.112 ppm, at Camden, at 16:00 hours on 28 December 2018. Section E includes a link to an analysis of the ozone exceedance event during 19–22 January 2018, with eight sites exceeding the 4-hour or 1-hour standards. The 1-hour NEPM ozone standard was exceeded on four distinct days in 2018 (Table 15).

Table 14 Summary of O_3: daily maximum rolling 4-hour average concentrations (2018)

Region/ monitoring station	Data availability rate (%)	Number of valid days	Maximum values (ppm)			
			Highest	Date, time of highest	2nd highest	Date, time of 2nd highest
Sydney						
Bargo	96.5	351	**0.084**	27/12/2018 18:00	**0.083**	22/01/2018 18:00
Bringelly	97.9	358	**0.092**	22/01/2018 16:00	**0.091**	28/12/2018 17:00
Camden	93.7	339	**0.094**	19/01/2018 15:00	**0.090**	28/12/2018 18:00
Campbelltown West	97.6	354	**0.098**	28/12/2018 16:00	**0.091**	22/01/2018 16:00
Chullora	99.1	361	**0.082**	28/12/2018 14:00	0.074	22/01/2018 15:00
Earlwood	98.9	360	0.065	30/12/2018 16:00	0.065	07/01/2018 16:00
Liverpool	97.4	352	**0.093**	28/12/2018 15:00	**0.089**	22/01/2018 16:00
Macquarie Park	97.5	357	0.080	22/01/2018 16:00	0.079	28/12/2018 16:00
Oakdale	97.7	352	**0.082**	19/01/2018 17:00	**0.081**	09/02/2018 15:00
Parramatta North	96.5	349	**0.095**	28/12/2018 16:00	**0.093**	22/01/2018 16:00
Prospect	89.6	326	**0.091**	22/01/2018 16:00	**0.087**	28/12/2018 17:00
Randwick	98.2	355	0.069	07/01/2018 13:00	0.061	02/04/2018 17:00
Richmond	98.2	356	**0.087**	12/01/2018 18:00	**0.081**	09/02/2018 15:00
Rozelle	70.5	255	0.066	07/01/2018 13:00	0.054	31/12/2018 13:00
St Marys	97.9	361	**0.094**	22/01/2018 18:00	**0.082**	28/12/2018 18:00
Central Coast						
Wyong	95.4	348	0.067	30/03/2018 17:00	0.066	14/02/2018 17:00
Illawarra						
Albion Park South	98.1	355	0.073	07/01/2018 15:00	0.065	12/04/2018 17:00
Kembla Grange	96.8	351	0.059	29/12/2018 15:00	0.058	08/01/2018 15:00
Wollongong	97.9	356	0.061	17/03/2018 18:00	0.060	12/04/2018 16:00
Lower Hunter						
Beresfield	97.6	357	**0.089**	31/12/2018 14:00	0.073	08/01/2018 15:00
Newcastle	97.4	355	0.058	03/11/2018 16:00	0.058	09/04/2018 17:00
Wallsend	97.8	355	0.068	28/12/2018 14:00	0.064	29/12/2018 14:00
Regional NSW						
Gunnedah	82.1	298	0.058	21/12/2018 17:00	0.056	04/11/2018 16:00

AAQ NEPM standard: 0.080 ppm (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

The maximum 4-hour ozone average was 0.098 ppm, at Campbelltown West, at 16:00 hours on 28 December 2018. Section E includes a link to an analysis of the ozone exceedance event during 19–22 January 2018, with eight sites exceeding either the 4-hour ozone standard, or both the 4-hour and 1-hour standards. The 4-hour NEPM ozone standard was exceeded on 10 distinct days (Table 16).

Ozone events in Sydney are highly variable in terms of both frequency and severity. This is largely due to the annual variability in meteorological conditions, which strongly affect the

frequency of events and the magnitude of peak concentrations. In the Sydney region, emissions of ozone precursors (such as nitrogen oxides and volatile organic compounds) lead to ozone concentrations well above the AAQ NEPM standards (NSW Environment Protection Authority [EPA] Emissions Inventory 2008).

Table 15 Days exceeding O_3 1-hour AAQ NEPM standard

Day count	Date	Stations where standard exceeded	Comments[1]
1	19/01/2018	Camden, Campbelltown West	Hot to very hot in Western Sydney. Light easterly to north-easterly sea breeze.
2	22/01/2018	Bringelly, Campbelltown West, Liverpool, Parramatta North, Prospect, St Marys	Very hot in Western Sydney (40.9°C maximum at St Marys). Light easterly to north-easterly winds.
3	27/12/2018	Bargo	Hot to very hot in Western Sydney. Light northerly to north-easterly sea breeze.
4	28/12/2018	Bringelly, Camden, Campbelltown West, Richmond	Hot to very hot in Western Sydney. Light north-easterly to south-easterly breeze.
5	31/12/2018	Beresfield	Warm to hot with light north-easterly sea breeze.

[1] Conditions that can be clearly identified as influencing pollution levels

Table 16 Days exceeding O_3 4-hour AAQ NEPM standard

[1] Conditions that can be clearly identified as influencing pollution levels

Day count	Date	Stations where standard exceeded	Comments[1]
1	12/01/2018	Richmond	Warm to hot in Western Sydney. Light easterly to north-easterly winds.
2	19/01/2018	Bringelly, Camden, Campbelltown West, Oakdale	Hot to very hot in Western Sydney. Light easterly to north-easterly sea breeze.
3	22/01/2018	Bargo, Bringelly, Camden, Campbelltown West, Liverpool, Parramatta North, Prospect, St Marys	Very hot in Western Sydney (40.9°C maximum at St Marys). Light easterly to north-easterly winds.
4	9/02/2018	Oakdale, Richmond	Warm to hot in Western Sydney. Light easterly to north-easterly sea breeze.
5	27/12/2018	Bargo	Hot to very hot in Western Sydney. Light northerly to north-easterly sea breeze.
6	28/12/2018	Bringelly, Camden, Campbelltown West, Chullora, Liverpool, Parramatta North, Prospect, St Marys	Hot to very hot in Western Sydney. Light north-easterly to south-easterly breeze.
7	31/12/2018	Beresfield, Bringelly, Camden, Campbelltown West, Liverpool	Warm to hot in Western Sydney with light north-easterly sea breeze. Similar conditions at Beresfield.

Sulfur dioxide

Table 17 Summary of SO_2: daily maximum 1-hour maximum concentrations (2018)

Region/ monitoring station	Data availability rate (%)	Number of valid days	Maximum values (ppm)			
			Highest	Date, time of highest	2nd highest	Date, time of 2nd highest
Sydney						
Bargo	94.1	356	0.010	13/11/2018 08:00	0.009	31/08/2018 10:00
Bringelly	94.3	357	0.011	12/01/2018 15:00	0.009	13/11/2018 09:00
Campbelltown West	93.5	353	0.016	29/03/2018 14:00	0.011	13/11/2018 09:00
Chullora	95.0	362	0.021	29/03/2018 10:00	0.012	10/08/2018 23:00
Macquarie Park	93.9	357	0.044	27/12/2018 09:00	0.022	20/01/2018 09:00
Parramatta North	91.6	344	0.021	29/03/2018 11:00	0.020	12/01/2018 13:00
Prospect	86.6	328	0.025	29/03/2018 11:00	0.018	12/01/2018 14:00
Randwick	93.3	351	0.021	06/08/2018 01:00	0.020	22/10/2018 01:00
Richmond	93.3	352	0.017	27/12/2018 18:00	0.012	12/01/2018 21:00
Rozelle	67.0	255	0.030	20/01/2018 10:00	0.024	31/08/2018 12:00
Central Coast						
Wyong	94.2	357	0.062	31/08/2018 11:00	0.059	01/11/2018 17:00
Illawarra						
Albion Park South	94.8	359	0.031	24/02/2018 13:00	0.026	05/11/2018 16:00
Wollongong	92.2	350	0.039	11/12/2018 21:00	0.023	31/10/2018 22:00
Lower Hunter						
Beresfield	94.1	360	0.070	09/02/2018 14:00	0.057	20/03/2018 01:00
Newcastle	92.8	351	0.039	19/01/2018 09:00	0.035	22/01/2018 09:00
Wallsend	93.4	352	0.079	19/05/2018 12:00	0.051	21/01/2018 09:00

AAQ NEPM standard: 0.200 ppm (1-hour average)

Sulfur dioxide (SO_2) levels in all regions were below the AAQ NEPM 1-hour sulfur dioxide standard (Table 17). The highest recorded 1-hour reading was 0.079 ppm at Wallsend at 12:00 hours on 19 May 2018.

Table 18 Summary of SO_2: maximum 24-hour average concentrations (2018)

Region/ monitoring station	Data availability rate (%)	Number of valid days	Maximum values (ppm)			
			Highest	Date, time of highest	2nd highest	Date, time of 2nd highest
Sydney						
Bargo	97.5	356	0.002	13/11/2018	0.002	18/02/2018
Bringelly	97.8	357	0.003	06/01/2018	0.003	12/01/2018
Campbelltown West	96.7	353	0.004	29/03/2018	0.003	23/10/2018
Chullora	99.2	362	0.003	03/05/2018	0.003	24/02/2018
Macquarie Park	97.8	357	0.007	27/12/2018	0.005	12/01/2018
Parramatta North	94.2	344	0.005	12/01/2018	0.004	23/10/2018
Prospect	89.9	328	0.005	12/01/2018	0.004	29/03/2018
Randwick	96.2	351	0.004	03/06/2018	0.004	22/10/2018
Richmond	96.4	352	0.005	12/01/2018	0.004	25/01/2018
Rozelle	69.9	255	0.005	02/10/2018	0.005	20/01/2018
Central Coast						
Wyong	97.8	357	0.008	31/08/2018	0.006	08/12/2018
Illawarra						
Albion Park South	98.4	359	0.008	28/12/2018	0.008	24/02/2018
Wollongong	95.9	350	0.009	28/08/2018	0.007	10/10/2018
Lower Hunter						
Beresfield	98.6	360	0.007	20/03/2018	0.007	03/06/2018
Newcastle	96.2	351	0.007	01/04/2018	0.006	19/04/2018
Wallsend	96.4	352	0.008	19/05/2018	0.007	10/12/2018

AAQ NEPM standard: 0.080 ppm (24-hour average)

Sulfur dioxide (SO_2) levels in all regions were below the AAQ NEPM 24-hour sulfur dioxide standard (Table 18). The highest recorded 24-hour reading was 0.009 ppm at Wollongong on 28 August 2018.

Particles as PM_{10}

Table 19 Summary of PM_{10}: maximum 24-hour average concentrations (2018)

Region/ monitoring station	Data availability rate (%)	Number of valid days	Maximum values (µg/m³)			
			Highest	Date, time of highest	2nd highest	Date, time of 2nd highest
Sydney						
Bargo	97.5	356	**60.8**	18/03/2018	47.7	18/07/2018
Bringelly	98.4	359	**92.9**	28/05/2018	**60.6**	09/05/2018
Camden	99.5	363	**68.1**	22/11/2018	**51.4**	18/03/2018
Campbelltown West	97.8	357	**72.3**	22/11/2018	45.5	14/04/2018
Chullora	98.1	358	**90.7**	22/11/2018	**55.7**	15/02/2018
Earlwood	98.6	360	**86.5**	22/11/2018	40.3	29/05/2018
Liverpool	98.4	359	**101.5**	22/11/2018	**60.6**	18/07/2018
Macquarie Park	98.4	359	**85.6**	22/11/2018	47.8	13/04/2018
Oakdale	99.2	362	**105.1**	18/05/2018	43.0	16/12/2018
Parramatta North	97.3	355	**107.4**	22/11/2018	**58.9**	29/05/2018
Prospect	99.5	363	**113.3**	22/11/2018	**58.7**	29/05/2018
Randwick	98.4	359	**95.5**	22/11/2018	47.4	29/05/2018
Richmond	96.2	351	**116.3**	28/05/2018	**57.5**	29/05/2018
Rozelle	70.4	257	**88.3**	22/11/2018	34.3	14/02/2018
St Marys	78.1	285	**100.5**	22/11/2018	37.1	01/11/2018
Central Coast						
Wyong	98.9	361	**138.3**	22/11/2018	**55.5**	15/02/2018
Illawarra						
Albion Park South	98.9	361	**94.4**	02/12/2018	44.7	14/04/2018
Kembla Grange	96.7	353	**71.8**	02/12/2018	**59.9**	14/04/2018
Wollongong	98.1	358	**59.7**	22/11/2018	47.3	18/03/2018
Lower Hunter						
Beresfield	99.5	363	**149.1**	22/11/2018	**55.7**	18/07/2018
Newcastle	98.6	360	**146.0**	22/11/2018	**56.7**	19/07/2018
Wallsend	94.8	346	**136.5**	22/11/2018	47.6	21/11/2018
Regional NSW						
Albury	95.6	349	**107.8**	12/04/2018	**50.8**	11/04/2018
Bathurst	98.4	359	**274.1**	15/12/2018	**68.1**	19/03/2018
Gunnedah	98.1	358	**234.9**	15/12/2018	**79.9**	06/11/2018
Narrabri	98.9	361	**221.7**	15/12/2018	**94.7**	01/09/2018
Tamworth	99.2	362	**145.4**	01/09/2018	**73.0**	04/08/2018
Wagga Wagga North	97.0	354	**127.2**	18/03/2018	**85.7**	24/04/2018

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

All 28 stations exceeded the AAQ NEPM 24-hour PM_{10} standard of 50 µg/m³ (Table 19). The maximum 24-hour PM_{10} was 274.1 µg/m³, recorded at Bathurst on 15 December 2018, during a widespread dust storm. Gunnedah recorded the second highest 24-hour average PM_{10} on 15 December 2018.

In accordance with the AAQ NEPM clause 18(3), Table 20 includes a determination on each PM_{10} exceedance event, as exceptional or non-exceptional, and describes the natural events or fire management activity which led to the determination of an exceptional event. A detailed episode analysis is included in Section E describing the exceptional exceedance event during 20–23 November 2018 when the network recorded their maximum 24-hour PM_{10} concentrations.

The 24-hour NEPM PM_{10} standard was exceeded on **59 distinct calendar days** (Table 20). Thirty-four exceedance days were exceptional events, 21 exceedance days were non-exceptional events due to a range of local particle sources, and four days recorded both exceptional and non-exceptional events. Twenty-two non-exceptional events occurred in the South West Slopes, due to drought-related local dust under light winds. Widespread dust storms and extensive hazard reduction burns (HRB) throughout the NSW Greater Metropolitan Region were the major influences on elevated PM_{10} levels throughout New South Wales. **Twenty-five of 26 stations met the AAQ NEPM annual PM_{10} goal,** with annual concentrations less than 25 µg/m^3.

Table 20 Days exceeding PM_{10} 24-hour AAQ NEPM Standard

Day count	Date	Stations where standard exceeded	Comments
1	12/01/2018	Wagga Wagga North	Dust storm under moderate westerly winds
2	08/02/2018	Wagga Wagga North	Non-exceptional event due to local dust
3	14/02/2018	Wagga Wagga North	Dust storm due to strong south-westerly winds
4	15/02/2018	Bargo, Beresfield, Bringelly, Camden, Chullora, Campbelltown West, Chullora, Earlwood, Kembla Grange, Liverpool, Macquarie Park, Newcastle, Oakdale, Prospect, Parramatta North, Randwick, Richmond, St Marys, Wallsend, Wollongong, Wyong	Dust storm due to strong south-westerly winds
5	12/03/2018	Wagga Wagga North	Dust storm under moderate west-south-westerly winds
6	16/03/2018	Wagga Wagga North	Non-exceptional event due to local dust
7	18/03/2018	Albury, Bargo, Bathurst, Camden, Kembla Grange, Oakdale, Wagga Wagga North	Widespread dust storm
8	19/03/2018	Albion Park South, Bathurst, Beresfield, Bringelly, Camden, Campbelltown West, Chullora, Earlwood, Liverpool, Macquarie Park, Newcastle, Randwick, Kembla Grange, Prospect, Richmond, Parramatta North, Wallsend, Wagga Wagga North, Wollongong, Wyong	Widespread dust storm
9	20/03/2018	Chullora	Dust storm, PM_{10} remained from high previous day
10	05/04/2018	Wagga Wagga North	Non-exceptional event due to local dust
11	06/04/2018	Wagga Wagga North	Non-exceptional event due to local dust
12	07/04/2018	Wagga Wagga North	Non-exceptional event due to local dust
13	08/04/2018	Wagga Wagga North	Non-exceptional event due to local dust
14	09/04/2018	Wagga Wagga North	Non-exceptional event due to local dust
15	10/04/2018	Wagga Wagga North	Non-exceptional event due to local dust
16	11/04/2018	Albury, Wagga Wagga North	Non-exceptional event due to local dust
17	12/04/2018	Kembla Grange	Non-exceptional event due to local particle source (construction site)
		Albury, Wagga Wagga North	Dust storm under strong west-north-west winds

Day count	Date	Stations where standard exceeded	Comments
18	13/04/2018	Kembla Grange	Non-exceptional event due to local particle source (construction site)
		Wagga Wagga North	Non-exceptional event due to local dust
19	14/04/2018	Kembla Grange, Albury, Wagga Wagga North	Dust storm under strong westerly winds across southern New South Wales
20	15/04/2018	Beresfield, Gunnedah, Narrabri, Newcastle, Tamworth, Wallsend	Dust under light to moderate south-west to north-west winds across northern New South Wales
21	17/04/2018	Liverpool	Forest fire at Moorebank Ave, Holsworthy, NSW Rural Fire Service (RFS) Incident 18041496605 (3448 ha) from 14/4 – 30/4
22	20/04/2018	Wagga Wagga North	Non-exceptional event due to local dust
23	23/04/2018	Wagga Wagga North	Non-exceptional event due to local dust
24	24/04/2018	Richmond	Fire, Faulconbridge West, HRB RFS Incident 18042197576 (905 ha) burned from 22/4 – 28/4
		Wagga Wagga North	Non-exceptional event due to local dust
25	25/04/2018	Oakdale	Fire, Faulconbridge West, HRB RFS Incident 18042197576 (905 ha) burned from 22/4 – 28/4
		Wagga Wagga North	Non-exceptional event due to local dust
26	30/04/2018	Wagga Wagga North	Non-exceptional event due to local dust
27	01/05/2018	Wagga Wagga North	Non-exceptional event due to local dust
28	02/05/2018	Wagga Wagga North	Non-exceptional event due to local dust
29	03/05/2018	Albury, Wagga Wagga North	Dust storm under moderate north-west winds
30	08/05/2018	Liverpool	Fire, Cliftonville HRB RFS Incident 18050498775 (105 ha) burned 5/5 – 13/5
31	09/05/2018	Bringelly, Camden, Liverpool	Fire, Cliftonville HRB RFS Incident 18050498775 (105 ha) burned 5/5 – 13/5
		Wagga Wagga North	Non-exceptional event due to local dust
32	10/05/2018	Tamworth	Dust storm impacted North West Slopes
33	18/05/2018	Liverpool, Oakdale	Non-exceptional event due to local particle source (Liverpool unsealed road, Oakdale unidentified source)
34	25/05/2018	Liverpool	Non-exceptional event due to local particle source (unsealed road)
35	28/05/2018	Bringelly, Liverpool, Parramatta North, Prospect, Richmond, St Marys	Fire, Colo Heights HRB RFS Incident 18052500957 (1973 ha) burned 26/5 – 7/6. Other HRB were burning in and around the Blue Mountains
36	29/05/2018	Bringelly, Liverpool, Parramatta North, Prospect, Richmond	Fire, Colo Heights HRB RFS Incident 18052500957 (1973 ha) burned 26/5 – 7/6. Other HRB were burning in and around the Blue Mountains
37	18/07/2018	Bathurst, Beresfield, Bringelly, Camden, Chullora, Liverpool, Newcastle, Parramatta North, Prospect, Randwick, Richmond, Wyong	Dust from South Australia and Victoria impacted much of New South Wales
38	19/07/2018	Beresfield, Bringelly, Chullora, Earlwood, Kembla Grange, Liverpool, Newcastle, Parramatta North, Prospect	Dust from South Australia and Victoria impacted much of New South Wales
39	20/07/2018	Chullora, Tamworth	Dust from South Australia and Victoria impacted much of New South Wales
40	25/07/2018	Liverpool	Fire, Hawkesbury – Ironbark West HRB RFS Incident 18072606634 (600 ha) burned 26/7 – 3/8
41	28/07/2018	Wollongong	Fire, Mackel Airfield HRB RFS Incident 18072706778 (4,300 ha) burned 27 – 17/8 at Holsworthy in order to contain an uncontrolled bushfire
42	04/08/2018	Beresfield, Gunnedah, Narrabri, Tamworth	Dust storm impacted north-east New South Wales

Day count	Date	Stations where standard exceeded	Comments
43	31/08/2018	Narrabri	Dust transported from south-west New South Wales
44	01/09/2018	Gunnedah, Narrabri, Tamworth	Dust transported from south-west New South Wales
45	30/10/2018	Wagga Wagga North	Non-exceptional event due to local dust
46	02/11/2018	Wagga Wagga North	Dust from the west under moderate winds
47	05/11/2018	Wagga Wagga North	Dust from the north-west under moderate winds
48	06/11/2018	Gunnedah, Narrabri, Tamworth	Dust storm with west to north-west winds
49	21/11/2018	Earlwood, Macquarie Park, Newcastle, Parramatta North, Prospect, Randwick, Richmond, Rozelle, Wyong	Significant dust storm, ahead of strong, dry cold front, transported dust from western New South Wales and the Mallee region of Victoria
50	22/11/2018	Bargo, Bathurst, Beresfield, Bringelly, Camden, Campbelltown West, Chullora, Earlwood, Gunnedah, Kembla Grange, Liverpool, Macquarie Park, Narrabri, Newcastle, Oakdale, Parramatta North, Prospect, Randwick, Richmond, Rozelle, St Marys, Tamworth, Wallsend, Wollongong, Wyong	Significant dust storm, ahead of second strong, dry cold front, transported dust from western New South Wales and the Mallee region of Victoria
51	23/11/2018	Beresfield, Gunnedah, Narrabri, Newcastle, Tamworth, Wallsend, Wyong	Significant dust storm transported dust from western New South Wales and the Mallee region of Victoria
52	02/12/2018	Albion Park South, Bargo, Gunnedah, Kembla Grange, Narrabri, Tamworth, Wollongong	Widespread dust storm with dust transported on strong westerly winds
53	14/12/2018	Albury, Bathurst, Gunnedah, Narrabri, Wagga Wagga North	Widespread dust event with north-west winds
54	15/12/2018	Albury, Bathurst, Gunnedah, Narrabri, Wagga Wagga North	Widespread dust event with north-west winds
55	16/12/2018	Bathurst, Gunnedah	Widespread dust event with north-west winds
56	20/12/2018	Bathurst	Widespread dust event with north-west winds
57	27/12/2018	Wagga Wagga North	Non-exceptional event due to local dust
58	28/12/2018	Kembla Grange, Wagga Wagga North	Non-exceptional event due to regional dust
59	30/12/2018	Wagga Wagga North	Non-exceptional event due to local dust

1 All comments describe exceptional events unless otherwise identified

An exceptional event can be clearly identified as influencing pollution levels and is **not included** as an exceedance day when assessing compliance against the daily PM_{10} standard and goal. An ***exceptional event*** means a fire or dust occurrence that adversely affects air quality at a particular location and causes an exceedance of 1-day average standard in excess of normal historical fluctuations and background levels and is directly related to bushfire, jurisdiction-authorised hazard reduction burning, or continental-scale windblown dust.

A **non-exceptional event** is **highlighted yellow** and is **included** when assessing against daily PM_{10} standard and goal.

Particles as $PM_{2.5}$

Table 21 Summary of $PM_{2.5}$: maximum 24-hour average concentrations (2018)

Region/ monitoring station	Data availability rate (%)	Number of valid days	Maximum values (µg/m³)			
			Highest	Date, time of highest	2nd highest	Date, time of 2nd highest
Sydney						
Bargo	97.3	355	**38.1**	08/04/2018	**28.5**	26/04/2018
Bringelly	98.9	361	**55.6**	28/05/2018	**41.5**	29/05/2018
Camden	98.6	360	**37.0**	09/05/2018	**29.0**	05/08/2018
Campbelltown West	93.4	341	**42.0**	01/08/2018	**33.7**	29/07/2018
Chullora	97.8	357	**29.1**	29/05/2018	**27.0**	28/05/2018
Earlwood	97.0	354	**28.5**	29/05/2018	23.5	02/08/2018
Liverpool	97.3	355	**45.4**	17/04/2018	**34.2**	09/05/2018
Macquarie Park	98.4	359	**51.8**	09/08/2018	**37.2**	08/08/2018
Oakdale	95.3	348	**75.4**	25/04/2018	**36.7**	26/04/2018
Parramatta North	95.1	347	**42.1**	29/05/2018	**30.6**	28/05/2018
Prospect	96.4	352	**47.5**	29/05/2018	**42.5**	28/05/2018
Randwick	92.3	337	**31.8**	29/05/2018	24.7	02/08/2018
Richmond	95.1	347	**123.9**	25/04/2018	**81.8**	28/05/2018
Rozelle	70.7	258	19.2	21/11/2018	18.2	03/08/2018
St Marys	93.7	342	**80.5**	28/05/2018	**58.3**	29/05/2018
Central Coast						
Wyong	91.5	334	18.1	19/03/2018	17.7	31/12/2018
Illawarra						
Albion Park South	95.9	350	**29.4**	28/07/2018	20.6	27/05/2018
Kembla Grange	97.3	355	21.9	21/01/2018	20.7	09/05/2018
Wollongong	96.2	351	**47.6**	28/07/2018	**26.6**	03/08/2018
Lower Hunter						
Beresfield	95.3	348	24.9	22/11/2018	17.7	20/03/2018
Newcastle	98.6	360	20.2	22/11/2018	19.5	06/11/2018
Wallsend	97.8	357	20.2	22/11/2018	16.5	14/07/2018
Regional NSW						
Albury	96.2	351	**30.4**	29/04/2018	**26.2**	24/04/2018
Bathurst	98.6	360	**40.5**	15/12/2018	**28.2**	06/05/2018
Gunnedah	98.1	358	**50.7**	15/12/2018	**31.9**	15/07/2018
Narrabri	97.8	357	**26.3**	15/12/2018	23.8	01/09/2018
Tamworth	92.1	336	24.2	22/11/2018	20.6	09/07/2018

Region/ monitoring station	Data availability rate (%)	Number of valid days	Maximum values (µg/m^3)			
			Highest	Date, time of highest	2nd highest	Date, time of 2nd highest
Wagga Wagga North	96.4	352	23.8	14/11/2018	21.6	10/06/2018

AAQ NEPM standard: 25.0 µg/m^3 (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

In 2018, 22 of 28 stations exceeded the AAQ NEPM 24-hour $PM_{2.5}$ standard of 25 µg/m^3 (Table 21). The maximum 24-hour $PM_{2.5}$ reading was 123.9 µg/m^3, recorded at Richmond on 25 April 2018, during a hazard reduction burn. St Marys recorded the second highest 24-hour average $PM_{2.5}$ 80.5 µg/m^{3}on 28 May 2018, during a hazard reduction burn.

Table 21a presents Federal Reference Method (FRM) data for Chullora, the only station where these measurements are currently performed. Data for Chullora from the BAM instrument (Table 21) and FRM (Table 21a) may demonstrate inter-method differences owing to differences in sampling strategies.

Table 21a Summary of $PM_{2.5}$: maximum 24-hour average concentration (2018) – FRM

Region/ monitoring station	Data availability rate (%)	Number of valid days	Maximum values (µg/m^3)			
			Highest	Date, time of highest	2nd highest	Date, time of 2nd highest
Sydney						
Chullora	84.7	103	**39.6**	25/05/2018	**30.0**	28/05/2018

AAQ NEPM standard: 25.0 µg/m^3 (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability rate based on 1-day-in-3 sampling regime.

The 24-hour NEPM $PM_{2.5}$ standard was exceeded on 27 distinct calendar days (Table 22), with 20 days experiencing exceptional events, mostly due to smoke from hazard reduction burning. One day recorded both exceptional and non-exceptional events.

Table 22 Days exceeding $PM_{2.5}$ 24-hour AAQ NEPM Standard

Day count	Date	Stations where standard exceeded	Comments
1	08/04/2018	Bargo	Fire near Kembla Grange, Joadja East HRB Incident 18031393477 (1450 ha) burned from 17/3 – 30/4
2	17/04/2018	Liverpool	Forest fire at Moorebank Ave, Holsworthy, RFS Incident 18041496605 (3448 ha) from 14/4 – 30/4
3	24/04/2018	Richmond	Fire, Faulconbridge West, HRB RFS Incident 18042197576 (905 ha) burned from 22/4-28/4
		Albury	Non-exceptional event due to agricultural burning
4	25/04/2018	Oakdale, Richmond	Fire, Faulconbridge West, HRB RFS Incident 18042197576 (905 ha) burned from 22/4 – 28/4
5	26/04/2018	Bargo, Oakdale	Fire, Faulconbridge West, HRB RFS Incident 18042197576 (905 ha) burned from 22/4 – 28/4
6	29/04/2018	Albury	Non-exceptional event due to agricultural burning
7	06/05/2018	Bathurst, Prospect	Fire, Rocky Creek HRB RFS Incident 18050398644 (2500 ha) burned from 5/5 – 27/5 impacting Bathurst.

Day count	Date	Stations where standard exceeded	Comments
			Cliftonville HRB RFS Incident 18050498775 (105 ha) burned 5/5 – 13/5 impacting Prospect
8	08/05/2018	Liverpool	Fire, Cliftonville HRB RFS Incident 18050498775 (105 ha) burned 5/5 – 13/5
9	09/05/2018	Bringelly, Camden, Liverpool, St Marys	Fire, Cliftonville HRB RFS Incident 18050498775 (105 ha) burned 5/5 – 13/5
10	25/05/2018	Chullora*	Non-exceptional event due to industrial activity
11	26/05/2018	Macquarie Park, Parramatta North	Fire, Colo Heights HRB RFS Incident 18052500957 (1973 ha) burned 26/5 – 7/6. Other HRB were burning in and around the Blue Mountains
12	27/05/2018	Bringelly, Liverpool, Parramatta North, Prospect	Fire, Colo Heights HRB RFS Incident 18052500957 (1973 ha) burned 26/5 – 7/6. Other HRB were burning in and around the Blue Mountains
13	28/05/2018	Bringelly, Chullora, Chullora*, Liverpool, Parramatta North, Prospect, Richmond, St Marys	Fire, Colo Heights HRB RFS Incident 18052500957 (1973 ha) burned 26/5 – 7/6. Other HRB were burning in and around the Blue Mountains
14	29/05/2018	Bringelly, Chullora, Earlwood, Liverpool, Parramatta North, Prospect, Randwick, Richmond, St Marys	Fire, Colo Heights HRB RFS Incident 18052500957 (1973 ha) burned 26/5 – 7/6. Other HRB were burning in and around the Blue Mountains
15	14/07/2018	Chullora, Gunnedah	Non-exceptional event (Chullora, industrial activity; Gunnedah, domestic wood smoke)
16	15/07/2018	Gunnedah	Non-exceptional event due to domestic wood smoke
17	16/07/2018	Gunnedah	Non-exceptional event due to domestic wood smoke
18	21/07/2018	Gunnedah	Non-exceptional event due to domestic wood smoke
19	25/07/2018	Liverpool	Fire, Hawkesbury-Ironbark West HRB RFS Incident 18072606634 (600 ha) burned 26/7 – 3/8
20	28/07/2018	Albion Park South, Wollongong	Fire, Mackel Airfield HRB RFS Incident 18072706778 (4300 ha) burned 27 – 17/8 at Holsworthy in order to contain an uncontrolled bushfire
21	29/07/2018	Campbelltown West, Wollongong	Fire, Mackel Airfield HRB RFS Incident 18072706778 (4300 ha) burned 27 – 17/8 at Holsworthy in order to contain an uncontrolled bushfire
22	01/08/2018	Campbelltown West, Liverpool	Fire, Mackel Airfield HRB RFS Incident 18072706778 (4300 ha) burned 27 – 17/8 at Holsworthy in order to contain an uncontrolled bushfire
23	03/08/2018	Wollongong	Fire, Mackel Airfield HRB RFS Incident 18072706778 (4300 ha) burned 27 – 17/8 at Holsworthy in order to contain an uncontrolled bushfire
24	05/08/2018	Camden	Fire, HRB 192 ha
25	08/08/2018	Macquarie Park	Fire, Burraneer Avenue, Saint Ives, RSF HRB Incident 18073007316 (30 ha) burned 2/8 – 8/8
26	09/08/2018	Macquarie Park	Fire, Burraneer Avenue, Saint Ives, RSF HRB Incident 18073007316 (30 ha) burned 2/8-8/8
27	15/12/2018	Bathurst, Gunnedah, Narrabri	Widespread dust storm with north-west winds

Notes

Chullora* refers to FRM monitoring results (refer to Tables 10a and 21a)

An exceptional event can be clearly identified as influencing pollution levels and is **not included** as an exceedance day when assessing compliance against the daily $PM_{2.5}$ standard and goal. An ***exceptional event*** means a fire or dust occurrence that adversely affects air quality at a particular location and causes an exceedance of 1-day average standard in excess of normal historical fluctuations and background levels and is directly related to bushfire, jurisdiction-authorised hazard reduction burning, or continental-scale windblown dust.

A **non-exceptional event** is **shaded** and is **included** when assessing against daily $PM_{2.5}$ standard and goal.

Assessment of progress towards achieving the goal

The AAQ NEPM goal is a driver for NSW air quality improvement strategies and a benchmark against which progress in managing air quality can be assessed.

In New South Wales, the Department of Planning, Industry and Environment operates the NSW AQMN. The NSW Environment Protection Authority (EPA) develops and implements regulation, policies and programs to achieve Air NEPM goals and protect public health.

Air quality management in the NSW Greater Metropolitan Region and Regional NSW

The EPA delivers numerous actions that target the pollutants of most concern in New South Wales, namely particles in the NSW GMR and some regional centres, and ground-level ozone by reducing 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.

The Department operates the NSW AQMN, which as at the end of 2018 included 83 monitoring stations across several (sub) networks. Air quality data and information are made publicly available on the Department's website, updated on an hourly basis, and subscribers are sent automated text messages when air quality is measured or forecast to exceed national air quality standards or other relevant thresholds. The Department also collaborates with the EPA, other agencies and science partners to deliver research to inform air policies and programs.

The following is an outline of the key mechanisms for managing air quality and the activities implemented in 2018.

Air quality monitoring

Fine particle monitoring was extended across the NSW AQMN in 2018. This monitoring supports air quality and health analysis and compliance assessments against national $PM_{2.5}$ standards. In 2018 new monitoring stations commenced operation in Armidale and Orange in Regional NSW.

Air incident monitoring and modelling capabilities have been established for incidents where air quality impacts may be experienced by the community for a period of several days or longer. This includes two portable monitoring pods, each equipped with compliance air quality monitors that meet Australian Standards and the AAQ NEPM requirements, and other non-compliance instruments and meteorological monitors. The pods are fitted with telemetry and communications systems coupled with web reporting capabilities for rapid transfer of information to a publicly accessible website.

Review of the NSW Air Quality Monitoring Plan

A review of the NSW Air Quality Monitoring Plan was conducted in 2017–19. The review was undertaken to ensure the current monitoring network is meeting community requirements and the objectives of the NEPM. It is anticipated an updated NSW Air Quality Management Plan will be released in 2020.

Air emissions and health impacts research

Broken Hill Environmental Lead Study

The Broken Hill Environmental Lead Study continued in 2018. This four-year study was commissioned by the BHELP (Broken Hill Environmental Lead Program) and the EPA in 2016 to inform remediation efforts underway as part of a program to address lead contamination and exposures. This collaborative study by BHELP and the Department aims to monitor airborne and deposited lead and assess contributions of current emissions from Line of Lode mining leases and emissions from non-mining areas.

Sydney Air Quality Study

This multi-year study commenced in 2016 to improve the understanding of air quality and the impacts of air pollution in the Greater Sydney Region. The study will extend the evidence base for air policies and programs, providing information on past, current and future air quality and its impacts on public health and the environment in the Greater Sydney Region. The study will support 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 initial results from the Sydney Air Quality Study were published in 2018 in a peer-reviewed journal and the first study report is expected to be delivered in second half of 2020.

Enhancing air quality forecasting in New South Wales

The Enhancing Air Quality Forecasting in New South Wales program was established to progressively expand the scope and enhance the accuracy of air quality forecasting capabilities in New South Wales. The Department issues a daily air quality forecast for the Greater Sydney Region, and the overall accuracy of forecasts is currently considered to be moderate. Through this program, the Department will work towards more accurately forecasting air quality for Greater Sydney and its subregions and will progressively expand forecasting to the whole of the NSW GMR and major regional areas.

The program involves several projects to develop specific advanced tools and capabilities, some involving collaboration with science partners. Advancements have been made in 2018 in chemical transport modelling to better forecast air pollution impacts from hazard reduction burns, wildfires, dust storms and incidents.

Air Emissions Inventory

The Air Emissions Inventory for the NSW GMR is a detailed technical snapshot of major sources of air pollution. The inventory estimates emissions for hundreds of substances from natural and human-made sources in the NSW GMR. Approximately 75% of the NSW population of 7.5 million reside in the GMR, which includes the metropolitan areas of Sydney, Newcastle, Central Coast, Blue Mountains and Wollongong.

Inventories have been compiled for the 1992, 2003, 2008 and 2013 calendar years (published in 1996, 2007, 2012 and 2019 respectively). Over 2018, work continued on collation of data for the 2013 inventory.

Non-road diesel emissions health impacts study

In 2018 the EPA, NSW Health and the Department commenced a joint research project on the health impacts of non-road diesel emissions, to quantify the burden of mortality and health costs associated with primary and secondary particle $PM_{2.5}$ emissions and nitrogen

dioxide from diesel plant and equipment in the NSW GMR. This research will support New South Wales in advocating for action to implement national non-road diesel standards and will also provide a useful evidence base for other future actions.

Industry emissions

In 2018 the EPA continued to implement its regulatory responsibilities, including licensing scheduled industry activities and conducting compliance and enforcement programs. The *Protection of the Environment Operations Act 1997* (POEO Act), the Protection of the Environment Operations (Clean Air) Regulation 2010 and the Protection of the Environment Operations (General) Regulation 2009 set the framework for managing air pollution from major industries in New South Wales.

Upper Hunter Dust Risk Forecasting Scheme

Throughout spring and summer 2018, the EPA implemented Operation Dust Patrol to ensure that coal mines in the Upper Hunter minimised particle emissions. Dust Patrol used a Dust Risk Forecasting Model to predict times of high dust risk, and the EPA increased surveillance of coal mines at these times. During the operation, the mines produced excessive dust on only one day. This was a significant improvement on earlier years when the mines produced excessive dust on up to 19 days over the same period.

Locomotives

In February 2017 the EPA published the Diesel Locomotive, Fuel Efficiency and Emissions Testing study. Together with the 2015 *Diesel Locomotive Emissions Reduction Technology* study, this demonstrated that PM emission reductions conforming to US Tier 0+ emission standards can be achieved through emission upgrade kits or other locomotive upgrade programs. Amendments to the POEO Act to regulate railway rolling stock operations were prepared in 2018 and came into effect in July 2019. The regulatory amendments mean that operators of rolling stock will be held directly accountable for their environmental performance, including management of air emissions.

Vehicle and fuel emissions

Smoky vehicle program

The EPA operates a smoky vehicle compliance program that targets vehicles emitting excessive air impurities. In 2018, 1661 reports of smoky vehicles were received from members of the public, and the EPA issued 669 advisory letters to vehicle owners, advising them to have their vehicles inspected and repaired if necessary. Twenty-one defective vehicle notices were also issued by the EPA, which required the owner to service or repair their vehicle to stop emitting excessive air impurities.

Vapour recovery at service stations

Vapour Recovery Stage 1 (VR1) equipment captures displaced vapours from storage tanks when a fuel tanker delivers fuel to a service station, while VR2 captures vapours displaced at the bowser when a motorist refuels. Medium to large service stations with a petrol throughput of 3.5 to 12 million litres per year, located in the Greater Sydney Region, and any ‘new or modified’ service stations, were required to install VR2 equipment, which captures vapours when vehicles are refilled at the dispenser, by 1 January 2017.

Data for the 2017–18 reporting period show that approximately 99% of petrol service stations required to have VR1 equipment installed and operating are compliant, and 96% of

petrol service stations required to install VR2 equipment have done so. Once fully implemented, vapour recovery is expected to reduce volatile organic compound (VOC) emissions in the GMR by approximately 5000 tonnes per year. As of 30 June 2017, regulatory responsibility for vapour recovery at service stations was transitioned from the EPA to local councils.

Regulation of motorway tunnel ventilation stacks

In February 2018, the NSW Government announced a proposal to strengthen the management of air quality associated with motorway tunnel emissions. Under the proposal, operation of all motorway tunnel ventilation stacks in New South Wales would require an environment protection licence issued by the EPA. Across 2018 the EPA consulted with industry and government agencies on the proposal. Amendments to the POEO Act regulating tunnel ventilation stacks came into effect in July 2019.

Wood smoke management

The EPA supports councils across New South Wales 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 lack of awareness of wood smoke impacts on health as the key barrier to changing people's wood heater use.

Based on recommendations in the 2016 Upper Hunter Wood Smoke Community Research Project, the EPA developed a new package of education materials to raise awareness about wood smoke impacts on people's health and the environment. During winter 2017 the EPA trialled the education package in two regional centres in the Upper Hunter – Singleton and Muswellbrook – before it was rolled out to councils across New South Wales for the winter of 2018.

Section D – Data analysis

Section D presents a statistical summary, using percentiles, by pollutant and for each NEPM standard, for each station (Tables 23 to 212).

Trend data, in the form of annual maxima, are provided for each standard for each pollutant, for stations with two years or more of data. Trend data are presented if any monitoring of a pollutant occurred at a station each year and **the annual data availability rate for the pollutant was at least 15% at each station**.

Carbon monoxide

Statistical summary for 2018

Table 23 Statistical summary for CO: daily maximum rolling 8-hour average concentrations

Region/ monitoring station	Data availability rate (%)	Maximum (ppm)	Percentile (ppm)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Camden	94.4	0.7	0.5	0.5	0.4	0.3	0.2	0.2	0.1
Campbelltown West	98.1	1.5	1.1	0.8	0.6	0.5	0.4	0.3	0.3
Chullora	95.6	3.4	1.2	1.0	0.8	0.7	0.5	0.3	0.2
Liverpool	98.5	1.9	1.6	1.4	1.2	1.0	0.6	0.4	0.3
Macquarie Park	92.5	2.5	0.7	0.6	0.5	0.4	0.3	0.2	0.2
Parramatta North	96.7	1.1	1.0	0.9	0.8	0.7	0.4	0.3	0.2
Prospect	90.9	1.1	0.9	0.8	0.6	0.5	0.3	0.1	0.0
Rozelle	*67.8*	*0.7*	*0.6*	*0.6*	*0.5*	*0.4*	*0.3*	*0.2*	*0.1*
Central Coast									
Wyong	98.8	0.9	0.3	0.3	0.3	0.2	0.2	0.2	0.1
Illawarra									
Wollongong	97.5	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2
Lower Hunter									
Newcastle	96.7	1.0	0.9	0.8	0.7	0.6	0.4	0.3	0.3

AAQ NEPM standard: 9.0 ppm (rolling 8-hour average)

Data availability between 15% and 75%, values shown in italics

Trend analysis

Table 24 Annual maximum rolling 8-hour average concentrations for CO (ppm)

Region/ monitoring station	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Sydney										
Camden	-	-	-	*0.3*	1.9	0.6	0.5	0.5	0.5	0.7
Macarthur/ Campbelltown West	0.8	0.9	1.1	0.7	**9.1**	0.9	1.0	1.2	0.8	1.5
Chullora	2.6	2.3	1.5	2.0	2.5	1.7	1.4	1.6	1.2	3.4
Liverpool	2.2	2.1	2.4	1.9	2.1	2.2	1.8	1.9	1.8	1.9
Macquarie Park	-	-	-	-	-	-	-	-	*0.5*	2.5
Parramatta North	-	-	-	-	-	-	-	-	-	1.1
Prospect	2.3	1.9	1.7	1.8	1.6	1.3	1.5	1.5	1.1	1.1
Rozelle	2.3	1.8	1.4	2.2	1.8	1.1	1.1	1.2	0.9	*0.7*
Central Coast										
Wyong	-	-	-	*0.4*	0.8	0.5	0.4	0.6	0.6	0.9
Illawarra										
Wollongong	1.3	1.5	1.2	1.2	2.7	0.9	0.8	0.9	0.7	0.9
Lower Hunter										
Newcastle	1.9	1.4	1.5	1.3	1.4	2.4	1.5	1.4	1.1	1.0

AAQ NEPM standard: 9.0 ppm (rolling 8-hour average)

Campbelltown West replaced Macarthur in September 2012

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Statistical summaries for multiple years, by station, CO

Daily maximum rolling 8-hour average, CO

Sydney

Table 25 Statistical summary for CO: daily maximum rolling 8-hour average concentrations. Station: Camden

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2012	*21.0*	*0*	*0.3*	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*	*0.2*	*0.1*
2013	99.0	0	1.9	0.9	0.6	0.4	0.4	0.2	0.2	0.1
2014	98.2	0	0.6	0.4	0.4	0.4	0.3	0.2	0.2	0.1
2015	97.6	0	0.5	0.4	0.4	0.3	0.3	0.2	0.1	0.1
2016	94.8	0	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1
2017	96.0	0	0.5	0.4	0.3	0.3	0.3	0.2	0.1	0.1
2018	94.4	0	0.7	0.5	0.5	0.4	0.3	0.2	0.2	0.1

AAQ NEPM standard: 9.0 ppm (rolling 8-hour average)

Data availability between 15% and 75%, values shown in italics

Table 26 Statistical summary for CO: daily maximum rolling 8-hour average concentrations. Station: Macarthur/Campbelltown West

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	95.1	0	0.8	0.8	0.7	0.6	0.6	0.4	0.4	0.2
2010	96.1	0	0.9	0.8	0.8	0.6	0.5	0.4	0.4	0.3
2011	95.3	0	1.1	0.8	0.7	0.6	0.5	0.4	0.3	0.3
2012	89.6	0	0.7	0.6	0.6	0.5	0.5	0.3	0.3	0.1
2013	98.7	1	**9.1**	0.8	0.7	0.5	0.5	0.3	0.1	0.0
2014	97.9	0	0.9	0.9	0.8	0.7	0.6	0.4	0.3	0.3
2015	96.2	0	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3
2016	98.7	0	1.2	0.9	0.8	0.7	0.6	0.5	0.4	0.3
2017	97.0	0	0.8	0.7	0.7	0.6	0.6	0.4	0.3	0.3
2018	98.1	0	1.5	1.1	0.8	0.6	0.5	0.4	0.3	0.3

AAQ NEPM standard: 9.0 ppm (rolling 8-hour average)

Campbelltown West replaced Macarthur in September 2012

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Table 27 Statistical summary for CO: daily maximum rolling 8-hour average concentrations. Station: Chullora

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	96.1	0	2.6	2.2	1.6	1.3	1.0	0.7	0.4	0.3
2010	98.0	0	2.3	1.8	1.5	1.2	0.9	0.7	0.5	0.4
2011	98.3	0	1.5	1.4	1.3	1.2	1.0	0.6	0.4	0.3
2012	97.7	0	2.0	1.6	1.2	1.1	0.9	0.6	0.5	0.4
2013	97.3	0	2.5	1.7	1.2	1.1	0.9	0.6	0.4	0.3
2014	97.9	0	1.7	1.3	1.1	0.9	0.8	0.5	0.4	0.3
2015	97.4	0	1.4	1.3	1.2	1.0	0.8	0.5	0.4	0.3
2016	96.9	0	1.6	1.2	1.1	0.9	0.7	0.5	0.3	0.3
2017	97.2	0	1.2	1.1	1.0	0.8	0.7	0.5	0.3	0.3
2018	95.6	0	3.4	1.2	1.0	0.8	0.7	0.5	0.3	0.2

AAQ NEPM standard: 9.0 ppm (rolling 8-hour average)

Table 28 Statistical summary for CO: daily maximum rolling 8-hour average concentrations. Station: Liverpool

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	92.4	0	2.2	1.9	1.7	1.5	1.2	0.8	0.5	0.3
2010	98.6	0	2.1	1.9	1.7	1.4	1.1	0.7	0.5	0.4
2011	97.9	0	2.4	2.1	1.8	1.5	1.2	0.7	0.5	0.4
2012	97.4	0	1.9	1.7	1.6	1.3	1.1	0.7	0.5	0.4
2013	98.7	0	2.1	1.9	1.8	1.4	1.1	0.7	0.5	0.3
2014	96.9	0	2.2	1.9	1.7	1.4	1.0	0.6	0.4	0.3
2015	90.8	0	1.8	1.6	1.4	1.2	0.9	0.6	0.4	0.3
2016	95.5	0	1.9	1.6	1.4	1.3	1.0	0.6	0.4	0.3
2017	99.1	0	1.8	1.6	1.5	1.1	0.9	0.6	0.4	0.3
2018	98.5	0	1.9	1.6	1.4	1.2	1.0	0.6	0.4	0.3

AAQ NEPM standard: 9.0 ppm (rolling 8-hour average)

Table 29 Statistical summary for CO: daily maximum rolling 8-hour average concentrations. Station: Macquarie Park

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2017	*37.8*	*0*	*0.5*	*0.5*	*0.5*	*0.4*	*0.4*	*0.3*	*0.2*	*0.2*
2018	92.5	0	2.5	0.7	0.6	0.5	0.4	0.3	0.2	0.2

AAQ NEPM standard: 9.0 ppm (rolling 8-hour average)

Data availability between 15% and 75%, values shown in italics

Table 30 Statistical summary for CO: daily maximum rolling 8-hour average concentrations. Station: Parramatta North

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2018	96.7	0	1.1	1.0	0.9	0.8	0.7	0.4	0.3	0.2

AAQ NEPM standard: 9.0 ppm (rolling 8-hour average)

Table 31 Statistical summary for CO: daily maximum rolling 8-hour average concentrations. Station: Prospect

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	97.5	0	2.3	2.1	1.8	1.3	1.1	0.7	0.5	0.3
2010	95.8	0	1.9	1.7	1.4	1.2	1.0	0.7	0.5	0.4
2011	95.6	0	1.7	1.5	1.4	1.1	1.0	0.6	0.4	0.3
2012	96.8	0	1.8	1.7	1.4	1.0	0.8	0.6	0.4	0.3
2013	94.7	0	1.6	1.4	1.2	0.9	0.7	0.4	0.2	0.1
2014	96.8	0	1.3	1.1	1.0	0.8	0.6	0.4	0.2	0.1
2015	98.4	0	1.5	1.3	1.3	0.9	0.7	0.3	0.2	0.1
2016	98.5	0	1.5	1.0	0.9	0.8	0.6	0.3	0.2	0.1
2017	98.7	0	1.1	1.0	0.9	0.8	0.6	0.4	0.2	0.1
2018	90.9	0	1.1	0.9	0.8	0.6	0.5	0.3	0.1	0.0

AAQ NEPM standard: 9.0 ppm (rolling 8-hour average)

Table 32 Statistical summary for CO: daily maximum rolling 8-hour average concentrations. Station: Rozelle

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	95.6	0	2.3	1.5	1.4	1.2	1.0	0.7	0.5	0.4
2010	93.6	0	1.8	1.5	1.4	1.1	0.9	0.7	0.5	0.4
2011	96.6	0	1.4	1.2	1.1	0.9	0.8	0.5	0.4	0.3
2012	96.9	0	2.2	1.3	1.2	1.0	0.8	0.6	0.5	0.4
2013	93.8	0	1.8	1.2	1.1	0.9	0.7	0.5	0.3	0.2
2014	99.0	0	1.1	1.0	0.9	0.8	0.6	0.4	0.3	0.2
2015	94.9	0	1.1	1.1	1.0	0.8	0.7	0.5	0.3	0.2
2016	97.8	0	1.2	1.1	1.0	0.8	0.6	0.4	0.3	0.2
2017	92.0	0	0.9	0.7	0.6	0.6	0.5	0.3	0.2	0.1
2018	*67.6*	*0*	*0.7*	*0.6*	*0.6*	*0.5*	*0.4*	*0.3*	*0.2*	*0.1*

AAQ NEPM standard: 9.0 ppm (rolling 8-hour average)

Data availability between 15% and 75%, values shown in italics

Central Coast

Table 33 Statistical summary for CO: daily maximum rolling 8-hour average concentrations. Station: Wyong

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2012	*20.1*	*0*	*0.4*	*0.4*	*0.4*	*0.3*	*0.2*	*0.2*	*0.1*	*0.1*
2013	98.7	0	0.8	0.4	0.3	0.3	0.3	0.2	0.1	0.1
2014	97.8	0	0.5	0.4	0.4	0.3	0.3	0.2	0.1	0.1
2015	98.5	0	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.1
2016	98.2	0	0.6	0.4	0.4	0.3	0.3	0.2	0.2	0.1
2017	98.3	0	0.6	0.4	0.3	0.3	0.2	0.2	0.1	0.1
2018	98.8	0	0.9	0.3	0.3	0.3	0.2	0.2	0.2	0.1

AAQ NEPM standard: 9.0 ppm (rolling 8-hour average)

Data availability between 15% and 75%, values shown in italics

Illawarra

Table 34 Statistical summary for CO: daily maximum rolling 8-hour average concentrations. Station: Wollongong

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	82.1	0	1.3	1.1	1.1	1.0	0.8	0.5	0.4	0.2
2010	98.4	0	1.5	1.2	1.1	0.9	0.8	0.6	0.5	0.4
2011	97.2	0	1.2	1.1	1.0	0.9	0.7	0.6	0.4	0.3
2012	96.5	0	1.2	1.1	1.0	0.8	0.7	0.5	0.4	0.3
2013	97.3	0	2.7	0.8	0.8	0.7	0.5	0.4	0.3	0.2
2014	98.4	0	0.9	0.8	0.8	0.7	0.6	0.4	0.3	0.2
2015	97.9	0	0.8	0.7	0.7	0.6	0.5	0.4	0.3	0.2
2016	98.8	0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2
2017	97.6	0	0.7	0.7	0.7	0.6	0.5	0.4	0.3	0.2
2018	97.5	0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2

AAQ NEPM standard: 9.0 ppm (rolling 8-hour average)

Lower Hunter

Table 35 Statistical summary for CO: daily maximum rolling 8-hour average concentrations. Station: Newcastle

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	84.3	0	1.9	1.6	1.4	1.1	0.9	0.6	0.4	0.3
2010	87.5	0	1.4	1.2	1.1	0.9	0.6	0.4	0.3	0.2
2011	98.8	0	1.5	1.2	1.0	0.7	0.5	0.3	0.1	0.1
2012	94.3	0	1.3	1.3	1.1	0.8	0.6	0.3	0.1	0.0
2013	98.3	0	1.4	1.0	1.0	0.8	0.5	0.3	0.1	0.1
2014	89.4	0	2.4	1.6	1.1	0.9	0.7	0.4	0.3	0.1
2015	92.0	0	1.5	1.3	1.2	1.0	0.9	0.6	0.5	0.3
2016	97.4	0	1.4	1.1	0.9	0.8	0.7	0.4	0.2	0.1
2017	96.2	0	1.1	0.9	0.9	0.8	0.6	0.4	0.3	0.2
2018	96.7	0	1.0	0.9	0.8	0.7	0.6	0.4	0.3	0.3

AAQ NEPM standard: 9.0 ppm (rolling 8-hour average)

Nitrogen dioxide

Statistical summary for 2018

Table 36 Statistical summary for NO_2: daily maximum 1-hour average concentrations

Region/ monitoring station	Data availability rate (%)	Maximum (ppm)	Percentile (ppm)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Bargo	94.2	0.048	0.041	0.038	0.034	0.031	0.025	0.017	0.009
Bringelly	94.6	0.036	0.030	0.025	0.023	0.020	0.016	0.012	0.008
Camden	90.7	0.029	0.026	0.025	0.021	0.020	0.016	0.012	0.007
Campbelltown West	94.1	0.054	0.051	0.044	0.040	0.037	0.031	0.023	0.017
Chullora	94.7	0.057	0.044	0.041	0.039	0.035	0.030	0.023	0.017
Earlwood	94.3	0.050	0.042	0.037	0.035	0.033	0.028	0.021	0.014
Liverpool	94.1	0.062	0.046	0.044	0.041	0.037	0.032	0.025	0.018
Macquarie Park	93.4	0.030	0.028	0.026	0.024	0.022	0.018	0.013	0.009
Oakdale	94.3	0.029	0.015	0.014	0.011	0.009	0.006	0.004	0.002
Parramatta North	92.7	0.064	0.051	0.043	0.038	0.034	0.030	0.023	0.016
Prospect	87.2	0.051	0.043	0.040	0.037	0.035	0.028	0.020	0.015
Randwick	92.5	0.040	0.037	0.034	0.032	0.030	0.025	0.017	0.011
Richmond	92.4	0.030	0.027	0.026	0.023	0.020	0.016	0.011	0.008
Rozelle	*67.7*	*0.057*	*0.045*	*0.039*	*0.036*	*0.034*	*0.028*	*0.022*	*0.014*
St Marys	93.4	0.037	0.031	0.030	0.028	0.024	0.018	0.012	0.008
Central Coast									
Wyong	93.6	0.035	0.028	0.026	0.024	0.021	0.017	0.011	0.008
Illawarra									
Albion Park South	94.7	0.039	0.035	0.032	0.026	0.022	0.016	0.010	0.005
Kembla Grange	91.6	0.037	0.033	0.031	0.027	0.023	0.017	0.012	0.007
Wollongong	93.2	0.043	0.036	0.035	0.033	0.030	0.025	0.017	0.011
Lower Hunter									
Beresfield	92.7	0.040	0.037	0.034	0.032	0.029	0.024	0.018	0.014
Newcastle	94.3	0.045	0.037	0.035	0.032	0.029	0.023	0.015	0.009
Wallsend	93.7	0.035	0.033	0.032	0.028	0.026	0.020	0.015	0.010
Regional NSW									
Gunnedah	78.3	0.034	0.031	0.029	0.026	0.025	0.019	0.013	0.009

Data availability between 15% and 75%, values shown in italics

Trend analysis

Table 37 Annual maximum 1-hour average concentrations for NO_2 (ppm)

Region/ monitoring station	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Sydney										
Bargo	0.048	0.059	0.046	0.044	0.068	0.036	0.048	0.046	0.066	0.048
Bringelly	0.034	0.037	0.029	0.038	0.037	0.025	0.027	0.030	0.036	0.036
Camden	-	-	-	0.022	0.036	0.032	0.026	0.029	0.044	0.029
Macarthur / Campbelltown West*	0.048	0.042	0.045	0.049	0.054	0.055	0.062	0.054	0.061	0.054
Earlwood	0.052	0.038	0.046	0.051	0.048	0.040	0.053	0.043	0.067	0.050
Chullora	0.052	0.057	0.051	0.059	0.055	0.064	0.054	0.046	0.060	0.057
Liverpool	0.053	0.053	0.046	0.046	0.056	0.044	0.060	0.047	0.064	0.062
Macquarie Park	-	-	-	-	-	-	-	-	*0.037*	0.030
Oakdale	0.038	0.023	0.027	0.022	0.019	0.026	0.024	0.022	0.022	0.029
Parramatta North	-	-	-	-	-	-	-	-	-	0.064
Prospect	0.051	0.043	0.039	0.050	0.049	0.047	0.053	0.053	0.060	0.051
Randwick	0.036	0.050	0.053	0.041	0.046	0.047	0.043	0.044	0.041	0.040
Richmond	0.030	0.033	0.029	0.046	0.032	0.028	0.024	0.030	0.026	0.030
Rozelle	0.049	0.049	0.050	0.062	0.070	0.055	0.060	0.050	0.061	*0.057*
St Marys	0.035	0.36	0.036	0.043	0.037	0.031	0.032	0.042	0.037	0.037
Central Coast										
Wyong	-	-	-	*0.029*	0.041	0.034	0.032	0.046	0.051	0.035
Illawarra										
Albion Park South	0.052	0.041	0.040	0.037	0.039	0.038	0.047	0.043	0.038	0.039
Kembla Grange	0.035	0.036	0.037	0.039	0.036	0.031	0.034	0.039	0.037	0.037
Wollongong	0.048	0.052	0.043	0.049	0.050	0.038	0.060	0.043	0.057	0.043
Lower Hunter										
Beresfield	0.036	0.032	0.042	0.044	0.041	0.039	0.049	0.041	0.040	0.040
Newcastle	0.043	0.038	0.038	0.038	0.042	0.046	0.044	0.038	0.037	0.045
Wallsend	0.040	0.038	0.037	0.034	0.043	0.034	0.042	0.037	0.037	0.035
Regional										
Gunnedah	-	-	-	-	-	-	-	-	-	0.034

AAQ NEPM standard: 0.120 ppm (1-hour average)

*Campbelltown West replaced the Macarthur trend station from September 2012

Data availability between 15% and 75%, values shown in italics

Table 38 Annual average concentrations for NO_2 (ppm)

Region/ monitoring stations	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Sydney										
Bargo	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.006
Bringelly	0.004	0.005	0.005	0.005	0.005	0.004	0.004	0.005	0.005	0.006
Camden	-	-	-	*0.005*	0.004	0.004	0.004	0.004	0.005	0.005
Macarthur/ Campbelltown West	0.009	0.009	0.008	0.009	0.010	0.010	0.010	0.010	0.011	0.011
Earlwood	0.010	0.010	0.009	0.009	0.010	0.008	0.008	0.010	0.011	0.010
Chullora	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.012	0.012
Liverpool	0.010	0.011	0.010	0.009	0.011	0.010	0.010	0.012	0.012	0.012
Macquarie Park	-	-	-	-	-	-	-	-	*0.005*	0.006
Oakdale	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.002
Parramatta North	-	-	-	-	-	-	-	-	-	0.011
Prospect	0.011	0.012	0.010	0.010	0.011	0.010	0.011	0.010	0.010	0.009
Randwick	0.007	0.007	0.007	0.006	0.007	0.006	0.008	0.008	0.007	0.007
Richmond	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.005	0.005
Rozelle	0.011	0.011	0.011	0.012	0.011	0.011	0.011	0.011	0.011	*0.010*
St Marys	0.006	0.006	0.006	0.005	0.005	0.004	0.004	0.004	0.004	0.005
Central Coast										
Wyong	-	-	-	*0.004*	0.005	0.005	0.005	0.005	0.005	0.004
Illawarra										
Albion Park South	0.003	0.003	0.002	0.004	0.004	0.004	0.003	0.004	0.004	0.004
Kembla Grange	0.003	0.003	0.004	0.005	0.005	0.004	0.005	0.005	0.004	0.005
Wollongong	0.010	0.009	0.008	0.009	0.008	0.008	0.008	0.006	0.006	0.007
Lower Hunter										
Beresfield	0.006	0.007	0.009	0.009	0.009	0.009	0.009	0.008	0.009	0.009
Newcastle	0.008	0.008	0.007	0.008	0.008	0.007	0.007	0.008	0.007	0.007
Wallsend	0.008	0.009	0.008	0.008	0.008	0.008	0.008	0.007	0.008	0.007
Regional										
Gunnedah	-	-	-	-	-	-	-	-	-	0.005

AAQ NEPM standard: 0.120 ppm (1-hour average)

*Campbelltown West replaced the Macarthur trend station from September 2012

Data availability between 15% and 75%, values shown in italics

Statistical summaries for multiple years, by station, NO_2

Annual daily maximum 1-hour concentration, NO_2

Sydney

Table 39 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Bargo

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	89.5	0	0.048	0.043	0.035	0.030	0.025	0.020	0.014	0.007
2010	85.1	0	0.059	0.041	0.034	0.028	0.024	0.018	0.013	0.008
2011	91.0	0	0.046	0.035	0.034	0.028	0.025	0.019	0.013	0.007
2012	94.0	0	0.044	0.036	0.033	0.029	0.025	0.021	0.014	0.009
2013	94.8	0	0.068	0.052	0.040	0.031	0.027	0.022	0.016	0.009
2014	93.0	0	0.036	0.033	0.031	0.027	0.025	0.021	0.015	0.009
2015	93.0	0	0.048	0.045	0.038	0.032	0.027	0.020	0.015	0.009
2016	92.8	0	0.046	0.041	0.039	0.032	0.028	0.021	0.015	0.008
2017	93.3	0	0.066	0.049	0.036	0.032	0.029	0.023	0.017	0.009
2018	94.2	0	0.048	0.041	0.038	0.034	0.031	0.025	0.017	0.009

AAQ NEPM standard: 0.120 ppm (1-hour average)

Table 40 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Bringelly

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	77.9	0	0.034	0.027	0.025	0.022	0.018	0.013	0.010	0.006
2010	87.4	0	0.037	0.029	0.027	0.022	0.019	0.015	0.011	0.009
2011	87.4	0	0.029	0.024	0.023	0.019	0.017	0.013	0.010	0.007
2012	89.7	0	0.038	0.027	0.025	0.022	0.018	0.015	0.011	0.007
2013	92.9	0	0.037	0.025	0.022	0.019	0.016	0.013	0.010	0.007
2014	91.2	0	0.025	0.025	0.023	0.020	0.016	0.013	0.009	0.007
2015	92.8	0	0.027	0.023	0.021	0.017	0.015	0.012	0.009	0.006
2016	94.3	0	0.030	0.025	0.023	0.020	0.019	0.014	0.010	0.007
2017	91.4	0	0.036	0.027	0.024	0.021	0.017	0.015	0.010	0.008
2018	94.6	0	0.036	0.030	0.025	0.023	0.020	0.016	0.012	0.008

AAQ NEPM standard: 0.120 ppm (1-hour average)

Table 41 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Camden

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2012	*20.0*	*0*	*0.022*	*0.022*	*0.022*	*0.020*	*0.017*	*0.012*	*0.009*	*0.007*
2013	94.1	0	0.036	0.024	0.020	0.018	0.015	0.013	0.010	0.007
2014	92.8	0	0.032	0.024	0.022	0.018	0.016	0.013	0.010	0.007
2015	92.6	0	0.026	0.021	0.021	0.018	0.016	0.012	0.009	0.006
2016	91.9	0	0.029	0.025	0.023	0.019	0.016	0.013	0.010	0.006
2017	94.2	0	0.044	0.027	0.022	0.019	0.017	0.013	0.011	0.007
2018	90.7	0	0.029	0.026	0.025	0.021	0.020	0.016	0.012	0.007

AAQ NEPM standard: 0.120 ppm (1-hour average)

Data availability between 15% and 75%, values shown in italics

Table 42 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Macarthur/Campbelltown West

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	91.0	0	0.048	0.044	0.040	0.035	0.031	0.025	0.020	0.016
2010	90.4	0	0.042	0.039	0.036	0.032	0.029	0.025	0.020	0.015
2011	92.9	0	0.045	0.039	0.037	0.033	0.029	0.024	0.019	0.014
2012	89.6	0	0.049	0.043	0.041	0.037	0.032	0.026	0.020	0.015
2013	94.9	0	0.054	0.043	0.042	0.038	0.035	0.029	0.023	0.017
2014	93.8	0	0.055	0.044	0.041	0.038	0.032	0.027	0.022	0.017
2015	91.8	0	0.062	0.048	0.043	0.036	0.033	0.027	0.021	0.016
2016	93.3	0	0.054	0.049	0.043	0.038	0.035	0.029	0.022	0.016
2017	93.5	0	0.061	0.046	0.045	0.040	0.036	0.030	0.024	0.017
2018	94.1	0	0.054	0.051	0.044	0.040	0.037	0.031	0.023	0.017

AAQ NEPM standard: 0.120 ppm (1-hour average)

Campbelltown West replaced Macarthur in September 2012

Data availability between 15% and 75%, values shown in italics

Table 43 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Chullora

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	90.5	0	0.052	0.044	0.041	0.036	0.033	0.028	0.023	0.018
2010	86.5	0	0.057	0.042	0.040	0.036	0.032	0.028	0.023	0.017
2011	93.2	0	0.051	0.046	0.043	0.037	0.034	0.029	0.024	0.018
2012	93.6	0	0.059	0.049	0.047	0.041	0.037	0.030	0.024	0.019
2013	92.2	0	0.055	0.051	0.047	0.043	0.038	0.031	0.026	0.019
2014	92.9	0	0.064	0.050	0.044	0.040	0.036	0.030	0.025	0.019
2015	94.0	0	0.054	0.051	0.042	0.037	0.034	0.029	0.024	0.018
2016	94.6	0	0.046	0.046	0.045	0.040	0.037	0.030	0.024	0.018
2017	93.3	0	0.060	0.049	0.046	0.040	0.036	0.031	0.025	0.019
2018	94.7	0	0.057	0.044	0.041	0.039	0.035	0.030	0.023	0.017

AAQ NEPM standard: 0.120 ppm (1-hour average)

Table 44 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Earlwood

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	85.9	0	0.052	0.042	0.037	0.033	0.029	0.025	0.020	0.014
2010	88.9	0	0.038	0.037	0.033	0.029	0.028	0.025	0.021	0.015
2011	91.0	0	0.046	0.037	0.034	0.031	0.028	0.024	0.019	0.014
2012	92.2	0	0.051	0.039	0.035	0.033	0.029	0.024	0.019	0.013
2013	91.0	0	0.048	0.040	0.037	0.032	0.029	0.025	0.021	0.015
2014	87.5	0	0.040	0.035	0.033	0.029	0.027	0.023	0.019	0.013
2015	94.4	0	0.053	0.034	0.032	0.028	0.026	0.023	0.019	0.014
2016	89.5	0	0.043	0.039	0.036	0.034	0.031	0.026	0.021	0.013
2017	94.5	0	0.067	0.044	0.040	0.034	0.031	0.027	0.022	0.016
2018	94.3	0	0.050	0.042	0.037	0.035	0.033	0.028	0.021	0.014

AAQ NEPM standard: 0.120 ppm (1-hour average)

Table 45 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Liverpool

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	85.3	0	0.053	0.044	0.042	0.034	0.030	0.025	0.020	0.015
2010	92.0	0	0.053	0.044	0.041	0.035	0.030	0.026	0.022	0.017
2011	92.0	0	0.046	0.039	0.038	0.032	0.030	0.025	0.020	0.015
2012	90.1	0	0.046	0.039	0.036	0.032	0.030	0.025	0.020	0.014
2013	92.2	0	0.056	0.047	0.040	0.037	0.034	0.028	0.024	0.017
2014	91.0	0	0.044	0.041	0.038	0.034	0.031	0.027	0.022	0.017
2015	90.4	0	0.060	0.046	0.038	0.034	0.031	0.026	0.021	0.015
2016	94.4	0	0.047	0.045	0.044	0.038	0.035	0.029	0.023	0.017
2017	94.7	0	0.064	0.046	0.045	0.040	0.036	0.031	0.025	0.019
2018	94.1	0	0.062	0.046	0.044	0.041	0.037	0.032	0.025	0.018

AAQ NEPM standard: 0.120 ppm (1-hour average)

Table 46 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Macquarie Park

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2017	*37.9*	*0*	*0.037*	*0.033*	*0.028*	*0.025*	*0.022*	*0.018*	*0.013*	*0.009*
2018	93.4	0	0.030	0.028	0.026	0.024	0.022	0.018	0.013	0.009

AAQ NEPM standard: 0.120 ppm (1-hour average)

Data availability between 15% and 75%, values shown in italics

Table 47 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Oakdale

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	84.1	0	0.038	0.020	0.017	0.014	0.011	0.007	0.004	0.002
2010	89.8	0	0.023	0.019	0.016	0.014	0.011	0.007	0.004	0.002
2011	94.5	0	0.027	0.017	0.013	0.011	0.010	0.006	0.004	0.002
2012	93.5	0	0.022	0.021	0.017	0.014	0.010	0.006	0.004	0.002
2013	94.3	0	0.019	0.017	0.016	0.012	0.010	0.007	0.004	0.002
2014	94.5	0	0.026	0.022	0.018	0.012	0.009	0.006	0.004	0.002
2015	94.4	0	0.024	0.015	0.012	0.010	0.008	0.006	0.003	0.002
2016	92.5	0	0.022	0.017	0.015	0.012	0.009	0.006	0.003	0.001
2017	95.3	0	0.022	0.015	0.013	0.010	0.008	0.005	0.003	0.002
2018	94.3	0	0.029	0.015	0.014	0.011	0.009	0.006	0.004	0.002

AAQ NEPM standard: 0.120 ppm (1-hour average)

Table 48 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Parramatta North

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2018	92.7	0	0.064	0.051	0.043	0.038	0.034	0.030	0.023	0.016

AAQ NEPM standard: 0.120 ppm (1-hour average)

Table 49 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Prospect

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	84.6	0	0.051	0.040	0.039	0.035	0.032	0.027	0.022	0.017
2010	82.0	0	0.043	0.039	0.038	0.033	0.031	0.027	0.023	0.017
2011	94.6	0	0.039	0.038	0.035	0.032	0.029	0.025	0.020	0.015
2012	92.7	0	0.050	0.043	0.037	0.034	0.030	0.026	0.021	0.015
2013	88.8	0	0.049	0.044	0.041	0.037	0.033	0.029	0.022	0.014
2014	92.2	0	0.047	0.045	0.040	0.034	0.032	0.027	0.022	0.017
2015	93.8	0	0.053	0.043	0.039	0.036	0.034	0.028	0.022	0.016
2016	94.3	0	0.053	0.046	0.042	0.037	0.033	0.028	0.021	0.015
2017	94.2	0	0.060	0.045	0.041	0.037	0.034	0.029	0.023	0.016
2018	87.2	0	0.051	0.043	0.040	0.037	0.035	0.028	0.020	0.015

AAQ NEPM standard: 0.120 ppm (1-hour average)

Table 50 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Randwick

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	89.4	0	0.036	0.035	0.032	0.029	0.027	0.024	0.019	0.012
2010	85.0	0	0.050	0.037	0.035	0.031	0.029	0.025	0.021	0.011
2011	89.5	0	0.053	0.035	0.034	0.031	0.029	0.025	0.019	0.011
2012	92.3	0	0.041	0.037	0.034	0.030	0.028	0.024	0.018	0.011
2013	92.5	0	0.046	0.041	0.037	0.031	0.028	0.025	0.020	0.011
2014	92.8	0	0.047	0.035	0.033	0.029	0.026	0.024	0.019	0.011
2015	93.0	0	0.043	0.037	0.036	0.032	0.030	0.027	0.021	0.012
2016	93.7	0	0.044	0.039	0.037	0.033	0.030	0.026	0.020	0.012
2017	92.9	0	0.041	0.037	0.035	0.031	0.029	0.026	0.020	0.010
2018	92.5	0	0.040	0.037	0.034	0.032	0.030	0.025	0.017	0.011

AAQ NEPM standard: 0.120 ppm (1-hour average)

Table 51 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Richmond

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	91.4	0	0.030	0.027	0.026	0.023	0.020	0.016	0.012	0.009
2010	87.9	0	0.033	0.025	0.024	0.021	0.020	0.015	0.012	0.008
2011	94.4	0	0.029	0.026	0.024	0.021	0.019	0.015	0.011	0.008
2012	93.1	0	0.046	0.042	0.028	0.021	0.019	0.015	0.011	0.007
2013	92.5	0	0.032	0.024	0.023	0.021	0.018	0.015	0.011	0.007
2014	93.3	0	0.028	0.022	0.021	0.020	0.017	0.013	0.009	0.007
2015	90.8	0	0.024	0.022	0.021	0.019	0.017	0.012	0.009	0.007
2016	93.9	0	0.030	0.024	0.023	0.020	0.018	0.014	0.010	0.007
2017	91.3	0	0.026	0.023	0.023	0.020	0.018	0.015	0.011	0.008
2018	92.4	0	0.030	0.027	0.026	0.023	0.020	0.016	0.011	0.008

AAQ NEPM standard: 0.120 ppm (1-hour average)

Table 52 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Rozelle

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	86.1	0	0.049	0.039	0.036	0.033	0.031	0.026	0.021	0.015
2010	79.6	0	0.049	0.039	0.037	0.034	0.031	0.028	0.022	0.015
2011	90.9	0	0.050	0.043	0.041	0.035	0.031	0.028	0.022	0.014
2012	92.1	0	0.062	0.049	0.046	0.038	0.034	0.028	0.022	0.017
2013	91.5	0	0.070	0.048	0.045	0.038	0.035	0.029	0.023	0.016
2014	93.9	0	0.055	0.042	0.037	0.033	0.032	0.027	0.022	0.016
2015	91.3	0	0.060	0.045	0.038	0.034	0.031	0.027	0.021	0.014
2016	93.8	0	0.050	0.044	0.039	0.036	0.033	0.029	0.022	0.015
2017	93.3	0	0.061	0.057	0.047	0.038	0.034	0.030	0.023	0.017
2018	*67.7*	*0*	*0.057*	*0.045*	*0.039*	*0.036*	*0.034*	*0.028*	*0.022*	*0.014*

AAQ NEPM standard: 0.120 ppm (1-hour average)

Data availability between 15% and 75%, values shown in italics

Table 53 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: St Marys

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	89.6	0	0.035	0.031	0.029	0.026	0.023	0.019	0.014	0.010
2010	93.5	0	0.036	0.031	0.027	0.024	0.022	0.019	0.014	0.011
2011	94.6	0	0.036	0.031	0.028	0.025	0.023	0.018	0.013	0.009
2012	92.7	0	0.043	0.031	0.029	0.026	0.022	0.018	0.013	0.009
2013	90.3	0	0.037	0.032	0.028	0.025	0.021	0.017	0.012	0.009
2014	85.4	0	0.031	0.028	0.025	0.023	0.019	0.016	0.010	0.007
2015	87.2	0	0.032	0.026	0.024	0.022	0.020	0.015	0.011	0.006
2016	93.2	0	0.042	0.028	0.024	0.022	0.020	0.016	0.011	0.007
2017	92.9	0	0.037	0.028	0.027	0.025	0.023	0.017	0.012	0.008
2018	93.4	0	0.037	0.031	0.030	0.028	0.024	0.018	0.012	0.008

AAQ NEPM standard: 0.120 ppm (1-hour average)

Central Coast

Table 54 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Wyong

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2012	*18.9*	*0*	*0.029*	*0.028*	*0.025*	*0.023*	*0.018*	*0.015*	*0.012*	*0.009*
2013	94.7	0	0.041	0.037	0.029	0.026	0.024	0.019	0.014	0.010
2014	94.3	0	0.034	0.032	0.029	0.025	0.023	0.019	0.013	0.010
2015	93.8	0	0.032	0.027	0.026	0.024	0.022	0.018	0.013	0.009
2016	93.4	0	0.046	0.032	0.029	0.024	0.021	0.017	0.013	0.009
2017	94.3	0	0.051	0.027	0.026	0.024	0.022	0.018	0.014	0.010
2018	93.6	0	0.035	0.028	0.026	0.024	0.021	0.017	0.011	0.008

AAQ NEPM standard: 0.120 ppm (1-hour average)

Data availability between 15% and 75%, values shown in italics

Illawarra

Table 55 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Albion Park South

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	91.3	0	0.052	0.038	0.033	0.024	0.022	0.014	0.009	0.004
2010	87.5	0	0.041	0.030	0.027	0.023	0.019	0.013	0.008	0.004
2011	89.1	0	0.040	0.030	0.027	0.021	0.016	0.012	0.007	0.003
2012	86.1	0	0.037	0.034	0.028	0.023	0.020	0.014	0.008	0.004
2013	92.4	0	0.039	0.036	0.030	0.025	0.019	0.013	0.010	0.006
2014	95.1	0	0.038	0.028	0.026	0.021	0.018	0.013	0.009	0.006
2015	91.6	0	0.047	0.032	0.026	0.022	0.016	0.012	0.008	0.004
2016	91.5	0	0.043	0.035	0.031	0.024	0.018	0.014	0.008	0.004
2017	93.0	0	0.038	0.031	0.027	0.023	0.020	0.014	0.009	0.005
2018	94.7	0	0.039	0.035	0.032	0.026	0.022	0.016	0.010	0.005

AAQ NEPM standard: 0.120 ppm (1-hour average)

Table 56 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Kembla Grange

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	83.0	0	0.035	0.029	0.025	0.021	0.018	0.013	0.009	0.004
2010	77.2	0	0.036	0.026	0.022	0.019	0.017	0.012	0.008	0.005
2011	91.0	0	0.037	0.030	0.028	0.024	0.019	0.014	0.009	0.006
2012	94.3	0	0.039	0.030	0.027	0.024	0.021	0.016	0.011	0.007
2013	95.1	0	0.036	0.029	0.027	0.023	0.020	0.016	0.012	0.008
2014	90.2	0	0.031	0.025	0.024	0.021	0.018	0.014	0.010	0.007
2015	93.1	0	0.034	0.026	0.024	0.022	0.019	0.015	0.010	0.007
2016	93.4	0	0.039	0.030	0.028	0.023	0.021	0.017	0.011	0.007
2017	93.7	0	0.037	0.032	0.028	0.026	0.022	0.017	0.011	0.007
2018	91.6	0	0.037	0.033	0.031	0.027	0.023	0.017	0.012	0.007

AAQ NEPM standard: 0.120 ppm (1-hour average)

Table 57 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Wollongong

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	*70.1*	*0*	*0.048*	*0.044*	*0.037*	*0.034*	*0.030*	*0.025*	*0.019*	*0.013*
2010	87.1	0	0.052	0.042	0.037	0.033	0.028	0.024	0.020	0.015
2011	90.8	0	0.043	0.039	0.037	0.031	0.029	0.024	0.019	0.013
2012	90.5	0	0.049	0.040	0.039	0.034	0.030	0.025	0.018	0.013
2013	89.2	0	0.050	0.048	0.043	0.035	0.031	0.026	0.020	0.014
2014	92.6	0	0.038	0.037	0.036	0.032	0.029	0.024	0.018	0.014
2015	92.7	0	0.060	0.036	0.035	0.032	0.029	0.024	0.018	0.013
2016	93.9	0	0.043	0.040	0.037	0.033	0.030	0.024	0.017	0.011
2017	93.8	0	0.057	0.039	0.037	0.033	0.029	0.025	0.017	0.011
2018	93.2	0	0.043	0.036	0.035	0.033	0.030	0.025	0.017	0.011

AAQ NEPM standard: 0.120 ppm (1-hour average)

Data availability between 15% and 75%, values shown in italics

Lower Hunter

Table 58 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Beresfield

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	79.6	0	0.036	0.032	0.030	0.024	0.021	0.018	0.014	0.010
2010	76.6	0	0.032	0.030	0.028	0.026	0.024	0.019	0.015	0.010
2011	89.9	0	0.042	0.034	0.031	0.028	0.027	0.022	0.018	0.014
2012	93.3	0	0.044	0.037	0.034	0.030	0.028	0.024	0.020	0.015
2013	88.6	0	0.041	0.036	0.035	0.033	0.030	0.025	0.020	0.014
2014	93.8	0	0.039	0.034	0.032	0.030	0.027	0.023	0.019	0.015
2015	93.9	0	0.049	0.035	0.034	0.031	0.027	0.023	0.019	0.014
2016	94.2	0	0.041	0.034	0.032	0.028	0.026	0.022	0.018	0.013
2017	93.7	0	0.040	0.036	0.033	0.030	0.029	0.025	0.020	0.015
2018	92.7	0	0.040	0.037	0.034	0.032	0.029	0.024	0.018	0.014

AAQ NEPM standard: 0.120 ppm (1-hour average)

Table 59 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Newcastle

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	89.5	0	0.043	0.037	0.032	0.029	0.027	0.022	0.016	0.010
2010	85.9	0	0.038	0.032	0.031	0.029	0.028	0.023	0.017	0.011
2011	90.7	0	0.038	0.034	0.033	0.029	0.027	0.023	0.017	0.010
2012	92.6	0	0.038	0.035	0.033	0.031	0.029	0.025	0.018	0.011
2013	95.0	0	0.042	0.039	0.036	0.033	0.029	0.025	0.019	0.011
2014	93.4	0	0.046	0.037	0.035	0.031	0.028	0.023	0.017	0.010
2015	93.8	0	0.044	0.034	0.033	0.030	0.027	0.023	0.018	0.010
2016	90.9	0	0.038	0.036	0.034	0.032	0.029	0.025	0.018	0.011
2017	94.3	0	0.037	0.037	0.034	0.032	0.030	0.025	0.018	0.010
2018	94.3	0	0.045	0.037	0.035	0.032	0.029	0.023	0.015	0.009

AAQ NEPM standard: 0.120 ppm (1-hour average)

Table 60 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Wallsend

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	83.8	0	0.040	0.033	0.031	0.027	0.025	0.021	0.016	0.011
2010	86.1	0	0.038	0.033	0.032	0.028	0.026	0.022	0.017	0.012
2011	90.7	0	0.037	0.032	0.029	0.027	0.026	0.021	0.016	0.011
2012	94.1	0	0.034	0.030	0.029	0.027	0.025	0.021	0.016	0.012
2013	91.8	0	0.043	0.033	0.030	0.027	0.024	0.021	0.016	0.012
2014	94.6	0	0.034	0.033	0.030	0.027	0.025	0.021	0.015	0.012
2015	93.4	0	0.042	0.033	0.031	0.027	0.025	0.020	0.016	0.012
2016	93.4	0	0.037	0.033	0.029	0.027	0.024	0.020	0.015	0.011
2017	94.5	0	0.037	0.032	0.031	0.029	0.027	0.022	0.016	0.012
2018	93.7	0	0.035	0.033	0.032	0.028	0.026	0.020	0.015	0.010

AAQ NEPM standard: 0.120 ppm (1-hour average)

North West Slopes

Table 61 Statistical summary for NO_2: annual daily maximum 1-hour average concentrations. Station: Gunnedah

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2018	78.3	0	0.034	0.031	0.029	0.026	0.025	0.019	0.013	0.009

AAQ NEPM standard: 0.120 ppm (1-hour average)

Ozone

Statistical summary for 2018

Table 62 Statistical summary for O_3: daily maximum 1-hour average concentrations

Region/ monitoring station	Data availability rate (%)	Maximum (ppm)	Percentile (ppm)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Bargo	92.8	**0.102**	0.085	0.082	0.066	0.057	0.042	0.034	0.030
Bringelly	94.1	**0.110**	0.097	0.084	0.070	0.059	0.042	0.032	0.028
Camden	90.0	**0.112**	0.096	0.089	0.071	0.060	0.044	0.033	0.029
Campbelltown West	93.7	**0.110**	0.097	0.085	0.070	0.058	0.038	0.031	0.027
Chullora	95.0	0.092	0.080	0.070	0.055	0.045	0.035	0.029	0.026
Earlwood	94.8	0.072	0.068	0.057	0.048	0.039	0.033	0.028	0.025
Liverpool	93.5	**0.111**	0.086	0.077	0.063	0.055	0.039	0.030	0.026
Macquarie Park	93.9	0.087	0.076	0.071	0.060	0.050	0.039	0.032	0.028
Oakdale	93.8	0.097	0.085	0.077	0.069	0.059	0.043	0.034	0.030
Parramatta North	92.7	**0.102**	0.081	0.076	0.059	0.053	0.038	0.031	0.027
Prospect	85.9	**0.105**	0.083	0.076	0.069	0.056	0.041	0.032	0.028
Randwick	94.1	0.073	0.062	0.056	0.049	0.042	0.035	0.032	0.028
Richmond	94.2	**0.103**	0.091	0.079	0.067	0.055	0.043	0.034	0.030
Rozelle	*67.7*	*0.078*	*0.062*	*0.051*	*0.043*	*0.039*	*0.033*	*0.030*	*0.026*
St Marys	93.9	**0.105**	0.088	0.085	0.073	0.059	0.045	0.035	0.031
Central Coast									
Wyong	91.8	0.075	0.064	0.058	0.049	0.042	0.035	0.031	0.027
Illawarra									
Albion Park South	94.1	0.076	0.061	0.055	0.046	0.039	0.033	0.030	0.027
Kembla Grange	92.9	0.070	0.062	0.055	0.048	0.040	0.034	0.031	0.027
Wollongong	93.8	0.066	0.063	0.055	0.049	0.041	0.035	0.031	0.026
Lower Hunter									
Beresfield	93.8	**0.107**	0.074	0.061	0.054	0.046	0.036	0.029	0.025
Newcastle	93.4	0.067	0.061	0.058	0.044	0.039	0.033	0.030	0.026
Wallsend	93.8	0.086	0.069	0.064	0.055	0.044	0.035	0.031	0.027
North West slopes									
Gunnedah	78.9	0.063	0.056	0.055	0.052	0.048	0.041	0.035	0.032

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Table 63 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations

Region/ monitoring station	Data availability rate (%)	Maximum (ppm)	Percentile (ppm)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Bargo	96.5	**0.084**	0.078	0.070	0.058	0.052	0.039	0.032	0.029
Bringelly	97.9	**0.092**	**0.083**	0.075	0.062	0.053	0.039	0.031	0.027
Camden	93.7	**0.094**	**0.082**	0.075	0.064	0.055	0.040	0.032	0.028
Campbelltown West	97.6	**0.098**	**0.088**	0.074	0.062	0.052	0.036	0.030	0.026
Chullora	99.1	**0.082**	0.071	0.061	0.049	0.042	0.032	0.028	0.024
Earlwood	98.9	0.065	0.061	0.053	0.044	0.036	0.030	0.027	0.023
Liverpool	97.4	**0.093**	0.077	0.069	0.056	0.050	0.036	0.029	0.025
Macquarie Park	97.5	0.080	0.068	0.064	0.055	0.046	0.036	0.031	0.027
Oakdale	97.7	**0.082**	0.076	0.070	0.061	0.053	0.041	0.033	0.030
Parramatta North	96.5	**0.095**	0.073	0.068	0.056	0.048	0.035	0.030	0.026
Prospect	89.6	**0.091**	0.074	0.070	0.058	0.051	0.038	0.031	0.026
Randwick	98.2	0.069	0.058	0.050	0.043	0.039	0.034	0.031	0.027
Richmond	98.2	**0.087**	0.076	0.069	0.060	0.050	0.041	0.033	0.029
Rozelle	*70.5*	*0.066*	*0.050*	*0.046*	*0.039*	*0.036*	*0.032*	*0.029*	*0.024*
St Marys	97.9	**0.094**	0.080	0.073	0.063	0.055	0.041	0.034	0.029
Central Coast									
Wyong	95.4	0.067	0.058	0.053	0.045	0.038	0.033	0.029	0.025
Illawarra									
Albion Park South	98.1	0.073	0.054	0.047	0.043	0.036	0.031	0.029	0.025
Kembla Grange	96.8	0.059	0.056	0.050	0.044	0.037	0.033	0.030	0.026
Wollongong	97.9	0.061	0.057	0.050	0.045	0.038	0.033	0.029	0.025
Lower Hunter									
Beresfield	97.6	**0.089**	0.064	0.058	0.050	0.042	0.032	0.028	0.023
Newcastle	97.4	0.058	0.054	0.052	0.040	0.037	0.031	0.028	0.024
Wallsend	97.8	0.068	0.060	0.058	0.047	0.041	0.033	0.029	0.025
North West slopes									
Gunnedah	82.1	0.058	0.054	0.053	0.050	0.047	0.040	0.034	0.031

AAQ NEPM standard: 0.080 ppm (rolling 4-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Trend analysis

Table 64 Maximum 1-hour average concentrations for O_3 (ppm)

Region/ monitoring station	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Sydney										
Bargo	**0.122**	**0.110**	**0.126**	0.091	0.095	**0.105**	0.083	**0.105**	0.095	**0.102**
Bringelly	**0.120**	**0.104**	**0.125**	0.088	**0.108**	**0.124**	0.087	0.094	0.098	**0.110**
Camden	-	-	-	*0.095*	**0.110**	**0.123**	0.086	0.097	**0.122**	**0.112**
Macarthur/ Campbelltown West*	**0.116**	**0.119**	**0.131**	0.080	0.094	**0.124**	0.086	0.091	0.094	**0.110**
Chullora	**0.154**	0.083	**0.114**	0.080	**0.105**	0.079	0.093	0.090	**0.114**	0.092
Earlwood	**0.138**	0.085	0.099	0.082	**0.101**	0.069	0.093	0.092	**0.109**	0.072
Liverpool	**0.151**	0.091	**0.103**	0.079	**0.117**	**0.103**	0.087	0.095	**0.135**	**0.111**
Macquarie Park	-	-	-	-	-	-	-	-	*0.091*	0.087
Oakdale	**0.128**	0.099	**0.126**	0.089	0.095	**0.110**	0.084	0.083	0.095	0.097
Parramatta North	-	-	-	-	-	-	-	-	-	**0.102**
Prospect	**0.126**	**0.104**	**0.126**	0.080	**0.111**	**0.103**	0.085	**0.104**	**0.123**	**0.105**
Randwick	0.078	0.084	0.073	0.066	0.075	0.066	**0.113**	0.099	**0.116**	0.073
Richmond	**0.102**	0.089	**0.116**	0.085	0.095	0.090	0.094	0.081	0.093	**0.103**
Rozelle	0.083	0.073	0.093	0.069	0.073	0.067	0.099	0.089	**0.114**	*0.078*
St Marys	**0.132**	0.095	**0.136**	0.085	**0.110**	**0.100**	0.082	**0.101**	**0.110**	**0.105**
Central Coast										
Wyong	-	-	-	*0.078*	0.079	0.076	0.097	0.086	**0.121**	0.075
Illawarra										
Albion Park South	**0.102**	0.093	**0.118**	0.067	**0.120**	0.094	0.079	**0.104**	**0.117**	0.076
Kembla Grange	**0.103**	0.081	**0.121**	0.068	**0.126**	0.094	**0.104**	**0.114**	**0.122**	0.070
Wollongong	0.083	0.082	0.084	0.065	**0.112**	0.077	0.092	0.095	**0.107**	0.066
Lower Hunter										
Beresfield	0.072	0.088	0.071	0.070	0.077	0.090	0.077	0.085	0.083	**0.107**
Newcastle	0.073	0.086	0.066	0.071	0.081	0.065	0.074	0.077	0.086	0.067
Wallsend	0.086	0.067	0.071	0.080	0.084	0.087	0.071	0.086	**0.106**	0.086
North West slopes										
Gunnedah	-	-	-	-	-	-	-	-	-	0.063

AAQ NEPM standard: 0.100 ppm (1-hour average)

*Campbelltown West replaced Macarthur trend station from September 2012

Bold font indicates values that exceed the AAQ NEPM standard.

Data availability between 15% and 75%, values shown in italics

Table 65 Maximum rolling 4-hour average concentrations for O_3 (ppm)

Region/ monitoring station	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Sydney										
Bargo	**0.111**	**0.086**	**0.098**	**0.083**	**0.082**	**0.093**	0.074	0.080	**0.086**	**0.084**
Bringelly	**0.108**	**0.089**	**0.118**	0.072	**0.102**	**0.113**	0.078	0.080	**0.089**	**0.092**
Camden	-	-	-	***0.084***	**0.090**	**0.110**	0.072	0.075	**0.108**	**0.094**
Macarthur/ Campbelltown West*	**0.097**	**0.103**	**0.122**	0.073	**0.082**	**0.111**	0.079	0.077	**0.091**	**0.098**
Chullora	**0.112**	0.072	**0.096**	0.068	**0.094**	0.073	0.078	0.077	**0.110**	**0.082**
Earlwood	**0.104**	0.074	**0.088**	0.068	**0.082**	0.065	**0.081**	**0.082**	**0.087**	0.065
Liverpool	**0.103**	**0.081**	**0.095**	0.071	**0.110**	**0.087**	0.077	**0.086**	**0.117**	**0.093**
Macquarie Park	-	-	-	-	-	-	-	-	***0.087***	0.080
Oakdale	**0.108**	**0.088**	**0.098**	**0.081**	**0.081**	**0.088**	0.070	0.067	0.080	**0.082**
Parramatta North	-	-	-	-	-	-	-	-	-	**0.095**
Prospect	**0.100**	**0.097**	**0.114**	0.073	**0.104**	**0.097**	0.070	0.078	**0.106**	**0.091**
Randwick	0.073	0.077	0.069	0.063	0.067	0.061	**0.085**	**0.090**	**0.102**	0.069
Richmond	**0.090**	**0.082**	**0.088**	0.070	0.076	0.073	0.074	0.070	**0.085**	**0.087**
Rozelle	0.073	0.067	0.080	0.054	0.063	0.060	0.079	0.075	**0.109**	*0.066*
St Marys	**0.106**	**0.083**	**0.121**	0.072	**0.101**	**0.085**	0.071	**0.081**	**0.096**	**0.094**
Central Coast										
Wyong	-	-	-	*0.066*	0.072	0.069	**0.091**	0.079	**0.105**	0.067
Illawarra										
Albion Park South	**0.083**	0.073	**0.099**	0.064	**0.100**	0.079	0.075	**0.098**	**0.102**	0.073
Kembla Grange	**0.090**	0.078	**0.105**	0.061	**0.103**	0.080	0.079	**0.102**	**0.098**	0.059
Wollongong	0.074	0.073	0.078	0.061	**0.091**	0.068	**0.083**	**0.085**	**0.094**	0.061
Lower Hunter										
Beresfield	0.065	**0.082**	0.064	0.067	0.074	0.077	0.067	0.068	0.079	**0.089**
Newcastle	0.067	0.076	0.063	0.057	0.075	0.056	0.066	0.069	0.073	0.058
Wallsend	0.076	0.063	0.059	0.070	0.078	0.065	0.062	0.078	0.097	0.068
North West slopes										
Gunnedah	-	-	-	-	-	-	-	-	-	0.058

AAQ NEPM standard: 0.080 ppm (rolling 4-hour average)

*Campbelltown West replaced Macarthur trend station from September 2012

Bold font indicates values that exceed the AAQ NEPM standard.

Data availability between 15% and 75%, values shown in italics

Statistical summaries for multiple years, by station, O_3

Annual daily maximum 1-hour average concentrations, O_3

Sydney

Table 66 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Bargo

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	93.1	**6**	**0.122**	**0.113**	0.092	0.079	0.064	0.041	0.032	0.030
2010	93.6	1	**0.110**	0.076	0.069	0.060	0.052	0.037	0.031	0.028
2011	94.9	1	**0.126**	0.082	0.076	0.060	0.049	0.035	0.029	0.025
2012	94.0	0	0.091	0.084	0.069	0.057	0.048	0.037	0.029	0.026
2013	94.8	0	0.095	0.087	0.082	0.066	0.056	0.040	0.031	0.027
2014	94.6	**2**	**0.105**	0.093	0.080	0.067	0.055	0.040	0.032	0.028
2015	93.4	0	0.083	0.076	0.070	0.059	0.051	0.039	0.029	0.026
2016	93.5	1	**0.105**	0.083	0.077	0.061	0.055	0.040	0.030	0.027
2017	94.0	0	0.095	0.090	0.075	0.067	0.056	0.039	0.032	0.028
2018	92.8	1	**0.102**	0.085	0.082	0.066	0.057	0.042	0.034	0.030

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 67 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Bringelly

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	90.8	**4**	**0.120**	**0.102**	0.089	0.072	0.062	0.041	0.030	0.026
2010	89.2	**2**	**0.104**	0.081	0.075	0.061	0.052	0.040	0.031	0.026
2011	88.5	**2**	**0.125**	0.087	0.080	0.065	0.055	0.038	0.030	0.026
2012	93.0	0	0.088	0.075	0.072	0.060	0.049	0.040	0.030	0.026
2013	94.8	1	**0.108**	0.085	0.081	0.062	0.053	0.040	0.031	0.026
2014	93.4	**2**	**0.124**	0.089	0.080	0.064	0.056	0.041	0.032	0.028
2015	93.1	0	0.087	0.078	0.072	0.065	0.055	0.040	0.029	0.026
2016	90.7	0	0.094	0.080	0.076	0.065	0.054	0.042	0.030	0.027
2017	92.0	0	0.098	0.088	0.081	0.071	0.054	0.041	0.032	0.027
2018	94.1	**2**	**0.110**	0.097	0.084	0.070	0.059	0.042	0.032	0.028

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 68 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Camden

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2012	*20.3*	*0*	*0.095*	*0.094*	*0.091*	*0.078*	*0.068*	*0.053*	*0.041*	*0.031*
2013	93.1	1	**0.110**	0.098	0.079	0.069	0.056	0.042	0.031	0.027
2014	94.4	**2**	**0.123**	0.099	0.085	0.067	0.056	0.042	0.033	0.028
2015	94.3	0	0.086	0.075	0.074	0.067	0.054	0.040	0.030	0.027
2016	91.1	0	0.097	0.083	0.077	0.066	0.056	0.043	0.031	0.027
2017	93.8	1	**0.122**	0.085	0.080	0.068	0.054	0.042	0.032	0.028
2018	90.0	**2**	**0.112**	0.096	0.089	0.071	0.060	0.044	0.033	0.029

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Data availability between 15% and 75%, values shown in italics

Table 69 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Macarthur/Campbelltown West

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	92.3	**7**	**0.116**	**0.108**	**0.102**	0.078	0.062	0.043	0.032	0.028
2010	93.9	1	**0.119**	0.090	0.083	0.065	0.054	0.040	0.032	0.028
2011	93.6	**2**	**0.131**	0.096	0.084	0.067	0.054	0.037	0.030	0.026
2012	88.5	0	0.080	0.075	0.071	0.063	0.050	0.037	0.030	0.026
2013	93.9	0	0.094	0.085	0.076	0.061	0.049	0.037	0.029	0.025
2014	91.8	1	**0.124**	0.087	0.076	0.060	0.052	0.038	0.030	0.026
2015	92.0	0	0.086	0.077	0.073	0.062	0.053	0.037	0.028	0.025
2016	94.0	0	0.091	0.087	0.073	0.066	0.055	0.039	0.029	0.026
2017	93.5	0	0.094	0.090	0.081	0.066	0.053	0.039	0.031	0.026
2018	93.7	**3**	**0.110**	0.097	0.085	0.070	0.058	0.038	0.031	0.027

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Data availability between 15% and 75%, values shown in italics

Table 70 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Chullora

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	92.7	**2**	**0.154**	0.089	0.077	0.061	0.050	0.035	0.027	0.023
2010	93.1	0	0.083	0.067	0.062	0.050	0.043	0.031	0.026	0.023
2011	94.2	1	**0.114**	0.073	0.061	0.052	0.043	0.032	0.025	0.021
2012	94.2	0	0.080	0.065	0.055	0.047	0.040	0.031	0.026	0.021
2013	94.8	1	**0.105**	0.072	0.066	0.052	0.045	0.035	0.028	0.023
2014	94.7	0	0.079	0.071	0.061	0.055	0.045	0.033	0.027	0.024
2015	93.8	0	0.093	0.085	0.072	0.056	0.047	0.035	0.028	0.024
2016	94.6	0	0.090	0.084	0.080	0.059	0.050	0.035	0.029	0.024
2017	93.7	1	**0.114**	0.085	0.072	0.055	0.048	0.035	0.030	0.025
2018	95.0	0	0.092	0.080	0.070	0.055	0.045	0.035	0.029	0.026

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances.

Table 71 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Earlwood

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	93.0	**2**	**0.138**	0.074	0.065	0.054	0.043	0.033	0.028	0.024
2010	88.8	0	0.085	0.074	0.056	0.049	0.039	0.032	0.027	0.023
2011	91.6	0	0.099	0.069	0.056	0.046	0.040	0.031	0.027	0.022
2012	94.8	0	0.082	0.065	0.052	0.047	0.042	0.032	0.028	0.024
2013	92.4	1	**0.101**	0.090	0.063	0.050	0.045	0.034	0.028	0.024
2014	95.0	0	0.069	0.066	0.056	0.048	0.042	0.032	0.028	0.024
2015	93.7	0	0.093	0.076	0.067	0.052	0.040	0.031	0.027	0.023
2016	94.1	0	0.092	0.081	0.072	0.053	0.042	0.031	0.027	0.023
2017	90.3	1	**0.109**	0.077	0.067	0.052	0.043	0.033	0.029	0.023
2018	94.8	0	0.072	0.068	0.057	0.048	0.039	0.033	0.028	0.025

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 72 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Liverpool

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	88.9	**2**	**0.151**	0.092	0.088	0.068	0.052	0.038	0.029	0.024
2010	94.2	0	0.091	0.078	0.069	0.057	0.047	0.035	0.028	0.023
2011	94.1	1	**0.103**	0.080	0.071	0.057	0.046	0.032	0.025	0.022
2012	92.4	0	0.079	0.068	0.065	0.054	0.047	0.035	0.028	0.022
2013	94.2	1	**0.117**	0.086	0.074	0.060	0.050	0.040	0.030	0.025
2014	93.6	1	**0.103**	0.084	0.073	0.062	0.052	0.038	0.030	0.026
2015	91.5	0	0.087	0.079	0.072	0.062	0.052	0.037	0.027	0.023
2016	93.1	0	0.095	0.078	0.075	0.064	0.055	0.038	0.028	0.024
2017	94.5	**2**	**0.135**	0.085	0.076	0.062	0.051	0.037	0.030	0.025
2018	93.5	1	**0.111**	0.086	0.077	0.063	0.055	0.039	0.030	0.026

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 73 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Macquarie Park

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2017	*35.9*	*0*	*0.091*	*0.084*	*0.077*	*0.063*	*0.051*	*0.042*	*0.033*	*0.030*
2018	93.9	0	0.087	0.076	0.071	0.060	0.050	0.039	0.032	0.028

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Data availability between 15% and 75%, values shown in italics

Table 74 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Oakdale

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	85.9	**6**	**0.128**	**0.106**	0.093	0.078	0.058	0.042	0.032	0.029
2010	94.2	0	0.099	0.090	0.080	0.066	0.055	0.039	0.033	0.029
2011	95.0	**3**	**0.126**	0.084	0.075	0.063	0.051	0.039	0.031	0.027
2012	92.7	0	0.089	0.078	0.072	0.056	0.048	0.039	0.030	0.027
2013	94.0	0	0.095	0.085	0.078	0.063	0.055	0.041	0.032	0.027
2014	94.5	1	**0.110**	0.090	0.079	0.066	0.054	0.042	0.032	0.028
2015	93.7	0	0.084	0.079	0.072	0.060	0.053	0.040	0.030	0.026
2016	93.3	0	0.083	0.074	0.072	0.061	0.054	0.041	0.031	0.028
2017	95.2	0	0.095	0.093	0.080	0.065	0.055	0.043	0.033	0.028
2018	93.8	0	0.097	0.085	0.077	0.069	0.059	0.043	0.034	0.030

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 75 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Parramatta North

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2018	92.7	1	**0.102**	0.081	0.076	0.059	0.053	0.038	0.031	0.027

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 76 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Prospect

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	93.3	**3**	**0.126**	0.099	0.086	0.070	0.061	0.041	0.032	0.026
2010	88.7	**2**	**0.104**	0.082	0.072	0.062	0.050	0.038	0.030	0.023
2011	95.2	1	**0.126**	0.086	0.068	0.057	0.046	0.034	0.028	0.023
2012	91.8	0	0.080	0.076	0.069	0.061	0.050	0.039	0.028	0.023
2013	91.5	1	**0.111**	0.084	0.070	0.062	0.053	0.042	0.031	0.026
2014	93.4	1	**0.103**	0.088	0.079	0.065	0.053	0.041	0.031	0.027
2015	94.2	0	0.085	0.075	0.071	0.062	0.052	0.039	0.028	0.025
2016	93.4	1	**0.104**	0.086	0.070	0.059	0.052	0.039	0.030	0.025
2017	94.6	1	**0.123**	0.078	0.075	0.061	0.050	0.038	0.030	0.025
2018	85.9	1	**0.105**	0.083	0.076	0.069	0.056	0.041	0.032	0.028

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 77 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Randwick

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	91.9	0	0.078	0.071	0.067	0.056	0.048	0.038	0.034	0.028
2010	88.6	0	0.084	0.072	0.064	0.051	0.043	0.036	0.031	0.027
2011	94.1	0	0.073	0.064	0.057	0.047	0.040	0.034	0.027	0.023
2012	94.0	0	0.066	0.059	0.057	0.049	0.041	0.033	0.029	0.024
2013	92.7	0	0.075	0.071	0.064	0.050	0.044	0.035	0.029	0.025
2014	94.6	0	0.066	0.059	0.056	0.047	0.041	0.033	0.030	0.026
2015	94.0	1	**0.113**	0.065	0.060	0.051	0.043	0.034	0.029	0.026
2016	94.8	0	0.099	0.085	0.077	0.058	0.045	0.035	0.030	0.025
2017	94.3	**2**	**0.116**	0.090	0.075	0.053	0.046	0.036	0.032	0.028
2018	94.1	0	0.073	0.062	0.056	0.049	0.042	0.035	0.032	0.028

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 78 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Richmond

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	90.1	1	**0.102**	0.086	0.078	0.066	0.058	0.043	0.034	0.029
2010	93.2	0	0.089	0.078	0.071	0.060	0.052	0.040	0.032	0.028
2011	94.3	1	**0.116**	0.077	0.067	0.058	0.048	0.037	0.031	0.026
2012	92.9	0	0.085	0.070	0.065	0.056	0.047	0.039	0.031	0.026
2013	94.3	0	0.095	0.071	0.070	0.061	0.054	0.043	0.034	0.027
2014	94.3	0	0.090	0.085	0.074	0.062	0.054	0.042	0.033	0.029
2015	93.2	0	0.094	0.083	0.066	0.056	0.050	0.040	0.030	0.027
2016	94.4	0	0.081	0.069	0.066	0.060	0.052	0.042	0.033	0.028
2017	92.9	0	0.093	0.089	0.081	0.060	0.053	0.041	0.034	0.029
2018	94.2	1	**0.103**	0.091	0.079	0.067	0.055	0.043	0.034	0.030

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 79 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Rozelle

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	92.6	0	0.083	0.068	0.060	0.050	0.042	0.032	0.028	0.023
2010	89.1	0	0.073	0.057	0.055	0.047	0.040	0.033	0.029	0.025
2011	93.3	0	0.093	0.066	0.053	0.044	0.038	0.031	0.026	0.023
2012	94.8	0	0.069	0.057	0.052	0.045	0.042	0.034	0.029	0.024
2013	92.4	0	0.073	0.063	0.054	0.046	0.041	0.033	0.029	0.025
2014	94.8	0	0.067	0.065	0.055	0.046	0.040	0.033	0.028	0.025
2015	92.9	0	0.099	0.068	0.057	0.051	0.040	0.031	0.027	0.023
2016	94.6	0	0.089	0.078	0.063	0.049	0.040	0.032	0.027	0.023
2017	93.3	1	**0.114**	0.076	0.057	0.045	0.040	0.032	0.027	0.021
2018	*67.7*	*0*	*0.078*	*0.062*	*0.051*	*0.043*	*0.039*	*0.033*	*0.030*	*0.026*

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Data availability between 15% and 75%, values shown in italics

Table 80 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: St Marys

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	93.0	5	**0.132**	**0.102**	0.082	0.073	0.062	0.041	0.032	0.028
2010	93.5	0	0.095	0.083	0.073	0.064	0.053	0.040	0.032	0.027
2011	94.8	3	**0.136**	0.094	0.074	0.060	0.051	0.037	0.030	0.026
2012	93.3	0	0.085	0.074	0.069	0.058	0.049	0.038	0.030	0.025
2013	93.7	1	**0.110**	0.076	0.073	0.063	0.054	0.043	0.032	0.027
2014	94.2	0	0.100	0.089	0.078	0.066	0.055	0.043	0.033	0.029
2015	93.0	0	0.082	0.078	0.073	0.061	0.055	0.041	0.030	0.026
2016	93.8	1	**0.101**	0.085	0.074	0.065	0.055	0.042	0.033	0.028
2017	94.2	1	**0.110**	0.092	0.081	0.067	0.056	0.043	0.034	0.029
2018	93.9	1	**0.105**	0.088	0.085	0.073	0.059	0.045	0.035	0.031

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Central Coast

Table 81 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Wyong

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2012	*19.3*	*0*	*0.078*	*0.077*	*0.071*	*0.060*	*0.056*	*0.041*	*0.032*	*0.028*
2013	92.2	0	0.079	0.070	0.061	0.053	0.044	0.037	0.030	0.026
2014	94.2	0	0.076	0.062	0.060	0.049	0.043	0.036	0.030	0.026
2015	92.0	0	0.097	0.068	0.060	0.051	0.042	0.034	0.029	0.025
2016	93.9	0	0.086	0.079	0.061	0.053	0.046	0.035	0.029	0.026
2017	94.2	1	**0.121**	0.074	0.067	0.053	0.046	0.037	0.031	0.027
2018	91.8	0	0.075	0.064	0.058	0.049	0.042	0.035	0.031	0.027

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Data availability between 15% and 75%, values shown in italics

Illawarra

Table 82 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Albion Park South

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	93.2	1	**0.102**	0.075	0.070	0.053	0.044	0.037	0.034	0.030
2010	90.3	0	0.093	0.061	0.059	0.049	0.041	0.031	0.028	0.026
2011	89.6	1	**0.118**	0.071	0.059	0.046	0.038	0.032	0.028	0.024
2012	93.8	0	0.067	0.058	0.051	0.044	0.041	0.032	0.029	0.025
2013	93.2	**3**	**0.120**	0.094	0.064	0.053	0.044	0.035	0.031	0.027
2014	93.2	0	0.094	0.064	0.058	0.050	0.042	0.035	0.031	0.029
2015	91.8	0	0.079	0.065	0.060	0.048	0.041	0.033	0.029	0.026
2016	94.6	1	**0.104**	0.075	0.067	0.051	0.043	0.033	0.030	0.027
2017	94.1	**2**	**0.117**	0.086	0.074	0.047	0.040	0.034	0.031	0.027
2018	94.1	0	0.076	0.061	0.055	0.046	0.039	0.033	0.030	0.027

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 83 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Kembla Grange

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	87.5	1	**0.103**	0.083	0.070	0.052	0.044	0.035	0.031	0.027
2010	89.7	0	0.081	0.061	0.056	0.049	0.043	0.033	0.029	0.025
2011	94.4	1	**0.121**	0.073	0.063	0.052	0.042	0.034	0.030	0.026
2012	94.3	0	0.068	0.057	0.052	0.045	0.041	0.032	0.029	0.025
2013	93.8	**2**	**0.126**	0.081	0.063	0.048	0.043	0.034	0.030	0.025
2014	94.4	0	0.094	0.064	0.062	0.051	0.042	0.034	0.030	0.027
2015	94.7	1	**0.104**	0.073	0.065	0.051	0.040	0.032	0.028	0.025
2016	92.9	1	**0.114**	0.071	0.065	0.052	0.042	0.033	0.029	0.026
2017	94.6	**2**	**0.122**	0.087	0.073	0.051	0.043	0.034	0.031	0.027
2018	92.9	0	0.070	0.062	0.055	0.048	0.040	0.034	0.031	0.027

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 84 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Wollongong

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	90.7	0	0.083	0.074	0.056	0.046	0.041	0.034	0.030	0.026
2010	91.8	0	0.082	0.067	0.062	0.052	0.043	0.034	0.029	0.025
2011	93.1	0	0.084	0.069	0.055	0.048	0.040	0.034	0.028	0.024
2012	94.9	0	0.065	0.062	0.054	0.047	0.039	0.031	0.027	0.024
2013	92.7	**2**	**0.112**	0.085	0.066	0.052	0.043	0.034	0.029	0.024
2014	94.3	0	0.077	0.061	0.055	0.048	0.041	0.033	0.029	0.026
2015	94.8	0	0.092	0.075	0.070	0.050	0.042	0.033	0.028	0.024
2016	94.6	0	0.095	0.083	0.069	0.051	0.043	0.035	0.030	0.027
2017	92.1	**2**	**0.107**	0.084	0.070	0.051	0.044	0.035	0.031	0.027
2018	93.8	0	0.066	0.063	0.055	0.049	0.041	0.035	0.031	0.026

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Lower Hunter

Table 85 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Beresfield

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	93.2	0	0.072	0.066	0.062	0.052	0.044	0.033	0.028	0.023
2010	87.1	0	0.088	0.062	0.057	0.049	0.042	0.033	0.027	0.023
2011	91.2	0	0.071	0.063	0.059	0.048	0.042	0.032	0.027	0.022
2012	92.9	0	0.070	0.065	0.057	0.050	0.043	0.033	0.027	0.022
2013	89.2	0	0.077	0.071	0.065	0.052	0.043	0.035	0.027	0.022
2014	95.0	0	0.090	0.068	0.063	0.053	0.047	0.035	0.029	0.025
2015	93.9	0	0.077	0.069	0.061	0.052	0.046	0.034	0.027	0.023
2016	94.8	0	0.085	0.067	0.063	0.055	0.046	0.035	0.028	0.024
2017	93.6	0	0.083	0.069	0.065	0.056	0.048	0.035	0.028	0.023
2018	93.8	1	**0.107**	0.074	0.061	0.054	0.046	0.036	0.029	0.025

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 86 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Newcastle

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	86.3	0	0.073	0.068	0.062	0.050	0.043	0.037	0.032	0.027
2010	89.1	0	0.086	0.069	0.060	0.049	0.041	0.036	0.031	0.027
2011	90.7	0	0.066	0.057	0.053	0.047	0.041	0.035	0.029	0.024
2012	94.3	0	0.071	0.057	0.052	0.046	0.041	0.033	0.028	0.024
2013	93.9	0	0.081	0.059	0.057	0.048	0.042	0.035	0.028	0.024
2014	93.7	0	0.065	0.060	0.054	0.046	0.040	0.034	0.030	0.026
2015	94.0	0	0.074	0.061	0.055	0.048	0.043	0.033	0.028	0.024
2016	93.5	0	0.077	0.064	0.058	0.050	0.041	0.034	0.029	0.025
2017	94.0	0	0.086	0.067	0.057	0.049	0.042	0.034	0.030	0.026
2018	93.4	0	0.067	0.061	0.058	0.044	0.039	0.033	0.030	0.026

AAQ NEPM standard: 0.100 ppm (1-hour average)

Table 87 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Wallsend

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	85.7	0	0.086	0.068	0.063	0.054	0.044	0.036	0.030	0.024
2010	88.3	0	0.067	0.065	0.056	0.047	0.040	0.034	0.029	0.024
2011	94.0	0	0.071	0.056	0.055	0.049	0.040	0.033	0.027	0.022
2012	94.7	0	0.080	0.064	0.055	0.050	0.043	0.034	0.028	0.023
2013	92.2	0	0.084	0.071	0.065	0.055	0.046	0.038	0.030	0.025
2014	94.7	0	0.087	0.064	0.057	0.050	0.044	0.036	0.030	0.026
2015	94.2	0	0.071	0.065	0.061	0.050	0.044	0.034	0.027	0.024
2016	94.4	0	0.086	0.073	0.066	0.056	0.046	0.036	0.029	0.024
2017	94.9	1	**0.106**	0.073	0.066	0.058	0.047	0.036	0.031	0.026
2018	93.8	0	0.086	0.069	0.064	0.055	0.044	0.035	0.031	0.027

AAQ NEPM standard: 0.100 ppm (1-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

North West Slopes

Table 88 Statistical summary for O_3: annual daily maximum 1-hour average concentrations. Station: Gunnedah

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2018	78.9	0	0.063	0.056	0.055	0.052	0.048	0.041	0.035	0.032

AAQ NEPM standard: 0.100 ppm (1-hour average)

Annual daily maximum rolling 4-hour average concentrations, O_3

Sydney

Table 89 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Bargo

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	97.3	**8**	**0.111**	**0.092**	**0.082**	0.069	0.056	0.038	0.032	0.029
2010	97.6	1	**0.086**	0.066	0.061	0.052	0.047	0.035	0.030	0.027
2011	99.1	1	**0.098**	0.074	0.068	0.051	0.044	0.033	0.028	0.024
2012	97.9	1	**0.083**	0.071	0.059	0.050	0.044	0.035	0.029	0.025
2013	98.9	1	**0.082**	0.076	0.073	0.060	0.049	0.037	0.030	0.027
2014	98.7	**3**	**0.093**	0.078	0.071	0.060	0.052	0.037	0.031	0.027
2015	97.4	0	0.074	0.066	0.062	0.052	0.046	0.036	0.029	0.025
2016	97.4	0	0.080	0.070	0.067	0.055	0.049	0.037	0.029	0.027
2017	98.0	3	**0.086**	0.073	0.067	0.059	0.050	0.037	0.031	0.027
2018	96.5	2	**0.084**	0.078	0.070	0.058	0.052	0.039	0.032	0.029

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 90 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Bringelly

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	92.5	**5**	**0.108**	**0.085**	0.078	0.063	0.054	0.039	0.029	0.025
2010	85.2	**3**	**0.089**	0.072	0.066	0.055	0.047	0.037	0.030	0.025
2011	88.5	**2**	**0.118**	0.076	0.070	0.056	0.048	0.035	0.029	0.025
2012	97.0	0	0.072	0.066	0.062	0.054	0.046	0.037	0.029	0.025
2013	98.9	1	**0.102**	0.074	0.068	0.054	0.047	0.037	0.030	0.025
2014	97.2	**3**	**0.113**	0.078	0.070	0.056	0.049	0.038	0.031	0.026
2015	97.0	0	0.078	0.065	0.062	0.057	0.050	0.037	0.029	0.025
2016	94.5	0	0.080	0.066	0.064	0.055	0.049	0.038	0.029	0.026
2017	95.6	1	**0.089**	0.077	0.070	0.063	0.050	0.038	0.031	0.026
2018	97.9	**4**	**0.092**	**0.083**	0.075	0.062	0.053	0.039	0.031	0.027

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 91 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Camden

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2012	*21.1*	*1*	***0.084***	***0.083***	*0.074*	*0.069*	*0.059*	*0.048*	*0.038*	*0.029*
2013	97.0	**4**	**0.090**	**0.085**	0.072	0.062	0.050	0.038	0.030	0.026
2014	98.3	**3**	**0.110**	0.080	0.071	0.058	0.050	0.040	0.032	0.027
2015	98.4	0	0.072	0.067	0.064	0.058	0.048	0.037	0.029	0.025
2016	94.8	0	0.075	0.070	0.066	0.056	0.051	0.039	0.030	0.026
2017	97.6	**3**	**0.108**	0.076	0.072	0.058	0.048	0.038	0.031	0.027
2018	93.7	**4**	**0.094**	**0.082**	0.075	0.064	0.055	0.040	0.032	0.028

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Data availability between 15% and 75%, values shown in italics

Table 92 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Macarthur/Campbelltown West

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	96.6	**9**	**0.097**	**0.090**	**0.083**	0.068	0.056	0.040	0.031	0.027
2010	98.0	1	**0.103**	0.075	0.073	0.057	0.049	0.038	0.031	0.027
2011	96.4	**2**	**0.122**	0.079	0.072	0.062	0.048	0.035	0.029	0.025
2012	88.2	0	0.073	0.065	0.061	0.055	0.045	0.035	0.029	0.025
2013	97.8	1	**0.082**	0.074	0.067	0.054	0.044	0.034	0.028	0.023
2014	95.4	**2**	**0.111**	0.078	0.066	0.054	0.046	0.035	0.029	0.025
2015	95.8	0	0.079	0.067	0.064	0.056	0.046	0.035	0.027	0.023
2016	97.7	0	0.077	0.075	0.064	0.056	0.049	0.036	0.028	0.025
2017	97.1	1	**0.091**	0.078	0.069	0.058	0.049	0.036	0.030	0.024
2018	97.6	**4**	**0.098**	**0.088**	0.074	0.062	0.052	0.036	0.030	0.026

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Data availability between 15% and 75%, values shown in italics

Table 93 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Chullora

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	96.8	**2**	**0.112**	0.075	0.070	0.056	0.045	0.033	0.026	0.021
2010	96.4	0	0.072	0.062	0.058	0.045	0.039	0.029	0.024	0.021
2011	97.1	1	**0.096**	0.067	0.056	0.047	0.038	0.030	0.023	0.020
2012	98.1	0	0.068	0.058	0.049	0.041	0.037	0.028	0.024	0.020
2013	98.7	1	**0.094**	0.061	0.055	0.048	0.042	0.032	0.026	0.022
2014	98.8	0	0.073	0.060	0.055	0.049	0.041	0.031	0.025	0.022
2015	97.9	0	0.078	0.069	0.063	0.052	0.042	0.033	0.026	0.022
2016	98.7	0	0.077	0.073	0.069	0.053	0.045	0.033	0.027	0.022
2017	97.7	**3**	**0.110**	0.079	0.064	0.050	0.044	0.033	0.028	0.024
2018	99.1	1	**0.082**	0.071	0.061	0.049	0.042	0.032	0.028	0.024

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 94 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Earlwood

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	95.3	**2**	**0.104**	0.063	0.061	0.047	0.039	0.031	0.026	0.022
2010	85.7	0	0.074	0.065	0.051	0.044	0.037	0.030	0.026	0.021
2011	95.4	1	**0.088**	0.061	0.052	0.042	0.036	0.030	0.025	0.021
2012	98.7	0	0.068	0.061	0.048	0.043	0.039	0.030	0.026	0.022
2013	96.1	**3**	**0.082**	0.075	0.052	0.045	0.041	0.032	0.026	0.022
2014	99.0	0	0.065	0.057	0.051	0.045	0.038	0.030	0.026	0.022
2015	97.6	1	**0.081**	0.064	0.058	0.051	0.039	0.029	0.025	0.021
2016	97.7	1	**0.082**	0.075	0.062	0.048	0.037	0.030	0.025	0.021
2017	93.9	**3**	**0.087**	0.075	0.058	0.048	0.039	0.032	0.028	0.022
2018	98.9	0	0.065	0.061	0.053	0.044	0.036	0.030	0.027	0.023

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 95 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Liverpool

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	92.5	**4**	**0.103**	**0.085**	0.077	0.057	0.046	0.035	0.028	0.022
2010	98.3	1	**0.081**	0.069	0.061	0.052	0.042	0.033	0.026	0.021
2011	97.3	1	**0.095**	0.068	0.060	0.051	0.042	0.030	0.024	0.020
2012	96.1	0	0.071	0.062	0.055	0.048	0.043	0.033	0.026	0.021
2013	98.2	1	**0.110**	0.070	0.065	0.055	0.044	0.036	0.028	0.023
2014	97.6	1	**0.087**	0.075	0.063	0.056	0.046	0.035	0.028	0.025
2015	95.2	0	0.077	0.065	0.061	0.054	0.047	0.034	0.026	0.022
2016	97.0	**2**	**0.086**	0.070	0.065	0.055	0.050	0.035	0.027	0.023
2017	98.5	**2**	**0.117**	0.075	0.066	0.056	0.047	0.035	0.029	0.023
2018	97.4	**3**	**0.093**	0.077	0.069	0.056	0.050	0.036	0.029	0.025

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 96 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Macquarie Park

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2017	*37.0*	*1*	*0.087*	*0.075*	*0.068*	*0.059*	*0.048*	*0.039*	*0.032*	*0.029*
2018	97.5	0	0.080	0.068	0.064	0.055	0.046	0.036	0.031	0.027

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Data availability between 15% and 75%, values shown in italics

Table 97 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Oakdale

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	89.9	**6**	**0.108**	**0.090**	0.080	0.064	0.053	0.040	0.032	0.029
2010	98.4	**2**	**0.088**	0.075	0.070	0.058	0.049	0.038	0.032	0.028
2011	99.2	**3**	**0.098**	0.074	0.066	0.057	0.047	0.036	0.030	0.026
2012	96.7	1	**0.081**	0.071	0.060	0.050	0.045	0.036	0.029	0.026
2013	97.9	1	**0.081**	0.069	0.068	0.057	0.050	0.039	0.031	0.026
2014	98.5	1	**0.088**	0.077	0.067	0.058	0.049	0.039	0.030	0.027
2015	97.7	0	0.070	0.069	0.062	0.054	0.047	0.038	0.029	0.025
2016	97.2	0	0.067	0.064	0.061	0.053	0.050	0.038	0.030	0.027
2017	99.3	0	0.080	0.076	0.070	0.057	0.051	0.040	0.032	0.027
2018	97.7	**2**	**0.082**	0.076	0.070	0.061	0.053	0.041	0.033	0.030

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 98 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Parramatta North

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2018	96.5	**2**	**0.095**	0.073	0.068	0.056	0.048	0.035	0.030	0.026

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 99 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Prospect

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	95.7	**6**	**0.100**	**0.087**	0.074	0.063	0.053	0.039	0.030	0.024
2010	85.9	**2**	**0.097**	0.072	0.068	0.056	0.046	0.035	0.028	0.022
2011	99.3	**3**	**0.114**	0.077	0.061	0.051	0.043	0.032	0.026	0.022
2012	95.6	0	0.073	0.064	0.061	0.053	0.045	0.036	0.027	0.022
2013	95.2	1	**0.104**	0.072	0.064	0.056	0.048	0.038	0.030	0.024
2014	97.3	1	**0.097**	0.076	0.068	0.056	0.049	0.038	0.029	0.025
2015	98.2	0	0.070	0.063	0.061	0.056	0.048	0.036	0.027	0.023
2016	97.2	0	0.078	0.067	0.062	0.054	0.048	0.036	0.029	0.024
2017	98.7	**2**	**0.106**	0.073	0.066	0.055	0.046	0.036	0.029	0.024
2018	89.6	**2**	**0.091**	0.074	0.070	0.058	0.051	0.038	0.031	0.026

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 100 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Randwick

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	94.1	0	0.073	0.066	0.062	0.049	0.043	0.036	0.032	0.027
2010	85.3	0	0.077	0.065	0.060	0.047	0.041	0.034	0.029	0.026
2011	97.7	0	0.069	0.055	0.051	0.043	0.037	0.032	0.026	0.022
2012	97.9	0	0.063	0.053	0.051	0.046	0.039	0.032	0.028	0.022
2013	96.6	0	0.067	0.059	0.056	0.047	0.042	0.033	0.028	0.024
2014	98.7	0	0.061	0.057	0.051	0.044	0.038	0.032	0.028	0.025
2015	97.9	1	**0.085**	0.059	0.055	0.047	0.039	0.032	0.028	0.025
2016	98.8	1	**0.090**	0.076	0.069	0.050	0.041	0.033	0.028	0.024
2017	98.3	**3**	**0.102**	0.080	0.066	0.051	0.041	0.034	0.030	0.027
2018	98.2	0	0.069	0.058	0.050	0.043	0.039	0.034	0.031	0.027

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 101 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Richmond

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	94.2	**3**	**0.090**	0.079	0.069	0.058	0.051	0.040	0.032	0.027
2010	97.3	1	**0.082**	0.067	0.061	0.054	0.047	0.037	0.031	0.026
2011	98.5	1	**0.088**	0.065	0.059	0.050	0.045	0.034	0.029	0.025
2012	96.6	0	0.070	0.061	0.056	0.050	0.044	0.036	0.030	0.025
2013	98.3	0	0.076	0.065	0.061	0.054	0.049	0.039	0.032	0.026
2014	98.3	0	0.073	0.068	0.065	0.057	0.049	0.039	0.032	0.028
2015	97.1	0	0.074	0.067	0.059	0.051	0.045	0.037	0.029	0.025
2016	98.4	0	0.070	0.061	0.059	0.053	0.047	0.038	0.031	0.027
2017	96.7	**2**	**0.085**	0.077	0.067	0.055	0.048	0.039	0.032	0.027
2018	98.2	**2**	**0.087**	0.076	0.069	0.060	0.050	0.041	0.033	0.029

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 102 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Rozelle

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	94.8	0	0.073	0.059	0.054	0.044	0.037	0.031	0.026	0.022
2010	86.8	0	0.067	0.056	0.051	0.043	0.036	0.031	0.027	0.023
2011	97.1	0	0.080	0.058	0.049	0.041	0.035	0.029	0.024	0.021
2012	98.6	0	0.054	0.049	0.047	0.042	0.037	0.032	0.028	0.023
2013	96.0	0	0.063	0.051	0.045	0.041	0.037	0.031	0.027	0.023
2014	98.8	0	0.060	0.053	0.049	0.042	0.036	0.030	0.027	0.022
2015	96.7	0	0.079	0.060	0.050	0.046	0.036	0.029	0.026	0.022
2016	98.6	0	0.075	0.067	0.059	0.043	0.036	0.030	0.026	0.022
2017	96.8	1	**0.109**	0.069	0.054	0.040	0.036	0.030	0.025	0.019
2018	*70.5*	*0*	*0.066*	*0.050*	*0.046*	*0.039*	*0.036*	*0.032*	*0.029*	*0.024*

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Data availability between 15% and 75%, values shown in italics

Table 103 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: St Marys

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	97.2	**5**	**0.106**	**0.087**	0.073	0.063	0.055	0.039	0.031	0.026
2010	97.8	1	**0.083**	0.072	0.066	0.057	0.049	0.038	0.031	0.026
2011	98.8	**3**	**0.121**	0.080	0.063	0.054	0.047	0.034	0.028	0.024
2012	97.2	0	0.072	0.065	0.061	0.053	0.045	0.035	0.029	0.024
2013	97.6	**2**	**0.101**	0.068	0.063	0.057	0.048	0.040	0.030	0.025
2014	97.7	**2**	**0.085**	0.076	0.068	0.059	0.051	0.040	0.032	0.027
2015	94.9	0	0.071	0.065	0.064	0.055	0.049	0.038	0.029	0.025
2016	97.7	1	**0.081**	0.068	0.065	0.057	0.051	0.040	0.031	0.027
2017	98.2	**4**	**0.096**	**0.082**	0.073	0.059	0.050	0.040	0.032	0.027
2018	97.9	**2**	**0.094**	0.080	0.073	0.063	0.055	0.041	0.034	0.029

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Central Coast

Table 104 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Wyong

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2012	*20.1*	*0*	*0.066*	*0.066*	*0.065*	*0.057*	*0.050*	*0.039*	*0.031*	*0.027*
2013	96.1	0	0.072	0.063	0.057	0.046	0.040	0.034	0.028	0.024
2014	98.1	0	0.069	0.058	0.055	0.046	0.039	0.033	0.029	0.025
2015	95.6	1	**0.091**	0.059	0.054	0.045	0.040	0.032	0.027	0.024
2016	97.9	0	0.079	0.070	0.057	0.048	0.041	0.033	0.028	0.024
2017	98.0	**2**	**0.105**	0.064	0.059	0.049	0.042	0.035	0.030	0.026
2018	95.4	0	0.067	0.058	0.053	0.045	0.038	0.033	0.029	0.025

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Data availability between 15% and 75%, values shown in italics

Illawarra

Table 105 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Albion Park South

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	95.4	1	**0.083**	0.066	0.060	0.048	0.041	0.036	0.033	0.028
2010	86.2	0	0.073	0.056	0.048	0.044	0.037	0.029	0.027	0.024
2011	85.7	**3**	**0.099**	0.061	0.052	0.042	0.034	0.031	0.027	0.023
2012	97.8	0	0.064	0.051	0.047	0.041	0.037	0.031	0.028	0.024
2013	97.1	**3**	**0.100**	0.074	0.056	0.047	0.041	0.034	0.029	0.026
2014	97.2	0	0.079	0.057	0.054	0.044	0.039	0.033	0.030	0.027
2015	95.7	0	0.075	0.061	0.054	0.044	0.037	0.032	0.028	0.025
2016	98.5	**2**	**0.098**	0.068	0.061	0.047	0.038	0.032	0.029	0.026
2017	98.0	**2**	**0.102**	0.076	0.063	0.042	0.037	0.033	0.029	0.026
2018	98.1	0	0.073	0.054	0.047	0.043	0.036	0.031	0.029	0.025

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 106 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Kembla Grange

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	90.1	**2**	**0.090**	0.075	0.065	0.046	0.040	0.033	0.029	0.026
2010	86.7	0	0.078	0.055	0.052	0.044	0.038	0.031	0.028	0.024
2011	98.4	**2**	**0.105**	0.066	0.057	0.048	0.038	0.033	0.029	0.025
2012	98.4	0	0.061	0.051	0.047	0.041	0.037	0.031	0.027	0.024
2013	97.8	**2**	**0.103**	0.070	0.057	0.044	0.039	0.032	0.029	0.024
2014	98.4	0	0.080	0.058	0.055	0.047	0.039	0.032	0.029	0.026
2015	98.8	0	0.079	0.071	0.057	0.046	0.037	0.031	0.027	0.024
2016	96.8	1	**0.102**	0.064	0.059	0.047	0.039	0.031	0.028	0.025
2017	98.6	**4**	**0.098**	**0.081**	0.063	0.047	0.040	0.033	0.030	0.026
2018	96.8	0	0.059	0.056	0.050	0.044	0.037	0.033	0.030	0.026

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 107 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Wollongong

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	92.9	0	0.074	0.064	0.050	0.043	0.037	0.033	0.029	0.025
2010	94.9	0	0.073	0.061	0.055	0.046	0.039	0.032	0.027	0.024
2011	96.9	0	0.078	0.066	0.052	0.043	0.036	0.032	0.027	0.023
2012	98.9	0	0.061	0.055	0.050	0.042	0.038	0.030	0.026	0.023
2013	96.5	**2**	**0.091**	0.076	0.058	0.048	0.041	0.032	0.027	0.023
2014	98.2	0	0.068	0.059	0.051	0.044	0.039	0.031	0.028	0.025
2015	98.4	1	**0.083**	0.066	0.064	0.048	0.039	0.031	0.027	0.023
2016	98.6	1	**0.085**	0.075	0.062	0.049	0.040	0.033	0.028	0.025
2017	96.0	**2**	**0.094**	0.080	0.063	0.047	0.041	0.034	0.030	0.026
2018	97.9	0	0.061	0.057	0.050	0.045	0.038	0.033	0.029	0.025

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Lower Hunter

Table 108 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Beresfield

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	95.9	0	0.065	0.062	0.057	0.048	0.041	0.031	0.026	0.022
2010	83.9	1	**0.082**	0.057	0.053	0.045	0.039	0.031	0.026	0.021
2011	94.5	0	0.064	0.058	0.052	0.045	0.038	0.030	0.025	0.021
2012	96.8	0	0.067	0.058	0.053	0.045	0.041	0.031	0.025	0.020
2013	92.9	0	0.074	0.065	0.054	0.048	0.040	0.033	0.025	0.021
2014	99.1	0	0.077	0.063	0.054	0.050	0.043	0.033	0.028	0.023
2015	97.8	0	0.067	0.062	0.057	0.049	0.042	0.032	0.026	0.021
2016	98.9	0	0.068	0.063	0.058	0.050	0.043	0.033	0.027	0.022
2017	97.5	0	0.079	0.065	0.060	0.050	0.044	0.034	0.027	0.022
2018	97.6	1	**0.089**	0.064	0.058	0.050	0.042	0.032	0.028	0.023

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

Table 109 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Newcastle

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	88.2	0	0.067	0.062	0.056	0.047	0.042	0.035	0.031	0.025
2010	85.1	0	0.076	0.062	0.054	0.045	0.040	0.034	0.029	0.025
2011	86.8	0	0.063	0.051	0.048	0.044	0.038	0.033	0.027	0.023
2012	97.8	0	0.057	0.049	0.048	0.043	0.039	0.032	0.027	0.022
2013	98.0	0	0.075	0.054	0.050	0.044	0.039	0.033	0.027	0.023
2014	97.0	0	0.056	0.054	0.048	0.042	0.037	0.032	0.028	0.024
2015	97.4	0	0.066	0.054	0.050	0.045	0.038	0.032	0.026	0.023
2016	97.4	0	0.069	0.058	0.055	0.045	0.039	0.032	0.027	0.023
2017	97.8	0	0.073	0.058	0.051	0.044	0.039	0.033	0.028	0.024
2018	97.4	0	0.058	0.054	0.052	0.040	0.037	0.031	0.028	0.024

AAQ NEPM standard: 0.080 ppm (4-hour average)

Table 110 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Wallsend

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	89.2	0	0.076	0.063	0.058	0.046	0.040	0.034	0.028	0.023
2010	88.2	0	0.063	0.056	0.052	0.042	0.037	0.032	0.027	0.023
2011	95.8	0	0.059	0.053	0.050	0.045	0.037	0.031	0.025	0.021
2012	98.7	0	0.070	0.056	0.051	0.046	0.041	0.033	0.027	0.022
2013	96.1	0	0.078	0.063	0.057	0.049	0.042	0.036	0.029	0.024
2014	98.8	0	0.065	0.059	0.052	0.045	0.040	0.034	0.029	0.024
2015	98.2	0	0.062	0.058	0.052	0.045	0.041	0.031	0.026	0.022
2016	98.1	0	0.078	0.061	0.057	0.050	0.042	0.033	0.027	0.023
2017	99.0	**2**	**0.097**	0.066	0.060	0.051	0.043	0.034	0.029	0.024
2018	97.8	0	0.068	0.060	0.058	0.047	0.041	0.033	0.029	0.025

AAQ NEPM standard: 0.080 ppm (4-hour average)

Bold font indicates AAQ NEPM standard and goal exceedances

North West Slopes

Table 111 Statistical summary for O_3: daily maximum rolling 4-hour average concentrations. Station: Gunnedah

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2018	82.1	0	0.058	0.054	0.053	0.050	0.047	0.040	0.034	0.031

Sulfur dioxide

Statistical summary for 2018

Table 112 Statistical summary for SO_2: daily maximum 1-hour average concentrations

Region/ monitoring station	Data availability rate (%)	Maximum (ppm)	Percentile (ppm)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Bargo	94.1	0.010	0.007	0.006	0.004	0.003	0.002	0.001	0.000
Bringelly	94.3	0.011	0.008	0.007	0.005	0.004	0.002	0.001	0.001
Campbelltown West	93.5	0.016	0.009	0.009	0.007	0.005	0.003	0.002	0.001
Chullora	95.0	0.021	0.012	0.010	0.007	0.006	0.003	0.002	0.001
Macquarie Park	93.9	0.044	0.018	0.014	0.009	0.006	0.003	0.001	0.001
Parramatta North	91.6	0.021	0.015	0.012	0.008	0.006	0.003	0.002	0.001
Prospect	86.6	0.025	0.013	0.011	0.009	0.006	0.003	0.002	0.001
Randwick	93.3	0.021	0.019	0.017	0.011	0.009	0.006	0.003	0.001
Richmond	93.3	0.017	0.009	0.008	0.005	0.004	0.002	0.001	0.000
Rozelle	*67.0*	*0.030*	*0.023*	*0.019*	*0.014*	*0.008*	*0.004*	*0.002*	*0.001*
Central Coast									
Wyong	94.2	0.062	0.038	0.034	0.021	0.013	0.005	0.001	0.000
Illawarra									
Albion Park South	94.8	0.031	0.021	0.019	0.017	0.013	0.006	0.001	0.000
Wollongong	92.2	0.039	0.018	0.017	0.015	0.011	0.008	0.004	0.001
Lower Hunter									
Beresfield	94.1	0.070	0.038	0.029	0.022	0.016	0.010	0.006	0.003
Newcastle	92.8	0.039	0.032	0.025	0.018	0.015	0.009	0.005	0.002
Wallsend	93.4	0.079	0.030	0.028	0.021	0.015	0.009	0.004	0.002

AAQ NEPM standard: 0.200 ppm (1-hour average)

Data availability between 15% and 75%, values shown in italics

Table 113 Statistical summary for SO_2: daily 24-hour average concentrations

Region/ monitoring station	Data availability rate (%)	Maximum (ppm)	Percentile (ppm)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Bargo	97.5	0.002	0.002	0.002	0.001	0.001	0.001	0.000	0.000
Bringelly	97.8	0.003	0.002	0.002	0.001	0.001	0.001	0.000	0.000
Campbelltown West	96.7	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.000
Chullora	99.2	0.003	0.003	0.002	0.002	0.002	0.001	0.000	0.000
Macquarie Park	97.8	0.007	0.003	0.003	0.002	0.002	0.001	0.000	0.000
Parramatta North	94.2	0.005	0.003	0.002	0.002	0.002	0.001	0.000	0.000
Prospect	89.9	0.005	0.004	0.003	0.002	0.002	0.001	0.001	0.000
Randwick	96.2	0.004	0.004	0.003	0.003	0.002	0.001	0.001	0.000
Richmond	96.4	0.005	0.003	0.002	0.001	0.001	0.001	0.000	0.000
Rozelle	*69.9*	*0.005*	*0.004*	*0.003*	*0.003*	*0.002*	*0.001*	*0.001*	*0.000*
Central Coast									
Wyong	97.8	0.008	0.005	0.004	0.003	0.002	0.001	0.000	0.000
Illawarra									
Albion Park South	98.4	0.008	0.006	0.005	0.004	0.003	0.001	0.000	0.000
Wollongong	95.9	0.009	0.005	0.004	0.003	0.002	0.001	0.001	0.000
Lower Hunter									
Beresfield	98.6	0.007	0.007	0.005	0.004	0.003	0.002	0.001	0.001
Newcastle	96.2	0.007	0.006	0.005	0.004	0.003	0.002	0.001	0.000
Wallsend	96.4	0.008	0.006	0.005	0.004	0.003	0.002	0.001	0.001

AAQ NEPM standard: 0.200 ppm (1-hour average)

Data availability between 15% and 75%, values shown in italics

Trend analysis

Table 114 Annual maximum 1-hour average concentrations for SO_2 (ppm)

Region/ monitoring station	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Sydney										
Bargo	0.011	0.008	0.010	0.009	0.017	0.010	0.009	0.010	0.010	0.010
Bringelly	0.012	0.008	0.011	0.015	0.011	0.009	0.007	0.006	0.009	0.011
Macarthur / Campbelltown West*	0.010	0.010	0.014	0.008	0.009	0.012	0.011	0.016	0.011	0.016
Chullora	0.029	0.021	0.026	0.025	0.012	0.019	0.014	0.014	0.014	0.021
Macquarie Park	-	-	-	-	-	-	-	-	*0.023*	0.044
Parramatta North	-	-	-	-	-	-	-	-	-	0.021
Prospect	0.017	0.018	0.014	0.012	0.020	0.019	0.027	0.021	0.023	0.025
Randwick	0.017	0.023	0.023	0.023	0.027	0.026	0.031	0.034	0.029	0.021
Richmond	0.013	0.009	0.010	0.013	0.010	0.009	0.032	0.025	0.034	0.017
Rozelle	-	-	-	-	-	-	0.028	0.020	0.024	*0.030*
Central Coast										
Wyong	-	-	-	*0.030*	0.029	0.040	0.069	0.032	0.047	0.062
Illawarra										
Albion Park South	0.031	0.032	0.035	0.027	0.039	0.016	0.036	0.022	0.030	0.031
Wollongong	0.020	0.027	0.018	0.017	0.040	0.019	0.019	0.020	0.047	0.039
Lower Hunter										
Beresfield	0.049	0.047	0.060	0.037	0.031	0.031	0.082	0.033	0.054	0.070
Newcastle	*0.039*	0.027	0.033	0.034	0.052	0.064	0.036	0.055	0.050	0.039
Wallsend	*0.044*	*0.031*	0.044	0.035	0.050	0.046	0.034	0.038	0.056	0.079

AAQ NEPM standard: 0.200 ppm (1-hour average)

*Campbelltown West replaced Macarthur in September 2012

Data availability between 15% and 75%, values shown in italics

Table 115 Annual maximum 24-hour average concentrations for SO_2 (ppm)

Region/ monitoring station	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Sydney										
Bargo	0.002	0.001	0.002	0.002	0.003	0.002	0.002	0.004	0.002	0.002
Bringelly	0.003	0.002	0.002	0.002	0.002	0.003	0.001	0.002	0.002	0.003
Macarthur / Campbelltown West*	0.004	0.003	0.002	0.002	0.002	0.004	0.002	0.002	0.003	0.004
Chullora	0.005	0.004	0.005	0.004	0.003	0.004	0.003	0.003	0.003	0.003
Macquarie Park	-	-	-	-	-	-	-	-	*0.003*	0.007
Parramatta North	-	-	-	-	-	-	-	-	-	0.005
Prospect	0.003	0.004	0.003	0.003	0.004	0.005	0.003	0.004	0.004	0.005
Randwick	0.004	0.006	0.005	0.005	0.004	0.004	0.004	0.003	0.008	0.004
Richmond	0.004	0.002	0.003	0.002	0.002	0.002	0.003	0.002	0.004	0.005
Rozelle	-	-	-	-	-	-	0.005	0.005	0.003	*0.005*
Central Coast										
Wyong	-	-	-	*0.004*	0.005	0.004	0.009	0.004	0.007	0.008
Illawarra										
Albion Park South	0.012	0.011	0.010	0.010	0.009	0.005	0.007	0.006	0.008	0.008
Wollongong	*0.004*	0.008	0.009	0.005	0.008	0.005	0.004	0.004	0.005	0.009
Lower Hunter										
Beresfield	0.010	0.008	0.012	0.009	0.005	0.007	0.008	0.008	0.008	0.007
Newcastle	*0.010*	0.005	0.009	0.007	0.007	0.006	0.007	0.007	0.006	0.007
Wallsend	*0.007*	*0.007*	0.007	0.005	0.005	0.008	0.007	0.006	0.010	0.008

AAQ NEPM standard: 0.080 ppm (24-hour average)

*Campbelltown West replaced Macarthur in September 2012

Data availability between 15% and 75%, values shown in italics

Table 116 Annual average concentrations for SO_2 (ppm)

Region/ monitoring station	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Sydney										
Bargo	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bringelly	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Macarthur / Campbelltown West*	0.001	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.001
Chullora	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Macquarie Park	-	-	-	-	-	-	-	-	*0.000*	0.001
Parramatta North	-	-	-	-	-	-	-	-	-	0.001
Prospect	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Randwick	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Richmond	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Rozelle	-	-	-	-	-	-	0.001	0.001	0.001	*0.001*
Central Coast										
Wyong	-	-	-	*0.001*	0.001	0.001	0.001	0.001	0.001	0.001
Illawarra										
Albion Park South	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001
Wollongong	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Lower Hunter										
Beresfield	0.002	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.002	0.002
Newcastle	*0.001*	0.001	0.002	0.002	0.001	0.001	0.001	0.002	0.002	0.001
Wallsend	*0.001*	*0.001*	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001

AAQ NEPM standard: 0.02 ppm (annual average)

*Campbelltown West replaced Macarthur in September 2012

Data availability between 15% and 75%, values shown in italics

Statistical summaries for multiple years, by station, SO_2

Annual daily maximum 1-hour average concentrations, SO_2

Sydney

Table 117 Statistical summary for SO_2: annual daily maximum 1-hour average concentrations. Station: Bargo

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	76.6	0	0.011	0.006	0.005	0.003	0.002	0.001	0.000	0.000
2010	91.6	0	0.008	0.005	0.004	0.003	0.002	0.001	0.001	0.000
2011	95.2	0	0.010	0.004	0.004	0.003	0.002	0.001	0.000	0.000
2012	94.0	0	0.009	0.005	0.004	0.003	0.002	0.001	0.001	0.000
2013	95.0	0	0.017	0.007	0.005	0.003	0.002	0.002	0.001	0.000
2014	94.3	0	0.010	0.005	0.004	0.003	0.002	0.001	0.001	0.000
2015	93.2	0	0.009	0.007	0.006	0.003	0.002	0.001	0.001	0.000
2016	92.4	0	0.010	0.007	0.004	0.003	0.003	0.002	0.001	0.001
2017	93.9	0	0.010	0.007	0.005	0.003	0.003	0.002	0.001	0.001
2018	94.1	0	0.010	0.007	0.006	0.004	0.003	0.002	0.001	0.000

AAQ NEPM standard: 0.200 ppm (1-hour average)

Table 118 Statistical summary for SO_2: annual daily maximum 1-hour average concentrations. Station: Bringelly

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	84.6	0	0.012	0.008	0.005	0.004	0.003	0.001	0.000	0.000
2010	79.9	0	0.008	0.005	0.005	0.004	0.003	0.002	0.001	0.000
2011	88.9	0	0.011	0.005	0.005	0.003	0.003	0.002	0.001	0.000
2012	94.6	0	0.015	0.005	0.005	0.003	0.003	0.002	0.001	0.000
2013	94.5	0	0.011	0.008	0.006	0.004	0.003	0.002	0.001	0.001
2014	92.4	0	0.009	0.007	0.006	0.004	0.002	0.002	0.001	0.000
2015	92.9	0	0.007	0.005	0.004	0.003	0.002	0.001	0.001	0.000
2016	94.5	0	0.006	0.006	0.005	0.004	0.003	0.001	0.001	0.000
2017	93.1	0	0.009	0.007	0.006	0.005	0.003	0.001	0.001	0.001
2018	94.3	0	0.011	0.008	0.007	0.005	0.004	0.002	0.001	0.001

AAQ NEPM standard: 0.200 ppm (1-hour average)

Table 119 Statistical summary for SO_2: annual daily maximum 1-hour average concentrations. Station: Macarthur/Campbelltown West

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	91.6	0	0.010	0.009	0.007	0.006	0.004	0.003	0.002	0.001
2010	92.9	0	0.010	0.006	0.006	0.005	0.004	0.002	0.001	0.001
2011	91.9	0	0.014	0.009	0.006	0.005	0.003	0.002	0.001	0.000
2012	89.9	0	0.008	0.005	0.005	0.004	0.003	0.002	0.001	0.001
2013	95.0	0	0.009	0.007	0.006	0.004	0.003	0.002	0.001	0.001
2014	93.2	0	0.012	0.007	0.006	0.005	0.003	0.002	0.001	0.001
2015	91.7	0	0.011	0.006	0.005	0.004	0.003	0.002	0.001	0.001
2016	94.2	0	0.016	0.009	0.007	0.005	0.004	0.002	0.001	0.001
2017	92.6	0	0.011	0.009	0.008	0.005	0.004	0.002	0.001	0.001
2018	93.5	0	0.016	0.009	0.009	0.007	0.005	0.003	0.002	0.001

AAQ NEPM standard: 0.200 ppm (1-hour average)

Campbelltown West replaced Macarthur in September 2012

Data availability between 15% and 75%, values shown in italics

Table 120 Statistical summary for SO_2: annual daily maximum 1-hour average concentrations. Station: Chullora

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	89.8	0	0.029	0.015	0.012	0.010	0.008	0.004	0.002	0.001
2010	92.1	0	0.021	0.015	0.014	0.010	0.007	0.004	0.002	0.001
2011	92.7	0	0.026	0.016	0.011	0.009	0.006	0.004	0.002	0.001
2012	93.6	0	0.025	0.011	0.008	0.007	0.005	0.003	0.002	0.001
2013	92.9	0	0.012	0.010	0.008	0.006	0.005	0.003	0.002	0.001
2014	94.7	0	0.019	0.010	0.009	0.007	0.005	0.003	0.001	0.001
2015	93.5	0	0.014	0.010	0.008	0.005	0.004	0.003	0.001	0.001
2016	93.9	0	0.014	0.011	0.008	0.006	0.004	0.003	0.002	0.001
2017	93.6	0	0.014	0.010	0.009	0.007	0.005	0.003	0.001	0.001
2018	95.0	0	0.021	0.012	0.010	0.007	0.006	0.003	0.002	0.001

AAQ NEPM standard: 0.200 ppm (1-hour average)

Table 121 Statistical summary for SO_2: annual daily maximum 1-hour average concentrations. Station: Macquarie Park

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2017	*37.9*	*0*	*0.023*	*0.017*	*0.014*	*0.011*	*0.008*	*0.003*	*0.001*	*0.000*
2018	93.9	0	0.044	0.018	0.014	0.009	0.006	0.003	0.001	0.001

AAQ NEPM standard: 0.200 ppm (1-hour average)

Data availability between 15% and 75%, values shown in italics

Table 122 Statistical summary for SO_2: annual daily maximum 1-hour average concentrations. Station: Parramatta North

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2018	91.6	0	0.021	0.015	0.012	0.008	0.006	0.003	0.002	0.001

AAQ NEPM standard: 0.200 ppm (1-hour average)

Table 123 Statistical summary for SO_2: annual daily maximum 1-hour average concentrations. Station: Prospect

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	91.3	0	0.017	0.010	0.010	0.008	0.006	0.004	0.002	0.001
2010	88.9	0	0.018	0.013	0.011	0.008	0.006	0.004	0.002	0.001
2011	93.8	0	0.014	0.011	0.008	0.006	0.005	0.003	0.002	0.001
2012	91.3	0	0.012	0.008	0.007	0.006	0.004	0.003	0.002	0.001
2013	90.9	0	0.020	0.014	0.010	0.006	0.005	0.003	0.002	0.001
2014	91.4	0	0.019	0.013	0.012	0.008	0.005	0.003	0.002	0.001
2015	94.6	0	0.027	0.010	0.008	0.006	0.004	0.003	0.002	0.001
2016	93.4	0	0.021	0.015	0.012	0.008	0.005	0.003	0.002	0.001
2017	94.5	0	0.023	0.012	0.011	0.007	0.005	0.003	0.002	0.001
2018	86.6	0	0.025	0.013	0.011	0.009	0.006	0.003	0.002	0.001

AAQ NEPM standard: 0.200 ppm (1-hour average)

Table 124 Statistical summary for SO_2: annual daily maximum 1-hour average concentrations. Station: Randwick

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	86.3	0	0.017	0.016	0.014	0.009	0.008	0.006	0.003	0.001
2010	81.9	0	0.023	0.018	0.016	0.014	0.010	0.006	0.004	0.002
2011	93.3	0	0.023	0.015	0.014	0.012	0.009	0.006	0.004	0.002
2012	89.8	0	0.023	0.016	0.015	0.011	0.009	0.006	0.004	0.002
2013	93.2	0	0.027	0.023	0.017	0.011	0.008	0.005	0.003	0.002
2014	93.7	0	0.026	0.018	0.013	0.011	0.009	0.006	0.004	0.002
2015	93.8	0	0.031	0.015	0.013	0.011	0.009	0.006	0.003	0.002
2016	93.9	0	0.034	0.021	0.017	0.012	0.009	0.006	0.003	0.001
2017	94.0	0	0.029	0.020	0.017	0.013	0.010	0.006	0.004	0.002
2018	93.3	0	0.021	0.019	0.017	0.011	0.009	0.006	0.003	0.001

AAQ NEPM standard: 0.200 ppm (1-hour average)

Table 125 Statistical summary for SO_2: annual daily maximum 1-hour average concentrations. Station: Richmond

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	89.5	0	0.013	0.010	0.009	0.006	0.004	0.002	0.001	0.000
2010	93.3	0	0.009	0.007	0.006	0.005	0.003	0.002	0.001	0.000
2011	94.5	0	0.010	0.008	0.005	0.004	0.003	0.002	0.001	0.000
2012	83.4	0	0.013	0.008	0.007	0.005	0.004	0.002	0.001	0.000
2013	94.2	0	0.010	0.008	0.007	0.005	0.004	0.002	0.001	0.000
2014	94.0	0	0.009	0.007	0.006	0.005	0.003	0.001	0.001	0.000
2015	92.6	0	0.032	0.011	0.006	0.005	0.003	0.002	0.001	0.000
2016	93.8	0	0.025	0.008	0.007	0.005	0.003	0.002	0.001	0.000
2017	91.9	0	0.034	0.011	0.008	0.006	0.004	0.002	0.001	0.000
2018	93.3	0	0.017	0.009	0.008	0.005	0.004	0.002	0.001	0.000

AAQ NEPM standard: 0.200 ppm (1-hour average)

Table 126 Statistical summary for SO_2: annual daily maximum 1-hour average concentrations. Station: Rozelle

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2015	78.8	0	0.028	0.021	0.019	0.014	0.009	0.004	0.002	0.001
2016	93.8	0	0.020	0.013	0.011	0.008	0.006	0.003	0.002	0.001
2017	92.6	0	0.024	0.015	0.013	0.010	0.006	0.003	0.001	0.001
2018	*67.0*	*0*	*0.030*	*0.023*	*0.019*	*0.014*	*0.008*	*0.004*	*0.002*	*0.001*

AAQ NEPM standard: 0.200 ppm (1-hour average)

Data availability between 15% and 75%, values shown in italics

Central Coast

Table 127 Statistical summary for SO_2: annual daily maximum 1-hour average concentrations. Station: Wyong

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2012	*19.3*	*0*	*0.030*	*0.030*	*0.027*	*0.018*	*0.013*	*0.005*	*0.002*	*0.001*
2013	94.7	0	0.029	0.024	0.020	0.015	0.009	0.004	0.002	0.001
2014	93.7	0	0.040	0.023	0.019	0.014	0.010	0.005	0.001	0.000
2015	92.9	0	0.069	0.029	0.022	0.015	0.009	0.004	0.001	0.000
2016	94.4	0	0.032	0.025	0.024	0.013	0.010	0.004	0.001	0.000
2017	92.9	0	0.047	0.029	0.023	0.017	0.010	0.004	0.001	0.000
2018	94.2	0	0.062	0.038	0.034	0.021	0.013	0.005	0.001	0.000

AAQ NEPM standard: 0.200 ppm (1-hour average)

Data availability between 15% and 75%, values shown in italics

Illawarra

Table 128 Statistical summary for SO_2: annual daily maximum 1-hour average concentrations. Station: Albion Park South

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	85.4	0	0.031	0.027	0.023	0.018	0.013	0.005	0.001	0.000
2010	89.6	0	0.032	0.027	0.023	0.019	0.013	0.005	0.001	0.000
2011	87.4	0	0.035	0.024	0.022	0.017	0.009	0.004	0.000	0.000
2012	92.5	0	0.027	0.017	0.015	0.010	0.008	0.003	0.001	0.000
2013	89.6	0	0.039	0.022	0.017	0.012	0.009	0.004	0.001	0.000
2014	94.5	0	0.016	0.015	0.013	0.010	0.008	0.004	0.001	0.000
2015	90.8	0	0.036	0.018	0.017	0.013	0.010	0.004	0.001	0.000
2016	94.1	0	0.022	0.019	0.017	0.013	0.009	0.004	0.001	0.000
2017	94.6	0	0.030	0.024	0.020	0.016	0.011	0.004	0.000	0.000
2018	94.8	0	0.031	0.021	0.019	0.017	0.013	0.006	0.001	0.000

AAQ NEPM standard: 0.200 ppm (1-hour average)

Table 129 Statistical summary for SO_2: annual daily maximum 1-hour average concentrations. Station: Wollongong

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	75.3	0	0.020	0.016	0.014	0.010	0.007	0.004	0.002	0.000
2010	88.4	0	0.027	0.018	0.015	0.013	0.011	0.006	0.003	0.001
2011	92.9	0	0.018	0.018	0.017	0.012	0.009	0.005	0.003	0.001
2012	94.9	0	0.017	0.016	0.014	0.010	0.008	0.004	0.002	0.001
2013	92.4	0	0.040	0.018	0.016	0.010	0.008	0.005	0.002	0.001
2014	92.7	0	0.019	0.017	0.016	0.012	0.009	0.005	0.003	0.001
2015	89.7	0	0.019	0.017	0.013	0.011	0.009	0.005	0.002	0.001
2016	91.7	0	0.020	0.016	0.014	0.011	0.009	0.005	0.002	0.001
2017	94.3	0	0.047	0.021	0.017	0.013	0.011	0.006	0.003	0.001
2018	92.2	0	0.039	0.018	0.017	0.015	0.011	0.008	0.004	0.001

AAQ NEPM standard: 0.200 ppm (1-hour average)

Lower Hunter

Table 130 Statistical summary for SO_2: annual daily maximum 1-hour average concentrations. Station: Beresfield

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	85.8	0	0.049	0.034	0.029	0.021	0.015	0.009	0.006	0.003
2010	84.7	0	0.047	0.024	0.022	0.015	0.012	0.008	0.005	0.002
2011	93.9	0	0.060	0.029	0.024	0.018	0.015	0.010	0.006	0.003
2012	94.1	0	0.037	0.026	0.021	0.016	0.013	0.009	0.005	0.003
2013	93.2	0	0.031	0.024	0.022	0.016	0.013	0.008	0.005	0.002
2014	94.4	0	0.031	0.026	0.022	0.018	0.014	0.009	0.005	0.002
2015	93.8	0	0.082	0.026	0.022	0.015	0.012	0.008	0.005	0.002
2016	94.6	0	0.033	0.030	0.025	0.018	0.013	0.009	0.006	0.003
2017	94.1	0	0.054	0.031	0.026	0.021	0.016	0.010	0.006	0.003
2018	94.1	0	0.070	0.038	0.029	0.022	0.016	0.010	0.006	0.003

AAQ NEPM standard: 0.200 ppm (1-hour average)

Table 131 Statistical summary for SO_2: annual daily maximum 1-hour average concentrations. Station: Newcastle

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	*69.7*	*0*	*0.039*	*0.033*	*0.027*	*0.021*	*0.015*	*0.008*	*0.005*	*0.002*
2010	84.6	0	0.027	0.022	0.020	0.015	0.012	0.008	0.004	0.002
2011	90.7	0	0.033	0.027	0.023	0.017	0.014	0.008	0.005	0.001
2012	93.1	0	0.034	0.025	0.022	0.019	0.014	0.008	0.004	0.002
2013	95.1	0	0.052	0.030	0.024	0.017	0.015	0.009	0.004	0.002
2014	93.7	0	0.064	0.030	0.024	0.019	0.015	0.009	0.004	0.001
2015	93.6	0	0.036	0.032	0.027	0.018	0.014	0.008	0.004	0.002
2016	93.1	0	0.055	0.033	0.025	0.020	0.015	0.010	0.006	0.002
2017	94.4	0	0.050	0.029	0.025	0.020	0.016	0.010	0.005	0.002
2018	92.8	0	0.039	0.032	0.025	0.018	0.015	0.009	0.005	0.002

AAQ NEPM standard: 0.200 ppm (1-hour average)

Data availability between 15% and 75%, values shown in italics

Table 132 Statistical summary for SO_2: annual daily maximum 1-hour average concentrations. Station: Wallsend

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	*67.2*	*0*	*0.044*	*0.028*	*0.025*	*0.019*	*0.014*	*0.009*	*0.005*	*0.001*
2010	*70.3*	*0*	*0.031*	*0.022*	*0.020*	*0.017*	*0.014*	*0.009*	*0.004*	*0.001*
2011	93.7	0	0.044	0.031	0.024	0.018	0.014	0.008	0.004	0.001
2012	95.1	0	0.035	0.021	0.020	0.016	0.013	0.008	0.004	0.002
2013	92.2	0	0.050	0.028	0.021	0.016	0.012	0.007	0.004	0.002
2014	93.7	0	0.046	0.030	0.022	0.018	0.015	0.009	0.004	0.002
2015	90.3	0	0.034	0.024	0.021	0.017	0.013	0.008	0.003	0.002
2016	93.5	0	0.038	0.024	0.022	0.018	0.013	0.008	0.004	0.002
2017	94.5	0	0.056	0.032	0.026	0.019	0.017	0.010	0.005	0.002
2018	93.4	0	0.079	0.030	0.028	0.021	0.015	0.009	0.004	0.002

AAQ NEPM standard: 0.200 ppm (1-hour average)

Data availability between 15% and 75%, values shown in italics

Annual maximum 24-hour average concentrations, SO_2

Sydney

Table 133 Statistical summary for SO_2: 24-hour average concentrations. Station: Bargo

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	76.7	0	0.002	0.002	0.001	0.001	0.000	0.000	0.000	-0.001
2010	95.9	0	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000
2011	99.5	0	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.000
2012	97.5	0	0.002	0.002	0.001	0.001	0.001	0.000	0.000	0.000
2013	99.5	0	0.003	0.002	0.001	0.001	0.001	0.001	0.000	0.000
2014	98.4	0	0.002	0.002	0.001	0.001	0.001	0.000	0.000	0.000
2015	96.2	0	0.002	0.002	0.001	0.001	0.001	0.000	0.000	0.000
2016	94.8	0	0.004	0.002	0.002	0.002	0.001	0.001	0.000	0.000
2017	97.5	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2018	97.5	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000	0.000

AAQ NEPM standard: 0.080 ppm (24-hour average)

Table 134 Statistical summary for SO_2: 24-hour average concentrations. Station: Bringelly

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	87.1	0	0.003	0.002	0.001	0.001	0.001	0.000	0.000	-0.001
2010	85.8	0	0.002	0.002	0.001	0.001	0.001	0.000	0.000	0.000
2011	94.8	0	0.002	0.001	0.001	0.001	0.001	0.000	0.000	0.000
2012	98.4	0	0.002	0.002	0.001	0.001	0.001	0.001	0.000	0.000
2013	98.6	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2014	96.2	0	0.003	0.002	0.002	0.001	0.001	0.000	0.000	0.000
2015	96.7	0	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000
2016	98.4	0	0.002	0.001	0.001	0.001	0.001	0.000	0.000	0.000
2017	96.7	0	0.002	0.002	0.001	0.001	0.001	0.000	0.000	0.000
2018	97.8	0	0.003	0.002	0.002	0.001	0.001	0.001	0.000	0.000

AAQ NEPM standard: 0.080 ppm (24-hour average)

Table 135 Statistical summary for SO_2: 24-hour average concentrations. Station: Macarthur/Campbelltown West

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	95.9	0	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.000
2010	97.0	0	0.003	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2011	96.2	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2012	89.9	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2013	99.2	0	0.002	0.002	0.002	0.002	0.001	0.001	0.000	0.000
2014	96.4	0	0.004	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2015	93.7	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2016	97.8	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2017	96.2	0	0.003	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2018	96.7	0	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.000

AAQ NEPM standard: 0.080 ppm (24-hour average)

Campbelltown West replaced Macarthur in September 2012

Data availability between 15% and 75%, values shown in italics

Table 136 Statistical summary for SO_2: 24-hour average concentrations. Station: Chullora

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	94.5	0	0.005	0.004	0.003	0.003	0.002	0.001	0.001	0.000
2010	96.2	0	0.004	0.004	0.003	0.003	0.002	0.001	0.001	0.000
2011	96.7	0	0.005	0.003	0.003	0.002	0.002	0.001	0.001	0.000
2012	97	0	0.004	0.003	0.002	0.002	0.001	0.001	0.000	0.000
2013	97.3	0	0.003	0.003	0.002	0.002	0.001	0.001	0.001	0.000
2014	98.6	0	0.004	0.003	0.002	0.002	0.001	0.001	0.000	0.000
2015	96.7	0	0.003	0.003	0.002	0.002	0.001	0.001	0.000	0.000
2016	97	0	0.003	0.002	0.002	0.002	0.001	0.001	0.000	0.000
2017	97.5	0	0.003	0.003	0.002	0.002	0.002	0.001	0.000	0.000
2018	99.2	0	0.003	0.003	0.002	0.002	0.002	0.001	0.000	0.000

AAQ NEPM standard: 0.080 ppm (24-hour average)

Table 137 Statistical summary for SO_2: 24-hour average concentrations. Station: Macquarie Park

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2017	*39.5*	*0*	*0.003*	*0.003*	*0.003*	*0.002*	*0.001*	*0.001*	*0.000*	*0.000*
2018	97.8	0	0.007	0.003	0.003	0.002	0.002	0.001	0.000	0.000

AAQ NEPM standard: 0.080 ppm (24-hour average)

Data availability between 15% and 75%, values shown in italics

Table 138 Statistical summary for SO_2: 24-hour average concentrations. Station: Parramatta North

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2018	94.2	0	0.005	0.003	0.002	0.002	0.002	0.001	0.000	0.000

AAQ NEPM standard: 0.080 ppm (24-hour average)

Table 139 Statistical summary for SO_2: 24-hour average concentrations. Station: Prospect

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	96.4	0	0.003	0.003	0.002	0.002	0.002	0.001	0.000	0.000
2010	96.4	0	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.000
2011	97.8	0	0.003	0.003	0.002	0.002	0.001	0.001	0.001	0.000
2012	94.5	0	0.003	0.002	0.002	0.002	0.002	0.001	0.001	0.000
2013	93.4	0	0.004	0.003	0.002	0.002	0.002	0.001	0.001	0.000
2014	94.5	0	0.005	0.003	0.002	0.002	0.002	0.001	0.001	0.000
2015	98.4	0	0.003	0.003	0.002	0.002	0.001	0.001	0.000	0.000
2016	97.5	0	0.004	0.003	0.002	0.002	0.001	0.001	0.000	0.000
2017	98.1	0	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.000
2018	89.9	0	0.005	0.004	0.003	0.002	0.002	0.001	0.001	0.000

AAQ NEPM standard: 0.080 ppm (24-hour average)

Table 140 Statistical summary for SO_2: 24-hour average concentrations. Station: Randwick

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	89.9	0	0.004	0.003	0.003	0.002	0.002	0.001	0.000	0.000
2010	88.8	0	0.006	0.004	0.004	0.003	0.002	0.002	0.001	0.000
2011	96.7	0	0.005	0.004	0.003	0.003	0.002	0.002	0.001	0.000
2012	93.4	0	0.005	0.004	0.003	0.003	0.002	0.002	0.001	0.001
2013	96.7	0	0.004	0.004	0.003	0.002	0.002	0.001	0.001	0.000
2014	96.7	0	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.000
2015	97.5	0	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.000
2016	97.8	0	0.003	0.003	0.003	0.002	0.002	0.001	0.001	0.000
2017	97.5	0	0.008	0.004	0.003	0.003	0.002	0.001	0.001	0.000
2018	96.2	0	0.004	0.004	0.003	0.003	0.002	0.001	0.001	0.000

AAQ NEPM standard: 0.080 ppm (24-hour average)

Table 141 Statistical summary for SO_2: 24-hour average concentrations. Station: Richmond

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	93.7	0	0.004	0.003	0.002	0.001	0.001	0.000	0.000	0.000
2010	97.5	0	0.002	0.002	0.001	0.001	0.001	0.000	0.000	0.000
2011	98.4	0	0.003	0.001	0.001	0.001	0.001	0.000	0.000	0.000
2012	86.3	0	0.002	0.002	0.001	0.001	0.001	0.000	0.000	0.000
2013	98.1	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2014	97.5	0	0.002	0.002	0.001	0.001	0.001	0.000	0.000	0.000
2015	95.1	0	0.003	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2016	97.3	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2017	94.8	0	0.004	0.003	0.002	0.002	0.001	0.000	0.000	0.000
2018	96.4	0	0.005	0.003	0.002	0.001	0.001	0.001	0.000	0.000

AAQ NEPM standard: 0.080 ppm (24-hour average)

Table 142 Statistical summary for SO_2: 24-hour average concentrations. Station: Rozelle

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2015	82.2	0.000	0.005	0.004	0.003	0.003	0.002	0.001	0.001	0.000
2016	97.3	0.000	0.005	0.003	0.003	0.002	0.001	0.001	0.000	0.000
2017	95.6	0.000	0.003	0.003	0.002	0.002	0.002	0.001	0.000	0.000
2018	*69.9*	*0.000*	*0.005*	*0.004*	*0.003*	*0.003*	*0.002*	*0.001*	*0.001*	*0.000*

AAQ NEPM standard: 0.080 ppm (24-hour average)

Data availability between 15% and 75%, values shown in italics

Central Coast

Table 143 Statistical summary for SO_2: 24-hour average concentrations. Station: Wyong

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2012	*19.9*	*0*	*0.004*	*0.004*	*0.004*	*0.003*	*0.003*	*0.002*	*0.001*	*0.000*
2013	98.1	0	0.005	0.004	0.003	0.002	0.002	0.001	0.000	0.000
2014	97.0	0	0.004	0.004	0.003	0.002	0.002	0.001	0.000	0.000
2015	96.4	0	0.009	0.003	0.003	0.002	0.002	0.001	0.000	0.000
2016	97.5	0	0.004	0.004	0.003	0.002	0.002	0.001	0.000	0.000
2017	96.2	0	0.007	0.004	0.004	0.003	0.002	0.001	0.000	0.000
2018	97.8	0	0.008	0.005	0.004	0.003	0.002	0.001	0.000	0.000

AAQ NEPM standard: 0.080 ppm (24-hour average)

Data availability between 15% and 75%, values shown in italics

Illawarra

Table 144 Statistical summary for SO_2: 24-hour average concentrations. Station: Albion Park South

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	88.5	0	0.012	0.009	0.008	0.006	0.004	0.002	0.000	0.000
2010	97.8	0	0.011	0.010	0.008	0.006	0.003	0.001	0.000	0.000
2011	94.8	0	0.010	0.007	0.006	0.004	0.002	0.001	0.000	0.000
2012	96.4	0	0.010	0.004	0.004	0.003	0.002	0.001	0.000	0.000
2013	93.4	0	0.009	0.007	0.005	0.003	0.002	0.001	0.000	0.000
2014	98.4	0	0.005	0.005	0.003	0.003	0.002	0.001	0.000	0.000
2015	93.4	0	0.007	0.006	0.004	0.003	0.002	0.001	0.000	0.000
2016	97.8	0	0.006	0.005	0.004	0.003	0.002	0.001	0.000	0.000
2017	97.8	0	0.008	0.007	0.006	0.004	0.003	0.001	0.000	0.000
2018	98.4	0	0.008	0.006	0.005	0.004	0.003	0.001	0.000	0.000

AAQ NEPM standard: 0.080 ppm (24-hour average)

Table 145 Statistical summary for SO_2: 24-hour average concentrations. Station: Wollongong

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	*73.4*	*0*	*0.004*	*0.003*	*0.003*	*0.002*	*0.002*	*0.001*	*0.000*	*-0.001*
2010	92.9	0	0.008	0.005	0.004	0.002	0.002	0.001	0.000	0.000
2011	96.7	0	0.009	0.004	0.003	0.003	0.002	0.001	0.000	0.000
2012	99.2	0	0.005	0.004	0.003	0.002	0.001	0.001	0.000	0.000
2013	96.4	0	0.008	0.004	0.003	0.002	0.002	0.001	0.000	0.000
2014	96.4	0	0.005	0.004	0.003	0.002	0.002	0.001	0.001	0.000
2015	93.4	0	0.004	0.004	0.003	0.002	0.002	0.001	0.000	0.000
2016	95.1	0	0.004	0.003	0.003	0.002	0.002	0.001	0.000	0.000
2017	98.4	0	0.005	0.005	0.004	0.003	0.002	0.001	0.001	0.000
2018	95.9	0	0.009	0.005	0.004	0.003	0.002	0.001	0.001	0.000

AAQ NEPM standard: 0.080 ppm (24-hour average)

Data availability between 15% and 75%, values shown in italics

Lower Hunter

Table 146 Statistical summary for SO_2: 24-hour average concentrations. Station: Beresfield

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	91.0	0	0.010	0.007	0.007	0.005	0.004	0.002	0.001	0.000
2010	91.2	0	0.008	0.006	0.004	0.003	0.003	0.002	0.001	0.000
2011	97.8	0	0.012	0.010	0.007	0.005	0.004	0.002	0.001	0.001
2012	98.4	0	0.009	0.006	0.005	0.004	0.003	0.002	0.001	0.001
2013	97.0	0	0.005	0.004	0.004	0.003	0.003	0.002	0.001	0.001
2014	98.4	0	0.007	0.006	0.004	0.003	0.003	0.002	0.001	0.000
2015	97.0	0	0.008	0.004	0.004	0.003	0.002	0.002	0.001	0.000
2016	98.9	0	0.008	0.007	0.005	0.004	0.003	0.002	0.001	0.001
2017	98.4	0	0.008	0.007	0.005	0.004	0.003	0.002	0.001	0.001
2018	98.6	0	0.007	0.007	0.005	0.004	0.003	0.002	0.001	0.001

AAQ NEPM standard: 0.080 ppm (24-hour average)

Table 147 Statistical summary for SO_2: 24-hour average concentrations. Station: Newcastle

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	*73.4*	*0*	*0.010*	*0.008*	*0.006*	*0.004*	*0.004*	*0.002*	*0.001*	*0.000*
2010	91.8	0	0.005	0.005	0.004	0.004	0.003	0.002	0.001	0.000
2011	98.9	0	0.009	0.006	0.005	0.005	0.004	0.002	0.001	0.000
2012	97.5	0	0.007	0.006	0.005	0.004	0.003	0.002	0.001	0.001
2013	98.6	0	0.007	0.006	0.005	0.004	0.003	0.002	0.001	0.000
2014	97.8	0	0.006	0.005	0.004	0.004	0.003	0.002	0.001	0.000
2015	97.3	0	0.007	0.006	0.005	0.004	0.003	0.002	0.001	0.000
2016	96.4	0	0.007	0.007	0.005	0.004	0.003	0.002	0.001	0.001
2017	98.1	0	0.006	0.006	0.006	0.004	0.004	0.002	0.001	0.001
2018	96.2	0	0.007	0.006	0.005	0.004	0.003	0.002	0.001	0.000

AAQ NEPM standard: 0.080 ppm (24-hour average)

Data availability between 15% and 75%, values shown in italics

Table 148 Statistical summary for SO_2: 24-hour average concentrations. Station: Wallsend

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (ppm)	Percentile (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2009	*68.2*	*0*	*0.007*	*0.006*	*0.006*	*0.004*	*0.003*	*0.002*	*0.001*	*0.000*
2010	*74.2*	*0*	*0.007*	*0.005*	*0.004*	*0.003*	*0.003*	*0.002*	*0.001*	*0.000*
2011	99.5	0	0.007	0.005	0.005	0.003	0.002	0.001	0.001	0.000
2012	99.7	0	0.005	0.004	0.004	0.003	0.002	0.002	0.001	0.000
2013	96.2	0	0.005	0.004	0.004	0.003	0.002	0.002	0.001	0.000
2014	97.5	0	0.008	0.006	0.004	0.004	0.003	0.002	0.001	0.000
2015	92.9	0	0.007	0.005	0.004	0.003	0.003	0.001	0.001	0.000
2016	97.8	0	0.006	0.005	0.004	0.003	0.003	0.002	0.001	0.000
2017	98.6	0	0.010	0.006	0.005	0.004	0.003	0.002	0.001	0.001
2018	96.4	0	0.008	0.006	0.005	0.004	0.003	0.002	0.001	0.001

AAQ NEPM standard: 0.080 ppm (24-hour average)

Data availability between 15% and 75%, values shown in italics

Particles as PM_{10}

Statistical summary for 2018

Table 149 Statistical summary for PM_{10}: 24-hour average concentrations

Region/ monitoring station	Data availability rate (%)	Maximum (µg/m³)	Percentile (µg/m³)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Bargo	98.1	**60.8**	**53.7**	46.5	33.6	28.0	21.3	14.5	10.7
Bringelly	98.4	**92.9**	**62.2**	**56.5**	38.1	32.7	26.5	19.5	13.6
Camden	99.5	**68.1**	**54.9**	45.6	31.5	27.6	22.5	15.3	11.1
Campbelltown West	97.8	**72.3**	49.4	44.6	31.6	28.8	22.5	15.8	11.5
Chullora	98.1	**90.7**	**60.5**	**50.6**	40.3	32.5	260.	20.3	14.8
Earlwood	98.6	**86.5**	**54.5**	39.5	34.0	29.4	23.5	18.4	13.8
Liverpool	98.4	**101.5**	**61.9**	**58.0**	43.7	37.5	29.3	23.2	15.5
Macquarie Park	98.4	**85.6**	**52.8**	43.8	29.9	27.1	20.7	15.3	11.7
Oakdale	99.2	**105.1**	**53.4**	42.9	28.1	25.4	19.4	12.8	9.1
Parramatta North	97.3	**107.4**	**63.8**	**52.2**	39.2	33.1	26.2	20.1	14.5
Prospect	99.5	**113.3**	**62.0**	**54.9**	37.5	33.4	25.8	20.2	14.8
Randwick	98.4	**95.5**	**60.1**	44.8	36.0	32.1	25.0	19.7	15.0
Richmond	96.2	**116.3**	**64.7**	**52.7**	34.7	29.0	22.7	16.6	11.3
Rozelle	*70.4*	***88.3***	*49.9*	*34.4*	*31.3*	*27.5*	*22.5*	*16.8*	*13.2*
St Marys	78.1	**100.5**	46.1	37.1	34.1	29.8	23.8	18	13.2
Central Coast									
Wyong	98.9	**138.3**	**66.9**	48.0	30.9	27.1	21.7	16.0	11.8
Illawarra									
Albion Park South	98.9	**94.4**	49.8	43.5	35.0	30.3	21.8	15.6	11.1
Kembla Grange	96.7	**71.8**	**64.9**	**54.1**	44.9	39.2	28.9	20.3	13.6
Wollongong	98.1	**59.7**	**53.2**	46.4	39.7	32.6	24.4	17.8	12.5
Lower Hunter									
Beresfield	99.5	**149.1**	**65.2**	**54.5**	37.6	32.8	25.3	19.5	14.4
Newcastle	98.6	**146.0**	**62.9**	**51.8**	41.7	35.1	28.2	23.1	18.1
Wallsend	94.8	**136.5**	**57.2**	45.3	33.8	28.6	21.9	17.8	13.7
Regional NSW									
Albury	95.6	**107.8**	**61.6**	50.0	40.8	33.6	24.3	16.4	12.1
Bathurst	98.4	**274.1**	**86.1**	**66.4**	38.9	32.6	21.7	15.1	10.4
Gunnedah	98.1	**234.9**	**92.4**	**70.2**	37.7	32.2	21.9	14.5	10.5
Narrabri	98.9	**221.7**	**103.3**	**65.5**	26.9	21.7	14.9	11.0	7.5
Tamworth	99.2	**145.4**	**95.2**	**61.1**	37.7	31.2	23.8	17.0	12.4

Region/ monitoring station	Data availability rate (%)	Maximum (µg/m³)	Percentile (µg/m³)						
			99th	98th	95th	90th	75th	50th	25th
Wagga Wagga North	97.0	**127.2**	**110.8**	**82.2**	**59.8**	49.1	36.4	22.5	14.2

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Trend analysis

Table 150 Annual maximum 24-hour average concentrations for PM_{10} (µg/m³)

Region/ monitoring station	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Sydney										
Bargo	-	34.9	**89.7**	45.2	**208.9**	**50.8**	**52.2**	**58.4**	**53.5**	**60.8**
Bringelly	**1683.9**	41.1	**86.0**	40.1	**97.2**	42.6	**57.0**	**61.6**	**83.7**	**92.9**
Camden	-	-	-	*35.6*	**97.5**	41.4	**62.4**	43.6	48.4	**68.1**
Macarthur / Campbelltown West*	**1146.3**	**58.7**	38.1	39.3	**56.9**	49.4	**69.7**	**50.1**	**53.1**	**72.3**
Chullora	**1474.7**	42.1	**65.2**	**52.4**	**69.4**	40.0	**64.6**	**63.5**	**63.0**	**90.7**
Earlwood	**1653.7**	47.8	**124.9**	44.2	**63.1**	45.2	**66.5**	42.9	**59.8**	**86.5**
Liverpool	**1579.8**	41.1	***68.8***	42.5	**98.5**	40.8	**68.6**	**68.7**	**74.0**	**101.5**
Macquarie Park	-	-	-	-	-	-	-	-	*49.6*	**85.6**
Oakdale	**1528.3**	33.3	**54.7**	38.9	**99.0**	**56.3**	**61.7**	**75.9**	46.8	**105.1**
Parramatta North	-	-	-	-	-	-	-	-	-	**107.4**
Prospect	**1680.3**	40.1	41.5	38.7	**81.8**	44.3	**68.7**	**110.1**	**61.1**	**113.3**
Randwick	**1735.6**	42.7	40.1	43.7	**55.3**	46.1	**77.4**	44.1	**56.0**	**95.5**
Richmond	**1637.3**	37.0	46.2	**99.2**	**104.6**	40.0	49.3	**102.8**	**51.5**	**116.3**
Rozelle	**1562.8**	37.6	39.4	40.7	**58.5**	43.8	**60.3**	**58.8**	**54.1**	***88.3***
St Marys	**1661.1**	**52.1**	**73.9**	34.3	**93.0**	45.0	**53.0**	**100.2**	49.8	**100.5**
Central Coast										
Wyong	-	-	-	*37.4*	**70.2**	41.9	**58.6**	46.0	**63.4**	**138.3**
Illawarra										
Albion Park South	**1359.6**	41.8	**51.0**	43.9	**69.0**	48.3	41.2	43.1	44.6	**94.4**
Kembla Grange	**1174.0**	47.5	**55.5**	**57.2**	**102.2**	**99.2**	**62.8**	**56.3**	**67.7**	**71.8**
Wollongong	**1145.4**	49.6	48.5	47.5	**93.8**	45.3	45.8	**52.9**	**55.2**	**59.7**
Lower Hunter										
Beresfield	**1999.0**	50.0	42.8	**50.8**	**55.3**	45.4	**64.9**	48.0	49.4	**149.1**
Newcastle	**2426.8**	**57.1**	49.2	48.7	**69.0**	**53.7**	**70.4**	**89.1**	**55.0**	**146**

Region/ monitoring station	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Wallsend	**2150.3**	32.8	38.9	38.1	***52.5***	43.4	**77.5**	**65.5**	47.9	**136.5**
Regional NSW										
Albury	**249.7**	**60.8**	28.0	**54.4**	**59.2**	**159.6**	**92.5**	**51.0**	48.8	**107.8**
Bathurst	**2114.4**	43.3	24.3	**55.5**	**145**	42.8	**94.6**	34.1	49.9	**274.1**
Gunnedah	-	-	-	-	-	-	-	-	-	**234.9**
Narrabri	-	-	-	-	-	-	-	-	-	**221.7**
Tamworth	**1791.4**	29.1	**50.9**	**55.1**	47.5	**66.6**	**52.7**	**51.7**	**54.1**	**145.4**
Wagga Wagga / Wagga Wagga North[#]	**297.4**	**64.9**	**56.3**	**67.2**	**110.7**	**88.2**	**145.1**	**114.7**	**171.6**	**127.2**

AAQ NEPM standard: 50.0 µg/m^3 (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

*Campbelltown West replaced Macarthur in September 2012

[#]Wagga Wagga North replaced Wagga Wagga in October 2011

Data availability between 15% and 75%, values shown in italics

Table 151 Annual average concentrations for PM_{10} (µg/m^3)

Region/ monitoring station	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Sydney										
Bargo	-	12.9	12.9	14.3	15.3	14.3	13.2	14.3	13.9	16.9
Bringelly	24.7	15.5	15.9	15.7	17.0	16.6	15.8	16.9	19.8	21.3
Camden	-	-	-	*20.1*	15.4	15.6	13.8	14.4	14.7	17.5
Macarthur / Campbelltown West*	21.3	14.0	13.2	18.9	15.5	17	15.6	16.1	15.7	17.9
Chullora	**26.1**	17.7	19.8	18.1	18.3	18.1	17.5	18.1	20.1	21.9
Earlwood	**26.9**	17.9	18.0	19.5	19.9	18.3	17.2	17.6	18.0	19.8
Liverpool	**25.8**	17.0	*18.1*	19.8	20.9	19.0	18.4	19.5	20.6	24.2
Macquarie Park	-	-	-	-	-	-	-	-	*15.2*	17.2
Oakdale	20.1	10.7	10.7	11.7	13.6	13.1	11.4	12.2	12.1	15.4
Parramatta North	-	-	-	-	-	-	-	-	-	21.6
Prospect	**25.9**	15.4	15.8	17.2	19.2	17.6	17.6	18.9	18.9	21.9
Randwick	**26.1**	16.0	16.0	17.9	18.8	18.1	18.6	18.0	19.2	21.2
Richmond	21.5	13.1	13.2	15.1	17.3	15.4	12.8	16.0	16	18.7
Rozelle	24.8	16.1	16.6	16.9	18.3	17.9	16.7	16.8	18.1	*18.4*
St Marys	23.2	15.1	14.7	14.5	16.0	16.7	15.0	16.1	16.2	*19.4*
Central Coast										
Wyong	-	-	-	*21.9*	16.6	15.1	14.9	15.2	16.1	18
Illawarra										
Albion Park South	22.0	14.0	13.6	13.6	14.7	16.2	14.0	14.9	15.3	17.8

Region/ monitoring station	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Kembla Grange	24.1	17.7	16.8	18.3	18.5	17.3	17.8	20.0	20.5	22.7
Wollongong	24.0	17.8	17.0	18.0	17.6	17.7	16.9	17.3	18.1	19.8
Lower Hunter										
Beresfield	**28.9**	16.6	17.2	21.3	21.4	19.4	18.8	19.1	19.6	21.6
Newcastle	**31.9**	18.6	19.1	20.6	22.7	21.4	21.4	21.6	22.4	24.5
Wallsend	**26.9**	14.7	14.2	14.9	17.4	16.9	16.7	16.6	17.4	19.4
Regional NSW										
Albury	19.2	12.6	12.3	14.3	15.8	15.9	14.6	15.1	15.8	19.8
Bathurst	23.1	9.4	11.0	13.4	15.1	14.6	13.4	13.3	14.1	18.8
Gunnedah	-	-	-	-	-	-	-	-	-	18.9
Narrabri	-	-	-	-	-	-	-	-	-	14.3
Tamworth	**27.2**	12.0	13.1	15.9	16.6	15.8	14.1	15.3	15.3	20.1
Wagga Wagga North[#]	**27.0**	17.2	16.5	18.8	22.1	20.7	19.9	20.6	20.6	**27.4**

AAQ NEPM standard: 25.0 µg/m^3 (annual average)

Bold font indicates values that exceed the AAQ NEPM standard

*Campbelltown West replaced Macarthur in September 2012

[#]Wagga Wagga North replaced Wagga Wagga in October 2011

Data availability between 15% and 75%, values shown in italics

Statistical summaries for multiple years, by station, PM_{10}

Annual maximum 24-hour concentrations, PM_{10}

Sydney

Table 152 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Bargo

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m^3)	Percentile (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2010	98.1	0	34.9	31.6	29.4	24.9	20.9	15.9	11.7	8.4
2011	99.2	1	**89.**7	38.0	27.6	23.4	19.8	15.8	11.8	8.5
2012	98.4	0	45.2	36.7	30.3	26.7	22.7	17.5	13.6	9.5
2013	98.4	2	**208.9**	44.4	36.5	30.2	25.6	18.6	12.8	9.2
2014	99.5	1	**50.8**	31.6	29.0	25.9	23.5	17.8	13.2	9.6
2015	97.3	2	**52.2**	37.6	29.4	24.0	21.0	16.4	11.9	8.9
2016	97.0	3	**58.4**	36.3	31.0	26.9	23.4	18.1	13.3	9.0
2017	98.6	1	**53.5**	32.0	27.7	24.0	21.9	17.1	12.7	9.9
2018	98.1	4	**60.8**	**53.7**	46.5	33.6	28.0	21.3	14.5	10.7

AAQ NEPM standard: 50.0 µg/m^3 (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 153 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Bringelly

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	94.8	6	**1683.9**	**114.8**	47.4	37.1	31.9	22.8	17.0	12.4
2010	97.3	0	41.1	37.5	33.9	29.1	23.7	18.5	14.4	10.7
2011	98.9	2	**86.0**	41.5	36.5	30.7	25.0	18.9	14.3	10.6
2012	100	0	40.1	34.6	30.2	27.1	24.7	19.0	14.9	11.2
2013	99.5	3	**97.2**	46.1	35.9	30.4	26.9	20.9	15.1	11.5
2014	98.4	0	42.6	36.2	33.4	29.2	25.9	20.6	15.5	11.5
2015	99.2	1	**57.0**	36.9	32.6	27.8	24.3	19.6	15.1	10.9
2016	98.6	3	**61.6**	41.4	34.1	30.1	26.7	21.5	15.9	11.0
2017	97.0	6	**83.7**	**55.0**	49.4	37.0	30.6	24.0	17.4	13.8
2018	98.4	8	**92.9**	**62.2**	**56.5**	38.1	32.7	26.5	19.5	13.6

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 154 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Camden

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2012	*19.1*	*0*	*35.6*	*35.5*	*34.5*	*31.1*	*28.6*	*23.6*	*20.0*	*14.8*
2013	98.9	2	**97.5**	40.9	34.3	30.6	25.9	18.8	13.5	9.7
2014	99.2	0	41.4	35.5	31.5	28.0	24.9	19.4	14.6	10.7
2015	98.9	1	**62.4**	32.4	30.6	24.7	22.2	16.9	12.6	9.5
2016	95.1	0	43.6	33.9	31.6	26.2	23.4	18.3	13.5	9.4
2017	98.4	0	48.4	33.9	31.4	27.1	23.9	18.1	13.3	10.4
2018	99.5	6	**68.1**	**54.9**	45.6	31.5	27.6	22.5	15.3	11.1

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Table 155 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Macarthur/Campbelltown West

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	96.7	**7**	**1146.3**	**111.4**	**56.2**	35.5	29.6	21.2	15.5	10.5
2010	99.5	1	**58.7**	35.7	30.9	26.8	21.5	16.7	12.5	9.5
2011	98.4	0	38.1	31.9	28.5	23.0	20.6	16.0	12.1	8.9
2012	90.1	0	39.3	33.5	30.4	27.7	24.7	18.7	14.1	10.0
2013	99.2	1	**56.9**	36.9	32.0	29.4	25.7	18.9	14.1	10.5
2014	91.8	0	49.4	36.6	33.8	30.1	26.2	20.7	16.0	12.2
2015	95.9	1	**69.7**	38.9	34.5	27.9	24.4	19.2	13.8	10.7
2016	98.1	1	**50.1**	35.3	31.7	29.2	25.3	20.4	15.0	10.6
2017	98.1	1	**53.1**	32.5	31.5	27.8	24.5	18.8	14.3	11.4
2018	97.8	3	**72.3**	49.4	44.6	31.6	28.8	22.5	15.8	11.5

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

*Campbelltown West replaced Macarthur in September 2012

Data availability between 15% and 75%, values shown in italics

Table 156 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Chullora

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	98.4	9	**1474.7**	**121.0**	**58.7**	38.1	32.7	25.0	19.9	14.8
2010	98.9	0	42.1	39.1	35.6	30.6	26.6	21.4	16.9	12.9
2011	99.2	7	**65.2**	**55.8**	49.0	38.1	30.7	23.1	18.1	13.6
2012	98.6	1	**52.4**	36.6	35.1	31.7	27.6	21.8	16.9	13.4
2013	99.5	4	**69.4**	**50.8**	39.0	32.3	28.0	21.6	17.1	13.0
2014	98.9	0	40.0	36.8	34.0	30.3	26.6	21.3	17.1	13.5
2015	98.1	1	**64.6**	46.0	32.2	29.4	26.3	21.7	16.3	12.7
2016	99.2	1	**63.5**	43.5	35.1	30.7	27.9	22.2	17.1	12.7
2017	99.5	4	**63.0**	**51.3**	42.7	33.9	30.0	24.1	18.2	14.3
2018	98.1	7	**90.7**	**60.5**	**50.6**	40.3	32.5	26.0	20.3	14.8

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 157 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Earlwood

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	96.7	8	**1653.7**	**84.0**	**52.7**	40.3	35.2	25.7	19.6	14.6
2010	98.1	0	47.8	42.5	36.2	31.0	26.3	21.8	17.0	12.6
2011	93.7	2	**124.9**	47.0	39.9	31.0	27.3	21.7	16.5	12.1
2012	99.5	0	44.2	38.8	37.6	34.3	30.2	23.6	18.1	14.0
2013	98.4	5	**63.1**	**52.6**	46.6	35.7	30.2	23.9	18.0	13.6
2014	99.2	0	45.2	39.2	36.6	30.5	28.0	21.7	17.0	13.3
2015	99.5	1	**66.5**	35.9	31.5	28.7	25.4	20.9	16.2	12.4
2016	97.0	0	42.9	40.7	34.1	30.5	27.8	22.3	16.6	11.8
2017	99.2	1	**59.8**	37.1	35.1	30.9	27.1	21.6	16.2	13.5
2018	98.6	5	**86.5**	**54.5**	39.5	34.0	29.4	23.5	18.4	13.8

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 158 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Liverpool

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	93.7	8	**1579.8**	**114.8**	**59.5**	38.8	31.7	25.1	18.4	14.3
2010	97.3	0	41.1	35.3	33.0	29.9	26.2	20.4	16.2	12.0
2011	*69.0*	*1*	***68.8***	*46.1*	*37.5*	*33.1*	*27.7*	*21.7*	*16.9*	*13.0*
2012	97.0	0	42.5	39.3	37.7	35.1	30.8	24.4	18.8	13.7
2013	97.8	3	**98.5**	45.2	40.3	36.5	31.9	26.1	19.3	14.1
2014	97.8	0	40.8	39.2	36.6	32.9	30.1	23.7	17.9	13.5
2015	95.1	1	**68.6**	35.6	34.1	31.0	28.3	22.9	17.2	12.8
2016	99.5	3	**68.7**	39.8	36.4	32.8	30.3	25.1	18.4	12.9
2017	98.9	2	**74.0**	42.4	38.0	35.0	31.3	25.0	19.6	15.1
2018	98.4	13	**101.5**	**61.9**	**58.0**	43.7	37.5	29.3	23.2	15.5

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Table 159 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Macquarie Park

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2017	*37.8*	*0*	*49.6*	*36.6*	*29.5*	*25.5*	*23.2*	*18.4*	*14.0*	*10.8*
2018	98.4	4	**85.6**	**52.8**	43.8	29.9	27.1	20.7	15.3	11.7

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Table 160 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Oakdale

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	91.2	6	**1528.3**	**130.2**	48.4	30.6	25.5	19.5	12.7	7.5
2010	99.5	0	33.3	29.3	27.9	23.3	18.1	13.4	9.2	6.6
2011	99.5	1	**54.7**	28.1	24.9	21.3	17.3	13.1	9.6	6.9
2012	98.9	0	38.9	33.4	28.2	24.0	19.8	14.9	10.2	6.9
2013	100	4	**99.0**	**70.3**	31.6	27.7	22.5	16.8	11.3	7.9
2014	98.4	1	**56.3**	32.7	31.3	24.9	21.9	16.5	11.3	8.4
2015	98.9	1	**61.7**	29.7	27.3	22.4	20.0	14.5	10.0	7.2
2016	96.4	5	**75.9**	**56.9**	27.4	23.5	21.0	15.0	10.5	7.1
2017	98.6	0	46.8	29.3	26.1	22.3	19.6	15.0	10.9	7.9
2018	99.2	5	**105.1**	**53.4**	42.9	28.1	25.4	19.4	12.8	9.1

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 161 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Parramatta North

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2018	97.3	8	**107.4**	**63.8**	**52.2**	39.2	33.1	26.2	20.1	14.5

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 162 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Prospect

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	96.4	11	**1680.3**	**135.3**	**60.7**	38.9	32.3	24.1	18.2	13.5
2010	97.5	0	40.1	31.7	30.1	26.7	22.8	18.7	14.9	11.2
2011	93.2	0	41.5	36.2	31.7	27.4	24.3	19.3	15.1	10.9
2012	94.3	0	38.7	34.8	33.8	29.3	26.5	20.5	16.3	13.0
2013	94.5	4	**81.8**	**51.2**	43.4	33.8	30.0	23.3	17.6	13.3
2014	93.4	0	44.3	35.4	34.3	30.2	25.6	21.1	16.8	12.7
2015	95.1	1	**68.7**	39.8	34.1	29.9	26.2	21.1	16.8	12.8
2016	98.9	4	**110.1**	**51.2**	38.0	33.8	29.7	23.1	17.6	12.5
2017	98.4	1	**61.1**	37.9	36.2	32.0	28.1	22.5	17.7	14.5
2018	99.5	8	**113.3**	**62.0**	**54.9**	37.5	33.4	25.8	20.2	14.8

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 163 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Randwick

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	97.3	9	**1735.6**	**149.3**	**56.9**	36.9	30.4	24.6	18.7	14.2
2010	98.6	0	42.7	33.8	31.5	27.9	24.8	19.3	15.0	11.3
2011	97.5	0	40.1	32.9	30.6	26.4	23.9	19.5	15.1	11.4
2012	96.2	0	43.7	36.6	33.4	31.4	27.5	21.7	16.7	13.2
2013	99.5	3	**55.3**	45.5	41.5	35.0	30.2	22.5	17.1	13.1
2014	95.6	0	46.1	40.7	39.6	31.7	26.1	21.2	16.8	13.4
2015	98.4	1	**77.4**	38.2	37.0	31.9	28.2	22.5	17.1	13.7
2016	99.2	0	44.1	35.3	34.3	32.1	28.6	22.0	17.2	11.9
2017	98.4	1	**56.0**	40.0	37.5	32.1	29.2	23.5	17.7	14.1
2018	98.4	5	**95.5**	**60.1**	44.8	36.0	32.1	25.0	19.7	15.0

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 164 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Richmond

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	95.9	6	**1637.3**	**121.7**	46.1	32.9	28.0	19.4	13.4	9.6
2010	96.2	0	37.0	30.2	26.9	24.6	20.6	15.9	12.0	9.2
2011	98.9	0	46.2	32.3	29.7	25.3	21.3	15.9	11.8	8.9
2012	95.9	3	**99.2**	43.7	33.8	28.6	24.8	17.6	12.9	10.2
2013	97.8	5	**104.6**	**69.9**	45.9	35.7	27.8	20.4	14.6	11.1
2014	96.7	0	40.0	34.5	32.7	26.4	23.7	19.2	14.2	10.7
2015	96.7	0	49.3	32.2	27.3	25.6	21.8	16.1	12.0	8.2
2016	96.2	2	**102.8**	44.5	35.5	31.1	26.2	19.3	14.6	10.2
2017	95.9	1	**51.5**	37.9	33.4	29.3	25.5	19.4	14.5	11.2
2018	96.2	8	**116.3**	**64.7**	**52.7**	34.7	29.0	22.7	16.6	11.3

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 165 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Rozelle

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	95.3	8	**1562.8**	**128.5**	**55.8**	36.1	31.0	24.3	17.8	13.1
2010	98.9	0	37.6	31.1	29.3	26.8	24.3	19.6	15.6	12.1
2011	98.4	0	39.4	34.7	32.3	27.2	24.5	20.5	15.7	12.0
2012	99.5	0	40.7	35.4	32.1	29.4	25.6	20.3	15.7	12.3
2013	96.7	3	**58.5**	42.9	39.5	33.6	29.3	21.9	16.6	12.5
2014	96.7	0	43.8	39.4	37.7	30.4	26.6	21.4	16.9	12.8
2015	96.4	1	**60.3**	37.1	32.6	29.5	25.5	20.4	15.4	11.9
2016	98.4	1	**58.8**	35.0	32.3	29.6	26.9	20.9	15.8	11.0
2017	98.6	1	**54.1**	43.0	35.4	31.2	27.8	21.5	16.3	13.2
2018	*70.4*	*2*	***88.3***	*49.9*	*34.4*	*31.3*	*27.5*	*22.5*	*16.8*	*13.2*

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Table 166 Statistical summary for PM_{10}: 24-hour average concentrations. Station: St Marys

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	96.2	9	**1661.1**	**118.3**	**58.5**	34.7	30.4	22.0	15.4	10.9
2010	98.1	1	**52.1**	35.7	30.9	29.4	24.3	18.7	13.7	10.3
2011	99.2	1	**73.9**	35.8	32.9	28.6	22.7	18.4	13.0	10.0
2012	96.7	0	34.3	32.1	30.4	26.6	23.5	17.7	13.2	10.3
2013	97.0	2	**93.0**	46.5	38.3	32.8	27.2	19.2	14.0	10.2
2014	98.9	0	45.0	38.2	33.3	28.5	25.3	21.0	15.4	11.4
2015	97.8	1	**53.0**	36.0	33.2	27.4	24.5	17.6	13.8	10.0
2016	96.7	3	**100.2**	47.2	34.3	29.9	26.4	19.9	14.1	10.2
2017	98.6	0	49.8	35.9	35.1	29.9	26.1	20.0	14.6	11.4
2018	78.1	2	**100.5**	46.1	37.1	34.1	29.8	23.8	18.0	13.2

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Central Coast

Table 167 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Wyong

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2012	*19.9*	*0*	*37.4*	*37.2*	*35.4*	*31.3*	*30.4*	*26.9*	*21.7*	*17.1*
2013	98.6	1	**70.2**	40.8	36.9	32.4	28.6	20.3	14.3	10.4
2014	98.6	0	41.9	37.4	35.2	28.0	24.2	18.4	13.7	10.1
2015	98.9	1	**58.6**	34.5	33.0	27.0	24.4	18.3	13.0	10.2
2016	98.4	0	46.0	33.6	32.1	27.5	25.2	19.1	13.6	9.6
2017	98.4	1	**63.4**	36.0	32.7	29.5	25.5	19.9	14.3	10.7
2018	98.9	6	**138.3**	**66.9**	48.0	30.9	27.1	21.7	16.0	11.8

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Illawarra

Table 168 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Albion Park South

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	99.5	9	**1359.6**	**73.0**	**50.7**	38.0	31.6	22.8	15.4	10.1
2010	96.7	0	41.8	37.2	35.6	29.0	24.7	18.4	11.6	8.6
2011	98.9	1	**51.0**	34.9	31.6	27.2	23.5	17.0	11.9	8.6
2012	98.4	0	43.9	36.0	32.7	26.9	22.9	16.7	11.9	8.6
2013	96.7	2	**69.0**	45.4	40.8	32.7	25.1	17.6	12.6	8.7
2014	99.7	0	48.3	39.7	35.9	30.0	25.9	20.0	15.1	10.8
2015	95.1	0	41.2	38.1	33.4	27.8	22.2	17.6	12.5	8.9
2016	98.4	0	43.1	36.7	33.8	30.4	25.7	19.5	12.9	9.0
2017	98.9	0	44.6	40.6	34.9	30.6	26.1	19.2	13.0	10.2
2018	98.9	2	**94.4**	49.8	43.5	35.0	30.3	21.8	15.6	11.1

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 169 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Kembla Grange

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	99.2	14	**1174.0**	**134.4**	**67.0**	42.5	34.0	25.5	18.0	11.5
2010	98.6	0	47.5	42.7	39.5	33.4	28.4	22.7	16.2	11.7
2011	98.9	1	**55.5**	45.9	39.7	33.6	29.1	21.1	15.0	9.9
2012	98.4	3	**57.2**	45.5	42.6	37.1	29.7	23.7	16.5	11.9
2013	99.7	4	**102.2**	**56.0**	46.7	37.4	31.2	23.0	15.9	11.9
2014	98.1	1	**99.2**	41.5	36.9	32.6	27.5	21.3	16.4	11.6
2015	99.2	1	**62.8**	45.0	42.1	34.5	28.7	22.1	16.5	11.2
2016	99.2	4	**56.3**	**50.7**	45.7	39.0	33.2	26.0	18.2	12.6
2017	98.4	4	**67.7**	**55.5**	45.4	38.9	33.1	24.8	18.1	14.4
2018	96.7	10	**71.8**	**64.9**	**54.1**	44.9	39.2	28.9	20.3	13.6

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 170 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Wollongong

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	95.9	6	**1145.4**	**107.0**	49.5	40.3	34.7	24.5	18.8	12.6
2010	95.1	0	49.6	44.2	40.2	31.9	28.3	22.4	15.8	12.1
2011	96.7	0	48.5	42.4	37.7	32.6	26.3	21.0	15.8	11.4
2012	98.6	0	47.5	38.2	36.1	33.4	28.8	22.8	16.5	12.2
2013	98.9	6	**93.8**	**54.1**	49.3	37.2	29.7	20.9	15.3	10.5
2014	99.7	0	45.3	40.9	37.9	34.8	29.7	21.6	16.0	12.0
2015	99.2	0	45.8	38.1	37.1	32.3	27.4	21.6	15.3	10.8
2016	98.6	2	**52.9**	46.5	42.1	36.1	29.9	22.5	15.4	10.4
2017	98.4	1	**55.2**	46.3	42.8	35.4	30.5	23.6	15.2	11.8
2018	98.1	5	**59.7**	**53.2**	46.4	39.7	32.6	24.4	17.8	12.5

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Lower Hunter

Table 171 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Beresfield

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	98.6	15	**1999.0**	**174.3**	**70.6**	47.7	35.3	26.2	18.4	14.2
2010	97.0	0	50.0	37.7	32.1	28.3	24.7	20.0	15.4	12.3
2011	95.1	0	42.8	39.9	35.8	29.3	25.5	21.3	16.1	12.5
2012	99.2	1	**50.8**	47.4	44.1	39.2	32.4	25.8	19.6	15.2
2013	95.9	5	**55.3**	**52.4**	44.3	38.0	34.5	26.5	19.1	14.8
2014	95.3	0	45.4	42.0	39.4	33.9	30.0	23.3	18.3	13.9
2015	97.8	2	**64.9**	42.2	36.4	32.4	28.4	22.8	17.8	13.1
2016	99.2	0	48.0	39.3	36.4	32.5	29.9	23.4	17.7	13.8
2017	98.9	0	49.4	40.8	37.1	33.4	29.2	23.7	18.6	14.2
2018	99.5	8	**149.1**	**65.2**	**54.5**	37.6	32.8	25.3	19.5	14.4

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 172 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Newcastle

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	93.2	13	**2426.8**	**119.5**	**71.2**	44.9	37.0	28.1	22.3	16.5
2010	96.2	1	**57.1**	38.7	34.7	30.3	27.3	23.1	17.9	13.7
2011	99.5	0	49.2	42.6	38.7	32.4	29.6	24.0	18.2	13.6
2012	98.9	0	48.7	43.3	41.8	36.2	32.5	26.0	18.8	14.4
2013	98.9	4	**69.0**	**50.5**	48.3	41.9	37.4	27.8	20.5	15.2
2014	98.6	2	**53.7**	48.1	40.5	35.7	31.8	25.6	20.5	15.8
2015	98.6	3	**70.4**	47.0	42.3	37.2	32.9	26.5	20.2	15.1
2016	97.5	1	**89.1**	43.1	41.1	36.9	34.3	27.1	20.8	15.2
2017	98.6	1	**55.0**	46.3	44.3	36.3	32.5	26.7	20.8	17.2
2018	98.6	8	**146.0**	**62.9**	**51.8**	41.7	35.1	28.2	23.1	18.1

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 173 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Wallsend

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	91.8	10	**2150.3**	**175.6**	**60.7**	36.4	31.9	23.5	16.6	12.7
2010	87.1	0	32.8	28.3	26.9	23.6	20.9	17.7	14.0	11.4
2011	99.5	0	38.9	31.5	26.9	24.3	21.3	17.2	13.4	10.5
2012	100	0	38.1	34.0	31.8	27.1	23.9	18.0	13.5	10.7
2013	*69.6*	*2*	***52.5***	*47.2*	*38.9*	*31.3*	*28.5*	*21.1*	*15.4*	*11.8*
2014	96.7	0	43.4	39.0	34.8	28.3	25.0	19.9	16.1	12.5
2015	97.3	1	**77.5**	37.0	33.6	28.4	25.3	20.0	15.5	11.7
2016	97.3	1	**65.5**	34.3	32.1	28.4	25.7	20.1	15.4	11.9
2017	97.5	0	47.9	35.8	33.7	28.9	25.7	20.1	16.5	13.1
2018	94.8	5	**136.5**	**57.2**	45.3	33.8	28.6	21.9	17.8	13.7

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Regional NSW

Table 174 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Albury

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	96.7	15	**249.7**	**144.0**	**102.0**	39.0	28.5	19.3	14.0	10.1
2010	99.5	2	**60.8**	45.1	31.6	24.1	19.4	14.6	11.2	8.6
2011	90.7	0	28.0	25.2	23.7	19.9	17.9	14.5	11.9	9.2
2012	92.1	1	**54.4**	38.7	32.3	25.8	21.3	16.7	12.8	10.2
2013	98.6	2	**59.2**	47.8	42.5	30.7	26.4	18.8	13.6	10.4
2014	98.9	5	**159.6**	**88.2**	37.8	29.4	22.8	17.4	13.4	10.5
2015	95.6	2	**92.5**	35.4	30.2	26.0	23.3	17.5	13.0	10.1
2016	98.6	1	**51.0**	47.2	43.5	32.4	25.6	18.7	13.1	9.3
2017	97.5	0	48.8	37.8	33.4	28.6	24.2	19.3	14.7	11.5
2018	95.6	7	**107.8**	**61.6**	50.0	40.8	33.6	24.3	16.4	12.1

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 175 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Bathurst

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	97.8	12	**2114.4**	**122.4**	**69.8**	36.9	26.8	20.3	13.8	9.0
2010	98.6	0	43.3	32.6	26.7	21.2	18.5	12.5	7.9	5.0
2011	97.3	0	24.3	23.2	21.1	18.6	17.5	13.8	10.3	7.8
2012	99.5	2	**55.5**	31.0	28.1	24.2	21.3	16.4	12.2	9.2
2013	99.7	3	**145.0**	46.9	43.7	32.4	25.3	17.3	12.7	9.4
2014	98.6	0	42.8	37.8	36.0	29.4	25.1	18.2	12.8	9.2
2015	99.5	2	**94.6**	39.5	32.9	28.7	22.3	16.1	11.7	8.5
2016	93.2	0	34.1	31.8	29.7	25.9	23.6	17.5	11.6	8.0
2017	97.3	0	49.9	37.3	30.3	24.9	21.2	16.9	12.8	9.9
2018	98.4	8	**274.1**	**86.1**	**66.4**	38.9	32.6	21.7	15.1	10.4

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 176 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Gunnedah

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2018	98.1	10	**234.9**	**92.4**	**70.2**	37.7	32.2	21.9	14.5	10.5

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 177 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Narrabri

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2018	98.9	10	**221.7**	**103.3**	**65.5**	26.9	21.7	14.9	11.0	7.5

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 178 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Tamworth

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	96.7	17	**1791.4**	**235.9**	**120.7**	47.0	33.8	22.8	15.7	11.4
2010	98.4	0	29.1	26.5	24.6	21.8	18.4	14.7	11.2	8.3
2011	96.7	1	**50.9**	34.0	27.4	22.4	19.2	15.8	12.3	9.1
2012	98.9	1	**55.1**	47.0	38.0	27.8	24.3	19.5	14.3	10.7
2013	98.4	0	47.5	43.8	35.9	30.7	27.0	20.4	15.2	11.3
2014	99.5	1	**66.6**	36.5	34.5	27.6	24.7	19.3	14.9	10.9
2015	98.9	1	**52.7**	30.9	29.1	24.7	22.2	17.1	12.9	10.2
2016	99.2	1	**51.7**	32.2	30.1	27.0	23.1	18.6	14.6	11.0
2017	99.2	2	**54.1**	37.1	33.7	27.1	22.5	18.5	14.0	10.7
2018	99.2	9	**145.4**	**95.2**	**61.1**	37.7	31.2	23.8	17.0	12.4

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 179 Statistical summary for PM_{10}: 24-hour average concentrations. Station: Wagga Wagga/Wagga Wagga North

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	82.5	21	**297.4**	**214.4**	**112.3**	**55.9**	46.2	30.6	19.8	12.4
2010	97.0	6	**64.9**	**52.1**	48.5	38.7	29.0	21.5	15.4	10.0
2011	96.4	1	**56.3**	34.4	31.9	27.6	24.2	19.6	14.5	10.7
2012	98.4	1	**67.2**	46.5	43.1	37.4	32.6	23.1	16.6	12.4
2013	98.9	15	**110.7**	**67.9**	**57.8**	47.2	40.5	27.9	18.9	12.8
2014	96.4	13	**88.2**	**59.3**	**55.1**	44.9	36.8	25.5	18.3	12.5
2015	98.4	7	**145.1**	**72.4**	**51.3**	42.3	34.2	24.8	17.2	11.3
2016	98.9	16	**114.7**	**66.8**	**57.7**	48.2	39.9	27.2	17.5	10.0
2017	98.4	10	**171.6**	**61.5**	**53.2**	42.5	33.3	25.7	17.9	12.2
2018	97.0	34	**127.2**	**110.8**	**82.2**	**59.8**	49.1	36.4	22.5	14.2

AAQ NEPM standard: 50.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Wagga Wagga North replaced Wagga Wagga in October 2011

Data availability between 15% and 75%, values shown in italics

Particles as $PM_{2.5}$

The current USEPA-approved method for $PM_{2.5}$ compliance monitoring (also known as the Federal Reference Method, FRM) is a non-continuous (batch), one-day-in-three technique that requires pre- and post-laboratory weighing. As this involves a substantial delay in acquiring and reporting data, jurisdictions use continuous monitoring techniques for near-real-time reporting of air quality (e.g. by using TEOM or BAM monitors).

The AAQ NEPM requires the reporting of all $PM_{2.5}$ data, including the compliance method (FRM) and the continuous monitoring techniques used.

Pre-2010 $PM_{2.5}$ data reporting

In New South Wales before 2010, all continuous TEOM $PM_{2.5}$ data were recorded with the internal USEPA PM_{10} equivalency factors applied (where, $y = A + Bx$, $A = 3$ and $B = 1.03$).

During 2010, the NSW Government recalculated all $PM_{2.5}$ data, removing the PM_{10} equivalency factor (i.e. now $A = 0$ and $B = 1$). This approach harmonised NSW reporting of $PM_{2.5}$ with that of other Australian jurisdictions. All data included in this report, for all years, have no equivalency factors applied.

Post-2012 $PM_{2.5}$ monitoring technique

During 2012, the NSW Government commenced a replacement program for all continuous TEOM $PM_{2.5}$ monitors with a USEPA-equivalent method, namely beta attenuation monitors (BAMs). The BAM method differs from the TEOM in terms of sample treatment, using lower temperatures intermittently to reduce moisture levels in the sample stream. This was intended to promote greater retention of volatile components adsorbed to the fine particulate matter.

In 2017, the NSW Government commissioned PM_{10} and $PM_{2.5}$ monitoring in the NSW North West Slopes region, at Gunnedah and Narrabri, using the USEPA-approved TEOM 1405DF monitors (Table 3).

Statistical summary for 2018

Table 180 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM and TEOM methods

Region/monitoring station	Data availability rate (%)	Maximum (µg/m³)	Percentile (µg/m³)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Bargo	97.3	**38.1**	20.7	16.1	12.2	10.6	8.4	6.0	4.4
Bringelly	98.9	**55.6**	**26.4**	18.5	15.5	13.0	9.8	7.2	4.9
Camden	98.6	**37.0**	20.6	19.0	14.2	11.4	8.9	6.6	4.4
Campbelltown West	93.4	**42.0**	21.5	18.2	15.3	13.6	10.2	7.5	5.6
Chullora	97.8	**29.1**	23.5	21.5	16.6	13.6	10.5	7.8	5.8
Earlwood	97.0	**28.5**	21.9	19.1	16.0	13.2	9.8	7.0	4.9
Liverpool	97.3	**45.4**	**30.1**	**26.5**	18.6	16.7	12.9	9.1	6.3
Macquarie Park	98.4	**51.8**	24.5	17.4	12.7	11.0	8.5	6.1	4.4
Oakdale	95.3	**75.4**	20.6	16.6	12.5	10.6	8.1	6.0	4.5
Parramatta North	95.1	**42.1**	**27.1**	22.0	17.6	14.4	10.8	8.3	6.3
Prospect	96.4	**47.5**	**27.0**	20.3	16.2	13.9	10.4	7.3	5.3
Randwick	92.3	**31.8**	20.4	17.0	13.9	12.4	9.3	7.0	5.2
Richmond	95.1	**123.9**	**38.4**	19.7	14.9	12.6	9.5	6.8	4.9
Rozelle	*70.7*	*19.2*	*17.2*	*16.4*	*13.8*	*11.5*	*8.8*	*6.6*	*5.0*
St Marys	93.7	**80.5**	25.0	15.9	13.3	11.3	9.3	7.2	5.0
Central Coast									
Wyong	91.5	18.1	16.5	14.3	12.0	10.5	8.2	6.3	4.8
Illawarra									
Albion Park South	95.9	**29.4**	18.4	16.2	13.6	11.0	8.2	6.1	4.6
Kembla Grange	97.3	21.9	17.8	15.8	13.4	11.3	8.6	6.7	4.7
Wollongong	96.2	**47.6**	22.3	16.6	13.6	11.9	8.9	6.5	4.5
Lower Hunter									
Beresfield	95.3	24.9	17.1	16.7	15.4	13.4	10.9	8.3	6.2
Newcastle	98.6	20.2	17.3	15.9	14.4	12.3	9.8	7.2	5.5
Wallsend	97.8	20.2	16.3	15.7	14.1	12.1	9.6	6.8	5.0
Regional NSW									
Albury	96.2	**30.4**	22.4	18.7	14.8	11.9	8.9	6.6	4.5
Bathurst	98.6	**40.5**	21.7	19.0	13.0	11.3	8.2	6.2	4.5
Gunnedah*	98.1	**50.7**	**29.3**	23.8	22.1	18.1	10.6	7.3	5.1
Narrabri*	97.8	**26.3**	17.5	13.7	9.3	7.6	5.6	4.3	3.3
Tamworth	92.1	24.2	19.9	19.2	16.9	14.1	10.3	7.5	5.6
Wagga Wagga North	96.4	23.8	21.0	20.0	16.4	14.5	10.7	7.6	5.1

AAQ NEPM standard: 25.0 µg/m³ (24-hour average) *TEOM 1405DF Method
Bold font indicates values that exceed the AAQ NEPM standard
Data availability between 15% and 75%, values shown in italics

Trend analysis

Table 181 Annual maximum 24-hour average concentrations for $PM_{2.5}$ (µg/m^3): continuous BAM and TEOM and methods.

Region/ monitoring station	2009	2010	2011	2012	2013*	2014*	2015*	2016*	2017*	2018
Sydney										
Bargo	-	-	-	-	-	-	-	-	20.9	**38.1**
Bringelly	-	-	-	-	-	-	-	*21.6*	**52.5**	**55.6**
Camden	-	-	-	*19.5*	61.9	18.5	25.0	**36.0**	**27.7**	**37.0**
Campbelltown West	-	-	-	-	-	-	*15.7*	**35.8**	25.0	**42.0**
Chullora	**183.2**	24.2	23.9	23.4	**49.1**	23.1	**37.2**	**49.4**	**44.6**	**29.1**
Earlwood	**186.7**	22.5	23.6	20.7	**37.3**	22.7	**28.0**	**33.3**	**50.9**	**28.5**
Liverpool	**268.1**	21.8	**38.0**	24.9	**73.8**	24.3	**32.2**	**50.8**	**56.4**	**45.4**
Macquarie Park	-	-	-	-	-	-	-	-	*24.1*	**51.8**
Oakdale	-	-	-	-	-	-	-	-	**25.5**	**75.4**
Parramatta North	-	-	-	-	-	-	-	-	-	**42.1**
Prospect	-	-	-	-	-	-	**29.6**	**84.9**	**30.1**	**47.5**
Randwick	-	-	-	-	-	-	-	-	***45.3***	**31.8**
Richmond	**192.3**	20.8	**42.9**	**116.7**	**68.0**	24.7	24.5	**83.4**	**34.3**	**123.9**
Rozelle	-	-	-	-	-	-	**33.4**	**49.4**	**36.3**	*19.2*
St Marys	-	-	-	-	-	-	-	**93.2**	**38.2**	**80.5**
Central Coast										
Wyong	-	-	-	*14.7*	**55.8**	19.7	13.2	19.8	**27.2**	18.1
Illawarra										
Albion Park South	-	-	-	-	-	-	21.1	**30.7**	19.3	**29.4**
Kembla Grange	-	-	-	-	-	-	*23.8*	**32.0**	21.3	21.9
Wollongong	**241.0**	23.5	17.7	15.6	**88.4**	17.3	**31.6**	**33.7**	24.7	**47.6**
Lower Hunter										
Beresfield	**230.8**	**25.9**	18.8	22.4	**40.8**	19.0	**25.9**	**27.9**	18.7	24.9
Newcastle	-	-	-	-	-	21.2	**28.4**	**66.1**	18.0	20.2
Wallsend	**415.6**	18.8	16.2	16.2	**37.0**	18.0	24.0	**50.7**	20.4	20.2
Regional NSW										
Albury	-	-	-	-	-	-	-	-	18.7	**30.4**
Bathurst	-	-	-	-	-	-	-	*15.0*	17.5	**40.5**
Gunnedah*	-	-	-	-	-	-	-	-	-	**50.7**
Narrabri*	-	-	-	-	-	-	-	-	-	**26.3**
Tamworth	-	-	-	-	-	-	-	*17.6*	21.6	24.2
Wagga Wagga North	-	-	*15.4*	23.2	**29.9**	**27.6**	24.2	**28.1**	**32.5**	23.8

AAQ NEPM standard: 25.0 µg/m^3 (24-hour average) *TEOM 1405DF

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Table 182 Annual average concentrations for $PM_{2.5}$ (µg/m^3) – continuous BAM and TEOM methods

Region/ monitoring station	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Sydney										
Bargo	-	-	-	-	-	-	-	-	6.3	6.8
Bringelly	-	-	-	-	-	-	-	*7.6*	7.5	8.0
Camden	-	-	-	*7.8*	6.5	6.3	6.2	6.4	6.7	7.2
Campbelltown West	-	-	-	-	-	-	*7.9*	7.9	7.4	**8.4**
Chullora	7.1	5.7	5.9	6.0	**8.4**	**9.0**	8.0	8.0	**9.5**	**8.6**
Earlwood	6.8	5.7	5.4	5.6	7.9	7.8	**8.5**	**8.1**	7.3	7.8
Liverpool	**8.3**	6.3	5.9	**8.5**	**9.4**	**8.6**	**8.5**	**8.7**	**8.9**	**10.1**
Macquarie Park	-	-	-	-	-	-	-	-	*6.3*	7.0
Oakdale	-	-	-	-	-	-	-	-	6.0	6.9
Parramatta North	-	-	-	-	-	-	-	-	**-**	**9.2**
Prospect	-	-	-	-	-	-	**8.2**	**8.7**	7.7	**8.5**
Randwick	-	-	-	-	-	-	-	-	-	7.6
Richmond	5.8	4.2	4.7	5.3	**8.3**	6.7	7.7	7.9	7.0	**8.1**
Rozelle	-	-	-	-	-	-	7.2	7.4	7.2	*7.3*
St Marys	-	-	-	-	-	-	-	7.8	7.0	7.8
Central Coast										
Wyong	-	-	-	*7.3*	6.7	5.5	5.2	5.7	5.8	6.8
Illawarra										
Albion Park South	-	-	-	-	-	-	6.4	7.2	6.6	6.8
Kembla Grange	-	-	-	-	-	-	*6.7*	6.6	6.9	7.0
Wollongong	7.1	5.1	4.6	4.6	7.7	7.0	7.6	7.4	7.1	7.3
Lower Hunter										
Beresfield	**8.5**	6.0	5.5	7.9	**8.2**	7.5	7.3	7.4	7.6	**8.7**
Newcastle	-	-	-	-	-	**8.1**	7.8	7.8	7.4	7.8
Wallsend	**8.1**	4.6	4.8	5.1	7.7	6.7	7.3	8.0	7.3	7.5
Regional NSW										
Albury	-	-	-	-	-	-	-	-	7.3	7.3
Bathurst	-	-	-	-	-	-	-	*5.9*	6.1	7.0
Gunnedah*	-	-	-	-	-	-	-	-	-	**9.0**
Narrabri*	-	-	-	-	-	-	-	-	-	4.9
Tamworth	-	-	-	-	-	-	-	*7.6*	7.8	**8.3**
Wagga Wagga North	-	-	*7.0*	**8.7**	7.9	7.5	7.6	7.4	**8.1**	**8.4**

AAQ NEPM standard: 8.0 µg/m^3 (annual average) * TEOM 1405DF method

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Statistical summaries for multiple years, by station, $PM_{2.5}$

Annual maximum 24-hour average concentration, $PM_{2.5}$

Sydney

Table 183 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM method. Station: Bargo

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2017	97.5	0	20.9	16.4	14.6	11.8	10.0	7.8	5.8	4.2
2018	97.3	2	**38.1**	20.7	16.1	12.2	10.6	8.4	6.0	4.4

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 184 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM method. Station: Bringelly

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2016	*47.5*	*0*	*21.6*	*17.4*	*14.8*	*13.2*	*12.0*	*9.6*	*7.1*	*5.4*
2017	94.5	2	**52.5**	21.9	17.8	15.3	12.4	9.1	6.4	4.7
2018	98.9	4	**55.6**	**26.4**	18.5	15.5	13.0	9.8	7.2	4.9

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Table 185 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM method. Station: Camden

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2012	*20.8*	*0*	*19.5*	*19.4*	*18.1*	*13.2*	*11.6*	*9.5*	*7.8*	*5.3*
2013	99.7	3	**61.9**	24.8	16.7	13.2	10.9	8.0	5.5	3.8
2014	98.6	0	18.5	15.4	14.0	12.4	10.6	8.1	5.8	3.9
2015	98.4	0	25.0	17.3	13.4	11.2	10.2	7.9	5.8	3.8
2016	94.3	3	**36.0**	17.2	13.4	11.2	10.1	8.0	5.9	4.1
2017	96.7	2	**27.7**	19.5	17.5	13.1	10.8	8.2	6.0	4.3
2018	98.6	2	**37.0**	20.6	19.0	14.2	11.4	8.9	6.6	4.4

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Table 186 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM method. Station: Campbelltown West

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2015	*20.3*	*0*	*15.7*	*15.6*	*15.2*	*13.4*	*11.9*	*10.2*	*7.3*	*5.5*
2016	95.1	3	**35.8**	**26.0**	17.0	14.0	12.3	9.6	7.2	5.3
2017	95.3	0	25.0	16.9	15.9	12.8	11.0	9.0	7.0	5.1
2018	93.4	2	**42.0**	21.5	18.2	15.3	13.6	10.2	7.5	5.6

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 187 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous TEOM and BAM* methods. Station: Chullora

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	98.6	3	**183.2**	19.4	17.3	14.1	11.3	8.5	5.9	3.9
2010	93.7	0	24.2	19.2	15.4	11.9	10.0	7.3	5.0	3.4
2011	98.9	0	23.9	18.6	16.2	12.3	10.8	7.6	5.2	3.4
2012	97.0	0	23.4	17.6	14.5	12.1	9.9	7.5	5.3	3.7
2013	98.6	3	**49.1**	22.4	19.9	15.9	13.6	10.6	7.2	5.3
2014	89.0	0	23.1	20.5	18.3	16.3	14.1	10.9	8.2	6.2
2015	96.4	1	**37.2**	16.8	15.3	14.4	12.5	9.7	7.4	5.6
2016	96.2	5	**49.4**	**28.5**	19.2	14.3	12.7	9.6	7.1	5.3
2017	97.3	8	**44.6**	**33.6**	26.4	20.1	14.7	10.9	8.3	6.3
2018	97.8	3	**29.1**	23.5	21.5	16.6	13.6	10.5	7.8	5.8

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

*TEOM was replaced by BAM on 14/12/2012

Table 188 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous TEOM and BAM* methods. Station: Earlwood

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	75.6	1	**186.7**	22.5	18.9	13.9	11.3	8.2	5.3	3.4
2010	95.6	0	22.5	16.7	14.2	11.4	9.9	7.3	5.0	3.4
2011	96.2	0	23.6	18.4	15.8	12.7	10.5	6.9	4.5	2.8
2012	98.9	0	20.7	17.4	14.5	11.8	10.3	7.3	4.6	3.2
2013	91.2	4	**37.3**	**27.4**	20.8	16.6	13.5	9.8	6.6	4.7
2014	97.3	0	22.7	18.1	17.4	14.5	12.9	9.7	7.1	5.2
2015	93.4	2	**28.0**	22.9	20.4	16.4	14.0	10.8	7.7	5.6
2016	95.6	5	**33.3**	**28.5**	21.9	15.9	13.4	10.0	6.8	5.0
2017	99.5	2	**50.9**	**20.7**	18.7	15.2	12.0	9.0	6.4	4.3
2018	97.0	1	**28.5**	21.9	19.1	16.0	13.2	9.8	7.0	4.9

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

*TEOM was replaced by BAM on 19/12/2012

Table 189 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous TEOM and BAM* method. Station: Liverpool

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	94.5	3	**268.1**	**25.2**	19.9	14.9	12.9	9.7	6.7	4.5
2010	95.9	0	21.8	17.7	15.6	13.2	11.0	8.1	5.6	3.9
2011	99.2	2	**38.0**	20.7	16.2	14.0	10.9	7.4	4.9	3.1
2012	85.8	0	24.9	21.5	19.5	15.2	13.9	10.8	7.6	5.7
2013	93.2	2	**73.8**	24.4	22.1	18.7	16.0	11.7	8.1	5.8
2014	97.0	0	24.3	20.4	19.1	16.1	14.4	10.8	7.6	5.7
2015	94.2	2	**32.2**	22.6	20.8	17.1	14.0	10.8	7.3	5.5
2016	95.6	4	**50.8**	**31.4**	20.9	15.6	13.4	10.9	7.6	5.7
2017	95.3	3	**56.4**	**25.2**	20.9	16.6	14.1	10.9	8.0	5.9
2018	97.3	8	**45.4**	**30.1**	**26.5**	18.6	16.7	12.9	9.1	6.3

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

*TEOM was replaced by BAM on 2/3/2012

Table 190 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM method. Station: Macquarie Park

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2017	*37.5*	*0*	*24.1*	*20.9*	*18.4*	*15.0*	*10.3*	*8.0*	*5.4*	*3.8*
2018	98.4	3	**51.8**	24.5	17.4	12.7	11.0	8.5	6.1	4.4

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Table 191 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM method. Station: Oakdale

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2017	94.8	1	**25.5**	16.3	13.9	11.0	9.2	7.7	5.4	4.0
2018	95.3	2	**75.4**	20.6	16.6	12.5	10.6	8.1	6.0	4.5

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 192 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM method. Station: Parramatta North

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2018	95.1	4	**42.1**	**27.1**	22.0	17.6	14.4	10.8	8.3	6.3

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 193 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous TEOM and BAM* methods. Station: Prospect

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2015	92.6	1	**29.6**	21.3	19.2	15.6	13.5	10.0	7.3	5.6
2016	98.6	5	**84.9**	**38.7**	23.5	17.9	14.0	10.1	7.2	5.2
2017	97.0	3	**30.1**	24.6	20.6	15.7	11.7	9.3	6.9	4.9
2018	96.4	4	**47.5**	**27.0**	20.3	16.2	13.9	10.4	7.3	5.3

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

*TEOM was replaced by BAM on 16/10/2015

Table 194 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM method. Station: Randwick

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2017	*72.3*	*1*	***45.3***	*20.7*	*17.1*	*12.8*	*10.8*	*8.2*	*5.9*	*4.6*
2018	92.3	1	**31.8**	20.4	17.0	13.9	12.4	9.3	7.0	5.2

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Table 195 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous TEOM and BAM* methods. Station: Richmond

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	89.3	3	**192.3**	24.8	18.8	11.5	9.9	6.7	4.4	2.8
2010	97.3	0	20.8	14.3	12.3	9.4	7.9	5.7	3.5	2.1
2011	97.8	2	**42.9**	22.7	15.7	10.6	8.6	6.2	3.7	2.2
2012	94.3	2	**116.7**	18.0	14.8	11.0	9.4	6.7	4.1	2.6
2013	95.1	14	**68.0**	**40.8**	**31.4**	24.3	14.8	9.9	6.0	4.2
2014	95.9	0	24.7	18.1	16.4	13.3	11.5	8.4	6.0	4.4
2015	92.6	0	24.5	23.4	18.2	15.0	13.1	9.6	6.9	5.0
2016	94.5	6	**83.4**	**35.4**	21.9	15.6	12.5	9.4	6.7	4.7
2017	93.2	3	**34.3**	24.9	20.7	14.3	11.6	8.5	6.2	4.3
2018	95.1	4	**123.9**	**38.4**	19.7	14.9	12.6	9.5	6.8	4.9

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

*TEOM was replaced by BAM on 7/9/2012

Table 196 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM method. Station: Rozelle

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2015	77.5	1	**33.4**	18.8	17.0	13.7	11.9	8.9	6.3	4.7
2016	97.8	5	**49.4**	**29.0**	22.8	14.4	12.0	8.8	6.4	4.5
2017	97.5	2	**36.3**	19.6	16.8	13.5	11.3	9.0	6.4	4.6
2018	*70.7*	*0*	*19.2*	*17.2*	*16.4*	*13.8*	*11.5*	*8.8*	*6.6*	*5.0*

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability was between 15% and 75%, values shown in italics

Table 197 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM method. Station: St Marys

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2016	77.0	5	**93.2**	**49.5**	23.6	13.7	11.5	9.1	6.5	4.6
2017	98.6	3	**38.2**	24.4	21.5	13.1	10.8	8.3	6.2	4.6
2018	93.7	3	**80.5**	25.0	15.9	13.3	11.3	9.3	7.2	5.0

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Central Coast

Table 198 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM method. Station: Wyong

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2012	*19.7*	*0*	*14.7*	*14.7*	*14.6*	*12.5*	*11.4*	*9.0*	*6.9*	*4.8*
2013	94.2	1	**55.8**	20.7	16.7	12.6	11.0	8.1	5.8	4.1
2014	96.2	0	19.7	14.6	13.1	10.8	8.9	6.5	4.9	3.7
2015	97.3	0	13.2	11.7	10.6	9.1	8.0	6.4	4.8	3.6
2016	97.3	0	19.8	13.9	13.0	10.9	9.4	7.1	5.3	3.9
2017	97.8	1	**27.2**	17.9	14.2	10.5	9.1	7.1	5.2	4.1
2018	91.5	0	18.1	16.5	14.3	12.0	10.5	8.2	6.3	4.8

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Illawarra

Table 199 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM method. Station: Albion Park South

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2015	78.4	0	21.1	16.9	15.3	13.0	11.1	7.8	5.4	4.1
2016	89.3	2	**30.7**	18.2	15.8	13.1	11.2	8.7	6.5	4.9
2017	85.8	0	19.3	15.5	14.0	11.3	10.5	8.1	6.0	4.5
2018	95.9	1	**29.4**	18.4	16.2	13.6	11.0	8.2	6.1	4.6

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 200 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM method. Station: Kembla Grange

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2015	*72.9*	*0*	*23.8*	*15.5*	*14.7*	*12.7*	*10.9*	*8.4*	*6.3*	*4.4*
2016	96.4	2	**32.0**	17.8	15.1	12.6	10.7	8.1	5.9	4.2
2017	93.2	0	21.3	17.3	15.2	12.8	11.0	8.6	6.2	4.5
2018	97.3	0	21.9	17.8	15.8	13.4	11.3	8.6	6.7	4.7

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Table 201 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous TEOM and BAM* methods. Station: Wollongong

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	96.2	3	**241.0**	23.0	19.3	14.9	12.1	8.2	5.6	3.4
2010	92.1	0	23.5	15.0	13.8	11.2	9.3	6.4	4.2	3.0
2011	96.4	0	17.7	16.0	14.1	11.2	8.8	6.4	3.8	2.4
2012	98.1	0	15.6	13.7	13.1	10.6	8.3	5.9	4.0	2.4
2013	94.8	4	**88.4**	**28.8**	21.5	15.5	12.8	9.2	6.4	4.6
2014	92.1	0	17.3	15.9	14.9	13.1	11.8	9.1	6.4	4.6
2015	81.6	1	**31.6**	18.9	16.3	14.2	12.6	9.5	6.9	4.9
2016	91.0	3	**33.7**	22.7	18.4	15.3	11.8	9.2	6.6	4.9
2017	94.8	0	24.7	16.4	15.6	13.4	11.5	8.8	6.5	4.6
2018	96.2	3	**47.6**	22.3	16.6	13.6	11.9	8.9	6.5	4.5

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

*TEOM was replaced by BAM on 5/12/2012

Lower Hunter

Table 202 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous TEOM and BAM* methods. Station: Beresfield – TEOM and BAM

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	93.7	5	**230.8**	**34.6**	21.5	16.3	13.6	9.7	6.7	4.8
2010	97.3	1	**25.9**	15.2	13.6	11.6	9.9	7.4	5.4	3.9
2011	99.2	0	18.8	15.0	13.5	11.0	9.7	7.0	4.9	3.2
2012	93.4	0	22.4	21.0	18.1	14.4	12.7	9.9	7.1	5.3
2013	94.2	2	**40.8**	23.2	20.4	15.9	13.3	10.3	7.2	5.1
2014	96.2	0	19.0	17.1	16.3	13.9	12.1	9.4	6.9	5.0
2015	93.7	1	**25.9**	19.7	16.5	13.4	12.4	9.3	6.6	4.7
2016	97.5	1	**27.9**	17.3	15.9	13.6	11.7	9.4	7.0	4.8
2017	98.6	0	18.7	16.7	15.5	13.8	11.8	9.4	7.0	5.2
2018	95.3	0	24.9	17.1	16.7	15.4	13.4	10.9	8.3	6.2

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

*TEOM was replaced by BAM on 29/11/2012

Table 203 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous TEOM and BAM* methods. Station: Newcastle

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2014	95.1	0	21.2	20.0	17.3	15.6	13.3	10.3	7.4	5.6
2015	93.2	1	**28.4**	19.5	17.3	15.4	13.0	9.5	7.2	5.1
2016	95.6	1	**66.1**	17.6	15.9	14.3	11.9	9.5	7.1	5.0
2017	97.3	0	18.0	16.9	15.4	12.8	11.8	9.2	6.8	5.2
2018	98.6	0	20.2	17.3	15.9	14.4	12.3	9.8	7.2	5.5

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

* TEOM was replaced by BAM on 10/4/2015

Table 204 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous TEOM and BAM methods. Station: Wallsend

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	88.8	5	**415.6**	**39.7**	21.0	14.5	12.5	8.4	5.6	3.9
2010	92.6	0	18.8	11.9	10.7	9.2	7.4	5.7	4.2	3.1
2011	100.0	0	16.2	13.9	12.3	10.9	8.8	6.2	4.2	2.7
2012	99.5	0	16.2	14.2	13.1	11.3	9.1	6.4	4.3	3.1
2013	96.2	6	**37.0**	**29.1**	22.5	16.6	13.1	9.6	6.2	4.5
2014	96.2	0	18.0	15.2	13.6	12.3	10.1	8.5	6.3	4.6
2015	95.9	0	24.0	21.9	17.2	14.2	12.3	9.3	6.3	4.6
2016	91.0	1	**50.7**	19.6	16.7	14.4	12.6	9.9	7.5	5.4
2017	98.6	0	20.4	17.1	15.6	13.7	11.7	9.4	6.7	4.8
2018	97.8	0	20.2	16.3	15.7	14.1	12.1	9.6	6.8	5.0

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

*TEOM was replaced by BAM on 21/2/2012

Regional NSW

Table 205 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM method. Station: Albury

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2017	85.5	0	18.7	17.7	16.9	14.8	13.1	9.5	6.3	4.4
2018	96.2	2	**30.4**	22.4	18.7	14.8	11.9	8.9	6.6	4.5

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 206 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM method. Station: Bathurst

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2016	*64.8*	*0*	*15.0*	*14.5*	*12.2*	*10.0*	*8.8*	*7.7*	*5.8*	*4.1*
2017	97.3	0	17.5	13.1	12.0	10.1	9.2	7.7	6.0	4.2
2018	98.6	2	**40.5**	21.7	19.0	13.0	11.3	8.2	6.2	4.5

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Table 207 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous TEOM-FDMS method. Station: Gunnedah

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2018	98.1	5	**50.7**	**29.3**	23.8	22.1	18.1	10.6	7.3	5.1

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 208 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous TEOM-FDMS method. Station: Narrabri

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2018	97.8	1	**26.3**	17.5	13.7	9.3	7.6	5.6	4.3	3.3

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 209 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM method. Station: Tamworth

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2016	*74.9*	*0*	*17.6*	*16.7*	*15.8*	*14.5*	*12.2*	*9.7*	*7.1*	*5.2*
2017	94.8	0	21.6	17.2	15.7	14.3	12.9	9.9	7.2	5.1
2018	92.1	0	24.2	19.9	19.2	16.9	14.1	10.3	7.5	5.6

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Table 210 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – continuous BAM method. Station: Wagga Wagga North

Year	Data availability rate (%)	Number of exceedance (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2011	*42.5*	*0*	*15.4*	*15.1*	*14.2*	*12.4*	*10.9*	*8.8*	*6.4*	*4.8*
2012	85.8	0	23.2	22.4	21.8	17.9	14.9	11.4	7.5	5.1
2013	98.9	3	**29.9**	24.3	20.7	16.2	14.3	9.6	6.6	4.9
2014	96.2	2	**27.6**	20.8	17.0	14.0	12.7	9.7	6.6	4.7
2015	99.2	0	24.2	21.4	20.0	16.6	13.8	9.4	6.4	4.6
2016	98.1	2	**28.1**	22.1	19.6	16.3	13.5	8.8	6.4	4.5
2017	98.1	5	**32.5**	**27.0**	22.8	18.3	14.4	10.1	6.7	4.7
2018	96.4	0	23.8	21.0	20.0	16.4	14.5	10.7	7.6	5.1

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability between 15% and 75%, values shown in italics

Statistical summary (FRM method)

Table 211 Statistical summary for $PM_{2.5}$ – 24-hour average concentration - FRM method

Region/ monitoring station	Data availability rate (%)	Maximum (µg/m³)	Percentile (µg/m³)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Chullora	84.7	**39.6**	**30.3**	24.1	16.3	11.7	9.2	6.9	5.0

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)
Bold font indicates values that exceed the AAQ NEPM standard
Data availability rates are based on a one-day-in-three sampling regime

Trend analysis (FRM method)

Table 212 Maximum 24-hour average concentration for $PM_{2.5}$ (µg/m³) – FRM method

Region/ monitoring station	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Sydney										
Chullora	**27.5**	**28.2**	16.7	14.6	**53.9**	18.9	**38.6**	21.0	**27.9**	**39.6**

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)
Bold font indicates values that exceed the AAQ NEPM standard
Data availability rates are based on a one-day-in-three sampling regime

Table 213 Annual average concentration for $PM_{2.5}$ (µg/m³) – FRM method

Region/ monitoring station	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Sydney										
Chullora	6.7	6.5	6.2	NA	*7.2*	7.2	6.9	6.9	7.4	7.8

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)
Bold font indicates values that exceed the AAQ NEPM standard
NA: due to technical problems, an annual average could not be calculated
Data availability rates are based on a one-day-in-three sampling regime
Data availability between 15% and 75%, values shown in italics

Statistical summaries for multiple years, by station (FRM method)

Table 214 Statistical summary for $PM_{2.5}$: 24-hour average concentrations – FRM method. Station: Chullora

Year	Data availability rate (%)	Number of exceedances (days)	Maximum (µg/m³)	Percentile (µg/m³)						
				99th	98th	95th	90th	75th	50th	25th
2009	87.6	2	**27.5**	**26.7**	19.1	13.1	11.3	9.1	5.4	3.8
2010	83.8	1	**28.2**	21.9	16.6	12.8	11.0	7.5	5.8	4.2
2011	77.9	0	16.7	16.3	15.5	13.9	12.5	7.5	5.4	3.8
2012	*38.0*	*0*	*14.6*	*12.7*	*10.8*	*9.9*	*9.4*	*8.3*	*6.3*	*4.6*
2013	*65.8*	*2*	***53.9***	***27.4***	*24.4*	*13.3*	*12.3*	*8.5*	*5.4*	*4.1*
2014	77.3	0	18.9	18.1	16.2	14.1	11.7	8.7	6.3	4.6
2015	80.6	1	**38.6**	14.3	13.8	13.0	12.3	8.4	5.9	4.1
2016	75.5	0	21.0	16.8	16.0	12.0	11.7	8.8	5.9	4.2
2017	77.9	1	**27.9**	24.2	21.3	17.5	12.5	8.8	6.1	4.2
2018	84.7	2	**39.6**	**29.9**	23.5	16.1	11.7	9.2	6.7	4.6

AAQ NEPM standard: 25.0 µg/m³ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Data availability rates are based on a one-day-in-three sampling regime

Data availability between 15% and 75%, values shown in italics

Section E – Episode analyses

In New South Wales, concentrations of ozone (O_3) in urban areas and particles (PM_{10} and $PM_{2.5}$) in both rural and urban areas can sometimes exceed national standards.

The NSW Government has published detailed analyses of typical NSW air pollution episodes, when PM_{10}, $PM_{2.5}$ and ozone concentrations exceeded national standards.

Episode analyses of significant air pollution events in 2018 may be viewed and downloaded from the Department's website: Air pollution episodes in New South Wales.

Ozone pollution episode, summer 2018

This episode analysis describes the conditions responsible for the summer ozone episode during 19–22 January 2018.

The four days,19–22 January, were very warm, with maximum temperatures between 34 and 41°C in Western Sydney. The temperature and meteorology on these days were typical of summer ozone episodes observed in Western Sydney. However, ozone exceedances were observed only on Friday 19 January and Monday 22 January and not during the intervening weekend.

This analysis attributes the pattern of maximum ozone levels during 19–22 January to two factors. Firstly, the lower traffic volume during the weekend mornings (20 and 21 January) lowered the amount of ozone precursors emitted into the atmosphere on these days. Consequently, maximum ozone levels were below national standards. Secondly, a bushfire in the Royal National Park on 22 January increased ozone precursor emissions and caused a more intense and widespread ozone exceedance event on this day.

$PM_{2.5}$ particle pollution episode, autumn 2018

This episode analysis provides insight into a typical poor air quality and reduced visibility event in Sydney, due to hazard reduction burning in 2018.

During 26–29 May 2018, $PM_{2.5}$ particle pollution concentrations at nine of 14 air quality monitoring stations in the Sydney region reached poor to hazardous levels on the NSW Air Quality Index (AQI). Visibility was reduced to poor to hazardous levels each day, for five to 15 hours. The event was associated with smoke from several hazard reduction burns (HRB) in bushland surrounding Sydney, to the north, north-east, west and south of the city. The HRB covered over 2500 hectares (ha) during 26–27 May and continued smouldering during 28–29 May 2018.

A strong high-pressure system over the Tasman Sea, with a broad ridge extending over New South Wales, favoured the formation of overnight and early morning temperature inversions in Sydney. Very light and variable winds during the day, and down-valley winds (westerlies), overnight and in the early morning, helped to transport smoke from HRB towards the city, reducing visibility and elevating $PM_{2.5}$ levels. The afternoon sea breezes (north to north-easterly winds) also transported smoke from HRB to the north and north-east of the city, contributing to the build-up of smoke. Under these calm conditions, smoke continued to elevate $PM_{2.5}$ concentrations, especially closer to the HRB in north-west Sydney during 26–29 May 2018. $PM_{2.5}$ levels were above the 24-hour national standard across the city, with most intense impacts on north-west Sydney. The passage of a cold front with stronger south-westerly winds assisted the dispersion of smoke on 30 May 2018.

PM_{10} particle pollution episode, spring 2018

This episode analysis provides insight into a statewide air pollution event due to long-range transport of windblown dust in 2018.

New South Wales recorded an increasing frequency of dust storms throughout 2018. The four-day dust event, during 20–23 November 2018, followed intensifying drought conditions and loss of ground cover across the State during 2018.

During 20–23 November 2018, 94% of monitoring stations in the NSW AQMN recorded daily PM_{10} concentrations above the national benchmark. Three dust plumes developed with the passage of the three cold fronts across the State, during 20–23 November 2018. Strong and gusty winds associated with these fronts entrained and transported dust from South Australia into western New South Wales and Victoria. Elevated PM_{10} levels were first observed by the NSW AQMN in the South West Slopes on 20 November 2018.

During 21–23 November 2018, daily PM_{10} concentrations reached beyond the benchmark in coastal regions and northern New South Wales. This dust event was one of the highest in terms of observed daily PM_{10} concentrations in the recent history of the NSW AQMN, since 2009.

Section F – Population exposures to particles as $PM_{2.5}$

Clause 17 of the AAQ NEPM requires every jurisdiction to report annual performance against air quality standards and goals, from June 2018, by evaluating population exposures to particles as $PM_{2.5}$.

This section sets out the approach adopted by New South Wales for assessing $PM_{2.5}$ population exposure, and presents $PM_{2.5}$ population exposure for 2018. 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, pending the finalisation of a more detailed assessment method.

NSW approach to $PM_{2.5}$ exposure assessment

The NSW Air Quality Index (AQI) developed by the NSW Government provides a simple but effective way to communicate how air quality compares with national standards, across regions and multiple pollutants. While the AQI has wide public acceptance and will continue to be used, the AQI does not consider the population exposed to different levels of pollution in a town or region.

The NSW Government developed a method to account for population exposure when tracking changes in average annual $PM_{2.5}$ concentrations. The NSW method focuses on a $PM_{2.5}$-based metric, rather than a multi-pollutant metric. The method combines population data from the Australian Bureau of Statistics (ABS) and air quality data from all NSW monitoring stations in the NSW GMR, including Greater Sydney, the Lower Hunter, Central Coast and Illawarra regions.

The NSW method generates population exposure to $PM_{2.5}$ at two different spatial scales: Greater Sydney Region and NSW GMR. The approach was described in the background paper, Clean Air Metric, published for the NSW Clean Air Summit, in June 2017.

The method involves two main steps:

1. Maps of annual population exposure to $PM_{2.5}$ pollution are generated using a spatial interpolation method. The maps summarise spatial distributions of annual population exposure to $PM_{2.5}$ pollution, expressed as product of population density (population per square kilometre) and annual average $PM_{2.5}$ concentrations (micrograms per cubic metre).
2. The Clean Air Metric (CAM) is calculated for the selected region or area from $PM_{2.5}$ data (only). The CAM values provide annual population-weighted air pollution levels, as population-weighted $PM_{2.5}$ concentrations, and as a population-weighted $PM_{2.5}$ AQI.

The benefit of this method is it is a means to help track whether air quality management is delivering the greatest positive health outcomes for the people of New South Wales.

How annual $PM_{2.5}$ exposure is calculated and mapped

Annual $PM_{2.5}$ exposure is calculated through a series of steps involving spatial mapping techniques. The steps are summarised below and illustrated with reference to the NSW GMR and Greater Sydney Region in Figure 3 to Figure 5:

- Gather air quality data measured as the annual average $PM_{2.5}$ concentrations ($\mu g/m^3$), for all NSW air quality monitoring stations in the defined region or study area.
- Allocate an annual average $PM_{2.5}$ concentration to each 1 km^2 area (i.e. 1-km^2 grid cell) across the region, using a spatial interpolation technique called kriging. This creates a grid across the region of $PM_{2.5}$ concentrations in $\mu g/m^3$, one value per 1 km^2 (Figure 3).
- Gather ABS Usual Resident Population Data, as density per 1 km^2 grid cell for the defined region (population density, expressed as number of people per square kilometre) (Figure 4).
- Generate a map of annual $PM_{2.5}$ exposure, as follows: for each 1-km^2 grid cell, multiply the cell's $PM_{2.5}$ value ($\mu g/m^3$) by the cell's population density value. The product (resulting value) for the cell is the population exposure to $PM_{2.5}$ concentration (Figure 5).

Annual population exposure to $PM_{2.5}$ pollution is assessed by analysing the spatial distribution of the exposure map, generated at the 1 km by 1 km resolution, or to the scale of a chosen study area. The Department generates maps for the Greater Sydney Region and the NSW GMR.

How CAM for $PM_{2.5}$ is calculated

The CAM is calculated for annual average $PM_{2.5}$, as both, concentration and AQI values, by applying the following steps to a chosen region:

- Sum the annual population exposure to $PM_{2.5}$ pollution (based on the method described above) for all grid cells across the region of interest.
- Divide the result by the total population of the region. The resulting CAM value is referred to as the region's annual average population-weighted $PM_{2.5}$ concentration ($\mu g/m^3$).
- The CAM can also be presented as the region's annual average population-weighted AQI if divided by the annual NEPM standard for $PM_{2.5}$.

Air quality can vary significantly from year to year due to 'exceptional events' such as bushfires, dust storms and climatological events like El Niño. The CAM uses three-year rolling averages to smooth out this natural variability. This aligns with reporting approaches used in the European Union and the USEPA exposure. It allows us to focus on assessing progress in addressing human sources contributing to poor air quality.

Further information on the CAM method can be found in the following references:

- Riley M, Scorgie Y, Jiang N, Capnerhurst J & Salter D 2017, 'A metric for assessing population-weighted average air quality exposure in New South Wales', 23rd International Clean Air and Environment Conference, Brisbane, 15–18 October 2017
- NSW Government 2017, Clean Air Metric (PDF 190KB), background paper prepared for the NSW Clean Air Summit, Sydney, June 2017.

The calculation of NSW population exposure to $PM_{2.5}$ pollution and the CAM values for 2018, for NSW GMR and Greater Sydney Region (Sydney) are discussed in further detail below.

NSW annual $PM_{2.5}$ concentration exposure maps, 2018

Spatial distribution of $PM_{2.5}$ annual average concentration, for NSW GMR and Greater Sydney Region during 2018

Figure 3 presents the estimated distribution of $PM_{2.5}$ annual average concentrations, across the GMR and the Greater Sydney Region for 2018. The highest $PM_{2.5}$ annual average concentrations above the AAQ NEPM standard of 8 µg/m^3 were estimated to be experienced in these areas:

- Sydney North West and Sydney South West subregions
- Beresfield in the Lower Hunter Valley
- The Upper Hunter Valley.

The NSW air emissions inventory reported that the main sources of $PM_{2.5}$ emissions in 2008 were solid fuel burning and motor vehicles in Sydney, industries and vehicles in Newcastle, and coal-fired power stations and domestic solid fuel burning in the Upper Hunter Valley.

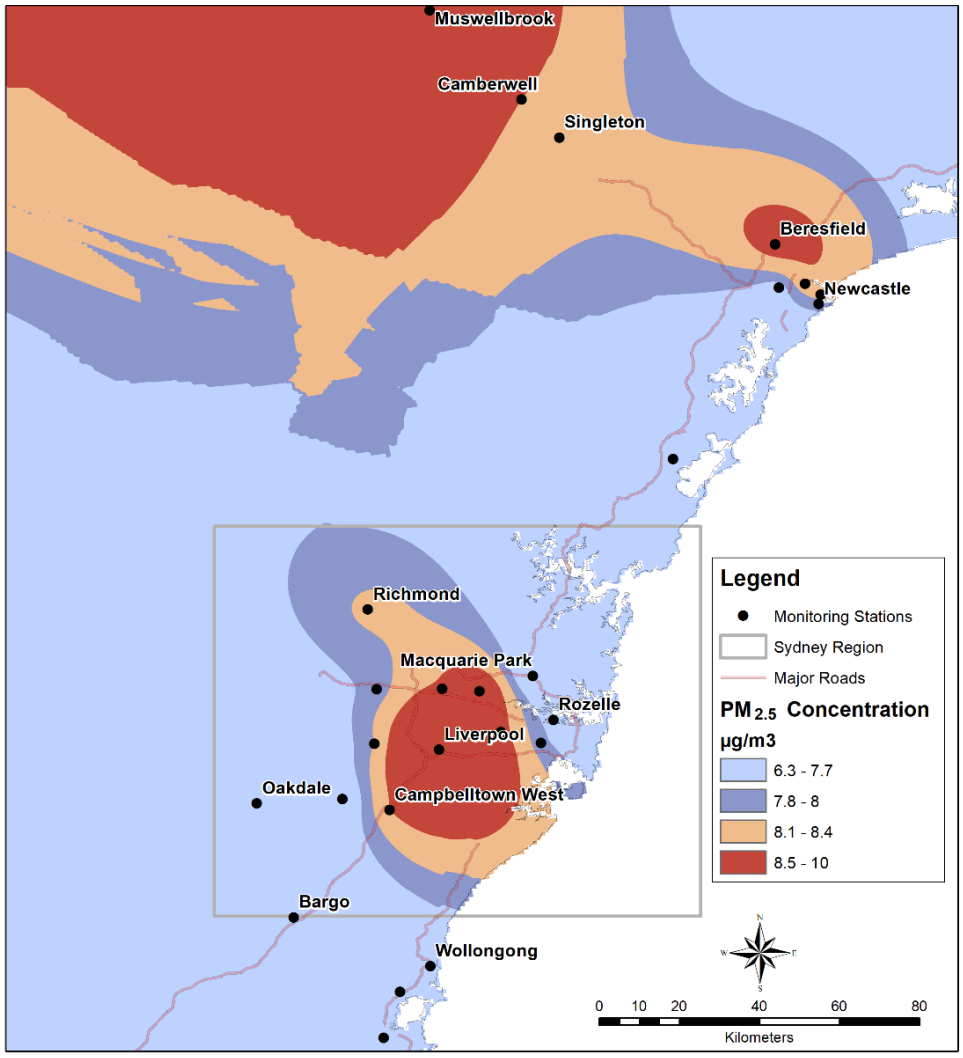

Figure 3 Spatial distribution of $PM_{2.5}$ annual average concentration for 2018, for NSW GMR and the Greater Sydney Region (inset)

The air quality monitoring stations measuring $PM_{2.5}$ concentrations are shown as black dots.

Figure 3 was generated using the method outlined above, with further details below:

1. The annual average $PM_{2.5}$ concentration (µg/m^3) for 2018 at each NSW air quality monitoring station in the GMR was plotted on a map of the region.
2. The GIS mapping technique known as kriging was applied to shade areas in proportion to the estimated annual average $PM_{2.5}$ concentrations across the region at the 1-km^2 resolution.

This technique created a grid of $PM_{2.5}$ concentrations in µg/m^3, one value per 1 km^2 across the region for 2018.

Population density for the NSW GMR and Greater Sydney Region in 2018

Figure 4 presents the population density for the GMR and Greater Sydney Region for 2018, at a resolution of 1 km^2, projected from the ABS Census, 2016. The higher population densities are in central, north-west, south-west and east Sydney regions and along major transport corridors in all NSW regions.

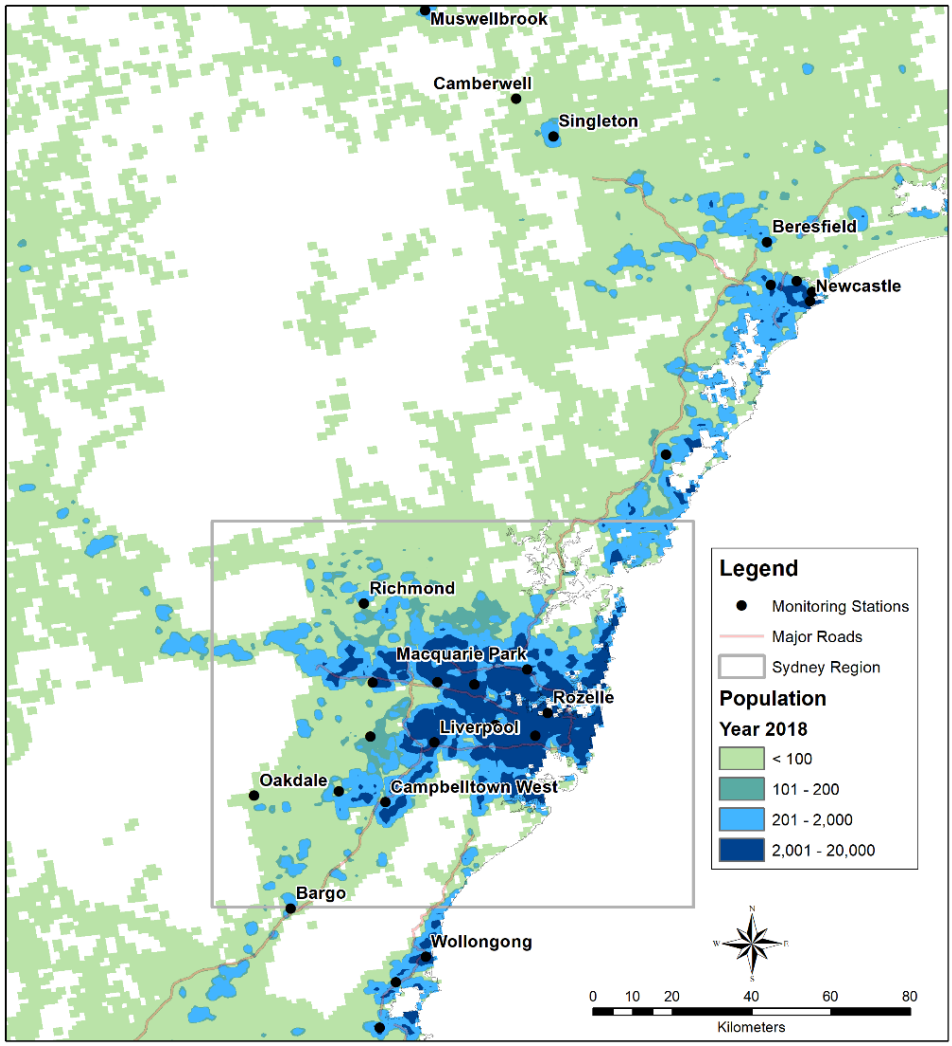

Figure 4 Population density (population/km^2) for the NSW GMR and Greater Sydney Region for 2018, projected from the ABS Census 2016

These population density values were used to calculate the population exposure to $PM_{2.5}$ concentrations for the region and the CAM, as described below.

$PM_{2.5}$ population exposure for the NSW GMR and Greater Sydney Region for 2018

Figure 5 presents an estimate of the population's exposure to $PM_{2.5}$ concentrations in 2018, represented by the product of annual average $PM_{2.5}$ concentration and population density at 1-km^2 resolution. The main points are summarised below:

- The highest population exposure to $PM_{2.5}$ pollution in the GMR during 2018 was in Sydney's CBD and along inner Sydney transport corridors (red shading).
- Within the Greater Sydney Region, population exposure to $PM_{2.5}$ was generally lower in regions outside the Sydney CBD and transport corridors (yellow shading).
- The population exposure to $PM_{2.5}$ in Greater Western Sydney, the Central Coast and Lower Hunter (green and grey shading) was much lower than in the Sydney CBD and Sydney transport corridors.

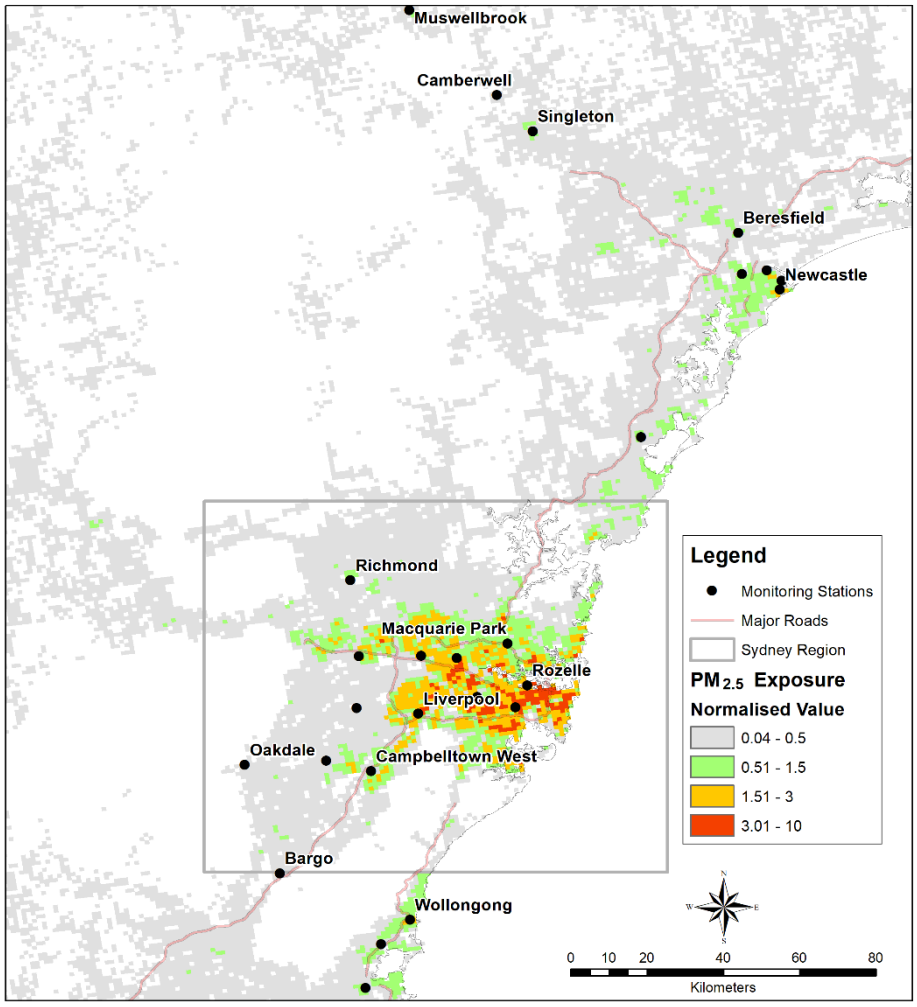

Figure 5 $PM_{2.5}$ exposure for NSW GMR and Greater Sydney Region during 2018

Exposure is expressed as values scaled to between 0 and 10, derived as the product of population and annual average $PM_{2.5}$ concentration (population/km^2 x $PM_{2.5}$).

The values of population exposure to $PM_{2.5}$, referred to above, were used to calculate the CAM, expressed as AQI (below).

2018 CAM expressed as AQI calculated from $PM_{2.5}$ data

Table 215 shows the $PM_{2.5}$ exposure for 2018, for the NSW GMR and the Greater Sydney Region. The CAM values are presented in Column 3 and Column 4 as the $PM_{2.5}$ population-weighted concentration and the population-weighted AQI, respectively.

The CAM for the NSW GMR and the Greater Sydney Region were calculated using the method outlined above, with further details below:

- Gather data and calculate the three-year rolling average $PM_{2.5}$ concentrations for 2018 for each NSW air quality monitoring station in the NSW GMR. The three-year rolling average is based on data for 2016 to 2018.
- Calculate and map the three-year rolling average population exposure to $PM_{2.5}$ concentrations for each 1-km^2 grid cell across the region based on mapping methods described above.
- Sum the three-year average population exposure to $PM_{2.5}$ concentration for all grid cells across the region.
- Divide the result by the total population of the region. The resulting value is referred to as the region's three-year rolling average population-weighted $PM_{2.5}$ concentration ($\mu g/m^3$).
- Convert the region's three-year rolling average population-weighed $PM_{2.5}$ concentration ($\mu g/m^3$) to a three-year rolling average population-weighed AQI. That is, multiply the region's three-year average population-weighted $PM_{2.5}$ concentration by 100/8. The value eight is used because the AAQ NEPM standard for the annual average $PM_{2.5}$ concentration is 8 $\mu g/m^3$.

Table 215 CAM expressed as population-weighted $PM_{2.5}$ concentration, and as population-weighted $PM_{2.5}$ AQI for the NSW GMR and the Greater Sydney Region, 2018

Region	Population, 3-year average	CAM as 3-year average, population-weighted $PM_{2.5}$ concentration ($\mu g/m^3$)	CAM as 3-year average, population-weighted $PM_{2.5}$ AQI
Greater Sydney	4,992,491	7.6	94
NSW GMR	6,107,589	7.6	95

Analysis of Table 215 shows:

- The CAM for the Greater Sydney Region in 2018 was 94. This means the population-weighted average exposure of residents to $PM_{2.5}$ was 94% of the NEPM annual standard for $PM_{2.5}$.
- The CAM for the NSW GMR in 2018 was 95. This means that the population-weighted average exposure of residents to $PM_{2.5}$, was 95% of the NEPM annual standard for $PM_{2.5}$.

The NSW Government commissioned the ABS to provide 1-km^2 resolution population data for all years from 1996 to 2018, based on the ABS Estimated Resident Population. This allowed calculation of the metric for historic years, to track changes in population exposure to air pollution.

Figure 6 and Figure 7 show the CAM time series for Greater Sydney Region and the NSW GMR, respectively, for 1998 to 2018.

Figure 6 shows the following recent trends:

- The population-weighted average exposure of residents to $PM_{2.5}$ in the Greater Sydney Region fell from 98% in 2016 to 94% of the NEPM standard in 2018.
- The level of exposure to $PM_{2.5}$ in 2018 was like levels in 2012 to 2014.

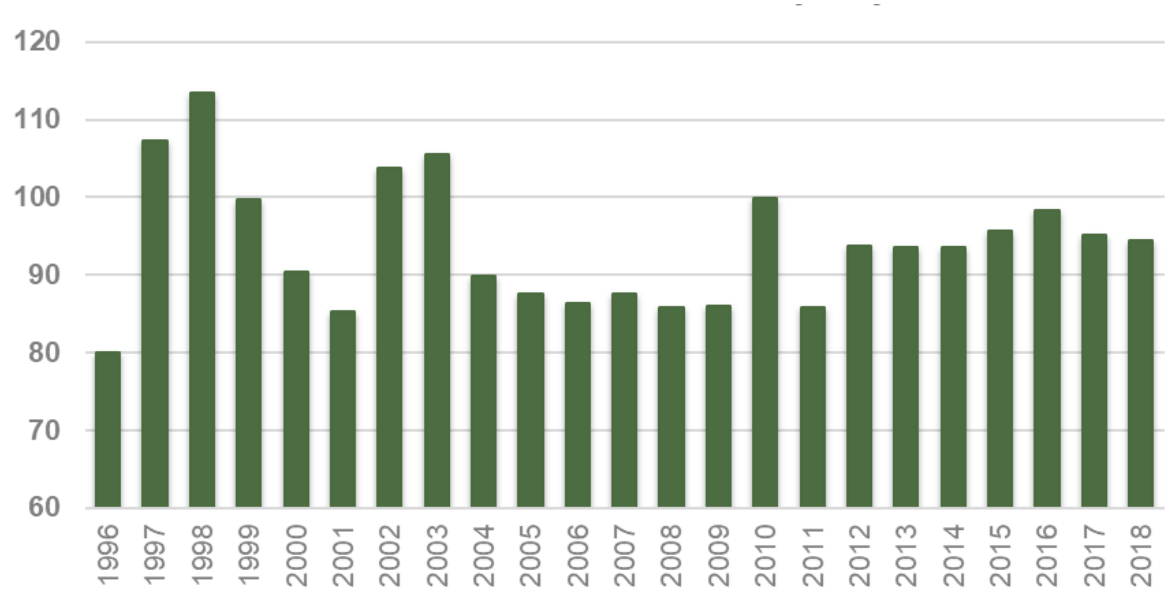

Figure 6 CAM time series expressed as AQI for Greater Sydney Region, 1996 to 2018

Figure 7 shows the following recent trends:

- The population-weighted average exposure of residents to $PM_{2.5}$ in the NSW GMR fell from 96% in 2016 to 95% of the NEPM standard in 2018.
- The level of exposure to $PM_{2.5}$ in 2018 was like levels in 2014, 2015 and 2010, and marginally higher than those in 2011 to 2013.

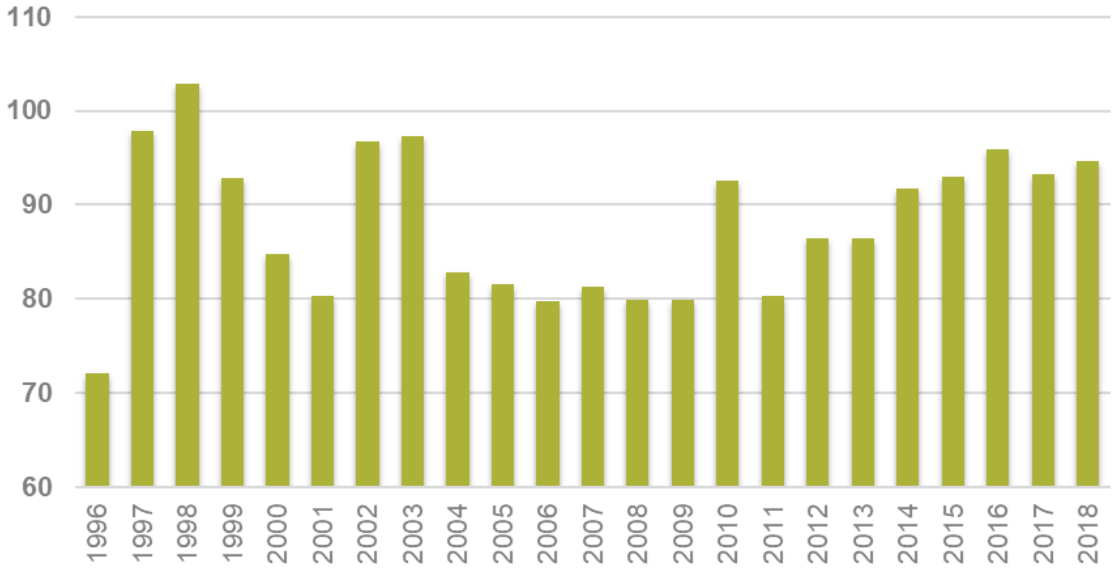

Figure 7 CAM time series expressed as AQI for the NSW GMR, 1996 to 2018

Appendix – Summary of compliance with NEPM standards and goals 2018

Table A.1 Number of calendar days recording NEPM particle exceedances and classifications as exceptional and non-exceptional events

NEPM particles	Exceedance days	Exceptional events	Non-exceptional events	Exceptional and non-exceptional events
PM_{10}	59	34	21	4
$PM_{2.5}$	27	20	6	1

Source: Tables 20, 22 and Table A.4 below

Table A.2 Compliance with AAQ NEPM goals, ozone, PM_{10} and $PM_{2.5}$, by NSW regions

Region	1-hour O_3	4-hour O_3	1-day PM_{10}	Annual PM_{10}	1-day $PM_{2.5}$	Annual $PM_{2.5}$
Sydney	N-C	N-C	C	C	N-C	N-C
Illawarra	C	C	N-C	C	N-C	C
Central Coast	C	C	C	C	C	C
Lower Hunter	C	C	C	C	C	N-C
Regional NSW	C	C	N-C	N-C	N-C	N-C

C indicates compliance

N-C indicates non-compliance

Source: Tables 5, 9, 10, and Table A.4 below

Table A.3 Summary classification of days exceeding AAQ NEPM standards, exceptional and non-exceptional events, by air pollutant

Air pollutant	Description of exceedance day	Number of exceedance days	Number of exceptional / non-exceptional event days	Calendar dates 2018
PM_{10}	Days when PM_{10} exceeded only	**45**	26 exceptional	26 exceptional events due to dust storms: 14–15 February; 12, 18–20 March; 14–15 April; 3, 10 May; 18–20 July; 4, 31 August; 1 September; 2, 5–6, 21–23 November; 2, 14, 20 December
			18 non-exceptional	Events due to local particle sources: 8 February; 16 March; 5–7, 9–11, 13, 20, 23, 30 April; 1–2, 18, 25 May; 30 October; 30 December
			1 day with exceptional and non-exceptional events	12 April: exceptional event due to a dust storm in the South West Slopes and a non-exceptional event due to local dust at Kembla Grange, Illawarra region
$PM_{2.5}$	Days when $PM_{2.5}$ exceeded only	**15**	10 exceptional	7 exceptional events due to HRB: 26 April; 6, 26–27 May; 5, 8–9 August 3 exceptional events due to HRB and bushfire: 29 July; 1, 3 August
			5 non-exceptional	1 non-exceptional event due to agricultural burning: 29 April 4 non-exceptional events due to domestic wood smoke: 14–16, 21 July
PM_{10} and $PM_{2.5}$	Days when PM_{10} and $PM_{2.5}$ exceeded	**11**	7 exceptional	6 exceptional events due to HRB and bushfire: 17 April; 8, 28–29 May; 25, 28 July 1 exceptional event due to a dust storm: 15 December
			4 days with exceptional and non-exceptional events	8 April: PM_{10} non-exceptional events due local dust in the South West Slopes and $PM_{2.5}$ exceptional events due to HRB in Sydney 24–25 April, 9 May: PM_{10} exceptional events due to HRB in Sydney and PM_{10} non-exceptional events due to local dust in the South West Slopes; $PM_{2.5}$ exceptional events due to HRB in Sydney and non-exceptional $PM_{2.5}$ event due to agricultural burning in South West Slopes

Air pollutant	Description of exceedance day	Number of exceedance days	Number of exceptional / non-exceptional event days	Calendar dates 2018
Ozone	Days when ozone exceeded only	**4**		19, 22 January; 9 February; 31 December
Ozone and PM_{10}	Days when both ozone and PM_{10} exceeded	**3**	1 exceptional 2 non-exceptional	12 January (PM_{10} due to dust storm, South West Slopes) 27–28 December (PM_{10} due to local dust at Wagga Wagga North and Kembla Grange)
Ozone and $PM_{2.5}$	Days when both ozone and $PM_{2.5}$ exceeded	**0**		
Total number of AAQ NEPM exceedance days		**78**		

HRB – hazard reduction burning

Source: Table A. 6 below

Shading:

- lighter green – days when only PM_{10} exceeded
- mid green – days when only $PM_{2.5}$ exceeded
- darker green – days when PM_{10} and $PM_{2.5}$ exceeded
- light olive – days when only ozone exceeded
- dark olive – days when both ozone and PM_{10} exceeded
- white – days when both ozone and $PM_{2.5}$ exceeded

Table A.4 Inventory of AAQ NEPM exceedance days

Source: NSW Office of Environment and Heritage exceedance events register 2018

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
1	12/01/2018	PM_{10} and ozone	Wagga Wagga North	Exceptional event – dust storm: due to moderate westerly winds				Richmond	Warm to hot in Western Sydney Light east-north-east winds
2	19/01/2018	Ozone only					Campbelltown West, Camden	Oakdale, Bringelly, Campbelltown West, Camden	Hot to very hot in Western Sydney Light east-north-east sea breeze
3	22/01/2018	Ozone only					Liverpool, Prospect, Bringelly, Campbelltown West, St Marys, Parramatta North	Liverpool, Prospect, Bringelly, Campbelltown West, Camden, Bargo, St Marys, Parramatta North	Very hot in Western Sydney (40.9°C max. at St Marys) Light east-north-east winds
4	8/02/2018	PM_{10} only	Wagga Wagga North	Non-exceptional event due to local dust					
5	9/02/2018	Ozone only						Oakdale, Richmond	Warm to hot in Western Sydney

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
									Light east-north-east sea breeze
6	14/02/2018	PM_{10} only	Wagga Wagga North	Exceptional event – dust storm: due to strong south-west winds					
7	15/02/2018	PM_{10} only	Bargo, Beresfield, Bringelly, Camden, Campbelltown West, Chullora, Earlwood, Kembla Grange, Liverpool, Newcastle, Oakdale, Prospect, Randwick, Richmond, St Marys, Wallsend, Wollongong, Wyong, Macquarie Park, Parramatta North	Exceptional event – dust storm: due to strong south-west winds					
8	12/03/2018	PM_{10} only	Wagga Wagga North	Exceptional event – dust storm: due to moderate west-south-west winds					

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
9	16/03/2018	PM_{10} only	Wagga Wagga North	Non-exceptional event					
10	18/03/2018	PM_{10} only	Albury, Bargo, Bathurst, Camden, Kembla Grange, Oakdale, Wagga Wagga North	Exceptional event – dust storm: widespread dust storm that also significantly impacted Canberra					
11	19/03/2018	PM_{10} only	Albion Park South, Bathurst, Beresfield, Bringelly, Camden, Campbelltown West, Chullora, Earlwood, Kembla Grange, Liverpool, Newcastle, Prospect, Randwick, Richmond, Wagga Wagga North, Wallsend, Wollongong, Wyong, Macquarie Park, Parramatta North	Exceptional event – dust storm: widespread dust storm that also significantly impacted Canberra					

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
12	20/03/2018	PM_{10} only	Chullora	Exceptional event – dust storm: PM_{10} remained high due to the dust storm from the previous day					
13	5/04/2018	PM_{10} only	Wagga Wagga North	Non-exceptional event due to local dust					
14	6/04/2018	PM_{10} only	Wagga Wagga North	Non-exceptional event due to local dust					
15	7/04/2018	PM_{10} only	Wagga Wagga North	Non-exceptional event due to local dust					
16	8/04/2018	PM_{10} and $PM_{2.5}$	Wagga Wagga North	Non-exceptional event due to local dust	Bargo	Exceptional event – fire: Joadja East HRB Incident 18031393477 (1450 ha) burned from 17/3 – 30/4			
17	9/04/2018	PM_{10} only	Wagga Wagga North	Non-exceptional event due to local dust					
18	10/04/2018	PM_{10} only	Wagga Wagga North	Non-exceptional event due to local dust					
19	11/04/2018	PM_{10} only	Albury, Wagga Wagga North	Non-exceptional event due to local dust					

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
20	12/04/2018	PM_{10} only	Albury, Kembla Grange, Wagga Wagga North	Non-exceptional event at Kembla Grange – local particle source (construction site) Exceptional event in Albury and Wagga Wagga North – dust storm: due to strong west-north-west winds					
21	13/04/2018	PM_{10} only	Kembla Grange, Wagga Wagga North	Non-exceptional event at Kembla Grange – local particle source (construction site) Non-exceptional event in Wagga Wagga North – local dust					
22	14/04/2018	PM_{10} only	Albury, Kembla Grange, Wagga Wagga North	Exceptional event – dust storm: due to strong west-north-west winds across southern NSW					
23	15/04/2018	PM_{10} only	Beresfield, Newcastle, Tamworth, Wallsend, Gunnedah, Narrabri	Exceptional event – dust storm: Dust under light to moderate south-west to north-west winds across northern NSW					
24	17/04/2018	PM_{10} and $PM_{2.5}$	Liverpool	Exceptional event – fire: Moorebank	Liverpool	Exceptional event – fire:			

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
				Ave, Holsworthy forest fire RFS Incident 18041496605 (3448 ha) from 14/4 – 30/4		Moorebank Ave, Holsworthy forest fire RFS Incident 18041496605 (3448 ha) from 14/4 – 30/4			
25	20/04/2018	PM_{10} only	Wagga Wagga North	Non-exceptional event due to local dust					
26	23/04/2018	PM_{10} only	Wagga Wagga North	Non-exceptional event due to local dust					
27	24/04/2018	PM_{10} and $PM_{2.5}$	Richmond, Wagga Wagga North	Exceptional event at Richmond – fire: Faulconbridge West HRB RFS Incident 18042197576 (905 ha) burned from 22/4 – 28/4 Non-exceptional event in Wagga Wagga North due to local dust	Albury, Richmond	Exceptional event at Richmond – fire: Faulconbridge West HRB RFS Incident 18042197576 (905 ha) burned from 22/4 – 28/4 Non-exceptional event in Albury due to agricultural burning			
28	25/04/2018	PM_{10} and $PM_{2.5}$	Oakdale, Wagga Wagga North	Exceptional event at Oakdale – fire: Faulconbridge West HRB RFS Incident 18042197576 (905 ha) burned from 22/4 – 28/4.	Oakdale, Richmond	Exceptional event – fire: Faulconbridge West HRB RFS Incident 18042197576 (905 ha) burned from 22/4 – 28/4			

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
				Non-exceptional event in Wagga Wagga North					
29	26/04/2018	$PM_{2.5}$ only			Bargo, Oakdale	Exceptional event – fire: Faulconbridge West HRB RFS Incident 18042197576 (905 ha) burned from 22/4 – 28/4			
30	29/04/2018	$PM_{2.5}$ only			Albury	Non-exceptional event due to agricultural burning			
31	30/04/2018	PM_{10} only	Wagga Wagga North	Non-exceptional event due to local dust					
32	1/05/2018	PM_{10} only	Wagga Wagga North	Non-exceptional event due to local dust					
33	2/05/2018	PM_{10} only	Wagga Wagga North	Non-exceptional event due to local dust					
34	3/05/2018	PM_{10} only	Albury, Wagga Wagga North	Exceptional event – dust storm: due to moderate north-west winds, pre-cold front					
35	6/05/2018	$PM_{2.5}$ only			Bathurst, Prospect	Exceptional event – fire: Rocky Creek HRB RFS Incident			

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
						18050398644 (2500 ha) burned from 5/5 – 27/5 impacting Bathurst Cliftonville HRB RFS Incident 18050498775 (105 ha) burned 5/5 – 13/5 impacting Prospect			
36	8/05/2018	PM_{10} and $PM_{2.5}$	Liverpool	Exceptional event – fire: Cliftonville HRB RFS Incident 18050498775 (105 ha) burned 5/5 – 13/5	Liverpool	Exceptional event – fire: Cliftonville HRB RFS Incident 18050498775 (105 ha) burned 5/5 – 13/5			
37	9/05/2018	PM_{10} and $PM_{2.5}$	Bringelly, Camden, Liverpool, Wagga Wagga North	Exceptional event at Bringelly, Camden and Liverpool – fire: Cliftonville HRB RFS Incident 18050498775 (105 ha) burned 5/5 – 13/5 Exceptional event – fire: Mt Airly HRB RFS Incident 18050799096 (845 ha) burned 9/5 – 23/5.	Bringelly, Camden, Liverpool, St Marys	Exceptional event – fire: Cliftonville HRB RFS Incident 18050498775 (105 ha) burned 5/5 – 13/5 Exceptional event – fire: Mt Airly HRB RFS Incident 18050799096 (845 ha) burned 9/5 – 23/5			

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
				Non-exceptional event in Wagga Wagga North					
38	10/05/2018	PM_{10} only	Tamworth	Exceptional event – dust storm: impacted North West Slopes					
39	18/05/2018	PM_{10} only	Liverpool, Oakdale	Non-exceptional events – local particle sources, Liverpool unsealed road likely Oakdale unidentified local particle source					
40	25/05/2018	PM_{10} and $PM_{2.5}$	Liverpool	Non-exceptional event – local particle source, unsealed road likely	Chullora*	Non-exceptional event – local particle source, industrial activity			
41	26/05/2018	$PM_{2.5}$ only			Macquarie Park, Parramatta North	Exceptional event – fire: Colo Heights HRB RFS Incident 18052500957 (1973 ha) burned 26/5 – 7/6 Other HRB were burning in and around the Blue Mountains			
42	27/05/2018	$PM_{2.5}$ only			Bringelly, Liverpool, Prospect,	Exceptional event – fire: Colo Heights HRB			

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
					Parramatta North	RFS Incident 18052500957 (1973 ha) burned 26/5 – 7/6 Other HRB were burning in and around the Blue Mountains			
43	28/05/2018	PM_{10} and $PM_{2.5}$	Bringelly, Liverpool, Prospect, Richmond, Parramatta North, St Marys	Exceptional event – fire: Colo Heights HRB RFS Incident 18052500957 (1973 ha) burned 26/5 – 7/6 Other HRB were burning in and around the Blue Mountains	Bringelly, Chullora, Chullora* Liverpool, Prospect, Richmond, Parramatta North	Exceptional event – fire: Colo Heights HRB RFS Incident 18052500957 (1973 ha) burned 26/5 – 7/6 Other HRB were burning in and around the Blue Mountains			
44	29/05/2018	PM_{10} and $PM_{2.5}$	Bringelly, Liverpool, Prospect, Richmond, Parramatta North	Exceptional event – fire: Colo Heights HRB RFS Incident 18052500957 (1973 ha) burned 26/5 – 7/6 Other HRB were burning in and around the Blue Mountains	Bringelly, Chullora, Earlwood, Liverpool, Prospect, Randwick, Richmond, St Marys, Parramatta North	Exceptional event – fire: Colo Heights HRB RFS Incident 18052500957 (1973 ha) burned 26/5 – 7/6 Other HRB were burning in and around the Blue Mountains			
45	14/07/2018	$PM_{2.5}$ only			Chullora, Gunnedah	Non-exceptional event Chullora			

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
						due to industrial activity Non-exceptional event Gunnedah due to domestic wood smoke			
46	15/07/2018	$PM_{2.5}$ only			Gunnedah	Non-exceptional event due to domestic wood smoke			
47	16/07/2018	$PM_{2.5}$ only			Gunnedah	Non-exceptional event due to domestic wood smoke			
48	18/07/2018	PM_{10} only	Bathurst, Beresfield, Bringelly, Camden, Chullora, Liverpool, Newcastle, Prospect, Randwick, Richmond, Wyong, Parramatta North	Exceptional event – dust storm: dust from South Australia and Victoria impacted much of NSW GMR					
49	19/07/2018	PM_{10} only	Beresfield, Bringelly, Chullora, Earlwood, Kembla Grange, Liverpool, Newcastle, Prospect,	Exceptional event – dust storm: dust from South Australia and Victoria impacted much of NSW GMR					

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
			Parramatta North						
50	20/07/2018	PM_{10} only	Chullora, Tamworth	Exceptional event – dust storm: dust from South Australia and Victoria impacted much of NSW					
51	21/07/2018	$PM_{2.5}$ only			Gunnedah	Non-exceptional event due to domestic wood smoke			
52	25/07/2018	PM_{10} and $PM_{2.5}$	Liverpool	Exceptional event – fire: Hawkesbury – Ironbark West HRB RFS Incident 18072606634 (600 ha) burned 26/7 – 3/8	Liverpool	Exceptional event – fire: Hawkesbury - Ironbark West HRB RFS Incident 18072606634 (600 ha) burned 26/7 – 3/8			
53	28/07/2018	PM_{10} and $PM_{2.5}$	Wollongong	Exceptional event – fire: Mackel Airfield HRB RFS Incident 18072706778 (4300 ha) burned 27 – 17/8 at Holsworthy to contain an uncontrolled bushfire	Albion Park South, Wollongong	Exceptional event – fire: Mackel Airfield HRB RFS Incident 18072706778 (4300 ha) burned 27 – 17/8 at Holsworthy to contain an uncontrolled bushfire			

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
54	29/07/2018	$PM_{2.5}$ only			Campbelltown West, Wollongong	Exceptional event – fire: Mackel Airfield HRB RFS Incident 18072706778 (4300 ha) burned 27 – 17/8 at Holsworthy backburning to contain the fire			
55	1/08/2018	$PM_{2.5}$ only			Campbelltown West, Liverpool	Exceptional event – fire: Mackel Airfield HRB RFS Incident 18072706778 (4300 ha) burned 27 – 17/8 to contain an uncontrolled bushfire in Holsworthy			
56	3/08/2018	$PM_{2.5}$ only			Wollongong	Exceptional event – fire: Mackel Airfield HRB RFS Incident 18072706778 (4300 ha) burned 27 – 17/8 to contain an uncontrolled bushfire in Holsworthy			

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
57	4/08/2018	PM_{10} only	Beresfield, Tamworth, Gunnedah, Narrabri	Exceptional event – dust storm: dust storm impacted the north-east of NSW					
58	5/08/2018	$PM_{2.5}$ only			Camden	Exceptional event – fire: 192 ha HRB			
59	8/08/2018	$PM_{2.5}$ only			Macquarie Park	Exceptional event – fire: Burraneer Avenue, Saint Ives, RSF HRB Incident 18073007316 (30 ha) burned 2/8 – 8/8/			
60	9/08/2018	$PM_{2.5}$ only			Macquarie Park	Exceptional event – fire: Burraneer Avenue, Saint Ives, RSF HRB Incident 18073007316 (30 ha) burned 2/8 – 8/8/			
61	31/08/2018	PM_{10} only	Narrabri	Exceptional event – dust storm: long-range dust transportation from drought-affected parts of south-west NSW					
62	1/09/2018	PM_{10} only	Tamworth, Gunnedah, Narrabri	Exceptional event – dust storm: long-range dust					

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
				transportation from drought-affected parts of south-west NSW					
63	30/10/2018	PM_{10} only	Wagga Wagga North	Non-exceptional event					
64	2/11/2018	PM_{10} only	Wagga Wagga North	Exceptional event – dust storm: dust from the west under moderate winds					
65	5/11/2018	PM_{10} only	Wagga Wagga North	Exceptional event – dust storm: dust from the north-west under moderate winds					
66	6/11/2018	PM_{10} only	Tamworth, Gunnedah, Narrabri	Exceptional event – dust storm: elevated levels across the Namoi region, with peaks in the mid-afternoon on a west to north-west wind					
67	21/11/2018	PM_{10} only	Earlwood, Newcastle, Prospect, Randwick, Richmond, Rozelle, Wyong, Macquarie Park,	Exceptional event – dust storm: significant dust storm that resulted from the long-range transport of dust from drought-affected south-west NSW and the Mallee region of					

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
			Parramatta North	Victoria. Dust plume travelled ahead of a strong, dry, cold front					
68	22/11/2018	PM_{10} only	Bargo, Bathurst, Beresfield, Bringelly, Camden, Campbelltown West, Chullora, Earlwood, Kembla Grange, Liverpool, Newcastle, Oakdale, Prospect, Randwick, Richmond, Rozelle, St Marys, Tamworth, Wallsend, Wollongong, Wyong, Macquarie Park, Gunnedah, Narrabri, Parramatta North	Exceptional event – dust storm: significant dust storm. Second plume of the event that resulted from the long-range transport of dust from drought-affected south-west NSW and the Mallee region of Victoria. Dust plume travelled ahead of a second strong, dry, cold front					
69	23/11/2018	PM_{10} only	Beresfield, Newcastle, Tamworth, Wallsend,	Exceptional event – dust storm: significant dust storm. Second					

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
			Wyong, Gunnedah, Narrabri	plume of the event that resulted from the long-range transport of dust from drought-affected south-west NSW and the Mallee region of Victoria. Dust plume travelled ahead of a second strong, dry, cold front					
70	2/12/2018	PM_{10} only	Albion Park South, Bargo, Kembla Grange, Tamworth, Wollongong, Gunnedah, Narrabri	Exceptional event – dust storm: large dust storm with dust transported from drought-affected parts of NSW on strong westerly winds					
71	14/12/2018	PM_{10} only	Albury, Bathurst, Gunnedah, Narrabri, Wagga Wagga North	Exceptional event – dust storm: widespread dust event in inland NSW, winds from the north-west quadrant					
72	15/12/2018	PM_{10} and $PM_{2.5}$	Albury, Bathurst, Gunnedah, Narrabri, Wagga Wagga North	Exceptional event – dust storm: widespread dust event in inland NSW, winds from the north-west quadrant	Bathurst, Gunnedah, Narrabri	Exceptional event – dust storm: widespread dust event in inland NSW, winds from the north-west quadrant			

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
73	16/12/2018	PM_{10} only	Bathurst, Gunnedah	Exceptional event – dust storm: widespread dust event in inland NSW, winds from the north-west quadrant					
74	20/12/2018	PM_{10} only	Bathurst	Exceptional event – dust storm					
75	27/12/2018	PM_{10} and ozone	Wagga Wagga North	Non-exceptional event due to local dust			Bargo	Bargo	Hot to very hot in Western Sydney Light north-north-east sea breeze
76	28/12/2018	PM_{10} and ozone	Kembla Grange, Wagga Wagga North	Non-exceptional event, unidentified local particle event at Kembla Grange Non-exceptional event at Wagga Wagga North, regional dust			Bringelly, Campbelltown West, Camden, Richmond	Liverpool, Prospect, Bringelly, Chullora, Campbelltown West, Camden, St Marys, Parramatta North	Hot to very hot in Western Sydney Light north-east to south-east breeze
77	30/12/2018	PM_{10} only	Wagga Wagga North	Non-exceptional event due to local dust					
78	31/12/2018	Ozone only					Beresfield	Liverpool, Bringelly, Campbelltown West,	Warm to hot in Western Sydney

Count	Date	Comment	PM_{10} exceedance	PM_{10} comment	$PM_{2.5}$ exceedance	$PM_{2.5}$ comment	Ozone 1-hour	Ozone 4-hour	Ozone comment
								Camden, Beresfield	with light north-east sea breeze Similar conditions at Beresfield

HRB – hazard reduction burning

Chullora* refers to FRM monitoring results (see Tables 10a and 21a)

Shading: as for Table A.3

Table A.5 Number of exceedance days, by region, for AAQ NEPM standard 2017 and 2018

Monitoring region /station	Ozone, O_3				Particles			
	1-hour		4-hour		24-hour PM_{10}		24-hour $PM_{2.5}$	
	2017	2018	2017	2018	2017	2018	2017	2018
Sydney	3	4	8	7	9 (4)	20 (18)	14 (9)	20 (18)
Central Coast	1	0	2	0	1 (1)	6 (6)	1 (1)	0
Illawarra	2	0	4	0	4 (2)	11 (8)	0	3 (3)
Lower Hunter	1	1	2	1	1 (1)	9 (9)	0	0
Regional NSW								
Albury	--	--	--	--	0	7 (6)	0	2 (0)
Bathurst	--	--	--	--	0	8 (8)	0	2 (2)
Gunnedah	--	0	--	0	--	10 (10)	--	5 (1)
Narrabri	--	--	--	--	--	10 (10)		1 (1)
Tamworth	--	--	--	--	2 (2)	9 (9)	0	0
Wagga Wagga North	--	--	--	--	10 (0)	34 (12)	5 (3)	0

Source: Table 15, Table 16 (ozone), Table 20 (PM_{10}), Table 22 ($PM_{2.5}$)

'—' not monitored

Notes on Table A.5

A blank cell means no monitoring was undertaken at the station.

Parentheses () show the number of days classified as exceptional events.

Compliance:

- light green shading indicates a region or station recorded **no exceedances** of AAQ NEPM standards and **complied with AAQ NEPM goals**
- dark green shading indicates a region or station **exceeded the AAQ NEPM standard** and **complied with the AAQ NEPM goal**. This means the region or station experienced only one exceedance day for ozone, and/or all exceedance days for particles were exceptional events.

Non-compliance:

- olive shading indicates a region or station **failed to comply with the AAQ NEPM goal**. This means the region or station experienced either more than one exceedance day for ozone, and/or one or more exceedance days for particles that were non-exceptional events.