

Wynnum Citizen Science Air Monitoring Project

Interim results fact sheet – February 2019



Wynnnum Citizen Science participants

About the project

The Department of Environment and Science (DES) is working in partnership with Clean Air Wynnnum (CAW) and Bayside Creeks Catchment Group to improve community understanding of air quality monitoring and associated standards through citizen science. The project involves monitoring airborne particles (PM_{2.5} and PM₁₀), dust deposition and dust composition over 12 months in collaboration with community members from CAW.

Participants from CAW are currently collecting monitoring data by housing air monitoring devices at their private properties that measure airborne particulate matter. Surface wipe sampling was also undertaken in July and November 2018 across five properties to determine the composition of dust that has settled at these sites. Participants also collected dust deposition data by housing dust gauges in November 2018 to quantify the dust deposition rate, and the composition of dust that settled at their properties over the period of one month.

This fact sheet provides results for surface wipe samples, dust deposition and interim results for PM_{2.5} and PM₁₀ for December 2018 and January 2019.

PM_{2.5} and PM₁₀

Concentrations measured in micrograms per cubic metre of air ($\mu\text{g}/\text{m}^3$) of PM_{2.5} and PM₁₀ were monitored and assessed against the [National Environment Protection \(Ambient Air Quality\) Measure \(NEPM\)](#) standards for safeguarding human health.

Measurements of PM_{2.5} over this period were well within the NEPM standard of $25\mu\text{g}/\text{m}^3$ over 24 hours. Average measurements were no greater than $5\mu\text{g}/\text{m}^3$ over 24 hours.

Similarly, measurements of PM₁₀ over this period were marginally higher but did not exceed $6\mu\text{g}/\text{m}^3$, also well below the 24 hour standard of $50\mu\text{g}/\text{m}^3$.

Compliance with the NEPM standards for average PM_{2.5} and PM₁₀ concentrations over 12 months will be analysed at the conclusion of the project when sufficient data has been collected.

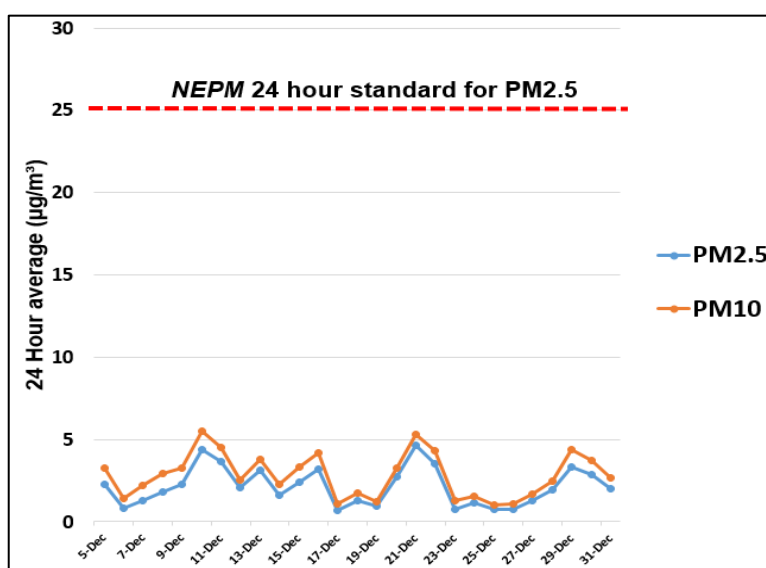


Figure 1: Average PM_{2.5} and PM₁₀ concentrations over 24 hours during December 2018.

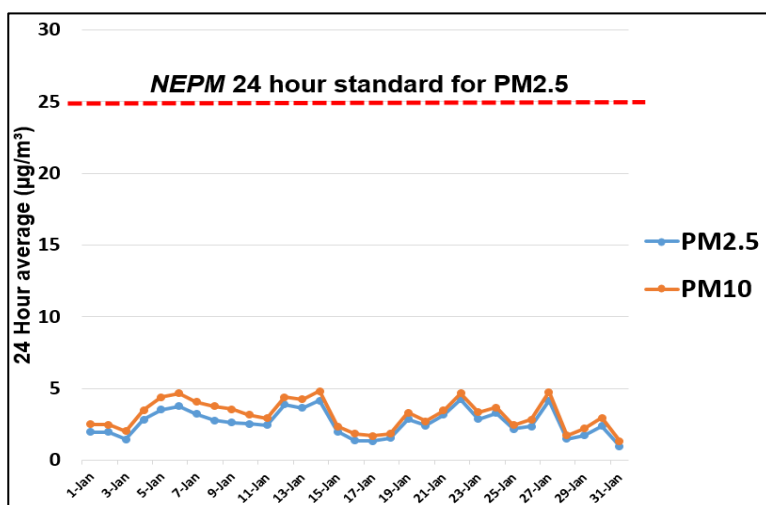


Figure 2: Average PM_{2.5} and PM₁₀ concentrations over 24 hours during January 2019.

Dust deposition

Dust deposition gauges measured dustfall rate at four sites during the month of November 2018. Airborne dust that settled in the gauge was collected, filtered and weighed to determine how much dust was deposited on average each day over one month (reported in **mg/m²/day**). A guideline of **120mg/m²/day** of insoluble dust averaged over one month is commonly used as an indication of dust nuisance.

During the month, the average dustfall rate was **75mg/m²/day**, below the guideline for dust nuisance. The highest dustfall rate across the four sites was 86mg/m²/day.



Figure 3: Dust gauge collection bottle contents.

Dust deposited in the gauges were also analysed to identify particle types. The majority of each sample consisted of **mineral dust from soil or rock (>70%)**, with small amounts of plant and insect debris, rubber dust and slime occurring in all samples. Minor to trace amounts of coal were detected in the samples, with an average of 2%.

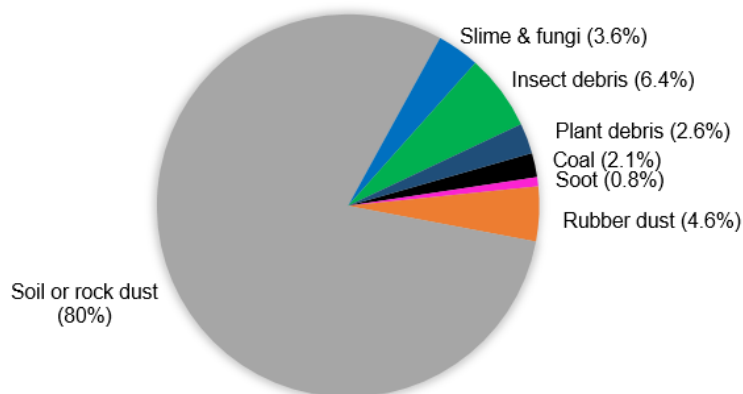


Figure 4: Average particle composition of dust gauge samples.

Surface wipe dust composition

The majority of each surface wipe dust sample consisted of **mineral dust from soil or rock**, and **black rubber dust**. Black rubber dust from tyre wear is common near roadways, and can be windblown into residential areas. Under microscope, rubber dust can be differentiated from other black coloured particles such as coal.

No significant coal particle proportions were detected, with only trace amounts (less than 1%) of coal identified in samples at one property.

Smaller proportions of insect and plant debris, cement dust and fibres were also detected across samples, which is common in domestic environments.

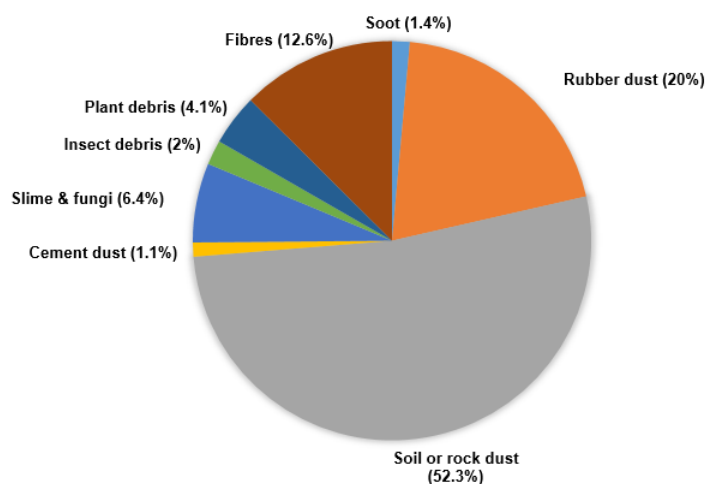


Figure 5: Average particle composition of surface wipe samples.

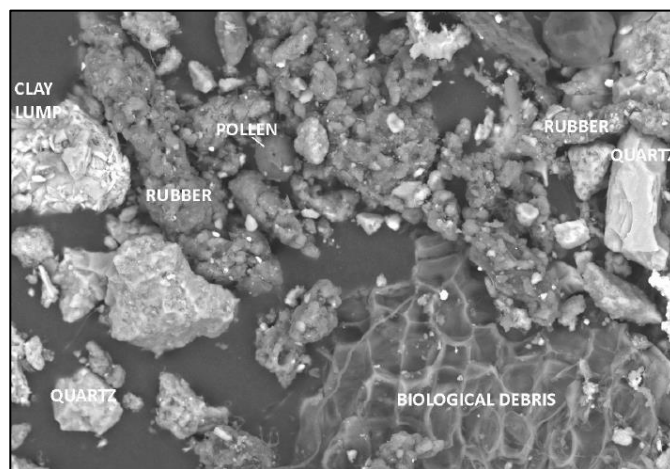


Figure 6: Microscope image of a surface wipe dust sample from Wynnum.

To learn more about the devices and see real-time readings, visit the PurpleAir webpage:

<https://www.purpleair.com/map?#11.73/-27.4541/153.0985>

To learn more about the project and air monitoring, visit the DES webpage:

<https://www.qld.gov.au/environment/pollution/monitoring/air/air-programs/wynnum-citizen-science>