WOODLAWN ARC PROJECT

AIR QUALITY IMPACT ASSESSMENT

Any Air Quality Impact Assessment completed in NSW is required to follow guidelines from the NSW Environment Protection Authority (EPA)'s *Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales.*

How is the Air Quality Impact Assessment undertaken?

There are five primary components:

1. Baseline Analysis

Real-world local and regional monitoring data is gathered to assess trends in current air pollution concentrations and meteorological conditions. Appropriate impact assessment criteria, consistent with NSW EPA guidelines for the protection of human health and well being, are adopted. Sensitive receivers (such as residential properties) in the surrounding region are reviewed and selected.

2. Meteorological Modelling

To provide inputs to the air pollution emission dispersion modelling, detailed three-dimensional meteorological modelling is completed. The modelling incorporates terrain elevations, land cover types and real-world surface meteorological measurements to generate a meteorological field that varies with distance and time in the area surrounding the proposal.

3. Air pollution emission calculations

Air pollution emission rates are quantified using project specific emissions data. Average and peak emission rates are quantified for use in the dispersion modelling process.

Legend:
- BOUNDARY - HERON
- BOUNDARY - INTERMODAL
- BOUNDARY - PYLARA
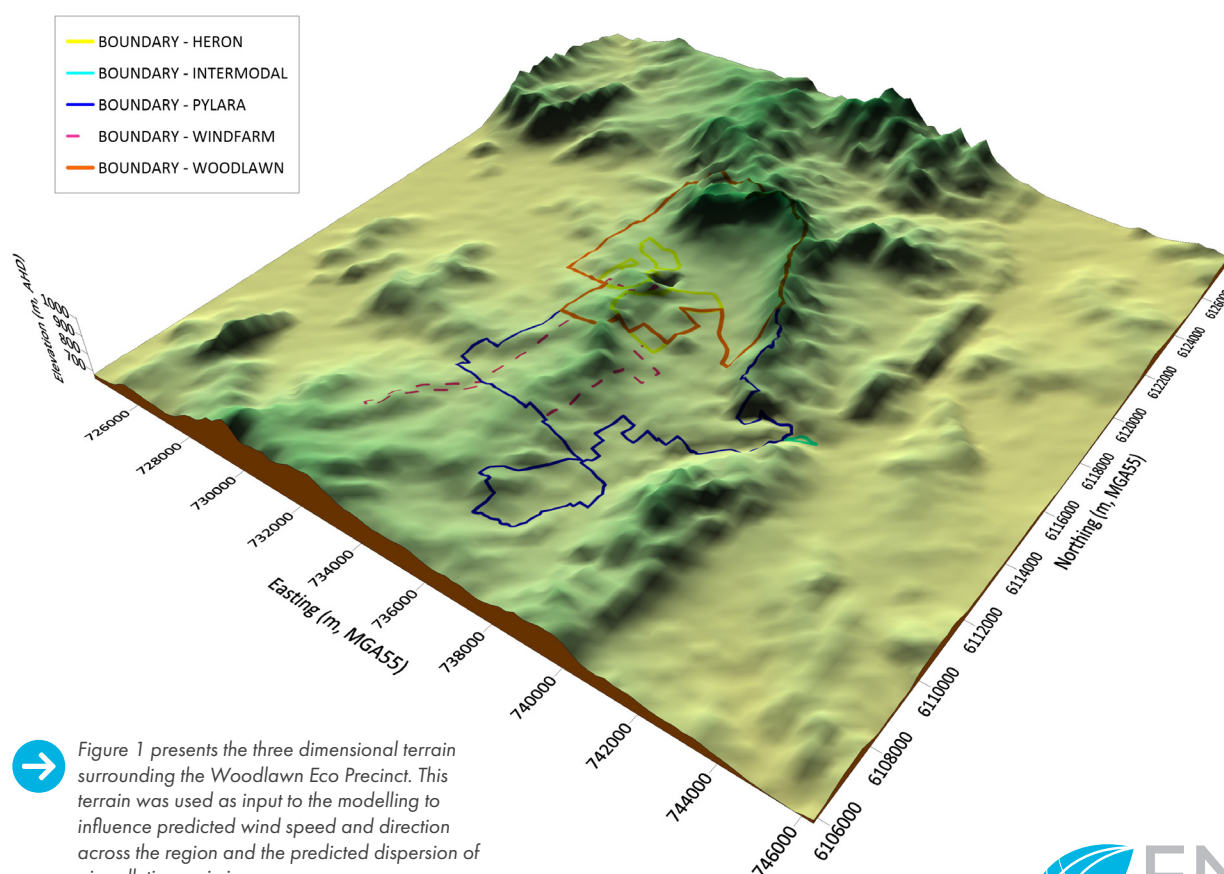- BOUNDARY - WINDFARM
- BOUNDARY - WOODLAWN

Figure 1 presents the three dimensional terrain surrounding the Woodlawn Eco Precinct. This terrain was used as input to the modelling to influence predicted wind speed and direction across the region and the predicted dispersion of air pollution emissions.

EMM
creating opportunities

4. Atmospheric Dispersion Modelling

Atmospheric dispersion modelling of air pollutant emissions is undertaken with a NSW EPA approved dispersion model, following recommend model settings and configurations.

The dispersion model combines input meteorological data, terrain data, sensitive receptor locations and calculated emissions data to predict ground level concentrations in the surrounding environment on a 1-hour basis for an entire 12-months.

5. Air Quality Impact Assessment

The results of the dispersion modelling are then combined with regional air quality background datasets to predict cumulative air quality impacts at surrounding sensitive locations.

Adopted NSW EPA impact assessment criteria are compared against the predicted concentrations to determine the significance of potential impacts. The results of the dispersion modelling are used to appraise the effectiveness of proposed emission mitigation technology and inform the selection of future ambient air quality monitoring locations.
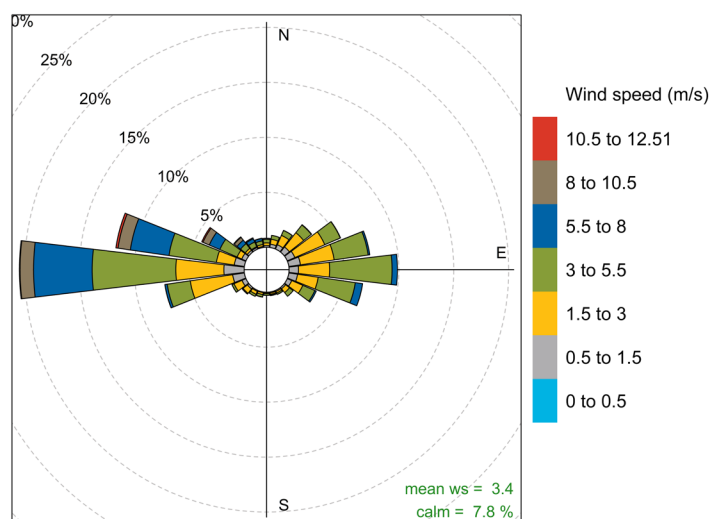
Frequency of counts by wind direction (%)

The Eco Precinct meteorological station records parameters such as wind, temperature, and rainfall. Long term records from the Eco Precinct meteorological station were analysed to understand prevailing winds in the area. The wind rose plot in figure 2 shows the frequency of recorded wind speed and direction (wind blowing from). There is a dominance of westerly and easterly air flow and this has been incorporated into the dispersion modelling for the Woodlawn ARC project air quality impact assessment.

Figure 3 illustrates the background air quality concentrations for PM$_{2.5}$ (fine particulate matter) recorded in Canberra and Goulburn between 2014 and 2021. Across the presented years, the graph shows routine seasonal variation during the colder months which is associated with domestic wood heating. There is also a notable increase in recorded concentrations between November 2019 and February 2020 associated with bushfire emissions.

It is important to understand that ambient concentrations of air pollutants exist in the atmosphere. The existing concentrations of air pollutants are taken into account when determining cumulative impacts for the Woodlawn ARC project.