



COMPLIANCE MONITORING

NEPM UPDATE

In 2021, the National Environment Protection Council (NEPC) approved a variation to the Ambient Air Quality NEPM standards for ozone (O₃), nitrogen dioxide (NO₂) and sulphur dioxide (SO₂).

Compliance Monitoring has incorporated the changes into its reporting templates.

The major changes are:

- establish an O₃ standard with an 8-hour averaging period – 65 ppb.
- strengthen NO₂ reporting standards for 1-hour and annual average NO₂ to 80 ppb and 15 ppb respectively.
- strengthen SO₂ reporting standards for 1-hour and 24-hour SO₂ to 100 ppb and 20 ppb respectively.
- extend annual reporting of population exposure from particles as PM_{2.5} to O₃ and NO₂ given the widespread exposure across whole populations.



<http://www.nepc.gov.au/nepms/ambient-air-quality>

COMPLIANCE MONITORING NEWS

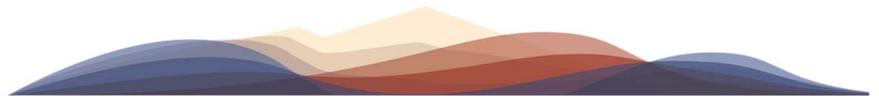
Volume 1 / Issue 3

Spring 2021

WELCOME

Thanks for reading this Spring edition of CM News. ¹Each year for the past few decades during the southern hemisphere spring, chemical reactions involving chlorine and bromine cause ozone in the southern polar region to be destroyed rapidly and severely. This depleted region is known as the “ozone hole”.

Ozone high up in the stratosphere provides a shield to protect life on Earth from ultraviolet rays. However, in the troposphere where we are, ozone is harmful. Ozone is formed when nitrogen dioxide from combustion reacts with volatile organic compounds. Consequently, monitoring ozone levels is an important part of a monitoring program.



FEATURES

In this edition we take a closer look at two further aspects of environmental monitoring.

Low Level Ammonia Monitoring

²OSHA says there are no long term effects from exposure to ammonia, but the ATSDR says that repeated exposure to ammonia may cause chronic irritation of the respiratory tract.

Particulate Monitoring

There are many instrument brands and methods available to measure particulate matter in air, but each will fall into one of three broad techniques. These are gravimetry, beta attenuation and light scatter (nephelometry). Gravimetry is the most accurate and is the only one traceable to International System of Units (SI).

³Feedback from CM clients, “*Interaction is always professional*”

Sources:

1. NASA Ozone Watch website June 2021

2. OSHA website

3. April 2021 client survey

LOW LEVEL AMMONIA MONITORING

Exposure to low levels of ammonia (NH_3) can cause irritation to eyes, nose, throat and the respiratory tract. Fortunately NH_3 is detectable by its pungent odour providing adequate early warning, however it also causes olfactory fatigue which reduces our ability to continuously smell it.

Compliance Monitoring uses a low detection limit system (cavity enhanced laser absorption spectroscopy) to measure NH_3 at ppb levels. This provides assurance that emissions are detected well before they become a nuisance or HSE problem. According to ²OSHA, the Odour Threshold is between 5 and 50 ppm.

Our systems can be solar powered and are supplied with live data and alarms displayed on most smart devices using ComplyLive.



PARTICULATE MONITORING

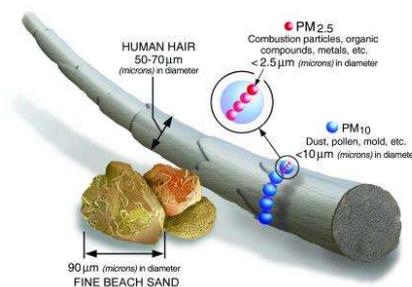
Particulate matter (PM) is made up of solid or liquid particles that are suspended in the air. These particles may include - dust, dirt, soot, smoke, salt, drops of liquid⁴. The health effects of breathing particulates are well documented.

Monitoring equipment is generally fitted with a sizing inlet to enable different size fractions to be measured e.g. PM_{10} and $\text{PM}_{2.5}$. Under Australian Standards, the main techniques for measuring particulates are:

- TEOM. Tapered element oscillating microbalance. An instrument conceived to measure the mass of comet dust in zero gravity space. Air is drawn through the inlet onto a filter attached to a small vibrating glass tube whose oscillation frequency changes when aerosol particles are deposited on it increasing its inertia. If fitted with FDMS, it is classed as a standard method with European Union (EU) equivalency.
- BAM. Beta attenuation monitor. Air is drawn through an inlet and onto a filter that is subjected to a constant beam of beta particles (electrons) that are absorbed (attenuated) by particulate matter. The more matter the greater the attenuation.
- HVAS/LVAS. High volume and low volume air sampling. Air is drawn through an inlet and onto a preweighed filter. After a fixed period of time, the filter is re-weighed and the weight gained is particulate matter.
- Light scatter. Air is drawn through an inlet where it is illuminated by a laser beam. Particles scatter the light and the fluctuations are detected at a known scattering angle by a detector. This is a non-equivalent instrumental method.



TEOM station



Graphic from US EPA

4. https://www.cdc.gov/air/particulate_matter.html



MONITORING NOW FOR OUR FUTURE

- ✚ Ambient Air Quality
- ✚ Meteorological Stations
- ✚ Stationary Source Emissions
- ✚ Water Quality
- ✚ Custom Monitoring Solutions
- ✚ Workplace
- ✚ Laboratory Equipment



The daily PM_{2.5} fix
Time for a tune-up?

Word of the Day

Nephelometer - a device that measures light scatter to provide an indicative amount of particulate matter in the air. An air sample is exposed to an incident light of wavelength 525 nm. Gaseous, and largely particulate components of the sampled air will cause the light to scatter like fog. Sensitive detectors in the instrument pick up this scattered light.

Contact Us

Compliance Monitoring

52 Cooper Road
Cockburn Central WA 6164
1800 04 06 08
sales@cmco.net.au
www.cmco.net.au

COMING UP IN A FUTURE EDITION

Low level mercury monitoring.

Mercury occurs naturally in coal and other fossil fuels. When these are burnt for energy, the mercury becomes airborne and goes into the atmosphere. Similarly, natural gas can contain mercury, and this can be released during extraction.

The health effects of mercury are well known so a sensitive means to detect it is essential to determine the appropriate pollution control measures to protect the population and environment.

Compliance Monitoring installs monitoring systems that can detect mercury at parts per trillion levels. This is a factor of 1000 or more below current OH&S guidelines.

