

WHAT IS PARTICULATE MATTER AND WHY IS IT IMPORTANT?

Introduction

Dust emissions from mining activities can be a serious issue if not closely monitored and effectively controlled. The NSW mining industry works very hard to meet the consistently high air quality standard that the NSW Government sets to preserve the health and safety of the communities in which mining operates.

Various government and industry initiatives contribute to NSW having air quality that is considered good by world standards and is generally comparable with other Australian jurisdictions.

This fact sheet contains information regarding air quality in the Upper Hunter and outlines what particulate matter is and why it is important that it be managed effectively.

Air quality and particulate matter

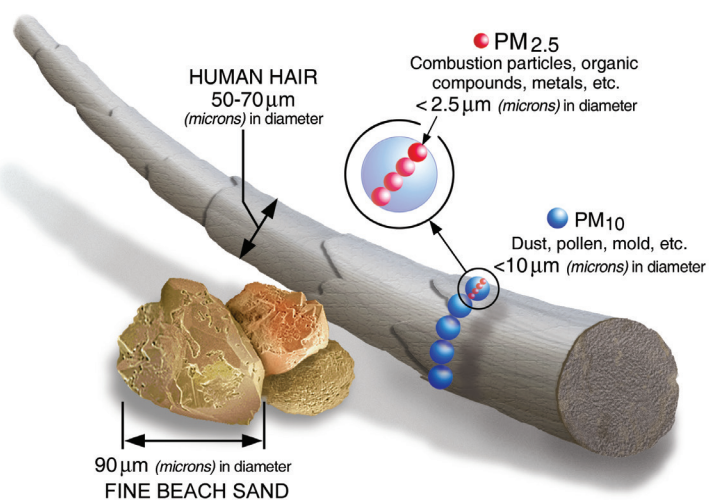
Air quality relates to the level of pollution that is in the air that we breathe. One component of air quality is the amount and size of particulate matter suspended in the air, known as PM. PM is the primary air pollutant associated with mining activities.

PM particles may be classified on the basis of their size as either:

- PM¹⁰: Inhalable particles measuring less than 10 microns in diameter; or
- PM^{2.5}: Fine inhalable particles measuring less than 2.5 microns in diameter.

The following infographic demonstrates the size of PM¹⁰ and PM^{2.5} particles compared to an average human hair, which can be up to 30 times larger than the largest fine PM^{2.5} particle.

Figure 1: Comparison of particulate matter with other fine particles such as beach sand and human hair. (Source: United States Environmental Protection Agency, 2016)



There are a number of emissions sources that generate fine particles. These include dust from mining operations, power stations, on-road vehicles, non-road diesel equipment, wood heaters, bushfires and hazard reduction burns, sea salt and biogenic sources, which may have varying impacts on air quality.

It is important that air quality is managed effectively as particle pollution can be harmful to human health. A 2015 report from the NSW Environment Protection Agency (EPA) and NSW Health found that fine particles (PM^{2.5}) are more detrimental to health and have a wider range of health effects than larger particles.

Meteorological conditions may also slow down the removal of pollutants, which can impact visibility or

reduce the amenity of landscapes.

Particulate matter in the Upper Hunter

Particulate matter is measured across the Upper Hunter through the Upper Hunter Air Quality Monitoring Network.

PM^{2.5}, or fine particles, are measured at Singleton, Camberwell and Muswellbrook. While Singleton and Camberwell have generally met the national air quality standard, Muswellbrook has exceeded the standard every year since monitoring began in 2011.

The Upper Hunter Valley Particle Characterisation Study conducted by CSIRO showed that dust from sources such as mining, and agriculture contributed an average of 11-12% of PM^{2.5} particles at Muswellbrook, while wood smoke contributed 30% of PM^{2.5}. Only five percent of dust generated from mine sites are PM^{2.5} particles.

In the 2015 review of data, the Office of Environment and Heritage stated, "Annual average PM^{2.5} levels were above the standard at Muswellbrook, where smoke from domestic wood heaters contributes significantly to particle levels". The EPA has prepared community advice regarding wood smoke pollution, available here www.epa.nsw.gov.au/your-environment/air/

reducing-wood-smoke-emissions

PM¹⁰ or coarse particles, are measured at fourteen locations across the Upper Hunter. Most of dust generated at mine sites are PM¹⁰ particles and are associated with amenity impacts in the Upper Hunter such as visible dust in the air, or on items such as clothing or property.

While PM¹⁰ particles generally do not have as significant a health impact as PM^{2.5} particles, the mining industry recognises that this is a priority area that needs to be focused on. Mining operations in the Upper Hunter are working collectively to reduce all PM emissions generated through mining activity and to manage any impacts should they arise.

The NSW Department of Health has more information regarding particulate matter and health in their Mine Dust and You page. To view this information, please visit: www.health.nsw.gov.au/environment/factsheets/Pages/mine-dust.aspx

For more information regarding industry actions to improve air quality and manage impacts, please see the Dialogue's fact sheet 'Actions To Improve Air Quality and Manage Impacts' for more information on the various industry and government initiatives.

For more information about the Dialogue and how you can get involved, visit: www.miningdialogue.com.au

