Submission No 144

INQUIRY INTO PERFORMANCE OF THE NSW ENVIRONMENT PROTECTION AUTHORITY

Organisation: Australian Air Quality Group

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The role of the EPA is to protect the environment & minimize the health impacts of pollution

People need the EPA to be a fearless and independent watchdog safeguarding the interests of the community and the natural environment. It makes no sense to allow polluters to cause thousands of dollars of health or environmental damage for the sake of a few hundred dollars worth of profit.

Adequate resources are needed to enable the EPA to do its job. 'Polluter-pays' taxes and charges equal to the health and environmental cost of polluting activities would be a fitting way to provide the necessary resources. As well as discouraging uneconomic and unnecessary activities that can't even cover the cost of their pollution, such taxes and levies could provide much-needed funds for environmental remediation and research into world's best practice pollution prevention.

Some examples of how the EPA is failing its key duty to protect the public and the environment are shown below, together with suggestions for improvement.

Inadequate measurement & reporting of the most health-hazardous air pollutant

The impact statement for the Draft Variation to the National Environment protection (Ambient Air Quality) Measure states: "*The greatest proportion (>99%) of the health costs accrue from avoiding premature deaths due to long-term exposure to PM2.5.*"[1] The NSW EPA report on valuing the health impacts of air pollution also bases its estimates on PM2.5, noting: "*A recent UK report states that P**M2.5 is considered to be the best index of PM for quantitative assessments of the effects of policy interventions** (COMEAP, 2009).*"[2]

Evidence linking PM2.5 exposure to adverse health effects rather than coarser particles has been known for decades. Studies published in 1993[3] and 1996[4] provided strong evidence that premature mortality is more closely linked to PM2.5 than particles between 2.5 and 10 microns. Yet the recent NSW State of the Environment Report devotes 5 graphs to PM10, but only one to PM2.5 - Figure 2.9, which shows maximum daily average PM2.5 concentration. Daily maxima are dominated by extreme events, e.g. the dust storms of 2009, so are not a particularly good indicator of the health damage from PM2.5. Health damages are usually calculated from annual average PM2.5 concentrations, although estimates have also been calculated for the health cost per kg of PM2.5 emissions (In Sydney, about $280 per kg).

It is disappointing that the EPA has not shown leadership in this area, instead of waiting for the cumbersome NEPC processes to eventuate. When resources are limited, the best and most cost-effective approach is to devote adequate resources to the most health-hazardous pollutants, including measurement, reporting, public education about the health effects, and development of strategies to reduce their impact. The NSW EPA appears to have failed on all these counts.

Failure to regulate an $8 billion health problem - domestic wood heating

A consultancy report for the NSW EPA estimated that domestic wood smoke is an $8 billion health problem but that a new health-based standard (set by health experts with no financial interest in the wood heating) together with 3 simple control measures could reduce the health damage by at least 75%.[5]

1) Require removal of all heaters that do not meet the health-based standard when houses are offered for sale
2) Allow only heaters meeting the health-based standard to be installed
3) Licensing fees to cover the cost of woodsmoke-reduction programs and assist people whose health or lifestyle has been affected by woodsmoke.

Other possible control measures investigated in the NSW Consultancy report were found to be less efficacious because Standards Australia abandoned the development of a real-life emissions test in 2007 after the wood heating industry vetoed recommendations by the majority of committee members for two interim measures while the new test was being developed: 1) halve the emissions limit from the current AS4013 test and 2) investigate how to warn wood-heater users about the health risks from breathing woodsmoke.[6]

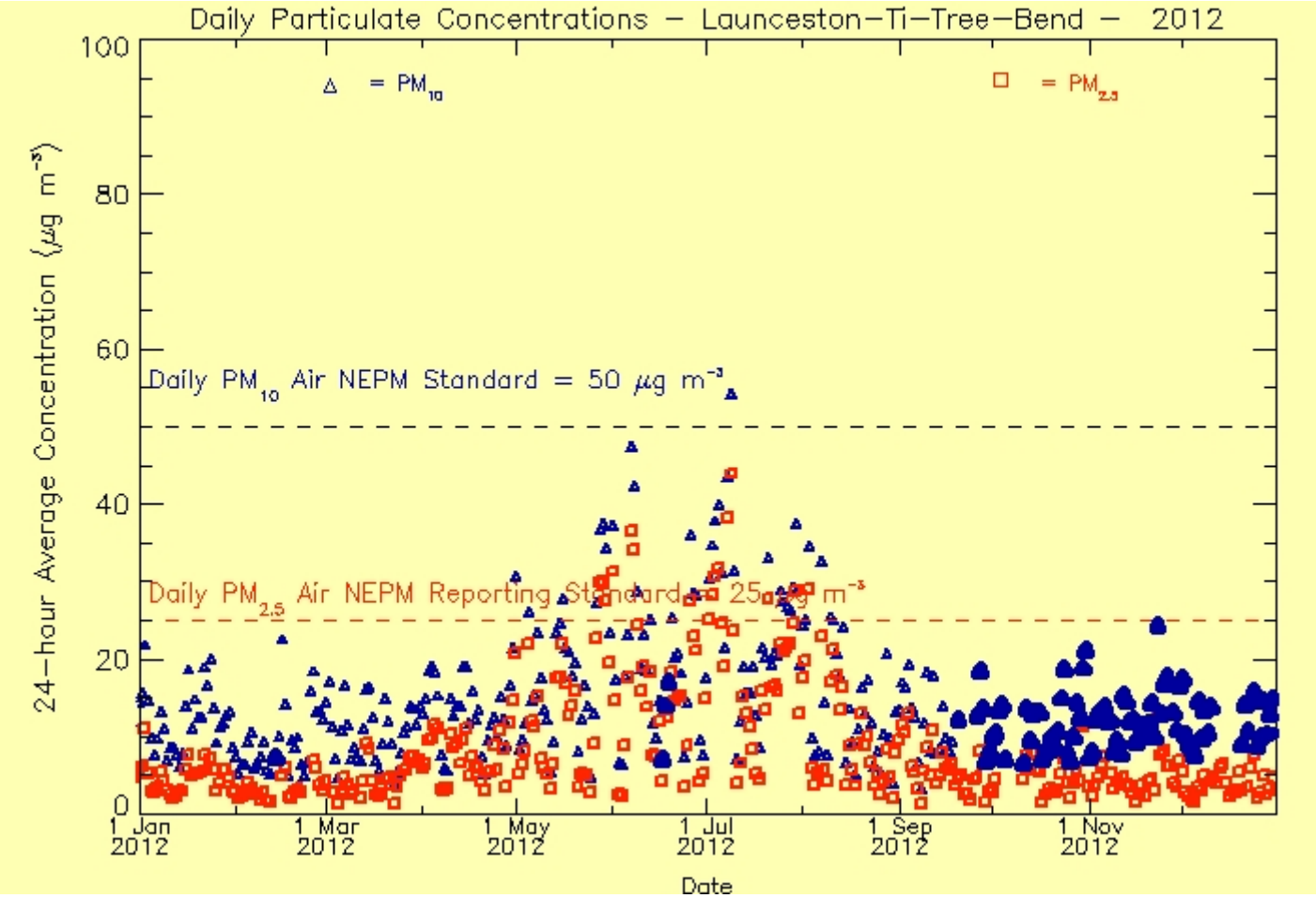
In the absence of a test that measures real-life emissions from wood-heaters, virtually all new installations have unacceptably high health costs. A new heater burning Sydney's average of 2 tonnes per year will emit 19.6 kg of PM2.5, with estimated health costs of ($280 per kilogram of PM2.5 emissions [2]) of $5,488 per year. Heaters rated less than 2.5 g/kg and 1.5 g/kg have only marginally lower real-life emissions (respectively 8.2 and 6.7 g/kg firewood burned) and health costs ($4,592 and $3,696) per heater per year. Many people

install wood-heaters for the ambiance. How many knowledgeable consumers (or their neighbours) would consider the ambiance worth more $4,000 per year?

The EPA emissions inventory for Sydney in 2008 reports that wood-heaters emitted 5,457 tonnes of PM2.5 (50.6% of man-made PM2.5 emissions), compared to 1,553 tonnes from on-road vehicles, 1,935 from industry, 952 from off-road vehicles and 881 tonnes from other sources.[7] As well as failing to show leadership in measuring and reporting PM2.5 as the most health-hazardous air pollutant, the EPA also failed to show leadership in regulating the largest single source of PM2.5 in large urban areas such as Sydney. When the number of households using wood-burning stoves in Launceston fell from 66% to 30%, wintertime particulate pollution fell by 40%. Deaths from cardiovascular diseases in winter fell by 20% and respiratory deaths by 28%. On a year-round basis, male mortality fell by 11.4 per cent, with reductions of 17.9% in total cardiovascular deaths and 22.8% in respiratory deaths [8, 9]. EPA leadership in this area could therefore prevent many premature deaths.

Most of the benefits in Launceston seem to have been achieved by reducing wood-heater use. Those that remain appear to be as bad as ever. Despite years of education on how to operate heaters correctly, a study of volunteers who knew their smoke was being measured and appeared to do everything they could to operate their AS4103-compliant heaters correctly – including getting up in the middle of the night to re-fuel heaters instead of leaving them to on low burn – found that emissions averaged 9.4 grams per kg of fuel. This is the absolute best that can be expected for current wood heater models on sale in Australia.

Even with a reported 15% of households using AS4013-compliant heaters[10], but less funding for continuing education, Launceston's air pollution has many days in excess of the PM2.5 standard (Source EPA Tas, http://epa.tas.gov.au/epa/view-air-pollution-data?airid=247)

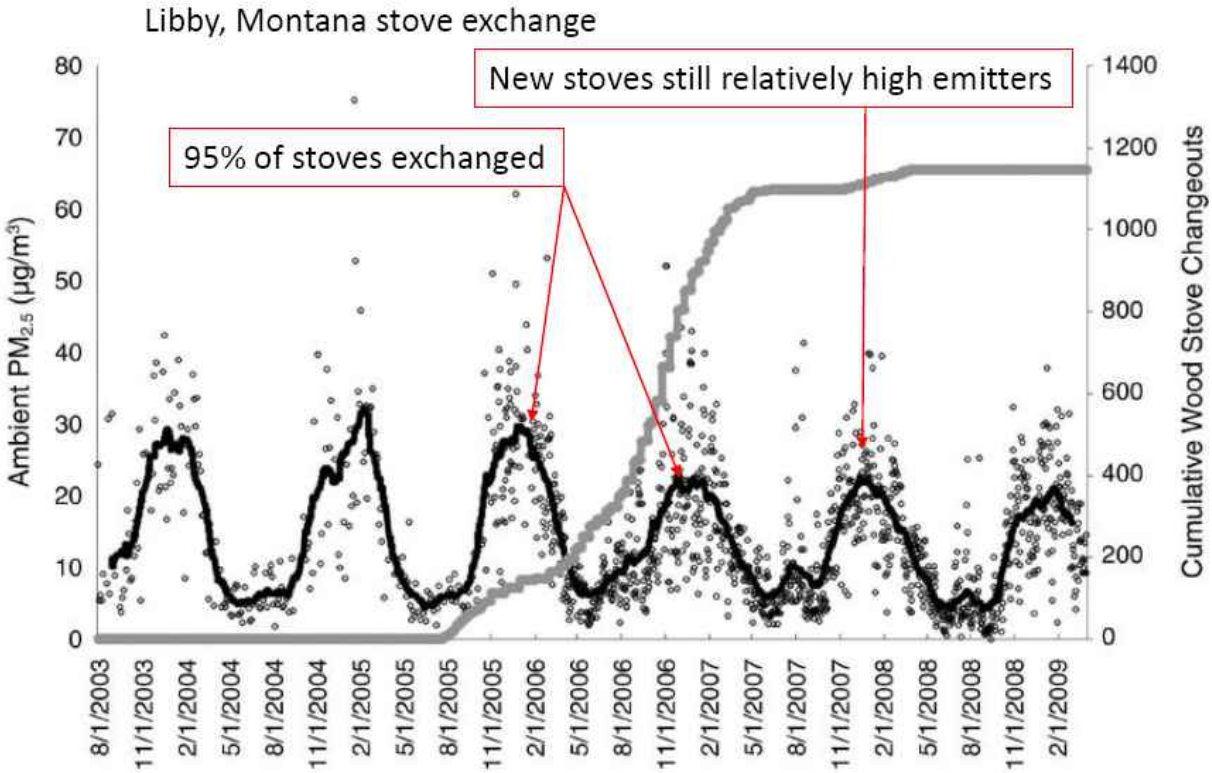


Similar problems were noted in Armidale, NSW. In 2013, the local Council said it had "*committed more than $300,000 (excluding wages) in the past 10 years on wood smoke abatement measures; a significant expenditure for a Council of our size*".[11] Yet in 2012-14, average PM2.5 pollution from May to August at the central monitor was 14.9 ug/m^3, 7% higher than the 13.9 ug/m^3 for June-August 1999, when the deleterious effect on community health was demonstrated a study showing a significant relationship between woodsmoke levels and visits to GPs for respiratory complaints.[12]

A mapping exercise showed that Armidale's residential areas are more polluted than the central area where PM2.5 are measured [13] and that woodsmoke was expected to cause an additional 15 deaths per year (in a population of 22,000 with about 177 deaths per year) with estimated health cost of about $4,270 per wood-heater per year.

Even low levels are woodsmoke have been shown to cause serious illness. Recent Canadian research compared residential areas with wintertime woodsmoke averages of: A) less than 6.8 ug/m^3, B) 6.8 to 10 ug/m^3 C) more than 10 ug/m^3. After adjusting for the effect of black carbon, NO2 and other PM2.5 exposure, people living in areas with winter woodsmoke of more than 10 ug/m^3 had a 15% higher risk of COPD (chronic obstructive pulmonary disease).[14]

The NSW EPA's response of passing the buck to local Councils and advising them to provide education on correct heater operation seems doomed to failure. It hasn't worked in Armidale, nor Launceston, nor in the USA. For example in Libby, Montana, huge sums (over US$2.5 million) were spent replacing 1130 stoves to achieve a 28% reduction in pollution in a town of 2,600 residents. This seems like a waste of money compared with the 70% reduction from Launceston program that focussed on replacing wood-heaters with non polluting heating, with 4,000 wood-heaters replaced for a lower cost (A$2.05 million) than Libby.



Sources of air pollution in the Hunter Valley

Although, as shown in Figure 49 (below, from the Upper Hunter Valley Particle Characterization Study[15]), dust is an important source of PM2.5 pollution, so is woodsmoke. In fact, despite its proximity to both the Bayeswater and Liddell power stations (which generate enough electricity for 3.25 million homes), woodsmoke is the largest single source of PM2.5 pollution in Muswellbrook (population 11,791), comprising 62% of measured PM2.5 pollution in winter and 30% on a year-round basis.

It is very informative to compare PM2.5 pollution in Armidale, where PM2.5 pollution is almost entirely woodsmoke, and Muswellbrook which is subject to pollution from mines and power generation. The EPA needs to show leadership and introduce State-wide strategies to address both forms of pollution, including the 3 measures noted above to reduce the $8 billion health costs of woodsmoke by over 75%.

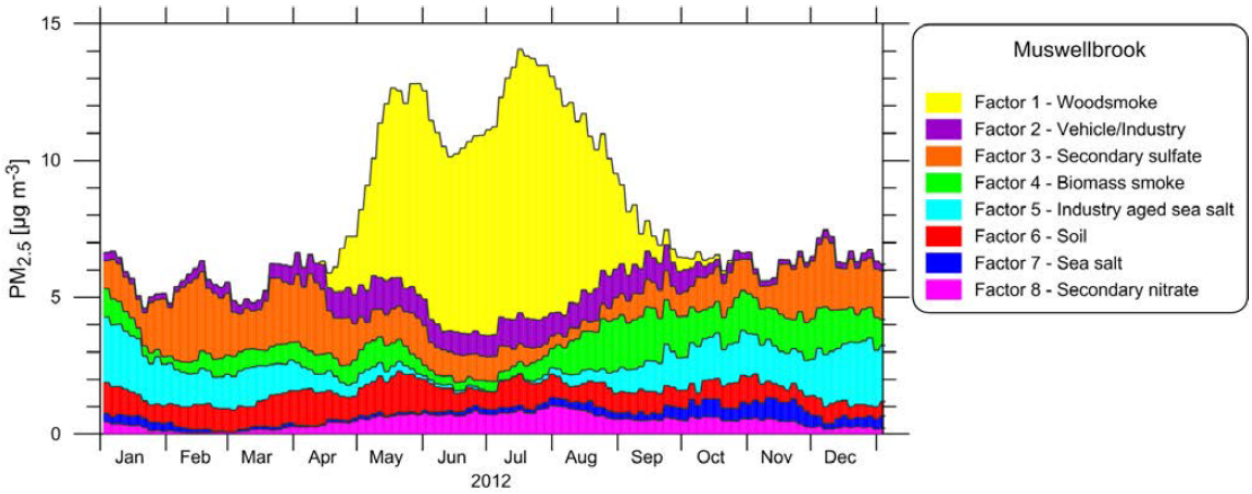
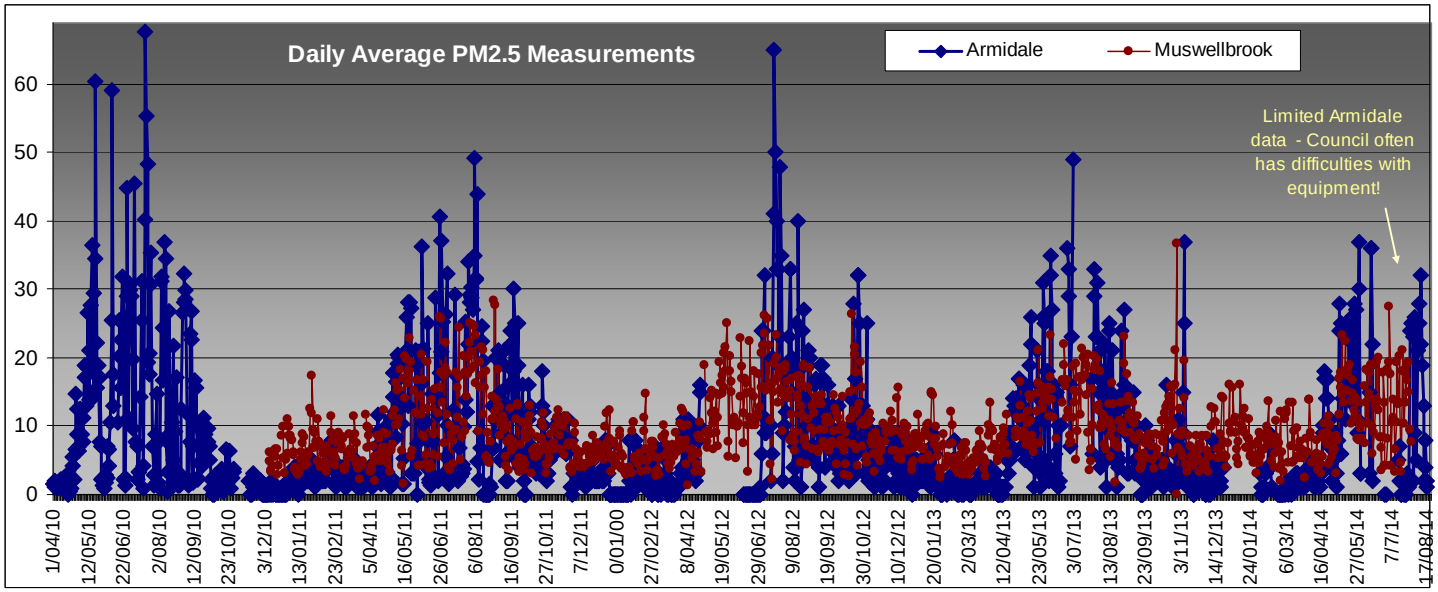


Figure 49. Time series (smoothed with 31-day running window) of the contribution of each factor to the total $PM_{2.5}$ in Muswellbrook

The Upper House Inquiry should consider the resources required to achieve a satisfactory outcome and whether 'Polluter-pays' taxes and charges equal to the health and environmental cost of the pollution would be a good way to provide resource to allow the EPA to do its job. In the case of wood-heaters, annual taxes could provide funds to replace heaters with non-polluting alternatives and provide advice on the most cost-effective forms of home heating. This strategy has been successfully used in Christchurch (where new wood-heaters are not permitted except for models rated < 1.0 g/kg installed heaters as replacements for more polluting models). When wood-heaters were replaced by reverse cycle heat pumps, electricity consumption increased by just 1% - a win-win-win situation – the households saved money compared with the cost of buying firewood, greenhouse gas emissions were also reduced, as was PM2.5 pollution leading to improved health.



The EPA should protect people whose health has been affected by pollution

Below are two examples of problems experienced by neighbours when new wood-heaters are installed.

Example 1: Sydney, near the coast: "*Our next door neighbour installed a new and approved wood burning heater in 2010. The smoke from this flue immediately entered most rooms of our old, renovated house. My wife's asthma was triggered by the smoke and last winter she developed bronchitis and needed multiple treatments with antibiotics.*"

Example 2: Sydney, near the coast: "*In the winter of 2008 subsequent to significant rises in the cost of electricity we began to regularly experience strong blasts of wood smoke from various directions around us followed by ongoing infusion of smoke into our home which would last all night and often into the next day … After exhaustive attempts to try to remedy the situation and upon advice from GP's and specialist medical practitioners I was finally forced to sell my home and move.*"

The EPA emissions inventory for Sydney in 2008 reports that wood-heaters emitted 5,457 tonnes of PM2.5 (50.6% of man-made PM2.5 emissions), compared to 1,553 tonnes from on-road vehicles, 1,935 from industry, 952 from off-road vehicles and 881 tonnes from other sources.[7] In 2008, ABS data show that 4.3% of households in Sydney used wood as the main form of heating.[16] By 2011, the proportion had increased to 5.0%. [17] With such a large and increasing proportion of the most health-hazardous air pollutant coming from domestic wood heaters, it makes no sense for the NSW to provide an air pollution hotline to report smoky vehicles but not wood heaters.

The NSW EPA needs to show leadership and extend licencing fees (set according to the health and environmental costs of the pollution) to all sources of pollution that cause significant harm, including wood-heaters and coal transport. Setting licence fees equal to the health costs and environmental costs will allow fair compensation and remediation. At least part of the money should be used to fund pollution hotlines and provide resources to solve these problems, so that neighbours of recently-installed wood-heaters do not need to need to seek medical attention, take antibiotics, or have to sell their homes.

The photographs (above) show brand new heaters with emissions ratings less than 2.5 g/kg installed in Armidale. The top photo is of a heater installed in August 2014 after receiving all relevant education material from the local Council. Emissions at the level shown were observed for almost 10 hours. The bottom photo shows another heater installed in a new house in Armidale after regulations required all new heaters to have emissions ratings less than 2.5 g/kg. The level of emissions shown was observed for nearly an hour. In the absence of new regulations, heaters with emissions such as those shown in the pictures will continue to be installed in NSW, even in Sydney, until 2018. Is this acceptable?

Tandem health benefits and climate benefits of reducing wood heater use

Reducing pollution also reduces global warming, both from coal-fired power stations and domestic wood-heaters. Professor Piers Forster from the University of Leeds said: "Reducing emissions from diesel engines and domestic wood and coal fires is a no-brainer as there are tandem health and climate benefits," "If we did everything we could to reduce these emissions we could buy ourselves up to half a degree less warming, or a couple of decades of respite." Prof Piers Forster is Coordinating lead author of the IPCC AR4 report chapter Changes in Atmospheric Constituents and in Radiative Forcing (which sets out the scientific evidence on the changes in the atmosphere that are causing global warming). More info: woodsmoke.3sc.net/greenhouse

NSW Chief Medical Officer Kerry Chant said that wood heaters are so detrimental to health she supported banning and phasing them out in built-up urban areas.

Transparency and accountability

The determination of licence fees and remediation costs (in the case of non-compliance) should be a transparent process with all reports and results of investigations are available online.

Consultation processes and public submissions should also be transparent. Despite the estimated $8 billion health cost, the submissions received as part of the Woodsmoke control options stakeholder consultation in 2012 do not yet appear to have been published http://www.epa.nsw.gov.au/woodsmoke/WoodSmokeOptions.htm

Increased transparency and accountability will assist the EPA in being seen to comply with its objectives (set out in the POEO legislation, see below) and allow it to regain much of the public trust that appears to have been lost over the years.

Appendix – Objectives of the NSW EPA, as set out in the POEO legislation
http://www.legislation.nsw.gov.au/maintop/view/inforce/act+60+1991+cd+0+N

- protecting, restoring and enhancing the quality of the environment in New South Wales, having regard to the need to maintain ecologically sustainable development
- promoting pollution prevention
- adopting the principle of reducing to harmless levels the discharge into the air, water or land of substances likely to cause harm to the environment
- minimising the creation of waste by the use of appropriate technology
- regulating the transportation, collection, treatment, storage and disposal of waste
- encouraging the reduction of the use of materials, encouraging the re-use and recycling of materials and encouraging material recovery
- adopting minimum environmental standards prescribed by complementary Commonwealth and State legislation and advising the Government to prescribe more stringent standards where appropriate
- setting mandatory targets for environmental improvement
- promoting community involvement in decisions about environmental matters
- ensuring the community has access to relevant information about hazardous substances arising from, or stored, used or sold by, any industry or public authority

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