

Air Monitoring Report 2004

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

September 2005

Air Monitoring Report 2004:
Produced in compliance with the National Environment Protection (Ambient Air Quality) Measure, for the
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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 2004 indicated that:

- where sufficient data were available to compare with the goal of the AAQ NEPM (to achieve by 2008), the goal of AAQ NEPM was met for all pollutants, except for lead at Port Pirie and 1 hour sulfur dioxide 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 have been achieved.
- exceedences of the PM₁₀ standard occurred on numerous occasions throughout the state. Some were caused by wind blown dust.
- in Port Pirie, the annual lead standard was exceeded at one NEPM site. The 1-hour SO₂ standard was exceeded thirty nine times and the 24 hour PM₁₀ standard was exceeded on four occasions (five exceedences are permitted per annum for PM₁₀).
- consistently high data capture rates were achieved in most cases, except where instrument malfunction occurred or sites were decommissioned during 2004.
- A campaign monitoring station at Whyalla was developed during 2004 to fulfil commitments in SA's monitoring plan (SA EPA, 2001).
- development of monitoring stations continue in order to meet the monitoring requirements specified in the plan. The stations yet to be developed include:
 - Air NEPM monitoring station to north east of Adelaide (PM₁₀ and SO₂).
 - Air NEPM monitoring station in the southern metropolitan area of Adelaide (O₃, NO₂, PM₁₀ and SO₂).

NOTE: There has been some delay in the planned installation of the above sites. This is due to the PM_{2.5} variation and co-location studies, which required use of TEOM monitoring units otherwise planned for north eastern Adelaide and southern metropolitan Adelaide. The southern metropolitan site will be installed in the 2005 / 2006 financial year.

- The EPA is currently reviewing the scale of its monitoring in the metropolitan airshed. This is because data generated so far has indicated ambient levels are consistently well below the standard. The recommendations are presented in a report titled South Australia's Ambient Air Quality Monitoring Program – a Review (Adeeb, F 2004).

Current monitoring stations

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 from which air pollutants are measured.

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).

Figure 1 below describes the monitoring station locations for metropolitan Adelaide. Figure 2 describes monitoring sites in the Spencer Gulf region. Monitoring is conducted in South Australia's most densely populated regions or where air pollution is of greatest concern—Adelaide, Port Pirie and Whyalla.

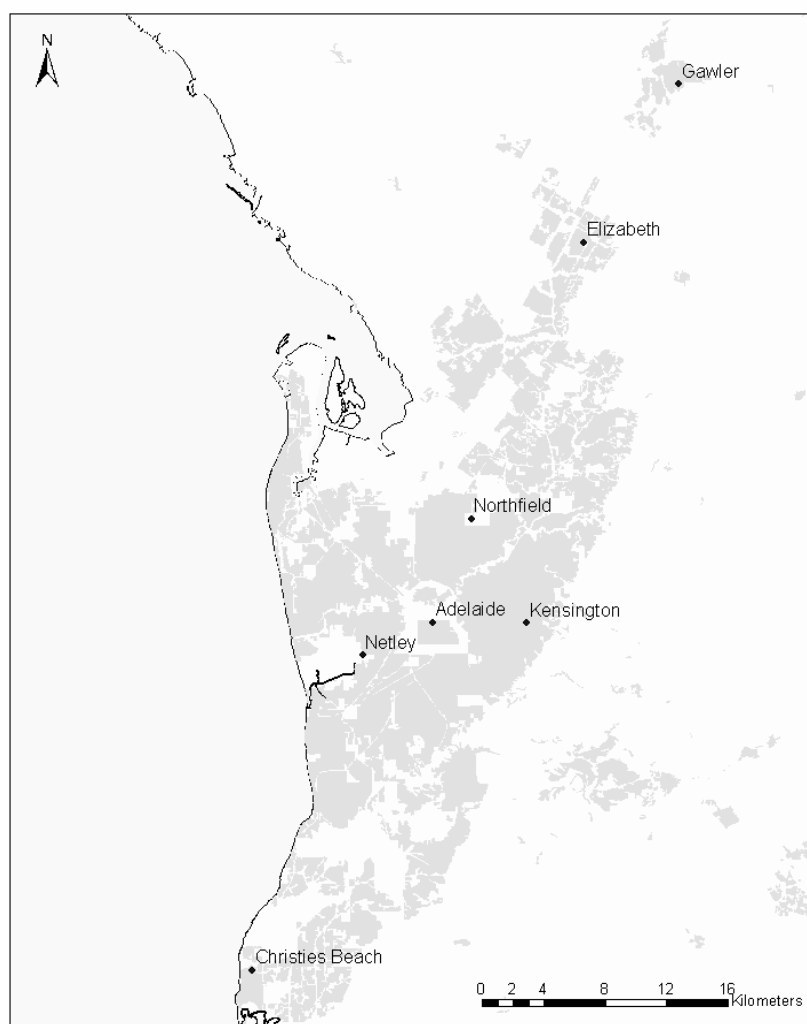


Figure 1 Map of Adelaide region and sites, South Australia

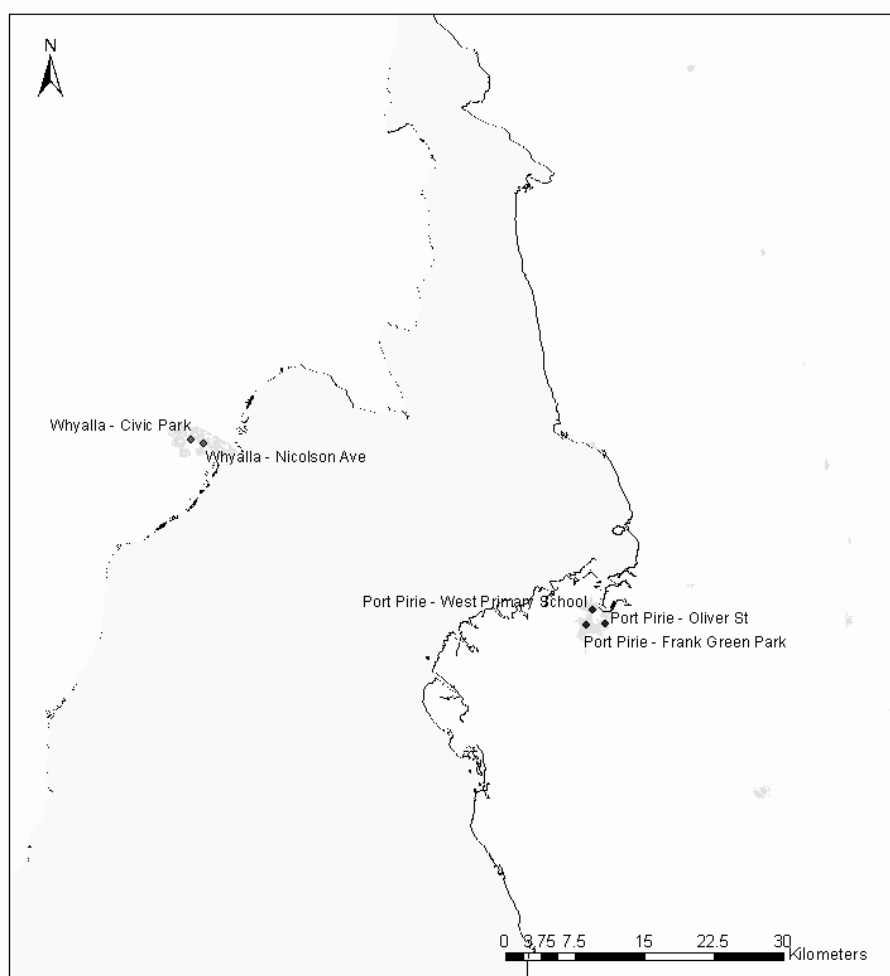


Figure 2 Map of Spencer region and sites, South Australia

The map in Figure 3 below describes the population distribution throughout most of South Australia (including all air monitoring regions) based on the 2001 census (Australian Bureau of Statistics, 2001).

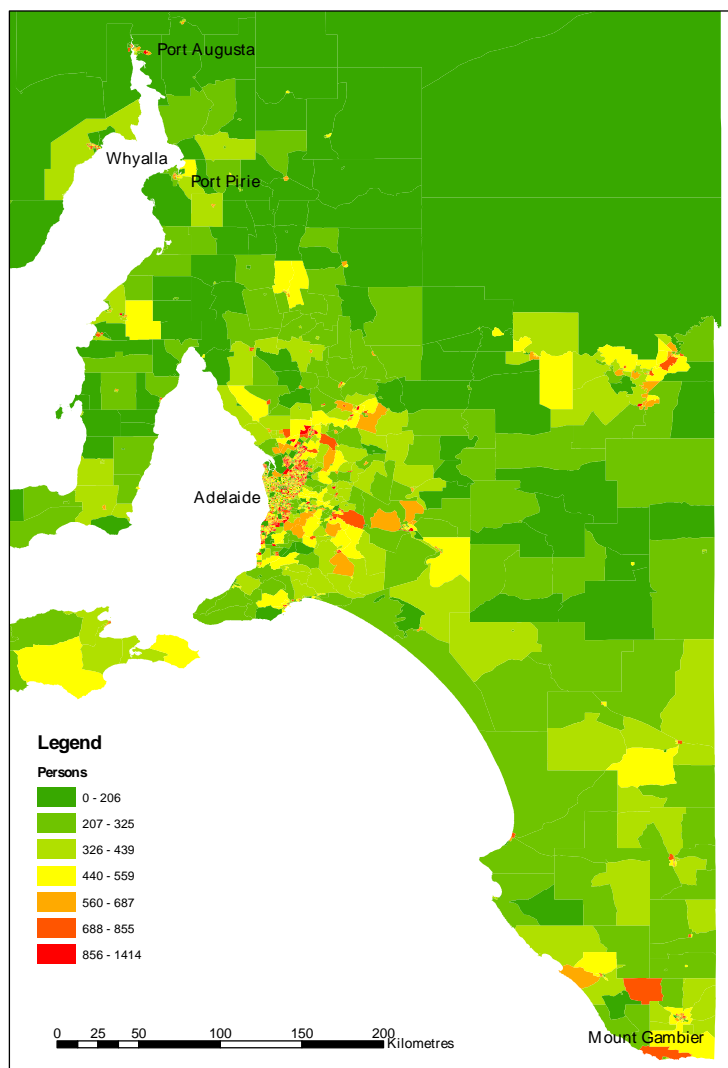


Figure 3 Map of population distribution in South Australia

Assessment of Compliance with Standards and 2008 Goal

Tables one to six 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 there is not sufficient data 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).

Carbon monoxide

Table 1 2004 compliance summary for CO in South Australia

AAQ NEPM Standard 9.0 ppm (8-hr average)

Region/ performance monitoring station	Data availability rates (% of 8 hour rolling averages)					Number of exceedences (days)	Performance against the standards and goal
	Q1	Q2	Q3	Q4	Annual		
Hindley Street	100	100	94	38	83	0	ND
Elizabeth	97	99	100	94	98	0	Met

Nitrogen dioxide

Table 2 2004 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	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
Gawler	96	91	97	19	76	0	0.004	ND	ND
Elizabeth	96	98	96	90	95	0	0.004	Met	Met
Northfield	98	91	98	98	96	0	0.006	Met	Met
Netley	98	97	97	93	96	0	0.009	Met	Met
Kensington	95	95	97	98	96	0	0.005	Met	Met
*Pt Pirie	97	97	97	97	97	0	0.003	Met	Met
*Whyalla	39	93	97	88	79	0	0.004	ND	ND

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

Ozone

Table 3 2004 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	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
Gawler	96	98	98	19	78	0	0	ND	ND
Elizabeth	97	97	98	93	96	0	0	Met	Met
Northfield	98	83	98	98	94	0	0	Met	Met
Netley	98	97	98	97	98	0	0	Met	Met
Kensington	97	98	98	97	97	0	0	Met	Met
*Pt Pirie	95	95	97	98	96	0	0	Met	Met
*Whyalla	50	93	98	98	85	0	0	ND	ND

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

Sulfur dioxide

Table 4 2004 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	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
Christies Beach	69	76	99	93	84	0	0	0.000	ND	ND	ND
Elizabeth	95	0	0	0	24	0	0	0.001	ND	ND	ND
Northfield	85	94	96	96	93	0	0	0.000	Met	Met	Met
Kensington	94	96	96	96	95	0	0	0.000	Met	Met	Met
*Pt Pirie	97	97	97	97	97	39	0	0.008	Not met	Met	Met
*Whyalla	1	90	96	96	71	0	0	0.000	ND	ND	ND

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

Particulate matter as PM₁₀

Table 5 2004 compliance summary for PM₁₀ in South AustraliaAAQ NEPM Standard 50 µg/m³ (24-hr average)

Region/ performance monitoring station	Data availability rates (% of days)				Annual	Number of exceedences (days)	Performance against the standards and goal
	Q1	Q2	Q3	Q4			
Elizabeth	0	33	97	91	55	1	ND
Kensington	77	100	100	98	94	1	Met
Netley	98	99	100	98	99	3	Met
Gawler	88	98	97	23	76	4	ND
*^Whyalla (Civic Park)	32	29	26	26	28	0	ND
^Pt Pirie (Oliver Street)	97	95	100	98	97	4	Met

*Indicates monitoring by high-volume sampler (one in three days). All other sites are measured using TEOM and reported as 'TEOM data' (NEPM PRC, 2001).

^Pt Pirie and Whyalla are regional centres, all other sites are located in Adelaide.

Lead

Table 6 2004 compliance summary for Lead in South Australia

AAQ NEPM Standard 0.50 µg/m³ (1-yr average)

Region/performance monitoring station	Data availability rates (% of days)				Annual	Annual (µg/m ³)	mean	Performance against the standards and goal
	Q1	Q2	Q3	Q4				
*Pt Pirie Frank Green Park	93	100	94	94	95	0.28		Met
*Pt Pirie Oliver Street	100	93	94	94	95	0.59		Not Met

*Pt Pirie is a regional centre.

Lead data is reported to ambient conditions and analyses are carried out by NATA accredited facilities at the South Australian Forensic Science laboratories.

Progress Towards Achieving the AAQ NEPM 2008 Goal

As assessed against the National Environment Protection (Ambient Air Quality) Measure (NEPC, 1998). The 2008 goal was met for all pollutants except:

- 1h SO₂ at Port Pirie, Oliver Street
- lead at Port Pirie, Oliver Street

In Adelaide, exceedences of the PM₁₀ standard occurred on a number of occasions throughout the airshed. This was often associated with dry days, coupled with strong northerly winds.

There were some instances where compliance with the goal could not be demonstrated, shown as 'ND'. For example, compliance of SO₂ at Christies Beach and CO at Hindley Street was assessed as 'not demonstrated'. This was due to insufficient data recovery averaged over the 1st and 4th quarter. Some data for PM₁₀ and NO₂ was likewise classed as 'ND'. These lower data recovery rates were due to a range of causes. This included campaign stations being decommissioned part way through 2004, instrument upgrade or insufficient sampling frequency.

For SO₂, O₃, NO₂ and CO, comparison with historical data and similar stations suggests that the AAQ NEPM 2008 goal was most likely achieved at all stations, despite insufficient data to demonstrate compliance.

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

On the basis of available data in 2004, the following observations were made:

- For CO, the standard and goal was met at Elizabeth but not demonstrated at Hindley Street
- For NO₂, the standard and goal were met at all stations but not demonstrated at Gawler and Whyalla
- For O₃, the standard and goal were met at all stations but not demonstrated at Gawler and Whyalla
- For SO₂ the 1h standard and goal was not met at Port Pirie. The standards and goal was not demonstrated at Christies Beach, Elizabeth and Whyalla. All other stations met the standard and goal for SO₂.
- For PM₁₀ the standard was not met on one occasion at Kensington and Elizabeth, on three occasions at Netley and four occasions at Gawler. For the regional centres, the standard was not met on four occasions at Port Pirie. The goal was not demonstrated at Elizabeth, Gawler and Whyalla but met for all other stations for this reporting period.
- For Pb, the annual standard and goal was not met at Port Pirie Oliver Street.
- Where compliance with the standards and the 2008 goal could not be demonstrated through low data capture, it is expected that compliance would have been achieved.

The future

The EPA in South Australia is undertaking a number of strategies and activities to ensure that the AAQ NEPM standards and 2008 goal are consistently met. Key actions towards this goal include:

- continued improvement of the EPA monitoring network and program to ensure high data capture
- assessment of the laboratory for NATA accreditation was carried out in late 2004. Documentation requirements are being finalised for accreditation in late 2005
- continued monitoring in regional areas in accordance with the monitoring plan endorsed by NEPC
- progressing a commitment to improve air quality in regional centres such as Port Pirie through environment improvement programs to achieve greater reduction in bioavailable lead emissions from the smelter in Port Pirie, as that is the city's major source of airborne lead. Zinifex will complete a survey of the health impact of their SO₂ emissions in Port Pirie, this survey should be available by the second half of 2005
- the necessity and scale of monitoring for SO₂ within the Adelaide airshed has been reviewed (Riordan, D and Adeeb, F 2004) and sulfur dioxide levels were found to be consistently below the standard prescribed in the National Environment Protection (Ambient Air Quality) Measure (NEPC, 1998). The report proposed that one site be retained in the Adelaide metropolitan area. NEPC has been advised and realignment of the network will commence in 2005
- a general review of monitoring has been conducted with NEPC advised of findings and proposed changes to the network (Adeeb, F 2005)
- Development of an overarching Air Quality Management Plan including review of the current Environment Protection (Air Quality) Policy
- Development of a wood heater Code of Practice
- Feasibility study for the establishment of a vehicle emission testing facility by the Department of Transport, Energy and Infrastructure

Monitoring Details

Current performance monitoring stations

The monitoring stations and the pollutants monitored at each are described below in table 7 and reflect the SA EPA's monitoring plan (SA EPA, 2001). They are classed as peak, campaign or generally representative upper bound sites (GRUB) to indicate how they relate to community exposure. Peak sites characteristically have relatively high concentration ranges but low community exposure. Campaign sites are chosen to fulfil GRUB site characteristics, but as part of a screening program. Campaign sites may only operate for a short period if the pollutant levels do not warrant ongoing measurement.

Table 7 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
Gawler Popham Ave. Gawler East	Adelaide (campaign)		×	×			×
Elizabeth Heard St. Elizabeth Downs	Adelaide (GRUB)	×	×	×	×		×
Northfield Folland Ave. Hampstead	Adelaide (GRUB)		×	×	×		
Netley Transport Ave. Netley	Adelaide (GRUB)		×	×			×
Kensington East Tce. Kensington	Adelaide (GRUB)		×	×	×		×
Christies Beach Winnerah Rd. Christies Beach	Adelaide (peak)				×		
Hindley Street Hindley St. Adelaide	Adelaide (peak)	×					
Pt Pirie, Oliver Street Oliver St. Port Pirie	Spencer (GRUB) and campaign)		×	×	×	×	×
Pt Pirie, Frank Green Park Senate Rd. Port Pirie	Spencer (GRUB)					×	
Whyalla, Civic Park Searle St. Whyalla	Spencer (Campaign)						×
Whyalla, Avenue Nicolson	Spencer (Campaign)		×	×	×		

Implementation of the air monitoring plan

During 2004, the EPA moved closer to fulfilling commitments made in SA's monitoring plan by upgrading monitoring stations and creating new sites. This included:

- upgrading of the Elizabeth site
- establishing a campaign monitoring site at Whyalla (O₃, NO₂ and SO₂).

Development of monitoring stations continue in order to meet the monitoring requirements specified in the plan. The stations yet to be developed include:

- Air NEPM monitoring station at Hope Valley (PM₁₀ and SO₂)
- Air NEPM monitoring station in the southern metropolitan area of Adelaide which is to commence in the 2005 / 2006 financial year (O₃, NO₂, PM₁₀ and SO₂, utilising OPSIS DOAS)

Sulfur dioxide levels (except for Port Pirie) have been consistently well below the standard prescribed in the National Environment Protection (Ambient Air Quality) Measure (NEPC, 1998). In response to this, a report entitled 'Air quality monitoring for sulfur dioxide in metropolitan Adelaide' (Riordan, D and Adeeb, F. 2004) investigated the necessity for monitoring within the Adelaide metropolitan area.

This investigation recommended the cessation of SO₂ monitoring in all but one metropolitan site.

NATA status

The South Australian Environment Protection Authority operates all monitoring stations described in this report. The EPA aims for NATA status of the monitoring network and laboratory by the end of 2005.

Data analysis

Tables presented in this report have been prepared according to the AAQ NEPM guidelines (NEPC PRC, 2002).

Summary statistics

Annual summary statistics described in tables 8 to 14 below allow assessment of air quality against the standards and the extent of compliance with the goal. 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.

Percentiles and trends

Previous trend analyses have shown that lead concentrations have decreased markedly over the last 10 years, and have now approached just detectable level (Adeeb F. et al., 2003). The EPA has published an assessment of long term trends for each pollutant in a separate report titled 'Ambient Air Quality monitoring - South Australia 1979 - 2003 (Gooding D., Riordan D., 2004). A further report describing Australia-wide trends for the years 1991–2001 has been prepared by Environment Australia (Environment Australia, 2004).

Analysis of Air Quality Monitoring

Carbon monoxide

Table 8 2004 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	Number of valid days	Highest (ppm)	Highest (date:hour)	2nd highest (ppm)	2nd highest (date:hour)
Hindley Street	306	4.9	08 Feb 5:00, 20 Mar 4:00	4.5	13 Apr 22:00
Elizabeth	361	0.8	19 Jul 10:00	0.7	05 Jul 0:00

Nitrogen dioxide

Table 9 2004 summary statistics for daily peak 1-hour NO₂ in South Australia

AAQ NEPM Standard 0.12 ppm (1-hr average)

Region/ performance monitoring station	Number of valid days	Highest (ppm)	Highest (date:hour)	2nd highest (ppm)	2nd highest (date:hour)
Gawler	289	0.028	17 Sep 20:00	0.027	28 Apr 19:00
Elizabeth	358	0.037	18 Feb 7:00	0.034	17 Sep 19:00
Northfield	362	0.045	7 May 19:00	0.040	24 Mar 20:00, 19 Sep 20:00
Netley	363	0.103	3 Mar 21:00	0.046	24 Mar 10:00
Kensington	363	0.037	12 May 18:00	0.034	7 May 19:00
Pt Pirie	366	0.047	3 Dec 13:00	0.017	11 May 19:00, 12 May 20:00
Whyalla	305	0.025	24 May 19:00, 7 Jul 19:00, 17 Dec 22:00	0.024	11 May 23:00, 20 Jun 19:00, 6 Jul 19:00, 12 Jul 19:00, 15 Jul 19:00, 5 Aug 21:00, 25 Oct 22:00

Ozone

Table 10 2004 summary statistics for daily peak 1-hour O₃ in South Australia

AAQ NEPM Standard 0.10 ppm (1-hr average)

Region/ performance monitoring station	Number of valid days	Highest (ppm)	Highest (date:hour)	2 nd highest (ppm)	2 nd highest (date:hour)
Gawler	293	0.077	13 Feb 17:00	0.067	17 Feb 16:00
Elizabeth	362	0.088	13 Feb 14:00	0.075	07 Feb 13:00
Northfield	354	0.081	13 Feb 14:00	0.073	07 Feb 13:00
Netley	366	0.067	13 Feb 13:00, 19 Feb 15:00	0.065	15 Feb 12:00
Kensington	366	0.078	07 Feb 14:00	0.073	02 Jan 14:00
Pt. Pirie	366	0.081	13 Apr 18:00	0.073	21 Apr 16:00
Whyalla	323	0.051	12 Oct 13:00	0.045	20 Feb 14:00, 10 Nov 23:00

Table 11 2004 summary statistics for daily peak 4-hour O₃ in South Australia

AAQ NEPM Standard 0.08 ppm (4-hr average)

Region/ performance monitoring station	Number of valid days	Highest (ppm)	Highest (date:hour)	2 nd highest (ppm)	2 nd highest (date:hour)
Gawler	293	0.065	13 Feb 18:00	0.062	17 Feb 16:00
Elizabeth	362	0.079	13 Feb 16:00	0.065	02 Jan 16:00
Northfield	355	0.067	13 Feb 16:00, 19 Feb 17:00	0.062	07 Feb 15:00
Netley	366	0.059	19 Feb 18:00	0.058	13 Feb 16:00
Kensington	366	0.071	07 Feb 15:00	0.067	02 Jan 15:00
Pt Pirie	366	0.063	22 Apr 03:00	0.060	13 Apr 20:00
Whyalla	324	0.046	12 Oct 21:00	0.043	10 Nov 23:00

Sulfur dioxide

Table 12 2004 summary statistics for daily peak 1-hour SO₂ in South Australia

AAQ NEPM Standard 0.20 ppm (1-hr average)

Region/ performance monitoring station	Number of valid days	Highest (ppm)	Highest (date:hour)	2nd highest (ppm)	2nd highest (date:hour)
Christies Beach	319	0.014	26 Nov 10:00	0.010	05 Feb 12:00, 27 Aug 15:00, 22 Sep 01:00
Elizabeth	92	0.008	03 Jan 20:00	0.007	08 Feb 10:00
Northfield	356	0.012	30 Jul 13:00, 21 Sep 00:00	0.011	08 Jun 10:00
Kensington	366	0.012	08 Jun 10:00	0.011	31 Oct 09:00
Pt Pirie	366	0.440	13 Mar 11:00	0.413	18 Apr 13:00
Whyalla	275	0.099	16 Oct 20:00	0.036	20 Jul 17:00

Table 13 2004 summary statistics for daily peak 24-hour SO₂ in South Australia

AAQ NEPM Standard 0.08 ppm (24-hr average)

Region/ performance monitoring station	Number of valid days	Highest (ppm)	Highest (date)	2nd highest (ppm)	2nd highest (date)
Christies Beach	304	0.004	26 Apr	0.002	25 Apr, 09 Oct
Elizabeth	90	0.004	29 Feb	0.003	13 Feb, 15 Feb, 16 Feb, 17 Feb, 18 Feb, 20 Feb, 25 Feb, 28 Feb, 01 Mar
Northfield	351	0.003	08 Jun	0.002	31 May, 07 Jun, 13 Jul, 30 Jul, 10 Aug
Kensington	362	0.003	08 Jun	0.002	31 May, 07 Jun, 30 Jul, 10 Oct, 31 Oct
Pt Pirie	365	0.051	09 Nov	0.043	25 Sep
Whyalla	271	0.007	16 Oct	0.005	21 Jul

Particulate matter as PM₁₀

Table 14 2004 summary statistics for 24-hour PM₁₀ in South AustraliaAAQ NEPM Standard 50 µg/m³ (24-hr average)

Region/ performance monitoring station	Number of valid days	Highest (µg/m ³)	Highest (date)	6th highest (µg/m ³)	6th highest (date)
Elizabeth	203	63.9	28 Jun	32.3	18 Dec
Kensington	343	53.7	10 Feb	32.4	28 Jun
Netley	361	62.7	10 Feb	41.2	20 Feb
Gawler	279	90.3	28 Mar	40.6	20 Feb
*Whyalla (Civic Park)	103	35.2	22 Mar	29.8	15 Feb
Pt Pirie (Oliver Street)	356	135.8	10 Feb	46.4	14 Apr

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

Data Analysis

This section provides the results of additional analyses, including percentiles of daily peak concentrations.

Carbon monoxide

Table 15 Percentiles of daily peak 8-hour CO concentrations for 2004

AAQ NEPM Standard 9.0 ppm (8-hr average)

Region/ performance monitoring station	Data availability (%) of days)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Hindley Street	83	4.9	4.5	4.0	3.6	3.2	2.5	1.8
Elizabeth	98	0.8	0.6	0.5	0.4	0.3	0.2	0.1

Nitrogen dioxide

Table 16 Percentiles of daily peak 1-hour NO₂ concentrations for 2004

AAQ NEPM Standard 0.12 ppm (1-hr average)

Region/ performance monitoring station	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Gawler	76	0.028	0.025	0.023	0.021	0.020	0.014	0.010
Elizabeth	95	0.037	0.031	0.029	0.025	0.023	0.019	0.012
Northfield	96	0.045	0.038	0.033	0.029	0.026	0.023	0.017
Netley	96	0.103	0.041	0.038	0.034	0.030	0.026	0.021
Kensington	96	0.037	0.032	0.028	0.025	0.023	0.019	0.013
Pt Pirie	97	0.047	0.016	0.014	0.013	0.012	0.009	0.006
Whyalla	79	0.025	0.024	0.024	0.023	0.021	0.015	0.008

Ozone

Table 17 Percentiles of daily peak 1-hour O₃ concentrations for 2004

AAQ NEPM Standard 0.10 ppm (1-hr average)

Region/ performance monitoring station	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Gawler	78	0.077	0.055	0.048	0.043	0.038	0.031	0.028
Elizabeth	96	0.088	0.065	0.055	0.046	0.041	0.033	0.029
Northfield	94	0.081	0.065	0.058	0.045	0.040	0.033	0.028
Netley	98	0.067	0.056	0.049	0.044	0.037	0.032	0.028
Kensington	97	0.078	0.067	0.062	0.047	0.041	0.033	0.029
Pt Pirie	96	0.081	0.060	0.055	0.048	0.042	0.035	0.030
Whyalla	85	0.051	0.044	0.040	0.037	0.035	0.031	0.028

Table 18 Percentiles of daily peak 4-hour rolling O₃ concentrations for 2004

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

Region/ performance monitoring station	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Gawler	79	0.065	0.050	0.043	0.040	0.034	0.030	0.027
Elizabeth	98	0.079	0.056	0.051	0.042	0.037	0.032	0.027
Northfield	96	0.067	0.058	0.049	0.041	0.038	0.032	0.027
Netley	100	0.059	0.048	0.044	0.040	0.036	0.031	0.027
Kensington	99	0.071	0.059	0.054	0.043	0.038	0.031	0.028
Pt Pirie	99	0.063	0.047	0.045	0.041	0.036	0.032	0.028
Whyalla	87	0.046	0.042	0.039	0.036	0.033	0.030	0.027

Sulfur dioxide

Table 19 Percentiles of daily peak 1-hour SO₂ concentrations for 2004

AAQ NEPM Standard 0.20 ppm (1-hr average)

Region/ performance monitoring station	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)
Christies Beach	84	0.014	0.010	0.005	0.003	0.002	0.001	0.000
Elizabeth	24	0.008	0.007	0.005	0.004	0.004	0.003	0.002
Northfield	93	0.012	0.007	0.006	0.004	0.003	0.001	0.001
Kensington	95	0.012	0.009	0.006	0.004	0.002	0.001	0.000
Pt Pirie	97	0.440	0.356	0.335	0.260	0.185	0.078	0.020
Whyalla	71	0.099	0.026	0.013	0.010	0.006	0.003	0.001

Table 20 Percentiles of 24-hour SO₂ concentrations for 2004

AAQ NEPM Standard 0.08 ppm (24-hr average)

Region/ performance monitoring station	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)
Christies Beach	83	0.004	0.001	0.001	0.001	0.000	0.000	0.000
Elizabeth	25	0.004	0.003	0.003	0.003	0.003	0.002	0.001
Northfield	96	0.003	0.002	0.001	0.001	0.001	0.001	0.000
Kensington	99	0.003	0.002	0.001	0.001	0.001	0.000	0.000
Pt Pirie	100	0.051	0.039	0.037	0.028	0.022	0.011	0.003
Whyalla	74	0.007	0.003	0.002	0.001	0.001	0.001	0.000

Particulate matter as PM₁₀

Table 21 Percentiles of daily 24-hour PM₁₀ concentrations for 2004AAQ NEPM Standard 50 µg/m³ (24-hr average)

Region/ performance monitoring station	Data availability rates (%)	Max (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Elizabeth	55	63.9	39.1	33.5	26.8	22.3	16.1	12.4
Kensington	94	53.7	34.0	31.4	27.5	23.2	18.2	13.0
Netley	99	62.7	42.4	40.3	33.6	29.5	23.1	17.3
Gawler	76	90.3	58.1	39.8	31.4	27.2	18.8	14.3
*Whyalla (Civic Park)	28	35.2	33.9	33.2	29.8	25.0	19.1	13.8
Pt Pirie Oliver Street	97	135.8	51.8	43.9	35.7	28.5	22.6	15.7

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

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Authorised by:

Chief Executive

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