

Fresh Air

The Newsletter of Air Resource Management Ltd

November 2008

The March of Time

There are many aspects of life that are beyond our control and are also one feels a tad unfair. One of those aspects is the *March of Time*.

Time stands still for no one, and even as I sit here and pen this newsletter, the second hand of the clock is following its well worn path around the circular dial, dispatching each second with a soft yet disturbing tick.

So it is with that little piece of philosophy that I apologise for the fact that it has been over 12 months since our last newsletter.

In that twelve months there has been much to talk about, ponder on and digest.

I hope with the following items and trivia to reflect on and provide information that this newsletter may be of some use to you whom take the time to read this editorial delight

Test Method Accreditation

Over the past few months and a lot of hard work, Air Resource Management has been able to gain accreditation for seven USEPA test methods. This allows us to expand our testing portfolio and offer our clients a wider range of testing services.

New Methods added to our Scope of accreditation

Method 6 Determination of sulphur dioxide emissions from stationary sources

Method 7C Determination of Nitrogen oxide emissions from Stationary sources

Method 8 Determination of sulphuric acid mist and sulphur dioxide emissions from stationary sources

Method 18 Measurements of gaseous organic compounds emissions

Method 201A Determination of PM₁₀ emissions (constant sampling rate procedure)

Method CTM-027 Procedure for collection and analysis of ammonia in stationary sources

Method CTM-040 Determination of PM₁₀ and PM_{2.5} emissions (constant sampling rate procedure)

In particular we are the only stack testing company in the country IANZ accredited for the determination of PM_{2.5} emissions from stationary sources.

What are PM₁₀ & PM_{2.5} Emissions

Particulates, alternatively referred to as particulate matter (PM), aerosols or fine particles, are tiny particles of solid or liquid suspended in a gas. They range in size from less than 10 nanometres to more than 100 micrometres in diameter. The notation PM₁₀ is used to describe particles of 10 micrometres or less and PM_{2.5} represents particles less than 2.5 micrometres in aerodynamic diameter. PM₁₀ can settle in the bronchi and lungs causing the onset of asthma, lung cancer, emphysema cardiovascular issues and premature death.

PM_{2.5} also can settle in the lungs but can be absorbed into the blood stream where they cause thickening of the blood leading to high blood pressure and damage to other organs.

PM pollution is estimated to have caused 22,000 – 52,000 deaths p/year in the US and 200,000 deaths p/year in Europe.

A Health and Air Pollution in New Zealand study, published in July 2007, shows that air pollution is associated with around 1,100 cases of premature mortality – that is people dying earlier than they would have if they had not been exposed to air pollution.

It is estimated that the effects from air pollution occur throughout New Zealand



are not just in the main cities. The primary sources are home heating nationally, transport in Auckland, and industry.

Other illnesses caused by air pollution include: around 1,500 extra cases of bronchitis and related illnesses, 700 extra hospital admissions for respiratory and cardiac illnesses, 1.9 million restricted activity days (days on which people cannot do the things they might otherwise have done if air pollution was not present).

The bulk of effects are associated with particulate pollution (PM₁₀), but there are also effects associated with other pollutants, such as nitrogen dioxide, carbon monoxide and volatile organic compounds.

The total economic costs of air pollution in New Zealand (from both premature death and adverse health impacts) are estimated to be \$1.14 billion per year or \$421 per person.

Monitoring of Particulate

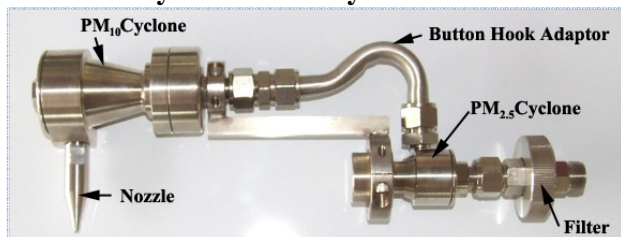
With changes to the RMA and direction from the government to lower the amount of air pollution in New Zealand, the overseeing authorities such as the regional and district councils have been set targets for the levels of air pollution and the gradual reduction of the same by the year 2011. Part of the program is to determine from those industries that emit particulate the percentage of PM₁₀ present in the Total Suspended Particulate being discharged.

We, as an emission testing company, are finding that more and more of the resource consents being issued or renewed, have a requirement for the determination of PM₁₀ emissions.

Overseas testing companies in USA and Europe inform us that most of their particulate testing is for PM₁₀, PM_{2.5} and condensable particulate. New Zealand will, we feel, follow this pattern.

Environmental Control Officers for industries that require air emission testing should allow for this PM₁₀ testing method when setting their budgets.

PM 10/2.5 cyclone assembly



USEPA Method 18 VOC Sampling

-Spike Recovery-

The USEPA Method 18 sampling method requires testers to undertake a recovery study for each sampling run conducted.

Methodology

Two identical sampling trains are set-up.

One of the sampling trains is designated the spiked train and the other the sample train. All of the compounds of interest are injected on to the sampling media of the spiked train before sampling. The mass of each spiked compound is a value estimated to be within 40 to 60 percent of the mass expected to be collected with the sample train. Gases are sampled onto each sampling train simultaneously. Identical analytical procedures and instrumentation are used to analyse each sample.

The fraction of spiked compound is calculated and this value is used to adjust the sampling train analyte mass.

Why is it important?

Manipulation of a sample can sometimes result in the loss of an analyte leading to erroneously low measured values. The physical composition of the sample or sample matrix may also introduce compounds that interfere with accurate measurement of the analyte. Spike recovery studies assist in accounting for the percent loss of an analyte. The recovery study is also used to confirm that the sampling media used to capture the target compounds is suitable.

Pierre Rebstock



Pierre has been with ARM for the past year and has become an extremely valuable asset to the team.

Pierre was recently granted KTP status by IANZ.

Look out for Pierre on site as one of the lead scientists.

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