



National Environment Protection (Ambient Air Quality) Measure

as amended

made under section 20 of the

National Environment Protection Council Act 1994 (Cwlth), National Environment Protection Council (New South Wales) Act 1995 (NSW), National Environment Protection Council (Victoria) Act 1995 (Vic), National Environment Protection Council (Queensland) Act 1994 (Qld), National Environment Protection Council (Western Australia) Act 1996 (WA), National Environment Protection Council (South Australia) Act 1995 (SA), National Environment Protection Council (Tasmania) Act 1995 (Tas), National Environment Protection Council Act 1994 (ACT) and the National Environment Protection Council (Northern Territory) Act 1994 (NT)

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Introductory Note

Section 14 of the *National Environment Protection Council Act 1994* and the equivalent provision of the corresponding Act of each participating State and Territory provides for the making of measures by the National Environment Protection Council and the matters to which they may relate. This Measure relates to ambient air quality (section 14 (1) (a)).

The Measure is to be implemented by the laws and other arrangements participating jurisdictions consider necessary: see section 7 of the Commonwealth Act and the equivalent provision of the corresponding Act of each participating State and Territory.

Part 1 Preliminary

1 Citation [see Note 1]

This Measure may be cited as the National Environment Protection (Ambient Air Quality) Measure.

Note This Measure commences on gazettal: see *National Environment Protection Council Act 1994*, s 21 and *Acts Interpretation Act 1901*, s 48 as applied by s 46A.

2 Definitions

- (1) This clause defines particular words and expressions used in this Measure.
- (2) The words and expressions indicated by an asterisk are defined in the Commonwealth Act and are included for information only to assist readers of the Measure. Minor changes from the definitions in the Commonwealth Act are indicated by square brackets ([]).
- (3) In this Measure:

Advisory Reporting Standard means a health-based standard to assess the results of monitoring for particles as PM_{2.5}. These standards do not have a timeframe for compliance associated with them.

****Agreement*** means the agreement made on 1 May 1992 between the Commonwealth, the States, the Australian Capital Territory, the Northern Territory and the Australian Local Government Association, a copy of which is set out in the Schedule [to the Commonwealth Act].

ambient air means the external air environment, it does not include the air environment inside buildings or structures.

Commonwealth Act means the *National Environment Protection Council Act 1994* of the Commonwealth.

Continuous direct mass measurement technique means a method for continuously monitoring suspended particulate matter changes of particles

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in ambient air, providing near real time measurement of mean particle concentration.

Council means the National Environment Protection Council established by section 8 of the Commonwealth Act and the equivalent provision of the corresponding Act of each participating State and Territory.

Fire management means all activities associated with the management of fire prone land, including the use of fire to meet land management goals and objectives.

Manual gravimetric method means a manual method for sampling particles by drawing air through a filter and determining the mass by weighing the filters.

monitoring station means a facility for measuring the concentration of one or more pollutants in the ambient air in a region or sub-region.

***national environment protection goal** means a goal:

- (a) that relates to desired environmental outcomes; and
- (b) that guides the formulation of strategies for the management of human activities that may affect the environment.

***national environment protection protocol** means a protocol that relates to the process to be followed in measuring environmental characteristics to determine:

- (a) whether a particular standard or goal is being met or achieved; or
- (b) the extent of the difference between the measured characteristic of the environment and a particular standard or a particular goal.

***national environment protection standard** means a standard that consists of quantifiable characteristics of the environment against which environmental quality can be assessed.

***participating jurisdiction** means the Commonwealth, a participating State or a participating Territory.

***participating State** means a State:

- (a) that is a party to the Agreement; and
- (b) in which an Act that corresponds to [the Commonwealth] Act is in force in accordance with the Agreement.

***participating Territory** means a Territory:

- (a) that is a party to the Agreement; and
- (b) in which an Act that corresponds to [the Commonwealth] Act is in force in accordance with the Agreement.

particles as PM_{10} means particulate matter with an equivalent aerodynamic diameter of 10 micrometres or less.

Particles as $PM_{2.5}$ means particulate matter with an equivalent aerodynamic diameter of 2.5 micrometres or less.

performance monitoring station means a monitoring station used to measure achievement against the goal.

pollutant means a pollutant mentioned in Schedule 1.

ppm means parts per million by volume.

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principal Measure means the National Environment Protection (Ambient Air Quality) Measure.

Reference method means the monitoring method used for collection of data that can be compared to the Advisory Reporting Standards.

region means an area within a boundary surrounding population centres as determined by the relevant participating jurisdiction.

sub-region means a populated area within a region whose air quality differs from other areas in the region due to the topography, meteorology and sources of pollutants.

TEOM means tapered element oscillating microbalance.

$\mu\text{g}/\text{m}^3$ means microgram per cubic metre referenced to a temperature of 0 degrees Celsius and an absolute pressure of 101.325 kilopascals.

3 Application

Participating jurisdictions must:

- (a) for carbon monoxide, nitrogen dioxide, photochemical oxidants (as ozone), sulfur dioxide, lead and particles as PM_{10} establish monitoring procedures and commence assessment and reporting in accordance with the Protocol in this Measure, within 3 years after its commencement;
- (b) for particles as $\text{PM}_{2.5}$ undertake monitoring and reporting in accordance with Schedule 4 and Schedule 5 in this Measure.

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Part 2 National environment protection goal**4 Purpose of Part**

The purpose of this Part is to set out a goal:

- (a) that relates to the desired environmental outcomes; and
- (b) that guides the formulation of strategies for the management of human activities that may affect the environment.

5 Desired environmental outcome

The desired environmental outcome of this Measure is ambient air quality that allows for the adequate protection of human health and well-being.

6 National environment protection goal

The National Environment Protection Goal of this Measure is:

- (a) for carbon monoxide, nitrogen dioxide, photochemical oxidants (as ozone), sulfur dioxide, lead and particles as PM₁₀ to achieve the National Environment Protection Standards as assessed in accordance with the monitoring protocol (Part 4) within ten years from commencement to the extent specified in Schedule 2 column 5; and
- (b) for particles as PM_{2.5} to gather sufficient data to facilitate a review of the Advisory Reporting Standards as part of the review of this Measure scheduled to commence in 2005.

Part 3 National environment protection standards

7 Purpose of Part

The purpose of this Part is to set standards that consist of quantifiable characteristics of the air against which ambient air quality can be assessed.

8 National environment protection standards

- (1) The national environment protection standards of this Measure are the standards set out in Schedule 2.
- (2) For:
 - (a) each pollutant mentioned in table 1 of Schedule 2, the standard for an averaging period mentioned in the Schedule is the concentration in column 4 of table 1 of Schedule 2;
 - (b) particles as PM_{2.5}, the Advisory Reporting Standard for an averaging period mentioned in the Schedule is the concentration in column 3 of table 2 of Schedule 2.

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Part 4 National environment protection protocol**9 Purpose of Part**

The purpose of this Part is to set out the processes to be followed in measuring the concentration of pollutants in the air to determine:

- (a) whether the standards of this Measure are being met; or
- (b) the extent of the difference between the measured concentration of pollutants in the air and the standards.

10 Monitoring plans

- (1) Each participating jurisdiction must ensure that a monitoring plan consistent with this Part is prepared setting out how the jurisdiction proposes to monitor air quality for the purposes of this Measure.
- (2) Each monitoring plan must be submitted to Council.

11 Methods of measuring and assessing concentration of pollutants

For the purpose of evaluating performance against the standards the concentration of pollutants in the air:

- (a) is to be measured at performance monitoring stations; or

Note Because the concentrations of different pollutants vary across a region, it would not be necessary or appropriate to co-locate the measuring instrumentation for all pollutants at each performance monitoring station.

- (b) is to be assessed by other means that provide information equivalent to measurements which would otherwise occur at a performance monitoring station.

Note These methods could include, for example, the use of emission inventories, windfield and dispersion modelling, and comparisons with other regions.

12 Accreditation of performance monitoring

- (1) Subject to subclause (2) the operator of a performance monitoring station must be accredited by the National Association of Testing Authorities.
- (2) The operator may apply an equivalent system for ensuring adequate monitoring, quality assurance, and validation procedures.

13 Location of performance monitoring stations

- (1) To the extent practicable, performance monitoring stations should be sited in accordance with the requirements for Australian Standard AS2922-1987 (Ambient Air-Guide for Siting of Sampling Units). Any variations from AS2922-1987 must be notified to Council for use in assessing reports.

Clause 16

- (2) Performance monitoring station(s) must be located in a manner such that they contribute to obtaining a representative measure of the air quality likely to be experienced by the general population in the region or sub-region.
- (3) A performance monitoring station should be operated in the same location for at least 5 years unless the integrity of the measurements is affected by unforeseen circumstances.

14 Number of performance monitoring stations

- (1) Subject to subclauses (2) and (3) below, the number of performance monitoring stations for a region with a population of 25,000 people or more must be the next whole number above the number calculated in accordance with the formula:

$$1.5P + 0.5$$

where **P** is the population of the region (in millions).

- (2) Additional performance monitoring stations may be needed where pollutant levels are influenced by local characteristics such as topography, weather or emission sources.
- (3) Fewer performance monitoring stations may be needed where it can be demonstrated that pollutant levels are reasonably expected to be consistently lower than the standards mentioned in this Measure.

15 Trend stations

- (1) A number of performance monitoring stations in each participating State and participating Territory must be nominated as trend stations.
- (2) The number of performance monitoring stations to be nominated as trend stations must be sufficient to monitor and assess long term changes in ambient air quality in different parts of the jurisdiction.
- (3) A trend station must be operated in the same location for one or more decades.

16 Monitoring methods

- (1) Subject to subclauses (2) and (3) the Australian Standard Methods set out in Schedule 3 should be used for monitoring pollutants in the air.
- (2) Where an Australian Standard Method has not yet been developed for a monitoring method, appropriate internationally recognised methods or standards may be used that provide equivalent information for assessment purposes.
- (3) Other monitoring methods may be used if:
 - (a) calibration and validation studies show:
 - (i) the accuracy and precision of the other method; and

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- (ii) the method can be compared with the relevant Australian Standard Method; and
- (b) the equipment used is calibrated to the standard required by the equipment manufacturer; and
- (c) the equipment provides equivalent information for assessment purposes.

17 Evaluation of performance against standards and goal

- (1) Each participating jurisdiction must evaluate its annual performance as set out in this clause.
- (2) For each performance monitoring station in the jurisdiction or assessment in accordance with subclause 11 (b) there must be:
 - (a) a determination of the exposed population in the region or sub-region represented by the station; and
 - (b) an evaluation of performance against the standards and goal of this Measure as:
 - (i) meeting; or
 - (ii) not meeting; or
 - (iii) not demonstrated.
- (3) Jurisdictions may provide an evaluation of a region as a whole against the standards using appropriate methodologies that provide equivalent information for assessment purposes.
- (4) Performance must be evaluated as ‘not demonstrated’ if there has been no monitoring or no assessment by an approved alternative method as provided in clause (11).

18 Reporting

- (1) Each participating jurisdiction must submit a report on its compliance with the Measure in an approved form to Council by the 30 June next following each reporting year.
- (2) In this clause *reporting year* means a year ending on 31 December.

The report must include:

 - (a) the evaluations and assessments mentioned in clause 17; and
 - (b) an analysis of the extent to which the standards of this Measure are, or are not, met in the jurisdiction; and
 - (c) a statement of the progress made towards achieving the goal.
- (3) The description of the circumstances which led to exceedences, including the influence of natural events and fire management, must be reported to the extent that such information can be determined.
- (4) A report for a pollutant must include the percentage of data available in the reporting period.

Schedule 1 Pollutants

Carbon monoxide

Sulfur dioxide

Nitrogen dioxide

Lead

Photochemical Oxidants (as Ozone)

Particles

Schedule 2 Standards and Goal

Table 1: Standards and Goal for Pollutants other than Particles as PM_{2.5}

Column 1 Item	Column 2 Pollutant	Column 3 Averaging period	Column 4 Maximum concentration	Column 5 Goal within 10 years Maximum allowable exceedences
1	Carbon monoxide	8 hours	9.0 ppm	1 day a year
2	Nitrogen dioxide	1 hour 1 year	0.12 ppm 0.03 ppm	1 day a year none
3	Photochemical oxidants (as ozone)	1 hour 4 hours	0.10 ppm 0.08 ppm	1 day a year 1 day a year
4	Sulfur dioxide	1 hour 1 day 1 year	0.20 ppm 0.08 ppm 0.02 ppm	1 day a year 1 day a year none
5	Lead	1 year	0.50 µg/m ³	none
6	Particles as PM ₁₀	1 day	50 µg/m ³	5 days a year

Table 2: Advisory Reporting Standards and Goal for Particles as PM_{2.5}

Column 1 Pollutant	Column 2 Averaging Period	Column 3 Maximum Concentration	Column 4 Goal
Particles as PM _{2.5}	1 day 1 year	25 µg/m ³ 8 µg/m ³	Goal is to gather sufficient data nationally to facilitate a review of the Advisory Reporting Standards as part of the review of this Measure scheduled to commence in 2005

For the purposes of this Measure the following definitions shall apply:

- (1) Lead sampling must be carried out for a period of 24 hours at least every sixth day.
- (2) Measurement of lead must be carried out on Total Suspended Particles (TSP) or its equivalent.
- (3) In Column 3, the averaging periods are defined as follows:
 - 1 hour clock hour average
 - 4 hour rolling 4 hour average based on 1 hour averages
 - 8 hour rolling 8 hour average based on 1 hour averages
 - 1 day calendar day average
 - 1 year calendar year average

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- (4) In Column 5, the time periods are defined as follows:
 - day calendar day during which the associated standard is exceeded
 - year calendar year.
 - (5) All averaging periods of 8 hours or less must be referenced by the end time of the averaging period. This determines the calendar day to which the averaging periods are assigned.
 - (6) For the purposes of calculating and reporting 4 and 8 hour averages, the first rolling average in a calendar day ends at 1.00 am, and includes hours from the previous calendar day.
 - (7) The concentrations in Column 4, are the arithmetic mean concentrations.

Schedule 3 Australian Standards Methods for Pollutant Monitoring

Pollutant	Method title	Method number
Carbon monoxide	Determination of Carbon Monoxide-Direct Reading Instrumental Method	AS3580.7.1-1992
Nitrogen dioxide	Determination of Oxides of Nitrogen-Chemiluminescence Method	AS3580.5.1-1993
Photochemical oxidants (as ozone)	Determination of Ozone-Direct Reading Instrumental Method	AS3580.6.1-1990
Sulfur dioxide	Determination of Sulfur Dioxide-Direct Reading Instrumental Method	AS3580.4.1-1990
Lead	Determination of Particulate Lead-High Volume Sampler Gravimetric Collection-Flame Atomic Absorption Spectrometric Method	AS2800-1985
	Determination of Total Suspended Particulates (TSP) - High Volume Sampler Gravimetric Method	AS2724.3-1984
Particles as PM ₁₀	Determination of Suspended Particulate Matter-PM ₁₀ High Volume Sampler with Size Selective Inlet-Gravimetric Method	AS3580.9.6-1990
	Determination of Suspended Particulate Matter-PM ₁₀ Dichotomous Sampler-Gravimetric Method	AS3580.9.7-1990

Schedule 4 Protocol for Monitoring PM_{2.5}

Note Clauses 11 to 18 of the Measure are not to be applied to PM_{2.5}. This Schedule sets out all applicable requirements for PM_{2.5}.

1 Location of monitoring for PM_{2.5}

Measurement and assessment of the concentration of PM_{2.5} in the air is to be undertaken at existing or planned performance monitoring stations specified for particles as PM₁₀ under this Measure as selected by participating jurisdictions.

2 Number of performance monitoring stations for PM_{2.5}

- (1) Each participating jurisdiction will establish at least one monitoring location for PM_{2.5} and commence monitoring in accordance with the Table below.

Dates for Commencement of PM_{2.5} Monitoring in Participating Jurisdictions

Jurisdiction	Commencement Date
New South Wales	1 January 2004
Victoria	1 January 2004
Queensland	1 January 2004
Western Australia	1 January 2004
South Australia	1 January 2004
Tasmania	1 July 2004*
Australian Capital Territory	1 July 2004*
Northern Territory	1 July 2004*

* These jurisdictions must commence monitoring on 1 July 2004 if resources are available and, if not, as soon as resources become available to ensure sufficient data are collected to inform the review of this Measure scheduled to commence in 2005.

- (2) Jurisdictions are encouraged to introduce monitoring for PM_{2.5} at as many performance monitoring stations for PM₁₀ as practicable. The extent of such monitoring may vary depending on the requirements and resources of the jurisdiction.

3 Monitoring methods for PM_{2.5}

- (1) The reference methods for monitoring particles as PM_{2.5} are reference, Class 1 and Class 2 equivalent manual gravimetric methods designated in the USEPA Federal Reference Method (USEPA reference method; *US Code of Federal Regulations Title 40 Part 50 Appendix L Reference Method for the Determination of Fine Particulate Matter as PM_{2.5} in the Atmosphere*).

- (2) Continuous direct mass methods using a tapered element oscillating microbalance may also be used in addition to the reference method, however the values obtained by using these methods cannot be used for comparison with the Advisory Reporting Standards until the outcomes of the PM_{2.5} Equivalence Program (Schedule 5) have been formally included in the Principal Measure.
- (3) To enable the development of equivalent methods for monitoring PM_{2.5} as part of the review of this Measure scheduled to commence in 2005, collocation of continuous direct mass monitors and reference samplers must be undertaken at a limited number of sites in accordance with Schedule 5.
- (4) Participating jurisdictions must reach agreement on the collocation of samplers to ensure that, nationally, a minimum of nine locations house collocated samplers and annual reporting to Council must include information on the collocation of samplers.

4 Evaluation of monitoring for PM_{2.5}

- (1) Each participating jurisdiction must evaluate its monitoring results for PM_{2.5} in accordance with this clause.
- (2) For each PM_{2.5} performance monitoring station in the jurisdiction there must be:
 - (a) a determination of the exposed population in the region or sub-region monitored by the station; and
 - (b) a report on whether the PM_{2.5} Advisory Reporting Standards of this Measure, as measured by the reference method, have been met.

5 Reporting

- (1) Each participating jurisdiction must submit a report on PM_{2.5} monitoring and data assessment in accordance with this clause to Council by the 30 June next following each reporting year.
- (2) In this clause *reporting year* means a year ending on 31 December.
- (3) The first report to Council will be for the 2003 reporting year for data currently being collected by jurisdictions.
- (4) The report must include:
 - (a) an evaluation and assessment of all PM_{2.5} data collected by the reference method;
 - (b) the evaluations and assessments outlined in clause 4 of this Schedule;
 - (c) the number of times the monitored values (by the reference method) are greater than the Advisory Reporting Standards of this Measure;
 - (d) all other PM_{2.5} data collected by other acceptable methods as outlined in this Schedule; and
 - (e) the maximum 24-hour concentration of PM_{2.5} in each jurisdiction collected by any method specified in Schedule 4 of this Variation.

- (5) A description of the circumstances that led to monitored values (by the reference method) being greater than the Advisory Reporting Standards including the influence of natural events and fire management, must be reported to the extent that such information can be determined.
- (6) The report must include the percentage of data available in the reporting period.

Schedule 5 PM_{2.5} Equivalence Program

- (1) Jurisdictions must undertake monitoring with collocated instruments for the purpose of determining equivalent methods for monitoring PM_{2.5} in accordance with the Table in this Schedule and the requirements specified in the Technical Paper on Monitoring and Reporting for Particles as PM_{2.5}.
- (2) At locations where reference method samplers are to be used, there is no requirement for equivalence studies to be undertaken, except where such locations have been designated as collocation sites.
- (3) If alternative PM_{2.5} monitoring methods are used, equivalence between the reference method and the alternative method must be demonstrated by collocation of samplers over a three-year period.
- (4) For jurisdictions undertaking equivalence monitoring, there must be at least one collocation site with a reference sampler run on a daily basis (preferred) or on a 1-in-3 day operation (minimum requirement).
- (5) Data availability must exceed 75% and it is recommended that higher data recovery be achieved during seasons with expected elevated particle loadings.
- (6) To ensure national consistency with regard to the collection of PM_{2.5} data, monitoring must be done in accordance with procedures specified in the Technical Paper on Monitoring and Reporting for Particles as PM_{2.5}.

Sites Proposed for the Equivalence Program

Jurisdiction	Site	Sampling Frequency (reference sampler)	Sampling Period	Alternative Method	Commencement Date
New South Wales	Earlwood	1 in 3 days	3 years	PM _{2.5} TEOM	1 January 2004
	Richmond	1 in 3 days	3 years		
Victoria	Alphington	1 in 3 days	3 years	PM _{2.5} TEOM	1 January 2004
	Mooroolbark	1 in 3 days	3 years		
Queensland	Springwood	1 in 3 days	3 years	PM _{2.5} TEOM	1 January 2004
	Rocklea	1 in 3 days	3 years		
Western Australia	Duncraig	1 in 3 days	3 years	PM _{2.5} TEOM	1 January 2004
South Australia	Netley	1 in 3 days	3 years	PM _{2.5} TEOM	1 January 2004
Tasmania	Launceston	1 in 3 days	3 years	PM _{2.5} TEOM	1 July 2004

Notes to the National Environment Protection (Ambient Air Quality) Measure

Note 1

The National Environment Protection (Ambient Air Quality) Measure (in force under section 20 of the *National Environment Protection Council Act 1994* (Cwlth), *National Environment Protection Council (New South Wales) Act 1995* (NSW), *National Environment Protection Council (Victoria) Act 1995* (Vic), *National Environment Protection Council (Queensland) Act 1994* (Qld), *National Environment Protection Council (Western Australia) Act 1996* (WA), *National Environment Protection Council (South Australia) Act 1995* (SA), *National Environment Protection Council (Tasmania) Act 1995* (Tas), *National Environment Protection Council Act 1994* (ACT) and the *National Environment Protection Council (Northern Territory) Act 1994* (NT)) as shown in this compilation is amended as indicated in the Tables below.

Table of Instruments

Title	Date of notification in Gazette	Date of commencement	Application, saving or transitional provisions
<i>National Environment Protection (Ambient Air Quality) Measure</i>	8 July 1998 (see c. 1 and Gazette 1998, No. GN27)	8 July 1998	
<i>National Environment Protection (Ambient Air Quality) Measure Variation, 2003</i>	2 June 2003 (see c. 1 and Gazette 2003, No. S190)	2 June 2003	—

Table of Amendments

Table of Amendments

ad. = added or inserted am. = amended rep. = repealed rs. = repealed and substituted

Provision affected	How affected
C. 2.....	am. Variation 2003
C. 3.....	am. Variation 2003
C. 6.....	am. Variation 2003
C. 8.....	am. Variation 2003
Schedule 2	am. Variation 2003
Schedule 4	ad. Variation 2003
Schedule 5	ad. Variation 2003
