

Air Monitoring Report for South Australia 2007

Compliance with the National Environment Protection (Ambient Air Quality) Measure

May 2008

Air Monitoring Report 2007:

Produced in compliance with the National Environment Protection (Ambient Air Quality) Measure, for the National Environment Protection Council

Level 5, 81 Flinders Street

Adelaide SA 5000

May 2008

SA EPA: Air and Noise Branch

Principal Author: Daniel Bellifemine

For further information please contact:

Information Officer

Environment Protection Authority

GPO Box 2607

Adelaide SA 5001

Telephone: (08) 8204 2004

Facsimile: (08) 8204 9393

Free call (country): 1800 623 445

© Environment Protection Authority

This document may be reproduced in whole or part for the purpose of study or training, subject to the inclusion of an acknowledgment of the source and to its not being used for commercial purposes or sale. Reproduction for purposes other than those given above requires the prior written permission of the Environment Protection Authority.

Printed on recycled paper

TABLE OF CONTENTS

SECTION A - MONITORING SUMMARY	1
Current performance monitoring stations.....	2
Additions to the monitoring network	2
NATA status	6
SECTION B - ASSESSMENT OF COMPLIANCE WITH STANDARDS AND 2008 GOAL	7
Carbon monoxide	7
Ozone	9
Sulfur dioxide	10
Particulate matter as PM ₁₀	11
Lead	12
Particulate matter as PM _{2.5}	12
SECTION C - ANALYSIS OF AIR QUALITY MONITORING	13
Progress Towards Achieving the AAQ NEPM 2008 Goal	13
Circumstances which led to Exceedences	13
Analysis of extent to which standards and goals are met or not met	16
Carbon monoxide	16
Nitrogen dioxide	17
Ozone	18
Sulfur dioxide	19
Particulate matter as PM ₁₀	21
Particulate matter as PM _{2.5}	22
SECTION D - DATA ANALYSIS	23
Carbon monoxide	23
Nitrogen dioxide	24
Ozone.....	26
Sulfur dioxide	30
Particulate matter as PM ₁₀	32
Particulate matter as PM _{2.5}	35

List of Figures

Figure 1	Adelaide region and population density with current monitoring sites. Based on the 2001 census (Australian Bureau of Statistics, 2001).	5
Figure 2	Spencer region and population density with current monitoring sites. Based on the 2001 census (Australian Bureau of Statistics, 2001).	5

List of Tables

Table 1	Summary of South Australian current performance monitoring stations	3
Table 2	Summary of Exposure at South Australian Performance Monitoring Stations	4
Table 3	Compliance with AS 2922-1987 for stations not covered in the monitoring plan	4
Table 4	2007 compliance summary for CO in South Australia	7
Table 5	2007 compliance summary for NO ₂ in South Australia	8
Table 6	2007 compliance summary for O ₃ in South Australia	9
Table 7	2007 compliance summary for SO ₂ in South Australia.....	10
Table 8	2007 compliance summary for PM ₁₀ in South Australia	11
Table 9	2007 compliance summary for Lead in South Australia	12
Table 10	2007 compliance summary for PM _{2.5} in South Australia	12
Table 11	Summary of PM ₁₀ exceedences during 2007 in South Australia	14
Table 12	Summary of SO ₂ exceedences during 2007 in South Australia	15
Table 13	2007 summary statistics for daily peak 8-hour CO in South Australia.....	16
Table 14	2007 summary statistics for daily peak 1-hour NO ₂ in South Australia	17
Table 15	2007 summary statistics for daily peak 1-hour O ₃ in South Australia.....	18
Table 16	2007 summary statistics for daily peak 4-hour O ₃ in South Australia.....	19
Table 17	2007 summary statistics for daily peak 1-hour SO ₂ in South Australia	19
Table 18	2007 summary statistics for daily peak 24-hour SO ₂ in South Australia	20
Table 19	2007 summary statistics for 24-hour PM ₁₀ in South Australia.....	21
Table 20	2007 summary statistics for 24-hour PM _{2.5} in South Australia	22
Table 21	Percentiles of daily peak 8-hour CO concentrations for Adelaide, ADL01 – Tandanya (2006 - 2007)	23
Table 22	Percentiles of daily peak 8-hour CO concentrations for Adelaide, ELI01 – Elizabeth Downs (2002 - 2007)	23
Table 23	Percentiles of daily peak 1-hour NO ₂ concentrations for Adelaide, ELI01-Elizabeth Downs (2002-2007)	24
Table 24	Percentiles of daily peak 1-hour NO ₂ concentrations for NOR01-Northfield Folland Avenue (2002 - 2007)	24
Table 25	Percentiles of daily peak 1-hour NO ₂ concentrations for NET01-Netley (2002 - 2007)	25
Table 26	Percentiles of daily peak 1-hour NO ₂ concentrations for KEN01-Kensington Gardens (2002 - 2007)	25

Table 27	Percentiles of daily peak 1-hour NO ₂ concentrations for CHD01-Christie Downs (2006 - 2007)	25
Table 28	Percentiles of daily peak 1-hour O ₃ concentrations for ELI01-Elizabeth Downs (2002 - 2007)	26
Table 29	Percentiles of daily peak 1-hour O ₃ concentrations for NOR01-Northfield Folland Avenue (2002 - 2007).....	26
Table 30	Percentiles of daily peak 1-hour O ₃ concentrations for NET01-Netley (2002 - 2007)	27
Table 31	Percentiles of daily peak 1-hour O ₃ concentrations for KEN01-Kensington Gardens (2002 - 2007)	27
Table 32	Percentiles of daily peak 1-hour O ₃ concentrations for CHD01-Christie Downs (2006 - 2007)	27
Table 33	Percentiles of daily peak 4-hour rolling O ₃ concentrations for ELI01-Elizabeth Downs (2002 - 2007)	28
Table 34	Percentiles of daily peak 4-hour rolling O ₃ concentrations for NOR01-Northfield Folland Avenue (2002 - 2007).....	28
Table 35	Percentiles of daily peak 4-hour rolling O ₃ concentrations for NET01-Netley (2002 - 2007)	29
Table 36	Percentiles of daily peak 4-hour rolling O ₃ concentrations for KEN01-Kensington Gardens (2002 - 2007).....	29
Table 37	Percentiles of daily peak 4-hour rolling O ₃ concentrations for CHD01-Christie Downs (2006 - 2007)	29
Table 38	Percentiles of daily peak 1-hour SO ₂ concentrations for NOR01-Northfield Folland Avenue (2002 - 2007).....	30
Table 39	Percentiles of daily peak 1-hour SO ₂ concentrations for PTP01-Pt Pirie Oliver Street (2003 - 2007)	31
Table 40	Percentiles of 24-hour SO ₂ concentrations for NOR01-Northfield Folland Avenue (2002 - 2007) .	31
Table 41	Percentiles of 24-hour SO ₂ concentrations for PTP01-Pt Pirie Oliver Street (2003 - 2007).....	32
Table 42	Percentiles of daily 24-hour PM ₁₀ concentrations for ELI01-Elizabeth Downs (2004 - 2007)	32
Table 43	Percentiles of daily 24-hour PM ₁₀ concentrations for KEN01-Kensington Gardens (2002 - 2007)	33
Table 44	Percentiles of daily 24-hour PM ₁₀ concentrations for NET01-Netley (2002 - 2007)	33
Table 45	Percentiles of daily 24-hour PM ₁₀ concentrations for CHD01-Christie Downs (2006 - 2007)	33
Table 46	Percentiles of daily 24-hour PM ₁₀ concentrations for WHY07-Whyalla Schulz Park (2007)	34
Table 47	Percentiles of daily 24-hour PM ₁₀ concentrations for PTP01-Pt Pirie Oliver Street (2002 - 2007) .	34
Table 48	Percentiles of daily 24-hour PM _{2.5} concentrations for NET01-Netley (2004 - 2007)	35

Section A - Monitoring Summary

Air quality in South Australia is monitored in accordance with a monitoring plan developed under the National Environment Protection (Ambient Air Quality) Measure (AAQ NEPM) (NEPC, 1998). This report assesses compliance with this measure.

South Australia's monitoring results for 2006 indicated that:

- Where sufficient data were available to compare with the goals set by the AAQ NEPM (to be achieved by 2008), the goal of AAQ NEPM was met for all pollutants, except for PM₁₀ particles at Netley, 1 hour sulfur dioxide, annual lead and PM₁₀ particles at Port Pirie.
- Where compliance with the standards and the 2008 goal could not be demonstrated through low data capture, it is expected that compliance would otherwise have been achieved, except at Schulz Park Whyalla where one additional exceedence would have resulted in the goal for PM₁₀ particles not being met.
- Exceedences of the PM₁₀ standard were recorded on numerous occasions throughout the state. The majority occurred on hot dry days, accompanied by Northerly winds. Bushfires occurring both within SA and interstate also contributed to the total particle levels.
- In Port Pirie, exceedences of the 1-hour SO₂ standard were recorded thirty three times and exceedences of the 24 hour PM₁₀ standard were recorded on eleven occasions.
- Consistently high data capture rates were achieved in most cases, except where instrument malfunction occurred or sites were decommissioned or installed during the 2007 reporting year.
- During 2007 monitoring was concluded at:
 - Tandanya, Grenfell Street Adelaide (CO)
- During 2007 monitoring stations were commissioned at:
 - Schulz Park, Whyalla as a replacement for Civic Park, Whyalla (PM₁₀)
- Development of monitoring stations continues in order to meet the monitoring requirements specified in the plan. The stations yet to be developed include:
 - Grenfell St Adelaide as a replacement for the now closed Tandanya station
 - North east Adelaide (PM₁₀ and SO₂)
 - Southern wineries (O₃, NO₂, PM₁₀, SO₂)
 - Barossa / Angaston (O₃, NO₂, PM₁₀, SO₂)
 - Riverland (O₃, NO₂, PM₁₀, SO₂)

NOTE: There has been some delay in the planned installation of the above sites. This is due to diversion of resources to meet requirements of the PM_{2.5} variation to the Ambient Air Quality NEPM and associated co-location studies at Netley, which require use of TEOM monitoring units otherwise planned for north eastern Adelaide. It is likely initial assessment of these sites will be through modelling.

Current performance monitoring stations

The AAQ NEPM requires the assessment of carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), sulfur dioxide (SO₂), lead (Pb) and particles less than 10 micrometres in diameter (PM₁₀) (NEPC, 1998). In 2003, the AAQ NEPM was varied to include monitoring of particles less than 2.5 micrometres in diameter (PM_{2.5}).

South Australia's AAQ NEPM air monitoring plan was approved by the NEPC in 2001. Data presented in this report have been produced in accordance with the plan (SA EPA, 2001), which details the stations where air pollutants are measured. Five regions have been identified in the monitoring plan: Adelaide, Spencer, Mount Gambier, Riverland and Barossa. Monitoring is currently being undertaken within the Adelaide and Spencer airsheds.

Performance monitoring stations (PMS) are designated as either trend or campaign stations to indicate the intended duration of monitoring. Trend stations are chosen to monitor pollutant levels over an extended period. Campaign sites are chosen as part of a screening program and may only operate for a short period if the pollutant levels do not warrant ongoing measurement. Figures 1 and 2 below show current monitoring stations and population density within the Adelaide and Spencer regions. The monitoring stations within the Adelaide region represent an exposed population of 1,037,263. Monitoring within the Spencer region represent an exposed population of 53,988 (SA EPA, 2001).

Additions to the monitoring network

The EPA commenced the monitoring of PM₁₀ using the TEOM method at Whyalla, Schulz Park. This station replaced the Civic Park site which measured PM₁₀ by the High Volume Sampler method on a one in six day basis.

In addition, the EPA has continued monitoring of PM_{2.5} at its Netley station using the reference method on a one in three day basis. This is in addition to monitoring PM_{2.5} by Tapered Element Oscillating Microbalance (TEOM) as part of the PM_{2.5} equivalence program.

Table 1 below describes the station type, pollutants monitored, methods used and locations of stations where data were collected for the 2007 reporting year. Table 2 describes compliance of stations with siting criteria not covered in the monitoring plan. Table 3 describes compliance of stations with siting criteria not covered in the monitoring plan.

Table 1 Summary of South Australian current performance monitoring stations

Performance monitoring station	Region (site type)	AAQ NEPM pollutants and method of measurement						
		CO AS3580.7.1 -1992	NO ₂ AS3580.5.1 -1993	O ₃ AS3580.6.1 -1990	SO ₂ AS3580.4.1 -1990	Pb AS2724.3-1984 AS2800-1985	PM ₁₀ AS3580.9.8 -2001	PM _{2.5} AS3580.9.8 -2001 DR 04060
Adelaide								
ELI01-Elizabeth Downs Heard St. Elizabeth Downs	Adelaide (TREND)	×	×	×			×	
NOR01-Northfield Folland Avenue Folland Ave. Hampstead	Adelaide (TREND)		×	×	×			
NET01-Netley Transport Ave. Netley	Adelaide (TREND)		×	×			×	×
KEN01-Kensington Gardens East Tce. Kensington	Adelaide (TREND)		×	×			×	
ADL01-Tandanya Grenfell St. Adelaide	Adelaide (PMS /TREND)	×						
CHD01-Christie Downs Sabina Crescent	Adelaide (Campaign)		×	×			×	
Spencer								
PTP01-Pt Pirie, Oliver Street Oliver St. Port Pirie	Spencer (Campaign)				×	×	×	
PTP05-Pt Pirie, Frank Green Park Senate Rd. Port Pirie	Spencer (TREND)					×		
WHY07-Whyalla, Schulz Park Searle St. Whyalla	Spencer (TREND)						×	

Table 2 Summary of Exposure at South Australian Performance Monitoring Stations

Performance monitoring station	Region (site type / exposed population)
Adelaide	
ELI01-Elizabeth Downs Heard St. Elizabeth Downs	Trend station in a largely residential area within the Northern Adelaide airshed
NOR01-Northfield Folland Avenue Folland Ave. Hampstead	Trend station in a largely residential area within the Central Adelaide airshed
NET01-Netley Transport Ave. Netley	Trend station in a largely residential area within the Central Western Adelaide airshed
KEN01-Kensington Gardens East Tce. Kensington	Trend station in a largely residential area within the Central Eastern Adelaide airshed
ADL01-Tandanya Grenfell St. Adelaide	Trend station within the Central Business District of the Adelaide airshed
CHD01-Christie Downs Sabina Crescent	Campaign station in a largely residential area within the Southern Adelaide airshed
Spencer	
PTP01-Pt Pirie, Oliver Street Oliver St. Port Pirie	Campaign station in a largely residential area within an industrial township in the Spencer airshed
PTP05-Pt Pirie, Frank Green Park Senate Rd. Port Pirie	Trend station in a largely residential area within an industrial township in the Spencer airshed
WHY07-Whyalla, Schulz Park McLennan Ave. Whyalla Norrie	Trend station in a largely residential area within an industrial township in the Spencer airshed

Table 3 Compliance with AS 2922-1987 for stations not covered in the monitoring plan

Region, Site Name	Height Above Ground	Min. Distance to Support Structure	Clear Sky Angle of 120°	Unrestricted Airflow 270/360	20m From Trees	No Boiler or Incinerators Nearby	Min Distance from Road or Traffic	Comments
Adelaide								
ADL01-Tandanya, Grenfell Street Adelaide	✓	✓	✗	✗	✗	✓	✗	
CHD01-Christie Downs, Sabina Crescent Christie Downs	✓	✓	✓	✓	✓	✗	✓	
Spencer								
WHY07-Whyalla, Schulz Park McLennan Ave. Whyalla Norrie	✓	✓	✓	✓	✓	✓	✓	This site was originally WHY05 - Civic Park and was moved to comply with the standard. The HVS method was replaced with TEOM

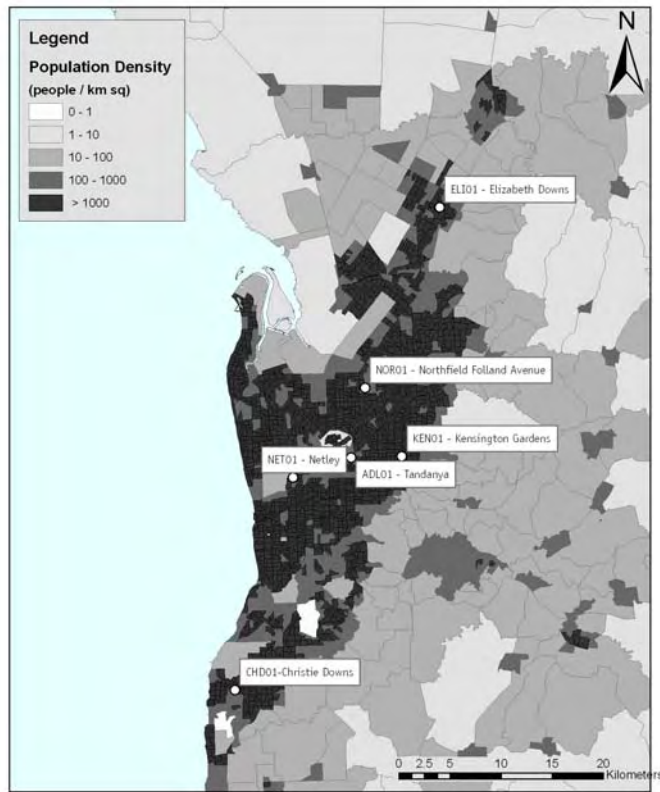


Figure 1 Adelaide region and population density with current monitoring sites. Based on the 2001 census (Australian Bureau of Statistics, 2001).

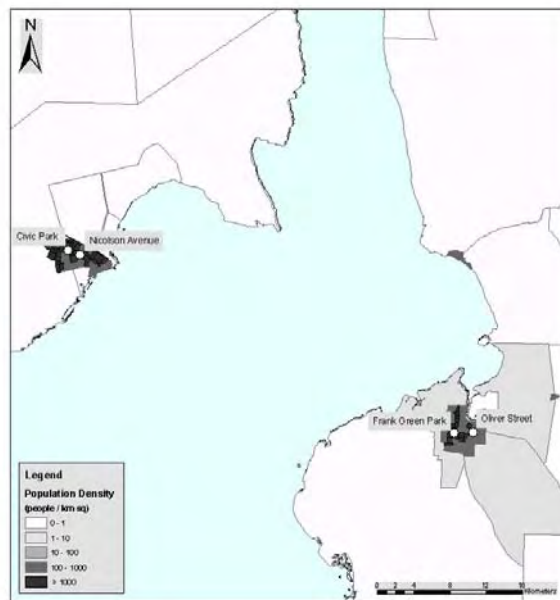


Figure 2 Spencer region and population density with current monitoring sites. Based on the 2001 census (Australian Bureau of Statistics, 2001).

Note: map does not include Port Augusta as monitoring did not occur during 2007

NATA status

The South Australian Environment Protection Authority operates all monitoring stations described in this report. The EPA obtained NATA accreditation of its monitoring network and laboratory in February of 2006 (accreditation number 15220).

Section B - Assessment of Compliance with Standards and 2008 Goal

Tables 4 to 10 provide information for compliance assessment required under the AAQ NEPM. The AAQ NEPM standards and goals are specified in Schedule 2 of the NEPM. The AAQ NEPM goal is to achieve the standards to the extent specified by 2008 (NEPC, 1998).

Performance is assessed as meeting the standards and 2008 goal if the number of exceedences of the standard is no more than the number specified in Schedule 2 of the AAQ NEPM, and data recovery was at least 75% in each quarter of the year (NEPC, 1998).

If insufficient data are collected to demonstrate that the standards and goal have or have not been met, performance is assessed as 'not demonstrated' (NEPC, 2002).

Calculations and reporting methods used, comply with requirements detailed in the NEPC Peer Review Committee, Technical Paper No 8: Annual Reports (NEPC, 2002).

PM₁₀ data reported as 'TEOM data' indicate data which has undergone an internal correction factor for US EPA equivalency and without subsequent treatment, as specified in Option 4 of PRC technical paper No 10 - Collection and reporting of TEOM PM₁₀ Data (NEPM PRC, 2001).

Carbon monoxide

Table 4 2007 compliance summary for CO in South Australia

AAQ NEPM Standard 9.0 ppm (8-hr average)

Region performance monitoring station/s	Data availability rates (% hours)				Annual	Number of exceedences (days)	Performance against the standards and goal
	Q1	Q2	Q3	Q4			
Adelaide							
*ADL01- Tandanya	84	0	0	0	21	0	ND
ELI01-Elizabeth Downs	100	99	100	100	100	0	Met

ND: Not Demonstrated as greater than 75% valid data capture was not achieved for all four quarters

*Monitoring at ADL01 - Tandanya Adelaide ceased in March 2007 due to site failure. A replacement site is being planned for 2008

Nitrogen dioxide

Table 5 2007 compliance summary for NO₂ in South Australia

AAQ NEPM Standard 0.12 ppm (1-hr average), 0.03 ppm (1-yr average)

Region performance monitoring station/s	Data availability rates (% of hours)					Number of exceedences (days)	Annual mean (ppm)	Performance against the standards and goal	
	Q1	Q2	Q3	Q4	Annual			1-hour	1-year
Adelaide									
ELI01-Elizabeth Downs	92	98	98	90	94	0	0.003	Met	Met
NOR01-Northfield Folland Avenue	94	97	97	94	96	0	0.006	Met	Met
NET01-Netley	98	97	97	97	97	0	0.009	Met	Met
KEN01-Kensington Gardens	96	97	96	85	94	0	0.005	Met	Met
CHD01-Christie Downs	98	98	98	94	97	0	0.005	Met	Met

* Whyalla is a regional centre, all other sites are within the Adelaide metropolitan area.

ND: Compliance with the Goal is Not Demonstrated, as greater than 75% valid data capture was not achieved for all four quarters

Ozone

Table 6 2007 compliance summary for O₃ in South Australia

AAQ NEPM Standards 0.10 ppm (1-hr average), 0.08 ppm (4-hr average)

Region performance monitoring station/s	Data availability rates (% of hours)					Number of exceedences (days)		Performance against the standards and goal	
	Q1	Q2	Q3	Q4	Annual	1-hour	4-hour	1-hour	4-hour
Adelaide									
ELI01-Elizabeth Downs	98	97	98	97	98	0	0	Met	Met
NOR01- Northfield Folland Avenue	98	97	97	97	97	0	0	Met	Met
NET01-Netley	98	97	98	97	97	0	0	Met	Met
KEN01- Kensington Gardens	97	97	97	90	96	0	0	Met	Met
CHD01-Christie Downs	97	98	98	94	97	0	0	Met	Met

ND: Compliance with the Goal is Not Demonstrated, as greater than 75% valid data capture was not achieved for all four quarters

Sulfur dioxide

Table 7 2007 compliance summary for SO₂ in South Australia

AAQ NEPM Standards 0.20 ppm (1-hr average), 0.08 ppm (24-hr average), 0.02 ppm (1-yr average)

Region performance monitoring station/s	Data availability rates (% of hours)					Number of exceedences (days)		Annual 1h mean (ppm)	Performance against the standards and goal		
	Q1	Q2	Q3	Q4	Annual	1-hr	24-hr		1-hr	24-hr	1-yr
Adelaide											
NOR01- Northfield Folland Avenue	98	97	97	93	96	0	0	0.000	Met	Met	Met
Spencer											
*PTP01-Pt Pirie Oliver Street	97	98	97	97	97	29	0	0.009	Not met	Met	Met

* Pt Pirie is a regional centres, all other sites are within the Adelaide metropolitan area.

ND: Compliance with the Goal is Not Demonstrated, as greater than 75% valid data capture was not achieved for all four quarters

Particulate matter as PM₁₀

Table 8 2007 compliance summary for PM₁₀ in South AustraliaAAQ NEPM Standard 50 µg/m³ (24-hr average)

Region performance monitoring station/s	Data availability rates (% of days)				Annual	Number of exceedences (days)	Performance against the standards and goal
	Q1	Q2	Q3	Q4			
Adelaide							
ELI01-Elizabeth Downs	90	98	100	100	97	3	Met
KEN01- Kensington Gardens	81	96	100	90	92	1	Met
NET01-Netley	90	100	100	90	95	11	Not Met
CHD01-Christie Downs	94	97	88	91	93	3	Met
Spencer							
*WHY07-Whyalla Schulz Park	0	71	100	95	67	5	ND
*PTP01-Pt Pirie Oliver Street	97	100	98	96	98	11	Not Met

*Pt Pirie and Whyalla are regional centres; all other sites are located in Adelaide.

ND: Compliance with the Goal is Not Demonstrated, as greater than 75% valid data capture was not achieved for all four quarters

Lead

Table 9 2007 compliance summary for Lead in South Australia

AAQ NEPM Standard $0.50 \mu\text{g}/\text{m}^3$ (1-yr average)

Region performance monitoring station/s	Data availability rates (% of days)				Annual	Annual mean ($\mu\text{g}/\text{m}^3$)	Performance against the standards and goal
	Q1	Q2	Q3	Q4			
Spencer							
*PTP05-Pt Pirie Frank Green Park	100	100	94	100	98	0.18	Met
*PTP01-Pt Pirie Oliver Street	100	100	100	100	100	0.51	Not Met

*Pt Pirie is a regional centre.

Lead data is reported to ambient conditions and analyses were carried out by NATA accredited facilities at the Pathology Queensland Health Scientific Services.

Particulate matter as PM_{2.5}

Table 10 2007 compliance summary for PM_{2.5} in South Australia

AAQ NEPM Advisory Reporting Standard $25 \mu\text{g}/\text{m}^3$ (24-hr average), $8 \mu\text{g}/\text{m}^3$ (1-yr average)

Region performance monitoring station/s	Data availability rates (% of days)				Annual	Annual Mean ($\mu\text{g}/\text{m}^3$)
	Q1	Q2	Q3	Q4		
Adelaide						
^NET01-Netley	33	7	28	27	24	6
*NET01-Netley	98	100	100	97	99	8

^Indicates monitoring by one-day-in-three partisol monitoring (Maximum data availability rate is 33%)

*Indicates monitoring by Tapered Element Oscillating Microbalance (TEOM)

Section C - Analysis of Air Quality Monitoring

Progress Towards Achieving the AAQ NEPM 2008 Goal

As assessed against the National Environment Protection (Ambient Air Quality) Measure (NEPM, 1998), the following observations were made for 2007:

- For CO, the standard and goal was met at the Elizabeth station but not demonstrated at the Tandanya station
- For NO₂, the standards and goals were met at all stations
- For O₃, the standards and goals were met at all
- For SO₂ the 1h standard and goal was not met at Port Pirie, Oliver Street. All other stations met the standard and goal
- For PM₁₀ in the Adelaide region, the standard was exceeded on three occasions at the Elizabeth station on one occasion at the Kensington station, on three occasions at the Christie Downs station and on eleven occasions at the Netley station. For the Spencer region, the standard was not met on five occasions at Whyalla, Schulz Park and on eleven occasions at Port Pirie, Oliver Street. The goal was not demonstrated at the newly installed Schulz Park monitoring station and not met at Netley and Port Pirie, Oliver Street. The goal was met for all other stations for this reporting period.
- For Pb, the annual standard and goal was met at Frank Green Park but not met at Oliver Street
- For PM_{2.5} the 1h advisory reporting standard was exceeded at Netley, the one station where monitoring was conducted.
- There were instances where compliance with the goal could not be demonstrated, shown as 'ND'. For example, compliance of CO at Tandanya and PM₁₀ at the Whyalla Schulz Park monitoring stations was assessed as 'not demonstrated'. This was due to insufficient data recovery caused by sites being installed or decommissioned part way through the year.

Circumstances which led to Exceedences

Exceedences of the PM₁₀ standard occurred on a number of occasions throughout the state. This was often associated with dry days, coupled with strong northerly winds. Bushfires occurring both within SA and interstate also contributed to the total particle levels. Table 11 below summarises dates and times of exceedences occurring during the 2007 reporting year.

Exceedences of the SO₂ standard and goal occurred at Port Pirie. These exceedences were due to emissions from a major lead and zinc smelter located within the region, coupled with suitable meteorological conditions. Table 12 summarises dates and times of exceedences occurring during the 2007 reporting year.

Table 11 Summary of PM₁₀ exceedences during 2007 in South AustraliaAAQ NEPM Standard 50 µg/m³ (24-hr average)

Date of Exceedence (dd mon)	Region / Site and Exceedence Value (ug/m3)						
	Adelaide Region				Spencer Region		
	ELI01- Elizabeth Downs	KENO1- Kensington Gardens	NET01- Netley	Inferred Cause	WHY07- Whyalla Schulz Park	PTPO1-Pt Pirie Oliver Street	Inferred Cause
10 Jan	51.9		91.5	Dusty day			
16 Jan			54.3	Smoke Haze		56.3	Smoke Haze
05 Feb						64.5	Dusty day
12 Feb						52.1	Dusty day
18 Feb			77.2			62.6	Dusty day
23 Feb						73.7	Dusty day
12 Mar						61.1	Dusty day
14 Mar			56.1	Dusty day			
27 Mar			62.8	Dusty day			
27 Aug			77.9	Dusty day			
30 Aug			86.0	Dusty day	57.2	63.0	Dusty day
21 Oct			57.2	Dusty day	65.6	75.5	Dusty day
27 Oct	54.9		82.3	Dusty day	97.2	173.8	Dusty day
28 Oct					59.2		Dusty day
20 Nov						58.0	Dusty day
06 Dec	74.9	51.1	125.9	Dusty day	75.4	76.3	Dusty day
14 Dec			56.6	Smoke Haze			

Table 12 Summary of SO₂ exceedences during 2007 in South Australia

AAQ NEPM Standard 0.20 ppm (1-hr average)

Date / time of Exceedence (dd mon hh:mm)	Region / Site and Exceedence Value (ug/m3)		Date / time of Exceedence (dd mon hh:mm)	Region / Site and Exceedence Value (ug/m3)	
	Spencer Region			Spencer Region	
	PTP01-Pt Pirie Oliver Street	Inferred Cause		PTP01-Pt Pirie Oliver Street	Inferred Cause
01 Jan 12:00	0.452	Industrial	07 Sep 13:00	0.316	Industrial
09 Jan 10:00	0.417	Industrial	24 Sep 12:00	0.256	Industrial
15 Jan 10:00	0.218	Industrial	01 Oct 15:00	0.269	Industrial
01 Feb 10:00	0.396	Industrial	04 Oct 11:00	0.365	Industrial
02 Mar 16:00	0.594	Industrial	14 Oct 16:00	0.365	Industrial
21 Mar 11:00	0.298	Industrial	17 Oct 15:00	0.277	Industrial
01 Apr 12:00	0.249	Industrial	20 Oct 13:00	0.279	Industrial
16 Apr 17:00	0.273	Industrial	23 Oct 13:00	0.228	Industrial
06 May 13:00	0.301	Industrial	08 Nov 09:00	0.211	Industrial
12 May 12:00	0.275	Industrial	11 Nov 10:00	0.226	Industrial
15 Jul 14:00	0.242	Industrial	13 Dec 19:00	0.247	Industrial
21 Jul 13:00	0.249	Industrial	28 Dec 17:00	0.268	Industrial
10 Aug 05:00	0.560	Industrial			
19 Aug 13:00	0.212	Industrial			
22 Aug 12:00	0.280	Industrial			
24 Aug 10:00	0.224	Industrial			
26 Aug 17:00	0.217	Industrial			

Analysis of extent to which standards and goals are met or not met

Annual summary statistics described in tables 13 to 20 below allow assessment of air quality against the standards and the extent of compliance with the goal. Instances where the standard or goal has been exceeded are highlighted in bold. The AAQ NEPM states that the short-term standards should not be exceeded on more than one day for CO, NO₂, O₃, SO₂ and on no more than five days per year for PM₁₀ (NEPC, 2002). The second highest daily value for the year (or the sixth for PM₁₀) indicates the extent to which the standards are or are not met.

Carbon monoxide

Table 13 2007 summary statistics for daily peak 8-hour CO in South Australia

AAQ NEPM Standard 9.0 ppm (8-hr rolling average)

Region performance monitoring station/s	Number of valid days	Highest (ppm)	Highest (dd mon hh:mm)	2nd highest (ppm)	2nd highest (dd mon hh:mm)
Adelaide					
ADL01-Tandanya	80	2.2	26 Feb 18:00	2.1	23 Feb 13:00, 01 Feb 13:00
ELI01-Elizabeth Downs	365	0.64	03 Jun 02:00	0.38	04 Jun 01:00

Nitrogen dioxide

Table 14 2007 summary statistics for daily peak 1-hour NO₂ in South Australia

AAQ NEPM Standard 0.12 ppm (1-hr average)

Region performance monitoring station/s	Number of valid days	Highest (ppm)	Highest (dd mon hh:mm)	2nd highest (ppm)	2nd highest (dd mon hh:mm)
Adelaide					
ELI01-Elizabeth Downs	356	0.039	05 Feb 09:00	0.030	21 Oct 21:00
NOR01-Northfield Folland Avenue	361	0.037	14 Mar 00:00, 24 Apr 20:00	0.037	
NET01-Netley	365	0.040	13 Apr 20:00, 16 Nov 22:00	0.040	
KEN01-Kensington Gardens	357	0.035	05 Feb 09:00	0.033	13 Feb 10:00
CHD01-Christie Downs	364	0.038	13 Apr 19:00	0.037	24 Apr 20:00

Ozone

Table 15 2007 summary statistics for daily peak 1-hour O₃ in South Australia

AAQ NEPM Standard 0.10 ppm (1-hr average)

Region performance monitoring station/s	Number of valid days	Highest (ppm)	Highest (dd mon hh:mm)	2 nd highest (ppm)	2 nd highest (dd mon hh:mm)
Adelaide					
ELI01-Elizabeth Downs	365	0.082	01 Dec 15:00	0.080	03 Feb 13:00
NOR01- Northfield Folland Avenue	365	0.069	05 Feb 12:00	0.064	04 Feb 14:00
NET01-Netley	365	0.077	04 Feb 13:00	0.063	30 Dec 12:00
KEN01- Kensington Gardens	362	0.076	30 Dec 11:00	0.068	03 Feb 12:00, 05 Feb 12:00
CHD01-Christie Downs	364	0.074	30 Dec 13:00	0.061	04 Feb 17:00

Table 16 2007 summary statistics for daily peak 4-hour O₃ in South Australia

AAQ NEPM Standard 0.08 ppm (4-hr average)

Region performance monitoring station/s	Number of valid days	Highest (ppm)	Highest (dd mon hh:mm)	2nd highest (ppm)	2nd highest (dd mon hh:mm)
Adelaide					
ELI01-Elizabeth Downs	365	0.078	01 Dec 16:00	0.074	03 Feb 15:00
NOR01- Northfield Folland Avenue	365	0.059	05 Feb 14:00	0.056	03 Feb 15:00, 01 Dec 16:00
NET01-Netley	365	0.070	04 Feb 15:00	0.057	27 Nov 17:00, 30 Dec 14:00
KEN01- Kensington Gardens	362	0.063	03 Feb 15:00, 30 Dec 13:00	0.063	
CHD01-Christie Downs	364	0.060	04 Feb 17:00, 30 Dec 14:00	0.060	

Sulfur dioxide

Table 17 2007 summary statistics for daily peak 1-hour SO₂ in South Australia

AAQ NEPM Standard 0.20 ppm (1-hr average)

Region performance monitoring station/s	Number of valid days	Highest (ppm)	Highest (dd mon hh: mm)	2nd highest (ppm)	2nd highest (dd mon hh: mm)
Adelaide					
NOR01- Northfield Folland Avenue	362	0.008	26 May 02:00, 25 Jun 09:00	0.008	
Spencer					
PTP01-Pt Pirie Oliver Street	365	0.594	02 Mar 16:00	0.560	10 Aug 05:00

Table 18 2007 summary statistics for daily peak 24-hour SO₂ in South Australia

AAQ NEPM Standard 0.08 ppm (24-hr average)

Region performance monitoring station/s	Number of valid days	Highest (ppm)	Highest (dd mon)	2nd highest (ppm)	2nd highest (dd mon)
Adelaide					
NOR01- Northfield Folland Avenue	360	0.002	25 May, 26 May	0.002	
Spencer					
PTP01-Pt Pirie Oliver Street	361	0.061	26 Aug, 14 Oct	0.061	

Particulate matter as PM₁₀

Table 19 2007 summary statistics for 24-hour PM₁₀ in South Australia

AAQ NEPM Standard 50 µg/m³ (24-hr average)

Region performance monitoring station/s	Number of valid days	Highest (µg/m ³)	Highest (dd mon)	6th highest (µg/m ³)	6th highest (dd mon)
Adelaide					
ELI01-Elizabeth Downs	354	74.9	06 Dec	42.1	15 Mar
KEN01- Kensington Gardens	335	51.1	06 Dec	41.3	18 Oct
NET01-Netley	347	125.9	06 Dec	77.2	18 Feb
CHD01-Christie Downs	338	70.5	06 Dec	41.4	21 Oct
Spencer					
*WHY05-Whyalla Schulz Park	244	97.2	27 Oct	50.0	25 Sep
PTP01-Pt Pirie Oliver Street	356	173.8	27 Oct	63.0	30 Aug

Particulate matter as PM_{2.5}

Table 20 2007 summary statistics for 24-hour PM_{2.5} in South Australia

AAQ NEPM Advisory Reporting Standard 25 µg/m³ (24-hr average)

Region performance monitoring station/s	Number of valid days	Highest (µg/m ³)	Highest (dd mon)	6th highest (µg/m ³)	6th highest (dd mon)
Adelaide					
^NET01-Netley	87	28.6	14 Feb	9.9	19 Aug, 03 Oct
*NET01-Netley	362	21.9	14 Dec	13.8	17 Nov

^Indicates monitoring by one –day-in-three partisol monitoring

*Indicates monitoring by Tapered Element Oscillating Microbalance (TEOM).

Section D - Data Analysis

Tables 21 to 47 provide results of additional analyses of daily peak values, including percentiles of daily peak concentrations. Where available, trend data has been included. Percentile data for 2002 has been recalculated from daily maxima as required in PRC technical paper number 8 (2002).

Carbon monoxide

Table 21 Percentiles of daily peak 8-hour CO concentrations for Adelaide, ADL01 – Tandanya (2006 - 2007)

AAQ NEPM Standard 9.0 ppm (8-hr average)

Region	Data availability (% of days)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Adelaide								
ADL01-Tandanya								
2006	24	2.5	2.4	2.2	2.0	1.6	1.3	1.0
2007	21	2.2	2.1	2.1	1.9	1.8	1.5	1.1

Table 22 Percentiles of daily peak 8-hour CO concentrations for Adelaide, ELI01 – Elizabeth Downs (2002 - 2007)

AAQ NEPM Standard 9.0 ppm (8-hr average)

Region	Data availability (% of days)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Adelaide								
ELI01-Elizabeth Downs								
2002	84	0.8	0.7	0.6	0.4	0.3	0.2	0.1
2003	92	1.4	0.8	0.7	0.5	0.4	0.2	0.1
2004	98	0.8	0.6	0.5	0.4	0.3	0.2	0.1
2005	94	0.8	0.6	0.4	0.4	0.3	0.1	0.1
2006	86	0.7	0.5	0.4	0.3	0.2	0.1	0.0
2007	100	0.6	0.4	0.3	0.3	0.2	0.1	0.0

Nitrogen dioxide

Table 23 Percentiles of daily peak 1-hour NO₂ concentrations for Adelaide, ELI01-Elizabeth Downs (2002-2007)

AAQ NEPM Standard 0.12 ppm (1-hr average)

Region	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Adelaide								
ELI01-Elizabeth Downs								
2002	94	0.040	0.034	0.033	0.029	0.026	0.022	0.014
2003	97	0.043	0.030	0.028	0.025	0.022	0.019	0.011
2004	95	0.037	0.031	0.029	0.025	0.023	0.019	0.012
2005	95	0.038	0.031	0.028	0.025	0.023	0.019	0.011
2006	89	0.043	0.030	0.029	0.026	0.023	0.017	0.011
2007	94	0.039	0.026	0.025	0.023	0.021	0.017	0.011

Table 24 Percentiles of daily peak 1-hour NO₂ concentrations for NOR01-Northfield Folland Avenue (2002 - 2007)

AAQ NEPM Standard 0.12 ppm (1-hr average)

Region	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Adelaide								
NOR01-Northfield Folland Avenue								
2002	94	0.047	0.038	0.033	0.031	0.028	0.024	0.018
2003	95	0.039	0.035	0.032	0.031	0.028	0.024	0.017
2004	96	0.045	0.038	0.033	0.029	0.026	0.023	0.017
2005	94	0.039	0.035	0.033	0.030	0.028	0.024	0.018
2006	93	0.034	0.031	0.030	0.028	0.025	0.021	0.016
2007	96	0.037	0.034	0.032	0.029	0.027	0.023	0.017

Table 25 Percentiles of daily peak 1-hour NO₂ concentrations for NET01-Netley (2002 - 2007)

AAQ NEPM Standard 0.12 ppm (1-hr average)

Region	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Adelaide								
NET01-Netley								
2002	84	0.050	0.042	0.037	0.035	0.032	0.028	0.023
2003	97	0.039	0.036	0.035	0.032	0.029	0.026	0.021
2004	96	0.103	0.041	0.038	0.034	0.030	0.026	0.021
2005	97	0.051	0.042	0.037	0.034	0.031	0.028	0.022
2006	95	0.054	0.037	0.036	0.033	0.030	0.027	0.021
2007	97	0.040	0.038	0.036	0.032	0.030	0.028	0.023

Table 26 Percentiles of daily peak 1-hour NO₂ concentrations for KEN01-Kensington Gardens (2002 - 2007)

AAQ NEPM Standard 0.12 ppm (1-hr average)

Region	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Adelaide								
KEN01-Kensington Gardens								
2002	94	0.041	0.030	0.030	0.028	0.025	0.022	0.015
2003	97	0.040	0.034	0.031	0.026	0.024	0.021	0.014
2004	96	0.037	0.032	0.028	0.025	0.023	0.019	0.013
2005	97	0.031	0.029	0.027	0.026	0.024	0.019	0.013
2006	96	0.037	0.028	0.027	0.025	0.022	0.018	0.013
2007	94	0.035	0.030	0.029	0.026	0.023	0.020	0.014

Table 27 Percentiles of daily peak 1-hour NO₂ concentrations for CHD01-Christie Downs (2006 - 2007)

AAQ NEPM Standard 0.12 ppm (1-hr average)

Region	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Adelaide								
CHD01- Christie Downs								
2006	69	0.033	0.024	0.023	0.020	0.016	0.008	0.003
2007	97	0.038	0.031	0.030	0.027	0.025	0.020	0.013

Ozone

Table 28 Percentiles of daily peak 1-hour O₃ concentrations for ELI01-Elizabeth Downs (2002 – 2007)

AAQ NEPM Standard 0.10 ppm (1-hr average)

Region	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Adelaide								
ELI01-Elizabeth Downs								
2002	95	0.072	0.062	0.053	0.045	0.040	0.033	0.030
2003	97	0.077	0.064	0.059	0.050	0.042	0.034	0.029
2004	96	0.088	0.065	0.055	0.046	0.041	0.033	0.029
2005	97	0.062	0.057	0.050	0.041	0.036	0.032	0.029
2006	90	0.072	0.061	0.055	0.051	0.040	0.035	0.029
2007	98	0.082	0.070	0.065	0.051	0.045	0.035	0.030

Table 29 Percentiles of daily peak 1-hour O₃ concentrations for NOR01-Northfield Folland Avenue (2002 – 2007)

AAQ NEPM Standard 0.10 ppm (1-hr average)

Region	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Adelaide								
NOR01-Northfield Avenue		Folland						
2002	98	0.080	0.060	0.051	0.045	0.040	0.033	0.029
2003	97	0.068	0.060	0.054	0.047	0.042	0.033	0.028
2004	94	0.081	0.065	0.058	0.045	0.040	0.033	0.028
2005	94	0.060	0.049	0.045	0.040	0.036	0.031	0.028
2006	95	0.067	0.053	0.050	0.043	0.038	0.031	0.027
2007	97	0.069	0.060	0.054	0.047	0.042	0.033	0.029

Table 30 Percentiles of daily peak 1-hour O₃ concentrations for NET01-Netley (2002 - 2007)

AAQ NEPM Standard 0.10 ppm (1-hr average)

Region Adelaide	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
NET01-Netley								
2002	98	0.087	0.056	0.048	0.042	0.037	0.031	0.028
2003	97	0.069	0.059	0.054	0.045	0.039	0.032	0.027
2004	98	0.067	0.056	0.049	0.044	0.037	0.032	0.028
2005	97	0.079	0.054	0.049	0.041	0.037	0.032	0.028
2006	95	0.105	0.058	0.054	0.043	0.038	0.031	0.028
2007	97	0.077	0.055	0.052	0.046	0.040	0.033	0.029

Table 31 Percentiles of daily peak 1-hour O₃ concentrations for KEN01-Kensington Gardens (2002 - 2007)

AAQ NEPM Standard 0.10 ppm (1-hr average)

Region Adelaide	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
KEN01-Kensington Gardens								
2002	96	0.086	0.057	0.053	0.046	0.042	0.035	0.030
2003	97	0.074	0.065	0.058	0.049	0.042	0.034	0.029
2004	97	0.078	0.067	0.062	0.047	0.041	0.033	0.029
2005	98	0.061	0.053	0.051	0.044	0.039	0.034	0.031
2006	96	0.090	0.061	0.057	0.048	0.040	0.033	0.029
2007	96	0.076	0.062	0.058	0.051	0.045	0.034	0.030

Table 32 Percentiles of daily peak 1-hour O₃ concentrations for CHD01-Christie Downs (2006 - 2007)

AAQ NEPM Standard 0.10 ppm (1-hr average)

Region Adelaide	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
CHD01-Christie Downs								
2006	66	0.055	0.050	0.046	0.040	0.037	0.033	0.030
2007	97	0.074	0.054	0.053	0.046	0.040	0.034	0.030

Table 33 Percentiles of daily peak 4-hour rolling O₃ concentrations for ELI01-Elizabeth Downs (2002 - 2007)

AAQ NEPM Standard 0.08 ppm (4-hr rolling average)

Region	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Adelaide								
ELI01-Elizabeth Downs								
2002	96	0.057	0.046	0.044	0.039	0.037	0.032	0.029
2003	99	0.063	0.056	0.052	0.045	0.040	0.032	0.028
2004	98	0.079	0.056	0.051	0.042	0.037	0.032	0.027
2005	99	0.056	0.049	0.044	0.038	0.034	0.030	0.028
2006	92	0.065	0.051	0.049	0.045	0.038	0.033	0.028
2007	100	0.078	0.063	0.056	0.048	0.042	0.033	0.029

Table 34 Percentiles of daily peak 4-hour rolling O₃ concentrations for NOR01-Northfield Folland Avenue (2002 - 2007)

AAQ NEPM Standard 0.08 ppm (4-hr rolling average)

Region	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Adelaide								
NOR01-Northfield Avenue		Folland						
2002	99	0.064	0.052	0.046	0.041	0.036	0.031	0.028
2003	100	0.061	0.053	0.047	0.044	0.038	0.031	0.027
2004	96	0.067	0.058	0.049	0.041	0.038	0.032	0.027
2005	96	0.054	0.046	0.041	0.036	0.035	0.030	0.027
2006	97	0.058	0.048	0.045	0.040	0.035	0.030	0.026
2007	100	0.059	0.054	0.052	0.044	0.040	0.032	0.028

Table 35 Percentiles of daily peak 4-hour rolling O₃ concentrations for NET01-Netley (2002 - 2007)

AAQ NEPM Standard 0.08 ppm (4-hr rolling average)

Region	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Adelaide								
NET01-Netley								
2002	99	0.071	0.050	0.044	0.038	0.034	0.030	0.027
2003	99	0.060	0.053	0.047	0.042	0.037	0.030	0.027
2004	100	0.059	0.048	0.044	0.040	0.036	0.031	0.027
2005	99	0.072	0.048	0.044	0.038	0.034	0.030	0.027
2006	97	0.094	0.052	0.047	0.041	0.036	0.030	0.027
2007	100	0.070	0.051	0.050	0.044	0.038	0.032	0.028

Table 36 Percentiles of daily peak 4-hour rolling O₃ concentrations for KEN01-Kensington Gardens (2002 - 2007)

AAQ NEPM Standard 0.08 ppm (4-hr rolling average)

Region	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Adelaide								
KEN01-Kensington Gardens								
2002	97	0.073	0.051	0.047	0.041	0.038	0.033	0.029
2003	99	0.071	0.054	0.051	0.045	0.040	0.032	0.028
2004	99	0.071	0.059	0.054	0.043	0.038	0.031	0.028
2005	100	0.055	0.050	0.044	0.040	0.037	0.032	0.029
2006	99	0.072	0.055	0.051	0.044	0.039	0.032	0.028
2007	98	0.063	0.058	0.054	0.047	0.043	0.033	0.029

Table 37 Percentiles of daily peak 4-hour rolling O₃ concentrations for CHD01-Christie Downs (2006 - 2007)

AAQ NEPM Standard 0.08 ppm (4-hr rolling average)

Region	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Adelaide								
CHD01-Christie Downs								
2006	66	0.049	0.047	0.042	0.038	0.035	0.032	0.029
2007	98	0.060	0.052	0.050	0.044	0.038	0.033	0.029

Sulfur dioxide

Table 38 Percentiles of daily peak 1-hour SO₂ concentrations for NOR01-Northfield Folland Avenue (2002 – 2007)

AAQ NEPM Standard 0.20 ppm (1-hr average)

Region	Data availability (% of hours)	Max (ppm)	99th percentile (ppm)	98 th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Adelaide								
NOR01-Northfield Avenue	Folland							
2002	15	0.027	0.024	0.020	0.013	0.010	0.005	0.003
2003	95	0.009	0.007	0.006	0.005	0.004	0.002	0.001
2004	93	0.012	0.007	0.006	0.004	0.003	0.001	0.001
2005	93	0.015	0.008	0.006	0.004	0.003	0.001	0.001
2006	94	0.020	0.005	0.004	0.003	0.002	0.002	0.001
2007	96	0.008	0.006	0.005	0.003	0.002	0.001	0.001

Table 39 Percentiles of daily peak 1-hour SO₂ concentrations for PTP01-Pt Pirie Oliver Street (2003 – 2007)

AAQ NEPM Standard 0.20 ppm (1-hr average)

Region Spencer	Data availability (% of hours)	Max (ppm)	99th percentile (ppm)	98 th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
PTP01-Pt Pirie Oliver Street								
2002	51	0.656	0.400	0.302	0.257	0.186	0.095	0.028
2003	96	0.487	0.388	0.309	0.221	0.152	0.070	0.023
2004	97	0.440	0.356	0.335	0.260	0.185	0.078	0.020
2005	94	0.721	0.391	0.362	0.234	0.186	0.105	0.042
2006	96	0.485	0.361	0.311	0.240	0.191	0.092	0.018
2007	97	0.594	0.404	0.312	0.249	0.175	0.101	0.029

Table 40 Percentiles of 24-hour SO₂ concentrations for NOR01-Northfield Folland Avenue (2002 – 2007)

AAQ NEPM Standard 0.08 ppm (24-hr average)

Region Adelaide	Data availability (% of days)	Max (ppm)	99th percentile (ppm)	98 th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
NOR01-Northfield Avenue		Folland						
2002	54	0.007	0.006	0.005	0.005	0.004	0.002	0.001
2003	99	0.003	0.002	0.002	0.002	0.001	0.001	0.000
2004	96	0.003	0.002	0.001	0.001	0.001	0.001	0.000
2005	96	0.004	0.002	0.002	0.001	0.000	0.000	0.000
2006	96	0.003	0.002	0.001	0.001	0.001	0.000	0.000
2007	99	0.002	0.001	0.001	0.001	0.000	0.000	0.000

Table 41 Percentiles of 24-hour SO₂ concentrations for PTP01-Pt Pirie Oliver Street (2003 – 2007)

AAQ NEPM Standard 0.08 ppm (24-hr average)

Region	Data availability (% of days)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
PTP01-Pt Pirie Oliver Street								
2002	52	0.050	0.045	0.040	0.035	0.029	0.013	0.005
2003	97	0.095	0.043	0.037	0.024	0.018	0.011	0.004
2004	100	0.051	0.039	0.037	0.028	0.022	0.011	0.003
2005	95	0.072	0.054	0.049	0.033	0.023	0.014	0.005
2006	98	0.053	0.043	0.040	0.032	0.023	0.013	0.002
2007	99	0.061	0.044	0.042	0.032	0.024	0.014	0.004

Particulate matter as PM₁₀

Table 42 Percentiles of daily 24-hour PM₁₀ concentrations for ELI01-Elizabeth Downs (2004 – 2007)AAQ NEPM Standard 50 µg/m³ (24-hr average)

Region	Data availability rates (%)	Max (µg/m ³)	99th percentile (µg/m ³)	98th percentile (µg/m ³)	95th percentile (µg/m ³)	90th percentile (µg/m ³)	75th percentile (µg/m ³)	50th percentile (µg/m ³)
ELI01-Elizabeth Downs								
2004	55	63.9	39.1	33.5	26.8	22.3	16.1	12.4
2005	95	84.8	58.8	48.5	38.2	30.0	21.7	14.9
2006	92	90.4	49.3	44.8	30.4	23.0	17.3	13.0
2007	97	74.9	47.2	41.9	31.9	25.9	19.5	13.5

Table 43 Percentiles of daily 24-hour PM₁₀ concentrations for KEN01-Kensington Gardens (2002 – 2007)AAQ NEPM Standard 50 µg/m³ (24-hr average)

Region	Data availability rates (%)	Max (µg/m ³)	99th percentile (µg/m ³)	98th percentile (µg/m ³)	95th percentile (µg/m ³)	90th percentile (µg/m ³)	75th percentile (µg/m ³)	50th percentile (µg/m ³)
KEN01-Kensington Gardens								
Adelaide								
2002	47	103.7	34.1	27.5	24.2	22.3	18.0	14.0
2003	89	85.9	44.5	35.2	26.3	21.4	16.7	13.1
2004	94	53.7	34.0	31.4	27.5	23.2	18.2	13.0
2005	98	76.2	39.8	35.2	27.9	24.1	19.0	13.7
2006	95	73.2	41.3	36.7	26.4	22.5	17.0	12.1
2007	92	51.1	43.0	39.4	29.3	25.2	19.0	13.0

Table 44 Percentiles of daily 24-hour PM₁₀ concentrations for NET01-Netley (2002 – 2007)AAQ NEPM Standard 50 µg/m³ (24-hr average)

Region	Data availability rates (%)	Max (µg/m ³)	99th percentile (µg/m ³)	98th percentile (µg/m ³)	95th percentile (µg/m ³)	90th percentile (µg/m ³)	75th percentile (µg/m ³)	50th percentile (µg/m ³)
NET01-Netley								
Adelaide								
2002	100	79.3	43.1	38.1	31.6	27.5	22.8	18.5
2003	97	119.4	54.0	46.0	33.9	29.4	22.1	17.9
2004	99	62.7	42.4	40.3	33.6	29.5	23.1	17.3
2005	90	58.7	54.5	48.1	38.3	32.3	24.3	17.9
2006	91	101.4	85.7	69.2	43.0	33.5	24.6	18.1
2007	95	125.9	80.3	57.6	37.6	31.0	23.3	17.6

Table 45 Percentiles of daily 24-hour PM₁₀ concentrations for CHD01-Christie Downs (2006 - 2007)AAQ NEPM Standard 50 µg/m³ (24-hr average)

Region	Data availability rates (%)	Max (µg/m ³)	99th percentile (µg/m ³)	98th percentile (µg/m ³)	95th percentile (µg/m ³)	90th percentile (µg/m ³)	75th percentile (µg/m ³)	50th percentile (µg/m ³)
CHD01-Christie Downs								
Adelaide								
2006	73	52.2	49.6	42.1	31.2	25.8	19.4	14.3
2007	93	70.5	43.8	38.3	31.7	27.3	21.6	15.5

Table 46 Percentiles of daily 24-hour PM₁₀ concentrations for WHY07-Whyalla Schulz Park (2007)AAQ NEPM Standard 50 µg/m³ (24-hr average)

Region Spencer	Data availability rates (%)	Max (µg/m ³)	99th percentile (µg/m ³)	98th percentile (µg/m ³)	95th percentile (µg/m ³)	90th percentile (µg/m ³)	75th percentile (µg/m ³)	50th percentile (µg/m ³)
WHY07-Whyalla Schulz Park								
2007	67	97.2	62.8	51.2	30.5	27.4	20.5	14.7

Table 47 Percentiles of daily 24-hour PM₁₀ concentrations for PTP01-Pt Pirie Oliver Street (2002 - 2007)AAQ NEPM Standard 50 µg/m³ (24-hr average)

Region Spencer	Data availability rates (%)	Max (µg/m ³)	99th percentile (µg/m ³)	98th percentile (µg/m ³)	95th percentile (µg/m ³)	90th percentile (µg/m ³)	75th percentile (µg/m ³)	50th percentile (µg/m ³)
PTP01-Pt Pirie Oliver Street								
2002 [#]	16	57.0	50.4	45.1	33.4	31.3	27.8	21.2
2003	50	60.5	51.7	47.0	38.9	30.8	21.8	14.1
2004	97	135.8	51.8	43.9	35.7	28.5	22.6	15.7
2005	95	464.3	68.4	45.6	37.6	31.6	23.4	16.6
2006	96	181.8	71.0	59.3	42.9	34.6	25.1	17.4
2007	98	173.8	68.6	60.8	45.2	37.2	25.2	16.8

[#] Monitoring by high-volume sampler (one in six days), otherwise monitoring is by TEOM and reported as TEOM data (NEPM PRC, 2001).

Particulate matter as PM_{2.5}

Table 48 Percentiles of daily 24-hour PM_{2.5} concentrations for NET01-Netley (2004 – 2007)

AAQ NEPM Advisory Reporting Standard 25 µg/m³ (24-hr average)

Region	Data availability rates (%)	Max (µg/m ³)	99th percentile (µg/m ³)	98th percentile (µg/m ³)	95th percentile (µg/m ³)	90th percentile (µg/m ³)	75th percentile (µg/m ³)	50th percentile (µg/m ³)
Adelaide								
NET01-Netley								
^2005	14	14.1	13.7	13.2	11.1	9.9	8.0	6.1
*2005	96	17.3	16.4	15.0	13.2	11.6	9.4	7.3
^2006	30	28.2	25.4	24.8	17.9	11.5	8.5	6.2
*2006	96	61.2	20.4	19.0	14.5	12.0	9.7	7.3
^2007	87	28.6	17.6	12.8	10.5	8.8	7.4	5.9
*2007	99	21.9	14.4	13.5	12.3	11.3	9.3	7.6

^Indicates monitoring by one -day-in-three partisol monitoring (Maximum data availability rate is 32%)

*Indicates monitoring by Tapered Element Oscillating Microbalance (TEOM)

REFERENCES

Adeeb, F 2005, *South Australia's ambient air quality monitoring program- a review*, Environment Protection Authority, Adelaide.

www.epa.sa.gov.au/pdfs/amp_review.pdf

Adeeb, et. al. 2003, *Future Air Quality Monitoring for Lead in Metropolitan Adelaide*, Environment Protection Authority, Adelaide.

http://www.epa.sa.gov.au/pdfs/lead_aq_report.pdf

Australian Bureau of Statistics 2001, *Census*

www.abs.gov.au

Department of Environment and Heritage 2004, *State of the Air: National Ambient Air Quality Status and Trends Report 1991–2001*, Department of Environment and Heritage, Adelaide.

EPA, 2006, *Ambient Air Quality in Gawler, South Australia: Monitoring campaign: 2002–2004* Environment Protection Authority, Adelaide.

http://www.epa.sa.gov.au/pdfs/air_gawler.pdf

Gooding, David; Riordan, Donna 2004, *Ambient Air Quality Monitoring, South Australia, 1979–2003*, Environment Protection Authority, Adelaide.

www.epa.sa.gov.au/pdfs/aq_report.pdf

NEPC Peer Review Committee 2001, *National Environment Protection (Ambient Air Quality) Measure: technical Paper No 3: Screening Procedures*, National Environment Protection Council.

http://www.ephc.gov.au/nepms/air/pdf/TP4_Screening_Procedures.pdf

NEPC Peer Review Committee 2001, *National Environment Protection (Ambient Air Quality) Measure: technical Paper No 4: Monitoring Strategy*, National Environment Protection Council.

http://www.ephc.gov.au/nepms/air/pdf/TP3_Monitoring_Strategy.pdf

NEPC Peer Review Committee 2002, *National Environment Protection (Ambient Air Quality) Measure: technical Paper No 8: Annual Reports*, National Environment Protection Council.

www.ephc.gov.au/prc/pdf/TP8_Annual_Reports.pdf

NEPC Peer Review Committee 2001, *National Environment Protection (Ambient Air Quality) Measure: technical Paper No 10: Collection and Reporting of TEOM PM₁₀ Data*, National Environment Protection Council.

www.ephc.gov.au/prc/pdf/TP10_Collection_&_Reporting.pdf

NEPC Peer Review Committee 2001, National Environment Protection (Ambient Air Quality) Measure: Technical Paper No 9: *Lead Monitoring*, National Environment Protection Council. www.ephc.gov.au/prc/pdf/TP9_Lead_Monitoring.pdf

National Environment Protection Council 1998, National Environment Protection (Ambient Air Quality) Measure.
www.ephc.gov.au/nepms.air/air_nepm.html

Riordan, D and Adeeb, F 2004, *Air quality monitoring for sulfur dioxide in metropolitan Adelaide*, Environment Protection Authority, Adelaide.
www.epa.sa.gov.au/pdfs/so2_report.pdf

SA EPA 2001, *Ambient Air Quality Monitoring Plan for South Australia*, Environment Protection Authority, Adelaide.
www.epa.sa.gov.au/pdfs/airnepm.pdf