

# **Select Committee on Perth's Air Quality**

## **Industry Emissions**

### **Discussion Paper 4**

Presented by  
**Mr F. C. Tubby, MLA**  
Laid on the Table of the Legislative Assembly  
on  
4 December 1997

**ORDERED TO BE PRINTED**

## Terms of Reference

The Legislative Assembly of the Parliament of Western Australia appointed on 29 May 1997 a Select Committee to investigate and report on air quality in Perth, with particular reference to the following -

- (1) (a) Assess community attitudes and concerns in relation to Perth's air quality;  
(b) Investigate ways in which urban air quality can be improved for current and future generations.
- (2) That the Committee have power to call for persons and papers, to sit on days over which the House stands adjourned, to move from place to place and to report from time to time.
- (3) That the Committee present its final report by 1 April 1998.

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## **Preamble**

It is the Committee's intention to release a series of five discussion papers in the near future, to be followed by a final report in April 1998.

Discussion papers will be released on the following issues -

- Smoke emissions from homes (released 11 September 1997);
- Smoke emissions from open burning (released 18 September 1997);
- Vehicle emissions (released 16 October 1997);
- Industry emissions; and
- Transport and urban planning (released 4 December 1997).

Each discussion paper will be structured into two sections -

- Section 1 of each discussion paper will present background information on the status of Perth's air quality and the major contributing pollution sources. The content of this section will remain relatively consistent throughout the series of papers; and
- Section 2 of the discussion paper will focus on suggested management strategies specific to that source and problem. The strategies are presented for public comment. They are not recommendations.

## Section 1

### Background

The Perth metropolitan area faces two distinctly different regional air quality problems- particulate haze and photochemical smog.

Evidence presented to the Committee suggests that Perth's air quality is relatively good for most of the year, experiencing occasional events of particulate haze and photochemical smog. These polluting events largely result from local winds failing to disperse emissions into the environment, thereby accumulating and causing pollution. However, there is a fine balance between these occasional situations and that involving an increasing number of individual pollution events. Evidence suggests that the air pollution problems in Perth will increase unless action is taken now.

Public submissions received by the Committee indicate that the community is acutely aware of this fine balance, and is demanding action from the Government to ensure that Perth's air quality does not deteriorate in the future.

The Committee recognises the need for the development of a long term Air Quality Management Plan for the Perth metropolitan area, and that any such plan needs to be based on strategies that target the key pollutant sources in an environmentally effective and economically efficient way.

Vehicle emissions, biomass burning including domestic wood heaters and open burning, and transport and urban planning are all major contributing factors to reduced air quality in Perth. Each of these subjects will be addressed in separate discussion papers to be released this year.

### Objective and scope

This paper outlines strategies designed to reduce the regional impact of industrial emissions on the Perth metropolitan area.

Industry is collectively a major contributor to the discharge of nitrogen oxides and reactive organic compounds that combine to form photochemical smog. Depending on the type of activity, industry also contributes to the overall amount of air toxics, and to the production of haze where the pollutants tend to react following their release into the environment.

Emissions from industry are regulated under the provisions of the *Environmental Protection Act 1986 (as amended)* and this Act makes it an offence to cause pollution. Control measures can be implemented against individual industries, such as in the issuing of a licence, or through a locational approach, such as an Environmental Protection Policy.

The Kwinana industrial area is the key location point for heavy industry in the Perth metropolitan area. Table 1 outlines the major heavy industries located in the Kwinana industrial area and the types of air pollutants the industry is permitted to discharge.

Historically, sulphur dioxide (SO<sub>2</sub>) levels in the Kwinana area were of extreme concern especially the frequency with which standards and guidelines were exceeded. Industry in the area has adopted a number of changes, including the use of cleaner fuels such as natural gas, improved technology and operations to reduce the frequency with which standards were exceeded. Industry has been successful to the extent that for the past four years (as recorded at the Wattleup air quality monitoring station) the one hour average limits and standards specified in the *Environmental Protection (Kwinana) (Atmospheric Wastes) Regulations 1992* were not exceeded.

Emissions from industry with a potential to impact on the environment are principally controlled under provisions of the *Environmental Protection Act 1986 (as amended)* and the *Environmental Protection Act Regulations 1987 (as amended)*. Legislative changes have been made to the licensing provisions of the Act to encourage continuous improvement by industry and to recognise and reward good environmental

performance<sup>1</sup>.

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<sup>1</sup> Department of Environmental Protection 1997, *Annual Report 1996-1997*, Perth, Western Australia.

Similarly, the Environmental Protection Authority expects the new projects it assesses to incorporate the four basic elements of ISO 14000<sup>2</sup>, being -

- an environmental management system;
- an environmental management plan with objectives and performance indicators;
- audit, both of the system and environmental performance; and
- review and amendment of the plan and system for continuous improvement<sup>3</sup>.

The Committee considers the development and successful implementation of these operational and strategic management plans (incorporating internal and operational review processes) to be imperative, particularly if industry is to compete effectively in the market, both economically and environmentally. To this end, rationalisation of industrial process and procedure, in the first instance, needs to occur at industry level and not through the regulatory process. If industry fails to deliver the results, then regulatory controls should be available as a back up measure. It is therefore essential for the Government to now clearly articulate to industry and the community its policy for industry best practice, best technologies and ISO 14000.

Whilst the Committee acknowledges that vigilance is required from industry to ensure that both processes and operations are at the leading edge of best practice technology in future, it must be recognised that the long term gains to be made by ever increasing technological improvements to industrial process and operations will plateau, and it must be acknowledged by the community that the key to ensuring good air quality in the future will be reliant on lifestyle changes.

As highlighted in the independent inquiry commissioned by the Federal Government<sup>4</sup>, acceptable air quality will only be assured by the pursuit of a wide range of actions and measures, and that the measures will only succeed through coordination of transport planning, infrastructure development and environmental planning.

***The number of times the Environmental Protection (Kwinana) (Atmospheric Wastes) Policy 1992 sulphur dioxide standards and limits, as monitored at the Wattleup Air Quality Monitoring Station were exceeded. (Source: Department of Environmental Protection).***

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<sup>2</sup> International Standard on Environmental Management Systems which guides the design and operation of processes to ensure quality outcomes with a commitment to continuous improvement.

<sup>3</sup> Environmental Protection Authority 1997, *Annual Report 1996-1997*, Perth, Western Australia.

<sup>4</sup> Commonwealth of Australia 1997, *Urban Air Pollution in Australia*. An Inquiry by the Australian Academy of Technological Sciences and Engineering.

Industry	Product	Air pollutants
Alcoa Australia Ltd	Alumina refinery	SO <sub>2</sub> , NO <sub>x</sub> , ROC's, Particulates
BP Refinery	Petroleum products refinery	SO <sub>2</sub> , NO <sub>x</sub> , ROC's, Hydrogen sulphide, Particulates
Cockburn Cement	Cement manufacturer	SO <sub>2</sub> , NO <sub>x</sub> , Particulates (lead), Carbon dioxide
Coogee Chemicals	Fertiliser and chemical manufacturer and fuel importer	SO <sub>2</sub> , SO <sub>3</sub> , Particulates (zinc oxide, calcium sulphate, copper, ferrous sulphate)
Tiwest	Titanium dioxide manufacturer	SO <sub>2</sub> , NO <sub>x</sub> , Carbon monoxide, Particulates (ammonium nitrate), Air toxics (chlorine, titanium tetrachloride)
Wesfarmers CSBP	Fertiliser and chemical manufacturer	SO <sub>2</sub> , NO <sub>x</sub> , Particulates, Air toxics <sup>5</sup> (Hydrogen fluoride, ammonia, chlorine)
Western Mining Corporation	Nickel refinery and transporter of sulphuric acid from Kalgoorlie	SO <sub>2</sub> , NO <sub>x</sub> , Particulates, Air toxics (ammonia)
Western Power	Electricity	SO <sub>2</sub> , NO <sub>x</sub> , Particulates

**Table 1 Kwinana industrial area - air pollutants monitored, estimated or permitted for discharge.**

The strategies presented in this discussion paper are a compilation of those implemented in other cities within Australia and around the world, and include suggestions presented in oral and written submissions to the Committee.

The strategies listed are intended as illustrations of the type of action that could be implemented to ensure that Perth's air quality does not deteriorate in the future. The Committee is not suggesting that every strategy should be or needs to be implemented. Instead it is acknowledging the need for action across a variety of areas and is seeking your comment on - *what do you consider to be the most effective measures, and what strategies you consider should be implemented for the Perth metropolitan area.*

The Committee's initial evaluation of these suggested strategies has been facilitated by the investigative tour to Sydney and Canberra (4 to 9 August 1997), and to Europe and North America (24 October to 10 November 1997) where specific strategies have also been proposed or are in various stages of implementation.

The Committee has received 163 written submissions to date and has received oral evidence on 32 occasions. The Committee recognises the importance of community consultation, and the evaluation of these strategies will take into account all comment received in response to this paper. Therefore, the Committee is not presenting any recommendations at this stage.

This paper is the fourth in a series to be released by the Committee which will contribute towards the compilation of the Committee's final report and recommendations.

<sup>5</sup> Air toxics as defined and listed by the United States Environmental Protection Agency.



## Perth's air quality now and into the future

The Perth metropolitan area faces two distinctly different regional air quality problems- particulate haze and photochemical smog. An additional concern is the community's exposure to air toxics, such as benzene, toluene and 1,3 butadiene, with research having recently shown that the levels currently considered safe may in fact be too high.

### Haze

Haze is caused by very small particles that are not visible to the eye but in the air they collectively cause the scattering of light and thereby reduce visibility. Particles that are ten microns in diameter (PM10 or "inhalable particles") and particles 2.5 microns in diameter (PM2.5 or "fine particles") are two measures of the concentration of these particles in the air, according to their size. These particles are small enough to be inhaled and are therefore important from a health aspect.

The Committee acknowledges the extensive scientific research that has been undertaken around the world linking particulate matter, especially fine particles, with a variety of health problems, including premature death due to respiratory causes, cardiovascular causes and cancer causes, aggravated asthma, acute respiratory symptoms including aggravated coughing, chronic bronchitis and decreased lung function.

International research has highlighted that there may be no safe level for exposure to fine particles, that is, health effects may be experienced even at extremely low levels.

Whilst it has been estimated that 70 premature deaths a year could be related to particulate haze in Perth, it must be noted that a higher proportion of the community will experience the other more immediate health effects of particles, such as needing to increase medication or seeking medical attention. The following diagram illustrates the heirachial health outcomes of particles<sup>6</sup>.

*The heirarchial effect of particles on human health. (Source: Dr Sverre Vedal, 1995).*

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<sup>6</sup> Vedal, Sverre 1995, *Health effects of inhalable particles: Implications for British Columbia*, prepared for the Air Resources Branch, British Columbia Ministry of Environment, Lands and Parks, June 1995.

In this triangle of adverse health effects, the effects are ordered from the least adverse at the base to the most adverse at the top. The area corresponding to a health effect roughly corresponds to the proportion of the population affected. As exposure increases, the area devoted to “no adverse health effects” becomes smaller.

*The Perth Haze Study 1994-1996*<sup>7</sup> found that haze levels are highest in winter and lowest in summer. The most significant contributor to winter and spring haze is smoke particles from domestic wood heaters. Vehicle emissions are the second largest contributor of which diesel vehicles are estimated to cause two-thirds of this emission. Summer haze formation is influenced more by the presence of soil, sea salt and the chemical reaction of other pollutants that may be present in the air at the time, such as smoke from wild fires. Industrial emissions may also contribute to this secondary production process.

***Relative contribution of emissions from industry (as a component of secondary production) in causing particulate haze in Perth.*** (Source: Gras J L, 1996 A report to Department of Environmental Protection of Western Australia on fine-particle haze in Perth).

Prolonged events of haze during autumn and spring are sometimes caused by smoke from open burning. These fires are not all necessarily in close proximity to the Perth metropolitan area. Under certain weather conditions smoke generated from open burning in the south west has been known to drift off shore and then be carried back into the metropolitan area causing an air pollution problem.

In general terms, the number of days per year when haze is experienced in the Perth metropolitan area is expected to increase. Particles from domestic sources, such as home fires and wood heaters, are expected to increase over the short to medium term, mainly as a result of the number of wood heaters installed in the Perth metropolitan area that do not meet Australian Standards designed to reduce emissions.

Particles from motor vehicles are also predicted to rise over the short to medium term, principally because of the growth in diesel vehicle use, with only those diesel engines manufactured from the mid 1990s required to meet the Australian Design Rules' lower particulate emissions level.<sup>8</sup> This growth in vehicle use is evidenced by the upward trend in the number of diesel vehicles registered in Western Australia, and in diesel fuel consumption.

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<sup>7</sup> Department of Environmental Protection, 1996, *The Perth Haze Study 1994-1996*.

<sup>8</sup> Real, John 1997, *Vehicle Emissions and Air Quality in Australia*, paper presented to the Professional Short Course Road Transport Engine Emissions University of Melbourne, 23-25 July 1997.

***Peak haze levels in the Perth metropolitan area due to particulate matter.*** (Source: Department of Environmental Protection, 1996, *The Perth Haze Study 1994-1996*).

### **Photochemical smog**

Photochemical smog is a pollution cocktail caused by the reaction of nitrogen oxides (NO<sub>x</sub>) and reactive organic compounds (ROCs) in the presence of heat and sunlight. Ozone is a product of this reaction, and the monitoring of ozone concentration at ground level is used as an indicator of photochemical smog.

*Relative source contribution to NO<sub>x</sub> and ROCs generation.* (Source: Department of Environmental Protection, Western Australia and Western Power, 1996, *The Perth Photochemical Smog Study*, Perth Western Australia).

Since heat and sunlight are essential components to the generation of photochemical smog, it tends to be a summer problem for the Perth metropolitan area.

*The Perth Photochemical Smog Study*<sup>9</sup> found smog events in Perth to be closely linked to the weather pattern. The highest smog concentrations occurred on those days during spring, summer and autumn when a weak low pressure trough was situated very close to the coast and subsequently crossed the coast in the afternoon (morning easterly winds, afternoon sea breeze). The location of the Kwinana industrial area is such that emissions from the main industrial area will be carried offshore during easterly winds and then pass over the city area when the sea breeze occurs later in the day.

*Number of days in the month when peak 1-hour ozone concentration exceeded 80 ppb somewhere in the Perth metropolitan area.* (Source: Department of Environmental Protection, Western Australia, and Main Roads Western

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<sup>9</sup> Western Power Corporation & Department of Environmental Protection, 1996, *The Perth Photochemical Smog Study*, Perth, Western Australia

*Australia, 1997, Air pollution and You.).*

Over the past four years, the Perth metropolitan area has experienced on average 10 days per year when photochemical smog levels were unacceptable from a health perspective. These events, except when associated with bushfire smoke, tend to be of short duration (around two hours) and are not necessarily experienced across the entire metropolitan area.

***Photochemical smog formation in the Perth metropolitan area*** (Source: Department of Environmental Protection, Western Australia and Main Roads Western Australia, 1996, *Airwatch - A Monitoring Program for Schools*).

To put Perth's air quality into context, it is useful to compare it to other Australian cities that have similar airsheds and similar sources of both NO<sub>x</sub>, ROCs, sulphur oxides (SO<sub>x</sub>) and carbon monoxide (CO).

On a per capita basis, the Perth metropolitan area has a relatively high loading of pollutants when compared to Sydney and Melbourne. The key factor is the influence that emissions from the Kwinana industrial area are having on Perth, in particular NO<sub>x</sub> emissions resulting from power generation and ROCs from petrol refining.

*Comparison of relative contributions of NO<sub>x</sub>, ROCs, SO<sub>x</sub> and CO from sources in Perth, Sydney, Brisbane and Melbourne. (Source: Commonwealth of Australia, 1997, Urban Air Pollution in Australia. An Inquiry by the Australian Academy of Technological Sciences and Engineering).*

### **Air toxics**

The United States Environmental Protection Agency has identified one hundred and eighty nine air toxic substances. This list includes benzene, 1,3 butadiene and polycyclic aromatic hydrocarbons (PAHs). These come from a wide variety of sources but, in the Perth metropolitan area, the greatest source is vehicle emissions, unless one is a smoker or is regularly exposed to passive smoking.

Each air toxic has a different level at which it will pose a health risk to people. Recent research highlights the need for concern about the effects of long term low level exposure, particularly as some air toxics attach themselves to fine particles (those present as haze) which can be taken in by our bodies.

Vehicle emissions have a toxic component which contains traces of a number of air toxics including carcinogens, such as PAHs which adsorb onto particles in the air.

There is no regular monitoring of air toxics in the Perth metropolitan area.

## Section 2

### Community perception and opinion of Perth's air quality and industry emissions

Written and oral submissions received to date have come from individuals, community groups and associations, businesses, industry, academics, health professionals, and Government agencies. A complete list will be provided in the Committee's final report.

The general perception presented in the submissions is that -

- Perth's air quality is relatively good on most days;
  - but it is getting worse, and
  - it is causing health problems.
- The key pollution sources in the Perth metropolitan area are considered to be;
  - motor vehicles, especially those with smokey exhausts,
  - backyard burning of waste,
  - smoke from home wood fires and heaters,
  - industrial emissions close to the city, and
  - smoke from bush fires and controlled burns of bush land, development sites and agricultural land.

The submissions highlighted the influence of the Kwinana industrial area on the air quality of Perth. Concern was expressed that plans for expanding the Kwinana industrial area, as proposed in the *Fremantle to Rockingham Industrial Area Review (FRIARS)*, would increase the air quality problem and was therefore unacceptable. Submissions suggested that air quality would be compromised not only from new and increased industrial emissions, but also from more vehicles travelling through the area. Submissions also considered that pollution from the Kwinana industrial area had the potential to interfere with coastal navigation mainly due to poor visibility if haze or photochemical smog occurred in this area.

Other submissions considered that future industrial sites should only be planned for areas outside of the metropolitan area. Concern was also expressed that there was only limited monitoring stations throughout the metropolitan area, and that there was no monitoring of air toxics. The submissions also outlined concerns that there was insufficient knowledge about the community's exposure to and the effect of organic compounds that are bound to dust particles.

A further opinion expressed was that the penalties under the *Environmental Protection Act 1986 (as amended)* for those who cause pollution were not severe enough and should be increased.

An underlying theme from the community submissions was that no individual has the right to pollute the air everyone has to breathe. There is also a general perception that, whilst there are technical fixes to improve Perth's air quality, the community is not convinced that the Government is committed to fixing the problem.



## Strategies to improve Perth's air quality by reducing emissions from industry

Emissions from industry with a potential to impact on the environment are principally controlled under provisions of the *Environmental Protection Act 1986 (as amended)* and the *Environmental Protection Act Regulations 1987 (as amended)*. Legislative changes have been made to the licensing provisions of the Act to encourage continuous improvement by industry and to recognise and reward good environmental performance<sup>10</sup>.

Whilst the Committee acknowledges that vigilance is required from industry to ensure that both processes and operations are at the leading edge of best practice technology in future, it must be recognised that the long term gains to be made by ever increasing technological improvements to industrial process and operations will plateau, and it must be acknowledged by the community that the key to ensuring good air quality in the future will be reliant on lifestyle changes. As highlighted in the independent inquiry commissioned by the Federal Government<sup>11</sup>, acceptable air quality will only be assured by the pursuit of a wide range of actions and measures, and that the measures will only succeed through coordination of transport planning, infrastructure development and environmental planning.

The strategies listed here are a subset of the range of actions that could be implemented to ensure that Perth's air quality does not deteriorate in the future. The Committee is not suggesting that every strategy as listed here should be or needs to be implemented. Instead, it is seeking your comment on what you consider to be the most effective measures and those which you consider should be implemented for the Perth metropolitan area.

The strategy options have been classified as either *educational*, *technical*, *regulatory* or *market based* where -

- *educational* strategies aim to improve the actions of individual people or the understanding of the community;
- *technical* strategies involve making changes to existing technology and implementing technologies;
- *regulatory* strategies are those which require some form of legal enforcement such as local council By-Laws or State regulations or legislation; and
- *market based* strategies which are direct financial incentives or disincentives.

### *Educational Strategies*

1. Implement a community education program on the health effects and causes of haze and photochemical smog, and the actions needed to reduce or prevent the problem.
2. Encourage the use of energy efficient processes, design features and fuel sources in all aspects of the community, particularly at the detailed planning level.
3. Encourage Universities to be involved with air pollution monitoring and research
4. Provide the community with easy access to all air pollution monitoring data and industrial emission data, including an interpretation of the results.
5. Undertake an education program aimed specifically at senior staff of Kwinana based industries to ensure that they fully understand and appreciate the impact of their industry on Perth's air quality, and the need for the discharges to be acceptable.
6. Encourage Perth's media to include air quality reports and predictions as part of the weather reports.
7. Request the Environmental Protection Authority and the Department of Environmental Protection to inform industry of new technical developments in emission reduction and process technology.

<sup>10</sup> Department of Environmental Protection 1997, *1996-1997 Annual Report*, Perth, Western Australia.

<sup>11</sup> Commonwealth of Australia 1997, *Urban Air Pollution in Australia*. An Inquiry by the Australian Academy of Technological Sciences and Engineering.

8. Government must clearly articulate its industry development policies and must promote and support these within the community. Need to be more consistent in public education.

#### *Technical Strategies*

9. All industry, including existing and future proposed industry, to adopt quality assured processes and procedures for best practice, waste minimisation, clean technology and pollution prevention principles in their operations.
10. Conduct a review of the future need for air quality buffer areas around all current and proposed industrial sites.
11. Develop an Air Quality (Clean Air) Management Plan for Perth in conjunction with local government to include components for education, monitoring and reporting of results.
12. The Department of Environmental Protection to expand the air quality monitoring network throughout the metropolitan area by increasing the number of sites and including the monitoring of air toxics.
13. Government to carry out research to determine the health impact of air pollution on the Perth community, including quantifying both short term and long term risk and exposure impacts.
14. Carry out research to determine the nature of adsorbed chemical species on air-borne particles in selected areas throughout the Perth metropolitan area.

#### *Regulatory Strategies*

15. Increase the severity of penalties for breaches of the *Environmental Protection Act 1986 (as amended)* particularly for causing pollution.
16. Set higher emission standards and limits for industry to achieve.
17. Implement planning policies that locate industrial sites away from the metropolitan area, and away from the prevailing wind direction of regional populations.
18. Require the Kwinana Power Station to install appropriate air pollution control equipment and processes to reduce the discharge of NO<sub>x</sub> and SO<sub>2</sub> from the site.
19. Require the Kwinana Power Station to phase out the use of coal and/or fuel oil as fuel sources for power generation.
20. Introduce requirements such as regulations or By-Laws for industry to make greater use of renewable energy sources.
21. Improve the mechanisms under the *Environmental Protection Act 1986 (as amended)* for resolving odour complaint issues.
22. Enforce the air quality standards proposed in the draft *National Environment Protection Measure for Ambient Air*.
23. Establish guidelines for the use of the *Environmental Protection Act 1986 (as amended)* to declare air pollution alerts.
24. Prevent any increase in the amount of emissions from the Kwinana industrial area.
25. Require air quality considerations to be included as part of the planning process.
26. Introduce By-Laws requiring energy efficiency in building design.
27. Introduce By-Laws requiring domestic use of renewable energy resources to reduce the reliance on power station energy supply.
28. Require all industrial emissions to be included on a statewide pollutant inventory.
29. Plan to locate any future power station away from the Perth metropolitan area, or other residential area in the State.

*Market Based Strategies*

30. Provide planning concessions for buildings incorporating energy efficient design features.
31. Introduce a tradeable pollution rights scheme to facilitate the influence of market forces on the more significant industrial discharge sources.
32. Request the Federal Government to provide taxation incentives to industries that plan to incorporate new and cleaner technologies as replacements for old technology.
33. Introduce a pollution tax or levy on all industry within the Kwinana area in recognition of the influence it has collectively on the regional air quality of the Perth metropolitan area.

## Criteria for assessing strategies to reduce emissions from industry

The Committee will assess the strategies outlined in this paper by giving consideration to the eight measures outlined below.

### Measure 1: Emission reduction potential

- What is the unit reduction in pollution per year, per capita?
- What total emission reduction is possible?

### Measure 2: Timing of effectiveness

- What time frame is needed for the strategy to have an effect?
- How long will it take to fully implement the strategy?

### Measure 3: Equity

- Are there individuals or groups within the community who will be disadvantaged by the strategy?
- Is the original source of pollution being targeted?
- Will the polluter pay?

### Measure 4: Technical feasibility

- Is the technology currently available?
- Are there administrative or public perception barriers to the introduction of the strategy?
- Is there a high likelihood of new technology being developed in the future to solve the problem?

### Measure 5: Enforceability

- Are regulatory mechanisms in place to support the strategy?
- Is there a need to enhance the mechanism?
- Is there a need to create a new mechanism?
- Is the mechanism enforceable?

### Measure 6: Cost effectiveness

- What is the cost to the individual?
- What is the cost to the community?
- What is the cost to industry?
- What is the cost to Government?

### Measure 7: Public acceptance

- What is the community's opinion of the strategy?

### Measure 8: Additional social, economic or environmental impacts and benefits

- Does the strategy support any other Federal, State or local Government strategy (eg Greenhouse Strategy)?

## How to have your say

This paper is one in a series of five to be released which will contribute towards the Committee's final report and recommendations. These papers are being developed to not only bring information to the community, but for the community to bring information to the Committee.

To have your say on the strategies presented in this paper, written comments can be sent to-

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***Submission period closes 28 February 1998.***