

NRM SOUTH

The Southern Natural Resource Management Regional Committee

SOUTHERN REGIONAL NRM STRATEGY

MANAGING AIR DISCUSSION PAPER

November 2003

NRM South has developed a series of Discussion Papers to get feedback from the community on natural resource management issues and options. Your feedback will inform the next step: development of a draft Southern NRM Strategy, expected to be released for consultation in April 2004.

Please send your comments on the Discussion Papers to:

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MANAGING AIR: SUMMARY

Managing the atmosphere, particularly air quality and the potential impact of climate change and greenhouse gas emissions, is an important aspect of natural resource management. Whilst it is recognised that these issues are global in their effects and management requirements, especially those of climate change, some management implications exist for the Southern region.

The atmosphere has for years been thought of as an endless expanse of self cleansing space that could be ignored except in very localised occurrences of air pollution. With the increase in our knowledge base and understanding of chemical processes and climatology, attitudes have dramatically changed in recent times. The role of the atmosphere in regulating global climate patterns through the greenhouse effect and in moderating the effects of the sun to enable the biological components of the planet to exist through the ozone layer has alerted the community to the global challenge of looking after this asset. When this is coupled with the more localised aspects of air quality and resultant health issues, the importance of managing the atmosphere becomes regionally apparent and critical.

The following specific issues are relevant for the Southern NRM Strategy:

- **Global climate change and climatic extremes:** The burning of fossil fuels, agriculture and deforestation are considered to be the largest contributors in our region to global climate change and virtually all our industries and many of our lifestyle choices are implicated in this in one way or other. The retention of native vegetation and the additional creation of new greenhouse ‘sinks’ through, for example, the creation of a large-scale plantation resource producing long-lasting timber products, is thought to play an important role in mitigating the negative effects of climate change. There are also significant

biological resources and landscape values, such as coastlines, that are at risk from climate change. To date the potential impacts of climate change have received little consideration by planners or policy makers

- **Air quality:** Urban wood heaters, vehicles and local industries can have a dramatic effect on air quality at the local level, with certain landform and climate variables combining to mean some valleys such as the Derwent and Huon are particularly susceptible to incidences of poor air quality.

Associated issues are:

- the need to understand the potential impact of climate change on our landscapes, our native vegetation and fauna and on our primary industries. Agriculture, forestry, fishing and aquaculture could all need to adjust to ensure enterprises are able to adapt to change climatic patterns.
- Incomplete monitoring of air quality parameters across the Southern region and industries
- Increase in prevalence and severity of respiratory diseases due to air pollution
- Air pollution impacts on Tasmania's image

Managing the atmosphere to address global climate change, climatic extremes and air quality is often a case of undertaking management actions in conjunction with decisions made by other stakeholders outside the region. The outcomes from such actions are often difficult to see locally and in short time frames, but the cost of inaction could be considerable for future generations. The very air we breath, the atmosphere that surrounds us and nurtures us with its composite gases and UV protection is dependent on our prudent action. Coordinated planning such as that being undertaken for the Southern Natural Resource Management Strategy can facilitate such activities.

CURRENT SITUATION

Global climate change and climatic extremes

Global climate change relates primarily to the potential impacts of the greenhouse effect. Ozone depletion can also have some adverse impacts through allowing increased Ultra Violet radiation to impact on the surface of the Earth. Resultant conditions include increased temperatures, changes in rainfall patterns, increased incidence of severe storms and bushfires, damage to coastal infrastructure, inadequate potable water supplies and adverse impacts on aquaculture operations.

Whilst global climate change deals with prediction models stretching years ahead, there are already signs that climatic conditions are changing locally (see section on Current Condition).

Most of the changes to global climate are thought to be the result of human activities causing an increase in atmospheric greenhouse gases, including:

- carbon dioxide (CO₂) emissions, about 75% of which are due to the burning of fossil fuels and the remainder predominately due to land use change and forestry;
- methane (CH₄), of which about 50% are anthropogenic (caused by human activities) in origin from the use of agriculture and landfills;
- nitrous oxide (N₂O), about a third of which are anthropogenic in origin from agriculture; and
- halocarbon gases (i.e. CFCs) which are both ozone depleting and greenhouse gases.

The region's extensive forests, covering about half of the land area, play an important global role in climate stability by acting as carbon sinks.

Air quality

Air quality across the region is highly varied with localised issues caused by settlement patterns, industry and topography. Ambient air quality in Hobart, as with other urban centres within Tasmania, can be heavily impacted by smoke from domestic woodheaters, with other contributions from sources such as industry and motor vehicles. In urban areas the major impact on air quality arises from motor vehicle emissions.

Of particular concern is particles, notably PM₁₀¹ and PM_{2.5}. PM_{2.5} particles are especially able to penetrate the deep areas of the lungs, and so are believed to exert significant health effects on populations. Concentrations of PM₁₀ have been measured in Australia for many years. However, PM_{2.5} is now regarded as the most important fraction correlating with human health impacts, and so is increasingly being measured throughout the country. In specific circumstances, monitoring of PM_{2.5} is now mandated under the *National Environment Protection Measure for Ambient Air Quality* (Air NEPM, see below). When very still (temperature inversion) conditions exist in the Derwent and other southern valleys, smoke and other pollutants emitted into the air are less able to escape. Hobart does not have the extreme meteorological conditions experienced in places such as Launceston, but has the potential for considerable build-up of pollution at times. While long-term monitoring at the primary Hobart station has shown the PM₁₀ standard is exceeded only infrequently, it is likely there are pockets within the Derwent Valley and Huon Valley that experience significant concentrations of particles from wood smoke under very stable weather conditions in winter. Preliminary monitoring, commissioned by Hobart City Council, suggests this to be the case. Further, in the view of air quality monitoring staff in the Department of Primary Industries, Water and Environment, the existing Prince of Wales Bay monitoring station does not seem to be representative of the upper limits of PM₁₀ pollution.

¹ PM₁₀ refers to the range of particles of sizes 10 micrometres or less, while PM_{2.5} refers to the range of 2.5 micrometers or less. These are termed "aerodynamic" sizes, because they refer to the way such particles are sampled in air, rather than actual physical size. Note that as PM_{2.5} particles are a subset of PM₁₀, they are expected to be about 80% or less of the PM₁₀ levels in this region.

Motor vehicles are likely to be significant contributors to air pollution in Hobart under stable conditions, during peak hour when traffic jams occur.

There are areas where large industries have or could contribute to reduced air quality within the southern region. These include:

- Southwood Wood Processing Centre, near Judbury, which is under development. A PM10 monitoring station has been established between Judbury and Glen Huon to obtain background air quality information, and to monitor the impact of this plant when it becomes operational, on air quality in these two population centres.
- Norske Skog paper mill at Boyer.
- Pasminco Hobart Smelter at Risdon monitors sulfur dioxide as a requirement of their permit conditions. At present, concentrations remain low, when compared with national standards.
- Forestry and agricultural burning operations. The regeneration burns conducted by Forestry Tasmania for regenerating native Eucalypt forest and for hazard reduction, especially in the Huon Valley, Upper Derwent Valley and the Tasman Peninsula, are a major source of smoke emissions, mainly in autumn.

Wildfire has the potential to create significant smoke emissions. Current trends in climatic condition seem to indicate the very real possibility of an increase in such events.

VALUES

The values of the Atmosphere and good air quality are far reaching. There are aspects of our local region that feed into the bigger picture. Contributions to the management of global climate change are made by the extensive forested and other vegetated areas that exist in the region, acting as they do as large carbon stores and sinks.

Air quality in the southern region benefits from the island nature of the state and the prevailing winds blowing across the Indian and Southern Oceans and from the relatively undisturbed areas of the South West. As a result the general ambient quality of the air is excellent.

The atmosphere has a significant role in several key ecosystem services such as:

- Protection of water resources
- Nutrient storage & cycling
- Pollution breakdown & absorption
- Contribution to climate stability
- Maintenance of ecosystems
- Recovery from unpredictable events

CURRENT CONDITION

Global climate change and climatic extremes

The issues relating to global climate change are very complex and still generate considerable debate in the scientific community. Changes in rainfall patterns and temperatures, either as a result of climate change or climatic extremes, are evident from the recent uncharacteristically dry and hot summer experienced throughout much of Tasmania. According to the Australian rainfall deciles (Australian Bureau of Meteorology), rainfall over the three months from December 1 2002 to 28 February 2003 was below average in the western part of the Region and very much below average in the eastern parts of the Region. Conversely the rainfall from the 1 July 2003 to 30 September 2003 were very much above average (www.bom.gov.au/climate/current/rainfall_3month.shtml) and the October temperatures were among the lowest on record. Maximum temperature anomalies for Tasmania show maximum temperatures in the Region were 1-2°C higher than average for the period between 1 December 2002 and 28 February 2003. Mean minimum temperatures for the same time period were 0-1°C higher than average.

Vegetation plays an important role as a natural carbon sink, if it is still actively growing. The removal of vegetation leads to carbon dioxide emissions, one of the key greenhouse gases. Currently about half of the region is under native forest, and the role of these forests in their totality, which includes the understorey vegetation and fallen timber, are important as stabilising influences in carbon cycling and slowing the release of carbon dioxide. Native vegetation and fauna are also at risk from climate change – these are dealt with in the separate *Native vegetation and fauna* discussion paper. Long-rotation plantations generating long-lasting timber products appear also to be valuable as carbon sinks (as long as they are not all harvested at the same time).

Air Quality

DPIWE has operated a monitoring station at Prince of Wales Bay for about two years as a *GRUB station*² under the Air NEPM. At present, this monitors for PM10 using both high volume samplers and TEOM monitors to give 24-hour averages.

In 2001-2002, the PM10 standard was exceeded only three times. Data for 2002-2003 is still being processed at the time of writing, but it appears likely the PM10 standard will be exceeded twice in this period. We can conclude from this that air quality at this site already meets the Air NEPM goal for PM10, but it is unlikely that this site is representative of the worst parts of Hobart.

Carbon monoxide is also monitored at this location, although levels have been so low that it is likely that this program will probably be terminated after the 2003 winter and the equipment transferred to Launceston. On this basis, DPIWE also concludes that air quality meets the NEPM goal for carbon monoxide at this site.

Pasminco operates a sulfur dioxide monitoring network around the plant as part of its permit conditions, and is required to provide DPIWE with its results. It is intended

² Generally Representative Upper Bound Station – in other words, a station that aims to monitor what are believed to be the highest concentrations of a pollutant in a way that is representative of the likely exposure of the population in the region.

that these results be incorporated into the DPIWE air quality database for reporting to the NEPC under the requirements of the Air NEPM. DPIWE is currently assessing the sulfur dioxide data but believes that sulfur dioxide does not constitute a major problem for the Derwent Valley at present.

No monitoring is required of pollution outputs from the Norske Skog mill at Boyer so the condition of the air quality around this site is unknown.

No monitoring of carbon monoxide from vehicles in the Hobart CBD is conducted, so the condition of air quality is unknown in these areas, though the increase in traffic will probably be having a detrimental effect.

Monitoring of the outputs from Forestry regeneration burns has not been kept to date although the station recently set up near the Southwood site may have useful data on this in the future. Currently, this site will monitor for PM10, not PM2.5.

MANAGING AIR AND THE ATMOSPHERE: ISSUES AND CHALLENGES

Global climate change and climatic extremes

The United Nations Inter-Governmental Panel on Climate Change (IPCC 2001) predicts a sea level rise of 9 to 88 cm will occur in the next 100 years. This is a significant increase from the current sea level. On sandy coasts a horizontal impact zone of 50 – 100 times the vertical rise in sea level might be expected. Recent sea level rise is a probable cause of the active coastal erosion presently widespread throughout Tasmania. This may result in the incursion of sea levels between 10 m and 100 m inland. In addition, a globally averaged warming of 1.4 and 5.8 degrees Centigrade is predicted over the same period.

Climate change and climatic extremes could have a major impact on sensitive ecosystems, plants and animals which may be unable to adjust to possible rises in ambient air or water temperature. Alpine and sub-alpine or sub-Antarctic environments could be particularly at risk to rising temperatures. Industries dependent on cool, moist summer conditions may be vulnerable if summers become hotter and drier.

Air Quality

Issues relating to air quality are primarily focussed on the health implications for humans, though the draft EPP (Air Quality) requires the protection of the life, health and well-being of humans and other life forms, and of the integrity of ecosystems and ecological processes, now and in the future. The protection of built assets also needs to be considered.

The increase in prevalence and severity of respiratory disease, due to air pollution, imposes costs on the community, both through human suffering and economic costs to the State's health system. Further, high pollution levels may affect Tasmania's 'clean, green' image and adversely impact on tourism

As with elsewhere in Tasmania a primary issue in urban areas within the region is the widespread use of woodheaters for domestic heating, but it is often the manner of use of these appliances that generates smoke and other emissions.

Industry air pollution and vehicular emissions may also be an issue, but the lack of monitoring beyond that at the Pasmenco smelter prevents real understanding of its impacts.

Regeneration and hazard reduction burns remain problematical, but again little monitoring is undertaken so assessment of the impacts is difficult.

Summary of issues relating to the Atmosphere

- Limited consideration to date of effects of global climate change by local and state governments, necessitating a review of planning and policy. Both State and local government are starting to take steps to address this now.
- Incomplete monitoring of air quality parameters across region and industries
- Increase in prevalence and severity of respiratory diseases due to air pollution
- Pollution impacts on Tasmania's image

QUESTIONS

Do you agree these are the main issues relating to the Atmosphere?

What other issues would you like to suggest?

CURRENT RESPONSES

Global climate change and climatic extremes

The State Government is currently giving consideration to the issues of greenhouse gas emissions and global climate change through, for example, the Tasmania *Together* process. Some Councils have begun to consider the impacts with regards to coastal infrastructure and planning but have by no means developed extensive policy to deal with the issue.

Air Quality

DPIWE has established a monitoring station at Prince of Wales Bay under the requirements of the Air NEPM to assess long term trends in PM10 particulate concentrations. Carbon monoxide has also been measured at this site for some two years, and the program is currently in its third winter.

The Draft Environment Protection Policy, which is due to be made in early 2004, includes provisions that prohibit the manufacture, importing or sale of heaters that do not comply with the standard (AS/NZS 4013) within the State. It also requires that heaters and fireplaces be operated in a way that minimises smoke emissions, explicitly makes emission of smoke from these appliances an environmental nuisance and provides for penalties if smoke comes into contact with other premises. Community education on the effective use of woodheaters forms part of the Launceston Woodheater Replacement Program. There is no equivalent program in the Southern region, although some of the material produced as part of the Launceston program could be used. The previous NHT-funded schools based program was seen to be an effective mechanism for educating school children.

The issue of smoke management from planned burning associated with hazard reduction, agricultural and regeneration burning is currently being considered by a working group under the State Fire Management Council (SFMC). The draft EPP (Air Quality) also addresses smoke management associated with planned burning and includes requirements for the adoption of best practice management consisting of competency training, complaint management, monitoring, effective planning to minimise smoke management and the SFMC working group on smoke management is currently considering these issues. The 'planned burning' industry is also involved at a national level in the development of better atmospheric prediction models to assist with fire management planning.

STRATEGIC FRAMEWORK: GOALS, OUTCOMES AND TARGETS

Managing air and the atmosphere effectively has a pervasive impact on other aspects of natural resource management. It will contribute to achievement of the following proposed Southern regional goals:

- Goal 2:** *maintain and improve the condition of the Southern region's natural assets*

- Goal 3:** *contribute to the development of sustainable communities*

- Goal 4:** *assist in the development of a sustainable and balanced approach to economic development*

It will also assist with delivery of five of the ten agreed 'national outcomes' for Natural Resource Management (see NRM South's *Introduction to NRM South Discussion Papers*).

All of the Matters for Target and recommended indicators agreed nationally have relevance to managing air and the atmosphere in the Southern region. These are listed in the Discussion Paper on *Strategic Framework*.

Targets

The National Framework requires regional NRM strategies to set ‘aspirational targets’. These are ‘stretch’ targets, to be achieved over the long term, for example, 50 years.

QUESTION

Aspirational target: Managing air & the atmosphere

What (if any) target(s) should we set for managing air quality and climate change by 2050?

Regional NRM strategies are also required to set Resource Condition Targets. These are specific, measurable targets which are achievable within a 10 – to 20-year time-frame. Air quality is not one of the matters required to have resource condition targets set.

QUESTION

What if any Resource Condition Target should we set for air quality for a 10-20 year time frame?

AIR AND ATMOSPHERE: ISSUES, GAPS AND CHALLENGES

How important do you think each of these issues are? For each proposed Management Action, please tell us whether you think they are:

- Urgent? Not urgent?
- Important? Not important?

Please let us know if you disagree with any of the proposed Management Actions.

ISSUE	POSSIBLE MANAGEMENT ACTIONS: OPTIONS	Do you agree with this action?	Is this Action Urgent?	Is this Action Important?
Information Gaps				
Incomplete understanding of levels of 'air toxics' in the region.	Assist in the identification of possible high risk sites for monitoring of "Air Toxics" (<i>formaldehyde</i> , the aromatic compounds <i>benzene, toluene and xylenes</i> (sometimes shortened to <i>BTEX</i>) and <i>polycyclic aromatic compounds (PAH)</i>).			
	Input into the NEPM for 'air toxics' to develop proposed standards and goals			
Little understanding of the impacts of climate change on Landscape features	Assess the impact of sea level rise around the region and particularly on coasts around the south-east and Channel areas. This can build on the work conducted by Sharples for the Southern Tasmanian Councils Board.			
On-ground Management				
Minimise adverse smoke effects from controlled burning	Adoption of best practice management consisting of competency training, complaint management, monitoring, effective planning to minimise smoke management issues			

ISSUE	POSSIBLE MANAGEMENT ACTIONS: OPTIONS	Do you agree with this action?	Is this Action Urgent?	Is this Action Important?
	Investigate and implement alternative harvesting and regeneration approaches to clearfelling/burning in wet forest environments.			
Species at risk due to climate change	Undertake measures to enhance protection of species identified as being at risk due to climate change, including ensuring the maintenance of genetic diversity.			
Communication & capacity building				
Improve community awareness of pollution emissions associated with wood heaters	Encourage adoption of alternative heating sources for domestic dwellings			
	Educate wood heater operators in correct operation to minimise pollution emissions			
Reduce pollution and resource depletion associated with transport.	Facilitate better public transport links on major feed routes to Hobart.			
	Encourage reduction in private car usage in urban environments			
	Encourage walking and use of bicycles			
Role of vegetation in greenhouse gas reduction	Encourage the growing of native vegetation in parks and gardens			
Energy consumption in buildings	Encourage use of renewable energy for heating/cooling of buildings			
Incentives				
Inefficient use of vehicles	Explore incentive options for car pooling (transit lanes), and increased public transport usage.			
Reduction of key pollution contributors in urban environments	Explore possibility of expanding Wood heater buy-back in Hobart.			
Monitoring & evaluation				
Need for appropriate air quality monitoring near pollution sources	If required, assist in the establishment of PM2.5 monitoring stations near large industry developments such as the			

ISSUE	POSSIBLE MANAGEMENT ACTIONS: OPTIONS	Do you agree with this action?	Is this Action Urgent?	Is this Action Important?
	Southwood site, Norske Skog mill and in Hobart.			
	Establish monitoring stations in Hobart for relevant emissions.			
Increase modelling capacity for atmospheric conditions in relation to fire management	Support efforts on the national level in the development of better atmospheric prediction models to assist with fire management planning			

QUESTION

Are there other measures we should implement in the Southern Region to improve our management of the air?

ISSUE	GAP OR CHALLENGE	POSSIBLE MANAGEMENT ACTIONS: OPTIONS	Is this Action Urgent?	Is this Action Important?
		<i>Decision making?</i>		
		<i>Communication & capacity building?</i>		
		<i>Planning & assessment?</i>		
		<i>Incentives?</i>		
		<i>On-ground works?</i>		
		<i>Regulatory arrangements?</i>		
		<i>Monitoring & evaluation?</i>		

QUESTION

What are the five most important and urgent things we should do, to make sure we manage air in the best way?