Air Quality Monitoring in Geraldton

Purpose

The purpose of this Fact Sheet is to provide information on air quality monitoring that is undertaken by the Department of Environment Regulation (DER) in Geraldton.

Introduction

Air quality monitoring is undertaken by DER at a number of regional and metropolitan locations within Western Australia in accordance with the National Environment Protection (Ambient Air Quality) Measure (NEPM).

DER is responsible for the operation and maintenance of 13 air quality monitoring sites in Western Australia, including Geraldton.

Geraldton's air quality monitoring site was founded in 2006 primarily to monitor windblown crustal material from agricultural activities and smoke from bushfires, prescribed fire hazard reduction burns, stubble burning and wood-fired home heaters.

Key Points - Air Quality in Geraldton

- Air quality in Geraldton is considered good on most days, although some poor air quality events occur in any given year.
- Poor air quality events have been primarily attributed to prescribed fire hazard reduction burns or bushfires.
- Monitoring will continue in accordance with NEPM as the national standard.
- Monitoring is scheduled to be expanded in 2018/19 to include the measurement of $PM_{2.5}$.

Our Monitoring

One air quality pollutant, particulate matter or particles less than 10 microns in diameter (PM_{10}), is monitored in Geraldton.

Particulate matter contains small particles that can be harmful to humans and can be attributed to industrial activities and natural sources such as bushfires, prescribed fire hazard reduction burns, dust storms and pollen.

Air Quality Particle Criteria

The NEPM provides a number of criteria for particles as shown through Table 1.

Table 1. Air Quality Particle Criteria

Pollutant	Averaging Period	Maximum concentration (micrograms per cubic metre)
Particle Matter as PM_{10}	1 day	50 µg/m^3
	1 year	25 µg/m^3
Particle Matter as $PM_{2.5}$	1 day	25 µg/m^3
	1 year	8 µg/m^3

All exceedences and events are reported and identified. If the exceedence is caused by a fire or dust event and causes the one day average particle standards to exceed normal historical fluctuations and background levels, it is referred to as an exceptional event.

Particle Levels in Geraldton

Geraldton has occasionally exceeded the daily (24 hr) standard of 50 µg/m^3 for PM_{10} since 2006 as shown through Figure 1.

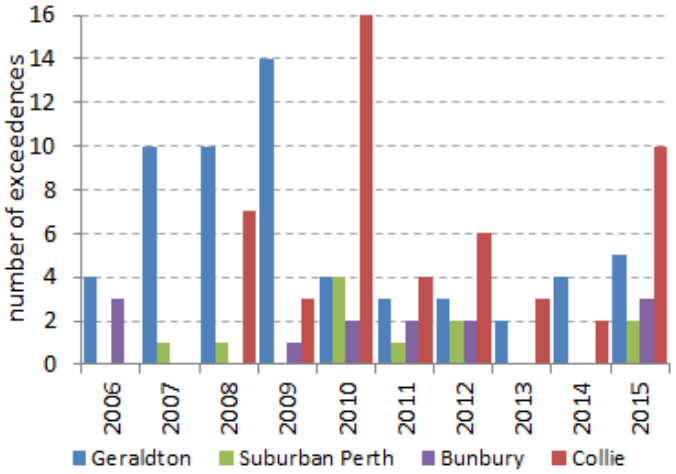

Figure 1. Number of times the NEPM 24 hour PM_{10} standard was exceeded at a range of sites

Geraldton experienced five exceedences of the daily NEPM PM_{10} standard in 2015. Three were caused by bushfires in January and February while in late February there were two exceedences which were from undetermined local sources.

Since commencement of particle monitoring in 2006, Geraldton has not exceeded the NEPM annual standard for PM_{10} size particles of 25 µg/m^3 (Figure 2). In 2015, the annual average PM_{10} concentration in Geraldton was 20.2 µg/m^3.

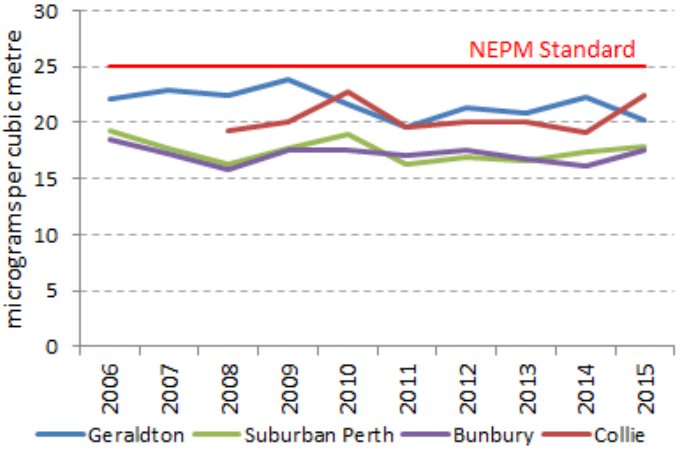

Figure 2. Annual average PM_{10} concentrations at a range of sites

Geraldton is prone to high winds which are likely to increase particle concentrations. The average 3pm wind speed at Geraldton Airport is 24.2 kilometres per hour while that at Perth Airport is 18.7 kilometres per hour. The main sources of particles in townships such as Geraldton are from bushfires, prescribed fire hazard reduction burns and natural events such as windblown dust.

As Figure 3 shows, over the past three years, elevated averaged particle levels at Geraldton have occurred predominantly in the afternoons and generally during the drier Summer months.

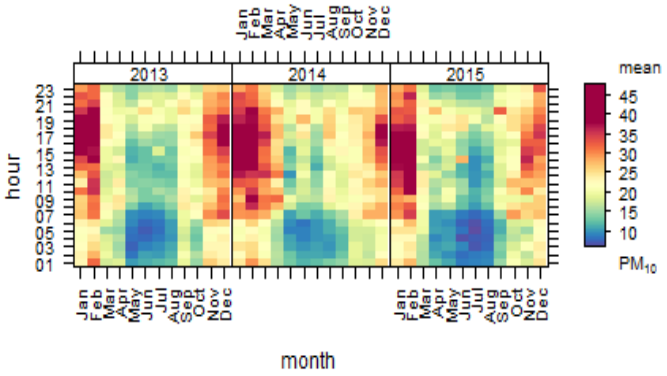

Figure 3. Average PM_{10} concentrations at Geraldton for each hour over the last three years

Future Monitoring in Geraldton

While there has been no $PM_{2.5}$ particle monitoring by DER in Geraldton, installation of a $PM_{2.5}$ particle monitor is scheduled for 2018/19

Particles Explained

Airborne particles are commonly classified by size in terms of their equivalent aerodynamic diameter (EAD). An EAD is the diameter of a spherical particle of density 1 gram per cubic centimeter (the same density as water) which exhibits the same aerodynamic behavior as the particle in question. Particles are sampled and described on the basis of their EAD but usually simply called the particle size.

PM_{10} particles are any substances that have an EAD less than or equal to 10 micrometres in diameter. $PM_{2.5}$ are any substances that have an EAD less than or equal to 2.5 micrometres in diameter. Particles in this size range make up a large portion of dust that can be drawn into the lungs. Larger particles tend to be trapped in the nose, mouth or throat[1].

The important thing to note is that PM_{10} and $PM_{2.5}$ is not one particular substance, but simply a classification of particle or dust size.

[1] National Pollutant Inventory, Particulate matter (PM_{10} and $PM_{2.5}$)

More Information

For advice on the Regulations, or related matters, please contact Licensing and Approvals on 6467 5000.

This document is available in alternative formats and other languages on request.

Related Documents

Additional publications about Air Quality are available online from www.der.wa.gov.au/airquality, or can be requested by phoning 6467 5000.

Legislation

This document is provided for guidance only. It should not be relied upon to address every aspect of the relevant legislation. Please refer to the State Law Publisher (SLP) for copies of the relevant legislation, available electronically from the SLP website at www.slp.wa.gov.au.

Document Versions

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