UPPER HUNTER

Air Quality Monitoring Data Analysis

Summary of Key Report Findings

NSW MINING Upper Hunter Mining Dialogue

The Upper Hunter Mining Dialogue has analysed available long-term air quality data through our Upper Hunter Air Quality Monitoring Data Analysis project to address stakeholder perceptions of worsening air quality in the region.

THE DATA ANALYSIS PROJECT WAS DESIGNED TO ADDRESS TWO COMMUNITY QUESTIONS

In response to community concerns that air quality was progressively worsening in the Upper Hunter compared to the rest of NSW, the Dialogue agreed to analyse air quality data to answer the following two questions:

1. Has the air quality in the Upper Hunter changed since monitoring began?
2. Is the air quality in the Upper Hunter measured at the monitoring stations different from air quality measured at other locations in NSW?

UPPER HUNTER AIR QUALITY MONITORING DATA WAS OBSERVED BETWEEN 2013 TO 2019

The Upper Hunter Air Quality Monitoring Network was established between 2010 and 2012, with publicly available monitoring data from 2013 to 2019 included in the independent analysis.

NSW air quality monitoring networks continuously measure particles, including PM^{10} (particles with a diameter of 10 micrometres or less), and $PM^{2.5}$ (particles with a diameter of 2.5 micrometres or less).

DATA FROM UPPER HUNTER AIR QUALITY MONITORING STATIONS WAS COMPARED TO STATIONS IN THE FOLLOWING NSW REGIONS

- Central Tablelands
- Lower Hunter & Central Coast
- South West Slopes
- Sydney North West
- Illawarra
- North West Slopes
- Sydney East
- Sydney South West

TRENDS IN UPPER HUNTER AIR QUALITY LEVELS HAVE MIRRORED CHANGES IN AIR QUALITY IN OTHER NSW REGIONS OVER THE PAST SEVEN YEARS

The analysis found that concentrations in the Upper Hunter have varied significantly since 2013, but in a manner that is generally consistent with monitoring data collected at NSW Government stations across the remainder of NSW.

This means that while the Upper Hunter experienced overall declines in air quality during 2019 compared with previous years, the same deterioration in air quality was observed across other NSW monitoring stations.

A STRONG CORRELATION WAS IDENTIFIED BETWEEN A LACK OF RAINFALL AND INCREASING PARTICULATES WITH A CORRESPONDING DROP IN AIR QUALITY

The highest levels of PM^{10} concentration occurred during 2018 and 2019, as NSW continued to experience drought conditions. This increase was identified across all NSW regions throughout 2019, the driest year on record.

The report shows that lower than average rainfall is associated with above average particulate matter concentrations, with drought conditions also increasing the prevalence of wind, dust storms and bushfire activity which can impact air quality.

NO CORRELATION WAS IDENTIFIED BETWEEN THE INCREASE IN PM^{10} AND $PM^{2.5}$ LEVELS AND INCREASED COAL PRODUCTION IN THE UPPER HUNTER

The analysis used coal production and reported emissions data to review whether there was any correlation between ambient PM^{10} concentrations and mining activity.

While coal production levels in the region remained relatively steady across the study period, particulate matter levels increased which points to the impact of regional conditions such as rainfall, and are indicative of a minimal change in contribution from local emission sources inclusive of mining.

A COMPARISON OF $PM^{2.5}$ LEVELS FOUND TRENDS SIMILAR TO THE PM^{10} CONCENTRATIONS

As consistent with PM^{10} monitoring results, $PM^{2.5}$ concentrations were found to be elevated during both 2018 and 2019. The highest concentrations were measured at the Upper Hunter Air Quality Monitoring Network large populations station group, which likely contains a significant influence from wood smoke (CSIRO, 2013).

Trends in annual average concentrations were also found to be consistent with the remainder of NSW.

THE REPORT HAS BEEN PEER-REVIEWED BY THE CSIRO AND KEY OBSERVATION ARE SUPPORTED BY OBJECTIVE STATISTICAL ANALYSIS

The Dialogue engaged the CSIRO to undertake a peer review of ERM's draft report. All peer review recommendations were supported and have been incorporated into the final report.

The Dialogue has also included regression analyses to assess the statistical significance of the relationships observed in the report (i.e. relationships between annual average PM^{10} concentrations and variables such as coal production, NPI Reported PM^{10} Emissions from coal mining, and mean rainfall).

To find out more, visit miningdialogue.com.au

The full report and supporting communications documents can be found on the Upper Hunter Mining Dialogue website.