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Re: M8 MCoA_E17 - Report on above ambient goal recording - July 2020 to July 2021

Dear Justin,

1 Introduction

The Ministers Condition of Approval (MCoA) E17 for WestConnex M8 (New M5) includes a requirement for ambient monitoring notification and reporting, as follows:

Within 20 working days of any Notification of Above-Goal Recording, the Proponent must prepare and submit to the Secretary a Report on Above-Goal Recording that details the cause and major contributor of the exceedance and the options available to prevent recurrence.

Where the operation of the tunnel is identified to be a significant contributor to the recorded above-goal reading, the Report on Above-Goal Recording must include consideration of improvements to the tunnel air quality management system so as to achieve compliance with the ambient air quality goals, including but not limited to installation of the additional ventilation management facilities allowed for under condition B5, and discussion of whether those improvements are feasible and reasonable.

The Proponent must comply with any requirements arising from the Secretary's review of the Report on Above-Goal Recording.

A *Notification of Ambient Above-Goal Recording* was sent to DPIE¹, NSW EPA and NSW Health for annual average PM_{2.5} exceedances which occurred for the period 4 July 2020 to 4 July 2021, at a number of the M8 ambient monitoring sites.

In accordance with MCoA E17, the purpose of this report is to follow up on the notification and provide a Report on Above-Goal Recording, identifying the cause and major contributor for the exceedance.

¹ Department of Planning, Industry and Environment

2 Analysis of above-goal recordings

The above-goal recordings for annual average PM_{2.5} concentrations are summarised in Table 2.1.

Table 2.1 Summary of above-goal recording

Date	Site	Pollutant	Concentration ($\mu\text{g}/\text{m}^3$)
			Goal = 8 $\mu\text{g}/\text{m}^3$
4 July 2020 to 4 July 2021	Arncliffe 2 (Eve St)	PM _{2.5}	8.6
	Barton Park		8.3
	Kingsgrove 2 (Kingsgrove Rd)		8.1
	St Peters 1 (Campbell St)		10.5
	St Peters 2 (SPI)		8.4
	St Peters 3 (St Peters St)		9.7

2.1 Analysis

The annual average PM_{2.5} concentration for the period 4 July 2020 to 4 July 2021 for all M8 monitoring sites are presented Figure 2.1. Also presented in the plot are the annual average PM_{2.5} concentrations recorded at the DPIE air quality monitoring stations (AQMS) for the central east region. Figure 2.1 shows that:

- annual average PM_{2.5} concentrations are at or above the goal of 8 $\mu\text{g}/\text{m}^3$ at five of the seven DPIE AQMS for the central-east, including the site closest to the M8 monitoring locations (Earlwood);
- the only DPIE AQMS that are not above goal of 8 $\mu\text{g}/\text{m}^3$ are those located further east and closer to the coast (Randwick and Rozelle);
- annual average PM_{2.5} concentration recorded at Arncliffe (Eve St), Barton Park, Kingsgrove Rd and St Peters (SPI) are comparable to the concentrations recorded at the DPIE AQMS; and
- annual average PM_{2.5} concentration recorded at St Peters (Campbell St) (10.5 $\mu\text{g}/\text{m}^3$) and St Peters (St Peters St) (9.7 $\mu\text{g}/\text{m}^3$) are higher than concentrations recorded at all other monitoring sites.

Exceedances of the annual average PM_{2.5} concentrations occur every year across Sydney², with the highest concentrations often observed at AQMS across western Sydney. The above-goal recordings for annual average PM_{2.5} concentrations at the M8 monitoring sites are a result of poor regional air quality rather than any significant or specific contribution from the motorway or ventilation outlets. Although the annual average PM_{2.5} concentration recorded at St Peters (Campbell St) (10.5 $\mu\text{g}/\text{m}^3$) and St Peters (St Peters St) (9.7 $\mu\text{g}/\text{m}^3$) are noticeably higher, this is most likely a result of the siting of these stations, for example close to busy surface roads (ie Princes Highway). The DPIE AQMS, on the other hand, are specifically sited to avoid source hot spots, as they aim to measure air pollution exposure typical of the general population.

The mean hourly PM_{2.5} concentrations for the period 4 July 2020 to 4 July 2021 are plotted with wind speed and direction and presented as polar plots in Figure 2.2. The plots demonstrate that the highest mean hourly PM_{2.5} concentrations occur under winds from all directions with no clear or obvious signal from the St Peters ventilation outlet (the location of the ventilation outlet relative to the monitoring locations is shown in Figure A.1).

² <https://www.environment.nsw.gov.au/topics/air/nsw-air-quality-statements#accordion-2013-to-201944169632>

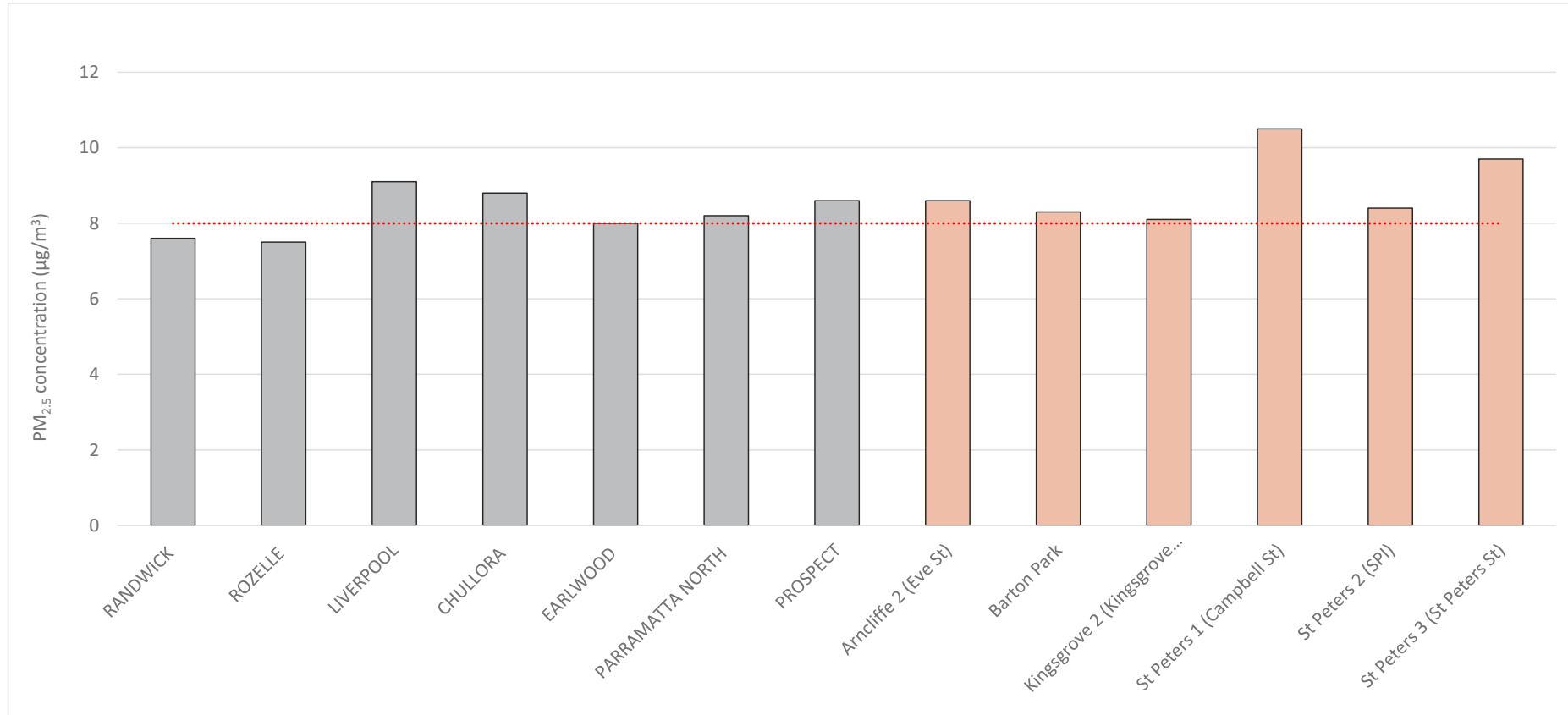
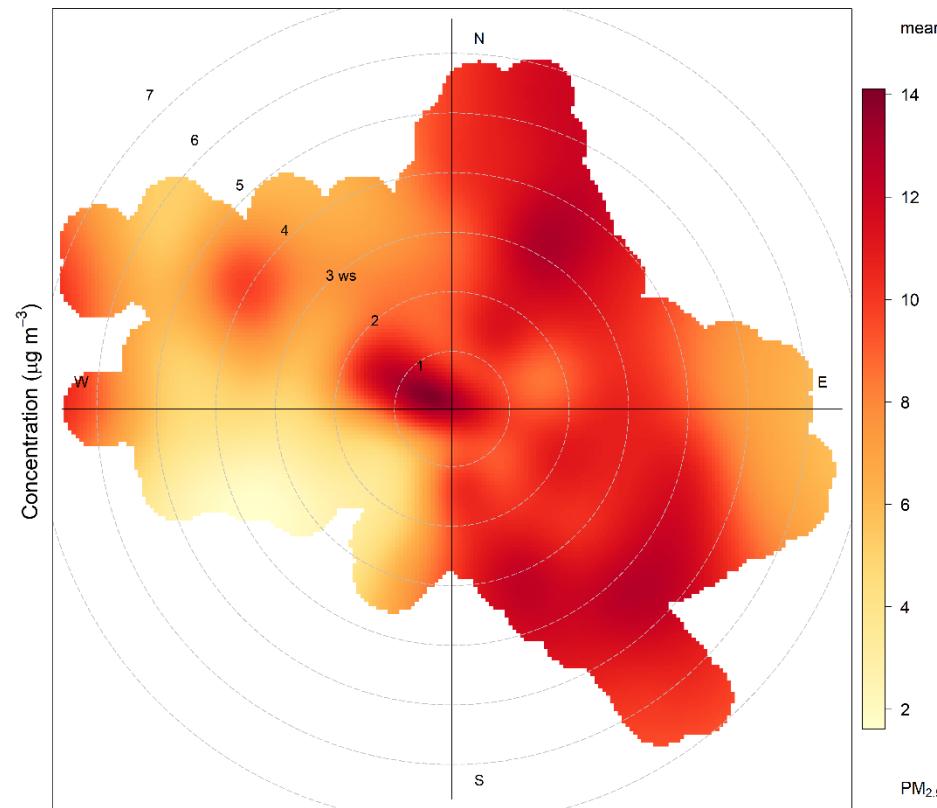
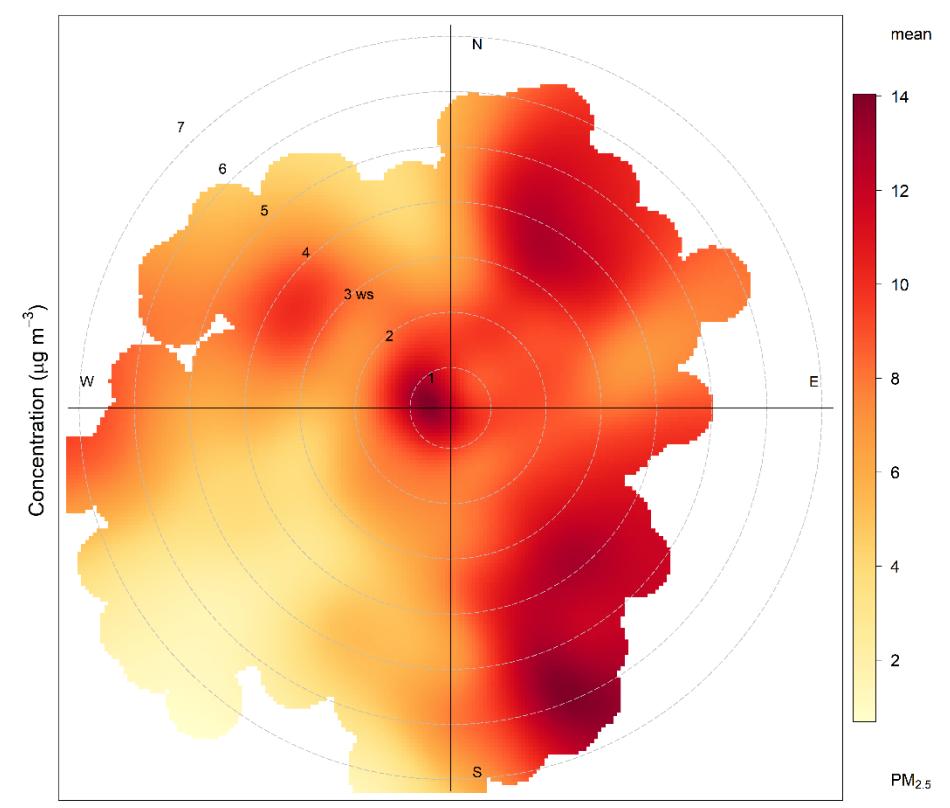


Figure 2.1 Annual average PM_{2.5} concentration ($\mu\text{g}/\text{m}^3$) for DPIE Central East and M8 monitoring sites for the period 4/07/2020 to 4/07/2021



St Peters 1 (Campbell St)



St Peters 3 (St Peters St)

Figure 2.2 Polar plot of mean 1-hour PM_{2.5} concentration ($\mu\text{g/m}^3$) for St Peters 1 and St Peters 3 for the period 4/07/2020 to 4/07/2021

3 Conclusion

Our review of ambient air quality data has found that the operation of the tunnel has not caused nor is a major contributor to the above-goal recording for annual average PM_{2.5} concentration from 4 July 2020 to 4 July 2021, for the following reasons:

- annual average PM_{2.5} concentrations are at or above the goal of 8 µg/m³ at five of the seven DPIE AQMS for the central-east, including the site closest to the M8 monitoring locations (Earlwood);
- the above-goal recordings for annual average PM_{2.5} concentrations at the M8 monitoring sites are a result of poor regional air quality rather than any significant or specific contribution from the motorway or ventilation outlets; and
- highest mean hourly PM_{2.5} concentrations occur under winds from all directions with no clear or obvious signal from the St Peters ventilation outlet.

Yours sincerely



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Appendix A

Monitoring locations

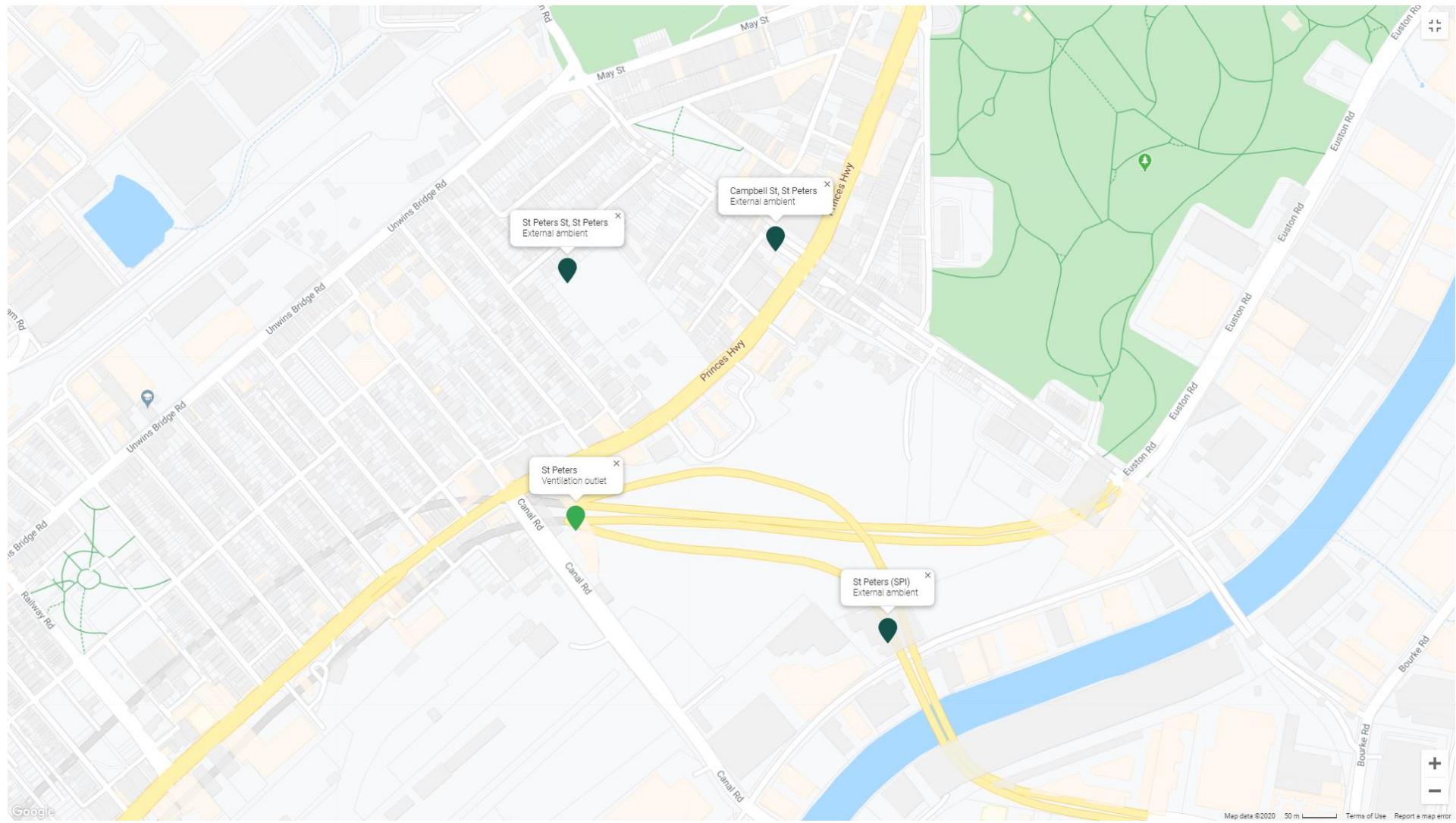


Figure A.1 St Peters monitoring locations

Figure A.2 Arncliffe monitoring locations

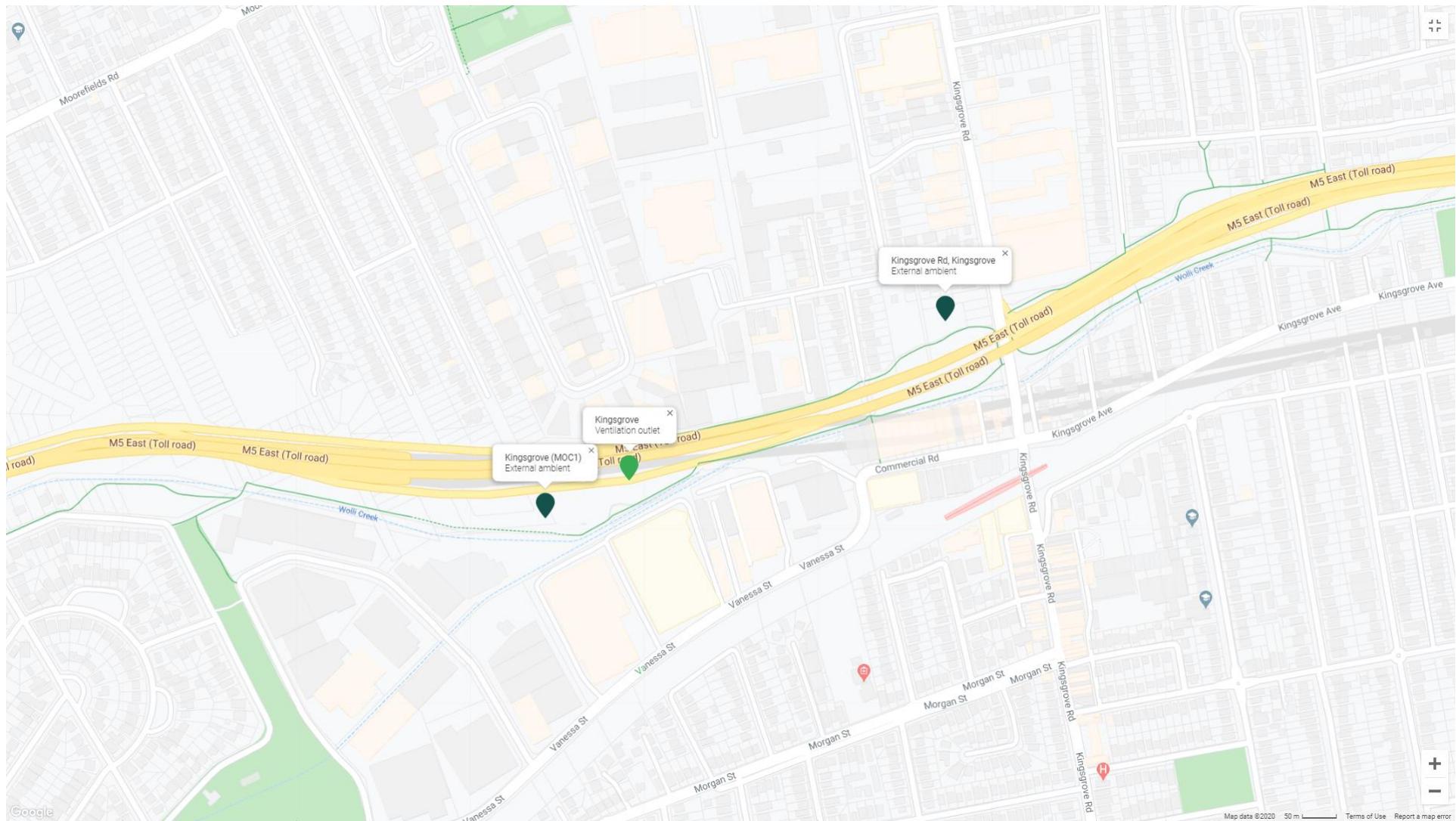


Figure A.3 Kingsgrove monitoring locations