2014 Air NEPM Review

Revision/Updating of Particulate Standards

Comments/Points on Impact Statement and (proposed) Draft NEPM

Background:

The **National Environment Protection (Ambient Air Quality) Measure** (Air NEPM) first gazetted in 1998 and revised in 2003, is currently under review, with the intention of varying the particulate standards specified in the NEPM. The standards for **PM_{10} and $PM_{2.5}$** are planned to be varied, with changes proposed to the numerical values of one or more of the standards, the proposed addition of a new annual PM_{10} standard, and a proposal to change the form of the $PM_{2.5}$ standard from an *advisory reporting standard* to a *health based standard*.

The public consultation information calls for submissions containing views and comments of stakeholders to be lodged with the NEPC by Oct 10th, 2014.

Alcoa's comments, queries and potential concerns with aspects of the proposed revised NEPM and/or the content of the Impact statement on the draft variation to the AAQ NEPM (specifically responding to several the questions posed at chapter endings) are set out below.

Chapter 2 Questions: Characteristics and measurement of airborne PM

> The characteristics of airborne PM are described in some detail. Would any further information on airborne PM characteristics assist in informing action to reduce airborne PM? If so, please provide details.

In response to the first question, it should be noted that in WA, with a high proportion of mining related activities, it is likely that much of the PM_{10} exposure in regional areas nearby to mining and mineral processing centres is made up of crustal dust of mineral origin generated by wind erosion. While it is acknowledged in the impact assessment that there is currently little information available in Australia that would enable differentiation of the different forms of particulate composition with respect to their specific health impacts, it must be acknowledged that many forms of mineral dust are essentially chemically inert. They are similar to other crustal dusts generated by wind erosion or other natural processes.

Particulate standards set on the basis of the known health effects of dust exposures in largely urban settings may therefore be unrepresentative of health impacts of these predominantly inert forms of particulate occurring in regional areas. For this reason it would be valuable to gain more information on the mineral and chemical composition of particulates, in order to facilitate comparison to the composition of the particulates in those mainly urban areas where the studies that the dose/effect relationships of particulates have been derived from were performed. This would be particularly relevant where a lowering of standards to levels below those currently advised

by WHO or in other international jurisdictions is being contemplated. This appears to be the case in this impact statement and draft variation.

> Please provide any additional Australia-specific aspects of PM measurement that you believe are important to the actions to reduce airborne PM being considered in this Impact Statement.

In the same vein as the previous response, it would be useful for jurisdictions to conduct some monitoring of both PM_{10} and $PM_{2.5}$ enabling collection of sufficient sample size to obtain useful compositional analyses. This may not be possible for the 24 hour average samples obtained for NEPM compliance measurement; it may be necessary to conduct sampling over longer time periods (a week or more) to gather sufficient particulate sample mass to allow analysis to a suitably low limit of detection for particulate constituent minerals and elements.

Chapter 3 Questions: Health effects of airborne PM and monetary costs associated

> Is there any additional Australia-specific information on the health effects or monetary costs of PM that should be included? If so, please provide details.

Alcoa understands that there was a health impact assessment performed on PM_{10} in the Pilbara region of WA, specifically at Port Hedland and surrounding communities. If useful information was collected in this study that would inform the NEPM review then we would urge that it be included.

We also note that a finding on the association between health effects and PM levels experienced in Australian cities is highlighted, though no similar finding with respect to regional PM levels is presented.

Chapter 4 Questions: Policy context and legislation

> What are your views on the feasibility of an exposure-reduction framework for PM in Australia?

From the information presented in Table 4.3 of the impact statement, it seems clear that the current PM_{10} 24 hourly standard in Australia is (with the sole exception of New Zealand) possibly the most stringent in the world. Accepting the evidence presented that there are likely to be health effects currently occurring at or below this level, it would seem logical and desirable to aim for a PM exposure reduction strategy across Australia in the longer term.

However it is our view that it would be premature for Australia to lower the 24 hour PM_{10} standard further, in advance of the World Health Organisation acting to reduce its guideline PM_{10} value. Regional areas of Australia, especially those with higher natural background dust levels along with higher concentrations of mining related dust, would appear some way off further improvements in PM levels to a point where they could comply with the existing 24 hourly standard, let alone with a new and lower value as has been suggested should be considered (40 – 50 $\mu g/m^3$).

Chapter 5 Questions: Airborne PM in Australia

> Are there any issues that have not been considered or have not been attributed sufficient weight in the discussion?

The discussion in Chapter 5 is wide ranging and substantial. It is clear from the discussion and presentation of data that natural sources of PM including soil erosion, marine aerosol (sea salt) and other background sources are substantial. In some regions outside of the major metropolitan centres, as well as in portions of the metropolitan air sheds, the natural PM component may often be greater than the anthropogenic and secondary atmospheric components. This raises the prospect that in those regions, the margin between peaks in natural levels of PM and the existing and proposed standards may be small, meaning that anthropogenic contributions only need to be modest in order for a standard to be approached or breached. This factor needs to be borne in mind when contemplating reductions in the existing standards, or addition of new and low (by global comparisons) standards. Application of stringent standards, or aggressive exposure reduction actions, needs to be tempered by the local regional dust background to avoid imposing an unreasonable cost of compliance on the minerals industry.

It is also clear in the discussion of trends and forecasts that over the next twenty years there are likely to be substantial increases in PM emissions for parts of Western Australia, particularly for industrial/commercial and domestic/commercial sources. The timeframe for introduction of an exposure reduction framework, and for reductions contemplated of any standards, should take this into consideration.

Chapter 6 Questions: The problem and the case for intervention

> Do you agree that further government involvement is required to address the potential future health impacts and costs of airborne PM?

Governments have the primary responsibility for setting, measuring and devising strategies for meeting air quality standards. This is as it should be. As background PM levels in Australia rise and the number of exceedances of NEPM standards grows, it is important that Govt takes the lead in managing the situation to prevent significant deterioration in air quality for the Australian public.

Chapter 7 Questions: Statement of Options (form of the standards)

> Do you agree that the AAQ NEPM framework is an important element in the management actions to address ambient air quality in Australia?

Yes

- Have any options for the metrics, averaging times, and values of the standards been overlooked?

The options presented appear to be comprehensive and adequate for consideration by policy makers and stakeholders.

- Do you agree that the PM standards selected for analysis (including metrics, averaging times and values) are appropriate for Australia?

While agreeing that the values of the various standards presented as options are suitable for consideration by policy makers and stakeholders, we do not agree that the lowest values selected

are economically achievable in Australia at the present time, and therefore do not support the adoption of the lowest values in the table.

- Do you consider the options outlined for the form of the standards to be feasible for Australia? Have any options been overlooked?

Some of the options would appear feasible for Australia. However not all are in our view likely to be economically achievable. For that reason we favour adoption of a form consistent with the US EPA form i.e. the 98th percentile concentration in a given year is compared with the standard and exceptional events are excluded.

- Is there any other information relating to the options for an exposure-reduction framework that should be considered?

In our view the only viable option at this point would be to aim for continual improvement and an objective of no deterioration in existing levels of air quality (particulate).

Chapter 8 Questions: Impact analysis

No specific comments

Chapter 9 Questions: Preferred options

a) Numerical value of the PM standards:

Of the options presented in Table 9.1, and for the reasons given in the preceding discussion points – we prefer the following standards:

a. PM_{10} annual mean – 20 µg/m3
b. PM_{10} 24 hour mean – 50 µg/m3
c. $PM_{2.5}$ annual mean – 8 µg/m3
d. $PM_{2.5}$ 24 hour mean – 25 µg/m3

These are the same values preferred by the authors of the discussion paper, with the exception of the PM_{10} 24 hour mean, for which the discussion paper proposes a tiered approach of 50 µg/m3, with consideration of lower values at 45 µg/m3 and 40 µg/m3.

b) Form of the 24 hour standards:

For consistency with international approaches, and to reflect the natural variability in background PM levels associated with natural events, we prefer the form adopted by US EPA, being:

- a rule in which the 98th percentile PM concentration in a given year is compared with a standard, but with exclusion of data for exceptional events
- it is understood that this value may be evaluated using either monitoring data (the average of the 98th percentile concentration for each of 3 years of monitoring after exclusion of exceptions); or using modelling data (the average of the 98th percentile concentration for each of 5 years of modelling);

Such an approach is sensible given the high and variable background PM concentrations in regional areas of Australia due to natural occurring events, such as wind erosion of bare and sparsely vegetated soil surfaces, combined with incoming dust from marine and terrestrial sources.

c) Form of exposure reduction framework:

Agree with the impact statement conclusion that a fixed reduction gradient such as 10%, is not likely to be practically achievable in the medium term. A more practical option, such as the development of an exposure index based on monitoring of $PM_{2.5}$ would seem to be more sensible in the interest of advancing a path towards gradual reduction in PM exposures in urban areas.

Alcoa of Australia
October 10th, 2014