

**REVIEW OF THE NATIONAL ENVIRONMENT PROTECTION  
(AMBIENT AIR QUALITY) MEASURE  
AIR QUALITY STANDARDS DISCUSSION PAPER**

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The headings below have been extracted from the discussion paper. **Chapter 5: Issues to be considered in evaluation of NEPM standards** (page 140 of *AAQNEPM Review Air Quality Standards Discussion Paper*) provides further discussion on these questions.

#### **ISSUES TO BE CONSIDERED**

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**Q1. Is there sufficient new health evidence to support a revised standard and if so, for which pollutants?**

Yes, a considerable amount of evidence is now available through us, the research community, the medical community, health authorities here and globally, aerosol researchers and countless other bodies relating to ultrafine particles and their potentially serious health effects. While it is understood by the authorities and industry here and globally that increased exposure to ultrafines increases the risk of health related problems, there are NO proper exposure guidelines in place in relation to acceptable levels / numbers of these potentially deadly aerosols.

**Q2. Does the current approach, which allows for a number of exceedences of the standard, meet the requirement for adequate protection or are there alternative methods that could provide more consistency in the level of health protection associated with complying with the NEPM standards?**

No. The standards for measuring particulates typically relate to older style gravimetric methods (high volume samplers, TEOM, deposition gauges etc). Such devices are not capable of continuously measuring particles in the community and or on work sites to an accurate enough level. High volume samplers for example can't adequately monitor, log or report dust events, they have no ability to show the duration of an event or the magnitude. They simply collect samples typically over a 24 hour or greater period for gravimetric analysis. While a TEOM offers improved information it also fails to provide dynamic real-time information. It can only provide 20 minute to 1 hour quality information (depending on who you speak with) for typical ambient air monitoring applications. Being micro balance based it is also some what insensitive to finer particles / aerosols. In fact the finer the particles get the less useful a TEOM becomes. As finer particles are playing a larger and larger part in health impact studies these days and authorities are moving their focus towards PM10, PM2.5 and even PM1, companies and authorities need instruments that are adequately capable of measuring these aerosols.

You can't possibly hope to control what you can't properly monitor

Most of these older technologies are also very expensive, very power hungry, heavy and require permanant powered installation. This is simply not practical in today's day and age where so many companies are expected to do dust monitoring. Of the many hundreds of dust related enquiries we receive every year, many companies are operating at remote sites where power is simply not available. Asking companies to buy a handful of high volume samplers (for example) along with a handful of generators and operate all these continuously in remote areas is crazy in our opinion. We receive countless calls from frustrated companies nationally every year and companies are constantly bartering with the EPA to try and get around using these older style devices. Expecting companies to establish and maintain air conditioned air monitoring stations containing TEOMs is also unnecessary and unrealistic we believe.

In comparison, light scattering devices (such as TSI's popular DustTrak series) which have been used for decades here and globally by countless health professionals, authorities, universities, CSIRO, research groups, thousands of local companies and even some EPA branches provide instant real-time dynamic data. They can operate off batteries, solar panels or mains and they cost a fraction of what some of these other devices cost. They come in fully portable, transportable or fixed varieties and are easily to use with very little maintenance.

When used correctly, they provide highly accurate, reliable and repeatable data with excellent correlation to current compliance monitoring devices.

Using these newer generation technologies allows companies and authorities to monitor dust and airborne particulates with high sensitivity. Particles along with wind speed, wind direction and other environmental data can be measured in real-time. SMS messages can be instantly sent to users on exceedences allowing companies to immediately act and take control. Even the slightest dust events can be seen, recorded and reported in real-time. All the standard hourly, daily, weekly, monthly, yearly data can be reported along with other valuable information. The exact time, date and magnitude of any single event in ug/m<sup>3</sup> or mg/m<sup>3</sup> can be instantly seen and recorded. You can also precisely record the duration of any event along with other environmental data.

This level of monitoring we believe is unmatched by any other methods and we have sold thousands of these light scattering style systems and instruments throughout Australia over the years to proactive companies wanting to better monitor and control their sites for both occupational health and environmental reasons.

Companies can access live real-time data in a variety of ways, including accessing it via the internet. For as little as \$20 per month our computer servers collect all the data remotely and this can be accessed via any web browser. Authorities / regulators can even log in and see raw client data if need be, thus keeping a close eye on companies nationally.

There are so many positive reasons why light scattering instruments should be considered as alternatives to the older style instruments. The costs and energy saving alone would be of great benefit to society and industry, not to mention all the additional valuable data, the ability for companies to act and take better control, the better sensitivity to ultrafine aerosols and so on.

In Australia, we pride ourselves as being world leaders in many areas. We have the opportunity to take a substantial leap forward again.

**Q3. Should changes be made to the reporting protocols that would lead to a greater transparency and better understanding of the causes of exceedences in jurisdictions, the potential risk to population health, and management approaches being undertaken to address these exceedences?**

The reporting protocols we believe are debatable, however we cannot stress the importance enough of companies doing proper continuous monitoring. There is no comparison between grabbing a gravimetric sample once a day versus actual live particle by particle monitoring. Getting that live dynamic data from sites all day every day with data streamed via the internet or via other means allows companies and regulators to far better understand the dynamics of what is going on at any given location. Companies and or regulators will also have a far better ability to react to events. This surely HAS to be a better, smater way forward. And remember, there is no use reporting what you largely can't measure.

The gravimetric style instruments currently used as compliance monitors are simply no longer adequate for 21<sup>st</sup> century air monitoring we believe, particularly if one wants to focus on health impact studies.

**Q4. Any other issues you wish to raise?**

On page 9 of the existing NEPM document it clearly states that "other monitoring instruments may be used if"....and then it sets various sub points. The newer generation laser based instruments we are referring to meet all of the criteria under this section. We are a NATA accredited laboratory specializing in these technologies and have decades of experience in this field.

Our concerns in summary are:

- 1) Ultrafine particles and their health effects. What are authorities doing in terms of monitoring and setting guidelines for industry.
- 2) The benefits of using light scattering instruments and how the regulators should investigate these options more seriously for the betterment of countless organizations versus traditionally steering companies towards these older style methods.

Please also note that for TSP measurements (particles up to 50um) we still suggest the use of high volume samplers. All of the EPA people we know I am confident would agree. For PM10 and lesser fractions however light scattering devices have proven very useful.