ENVIRONMENT REPORT

AIR MONITORING REPORT 2010 – COMPLIANCE WITH THE NATIONAL ENVIRONMENT PROTECTION (AMBIENT AIR QUALITY) MEASURE

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OVERVIEW

This report presents the results of air quality monitoring in Victoria and assesses them against the requirements of the *Ambient Air Quality National Environment Protection Measure*[1] (AAQ NEPM). EPA also produces an annual air quality summary and data tables on its website.[2]

The AAQ NEPM establishes:

- requirements for monitoring air quality
- air quality standards that are levels of specified pollutants against which air quality can be assessed
- a goal that the air quality standards be met to the extent specified in the NEPM. Recognising that certain events can impact on air quality, the NEPM specifies a maximum number of days on which it is permissible to exceed the standard.

Victoria's air quality in 2010 was generally good. The major impacts on Victoria's air quality during the year were associated with particles from fire, local dust and urban emissions.

In the Port Phillip region in 2010, the goal was met for particles as PM_{10} at NEPM stations for the first time since NEPM reporting commenced in 2002. Another issue-specific station not included in the NEPM network located in Brooklyn did not report good air quality due to impacts from local sources[3]. The goal for particles as PM_{10} was also met at Traralgon in the Latrobe Valley.

The maximum number of days when the levels were measured above the air quality standard at a single station (four) occurred at the Footscray monitoring station in Port Phillip. Three days with levels above the air quality standard occurred at Traralgon in the Latrobe Valley. These were below the goal of no more than five days having levels above the standard.

The causes were attributed to bushfires and/or planned burning (three days at Traralgon), local dust (five days in Port Phillip) and urban sources, typically from vehicle traffic and/or domestic wood heaters (three days in Port Phillip).

The 24-hour advisory reporting standard for particles as $PM_{2.5}$ was not exceeded at Footscray in Port Phillip. However, the standard was exceeded at Alphington in Port Phillip on three days. Urban sources were identified as the likely causes on all three days. The annual reporting standard for $PM_{2.5}$ was met at both Alphington and Footscray.

The goals for ozone (O_3) were met at all stations under typical summer smog formation conditions where sufficient air monitoring data was available. Lack of air monitoring data prevented assessment during typical summer smog formation conditions at Melton and Point Henry.

Monitoring in 2010 showed that the AAQ NEPM goals and standards were met for carbon monoxide (CO), nitrogen dioxide (NO_2) and sulfur dioxide (SO_2).

Monitoring was performed in accordance with a modified form of Victoria's monitoring plan,[4] AAQ NEPM Technical Papers and EPA's NATA accreditation. Data capture targets were achieved at all stations, except for ozone at Alphington (Q3), Brighton (Q3), Melton (Q4) and Point Henry (Q3, Q4), due to technical problems with equipment.

1 *National Environment Protection Measure for Ambient Air Quality*, National Environment Protection Council publication, available from www.ephc.gov.au.

2 www.epa.vic.gov.au/air/monitoring

3 Environment Report-Air monitoring in Brooklyn November 2009 to October 2010 from from www.epa.vic.gov.au, under 'Resources > Publications online'.

4 *Ambient air quality NEPM monitoring plan Victoria* (EPA publication 763), available from www.epa.vic.gov.au, under 'Resources > Publications online'.

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A MONITORING SUMMARY

Current performance monitoring stations

Victoria's AAQ NEPM air monitoring plan was approved by the National Environment Protection Council Ministers in February 2001. Data presented in this report has been produced in accordance with the monitoring plan, except where noted.

The AAQ NEPM requires the monitoring of the pollutants carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), lead (Pb), particles less than 10 micrometres in diameter (PM_{10}) and particles less than 2.5 micrometres in diameter ($PM_{2.5}$).

Eight regions are defined in the monitoring plan. Consistent with the monitoring plan:

- **Port Phillip** and **Latrobe Valley** regions have permanent performance monitoring stations
- Campaign monitoring has been conducted in **Ballarat**, **Bendigo**, **Shepparton**, **Warrnambool** and **Mildura**.
- Data from New South Wales monitoring at Albury has been used for **Wodonga**.

Stations at which monitoring was conducted in 2010 are shown in Figures 1 and 2.

The monitoring stations, pollutants monitored and site types are summarised in Table 2. Site types are defined as: *generally representative upper bound* for community exposure sites; and *population-average* sites.[5]

Description of exposed population

The exposed population represented by each monitoring station is described qualitatively by the location category column in tables 1 and 2. Further information is given in Appendix C of the monitoring plan.

Investigative monitoring stations

A short-term, targeted air monitoring program for particles was also conducted in Brooklyn and Sunshine West to measure dust impacts from a local industrial estate in the Brooklyn area. These sites are not included in the Victoria's NEPM monitoring plan and are reported in separate Environment reports.

Table 1: Victorian performance monitoring stations

Region	Location category	Site type				
Performance monitoring station		CO	NO_2	O_3	SO_2	PM_{10}
Port Phillip						
Alphington	Res/LI	G*	G*	Pop	Pop*	G*
Altona North	I/Res				G	
Brighton	Res		G	Pop*		Pop
Dandenong	LI			Pop		Pop
Footscray	I/Res		G*	G*		G*
Geelong South	LI/Res	G*	G*	Pop*	G*	G*
Melton	Res			G		
Mooroolbark	Res			Pop		Pop
Point Cook	Rur/Res		Pop*	G*		
Point Henry	I/Rur			Pop		
Richmond	Res	G				G
RMIT (CBD)[a]	CBD	G*	G*		G	G*
Latrobe Valley						
Moe[b]	Res		Pop	G	G	G
Traralgon	Res		G*	G*	G*	G*

RMIT (CBD) RMIT University (central business district)
LI Light industrial
Rur Rural
Pop Population-average
a RMIT station closed in 2006.
b Moe closed in 2009

I Industrial
Res Residential
G Generally representative upper bound
* Trend station

Alternatives for RMIT and Moe will be considered as part of an overall review of Victoria's monitoring plan.

5 National Environment Protection (Ambient Air Quality) Measure Technical Paper No. 3, *Monitoring Strategy*, available from www.ephc.gov.au.

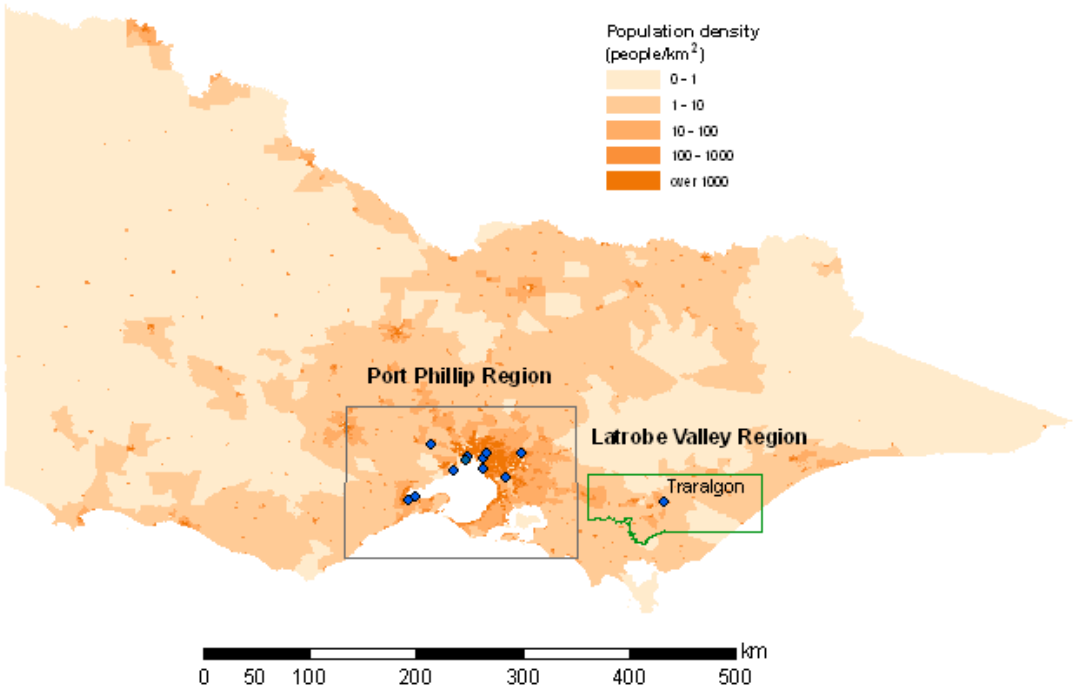

Figure 1: AAQ NEPM regions and population density in Victoria.

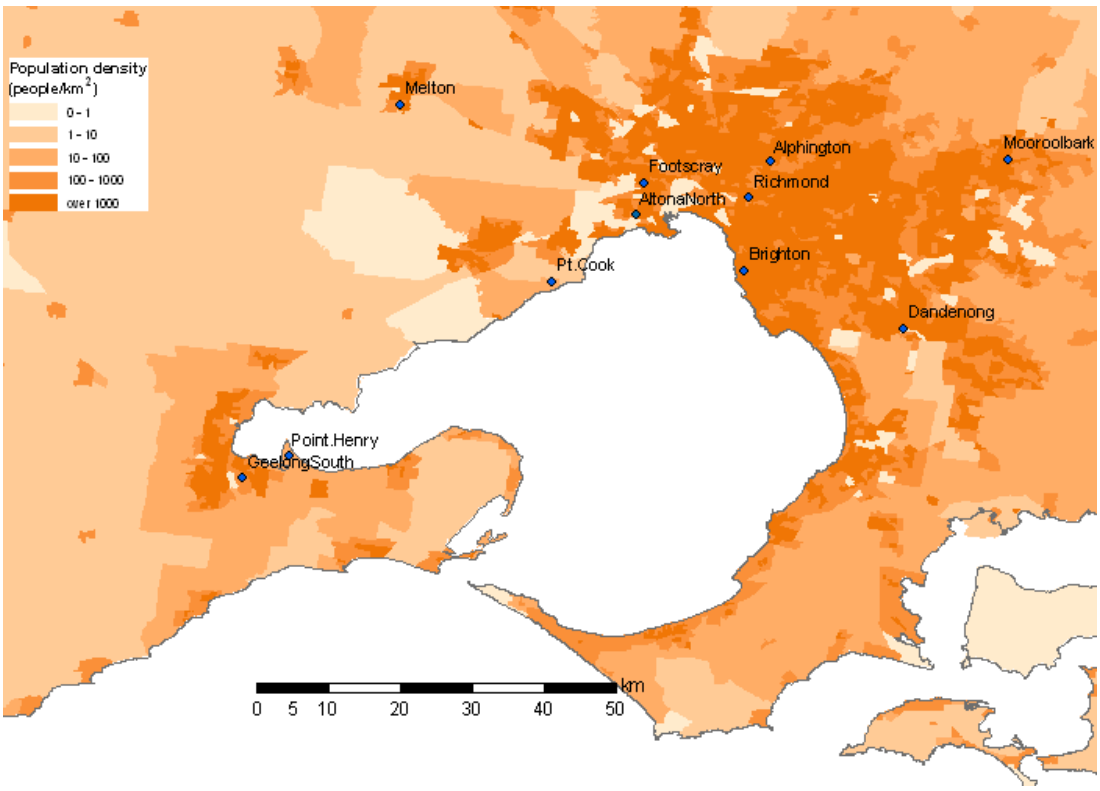

Figure 2: Monitoring stations and population density in the Port Phillip region.

Table 2: Summary of stations' siting compliance with AS 3580.1.1–2007

Region Station	Location category	Height above ground	Minimum distance to support structure	Clear sky angle of 120˚	Unrestricted airflow of 270˚/360˚	20 m from trees	No boilers or incinerators nearby	Minimum distance from road or traffic
Port Phillip								
Alphington	Res/LI	☑	☑	☑	☑	☒	☑	☑
Altona North	I/Res	☑	☑	☑	☑	☑	☑	☑
Brighton	Res	☑	☑	☑	☑	☑	☑	☑
Dandenong	LI	☑	☑	☑	☑	☑	☑	☑
Footscray	I/Res	☑	☑	☑	☑	☑	☑	☑
Geelong South	LI/Res	☑	☑	☑	☑	☑	☑	☑
Melton	Res	☑	☑	☑	☑	☑	☑	☑
Mooroolbark	Res	☑	☑	☑	☑	☑	☑	☑
Point Cook	Rur/Res	☑	☑	☑	☑	☑	☑	☑
Point Henry	I/Rur	☑	☑	☑	☑	☑	☑	☑
Richmond	Res	☑	☑	☑	☑	☒	☑	☑
Latrobe Valley								
Traralgon	Res	☑	☑	☑	☑	☒	☑	☑

I Industrial LI Light industrial Res Residential Rur Rural

Implementation of the monitoring plan

Victoria's air quality monitoring program is continually examined and options for current and future monitoring considered yearly, depending on needs and the findings of reviews. Since implementing the AAQ NEPM monitoring plan for Victoria[3], a number of modifications and reviews of components of the original plan have been made. The reviews will be completed and the monitoring plan finalised by the end of the 2011–12 financial year.

Monitoring ceased at the CBD station (at RMIT University) in October 2006, when the lease was terminated due to building extensions. The station at Paisley was renamed Altona North in June 2006 to better reflect its geographic location.

The peak station for lead, in Collingwood, was closed in December 2004 because levels were so low compared to the air quality objective. This change to Victoria's monitoring plan was approved in accordance with NEPM procedures.[5]

The station at Moe was closed in October 2009 when the lease was terminated due to building construction works, and following a review finding the Traralgon station was comparable to Moe and representative of Latrobe Valley.

Each of the monitoring stations meets the recommendations of the Australian Standard for siting of sampling units as shown in Table 2. Alphington, Richmond and Traralgon continue to have minor non-compliances due to the proximity of trees. Only a few small trees are within the 20-metre requirement at the Richmond site. An assessment of the impact of the trees on the Alphington and Traralgon sites, which have trees close to the station, will be conducted during 2011 to determine whether the sites need to be relocated close by.

Monitoring methods

Victorian monitoring is conducted in accordance with the standards shown in Table 3. Data not meeting the requirements of these standards and EPA's quality assurance procedures is identified as invalid and not included in reporting.

Particle concentration units of $\mu g/m^3$ refer to volumes at 0 °C and one atmosphere.

TEOM PM_{10} data included in this report has been adjusted according to the approved procedure[6], using the temperature-dependent formula with a constant value of K equal to 0.04.

The resulting adjustments vary from no change at daily average temperatures at or above 15 °C to an increase of 40 per cent at a temperature of 5 °C.

[5] National Environment Protection (Ambient Air Quality) Measure Technical Paper No. 9, *Lead Monitoring*, available from www.ephc.gov.au.

[6] National Environment Protection (Ambient Air Quality) Measure Technical Paper No. 10, *Collection and Reporting of TEOM PM_{10} Data*, available from www.ephc.gov.au.

Table 3: Methods for monitoring the NEPM pollutants

Pollutant		Standard	Title	Method used
Carbon monoxide	CO	AS3580.7.1-1992	*Ambient air – Determination of carbon monoxide – Direct reading instrument method*	Gas filter correlation/infrared.
Nitrogen dioxide	NO_2	AS3580.5.1-1993	*Ambient air – Determination of oxides of nitrogen – Chemiluminescence method*	Gas phase chemiluminescence
Photochemical oxidant (ozone)	O_3	AS3580.6.1-1990	*Ambient air – Determination of ozone – Direct reading instrument method*	Non-dispersive ultraviolet
Sulfur dioxide	SO2	AS3580.4.1-2008	*Ambient air – Determination of sulfur dioxide – Direct reading instrument method*	Pulsed fluorescence
Particles	PM_{10}	AS3580.9.8-2001 a	*Determination of suspended particulate matter – PM_{10} continuous direct mass method using a tapered element oscillating microbalance analyser*	Tapered element oscillating microbalance (TEOM)
	$PM_{2.5}$	AS/NZS3580.9.10-2006b	*Reference method for the determination of fine particulate matter as $PM_{2.5}$ in the atmosphere*	Gravimetric reference method
	$PM_{2.5}$	AS3580.9.8-2001b	*Technical paper on monitoring for particles as $PM_{2.5}$*	TEOM

b Modified for use in the $PM_{2.5}$ Equivalence Program according to the NEPM Technical Paper.

NATA status

All monitoring stations operated by EPA are covered by its NATA accreditation (Number 15119). EPA was successfully reaccredited in 2010.

Monitoring in the Latrobe Valley region was performed for EPA by Aurecon under its NATA accreditation (Number 4669).

Screening

The monitoring plan outlines processes to demonstrate whether levels of pollutants are consistently below the standards. Monitoring is not required, or may be at fewer than the specified number of stations, if screening procedures are satisfied[7]. Screening procedures conducted in accordance with the NEPM have been satisfied for Victorian regions – except for PM_{10} – at Ballarat, Bendigo, Mildura, Shepparton, Wodonga and Warrnambool.

Details of screening arguments are given in the monitoring plan and previous annual reports.

Regional campaign monitoring has recorded elevated concentrations of PM_{10} that do not meet screening criteria. This issue will be considered further in the current review of monitoring.

$PM_{2.5}$ monitoring

In 2003 the NEPM was varied to include advisory reporting standards for $PM_{2.5}$. Victoria monitors $PM_{2.5}$ by the reference method specified in the NEPM (on a one-day-in-three basis) at two stations (Alphington and Footscray).

Victoria also participates in the $PM_{2.5}$ Equivalence Program, with TEOM monitors located at Alphington and Footscray. Alphington was substituted for Mooroolbark, which was originally proposed in Schedule 5 of the NEPM. TEOM $PM_{2.5}$ readings are taken with the inbuilt adjustment for PM_{10} removed (A and B constants set to 0 and 1) and no adjustment for loss of volatiles[8].

[7] National Environment Protection (Ambient Air Quality) Measure Technical Paper No. 4, *Screening Procedures* (Revision 1, 2007), available from www.ephc.gov.au.

[8] *National Environment Protection (Ambient Air Quality) Measure Technical Paper on Monitoring for $PM_{2.5}$*, available from www.ephc.gov.au.

B ASSESSMENT OF COMPLIANCE WITH STANDARDS AND GOAL

Air quality is assessed against the AAQ NEPM standards and goal shown in Table 5.

- **Standards** are concentrations, in parts per million (ppm) or micrograms per cubic metre ($\mu g/m^3$), against which air quality can be assessed.
- The **goal** of the AAQ NEPM is to achieve the National Environment Protection Standards within ten years from commencement (that is, by 2008), as assessed in accordance with the monitoring protocol to the extent specified in Schedule 2 of the AAQ NEPM. The extent is expressed as a maximum allowable number of exceedances for each standard (shown in column four of Table 5).

The number of allowable exceedances associated with the standards has been set to account for unusual meteorological conditions and, in the case of particles, natural events such as bushfires and dust storms that cannot be controlled through normal air quality management strategies.

Air quality monitoring data from each monitoring site is assessed against these standards and the associated goal.

The AAQ NEPM also specifies advisory reporting standards for $PM_{2.5}$, with a daily (25 $\mu g/m^3$) and annual (8 $\mu g/m^3$) standard. The goal for $PM_{2.5}$ is to collect sufficient data to allow a review of the $PM_{2.5}$ standards.

Table 5: AAQ NEPM air quality standards and goal

Pollutant	Averaging period	Standard	Goal max. allowable exceedances
Carbon monoxide	8 hours	9.0 ppm	1 day a year
Nitrogen dioxide	1 hour 1 year	0.12 ppm 0.03 ppm	1 day a year None
Ozone	1 hour	0.10 ppm	1 day a year
	4 hours	0.08 ppm	1 day a year
Sulfur dioxide	1 hour	0.20 ppm	1 day a year
	1 day	0.08 ppm	1 day a year
	1 year	0.02 ppm	none
Particles as PM_{10}	1 day	50 $\mu g/m^3$	5 days a year
Lead	1 year	0.50 $\mu g/m^3$	none
Particles as $PM_{2.5}$	1 day 1 year	25 $\mu g/m^3$ 8 $\mu g/m^3$	Not applicable Not applicable

The following tables summarise compliance with the standards and goal of the AAQ NEPM.

Air quality is assessed as complying with the NEPM if the number of exceedances of the standard is no more than the number specified in Schedule 2 of the AAQ NEPM and data availability was at least 75 per cent in each quarter of the year. Regions also meet the standards and goal if they do not require monitoring on the basis that screening shows pollutant levels are reasonably expected to be consistently below the relevant standards.

Air quality is assessed as 'not demonstrated' if there has been insufficient data collected to demonstrate that the standards and goal have been met or not met.

Regions may also be assessed as 'not demonstrated' if screening has not been completed.

Carbon monoxide

Table 6: 2010 compliance summary for carbon monoxide in Victoria

AAQ NEPM standard: 9.0 ppm (eight-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Region Performance monitoring station	Data availability rates (% of hours)					Number of exceedances (days)	Performance against the standard and goal
	Q1	Q2	Q3	Q4	Annual		
Port Phillip							
Alphington	92.6	92.9	93.9	93.8	93.3	0	met
Geelong South	94.6	94.8	94.1	94.9	94.6	0	met
Richmond	94.6	92.5	86.9	92.1	91.5	0	met

Regions that do not require monitoring on the basis that screening shows pollutant levels are reasonably expected to be consistently below the relevant AAQ NEPM standard are Latrobe Valley, Ballarat, Bendigo, Shepparton, Warrnambool, Wodonga and Mildura.

At stations operated during 2010, the carbon monoxide standard was not exceeded and compliance was demonstrated at all stations.

Nitrogen dioxide

Table 7: 2010 compliance summary for nitrogen dioxide in Victoria

AAQ NEPM standards: 0.12 ppm (one-hour average); 0.03 ppm (one-year average)
AAQ NEPM goal: one-hour standard exceeded on no more than one day per year

Region Performance monitoring station	Data availability rates (% of hours)					Number of exceedances (days)	Annual mean (ppm)	Performance against the standards and goal	
	Q1	Q2	Q3	Q4	Annual			1-hour	1-year
Port Phillip									
Alphington	93.0	93.6	94.4	94.2	93.8	0	0.009	met	met
Brighton	95.0	94.9	94.7	95.0	94.9	0	0.008	met	met
Footscray	94.3	94.3	94.8	94.9	94.6	0	0.011	met	met
Geelong South	94.6	94.8	90.9	94.9	93.8	0	0.006	met	met
Point Cook	81.4	87.8	91.2	83.9	86.1	0	0.005	met	met
Latrobe Valley									
Traralgon	95.6	95.6	93.1	95.3	94.9	0	0.007	met	met

ND: Not demonstrated by monitoring. See comments below.

Regions that do not require monitoring on the basis of screening arguments that pollutant levels are reasonably expected to be consistently below the relevant AAQ NEPM standard are Ballarat, Bendigo, Shepparton, Warrnambool, Wodonga and Mildura.

At all stations operating during 2010, the nitrogen dioxide standards were not exceeded and compliance was demonstrated.

Ozone

Table 8: 2010 compliance summary for ozone in Victoria

AAQ NEPM standards: 0.10 ppm (one-hour average); 0.08 ppm (four-hour average)
AAQ NEPM goal: Standards exceeded on no more than one day per year

Region / Performance monitoring station	Data availability rates (% of hours)					Number of exceedances (days)		Performance against the standards and goal	
	Q1	Q2	Q3	Q4	Annual	1-hour	4-hour	1-hour	4-hour
Port Phillip									
Alphington	92.9	93.4	*64.0*	89.0	84.7	0	0	ND	ND
Brighton	92.0	94.9	*24.7*	95.0	76.5	0	0	ND	ND
Dandenong	94.6	94.3	89.4	95.0	93.3	0	0	met	met
Footscray	94.3	94.5	94.8	94.7	94.6	0	0	met	met
Geelong South	94.4	94.8	81.6	94.9	91.4	0	0	met	met
Melton	94.9	95.1	86.4	*71.2*	86.8	0	0	ND	ND
Mooroolbark	89.5	95.1	94.7	88.6	92.0	0	0	met	met
Point Cook	87.0	93.5	94.7	92.5	92.0	0	0	met	met
Point Henry	95.4	90.2	*71.9*	*58.3*	78.8	0	0	ND	ND
Latrobe Valley									
Traralgon	95.5	95.6	95.3	95.5	95.5	0	0	met	met

ND: Not demonstrated by monitoring. See comments below.

Regions that do not require monitoring on the basis of screening arguments that pollutant levels are reasonably expected to be consistently below the relevant AAQ NEPM standard are Shepparton, Warrnambool, Wodonga, Mildura.

Compliance was not demonstrated (ND) at Alphington (Q3), Brighton (Q3), Melton (Q4) and Point Henry (Q3, Q4) due to technical problems with equipment.

At all other stations operating during 2010, the goals for the one and four-hour levels were met.

Sulfur dioxide

Table 9: 2010 compliance summary for sulfur dioxide in Victoria

AAQ NEPM standards: 0.20 ppm (one-hour average); 0.08 ppm (24-hour average); 0.02 ppm (1-year average)
AAQ NEPM goal: one-hour and 24-hour standards exceeded on no more than one day per year

Region / Performance monitoring station	Data availability rates (% of hours)					Exceedances (days)		Annual mean (ppm)	Performance against the standards and goal		
	Q1	Q2	Q3	Q4	Annual	1-hour	24-hour		1-hour	24-hour	1-year
Port Phillip											
Alphington	89.0	81.3	89.5	89.9	87.4	0	0	0.000	met	met	met
Altona North	88.3	84.9	88.0	91.2	88.1	0	0	0.002	met	met	met
Geelong South	90.5	76.8	89.5	92.3	87.2	0	0	0.001	met	met	met
Latrobe Valley											
Traralgon	95.6	95.5	95.1	95.3	95.4	0	0	0.002	met	met	met

ND: Not demonstrated by monitoring. See comments below.

Regions that do not require monitoring on the basis of screening arguments that pollutant levels are reasonably expected to be consistently below the relevant AAQ NEPM standard are Ballarat, Bendigo, Shepparton, Warrnambool, Wodonga and Mildura.

At all stations operating during 2010, the sulfur dioxide standards were not exceeded and compliance was demonstrated. Annual mean values are close to the limits of detection.

Particles as PM_{10}

Table 10: 2010 compliance summary for PM_{10} in Victoria

AAQ NEPM Standard: 50 μg/m³ (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than 5 days per year

Region Performance monitoring station	Data availability rates (% of days)					Number of exceedances (days)	Performance against the standard and goal
	Q1	Q2	Q3	Q4	Annual		
Port Phillip							
Alphington	97.8	97.8	97.8	97.8	97.8	0	met
Brighton	100.0	81.3	84.8	100.0	91.5	0	met
Dandenong	100.0	98.9	96.7	98.9	98.6	0	met
Footscray	98.9	100.0	97.8	100.0	99.2	4	met
Geelong South	97.8	100.0	100.0	100.0	99.5	1	met
Mooroolbark	85.6	94.5	95.7	100.0	94.0	3	met
Richmond	100.0	95.6	94.6	98.9	97.3	0	met
Latrobe Valley							
Traralgon	100.0	100.0	100.0	100.0	100.0	3	met

Monitoring was by TEOM.

Screening arguments that PM_{10} levels are reasonably expected to be consistently below the relevant AAQ NEPM standard have not been satisfied for other regions (Ballarat, Bendigo, Shepparton, Wodonga and Mildura). These are assessed as 'not demonstrated'.

The PM_{10} standard was exceeded at Footscray, Geelong South, Mooroolbark and Traralgon. These exceedances were the result of planned burning, windborne dust and urban sources, as detailed in Section C. Compliance and the NEPM goal was met at all stations.

Particles as $PM_{2.5}$

The NEPM was varied in 2003 to include advisory reporting standards for particles as $PM_{2.5}$. There is no time frame for compliance, but monitoring by the reference method and other acceptable methods must be reported.

Table 11 summarises Victoria's monitoring of $PM_{2.5}$ by the reference method. Only reference method monitoring is to be used for comparisons with the advisory reporting standards. The goal is to gather sufficient data nationally to facilitate a review of the advisory reporting standards as part of the review of the NEPM that commenced in 2005.

Table 11: 2010 monitoring summary for $PM_{2.5}$ in Victoria

AAQ NEPM advisory reporting standards: 25 μg/m³ (24-hour average); 8 μg/m³ (1-year average)

Region Performance monitoring station	Data availability rates (% of days)					Number of exceedances (days)	Annual mean (μg/m³)
	Q1	Q2	Q3	Q4	Annual		
Port Phillip							
Alphington	100.0	100.0	100.0	100.0	100.0	3	7.3
Footscray	83.3	100.0	100.0	100.0	95.9	0	6.8

Monitoring by reference method (one-day-in-three).

Exceedances of the 24-hour $PM_{2.5}$ reporting standard were caused by accumulation of urban emissions, as detailed in Section C.

Table 12 summarises Victoria's monitoring of $PM_{2.5}$ by TEOM for the Equivalence Program. TEOM $PM_{2.5}$ data is usually lower than the reference method, especially in the cooler months due, to the loss of the volatile component of $PM_{2.5}$. Details are given in Section C.

Table 12: $PM_{2.5}$ Equivalence Program 2010 TEOM monitoring summary

Region Performance monitoring station	**Data availability rates (% of days)**					**Annual mean**
	Q1	Q2	Q3	Q4	Annual	($\mu g/m^3$)
Port Phillip						
Alphington	97.8	97.8	97.8	98.9	98.1	4.9
Footscray	97.8	97.8	100.0	100.0	98.9	4.5

Monitoring by TEOM (daily).

Lead

Following the phasing out of leaded petrol, concentrations at the peak station, Collingwood, were below the level specified for discontinuing monitoring.[9] Monitoring of lead in Melbourne ceased at the end of 2004. All other regions meet screening criteria as set out in the monitoring plan and all regions are assessed as complying with the standard and goal.

9 *National Environment Protection (Ambient Air Quality) Measure Technical Paper No. 9, Lead Monitoring*, available from www.ephc.gov.au.

C ANALYSIS OF AIR QUALITY MONITORING

Annual summary statistics are presented in this section. The AAQ NEPM states that the short-term standards should not be exceeded on more than one day per year for carbon monoxide, nitrogen dioxide, ozone and sulfur dioxide, or on more than five days per year for PM_{10}. The second highest non-overlapping daily value for the year (or the sixth for PM_{10}) can indicate the extent to which the standards are, or are not, met. Concentrations exceeding the standard are highlighted in bold.

All occasions when a standard was exceeded are listed, as are the circumstances leading to the exceedance.

Tables of monitoring statistics presented in this section have been prepared according to AAQ NEPM guidelines.[10]

Carbon monoxide

Table 13: 2010 summary statistics for daily peak eight-hour carbon monoxide in Victoria

AAQ NEPM standard: 9.0 ppm (eight-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Region Performance monitoring station	**Number of valid days**	**Highest (ppm)**	**Highest (date:hour)**	**2nd highest (ppm)**	**2nd highest (date:hour)**
Port Phillip					
Alphington	356	2.8	May 17:02	2.7	Jun 22:02
Geelong South	358	1.8	Jun 22:03	1.7	Jun 21:24
Richmond	343	3.2	May 17:02	3.0	Jun 21:24

Carbon monoxide levels were well within the standard at all stations. The highest readings were at the inner-suburban site Richmond, where carbon monoxide reached 36 per cent of the standard.

Nitrogen dioxide

Table 14: 2010 summary statistics for daily peak one-hour nitrogen dioxide in Victoria

AAQ NEPM standard: 0.12 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Region Performance monitoring station	**Number of valid days**	**Highest (ppm)**	**Highest (date:hour)**	**2nd highest (ppm)**	**2nd highest (date:hour)**
Port Phillip					
Alphington	360	0.038	May 17:18		
			Jan 08:22		
Brighton	365	0.045	Jun 22:23	0.039	Apr 16:20
					Mar 18:21
Footscray	365	0.062	Jun 22:20	0.058	May 20:13
Geelong South	361	0.039	Mar 18:16	0.038	May 03:18
Point Cook	327	0.037	Jan 21:23	0.036	Apr 16:21
Latrobe Valley					
Traralgon	362	0.031	Aug 30:19	0.028	Apr 19:18
					Jul 08:18

Nitrogen dioxide levels were well within the standard at all stations. The highest one-hour average occurred at Footscay, and was 52 per cent of the hourly standard. The highest annual average occurred at Footscray, and was 37 per cent of the standard (Table 7).

10 *National Environment Protection (Ambient Air Quality) Measure Technical Paper No. 8*, Annual Reports, available from www.ephc.gov.au.

Ozone

Table 15: 2010 summary statistics for daily peak one-hour ozone in Victoria

AAQ NEPM standard: 0.10 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Region Performance monitoring station	**Number of valid days**	**Highest (ppm)**	**Highest (date:hour)**	**2nd highest (ppm)**	**2nd highest (date:hour)**
Port Phillip					
Alphington	322	0.061	Feb 08:16	0.054	Feb 10:13
Brighton	294	0.060	Feb 02:14	0.058	Feb 08:15
Dandenong	357	0.077	Feb 10:13	0.059	Jan 09:12
Footscray	364	0.068	Feb 08:16	0.065	Feb 02:15
Geelong South	351	0.084	Jan 11:13	0.064	Jan 08:19
Melton	330	0.062	Feb 08:16	0.061	Feb 02:16
Mooroolbark	351	0.066	Jan 09:14	0.062	Feb 09:15
Point Cook	350	0.058	Mar 15:17	0.053	Jan 04:18
Point Henry	296	0.077	Jan 11: 13	0.075	Feb 10:15
Latrobe Valley					
Traralgon	365	0.057	Mar 19:16	0.056	Mar 17:18

Table 16: 2010 summary statistics for daily peak four-hour ozone in Victoria

AAQ NEPM standard: 0.08 ppm (four-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Region Performance monitoring station	**Number of valid days**	**Highest (ppm)**	**Highest (date:hour)**	**2nd highest (ppm)**	**2nd highest (date:hour)**
Port Phillip					
Alphington	321	0.057	Feb 08:17	0.046	Feb 02:17
Brighton	292	0.055	Feb 02:16		
			Jan 11:14		
Dandenong	356	0.071	Feb 10:14	0.055	Jan 09:13
					Feb 11:15
					Feb 09:17
Footscray	364	0.061	Feb 08:17	0.059	Feb 02:16
					Jan 11:14
Geelong South	350	0.067	Jan 11:15	0.058	Jan 08:22
Melton	329	0.058	Feb 08:17	0.056	Jan 30:18
Mooroolbark	350	0.062	Jan 09:16	0.060	Feb 08:16
Point Cook	351	0.054	Mar 15:18	0.048	Oct 21:21
Point Henry	296	0.067	Jan 11:15	0.063	Jan 08:21
Latrobe Valley					
Traralgon	365	0.047	Mar 17:19		
			Mar 19:16		

Ozone is generated by chemical reactions in strong sunlight as precursor chemicals are transported from the point of emission. Ozone events in Melbourne typically occur when air masses are recirculated back into the metropolitan area. Compared to their respective standards, the four-hour averages are usually proportionally higher than one-hour averages, leading to more exceedances of the four-hour standard.

The standards and the goals for ozone (O_3) were met at all stations during 2010 for one-hour average and four-hour average ozone. There were no exceedances of the one-hour and four-hour standards. The highest one-hour average in the Port Phillip region, at Geelong South, was 84 per cent of the standard and in the Latrobe Valley, at Traralgon, 57 per cent of the standard. The highest four-hour average in the Port Phillip region, at Dandenong, was 89 per cent of the standard and in the Latrobe Valley, at Traralgon, 59 per cent of the standard.

Table 17: 2010 ozone exceedances

AAQ NEPM standards: 0.10 ppm (one-hour average), 0.08 ppm (four-hour average)
AAQ NEPM goal: Standards exceeded on no more than one day per year

Date	Region	Station	Exceedance	Inferred cause
Averaging period one-hour				
none	Port Phillip	Alphington	none	none
none		Brighton	none	none
none		Dandenong	none	none
none		Footscray	none	none
none		Geelong South	none	none
none		Melton	none	none
none		Mooroolbark	none	none
none		Point Cook	none	none
none		Point Henry	none	none
none	Latrobe Valley	Traralgon	none	none
Averaging period four-hour				
none	Port Phillip	Alphington	none	none
none		Brighton	none	none
none		Dandenong	none	none
none		Footscray	none	none
none		Geelong South	none	none
none		Melton	none	none
none		Mooroolbark	none	none
none		Point Cook	none	none
none		Point Henry	none	none
none	Latrobe Valley	Traralgon	none	none

Sulfur dioxide

Table 18: 2010 summary statistics for daily peak one-hour sulfur dioxide in Victoria

AAQ NEPM standard: 0.20 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Region Performance monitoring station	Number of valid days	Highest (ppm)	Highest (date:hour)	2nd highest (ppm)	2nd highest (date:hour)
Port Phillip					
Alphington	349	0.008	Sep 20:09		
			Sep 19:08		
Altona North	336	0.068	Sep 16:14	0.067	Dec 20:09
					Sep 15:17
Geelong South	338	0.052	Jun 14:19	0.040	Jun 03:11
Latrobe Valley					
Traralgon	365	0.049	Jan 25:15	0.037	Nov 20:11

Table 19: 2010 summary statistics for daily peak 24-hour sulfur dioxide in Victoria

AAQ NEPM standard: 0.08 ppm (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Region Performance monitoring station	**Number of valid days**	**Highest (ppm)**	**Highest (date)**	**2nd highest (ppm)**	**2nd highest (date)**
Port Phillip					
Alphington	349	0.004	Jun 25	0.003	Apr 01
Altona North	336	0.026	Dec 20	0.017	Sep 17
Geelong South	338	0.007	Oct 30	0.005	Dec 26
					Jun 14
Latrobe Valley					
Traralgon	365	0.007	Nov 14		
			Jan 25		

Sulfur dioxide levels were well below the standards at all stations. Maximum one-hour averages are higher relative to the standard than 24-hour or annual averages. The highest one-hour reading occurred at Altona North and was 34 per cent of the one-hour standard. The 24-hour reading on the same day was 16 per cent of the 24-hour standard. Annual averages at all stations (Table 9) are close to the limit of detection. The highest 24-hour reading occurred at Altona North and was 33 per cent of the 24-hour standard.

Particles as PM_{10}

Table 20: 2010 summary statistics for 24-hour PM_{10} in Victoria

AAQ NEPM standard: 50 $\mu g/m^3$ (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than 5 days per year

Region Performance monitoring station	**Number of valid days**	**Highest ($\mu g/m^3$)**	**Highest (date)**	**6th highest ($\mu g/m^3$)**	**6th highest (date)**
Port Phillip					
Alphington	357	47.7	Jun 22	37.0	Jan 31
Brighton	334	41.0	May 18	34.3	Feb 02
Dandenong	360	43.7	Jun 22	38.1	Jul 28
Footscray	362	**74.8**	Jun 22	45.5	Sep 16
Geelong South	363	**50.4**	Nov 23	43.9	Oct 22
Mooroolbark	343	**53.8**	Jul 06	46.9	May 19
					Mar 18
Richmond	355	46.6	Jun 22	32.7	May 18
Latrobe Valley					
Traralgon	365	**77.6**	Mar 17	36.7	Mar 19

The NEPM goal was achieved at all stations in the Port Phillip region and Traralgon in the Latrobe Valley.

In addition to TEOM monitoring, PM_{10} was monitored by high-volume sampler one day in six, at Alphington and Footscray, throughout the year. The highest high-volume sampler reading at each station respectively was 35 $\mu g/m^3$ (12 Jan) and 32 $\mu g/m^3$ (18 May).

In 2010, PM10 exceedances occurred on the days listed in Table 21. The likely causes have been inferred, with the exceedances attributed to the buildup of pollution in stable atmospheric conditions with low winds (four days), windborne dust during the warmer months (four days) and bushfires or planned burning (three days).

Exceedances caused by the buildup of pollution in stable atmospheric conditions with low winds occurred on three days at Mooroolbark, where the station is located in a valley.

Overall there has been a significant reduction in exceedances in 2010, with 11 exceedances over 11 days. In comparison, the standard was exceeded 90 times over 32 days in 2009, 49 times over 18 days in 2008 and 58 times over 34 days in 2007.

Table 21: 2010 PM_{10} exceedances

AAQ NEPM standard: 50μg/m^3 (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than 5 days per year

Date	Port Phillip							Latrobe Valley	Inferred cause[a]
	Alphington	Brighton	Dandenong	Footscray	Geelong South	Mooroolbark	Richmond	Traralgon	
Jan 12				**74.7**					Dust
Feb 22				**58.1**					Dust
Mar 17								**77.6**	Fire
Mar 18								**53.4**	Fire
Apr 19								**51.3**	Fire
May 17						**51.3**			Urban
May 18						**51.9**			Urban
Jun 22				**74.8**					Urban
Jul 06						**53.8**			Urban
Sep 17				**55.3**					Dust
Nov 23					**50.4**				Dust
Total	0	0	0	4	1	3	0	3	

All readings in μg/m^3.
a Dust = windborne crustal dust, often from distant sources.
Fire = smoke from bushfires, planned burning or agricultural burning.
Urban = particles accumulating in stable atmospheric conditions, typically from motor vehicles or domestic wood heaters.

Particles as $PM_{2.5}$

Table 22: 2010 summary statistics for 24-hour $PM_{2.5}$ in Victoria

AAQ NEPM advisory reporting standard: 25 μg/m³ (24-hour average)

Region Performance monitoring station	**Number of valid days**	**Highest (μg/m³)**	**Highest (date)**
Port Phillip			
Alphington	121	**27.0**	May 18
Footscray	116	24.5	Mar 25

Monitoring by reference method (one day in three).

The 24-hour reporting standard for $PM_{2.5}$ was exceeded at Alphington on three days when particles accumulated typically from vehicle traffic or domestic wood heaters.

The annual reporting standard (8 μg/m³) was achieved at both stations (Table 11).

Table 23: 2010 $PM_{2.5}$ exceedances

AAQ NEPM standard: 25 μg/m³ (24-hour average)

Date	**Port Phillip**		**Inferred cause**[a]
	Alphington	Footscray	
May 18	**27.0**		Urban
Jul 18	**25.5**		Urban
Aug 10	**26.5**		Urban

All readings in μg/m³. Measured by reference method.

a Urban = particles accumulating in stable atmospheric conditions, typically from vehicle traffic or domestic wood heaters.

Results of $PM_{2.5}$ monitoring by TEOM (Table 24) are not adjusted for loss of volatiles. The highest reading at Alphington (May 17) occurred on a day where particles accumulated typically from vehicle traffic or domestic wood heaters. The highest reading at Footscray (Mar 25) was due to smoke from planned burns.

Table 24: $PM_{2.5}$ Equivalence Program 2010 TEOM monitoring – daily statistics

Region Performance monitoring station	**Number of valid days**	**Highest (μg/m³)**	**Highest (date)**
Port Phillip			
Alphington	358	17.3	May 17
Footscray	361	22.9	Mar 25

Summary of progress towards achieving the AAQ NEPM goal

Compliance in 2010

The AAQ NEPM goal for carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide, lead and PM_{10} is to achieve the standards, to the extent specified by the number of times allowed to exceed the standard.

In 2010, at all stations where there was sufficient data capture the goal was met. The exceptions were ozone where there was insufficient data at Alphington (Q3), Brighton (Q3), Melton (Q4) and Point Henry (Q3,Q4).

All of the PM_{10} exceedances in the Port Phillip region were attributed to windborne dust (five) and accumulation of urban emissions (three). The days exceeding the standard in the Latrobe Valley at Traralgon (three) were attributed to bushfires and/or planned burning. In the Port Phillip and Latrobe Valley regions, particles as PM_{10} goal were met in 2010.

The one-hour average and four-hour average ozone standards and the goals for ozone (O_3) were met at all stations where there was sufficient data during 2010 in the Port Phillip region and at Traralgon in the Latrobe Valley There were no exceedances of the one-hour and four-hour standards.

The 24-hour advisory reporting standard for particles (as $PM_{2.5}$) was exceeded three times in the Port Phillip region. These were at Alphington due to particles accumulating typically from vehicle traffic or domestic wood heaters. The annual reporting standard (8 μg/m³) was met for $PM_{2.5}$.

Trends in compliance

An analysis of Victoria's compliance with the NEPM has been performed taking into account monitoring over 2003–10[11] and screening (summarised in Table 4).

Over 2003–10, the goal and standards have been consistently met in Victoria for carbon monoxide, nitrogen dioxide, sulfur dioxide and lead.

For ozone, the NEPM goal was met in four of the last eight years in the Port Phillip region (2004, 2005, 2007, 2010) and in seven of the last eight years in the Latrobe Valley region (2003, 2004, 2005, 2007, 2008, 2009, 2010).[12] Exceedances of both the four-hour and (less frequently) one-hour standards have been recorded. Major bushfires in 2003, 2006 and 2007 caused or exacerbated many of the ozone exceedances observed (see Figure 3).[13] Ozone monitoring in other rural regions did not record any

11 Prior to 2003 Victoria's monitoring network was not fully established for ozone and particles.

12 A region achieves the goal in any year if all stations in the region achieve the goal.

13 The regional exceedances shown in Figures 3 to 5 are the sum of the exceedance days recorded at all stations in the region. This number cannot be compared with the AAQ NEPM goal.

exceedances and all except Ballarat satisfy screening criteria.

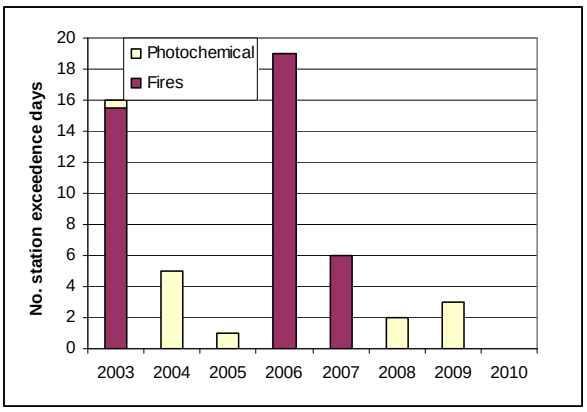

Figure 3: Inferred causes of exceedances of the ozone four-hour standard (Port Phillip region 2003–10)

In the Port Phillip region, the particles as PM_{10} goal have only been met in 2010 during the period 2003–10. The elevated particles levels resulting in levels above the air quality standard were attributed (See Figure 4) to fires (bushfires or planned burning) as the most frequent cause, followed by windborne dust (either locally raised dust or dust storms with transport over larger distances). 2003, 2006 and 2009 were particularly affected by fires, with all stations in the Port Phillip region not meeting the goal. In other years, although some stations did not meet the goal, the majority of stations in the region met the goal.

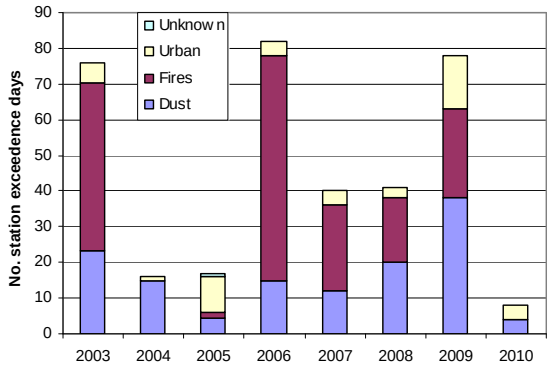

Figure 4: Inferred causes of exceedances of the PM_{10} standard (Port Phillip region 2003–10)

In the Latrobe Valley region, the particles as PM_{10} goal during 2002–10 were not met during the years 2003, 2006, 2007, 2008 and 2009.

The major cause of the elevated particle levels were attributed to mainly fire – bushfires and/or planned burning – followed by windborne dust (either locally raised dust or dust storms with transport over larger distances).

The AAQ NEPM goal for $PM_{2.5}$ is to gather sufficient data to facilitate a review of the advisory reporting standards as part of the review of the NEPM. $PM_{2.5}$ has been monitored at two stations (Alphington and Footscray) in the Port Phillip region since 2002. Exceedances of the 24-hour $PM_{2.5}$ standard have occurred at these stations (Figure 5), attributed to urban and bushfire and planned burning sources.

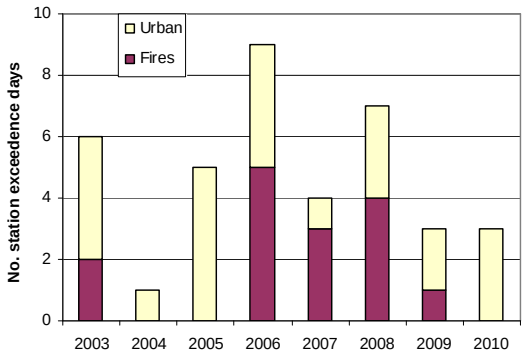

Figure 5: Inferred causes of exceedances of the $PM_{2.5}$ 24-hour standard (Port Phillip region 2003–10)

Data capture

Compliance with the standards and goal can only be demonstrated if data capture is at least 75 per cent in each quarter of the year.[14] In 2010 this requirement was achieved for all pollutants at all stations, except Alphington (Q3), Brighton (Q3), Melton (Q4) and Point Henry (Q3,Q4) for ozone.

Screening

Screening for carbon monoxide, nitrogen dioxide and ozone for the rural regions of Ballarat, Bendigo, Mildura, Shepparton, Wodonga, and Warrnambool indicate levels for these pollutants will meet the goal. Campaign monitoring in these regions (with the exception of Mildura) show that the particles as PM_{10} met the goal although on some days the levels exceed the air quality standard. Monitoring at Mildura indicated that the region did not meet the goal during the monitoring period due to frequent dust storms.

[14] *National Environment Protection (Ambient Air Quality) Measure Technical paper No. 8,* Annual Reports, available from www.ephc.gov.au.

D TRENDS AND POLLUTANT DISTRIBUTIONS

Results of further analysis of the monitoring data are presented in this section. Percentiles of 2010 daily peak concentrations are presented for each station and standard. In these tables daily peak values are formed only when at least 75 per cent of the data for the day are valid. Data for stations with less than 15 per cent data in the year are omitted and stations with less than 75 per cent data are shown in italics. Exceedances are shown in bold. The percentiles for eight-hour carbon monoxide and four-hour ozone are based on running averages, including those that overlap from one day to the next.

Percentiles of the daily peak concentrations in Port Phillip Region, are plotted after 2001, when monitoring according to the NEPM protocol ensured greater continuity of stations operating each year. The values plotted are averages of the percentiles from stations having at least 75 per cent of data in the year. Different stations and different statistics can suggest different trend behaviour; no estimates of statistical significance are presented.

Annual statistics are also presented in tables for each station with at least five years of data. Trend data for lead is presented, although monitoring ceased in 2004.

Carbon monoxide

Table 25: 2010 percentiles of daily peak eight-hour carbon monoxide concentrations in Victoria

AAQ NEPM standard: 9.0 ppm (eight-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Region	**Data availability**	**Max**	**Percentiles (ppm)**					
Performance monitoring station	**(% of days)**	**(ppm)**	**99th**	**98th**	**95th**	**90th**	**75th**	**50th**
Port Phillip								
Alphington	97.5	2.8	2.4	2.1	1.8	1.4	0.4	0.1
Geelong South	98.1	1.8	1.3	1.2	0.8	0.7	0.5	0.3
Richmond	94.0	3.2	2.7	1.9	1.6	1.4	0.7	0.5

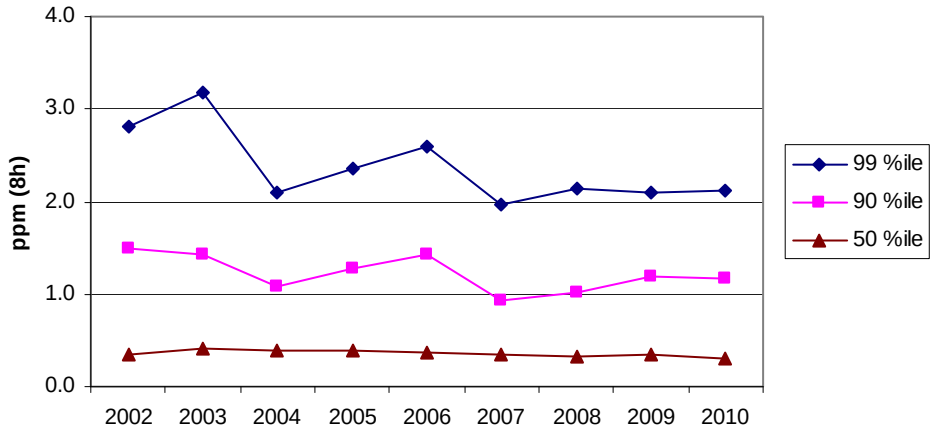

Figure 6: Percentiles of daily maximum eight-hour carbon monoxide (average of Port Phillip stations 2002-10)

In interpreting trends, it should be noted that monitoring at RMIT ceased in October 2006. This CBD station tended to record higher carbon monoxide, so averages in later years may be relatively lower.

Table 26: Percentiles of daily maximum eight-hour carbon monoxide at Alphington (1995–2010)

AAQ NEPM standard: 9.0 ppm (eight-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	92.1	0	6.0	4.9	4.5	3.4	2.5	1.5	0.8
1996	98.6	0	6.5	5.8	5.0	3.3	2.5	1.6	0.8
1997	98.9	0	6.5	5.5	4.4	3.4	2.6	1.5	0.8
1998	95.3	0	6.8	6.0	5.1	3.9	2.7	1.7	0.7
1999	*55.1*	*0*	*6.2*	*4.7*	*4.1*	*3.0*	*2.1*	*1.1*	*0.6*
2000	96.7	0	5.0	4.5	4.3	3.1	2.4	1.2	0.6
2001	92.9	0	5.2	3.8	3.4	2.9	2.0	1.1	0.6
2002	93.7	0	3.8	3.5	3.1	2.7	2.0	0.9	0.4
2003	96.7	0	5.4	3.9	3.5	2.7	1.8	0.9	0.5
2004	97.0	0	3.7	2.4	2.3	1.7	1.3	0.8	0.5
2005	93.7	0	3.1	2.5	2.4	2.0	1.6	0.9	0.6
2006	89.6	0	3.6	3.2	3.0	2.5	1.9	1.0	0.6
2007	98.6	0	2.8	2.3	1.9	1.6	1.2	0.8	0.5
2008	98.4	0	3.2	2.7	2.3	1.7	1.4	0.8	0.4
2009	97.5	0	2.6	2.1	2.0	1.8	1.3	0.7	0.3
2010	97.5	0	2.8	2.4	2.1	1.8	1.4	0.4	0.1

Years with data availability below 75 per cent shown in italics.

Table 27: Percentiles of daily maximum eight-hour carbon monoxide at Geelong South (1995–2010)

AAQ NEPM standard: 9.0 ppm (eight-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	80.5	0	4.2	3.2	2.9	2.4	1.6	0.8	0.4
1996	86.3	0	4.3	3.3	2.9	1.9	1.2	0.5	0.3
1997	*0.0*								
1998	*66.0*	*0*	*3.3*	*2.8*	*2.6*	*2.3*	*1.6*	*0.7*	*0.4*
1999	92.6	0	3.0	2.7	2.3	1.6	1.1	0.7	0.3
2000	85.8	0	2.7	2.1	1.9	1.4	1.0	0.5	0.3
2001	87.7	0	2.2	1.9	1.6	1.2	0.9	0.5	0.2
2002	87.1	0	2.3	1.8	1.4	1.0	0.6	0.3	0.1
2003	87.1	0	3.2	1.8	1.6	1.1	0.7	0.4	0.2
2004	85.8	0	2.9[a]	1.7	1.6	0.9	0.6	0.4	0.1
2005	96.4	0	3.5	1.8	1.5	0.9	0.7	0.2	0.1
2006	92.3	0	2.2	1.9	1.6	1.2	0.7	0.3	0.1
2007	98.1	0	1.9	1.3	1.1	0.7	0.6	0.4	0.2
2008	94.5	0	2.2	1.8	1.6	1.0	0.5	0.3	0.2
2009	98.6	0	2.6	1.6	1.2	1.0	0.7	0.4	0.3
2010	98.1	0	1.8	1.3	1.2	0.8	0.7	0.5	0.3

a Recorded on a day time with less than 75% of valid eight -hour averages.

Years with data availability below 75 per cent shown in italics.

Table 28: Percentiles of daily maximum eight-hour carbon monoxide at Richmond (2001–10)

AAQ NEPM standard: 9.0 ppm (eight-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
2001	89.3	0	4.0	3.4	3.1	2.7	2.0	1.1	0.5
2002	93.2	0	5.0	3.1	2.8	2.4	1.9	0.8	0.3
2003	96.4	0	6.4	4.0	3.6	2.6	1.7	0.8	0.3
2004	96.2	0	3.9	2.4	2.2	1.8	1.2	0.6	0.3
2005	96.2	0	3.8	3.1	2.8	2.2	1.5	0.6	0.2
2006	95.3	0	3.2	2.9	2.8	2.3	1.7	0.7	0.3
2007	97.3	0	2.9	2.3	1.9	1.5	1.0	0.5	0.3
2008	95.4	0	3.7	1.9	1.6	1.5	1.2	0.6	0.4
2009	95.3	0	3.3[a]	2.5	2.3	2.0	1.5	0.8	0.5
2010	94.0	0	3.8	2.7	1.9	1.6	1.4	0.7	0.5

a Recorded on a day time with less than 75% of valid eight-hour averages.

Table 29: Percentiles of daily maximum eight-hour carbon monoxide at RMIT (CBD) (1995–2006)

AAQ NEPM standard: 9.0 ppm (eight-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	*2.7*								
1996	90.4	0	5.5	4.5	3.8	2.8	2.2	1.6	0.9
1997	98.4	0	5.5	4.3	3.8	2.9	2.4	1.4	0.9
1998	86.3	0	5.9	4.7	4.4	3.0	2.1	1.4	0.8
1999	*35.6*	*0*	*5.9*	*5.0*	*3.3*	*2.7*	*2.0*	*1.5*	*1.2*
2000	96.4	0	5.0	3.4	3.2	2.5	1.8	1.1	0.8
2001	88.8	0	3.6	2.7	2.4	2.1	1.7	1.1	0.7
2002	85.2	0	3.2	2.9	2.7	1.8	1.5	0.9	0.5
2003	96.7	0	3.9	3.0	2.6	1.8	1.5	0.9	0.6
2004	91.5	0	2.1	1.9	1.8	1.5	1.2	0.8	0.6
2005	95.3	0	2.4	2.1	2.0	1.7	1.3	0.9	0.6
2006	77.0	0	2.9	2.5	2.0	1.7	1.5	1.0	0.6

Years with data availability below 75 per cent shown in italics.

Nitrogen dioxide

Table 30: 2010 percentiles of daily peak one-hour nitrogen dioxide concentrations in Victoria

AAQ NEPM standard: 0.12 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Region	Data availability	Max	Percentiles (ppm)					
Performance monitoring station	(% of days)	(ppm)	99th	98th	95th	90th	75th	50th
Port Phillip								
Alphington	98.4	0.038	0.034	0.034	0.031	0.028	0.024	0.019
Brighton	99.7	0.045	0.036	0.035	0.032	0.029	0.024	0.018
Footscray	99.7	0.062	0.045	0.043	0.036	0.032	0.026	0.020
Geelong South	98.6	0.039	0.029	0.028	0.025	0.023	0.020	0.013
Point Cook	89.3	0.037	0.033	0.032	0.027	0.024	0.010	0.012
Latrobe Valley								
Traralgon	99.2	0.031	0.026	0.026	0.025	0.023	0.019	0.014

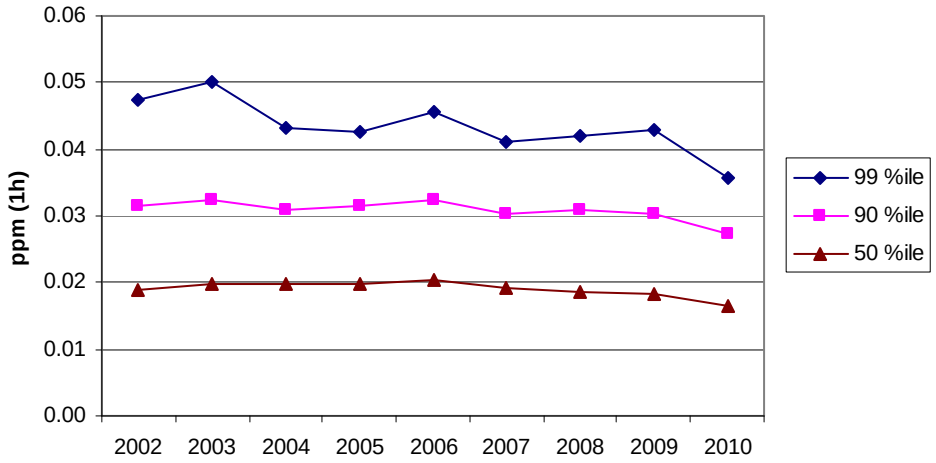

Figure 7: Percentiles of daily maximum one-hour nitrogen dioxide (average of Port Phillip stations 2002–10)

In interpreting trends, it should be noted that monitoring at RMIT ceased in October 2006. This CBD station tended to record higher nitrogen dioxide, so averages in later years may be relatively lower.

Table 31: Percentiles of daily maximum one-hour nitrogen dioxide at Alphington (1995–2010)

AAQ NEPM standard: 0.12 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	*72.6*	*0*	*0.052*[a]	*0.046*	*0.043*	*0.039*	*0.035*	*0.030*	*0.025*
1996	93.7	0	0.061	0.046	0.043	0.038	0.034	0.029	0.024
1997	84.4	0	0.075	0.059	0.051	0.044	0.038	0.030	0.025
1998	95.9	0	0.073	0.058	0.055	0.045	0.039	0.031	0.026
1999	97.5	0	0.065	0.046	0.045	0.038	0.035	0.029	0.025
2000	89.0	0	0.069	0.053	0.048	0.040	0.035	0.029	0.024
2001	90.4	0	0.060	0.052	0.047	0.039	0.034	0.029	0.024
2002	93.7	0	0.060	0.048	0.046	0.038	0.034	0.030	0.023
2003	90.1	0	0.065	0.050	0.046	0.037	0.032	0.027	0.023
2004	95.6	0	0.056	0.044	0.039	0.034	0.032	0.028	0.023
2005	94.8	0	0.050	0.043	0.039	0.035	0.033	0.027	0.022
2006	90.7	0	0.069	0.044	0.042	0.038	0.034	0.030	0.024
2007	100.0	0	0.052	0.046	0.039	0.035	0.033	0.029	0.024
2008	97.8	0	0.060	0.043	0.039	0.035	0.032	0.028	0.022
2009	98.4	0	0.051	0.043	0.042	0.035	0.031	0.026	0.020
2010	98.4	0	0.038	0.034	0.034	0.031	0.028	0.024	0.019

a Recorded on a day time with less than 75% of valid eight-hour averages

Years with data availability below 75 per cent shown in italics.

Table 32: Percentiles of daily maximum one-hour nitrogen dioxide at Brighton (1995–2010)

AAQ NEPM standard: 0.12 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	85.2	0	0.060	0.049	0.042	0.038	0.034	0.028	0.022
1996	82.8	0	0.056	0.044	0.044	0.038	0.034	0.028	0.022
1997	90.7	0	0.075	0.063	0.058	0.047	0.042	0.034	0.026
1998	85.5	0	0.054	0.048	0.044	0.040	0.035	0.028	0.022
1999	99.7	0	0.054	0.047	0.043	0.040	0.035	0.030	0.024
2000	92.3	0	0.061	0.054	0.044	0.038	0.033	0.028	0.022
2001	81.9	0	0.058	0.049	0.043	0.037	0.035	0.029	0.022
2002	94.8	0	0.053	0.049	0.044	0.038	0.033	0.028	0.021
2003	98.1	0	0.074	0.053	0.045	0.037	0.033	0.027	0.021
2004	96.4	0	0.049	0.042	0.039	0.035	0.031	0.025	0.019
2005	99.2	0	0.054	0.040	0.038	0.034	0.032	0.027	0.020
2006	94.0	0	0.052	0.045	0.040	0.036	0.032	0.026	0.019
2007	99.7	0	0.048	0.040	0.038	0.034	0.032	0.026	0.020
2008	98.9	0	0.053	0.042	0.039	0.035	0.033	0.027	0.021
2009	97.3	0	0.065	0.042	0.039	0.034	0.031	0.026	0.020
2010	99.7	0	0.045	0.036	0.035	0.032	0.029	0.024	0.018

Table 33: Percentiles of daily maximum one-hour nitrogen dioxide at Footscray (1995–2010)

AAQ NEPM standard: 0.12 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	87.1	0	0.056	0.051	0.048	0.043	0.038	0.031	0.024
1996	91.5	0	0.071	0.054	0.049	0.043	0.037	0.028	0.023
1997	98.1	0	0.088	0.066	0.058	0.048	0.040	0.032	0.026
1998	89.9	0	0.070	0.057	0.053	0.048	0.042	0.032	0.024
1999	97.8	0	0.081	0.057	0.051	0.045	0.040	0.033	0.026
2000	82.7	0	0.070	0.060	0.054	0.046	0.039	0.030	0.025
2001	*32.6*	*0*	*0.041*	*0.040*	*0.039*	*0.036*	*0.033*	*0.028*	*0.021*
2002	91.8	0	0.059	0.055	0.049	0.040	0.035	0.029	0.022
2003	97.8	0	0.065	0.058	0.054	0.044	0.037	0.029	0.022
2004	95.6	0	0.056	0.047	0.044	0.040	0.035	0.029	0.023
2005	99.5	0	0.053	0.046	0.043	0.038	0.034	0.027	0.021
2006	87.7	0	0.071	0.051	0.046	0.040	0.034	0.028	0.022
2007	99.7	0	0.056	0.050	0.045	0.038	0.035	0.030	0.025
2008	100.0	0	0.064	0.048	0.045	0.038	0.034	0.029	0.022
2009	99.5	0	0.064	0.052	0.047	0.041	0.036	0.029	0.023
2010	99.7	0	0.062	0.045	0.043	0.036	0.032	0.026	0.020

Years with data availability below 75 per cent shown in italics.

Table 34: Percentiles of daily maximum one-hour nitrogen dioxide at Geelong South (1995–2010)

AAQ NEPM standard: 0.12 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	*68.8*	*0*	*0.048*	*0.039*	*0.038*	*0.034*	*0.031*	*0.025*	*0.021*
1996	86.6	0	0.044	0.041	0.038	0.033	0.028	0.024	0.018
1997	*0*								
1998	*68.5*	*0*	*0.067*	*0.039*	*0.037*	*0.034*	*0.032*	*0.026*	*0.020*
1999	93.7	0	0.046	0.038	0.035	0.031	0.028	0.022	0.016
2000	85.2	0	0.048	0.038	0.037	0.028	0.024	0.019	0.015
2001	91.2	0	0.047	0.035	0.032	0.029	0.027	0.022	0.015
2002	94.2	0	0.056	0.036	0.031	0.027	0.025	0.019	0.012
2003	87.7	0	0.050	0.034	0.033	0.028	0.025	0.021	0.014
2004	93.2	0	0.050	0.037	0.030	0.027	0.024	0.020	0.015
2005	98.1	0	0.048	0.038	0.034	0.029	0.026	0.021	0.015
2006	92.9	0	0.043	0.036	0.034	0.028	0.026	0.022	0.016
2007	99.7	0	0.037	0.032	0.030	0.028	0.026	0.022	0.015
2008	99.5	0	0.052	0.039	0.033	0.029	0.027	0.021	0.015
2009	97.8	0	0.048	0.036	0.032	0.028	0.025	0.021	0.014
2010	98.6	0	0.039	0.029	0.028	0.025	0.023	0.020	0.013

Years with data availability below 75 per cent shown in italics.

Table 35: Percentiles of daily maximum one-hour nitrogen dioxide at Point Cook (1995–2010)

AAQ NEPM standard: 0.12 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	83.6	0	0.048	0.041	0.038	0.032	0.028	0.020	0.014
1996	91.5	0	0.054	0.046	0.045	0.038	0.029	0.023	0.015
1997	*0*								
1998	92.1	0	0.064	0.049	0.046	0.036	0.028	0.022	0.015
1999	84.4	0	0.044	0.037	0.036	0.032	0.028	0.018	0.011
2000	*68.8*	*0*	*0.048*	*0.043*	*0.039*	*0.032*	*0.028*	*0.020*	*0.014*
2001	87.7	0	0.054	0.044	0.040	0.033	0.029	0.022	0.015
2002	96.2	0	0.056	0.045	0.041	0.031	0.027	0.021	0.013
2003	93.2	0	0.064	0.048	0.044	0.031	0.028	0.020	0.013
2004	94.8	0	0.066	0.041	0.035	0.030	0.026	0.020	0.013
2005	96.7	0	0.043	0.039	0.037	0.032	0.027	0.021	0.014
2006	89.6	0	0.049	0.047	0.043	0.033	0.028	0.022	0.014
2007	97.0	0	0.046	0.038	0.034	0.029	0.025	0.020	0.013
2008	99.7	0	0.065	0.037	0.035	0.032	0.028	0.020	0.013
2009	98.1	0	0.055	0.041	0.036	0.032	0.028	0.021	0.014
2010	89.3	0	0.037	0.033	0.032	0.027	0.024	0.010	0.012

Years with data availability below 75 per cent shown in italics.

Table 36: Percentiles of daily maximum one-hour nitrogen dioxide at RMIT (CBD) (1996–2006)

AAQ NEPM standard: 0.12 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1996	92.1	0	0.085	0.059	0.052	0.045	0.040	0.032	0.027
1997	90.4	0	0.100	0.074	0.065	0.055	0.046	0.039	0.032
1998	83.8	0	0.089	0.067	0.057	0.049	0.046	0.036	0.028
1999	97.3	0	0.078	0.062	0.050	0.045	0.041	0.033	0.028
2000	91.5	0	0.090	0.064	0.058	0.049	0.041	0.032	0.026
2001	93.4	0	0.071	0.055	0.050	0.043	0.036	0.029	0.024
2002	94.2	0	0.079	0.053	0.046	0.039	0.035	0.028	0.023
2003	98.9	0	0.069	0.059	0.053	0.045	0.039	0.032	0.026
2004	93.7	0	0.075	0.049	0.046	0.040	0.037	0.031	0.026
2005	98.1	0	0.058	0.050	0.047	0.041	0.037	0.032	0.027
2006	78.9	0	0.056	0.051	0.048	0.044	0.040	0.033	0.028

Table 37: Percentiles of daily maximum one-hour nitrogen dioxide at Moe (1995–2009)

AAQ NEPM standard: 0.12 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	*74.8*	*0*	*0.031*	*0.028*	*0.026*	*0.024*	*0.022*	*0.018*	*0.014*
1996	*26.8*	*0*	*0.027*	*0.021*	*0.018*	*0.016*	*0.013*	*0.012*	*0.009*
1997	*69.6*	*0*	*0.036*	*0.031*	*0.031*	*0.026*	*0.023*	*0.020*	*0.016*
1998	87.9	0	0.049	0.036	0.033	0.029	0.026	0.022	0.016
1999	86.0	0	0.049	0.035	0.032	0.028	0.025	0.022	0.017
2000	*73.5*	*0*	*0.050*	*0.040*	*0.036*	*0.027*	*0.024*	*0.020*	*0.015*
2001	95.1	0	0.036	0.028	0.026	0.024	0.022	0.018	0.014
2002	96.7	0	0.036	0.030	0.029	0.027	0.026	0.021	0.014
2003	98.4	0	0.034	0.031	0.029	0.027	0.024	0.020	0.014
2004	100.0	0	0.032	0.026	0.024	0.023	0.021	0.018	0.014
2005	99.5	0	0.039	0.034	0.032	0.027	0.024	0.019	0.014
2006	81.1	0	0.058	0.030	0.029	0.026	0.024	0.020	0.016
2007	98.4	0	0.032	0.028	0.027	0.024	0.022	0.019	0.014
2008	99.7	0	0.046	0.028	0.026	0.023	0.021	0.017	0.013
2009	81.6	0	0.062	0.025	0.025	0.022	0.020	0.017	0.012

Years with data availability below 75 per cent shown in italics.

Table 38: Percentiles of daily maximum one-hour nitrogen dioxide at Traralgon (1995–2010)

AAQ NEPM standard: 0.12 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	94.0	0	0.040	0.029	0.028	0.027	0.024	0.021	0.016
1996	85.8	0	0.035	0.032	0.029	0.027	0.025	0.022	0.016
1997	*64.7*	*0*	*0.038*	*0.037*	*0.034*	*0.031*	*0.028*	*0.024*	*0.018*
1998	89.0	0	0.036	0.030	0.029	0.027	0.025	0.022	0.016
1999	80.8	0	0.042	0.034	0.031	0.028	0.027	0.023	0.018
2000	98.4	0	0.041	0.037	0.033	0.027	0.025	0.021	0.017
2001	98.9	0	0.033	0.031	0.026	0.024	0.022	0.019	0.015
2002	98.1	0	0.033	0.031	0.030	0.027	0.025	0.020	0.015
2003	99.2	0	0.053	0.032	0.030	0.028	0.026	0.022	0.016
2004	98.6	0	0.036	0.034	0.030	0.028	0.024	0.019	0.015
2005	91.5	0	0.040	0.032	0.030	0.028	0.026	0.023	0.016
2006	99.2	0	0.045	0.027	0.026	0.025	0.023	0.020	0.015
2007	97.5	0	0.032	0.029	0.027	0.026	0.024	0.019	0.015
2008	99.5	0	0.039	0.033	0.029	0.026	0.024	0.020	0.014
2009	99.7	0	0.067	0.030	0.028	0.027	0.025	0.020	0.013
2010	99.2	0	0.031	0.026	0.026	0.025	0.023	0.019	0.014

Years with data availability below 75 per cent shown in italics.

Ozone

Table 39: 2010 percentiles of daily peak one-hour ozone concentrations in Victoria

AAQ NEPM standard: 0.10 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Region	Data availability	Max	Percentiles (ppm)					
Performance monitoring station	(% of days)	(ppm)	99th	98th	95th	90th	75th	50th
Port Phillip								
Alphington	88.2	0.061	0.048	0.044	0.040	0.035	0.027	0.022
Brighton	80.5	0.060	0.053	0.051	0.043	0.038	0.030	0.026
Dandenong	97.8	0.077	0.059	0.053	0.044	0.038	0.029	0.024
Footscray	99.7	0.068	0.053	0.049	0.042	0.038	0.030	0.025
Geelong South	96.2	0.084	0.057	0.052	0.047	0.039	0.031	0.027
Melton	90.4	0.062	0.059	0.051	0.044	0.039	0.031	0.027
Mooroolbark	96.2	0.066	0.055	0.051	0.042	0.037	0.030	0.025
Point Cook	95.9	0.058	0.053	0.047	0.042	0.037	0.030	0.025
Point Henry	81.1	0.077	0.053	0.049	0.043	0.038	0.031	0.026
Latrobe Valley								
Traralgon	100.0	0.057	0.050	0.047	0.039	0.033	0.027	0.024

Table 40: 2010 percentiles of daily peak four-hour ozone concentrations in Victoria

AAQ NEPM standard: 0.08 ppm (four-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Region	Data availability	Max	Percentiles (ppm)					
Performance monitoring station	(% of days)	(ppm)	99th	98th	95th	90th	75th	50th
Port Phillip								
Alphington	87.9	0.057	0.044	0.041	0.037	0.033	0.026	0.021
Brighton	80.0	0.055	0.048	0.046	0.039	0.035	0.029	0.024
Dandenong	97.5	0.071	0.054	0.048	0.043	0.037	0.030	0.025
Footscray	99.7	0.061	0.050	0.045	0.040	0.034	0.029	0.024
Geelong South	95.9	0.067	0.048	0.044	0.039	0.035	0.029	0.024
Melton	90.1	0.058	0.048	0.042	0.040	0.035	0.029	0.026
Mooroolbark	95.9	0.062	0.055	0.052	0.044	0.036	0.027	0.023
Point Cook	96.2	0.054	0.044	0.044	0.037	0.034	0.029	0.026
Point Henry	81.1	0.067	0.052	0.046	0.042	0.034	0.029	0.025
Latrobe Valley								
Traralgon	100.0	0.047	0.043	0.040	0.036	0.031	0.026	0.022

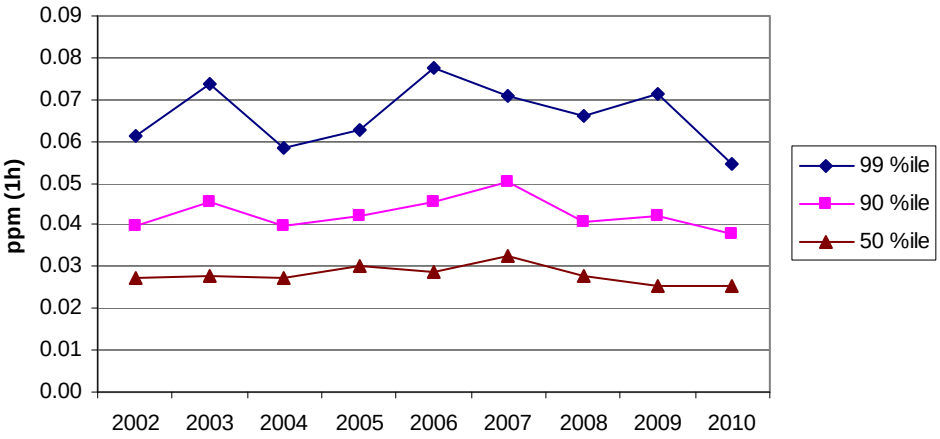

Figure 8: Percentiles of daily maximum one-hour ozone (average of Port Phillip stations 2002-10)

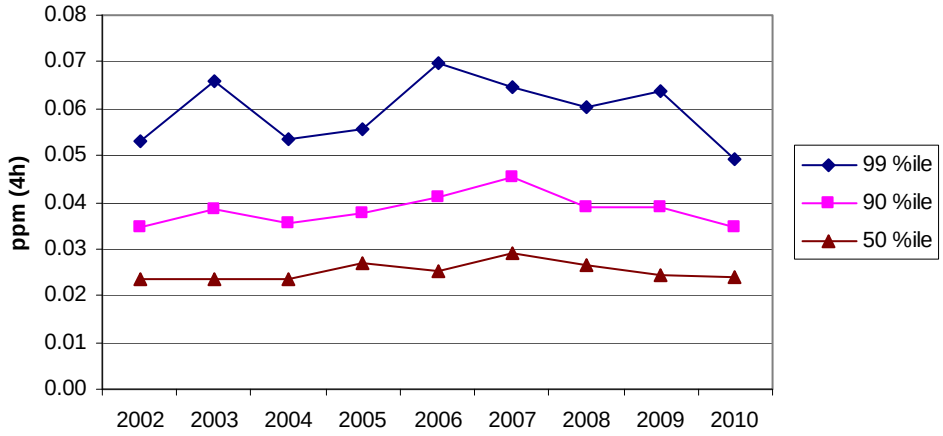

Figure 9: Percentiles of daily maximum four-hour ozone (average of Port Phillip stations 2002-10)

Table 41: Percentiles of daily maximum one-hour ozone at Alphington (1995–2010)

AAQ NEPM standard: 0.10 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	95.9	0	0.089	0.057	0.050	0.041	0.034	0.027	0.022
1996	97.3	0	0.076	0.062	0.060	0.044	0.038	0.026	0.021
1997	91.2	0	0.099	0.076	0.069	0.050	0.036	0.026	0.020
1998	96.2	0	0.088	0.061	0.056	0.044	0.035	0.023	0.018
1999	97.8	0	0.074	0.063	0.057	0.047	0.035	0.026	0.020
2000	98.1	0	0.067	0.055	0.049	0.045	0.034	0.024	0.020
2001	92.1	0	0.077	0.054	0.051	0.042	0.036	0.026	0.021
2002	89.6	0	0.051	0.048	0.046	0.040	0.036	0.027	0.023
2003	96.4	1	**0.102**	0.064	0.059	0.050	0.041	0.030	0.025
2004	96.7	0	0.073	0.048	0.046	0.040	0.037	0.028	0.023
2005	92.9	0	0.077	0.058	0.051	0.045	0.039	0.031	0.026
2006	90.1	3	**0.127**	0.084	0.068	0.059	0.048	0.033	0.026
2007	98.9	1	**0.121**	0.072	0.067	0.060	0.048	0.034	0.029
2008	97.3	0	0.075	0.056	0.051	0.044	0.037	0.028	0.023
2009	96.7	0	0.084	0.070	0.055	0.045	0.040	0.028	0.023
2010	88.2	0	0.061	0.048	0.044	0.040	0.035	0.027	0.022

Exceedances shown in bold.

Table 42: Percentiles of daily maximum one-hour ozone at Brighton (1995–2010)

AAQ NEPM standard: 0.10 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	95.1	1	**0.108**	0.078	0.071	0.047	0.039	0.030	0.025
1996	95.6	0	0.089	0.077	0.062	0.049	0.039	0.029	0.024
1997	95.6	3	**0.112**	0.082	0.072	0.056	0.039	0.028	0.024
1998	95.6	0	0.085	0.070	0.060	0.050	0.037	0.027	0.022
1999	99.5	0	0.070	0.067	0.063	0.052	0.041	0.030	0.024
2000	96.4	0	0.073	0.068	0.060	0.048	0.041	0.028	0.023
2001	80.3	0	0.078	0.071	0.058	0.049	0.039	0.029	0.024
2002	93.7	0	0.085	0.063	0.053	0.043	0.036	0.029	0.025
2003	99.2	2	**0.109**	0.070	0.065	0.056	0.046	0.029	0.025
2004	94.5	1	**0.106**	0.062	0.058	0.043	0.039	0.030	0.025
2005	97.8	0	0.088	0.067	0.053	0.047	0.040	0.032	0.028
2006	92.9	1	**0.114**	0.080	0.072	0.059	0.046	0.032	0.026
2007	99.7	1	**0.122**	0.076	0.069	0.060	0.053	0.039	0.032
2008	98.9	0	0.090	0.073	0.071	0.050	0.044	0.034	0.029
2009	95.3	0	0.077	0.072	0.064	0.052	0.042	0.030	0.025
2010	80.5	0	0.060	0.053	0.051	0.043	0.038	0.030	0.026

Exceedances shown in bold.

Table 43: Percentiles of daily maximum one-hour ozone at Dandenong (1995–2010)

AAQ NEPM standard: 0.10 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	97.0	0	0.098	0.057	0.052	0.043	0.036	0.029	0.025
1996	94.0	0	0.075	0.063	0.055	0.047	0.038	0.028	0.023
1997	93.2	2	**0.107**	0.078	0.073	0.049	0.039	0.030	0.025
1998	98.9	0	0.096	0.078	0.063	0.049	0.039	0.029	0.024
1999	98.9	0	0.077	0.070	0.065	0.053	0.042	0.032	0.025
2000	*63.6*	*0*	*0.071*	*0.065*	*0.062*	*0.052*	*0.043*	*0.028*	*0.023*
2001	75.9	0	0.073	0.062	0.058	0.048	0.041	0.032	0.026
2002	84.9	0	0.078	0.064	0.054	0.047	0.040	0.032	0.027
2003	97.5	0	0.098	0.079	0.061	0.053	0.044	0.028	0.024
2004	96.4	0	0.080	0.064	0.049	0.042	0.038	0.029	0.024
2005	92.6	0	0.072	0.062	0.054	0.045	0.041	0.033	0.028
2006	98.9	1	**0.108**	0.067	0.065	0.057	0.046	0.033	0.027
2007	98.6	1	**0.112**	0.072	0.063	0.056	0.047	0.035	0.028
2008	100.0	0	0.074	0.063	0.056	0.048	0.041	0.031	0.027
2009	98.4	0	0.068	0.065	0.063	0.051	0.042	0.030	0.025
2010	97.8	0	0.077	0.059	0.053	0.044	0.038	0.029	0.024

Exceedances shown in bold. Years with data availability below 75 per cent shown in italics.

Table 44: Percentiles of daily maximum one-hour ozone at Footscray (1995–2010)

AAQ NEPM standard: 0.10 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	95.9	0	0.091	0.063	0.058	0.043	0.037	0.029	0.025
1996	96.4	0	0.082	0.069	0.063	0.049	0.040	0.028	0.025
1997	98.1	1	**0.105**	0.090	0.073	0.055	0.042	0.030	0.025
1998	94.2	1	**0.113**	0.064	0.059	0.048	0.038	0.028	0.023
1999	95.9	0	0.079	0.070	0.066	0.054	0.041	0.032	0.025
2000	88.2	0	0.064	0.054	0.052	0.046	0.038	0.027	0.022
2001	*34.5*	*0*	*0.044*	*0.043*	*0.041*	*0.038*	*0.036*	*0.030*	*0.026*
2002	96.7	0	0.095	0.066	0.047	0.042	0.038	0.028	0.024
2003	98.1	1	**0.105**	0.072	0.061	0.051	0.041	0.027	0.023
2004	94.8	1	**0.106**	0.058	0.049	0.042	0.036	0.028	0.024
2005	99.2	0	0.082	0.063	0.052	0.044	0.039	0.031	0.027
2006	91.5	1	**0.127**	0.082	0.066	0.053	0.041	0.030	0.024
2007	99.2	1	**0.127**	0.067	0.063	0.057	0.049	0.035	0.029
2008	98.4	0	0.073	0.065	0.055	0.048	0.041	0.032	0.026
2009	94.2	0	0.085	0.071	0.060	0.051	0.043	0.030	0.025
2010	99.7	0	0.068	0.053	0.049	0.042	0.038	0.030	0.025

Exceedances shown in bold. Years with data availability below 75 per cent shown in italics.

Table 45: Percentiles of daily maximum one-hour ozone at Geelong South (1995–2010)

AAQ NEPM standard: 0.10 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	82.2	0	0.071	0.056	0.052	0.040	0.030	0.026	0.023
1996	86.8	0	0.091	0.063	0.056	0.044	0.033	0.027	0.022
1997	*0.0*								
1998	95.3	0	0.083	0.056	0.046	0.035	0.031	0.027	0.024
1999	95.3	0	0.073	0.053	0.048	0.040	0.033	0.027	0.022
2000	88.8	0	0.065	0.057	0.049	0.040	0.033	0.021	0.017
2001	92.3	0	0.082	0.064	0.057	0.040	0.032	0.024	0.020
2002	90.7	0	0.058	0.056	0.053	0.043	0.032	0.025	0.021
2003	97.3	0	0.081	0.069	0.063	0.043	0.033	0.023	0.020
2004	92.1	0	0.094	0.061	0.058	0.044	0.035	0.030	0.025
2005	97.8	0	0.080	0.059	0.056	0.046	0.039	0.031	0.028
2006	95.1	2	**0.169**	0.076	0.062	0.049	0.040	0.031	0.026
2007	99.7	0	0.088	0.068	0.063	0.053	0.045	0.035	0.030
2008	98.6	0	0.084	0.073	0.063	0.047	0.038	0.032	0.029
2009	99.5	0	0.083	0.066	0.059	0.050	0.038	0.030	0.026
2010	96.2	0	0.084	0.057	0.052	0.047	0.039	0.031	0.027

Exceedances shown in bold. Years with data availability below 75 per cent shown in italics.

Table 46: Percentiles of daily maximum one-hour ozone at Melton (2002–10)

AAQ NEPM standard: 0.10 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
2002	*14.2*								
2003	97.8	1	**0.112**	0.083	0.074	0.056	0.046	0.032	0.029
2004	94.0	0	0.076	0.053	0.050	0.047	0.040	0.033	0.028
2005	94.0	0	0.079	0.063	0.056	0.048	0.043	0.036	0.031
2006	99.2	1	**0.126**	0.084	0.067	0.053	0.046	0.036	0.030
2007	89.6	0	0.085	0.076	0.071	0.064	0.054	0.037	0.032
2008	90.2	0	0.067	0.056	0.052	0.047	0.041	0.033	0.030
2009	97.5	0	0.092	0.074	0.065	0.054	0.044	0.032	0.027
2010	90.4	0	0.062	0.059	0.051	0.044	0.039	0.031	0.027

Exceedances shown in bold. Years with data availability below 75 per cent shown in italics.

Table 47: Percentiles of daily maximum one-hour ozone at Mooroolbark (2002–10)

AAQ NEPM standard: 0.10 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
2002	*57.5*	*0*	*0.089*	*0.070*	*0.055*	*0.046*	*0.038*	*0.033*	*0.028*
2003	99.7	0	0.098	0.072	0.065	0.055	0.047	0.031	0.026
2004	95.6	0	0.072	0.056	0.053	0.047	0.042	0.034	0.027
2005	97.8	0	0.089	0.064	0.053	0.045	0.042	0.035	0.029
2006	96.2	1	**0.101**	0.086	0.071	0.058	0.048	0.036	0.028
2007	99.7	0	0.084	0.076	0.072	0.057	0.051	0.038	0.031
2008	98.6	0	0.081	0.064	0.057	0.051	0.045	0.034	0.027
2009	96.7	0	0.087	0.077	0.068	0.055	0.048	0.036	0.027
2010	96.2	0	0.066	0.055	0.051	0.042	0.037	0.030	0.025

Exceedances shown in bold. Years with data availability below 75 per cent shown in italics.

Table 48: Percentiles of daily maximum one-hour ozone at Point Cook (1995–2010)

AAQ NEPM standard: 0.10 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	99.7	1	**0.111**	0.076	0.060	0.046	0.039	0.031	0.027
1996	99.5	0	0.090	0.079	0.069	0.051	0.038	0.030	0.026
1997	86.8	2	**0.126**	0.080	0.064	0.049	0.037	0.030	0.025
1998	94.5	1	**0.107**	0.083	0.063	0.044	0.034	0.025	0.021
1999	91.2	0	0.083	0.071	0.067	0.055	0.040	0.028	0.023
2000	85.2	0	0.079	0.067	0.063	0.049	0.040	0.032	0.028
2001	91.0	0	0.099	0.072	0.064	0.050	0.044	0.031	0.025
2002	97.0	0	0.093	0.068	0.063	0.048	0.039	0.030	0.027
2003	97.0	0	0.094	0.080	0.069	0.053	0.041	0.031	0.025
2004	98.6	0	0.093	0.065	0.056	0.047	0.039	0.028	0.025
2005	97.0	0	0.092	0.068	0.059	0.047	0.038	0.031	0.027
2006	85.2	1	**0.104**	0.069	0.062	0.048	0.039	0.029	0.026
2007	99.5	0	0.095	0.070	0.064	0.057	0.047	0.038	0.034
2008	99.7	0	0.088	0.081	0.065	0.049	0.043	0.035	0.031
2009	96.2	2	**0.102**	0.085	0.071	0.057	0.045	0.032	0.026
2010	95.9	0	0.058	0.053	0.047	0.042	0.037	0.030	0.025

Exceedances shown in bold.

Table 49: Percentiles of daily maximum one-hour ozone at Point Henry (1995–2010)

AAQ NEPM standard: 0.10 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	*69.3*	*0*	*0.060*	*0.047*	*0.044*	*0.042*	*0.039*	*0.036*	*0.033*
1996	98.1	1	**0.104**	0.065	0.058	0.047	0.036	0.032	0.029
1997	80.3	0	0.081	0.062	0.057	0.046	0.038	0.029	0.024
1998	*27.7*	*0*	*0.087*	*0.072*	*0.067*	*0.052*	*0.043*	*0.032*	*0.025*
1999	*0.0*								
2000	*14.2*								
2001	*57.3*	*0*	*0.089*	*0.074*	*0.068*	*0.052*	*0.045*	*0.032*	*0.024*
2002	97.0	0	0.069	0.065	0.059	0.045	0.040	0.030	0.027
2003	97.8	0	0.095	0.075	0.071	0.052	0.041	0.030	0.025
2004	97.3	0	0.093	0.060	0.054	0.043	0.037	0.029	0.025
2005	99.5	0	0.088	0.059	0.057	0.048	0.038	0.033	0.029
2006	98.9	1	**0.144**	0.070	0.057	0.047	0.039	0.030	0.026
2007	99.7	1	**0.101**	0.062	0.059	0.048	0.041	0.030	0.027
2008	98.6	0	0.080	0.064	0.057	0.043	0.036	0.030	0.027
2009	98.1	0	0.087	0.063	0.060	0.048	0.038	0.029	0.026
2010	81.1	0	0.077	0.053	0.049	0.043	0.038	0.031	0.026

Exceedances shown in bold. Years with data availability below 75 per cent shown in italics.

Table 50: Percentiles of daily maximum one-hour ozone at Moe (1995–2009)

AAQ NEPM standard: 0.10 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	98.1	0	0.068	0.051	0.049	0.042	0.035	0.030	0.026
1996	98.4	0	0.052	0.042	0.038	0.034	0.030	0.025	0.022
1997	92.9	0	0.072	0.058	0.049	0.036	0.031	0.026	0.021
1998	94.2	0	0.046	0.043	0.039	0.031	0.028	0.022	0.018
1999	81.1	0	0.063	0.042	0.038	0.032	0.030	0.027	0.022
2000	86.6	0	0.066	0.055	0.049	0.040	0.034	0.029	0.025
2001	99.5	0	0.070	0.052	0.048	0.043	0.037	0.030	0.024
2002	96.4	0	0.059	0.050	0.046	0.041	0.036	0.031	0.027
2003	97.3	0	0.083	0.061	0.060	0.051	0.043	0.031	0.026
2004	100.0	0	0.055	0.052	0.049	0.044	0.039	0.031	0.027
2005	99.5	0	0.062	0.055	0.047	0.041	0.036	0.031	0.027
2006	89.0	1	**0.104**	0.077	0.069	0.051	0.041	0.030	0.027
2007	97.8	0	0.099	0.070	0.065	0.054	0.044	0.034	0.030
2008	100.0	0	0.057	0.052	0.047	0.038	0.031	0.024	0.021
2009	81.6	0	0.057	0.043	0.037	0.030	0.026	0.020	0.016

Exceedances shown in bold.

Table 51: Percentiles of daily maximum one-hour ozone at Traralgon (1995–2010)

AAQ NEPM standard: 0.10 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	92.6	0	0.050	0.043	0.041	0.036	0.031	0.025	0.021
1996	80.8	0	0.049	0.043	0.041	0.036	0.033	0.028	0.022
1997	*60.3*	*0*	*0.072*	*0.058*	*0.057*	*0.052*	*0.041*	*0.030*	*0.025*
1998	92.3	0	0.075	0.062	0.054	0.044	0.037	0.030	0.026
1999	*31.8*	*0*	*0.060*	*0.055*	*0.050*	*0.043*	*0.036*	*0.028*	*0.023*
2000	96.2	0	0.056	0.050	0.047	0.039	0.033	0.027	0.023
2001	97.0	0	0.064	0.053	0.048	0.040	0.034	0.028	0.024
2002	100.0	0	0.057	0.048	0.043	0.036	0.033	0.029	0.024
2003	97.3	0	0.077	0.062	0.060	0.049	0.037	0.030	0.024
2004	97.5	0	0.058	0.049	0.048	0.042	0.037	0.031	0.025
2005	86.3	0	0.067	0.050	0.046	0.040	0.035	0.031	0.026
2006	100.0	3	**0.138**	0.083	0.077	0.052	0.044	0.033	0.027
2007	99.2	0	0.094	0.067	0.061	0.052	0.041	0.031	0.027
2008	100.0	0	0.061	0.055	0.048	0.038	0.032	0.026	0.023
2009	95.3	1	**0.104**	0.053	0.050	0.040	0.034	0.027	0.024
2010	100.0	0	0.057	0.050	0.047	0.039	0.033	0.027	0.024

Exceedances shown in bold. Years with data availability below 75 per cent shown in italics.

Table 52: Percentiles of daily maximum four-hour ozone at Alphington (1995–2010)

AAQ NEPM standard: 0.08 ppm (four-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	95.9	0	0.067	0.050	0.046	0.039	0.032	0.025	0.021
1996	97.3	0	0.064	0.053	0.052	0.042	0.036	0.025	0.020
1997	91.2	0	0.078	0.070	0.060	0.049	0.035	0.024	0.018
1998	96.4	0	0.075	0.055	0.050	0.040	0.033	0.022	0.016
1999	97.8	0	0.067	0.054	0.052	0.041	0.033	0.025	0.018
2000	97.3	0	0.060	0.047	0.046	0.042	0.033	0.022	0.018
2001	91.5	0	0.062	0.051	0.046	0.040	0.034	0.025	0.020
2002	89.3	0	0.046	0.044	0.043	0.038	0.033	0.026	0.021
2003	95.9	1	**0.090**	0.058	0.053	0.047	0.038	0.028	0.023
2004	96.4	0	0.069	0.045	0.044	0.038	0.034	0.026	0.022
2005	92.9	0	0.070	0.050	0.047	0.042	0.037	0.030	0.025
2006	90.1	3	**0.116**	0.073	0.063	0.054	0.045	0.031	0.025
2007	98.6	1	**0.115**	0.065	0.062	0.053	0.046	0.033	0.027
2008	97.3	0	0.063	0.050	0.047	0.038	0.035	0.027	0.022
2009	96.4	0	0.080	0.064	0.048	0.041	0.036	0.027	0.022
2010	87.9	0	0.057	0.044	0.041	0.037	0.033	0.026	0.021

Exceedances shown in bold.

Table 53: Percentiles of daily maximum four-hour ozone at Brighton (1995–2010)

AAQ NEPM standard: 0.08 ppm (four-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	95.1	1	**0.087**	0.067	0.058	0.043	0.036	0.028	0.024
1996	95.6	0	0.078	0.065	0.056	0.044	0.035	0.027	0.022
1997	95.6	3	**0.097**	0.068	0.062	0.049	0.037	0.026	0.023
1998	95.6	1	**0.082**	0.062	0.055	0.042	0.034	0.026	0.021
1999	99.5	0	0.069	0.059	0.056	0.047	0.037	0.028	0.022
2000	96.4	0	0.064	0.061	0.052	0.044	0.038	0.026	0.022
2001	80.0	0	0.068	0.059	0.055	0.046	0.038	0.027	0.022
2002	93.2	0	0.072	0.056	0.048	0.039	0.034	0.028	0.023
2003	98.4	2	**0.102**	0.065	0.061	0.048	0.042	0.028	0.024
2004	94.5	1	**0.092**	0.057	0.051	0.042	0.036	0.029	0.024
2005	97.5	0	0.069	0.062	0.051	0.043	0.038	0.030	0.026
2006	92.9	3	**0.105**	0.075	0.065	0.054	0.043	0.031	0.025
2007	99.7	1	**0.111**	0.068	0.063	0.054	0.049	0.036	0.031
2008	98.6	0	0.079	0.068	0.066	0.047	0.041	0.033	0.028
2009	95.3	0	0.069	0.066	0.058	0.049	0.038	0.029	0.024
2010	80.0	0	0.055	0.048	0.046	0.039	0.035	0.029	0.024

Exceedances shown in bold.

Table 54: Percentiles of daily maximum four-hour ozone at Dandenong (1995–2010)

AAQ NEPM standard: 0.08 ppm (four-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	97.0	1	**0.082**	0.052	0.049	0.041	0.033	0.028	0.023
1996	94.2	0	0.068	0.056	0.050	0.044	0.035	0.027	0.022
1997	93.2	1	**0.092**	0.068	0.062	0.047	0.035	0.028	0.024
1998	98.9	0	0.076	0.065	0.059	0.044	0.036	0.027	0.023
1999	98.6	0	0.074	0.062	0.058	0.048	0.039	0.030	0.023
2000	*64.1*	*0*	*0.066*	*0.060*	*0.056*	*0.047*	*0.040*	*0.027*	*0.021*
2001	75.3	0	0.063	0.055	0.054	0.045	0.038	0.030	0.025
2002	85.2	0	0.063	0.053	0.052	0.043	0.038	0.030	0.025
2003	97.8	2	**0.093**	0.067	0.059	0.047	0.040	0.027	0.023
2004	96.7	0	0.067	0.058	0.046	0.040	0.035	0.027	0.023
2005	92.6	0	0.067	0.054	0.052	0.043	0.039	0.031	0.026
2006	98.6	1	**0.096**	0.061	0.058	0.052	0.042	0.031	0.026
2007	98.6	1	**0.106**	0.064	0.060	0.052	0.044	0.033	0.027
2008	100.0	0	0.073	0.058	0.053	0.044	0.040	0.030	0.025
2009	98.4	0	0.063	0.059	0.054	0.047	0.039	0.028	0.024
2010	97.5	0	0.071	0.054	0.048	0.043	0.037	0.030	0.025

Exceedances shown in bold. Years with data availability below 75 per cent shown in italics.

Table 55: Percentiles of daily maximum four-hour ozone at Footscray (1995–2010)

AAQ NEPM standard: 0.08 ppm (four-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	95.9	0	0.080	0.058	0.051	0.039	0.034	0.028	0.023
1996	96.2	0	0.070	0.062	0.057	0.043	0.036	0.027	0.023
1997	98.1	3	**0.095**	0.072	0.063	0.049	0.038	0.028	0.024
1998	94.2	1	**0.089**	0.055	0.051	0.041	0.035	0.027	0.022
1999	95.9	0	0.069	0.063	0.057	0.048	0.037	0.030	0.024
2000	87.7	0	0.055	0.052	0.047	0.043	0.035	0.026	0.021
2001	*34.5*	*0*	*0.042*	*0.042*	*0.040*	*0.035*	*0.034*	*0.028*	*0.025*
2002	96.7	0	0.080	0.051	0.046	0.038	0.034	0.027	0.023
2003	97.8	2	**0.094**	0.063	0.056	0.045	0.038	0.026	0.021
2004	94.8	1	**0.083**	0.051	0.045	0.039	0.034	0.027	0.022
2005	98.9	0	0.066	0.053	0.047	0.042	0.035	0.030	0.025
2006	91.2	3	**0.103**	0.070	0.059	0.047	0.040	0.028	0.023
2007	98.9	1	**0.113**	0.060	0.057	0.052	0.045	0.033	0.028
2008	98.1	0	0.064	0.059	0.053	0.042	0.039	0.030	0.025
2009	94.2	0	0.073	0.063	0.055	0.046	0.038	0.028	0.024
2010	99.7	0	0.061	0.050	0.045	0.040	0.034	0.029	0.024

Exceedances shown in bold. Years with data availability below 75 per cent shown in italics.

Table 56: Percentiles of daily maximum four-hour ozone at Geelong South (1995–2010)

AAQ NEPM standard: 0.08 ppm (four-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	91.8	0	0.065	0.051	0.048	0.037	0.028	0.025	0.022
1996	86.8	0	0.076	0.058	0.051	0.039	0.031	0.026	0.021
1997	*0.0*								
1998	95.1	0	0.076	0.048	0.042	0.033	0.029	0.026	0.022
1999	95.6	0	0.063	0.048	0.044	0.038	0.031	0.026	0.021
2000	89.0	0	0.057	0.052	0.045	0.035	0.030	0.020	0.016
2001	92.3	0	0.075	0.057	0.054	0.038	0.030	0.023	0.019
2002	89.3	0	0.053	0.048	0.046	0.038	0.031	0.024	0.020
2003	97.0	0	0.072	0.059	0.054	0.040	0.029	0.022	0.019
2004	91.3	1	**0.085**	0.054	0.052	0.041	0.034	0.028	0.023
2005	97.3	0	0.068	0.055	0.049	0.042	0.037	0.030	0.026
2006	94.2	2	**0.142**	0.070	0.059	0.047	0.038	0.030	0.025
2007	99.7	0	0.076	0.062	0.057	0.049	0.042	0.034	0.029
2008	98.1	0	0.076	0.067	0.060	0.045	0.038	0.031	0.028
2009	99.5	0	0.079	0.058	0.054	0.046	0.036	0.029	0.025
2010	95.9	0	0.067	0.048	0.044	0.039	0.035	0.029	0.024

Exceedances shown in bold. Years with data availability below 75 per cent shown in italics.

Table 57: Percentiles of daily maximum four-hour ozone at Melton (2002–10)

AAQ NEPM standard: 0.08 ppm (four-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
2002	*14.5*								
2003	97.8	4	**0.099**	0.077	0.063	0.052	0.042	0.032	0.028
2004	94.0	0	0.068	0.050	0.047	0.043	0.038	0.031	0.027
2005	94.2	0	0.075	0.054	0.051	0.045	0.041	0.034	0.030
2006	99.2	3	**0.115**	0.073	0.060	0.051	0.043	0.034	0.029
2007	89.9	0	0.080	0.068	0.066	0.057	0.050	0.036	0.031
2008	90.2	0	0.057	0.052	0.048	0.045	0.039	0.032	0.029
2009	97.5	0	0.078	0.063	0.057	0.049	0.042	0.031	0.026
2010	90.1	0	0.058	0.048	0.042	0.040	0.035	0.029	0.026

Exceedances shown in bold. Years with data availability below 75 per cent shown in italics.

Table 58: Percentiles of daily maximum four-hour ozone at Mooroolbark (2002–10)

AAQ NEPM standard: 0.08 ppm (four-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
2002	*57.5*	*0*	*0.075*	*0.063*	*0.047*	*0.041*	*0.036*	*0.030*	*0.026*
2003	98.9	3	**0.090**	0.065	0.056	0.050	0.044	0.030	0.025
2004	95.6	0	0.059	0.050	0.049	0.044	0.038	0.032	0.025
2005	97.8	0	0.072	0.055	0.049	0.043	0.039	0.033	0.028
2006	96.2	2	**0.091**	0.077	0.064	0.054	0.045	0.034	0.026
2007	99.5	0	0.077	0.072	0.066	0.054	0.047	0.036	0.030
2008	98.6	0	0.073	0.057	0.053	0.047	0.041	0.032	0.027
2009	96.7	0	0.076	0.066	0.062	0.050	0.045	0.033	0.026
2010	95.9	0	0.062	0.055	0.052	0.044	0.036	0.027	0.023

Exceedances shown in bold. Years with data availability below 75 per cent shown in italics.

Table 59: Percentiles of daily maximum four-hour ozone at Point Cook (1995–2010)

AAQ NEPM standard: 0.08 ppm (four-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	99.7	1	**0.095**	0.063	0.057	0.043	0.036	0.030	0.026
1996	99.5	0	0.079	0.066	0.057	0.045	0.034	0.029	0.025
1997	86.8	2	**0.113**	0.073	0.057	0.044	0.034	0.028	0.024
1998	94.8	3	**0.090**	0.075	0.061	0.039	0.032	0.024	0.020
1999	91.2	0	0.069	0.065	0.060	0.047	0.035	0.026	0.022
2000	85.5	0	0.067	0.060	0.058	0.046	0.037	0.030	0.027
2001	91.0	1	**0.095**	0.063	0.057	0.048	0.040	0.029	0.024
2002	96.4	0	0.070	0.062	0.056	0.044	0.036	0.029	0.025
2003	96.2	1	**0.093**	0.072	0.063	0.048	0.038	0.029	0.024
2004	98.6	1	**0.082**	0.058	0.051	0.044	0.036	0.027	0.024
2005	96.7	1	**0.082**	0.062	0.050	0.043	0.037	0.030	0.026
2006	84.9	1	**0.089**	0.061	0.057	0.046	0.036	0.027	0.025
2007	99.5	1	**0.086**	0.067	0.060	0.052	0.044	0.037	0.033
2008	99.7	2	**0.082**	0.074	0.061	0.045	0.040	0.034	0.030
2009	95.9	2	**0.095**	0.074	0.069	0.053	0.042	0.030	0.025
2010	96.2	0	0.054	0.044	0.044	0.037	0.034	0.029	0.026

Exceedances shown in bold.

Table 60: Percentiles of daily maximum four-hour ozone at Point Henry (1995–2010)

AAQ NEPM standard: 0.08 ppm (four-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	*69.3*	*0*	*0.056*	*0.042*	*0.042*	*0.039*	*0.038*	*0.035*	*0.032*
1996	98.1	1	**0.097**	0.058	0.054	0.042	0.034	0.031	0.028
1997	80.3	0	0.070	0.059	0.053	0.043	0.038	0.028	0.023
1998	*27.7*	*0*	*0.076*	*0.064*	*0.060*	*0.043*	*0.038*	*0.030*	*0.023*
1999	*0.0*								
2000	*14.2*								
2001	*57.3*	*1*	***0.085***	*0.067*	*0.061*	*0.051*	*0.042*	*0.030*	*0.023*
2002	96.7	0	0.064	0.058	0.052	0.042	0.036	0.029	0.026
2003	97.8	1	**0.083**	0.065	0.061	0.049	0.037	0.029	0.024
2004	97.3	1	**0.085**	0.056	0.048	0.041	0.035	0.027	0.024
2005	99.5	0	0.076	0.056	0.051	0.045	0.036	0.031	0.028
2006	98.4	1	**0.126**	0.067	0.053	0.043	0.036	0.029	0.025
2007	99.7	1	**0.085**	0.058	0.052	0.045	0.038	0.029	0.026
2008	98.6	0	0.073	0.058	0.050	0.041	0.035	0.029	0.026
2009	98.4	1	**0.082**	0.060	0.052	0.045	0.036	0.028	0.025
2010	81.1	0	0.067	0.052	0.046	0.042	0.034	0.029	0.025

Exceedances shown in bold. Years with data availability below 75 per cent shown in italics.

Table 61: Percentiles of daily maximum four-hour ozone at Moe (1995–2009)

AAQ NEPM standard: 0.08 ppm (four-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	98.1	0	0.059	0.047	0.044	0.039	0.034	0.029	0.024
1996	98.4	0	0.047	0.038	0.036	0.032	0.029	0.025	0.021
1997	92.9	0	0.067	0.050	0.047	0.033	0.029	0.024	0.020
1998	94.2	0	0.044	0.038	0.035	0.030	0.025	0.020	0.017
1999	81.1	0	0.045	0.039	0.036	0.030	0.028	0.025	0.020
2000	86.6	0	0.056	0.051	0.045	0.037	0.033	0.028	0.024
2001	99.5	0	0.054	0.047	0.044	0.040	0.034	0.028	0.023
2002	96.7	0	0.056	0.046	0.041	0.037	0.035	0.030	0.026
2003	97.3	0	0.072	0.059	0.056	0.048	0.038	0.029	0.025
2004	100.0	0	0.051	0.046	0.044	0.040	0.036	0.030	0.025
2005	99.5	0	0.051	0.049	0.042	0.038	0.034	0.030	0.025
2006	88.8	3	**0.094**	0.065	0.056	0.047	0.038	0.030	0.025
2007	97.8	1	**0.089**	0.064	0.059	0.050	0.040	0.033	0.029
2008	100.0	0	0.057	0.048	0.043	0.036	0.029	0.023	0.020
2009	81.6	0	0.047	0.040	0.034	0.028	0.025	0.019	0.015

Exceedances shown in bold.

Table 62: Percentiles of daily maximum four-hour ozone at Traralgon (1995–2010)

AAQ NEPM standard: 0.08 ppm (four-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	93.2	0	0.048	0.040	0.038	0.032	0.028	0.024	0.020
1996	80.8	0	0.043	0.039	0.037	0.033	0.031	0.026	0.021
1997	*60.5*	*0*	*0.064*	*0.055*	*0.051*	*0.045*	*0.039*	*0.029*	*0.024*
1998	92.1	0	0.058	0.053	0.048	0.041	0.035	0.029	0.024
1999	*31.8*	*0*	*0.053*	*0.051*	*0.044*	*0.040*	*0.033*	*0.026*	*0.021*
2000	96.7	0	0.050	0.046	0.043	0.034	0.031	0.026	0.021
2001	97.3	0	0.052	0.047	0.045	0.037	0.031	0.026	0.022
2002	100.0	0	0.049	0.046	0.038	0.034	0.031	0.027	0.022
2003	97.3	0	0.067	0.056	0.052	0.046	0.035	0.027	0.023
2004	97.3	0	0.050	0.044	0.043	0.039	0.034	0.029	0.023
2005	86.1	0	0.055	0.046	0.039	0.035	0.033	0.029	0.024
2006	100.0	2	**0.123**	0.072	0.067	0.046	0.041	0.031	0.026
2007	99.2	1	**0.082**	0.058	0.056	0.047	0.037	0.029	0.026
2008	100.0	0	0.053	0.050	0.042	0.036	0.030	0.025	0.022
2009	95.6	0	0.074	0.047	0.045	0.037	0.031	0.026	0.022
2010	100.0	0	0.047	0.043	0.040	0.036	0.031	0.026	0.022

Exceedances shown in bold. Years with data availability below 75 per cent shown in italics.

Sulfur dioxide

Table 63: 2010 percentiles of daily peak one-hour sulfur dioxide concentrations in Victoria

AAQ NEPM standard: 0.20 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Region	Data availability	Max	Percentiles (ppm)					
Performance monitoring station	(% of days)	(ppm)	99th	98th	95th	90th	75th	50th
Port Phillip								
Alphington	95.6	0.008	0.007	0.007	0.005	0.004	0.002	0.001
AltonaNorth	92.1	0.068	0.049	0.040	0.032	0.025	0.012	0.006
GeelongSouth	92.6	0.052	0.028	0.025	0.019	0.013	0.007	0.003
Latrobe Valley								
Traralgon	100.0	0.049	0.028	0.021	0.012	0.009	0.006	0.003

Table 64: 2010 percentiles of daily sulfur dioxide concentrations in Victoria

AAQ NEPM standard: 0.08 ppm (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Region	Data availability	Max	Percentiles (ppm)					
Performance monitoring station	(% of days)	(ppm)	99th	98th	95th	90th	75th	50th
Port Phillip								
Alphington	95.6	0.004	0.002	0.001	0.001	0.001	0.000	-0.001
AltonaNorth	92.1	0.026	0.012	0.009	0.006	0.004	0.003	0.001
GeelongSouth	92.6	0.007	0.004	0.004	0.003	0.002	0.001	0.001
Latrobe Valley								
Traralgon	100.0	0.007	0.005	0.004	0.003	0.003	0.002	0.001

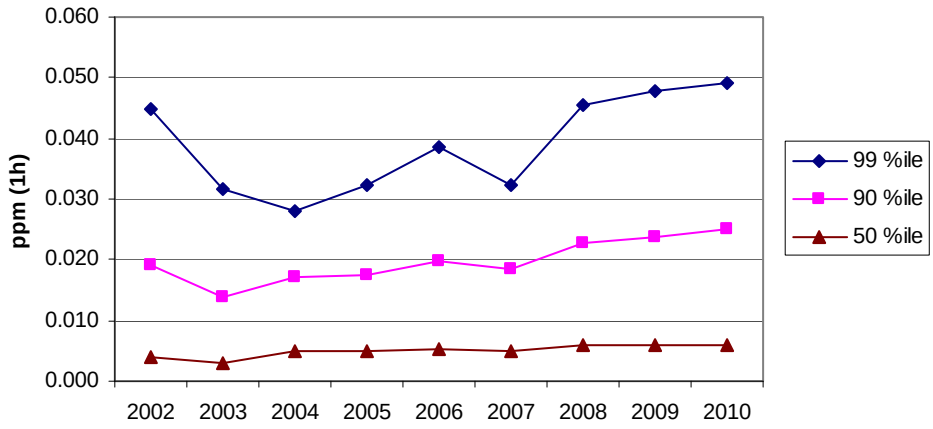

Figure 10: Percentiles of daily maximum one-hour sulfur dioxide (Altona North 2002-2010)

As there are few SO_2 stations, and some changes from year to year, only data from Altona North is presented. This station consistently records the highest readings in the Port Phillip region.

Table 65: Percentiles of daily maximum one-hour sulfur dioxide at Alphington (1995–2010)

AAQ NEPM standard: 0.20 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	*71.5*	*0*	*0.015*	*0.008*	*0.007*	*0.005*	*0.004*	*0.002*	*0.000*
1996	97.0	0	0.008	0.006	0.006	0.005	0.003	0.002	0.001
1997	94.2	0	0.012	0.010	0.008	0.006	0.004	0.003	0.001
1998	97.0	0	0.015	0.012	0.008	0.007	0.005	0.003	0.002
1999	97.8	0	0.012	0.007	0.006	0.005	0.003	0.002	0.001
2000	97.8	0	0.010	0.007	0.006	0.004	0.003	0.001	0.000
2001	93.4	0	0.009	0.008	0.007	0.006	0.004	0.002	0.000
2002	98.4	0	0.012	0.008	0.007	0.006	0.004	0.002	0.000
2003	96.7	0	0.021	0.007	0.006	0.004	0.003	0.002	0.001
2004	99.7	0	0.014	0.009	0.007	0.005	0.004	0.003	0.001
2005	94.5	0	0.011	0.008	0.007	0.005	0.004	0.002	0.001
2006	90.7	0	0.013	0.011	0.009	0.008	0.006	0.004	0.002
2007	99.5	0	0.022	0.010	0.008	0.006	0.005	0.004	0.002
2008	98.4	0	0.014	0.010	0.009	0.006	0.005	0.003	0.002
2009	97.5	0	0.012	0.009	0.008	0.006	0.005	0.002	0.001
2010	95.6	0	0.008	0.007	0.007	0.005	0.004	0.002	0.001

Years with data availability below 75 per cent shown in italics.

Table 66: Percentiles of daily maximum one-hour sulfur dioxide at Altona North (1995–2010)

AAQ NEPM standard: 0.20 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	97.5	0	0.039	0.023	0.022	0.018	0.015	0.008	0.004
1996	87.7	0	0.041	0.025	0.021	0.017	0.012	0.008	0.005
1997	96.4	0	0.069	0.054	0.048	0.031	0.022	0.009	0.004
1998	92.9	0	0.125	0.080	0.073	0.051	0.035	0.017	0.007
1999	96.2	0	0.059	0.044	0.039	0.032	0.024	0.012	0.005
2000	92.3	0	0.068	0.049	0.044	0.031	0.024	0.010	0.003
2001	95.6	0	0.073	0.053	0.043	0.035	0.026	0.012	0.004
2002	97.3	0	0.122	0.045	0.037	0.024	0.019	0.010	0.004
2003	94.8	0	0.036	0.032	0.027	0.020	0.014	0.007	0.003
2004	97.5	0	0.044	0.028	0.026	0.021	0.017	0.010	0.005
2005	96.2	0	0.044	0.032	0.028	0.021	0.018	0.009	0.005
2006	92.3	0	0.053	0.039	0.031	0.024	0.020	0.011	0.005
2007	97.3	0	0.039	0.032	0.029	0.023	0.018	0.010	0.005
2008	98.9	0	0.059	0.046	0.038	0.029	0.023	0.011	0.006
2009	97.0	0	0.068[a]	0.048	0.040	0.031	0.024	0.012	0.006
2010	92.1	0	0.068	0.049	0.040	0.032	0.025	0.012	0.006

a Recorded on a day time with less than 75% of valid one-hour averages

Table 67: Percentiles of daily maximum one-hour sulfur dioxide at Geelong South (1995–2010)

AAQ NEPM standard: 0.20 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	88.2	0	0.088	0.030	0.023	0.015	0.011	0.006	0.002
1996	76.8	0	0.032	0.026	0.023	0.016	0.010	0.004	0.001
1997	*0.0*								
1998	*68.8*	*0*	*0.038*	*0.023*	*0.021*	*0.016*	*0.012*	*0.008*	*0.003*
1999	94.0	0	0.032	0.020	0.019	0.015	0.011	0.007	0.003
2000	88.2	0	0.029	0.019	0.014	0.010	0.007	0.004	0.001
2001	*50.7*	*0*	*0.037*	*0.024*	*0.023*	*0.018*	*0.012*	*0.006*	*0.002*
2002	84.9	0	0.040	0.029	0.024	0.016	0.012	0.005	0.001
2003	96.2	0	0.039	0.032	0.026	0.015	0.011	0.005	0.001
2004	90.7	0	0.069	0.026	0.023	0.019	0.013	0.007	0.003
2005	96.4	0	0.054	0.029	0.022	0.017	0.012	0.008	0.003
2006	93.2	0	0.036	0.029	0.026	0.017	0.013	0.007	0.003
2007	98.9	0	0.083	0.033	0.027	0.017	0.013	0.008	0.003
2008	96.7	0	0.050	0.032	0.024	0.016	0.014	0.007	0.003
2009	98.9	0	0.037	0.026	0.024	0.017	0.012	0.007	0.003
2010	92.6	0	0.052	0.028	0.025	0.019	0.013	0.007	0.003

Years with data availability below 75 per cent shown in italics.

Table 68: Percentiles of daily maximum one-hour sulfur dioxide at RMIT (CBD) (1995–2006)

AAQ NEPM standard: 0.20 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	*2.7*								
1996	82.8	0	0.016	0.014	0.013	0.009	0.007	0.004	0.001
1997	97.8	0	0.029	0.025	0.018	0.014	0.011	0.007	0.004
1998	92.6	0	0.038	0.020	0.016	0.013	0.010	0.007	0.003
1999	98.6	0	0.020	0.013	0.012	0.010	0.008	0.005	0.002
2000	96.7	0	0.017	0.014	0.013	0.010	0.007	0.004	0.002
2001	94.2	0	0.018	0.015	0.013	0.012	0.009	0.006	0.002
2002	94.2	0	0.024	0.017	0.013	0.012	0.010	0.006	0.002
2003	99.2	0	0.035	0.017	0.013	0.010	0.008	0.005	0.002
2004	98.4	0	0.023	0.017	0.015	0.011	0.009	0.006	0.003
2005	98.9	0	0.017	0.015	0.012	0.010	0.008	0.005	0.003
2006	76.2	0	0.034	0.020	0.017	0.014	0.011	0.007	0.003

Years with data availability below 75 per cent shown in italics.

Table 69: Percentiles of daily maximum one-hour sulfur dioxide at Moe (1995–2009)

AAQ NEPM standard: 0.20 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	97.8	0	0.025	0.021	0.017	0.011	0.008	0.004	0.002
1996	98.9	0	0.033	0.019	0.015	0.012	0.008	0.004	0.002
1997	92.3	0	0.047	0.024	0.018	0.014	0.010	0.005	0.002
1998	94.8	0	0.032	0.023	0.021	0.013	0.009	0.005	0.002
1999	94.0	0	0.030	0.020	0.017	0.015	0.011	0.006	0.002
2000	98.4	0	0.039	0.032	0.025	0.017	0.013	0.007	0.004
2001	98.4	0	0.034	0.026	0.022	0.016	0.012	0.007	0.003
2002	97.5	0	0.046	0.022	0.020	0.014	0.010	0.005	0.003
2003	99.2	0	0.030	0.026	0.024	0.019	0.013	0.006	0.003
2004	99.7	0	0.048	0.024	0.021	0.016	0.009	0.004	0.001
2005	100.0	0	0.047	0.029	0.026	0.017	0.012	0.006	0.002
2006	88.5	0	0.046	0.028	0.024	0.017	0.012	0.005	0.002
2007	98.9	0	0.066	0.032	0.019	0.015	0.011	0.007	0.003
2008	99.2	0	0.033	0.025	0.023	0.016	0.012	0.006	0.002
2009	81.6	0	0.054	0.026	0.021	0.016	0.011	0.005	0.003

Table 70: Percentiles of daily maximum one-hour sulfur dioxide at Traralgon (1995–2010)

AAQ NEPM standard: 0.20 ppm (one-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	88.5	0	0.049	0.021	0.020	0.015	0.011	0.007	0.004
1996	85.8	0	0.032	0.017	0.014	0.011	0.008	0.006	0.003
1997	*67.1*	*0*	*0.116*	*0.025*	*0.021*	*0.014*	*0.011*	*0.007*	*0.004*
1998	84.1	0	0.055	0.022	0.020	0.016	0.013	0.009	0.006
1999	80.3	0	0.032	0.020	0.017	0.013	0.012	0.007	0.004
2000	90.4	0	0.061	0.038	0.024	0.018	0.013	0.008	0.004
2001	98.6	0	0.063	0.036	0.020	0.014	0.011	0.008	0.005
2002	96.7	0	0.062	0.032	0.022	0.016	0.012	0.008	0.005
2003	97.5	0	0.082	0.038	0.030	0.020	0.015	0.009	0.005
2004	98.4	0	0.079	0.042	0.030	0.018	0.013	0.008	0.005
2005	91.5	0	0.061	0.044	0.034	0.022	0.015	0.009	0.005
2006	97.5	0	0.095	0.037	0.033	0.022	0.017	0.010	0.006
2007	96.2	0	0.092	0.041	0.029	0.022	0.016	0.011	0.006
2008	97.8	0	0.170	0.042	0.032	0.018	0.013	0.009	0.005
2009	99.5	0	0.110	0.040	0.030	0.019	0.013	0.008	0.004
2010	100.0	0	0.049	0.028	0.021	0.012	0.009	0.006	0.003

Years with data availability below 75 per cent shown in italics.

Table 71: Percentiles of daily average sulfur dioxide at Alphington (1995–2010)

AAQ NEPM standard: 0.08 ppm (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	*71.5*	*0*	*0.002*	*0.001*	*0.000*	*0.000*	*0.000*	*-0.001*	*-0.001*
1996	97.0	0	0.003	0.002	0.002	0.002	0.001	0.001	0.000
1997	94.2	0	0.003	0.002	0.002	0.001	0.001	0.001	0.000
1998	97.0	0	0.003	0.002	0.002	0.002	0.001	0.001	0.000
1999	97.8	0	0.001	0.001	0.001	0.001	0.000	0.000	-0.001
2000	97.8	0	0.002	0.001	0.001	0.000	0.000	0.000	-0.001
2001	93.4	0	0.002	0.001	0.001	0.000	0.000	0.000	-0.001
2002	98.4	0	0.002	0.001	0.001	0.000	0.000	0.000	-0.001
2003	96.7	0	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2004	99.7	0	0.003	0.002	0.002	0.001	0.001	0.001	0.000
2005	94.5	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000
2006	90.7	0	0.004	0.003	0.003	0.002	0.002	0.001	0.001
2007	99.5	0	0.004	0.003	0.003	0.002	0.002	0.001	0.001
2008	98.4	0	0.005	0.003	0.002	0.002	0.002	0.001	0.001
2009	97.5	0	0.003	0.002	0.002	0.002	0.001	0.000	-0.001
2010	95.6	0	0.004	0.002	0.001	0.001	0.001	0.000	-0.001

Years with data availability below 75 per cent shown in italics.

Table 72: Percentiles of daily average sulfur dioxide at Altona North (1995–2010)

AAQ NEPM standard: 0.08 ppm (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	97.5	0	0.007	0.005	0.005	0.003	0.002	0.001	0.000
1996	87.7	0	0.018	0.008	0.005	0.004	0.004	0.002	0.001
1997	96.4	0	0.011	0.010	0.008	0.005	0.003	0.001	0.000
1998	92.9	0	0.021	0.017	0.014	0.010	0.005	0.003	0.001
1999	96.2	0	0.016	0.009	0.006	0.005	0.003	0.001	0.000
2000	92.3	0	0.010	0.008	0.006	0.004	0.003	0.001	0.000
2001	95.6	0	0.033	0.013	0.011	0.006	0.004	0.001	0.000
2002	97.3	0	0.019	0.008	0.008	0.005	0.003	0.001	0.001
2003	94.8	0	0.009	0.007	0.005	0.003	0.002	0.001	0.000
2004	97.5	0	0.013	0.008	0.006	0.005	0.003	0.002	0.001
2005	96.2	0	0.010	0.007	0.006	0.004	0.003	0.002	0.001
2006	92.3	0	0.019	0.009	0.006	0.004	0.003	0.002	0.001
2007	97.3	0	0.013	0.008	0.006	0.004	0.003	0.002	0.001
2008	98.9	0	0.015	0.009	0.007	0.006	0.004	0.002	0.001
2009	97.0	0	0.034	0.011	0.009	0.006	0.005	0.003	0.001
2010	92.1	0	0.026	0.012	0.009	0.006	0.004	0.003	0.001

Table 73: Percentiles of daily average sulfur dioxide at Geelong South (1995–2010)

AAQ NEPM standard: 0.08 ppm (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	98.4	0	0.004	0.003	0.003	0.002	0.001	0.000	-0.001
1996	76.8	0	0.005	0.004	0.003	0.002	0.001	0.000	-0.001
1997	*0.0*								
1998	*68.8*	*0*	*0.006*	*0.004*	*0.004*	*0.003*	*0.002*	*0.001*	*0.001*
1999	94.0	0	0.005	0.003	0.003	0.002	0.002	0.001	0.000
2000	88.2	0	0.006	0.003	0.002	0.002	0.001	0.001	0.000
2001	*50.7*	*0*	*0.006*	*0.005*	*0.003*	*0.002*	*0.001*	*0.000*	*-0.001*
2002	84.9	0	0.004	0.002	0.002	0.001	0.001	0.000	-0.001
2003	96.2	0	0.004	0.003	0.002	0.002	0.001	0.000	-0.001
2004	90.7	0	0.006	0.004	0.003	0.002	0.002	0.001	0.000
2005	96.4	0	0.008	0.005	0.004	0.003	0.002	0.001	0.001
2006	93.2	0	0.005	0.005	0.004	0.003	0.002	0.001	0.001
2007	98.9	0	0.009	0.004	0.003	0.003	0.002	0.001	0.001
2008	96.7	0	0.007	0.004	0.004	0.003	0.002	0.001	0.001
2009	98.9	0	0.006	0.004	0.003	0.003	0.002	0.001	0.001
2010	92.6	0	0.007	0.004	0.004	0.003	0.002	0.001	0.001

Years with data availability below 75 per cent shown in italics.

Table 74: Percentiles of daily average sulfur dioxide at RMIT (CBD) (1995–2006)

AAQ NEPM standard: 0.08 ppm (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	*2.7*								
1996	82.8	0	0.003	0.003	0.002	0.002	0.001	0.000	-0.001
1997	97.8	0	0.006	0.006	0.005	0.004	0.003	0.002	0.001
1998	92.6	0	0.007	0.005	0.004	0.003	0.002	0.001	0.000
1999	98.6	0	0.005	0.003	0.003	0.002	0.002	0.001	0.000
2000	96.7	0	0.006	0.004	0.003	0.002	0.002	0.001	0.000
2001	94.2	0	0.004	0.004	0.003	0.002	0.002	0.000	0.000
2002	94.2	0	0.005	0.004	0.003	0.003	0.002	0.001	0.000
2003	99.2	0	0.006	0.005	0.004	0.003	0.002	0.001	0.001
2004	98.4	0	0.007	0.004	0.004	0.003	0.003	0.002	0.001
2005	98.9	0	0.005	0.004	0.003	0.003	0.002	0.001	0.001
2006	76.2	0	0.008	0.005	0.004	0.003	0.003	0.002	0.001

Years with data availability below 75 per cent shown in italics.

Table 75: Percentiles of daily average sulfur dioxide at Moe (1995–2009)

AAQ NEPM standard: 0.08 ppm (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	97.8	0	0.007	0.005	0.004	0.004	0.003	0.002	0.001
1996	98.9	0	0.008	0.005	0.004	0.003	0.003	0.002	0.001
1997	92.3	0	0.010	0.007	0.006	0.004	0.003	0.002	0.001
1998	94.8	0	0.007	0.005	0.005	0.004	0.003	0.001	0.000
1999	94.0	0	0.008	0.005	0.005	0.004	0.003	0.002	0.001
2000	98.4	0	0.012	0.008	0.007	0.006	0.005	0.003	0.002
2001	98.4	0	0.009	0.006	0.006	0.005	0.004	0.003	0.001
2002	97.5	0	0.010	0.007	0.006	0.004	0.004	0.002	0.001
2003	99.2	0	0.009	0.007	0.007	0.005	0.004	0.002	0.001
2004	99.7	0	0.006	0.005	0.004	0.003	0.002	0.001	0.000
2005	100.0	0	0.009	0.006	0.004	0.004	0.003	0.002	0.001
2006	88.5	0	0.009	0.007	0.005	0.004	0.003	0.002	0.001
2007	98.4	0	0.010	0.006	0.005	0.004	0.003	0.002	0.001
2008	99.2	0	0.007	0.006	0.005	0.004	0.003	0.002	0.001
2009	81.6	0	0.011	0.005	0.005	0.004	0.003	0.002	0.002

Table 76: Percentiles of daily average sulfur dioxide at Traralgon (1995–2010)

AAQ NEPM standard: 0.08 ppm (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than one day per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(ppm)	99th	98th	95th	90th	75th	50th
1995	88.5	0	0.005	0.004	0.004	0.003	0.003	0.002	0.001
1996	85.8	0	0.008	0.004	0.003	0.003	0.002	0.002	0.001
1997	*67.1*	*0*	*0.028*	*0.008*	*0.006*	*0.004*	*0.003*	*0.002*	*0.001*
1998	84.1	0	0.009	0.007	0.007	0.005	0.005	0.004	0.002
1999	80.3	0	0.006	0.005	0.004	0.004	0.003	0.003	0.001
2000	90.4	0	0.013	0.007	0.005	0.004	0.003	0.002	0.001
2001	98.6	0	0.008	0.006	0.005	0.004	0.003	0.002	0.002
2002	96.7	0	0.009	0.008	0.005	0.004	0.004	0.003	0.002
2003	97.5	0	0.008	0.006	0.005	0.005	0.004	0.002	0.001
2004	98.4	0	0.010	0.007	0.006	0.004	0.003	0.002	0.001
2005	91.5	0	0.012	0.007	0.005	0.004	0.003	0.002	0.001
2006	97.5	0	0.023	0.007	0.006	0.005	0.004	0.003	0.002
2007	95.6	0	0.011	0.009	0.008	0.006	0.005	0.003	0.002
2008	97.8	0	0.026	0.008	0.007	0.005	0.004	0.003	0.002
2009	99.5	0	0.013	0.008	0.006	0.005	0.004	0.003	0.002
2010	100.0	0	0.007	0.005	0.004	0.003	0.003	0.002	0.001

Years with data availability below 75 per cent shown in italics.

Particles as PM_{10}

Table 77: 2010 percentiles of daily PM_{10} concentrations in Victoria

AAQ NEPM standard: 50 µg/m³ (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than 5 days per year

Region	Data availability	Max	Percentiles (µg/m³)					
Performance monitoring station	(% of days)	(µg/m³)	99th	98th	95th	90th	75th	50th
Port Phillip								
Alphington	97.8	47.7	37.7	35.2	31.3	27.6	22.9	17.7
Brighton	91.5	41.0	35.8	33.3	28.2	25.7	20.1	15.4
Dandenong	98.6	43.7	38.6	36.0	31.8	27.4	21.8	15.8
Footscray	99.2	**74.8**	**50.8**	41.3	35.4	29.3	23.2	17.4
Geelong South	99.5	**50.4**	44.6	42.3	34.0	29.6	22.2	16.5
Mooroolbark	94.0	**53.8**	48.1	43.9	36.5	32.3	25.6	17.6
Richmond	97.3	46.6	33.7	30.9	27.6	24.8	20.3	15.8
Latrobe Valley								
Traralgon	100.0	**77.6**	39.5	33.4	28.1	24.4	19.4	15.6

Exceedances shown in bold.

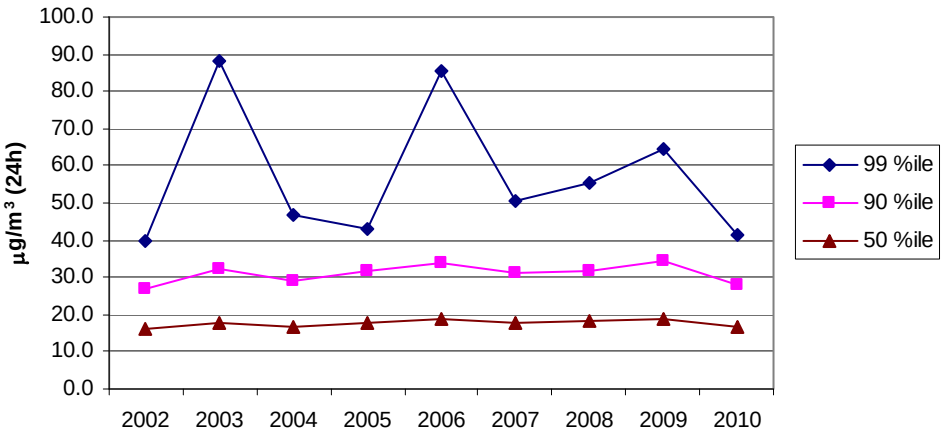

Figure 11: Percentiles of daily PM_{10} (average of Port Phillip stations 2002-2010)

In interpreting trends, it should be noted that PM_{10} monitoring commenced at Geelong and Mooroolbark during 2002 (<75% data capture this year) and these stations, which tend to record higher PM_{10}, are not included in the average for 2002.

Table 78: Percentiles of 24-hour PM_{10} at Alphington (1995–2010)

AAQ NEPM standard: 50 μg/m³ (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than 5 days per year

Year	Data availability	No. of exceedances	Max	Percentiles (μg/m³)					
	(% of days)	(days)	(μg/m³)	99th	98th	95th	90th	75th	50th
1995	*63.0*	*0*	*43.3*	*37.3*	*35.1*	*30.4*	*26.1*	*21.2*	*17.0*
1996	97.0	0	41.7	39.6	37.8	30.4	26.1	21.5	17.2
1997	98.1	2	**68.6**	44.3	37.8	33.4	29.5	23.0	18.1
1998	90.1	1	**53.5**	46.0	42.1	36.6	31.8	24.4	18.5
1999	84.7	0	43.7	34.1	32.7	30.3	26.3	21.6	17.4
2000	95.1	2	**56.5**	43.6	34.8	31.6	26.8	21.4	16.8
2001	91.0	2	**72.6**	39.6	35.1	32.8	27.9	23.4	17.2
2002	97.5	1	**66.2**	35.9	34.5	30.4	27.9	22.4	17.2
2003	95.9	10	**181.7**	**80.9**	**56.4**	38.3	30.9	22.9	17.2
2004	97.0	1	**51.6**	45.2	36.8	30.9	27.6	22.0	16.5
2005	92.6	0	46.6	40.7	36.8	34.5	31.4	23.3	17.0
2006	87.1	8	**154.7**	**82.5**	**58.4**	40.0	31.3	23.9	18.4
2007	100.0	2	**83.1**	43.5	40.4	35.2	30.8	22.8	17.6
2008	99.5	3	**71.1**	45.2	40.0	34.8	29.1	23.5	17.8
2009	98.1	7	**140.8**	**58.9**	49.6	39.8	31.5	25.3	18.5
2010	97.8	0	47.7	37.7	35.2	31.3	27.6	22.9	17.7

Years with data availability below 75 per cent shown in italics. Exceedances shown in bold.

Table 79: Percentiles of 24-hour PM_{10} at Brighton (1996–2009)

AAQ NEPM standard: 50 μg/m³ (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than 5 days per year

Year	Data availability	No. of exceedances	Max	Percentiles (μg/m³)					
	(% of days)	(days)	(μg/m³)	99th	98th	95th	90th	75th	50th
1996	*5.5*								
1997	*47.4*	*1*	***54.8***	*43.9*	*36.9*	*32.9*	*30.2*	*22.4*	*17.7*
1998	85.2	0	49.0	44.7	40.3	34.0	29.0	21.4	16.4
1999	99.5	0	49.0	32.0	31.0	26.0	23.9	19.3	15.7
2000	94.0	2	**52.6**	45.0	32.5	26.4	23.4	17.9	13.8
2001	95.6	1	**70.8**	33.4	30.9	26.5	24.3	19.4	13.9
2002	97.3	1	**69.1**	34.7	31.1	28.2	24.8	19.6	14.7
2003	88.8	8	**182.3**	**89.3**	**67.8**	35.9	30.5	21.5	15.8
2004	89.3	0	44.9	40.5	36.6	30.4	26.4	20.9	15.9
2005	84.1	0	41.5	33.8	32.7	28.0	25.8	19.7	14.4
2006	89.9	6	**109.1**	**78.0**	46.2	36.7	25.9	19.8	13.8
2007	99.7	1	**78.4**	35.9	32.7	29.4	24.1	18.1	13.7
2008	100.0	5	**65.3**	**52.5**	43.8	33.4	26.7	21.8	16.1
2009	99.5	6	**132.4**	**57.1**	48.5	35.7	29.1	22.8	17.1
2010	91.5	0	41.0	35.8	33.3	28.2	25.7	20.1	15.4

Years with data availability below 75 per cent shown in italics. Exceedances shown in bold.

Table 80: Percentiles of 24-hour PM_{10} at Dandenong (1998–2010)

AAQ NEPM standard: 50 μg/m³ (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than 5 days per year

Year	Data availability	No. of exceedances	Max	Percentiles (μg/m³)					
	(% of days)	(days)	(μg/m³)	99th	98th	95th	90th	75th	50th
1998	*69.6*	*1*	***50.4***	*42.8*	*41.1*	*35.1*	*30.3*	*23.5*	*17.4*
1999	*65.2*	*1*	***52.3***	*40.9*	*37.0*	*32.1*	*27.3*	*22.4*	*17.1*
2000	*73.8*	*1*	***74.5***	*43.8*	*39.8*	*32.3*	*29.3*	*22.5*	*15.3*
2001	*14.5*								
2002	87.4	3	**84.8**	45.6	37.6	31.5	26.5	21.0	15.8
2003	93.4	8	**295.1**	**92.3**	**52.4**	39.0	30.9	23.4	17.6
2004	92.3	1	**50.1**	44.5	42.1	35.7	30.8	23.4	16.7
2005	90.1	0	43.7	40.5	37.5	34.0	31.5	24.8	17.4
2006	100.0	12	**149.2**	**90.9**	**71.3**	47.5	38.2	30.0	22.8
2007	100.0	5	**84.6**	**52.3**	47.3	39.4	35.0	27.4	19.1
2008	99.2	8	**88.6**	**61.3**	**52.8**	39.4	33.2	25.4	19.1
2009	94.2	12	**199.7**	**63.7**	**54.8**	43.3	36.8	26.0	18.7
2010	98.6	0	43.7	38.6	36.0	31.8	27.4	21.8	15.8

Years with data availability below 75 per cent shown in italics. Exceedances shown in bold.

Table 81: Percentiles of 24-hour PM_{10} at Footscray (1996–2010)

AAQ NEPM standard: 50 μg/m³ (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than 5 days per year

Year	Data availability	No. of exceedances	Max	Percentiles (μg/m³)					
	(% of days)	(days)	(μg/m³)	99th	98th	95th	90th	75th	50th
1996	*13.1*								
1997	98.9	4	**65.5**	**50.1**	41.5	38.2	32.5	25.7	19.8
1998	94.8	4	**59.8**	**50.5**	43.9	41.4	34.7	26.9	19.8
1999	96.7	1	**50.7**	41.2	38.0	32.8	28.4	23.9	19.1
2000	89.0	2	**57.8**	43.6	40.7	36.6	30.0	23.9	17.6
2001	*40.5*	*0*	*38.9*	*33.7*	*28.4*	*26.3*	*23.5*	*18.2*	*15.1*
2002	98.4	2	**79.1**	42.9	38.7	32.2	28.3	22.1	17.5
2003	87.7	10	**314.5**	**89.1**	**66.0**	41.0	32.2	23.4	17.6
2004	93.2	3	**58.1**	48.4	40.4	33.5	29.1	22.3	16.1
2005	96.4	0	48.9	44.7	41.3	37.4	35.0	26.0	18.9
2006	90.1	11	**124.5**	**77.0**	**55.9**	41.0	35.5	25.8	19.5
2007	99.5	4	**65.9**	49.8	42.2	38.6	32.2	24.4	17.8
2008	100.0	4	**89.3**	48.6	46.0	42.0	33.1	25.8	19.2
2009	98.9	13	**166.5**	**67.9**	**58.5**	43.5	34.8	27.0	18.7
2010	99.2	4	**74.8**	**50.8**	41.3	35.4	29.3	23.2	17.4

Years with data availability below 75 per cent shown in italics. Exceedances shown in bold.

Table 82: Percentiles of 24-hour PM_{10} at Geelong South (2002–10)

AAQ NEPM standard: 50 μg/m³ (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than 5 days per year

Year	Data availability	No. of exceedances	Max	Percentiles (μg/m³)					
	(% of days)	(days)	(μg/m³)	99th	98th	95th	90th	75th	50th
2002	*32.1*	*6*	***81.1***	***73.2***	***56.8***	*49.5*	*35.8*	*27.4*	*20.1*
2003	94.0	10	**148.7**	**80.2**	**57.7**	45.3	35.3	25.6	18.4
2004	91.8	11	**149.0**	**62.5**	**53.5**	44.0	34.3	26.1	18.3
2005	96.2	7	**83.0**	**55.2**	49.3	40.6	33.7	26.6	18.5
2006	91.0	17	**116.4**	**98.0**	**72.2**	49.1	38.0	26.9	19.6
2007	98.9	14	**129.1**	**65.2**	**59.9**	43.4	32.8	26.5	19.1
2008	99.7	6	**168.7**	**66.6**	48.8	39.4	35.4	26.4	18.9
2009	85.2	12	**154.6**	**65.4**	**57.3**	46.2	36.6	27.8	20.1
2010	99.5	1	**50.4**	44.6	42.3	34.0	29.6	22.2	16.5

Years with data availability below 75 per cent shown in italics. Exceedances shown in bold.

Table 83: Percentiles of 24-hour PM_{10} at Mooroolbark (2002–10)

AAQ NEPM standard: 50 μg/m³ (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than 5 days per year

Year	Data availability	No. of exceedances	Max	Percentiles (μg/m³)					
	(% of days)	(days)	(μg/m³)	99th	98th	95th	90th	75th	50th
2002	*57.0*	*1*	***66.7***	*44.9*	*44.3*	*39.7*	*33.2*	*27.0*	*19.9*
2003	91.8	13	**322.2**	**118.1**	**91.3**	45.6	37.4	26.8	19.1
2004	94.8	1	**63.9**	46.0	42.8	34.7	30.1	23.9	17.3
2005	99.5	9	**57.6**	**53.7**	**52.1**	43.1	36.1	27.4	19.3
2006	97.3	17	**219.9**	**135.9**	**69.6**	46.1	39.2	29.1	21.3
2007	100.0	11	**136.1**	**63.0**	**51.7**	43.0	37.3	27.4	19.4
2008	97.8	10	**99.9**	**60.6**	**54.7**	44.5	37.8	27.7	21.1
2009	98.1	20	**214.1**	**82.3**	**67.5**	**50.7**	41.6	28.6	20.7
2010	94.0	3	**53.8**	48.1	43.9	36.5	32.3	25.6	17.6

Years with data availability below 75 per cent shown in italics. Exceedances shown in bold.

Table 84: Percentiles of 24-hour PM_{10} at Richmond (2002–10)

AAQ NEPM standard: 50 μg/m³ (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than 5 days per year

Year	Data availability	No. of exceedances	Max	Percentiles (μg/m³)					
	(% of days)	(days)	(μg/m³)	99th	98th	95th	90th	75th	50th
2002	92.6	1	**70.0**	40.3	34.7	29.2	26.5	21.2	16.5
2003	92.3	6	**274.9**	**73.8**	48.2	33.2	29.1	21.6	16.5
2004	100.0	0	43.9	40.6	35.7	30.0	26.0	20.7	15.9
2005	96.2	1	**54.9**	39.0	37.0	32.0	28.9	22.5	17.1
2006	97.5	9	**140.0**	**78.6**	**53.5**	37.9	31.4	24.3	18.4
2007	94.0	3	**78.7**	44.8	36.6	32.5	27.9	21.0	16.3
2008	97.5	5	**73.5**	**53.2**	44.3	34.0	27.2	22.4	17.4
2009	95.3	8	**121.2**	**55.2**	**50.3**	36.7	30.0	23.5	17.8
2010	97.3	0	46.6	33.7	30.9	27.6	24.8	20.3	15.8

Years with data availability below 75 per cent shown in italics. Exceedances shown in bold.

Table 85: Percentiles of 24-hour PM_{10} at RMIT (CBD) (2002–06)

AAQ NEPM standard: 50 μg/m³ (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than 5 days per year

Year	Data availability	No. of exceedances	Max	Percentiles (μg/m³)					
	(% of days)	(days)	(μg/m³)	99th	98th	95th	90th	75th	50th
2002	*23.3*	*2*	***82.9***	***66.3***	***51.5***	*37.6*	*33.3*	*27.2*	*21.1*
2003	96.7	11	**279.4**	**83.5**	**58.3**	38.8	31.3	23.9	18.7
2004	94.5	2	**79.8**	46.7	41.8	32.3	28.9	23.5	18.2
2005	98.4	0	41.7	36.5	35.2	33.2	29.4	22.8	17.4
2006	78.1	1	**53.0**	42.6	41.4	36.0	30.0	23.6	18.0

Years with data availability below 75 per cent shown in italics. Exceedances shown in bold.

Table 86: Percentiles of 24-hour PM_{10} at Moe (2002–09)

AAQ NEPM standard: 50 μg/m³ (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than 5 days per year

Year	Data availability	No. of exceedances	Max	Percentiles (μg/m³)					
	(% of days)	(days)	(μg/m³)	99th	98th	95th	90th	75th	50th
2002	*14.8*								
2003	98.1	11	**288.8**	**81.2**	**56.2**	37.7	31.0	21.2	14.7
2004	90.2	1	**56.3**	41.2	37.6	31.8	27.8	20.0	14.5
2005	99.7	0	36.9	33.4	32.6	28.5	24.7	19.8	14.2
2006	87.9	15	**254.0**	**135.3**	**85.2**	42.3	28.7	21.6	16.0
2007	90.7	13	**137.2**	**71.0**	**56.3**	43.5	35.1	25.6	18.6
2008	98.9	6	**90.9**	**61.9**	46.5	36.3	27.8	20.8	15.8
2009	81.6	7	**169.6**	**55.2**	**51.8**	37.6	30.0	21.6	16.3

Years with data availability below 75 per cent shown in italics. Exceedances shown in bold.

Table 87: Percentiles of 24-hour PM_{10} at Traralgon (2002–10)

AAQ NEPM standard: 50 μg/m³ (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than 5 days per year

Year	Data availability	No. of exceedances	Max	Percentiles (μg/m³)					
	(% of days)	(days)	(μg/m³)	99th	98th	95th	90th	75th	50th
2002	*15.3*	*0*	*37.1*	*33.2*	*30.0*	*28.8*	*26.4*	*23.5*	*18.7*
2003	98.1	7	**237.8**	**59.3**	47.5	37.2	27.3	21.6	16.8
2004	99.7	0	44.5	34.2	31.8	29.8	25.9	20.6	15.9
2005	90.1	0	44.9	41.0	36.8	31.5	26.3	20.8	16.2
2006	99.2	9	**193.5**	**82.7**	**50.5**	32.9	27.4	22.1	17.5
2007	96.4	5	**151.2**	**52.0**	40.8	32.3	27.0	21.7	17.0
2008	100.0	2	**64.9**	42.1	39.2	33.2	27.9	22.4	17.6
2009	100.0	5	**125.7**	**51.0**	40.4	35.3	29.2	23.5	17.9
2010	100.0	3	**77.6**	39.5	33.4	28.1	24.4	19.4	15.6

Years with data availability below 75 per cent shown in italics. Exceedances shown in bold.

Particles as $PM_{2.5}$

Table 88: 2010 percentiles of Daily $PM_{2.5}$ concentrations in Victoria

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

Region	Data availability	Max	Percentiles (μg/m³)					
Performance monitoring station	(% of days)	(μg/m³)	99th	98th	95th	90th	75th	50th
Port Phillip								
Alphington	100.0	**27.0**	**26.3**	22.9	15.8	12.5	8.7	6.1
Footscray	95.9	24.5	20.2	18.7	14.1	11.7	8.5	5.7

Monitoring by reference method (one-day-in-three). Exceedances shown in bold.

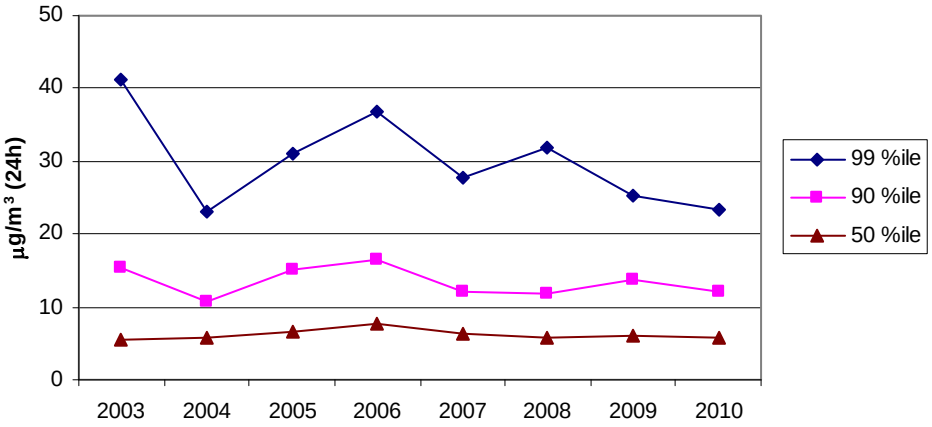

Figure 12: Percentiles of daily $PM_{2.5}$ (average of Port Phillip stations 2003-10)

Table 89: Percentiles of daily $PM_{2.5}$ at Alphington (2002–10)

AAQ NEPM standard: 25 μg/m³ (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than 5 days per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(μg/m³)	99th	98th	95th	90th	75th	50th
2002	*33.6*	*0*	*19.3*	*17.9*	*16.6*	*11.6*	*11.0*	*8.7*	*6.0*
2003	91.8	5	**41.0**	**39.0**	**34.2**	19.2	15.5	9.1	6.0
2004	94.3	1	**27.4**	24.2	19.4	13.0	11.3	8.6	6.0
2005	94.3	3	**38.3**	**31.2**	**27.0**	19.5	16.8	9.3	7.2
2006	86.9	6	**56.4**	**36.9**	**31.0**	**25.4**	16.4	10.7	7.6
2007	95.1	3	**36.0**	**30.7**	24.7	17.1	12.6	8.9	6.5
2008	100.0	4	**46.7**	**34.5**	**32.2**	15.8	11.6	8.6	6.0
2009	100.0	2	**27.0**	**26.4**	24.1	21.2	15.0	9.1	6.6
2010	100.0	3	**27.0**	**26.3**	22.9	15.8	12.5	8.7	6.1

Monitoring by reference method (one-day-in-three). Years with data availability below 75 per cent shown in italics. Exceedances shown in bold.

Table 90: Percentiles of daily $PM_{2.5}$ at Footscray (2002–10)

AAQ NEPM standard: 25 μg/m³ (24-hour average)
AAQ NEPM goal: Standard exceeded on no more than 5 days per year

Year	Data availability	No. of exceedances	Max	Percentiles (ppm)					
	(% of days)	(days)	(μg/m³)	99th	98th	95th	90th	75th	50th
2002	*22.1*	*0*	*10.2*	*10.2*	*10.1*	*9.6*	*8.3*	*7.2*	*4.2*
2003	80.3	3	**55.7**	**43.5**	**29.2**	22.5	15.0	8.4	5.1
2004	89.3	0	22.3	21.8	19.7	13.9	10.2	7.5	5.7
2005	81.1	2	**32.8**	**31.2**	21.3	16.8	13.5	9.0	6.1
2006	*65.6*	*2*	***36.7***	***31.4***	*22.5*	*16.6*	*14.3*	*9.4*	*6.1*
2007	95.1	1	**33.1**	24.7	22.4	17.0	11.3	8.5	6.4
2008	92.6	3	**30.5**	**29.2**	23.9	13.9	11.9	7.9	5.5
2009	92.6	1	**26.9**	24.1	19.4	15.7	12.7	9.4	5.6
2010	95.9	0	24.5	20.2	18.7	14.1	11.7	8.5	5.7

Monitoring by reference method (one-day-in-three). Years with data availability below 75 per cent shown in italics. Exceedances shown in bold.

Monitoring for the $PM_{2.5}$ Equivalence Program was conducted using TEOM instruments. Results are presented in Tables 91 to 93.

Table 91: $PM_{2.5}$ Equivalence Program 2010 TEOM monitoring – Daily concentrations in Victoria

Region	Data availability	Max	Percentiles (μg/m³)					
Performance monitoring station	(% of days)	(μg/m³)	99th	98th	95th	90th	75th	50th
Port Phillip								
Alphington	98.1	**17.3**	**16.1**	**14.4**	**11.1**	**9.4**	**6.2**	**4.1**
Footscray	98.9	**22.9**	**15.7**	**12.5**	**10.3**	**8.4**	**5.7**	**3.7**

Table 92: Percentiles of daily TEOM $PM_{2.5}$ (Equivalence Program) at Alphington (2003–10)

Year	Data availability	Max	Percentiles (μg/m³)					
	(% of days)	(μg/m³)	99th	98th	95th	90th	75th	50th
2003	94.2	**59.5**	**39.2**	**29.9**	17.9	13.7	8.3	5.6
2004	94.8	21.7	15.6	12.3	10.1	7.8	6.1	4.3
2005	93.4	24.8	17.9	16.2	14.0	11.2	6.9	4.3
2006	87.7	**112.6**	**50.5**	**28.7**	14.9	11.2	7.6	4.7
2007	100.0	**59.4**	21.7	17.9	14.3	12.0	7.5	5.0
2008	99.5	**44.2**	**25.6**	19.0	12.8	9.9	6.8	4.7
2009	98.4	**32.7**	22.4	21.3	14.8	11.7	7.3	4.7
2010	98.1	17.3	16.1	14.4	11.1	9.4	6.2	4.1

Table 93: Percentiles of daily TEOM $PM_{2.5}$ (Equivalence Program) at Footscray (2003–10)

Year	Data availability	Max	Percentiles (μg/m³)					
	(% of days)	(μg/m³)	99th	98th	95th	90th	75th	50th
2003	*10.1*							
2004	88.5	23.8	14.1	12.5	9.9	8.2	5.8	3.8
2005	99.7	20.3	14.3	13.0	10.8	9.0	5.9	3.9
2006	91.8	**95.7**	**44.0**	23.2	15.6	11.3	6.8	4.3
2007	99.5	**42.9**	18.9	16.0	12.0	10.4	6.3	4.2
2008	99.7	**34.5**	23.2	16.6	11.6	9.2	6.6	4.5
2009	99.5	**32.9**	23.3	19.4	13.8	10.8	7.3	4.2
2010	98.9	22.9	15.7	12.5	10.3	8.4	5.7	3.7

Years with data availability below 75 per cent shown in italics.

Lead

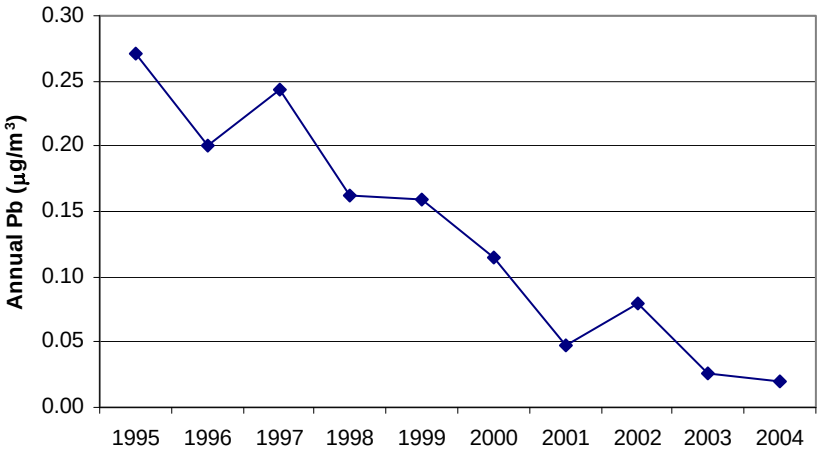

Figure 13: Annual average lead (Collingwood 1995-2004)

Table 94: Annual average lead (Collingwood 1995–2004)

AAQ NEPM standard: 0.50 μg/m³ (1-year average)

Year	Data availability (% of days)	Annual Average (μg/m³)
1995	80.5	0.27
1996	100.0	0.20
1997	100.0	0.24
1998	90.4	0.16
1999	98.6	0.16
2000	100.0	0.11
2001	92.1	0.05
2002	92.1	0.08
2003	98.6	0.03
2004	91.8	0.02