Wallgrove Road Business Hub

Air Quality and Odour Assessment

Western Sydney Parklands Trust

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Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Western Sydney Parklands Trust (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

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Appendix B **Operational Phase Risk Assessment Methodology**
Appendix C **Odour Risk Assessment Methodology**

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Appendix E General Air Quality Mitigation Measures for Construction Sites

1.0 Introduction

In June 2024, SLR Consulting Australia Pty Ltd (SLR) prepared an Air Quality and Odour Assessment (AQOA) (SLR 2024) for Western Sydney Parklands Trust (WSPT) relating to the proposed construction and operation of a Business Hub in Cecil Park known as Wallgrove Business Hub (WBH) located at 97-123 & 125-151 Wallgrove Road, Cecil Park NSW 2178 (the Site) within the Fairfield City Council in response the State Significant Development Application (SSD- 50972718) for the proposal.

On 3 June 2025, the Department of Planning, Housing and Infrastructure (DPHI) requested additional information relating to the Project. The specific request concerning air quality impacts during the construction phase of the Project is outlined below:

> *"The air quality assessment does not appear to have considered the adjoining residential property at 11 Kosovich Place, Cecil Park. Given the property's close proximity to the site (approximately 20-25 m), there is potential for increased impacts from construction activities that have not been adequately addressed."*

In response to this request, the list of receptors with the potential to be affected by air quality impacts from both the construction and operational phases of the Project (refer to **Section 7.0** and **Section 8.0**) has been revised to incorporate the identified residence. Subsequently, the relevant assessments have been reviewed and updated based on the revised receptor list.

1.1 Approach to Assessment

A quantitative modelling assessment of potential dust emissions associated with the construction activities would require a number of assumptions to be made to enable the estimation of particulate emission rates for input into the models. The uncertainty associated with the output of such studies means it would be of limited value and would not (in itself) assist with the identification of air quality control measures to actively manage the risks.

SLR has therefore performed a qualitative (risk-based) assessment of construction impacts, based on the information available, to identify those activities that have the potential for off-site air quality impacts if not adequately controlled, so that appropriate mitigation measures can be identified and incorporated into the project design and relevant environmental management plans.

As the proposed warehouse buildings will be used for general warehousing and distribution, the primary sources of air emissions during the operational phase are expected to be products of fuel combustion and particulate matter generated by trucks and other vehicles accessing the Site.

Accordingly, a first-pass screening assessment of air quality impacts from vehicle-related activities has been undertaken. The results of this screening have informed a subsequent risk-based assessment of the proposed operational activities.

1.1.1 Construction Impact Assessment Methodology

For the assessment of construction phase impacts, the IAQM Guidance on the Assessment of Dust from Demolition and Construction, developed in the United Kingdom by the Institute of Air Quality Management (IAQM 2024), has been used to provide a qualitative assessment method (see **Appendix A** for full methodology). The IAQM method uses a four-step process for assessing potential dust impacts from construction activities:

- **Step 1:** Screening based on distance to the nearest sensitive receptor; whereby the sensitivity to dust deposition and human health impacts of the identified sensitive receptors is determined.

- **Step 2**: Assess risk of dust effects from activities based on:
  - the scale and nature of the works, which determines the potential dust emission magnitude; and
  - the sensitivity of the area surrounding dust-generating activities.
- **Step 3**: Determine site-specific mitigation for remaining activities with greater than negligible effects.
- **Step 4**: Assess significance of remaining activities after management measures have been considered.

1.1.2 Operational Impact Assessment Methodology

A semi-quantitative risk-based assessment approach has been adopted for the proposed operational activities of the Project (refer to **Appendix B** and **Appendix C** for full methodology).

The risk-based operational assessment methodology takes account of a range of impact descriptors, including the following:

- **Nature of Impact**: does the impact result in an adverse or beneficial environment?
- **Sensitivity**: how sensitive is the receiving environment to the anticipated impacts? This may be applied to the sensitivity of the environment in a regional context or specific receptor locations.
- **Magnitude**: what is the anticipated scale of the impact?

As the operational activities associated with the Project are limited to general warehousing and distribution, the primary potential air quality concern during the operational phase is the emission of combustion products and particulate matter from traffic accessing the Site.

To assess these potential impacts, the Roadside Air Quality Screening Tool (RAQST)1 developed by Transport for NSW (TfNSW) has been employed as part of a risk-based assessment approach (refer to **Appendix D**). RAQST is a simplified screening-level tool derived from the road vehicle emissions model and is designed for first-pass evaluation of air quality impacts related to new or existing road developments. The tool applies worst-case assumptions to determine whether a more detailed assessment is warranted and is considered to provide conservative estimates of potential incremental impacts. TfNSW recommends RAQST for use as a conservative method for predicting near-field ground-level pollutant concentrations from road traffic.

The assessment integrates the sensitivity of the surrounding environment with the magnitude of the potential impact to determine the overall significance of the change. Given the nature of the proposed warehousing operations, this approach is considered appropriate for identifying key activities that may result in off-site air quality impacts. This enables the identification of suitable mitigation measures, if required.

Where appropriate, the recommendations from this assessment may include undertaking more detailed dispersion modelling for specific operational activities, once detailed design information becomes available, to verify that the proposed mitigation measures will ensure compliance with relevant air quality criteria.

1

2.0 Project Overview

2.1 Site Location

The Site is located at 97-123 & 125-151 Wallgrove Road, Cecil Park NSW 2178 within the Fairfield Local Government Area (LGA), approximately 15 kilometres (km) southwest of the Parramatta Central Business District (CBD) and 34 km southwest of the Sydney CBD. The regional location of the Site is shown in **Figure 1**.

Figure 1 Regional Location of the Site

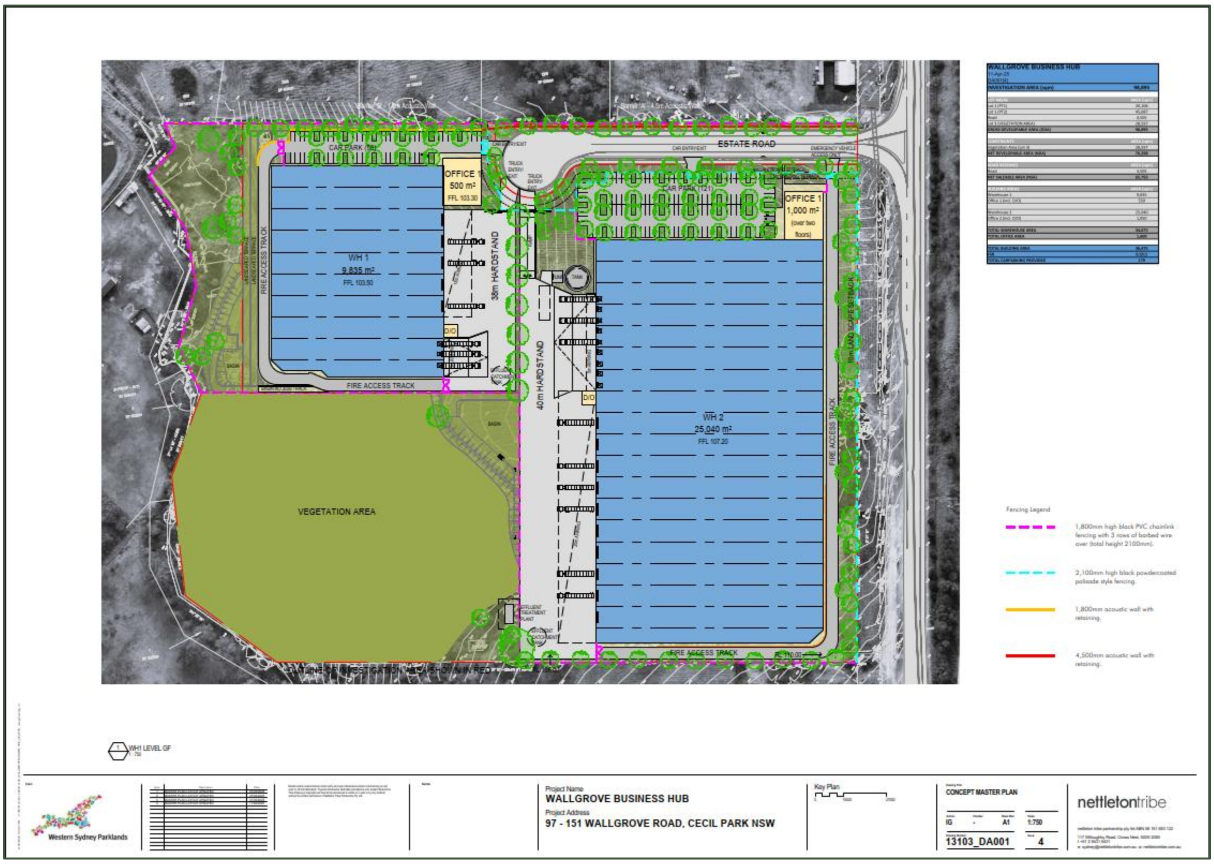
2.2 Proposal Description

The main elements of the concept proposal include:

- Access to the Site off Wallgrove Road at the northern boundary, with a turning head in the middle of the site.
- Building 1, setback approximately 230 m from Wallgrove Road, with industrial/warehouse space of approximately 10,385 m^2 and with ancillary office spaces
- Building 2, located adjacent to Wallgrove Road, with industrial/warehouse space of approximately 26,090 m^2, with ancillary office spaces.
- Loading docks, truck hardstand areas and carparking areas.

The concept masterplan for the proposal is shown in **Figure 2**.

Figure 2 Warehouse Ground Floor Plan



3.0 Emission Sources and Pollutants of Concern

3.1 Project Construction Works

The main air quality issues associated with construction works relate to emissions of fugitive dust. The potential for dust to be emitted during the construction works will be directly influenced by the nature of the activities being performed at any given time. Generally, the activities that are most likely to lead to short-term emissions of dust, include:

- Grading.
- Loading and unloading of materials.
- Wheel-generated dust and combustion emissions from construction equipment.
- Wheel-generated dust from trucks travelling on unpaved surfaces.
- Wind erosion of exposed surfaces.

Temporary elevations in local dust levels are most likely to occur when construction activities are undertaken during periods of low rainfall and/or windy conditions. The impact of elevated dust emissions is dependent upon the potential for particulates to become and remain airborne prior to being deposited as dust or experienced as an ambient particulate concentration.

A number of environmental factors may affect the generation and dispersion of dust emissions, including:

- Wind direction - determines whether dust and suspended particles are transported in the direction of the sensitive receptors.
- Wind speed - determines the potential suspension and drift resistance of particles.
- Surface type - more erodible surface material types have an increased soil or dust erosion potential.
- Surface material moisture - increased surface material moisture reduces soil or dust erosion potential; and
- Rainfall or dew - rainfall or heavy dew that wets the surface of the soil reduces the risk of dust generation.

Where diesel-powered mobile machinery and vehicles are being used, localised elevations in ambient concentrations of combustion-related pollutants may also occur, however any potential for the relevant impact assessment criteria for these pollutants to be exceeded at surrounding sensitive areas will be minimal. Fugitive dust emissions are generally considered to have the greatest potential to give rise to downwind air quality impacts at construction sites.

Potential air quality impacts associated with fugitive dust emissions from the construction phase of the Project have been addressed in **Section 7.0**.

3.2 Project Operations

During the operational phase, the main source of air emissions would be emissions of products of fuel combustion and particulate matter (from brake and tyre wear as well as re-entrainment of road dust) associated with the trucks and other vehicles entering and leaving or idling at the Site during loading/unloading operations.

Emissions associated with the combustion of fuel (diesel, petrol, etc.) in road vehicles will include carbon monoxide (CO), oxides of nitrogen (NO_x), particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide (SO_2) and volatile organic compounds (VOCs).

The rate and composition of air pollutant emissions from road vehicles is a function of a number of factors, including the type, size and age of the vehicles, the type of fuel combusted, number and speed of vehicles and the road gradient.

According to the traffic generation rates provided by Western Sydney Parklands Trust and the Project Gross Floor Area (GFA), the hourly Project traffic generation is anticipated to be 290 vehicles per hour (vph) for AM peak and 328 vph for PM peak. SLR understands that the Project related traffic generation composition during AM peak includes 20% light duty vehicles and 80% heavy duty vehicles (Bitzios Consulting 2023).

3.3 Pollutants of Concern

As identified in **Section 3.1** and **Section 3.2**, the key air pollutants of interest are considered to be particulate matter from construction works, and traffic emissions (products of fuel combustion and wheel-generated particulate matter) from operations.

Particulate Matter

Airborne contaminants that can be inhaled directly into the lungs can be classified on the basis of their physical properties as gases, vapours or particulate matter. In common usage, the terms “dust” and “particulates” are often used interchangeably. The health effects of particulate matter are strongly influenced by the size of the airborne particles. Smaller particles can penetrate further into the respiratory tract, with the smallest particles having a greater impact on human health as they penetrate to the gas exchange areas of the lungs. Larger particles primarily cause nuisance associated with coarse particles settling on surfaces.

The term “particulate matter” refers to a category of airborne particles, typically less than 30 microns (µm) in diameter and ranging down to 0.1 µm and is termed total suspended particulate (TSP). Particulate matter with an aerodynamic diameter of 10 microns or less is referred to as PM_{10}. The PM_{10} size fraction is sufficiently small to penetrate the large airways of the lungs, while $PM_{2.5}$ (2.5 microns or less) particulates are generally small enough to be drawn in and deposited into the deepest portions of the lungs. Potential adverse health impacts associated with exposure to PM_{10} and $PM_{2.5}$ include increased mortality from cardiovascular and respiratory diseases, chronic obstructive pulmonary disease and heart disease, and reduced lung capacity in asthmatic children.

Nuisance Dust

In addition to the health effects of suspended particulate matter, nuisance impacts also need to be considered, mainly in relation to deposited dust. Dust can cause nuisance by settling on surfaces and possessions, affecting visibility and contaminating tank water supplies. High rates of dust deposition can also adversely affect vegetation by blanketing leaf surfaces.

Products of Combustion

Emissions associated with road traffic and the combustion of fossil fuels (diesel, petrol, AVGAS etc.) will include CO, NO_x, particulate matter, SO_2 and VOCs.

CO is an odourless, colourless gas formed from the incomplete burning of fuels in motor vehicles. It can be a common pollutant at the roadside and highest concentrations are found at the kerbside with concentrations decreasing rapidly with increasing distance from the road. CO in urban areas results almost entirely from vehicle emissions and its spatial distribution follows that of traffic flow. The incomplete combustion of fuel in diesel powered vehicles can generate particulate in the form of black soot.

NO_X is a general term used to describe any mixture of nitrogen oxides formed during combustion. In atmospheric chemistry, NO_X generally refers to the total concentration of nitric oxide (NO) and nitrogen dioxide (NO_2). NO is a colourless and odourless gas that does not significantly affect human health. However, in the presence of oxygen, NO can be oxidised to NO_2 which can have significant health effects including damage to the respiratory tract and increased susceptibility to respiratory infections and asthma. NO will be converted to NO_2 after being emitted from engine exhausts.

Engine exhausts can contain emissions of SO_2 due to impurities in the fuel. The sulfur content of diesel fuel in Australia has been significantly reduced over the years and ambient SO2 concentrations in Australian cities are typically well below regulatory criteria.

Volatile organic compounds (VOCs) may be emitted as a result of the incomplete combustion of fuel. VOC emissions are reducing significantly due to the improved combustion processes offered by modern engines.

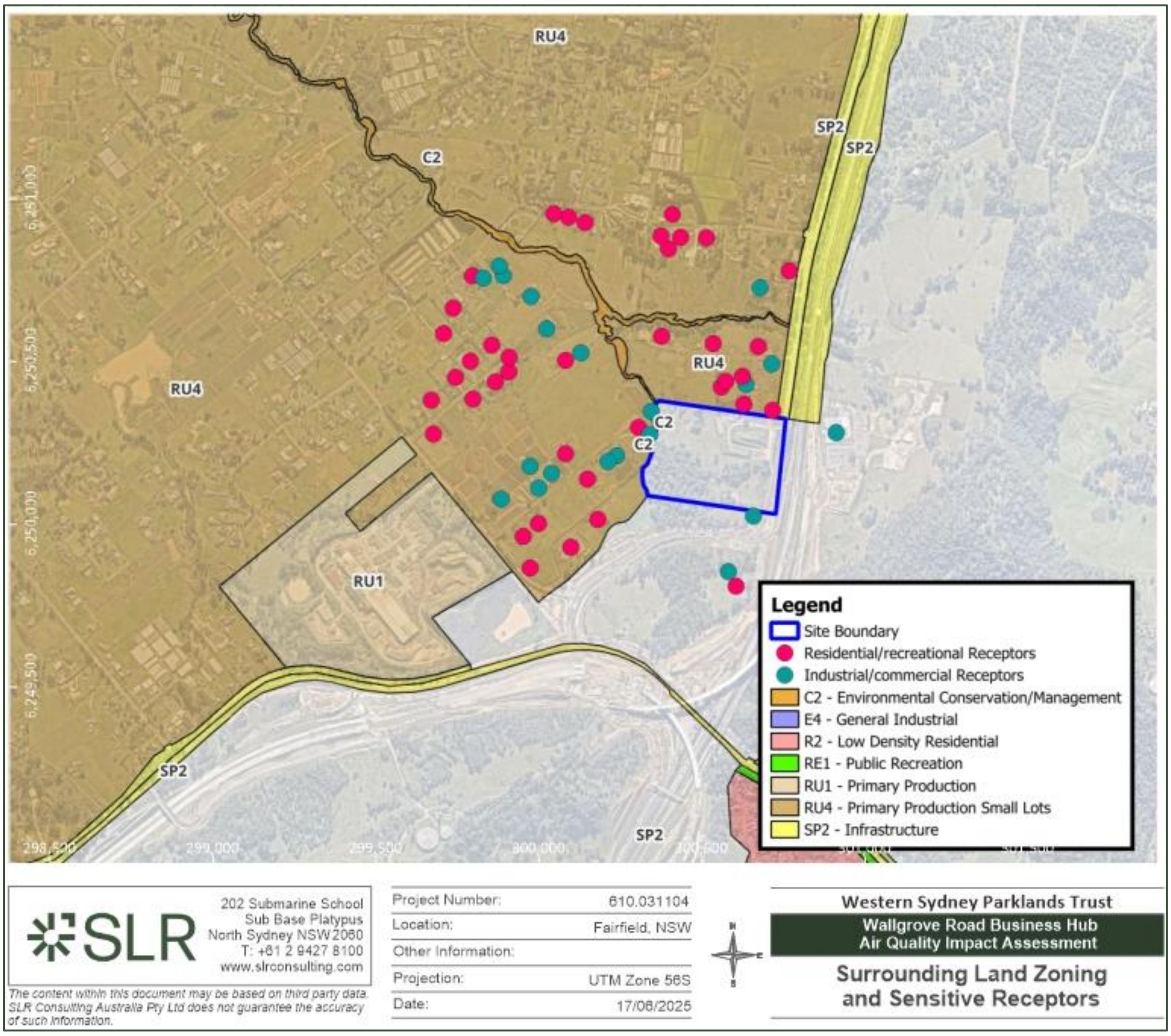
4.0 Existing Environment

4.1 Surrounding Land Zoning and Receptors

As shown in **Figure 3**, the Site and land to its south and east are Unzoned Land (UL). The areas north of the Site are zoned Primary Production Small Lots (RU4) and Infrastructure (SP2) and the lands to its west are zoned Environmental Conservation (C2) and RU4.

The nearest residential or recreational receptor is located approximately 20 m north of the Site boundary located at 11 Kosovich Place. Industrial and commercial receptors are situated in all directions around the Site, with the closest located immediately adjacent to the western boundary.

Figure 3 Surrounding Land Zoning and Receptors



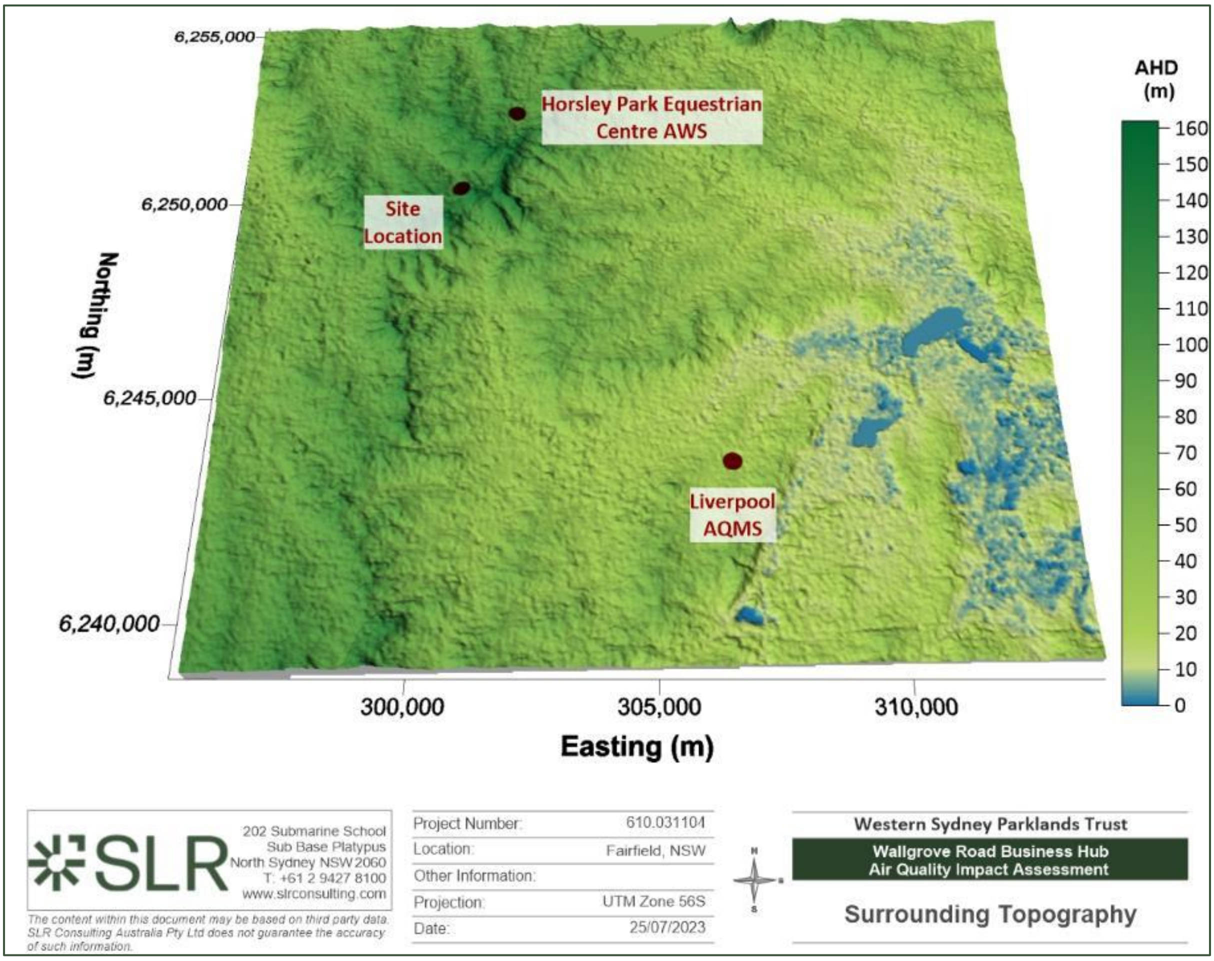
4.2 Topography

Local topography is important in air quality studies as local atmospheric dispersion can be influenced by night-time katabatic (downhill) drainage flows from elevated terrain or channelling effects in valleys or gullies.

The topography of the Site and near surrounds is relatively flat with an elevation of the approximately 110 m Australian Height Datum (AHD). A three-dimensional representation of the area surrounding the Site is presented in **Figure 4**. The locations of Horsley Park

Equestrian Centre automatic weather station (AWS; refer **Section 4.3**) and Liverpool air quality monitoring station (AQMS; refer **Section 6.0**) are also indicated.

Figure 4 Regional Topography



4.3 Local Meteorology

4.3.1 Wind Speed and Wind Direction

Local wind speed and direction influence the dispersion of air pollutants. Wind speed determines both the distance of downwind transport and the rate of dilution as a result of 'plume' stretching. Wind direction, and the variability in wind direction, determines the general path pollutants will follow and the extent of crosswind spreading. Surface roughness (characterised by features such as the topography of the land and the presence of buildings, structures and trees) will also influence dispersion.

The Bureau of Meteorology (BoM) maintains and publishes data from weather stations across Australia. The closest such station recording wind speed and wind direction data is the Horsley Park Equestrian Centre Automatic Weather Station (AWS), located approximately 3.2 km southeast of the Site (Station ID 67119). For the purpose of this assessment, it is assumed that the wind conditions recorded at Horsley Park Equestrian Centre AWS are representative of the wind conditions experienced at the Site.

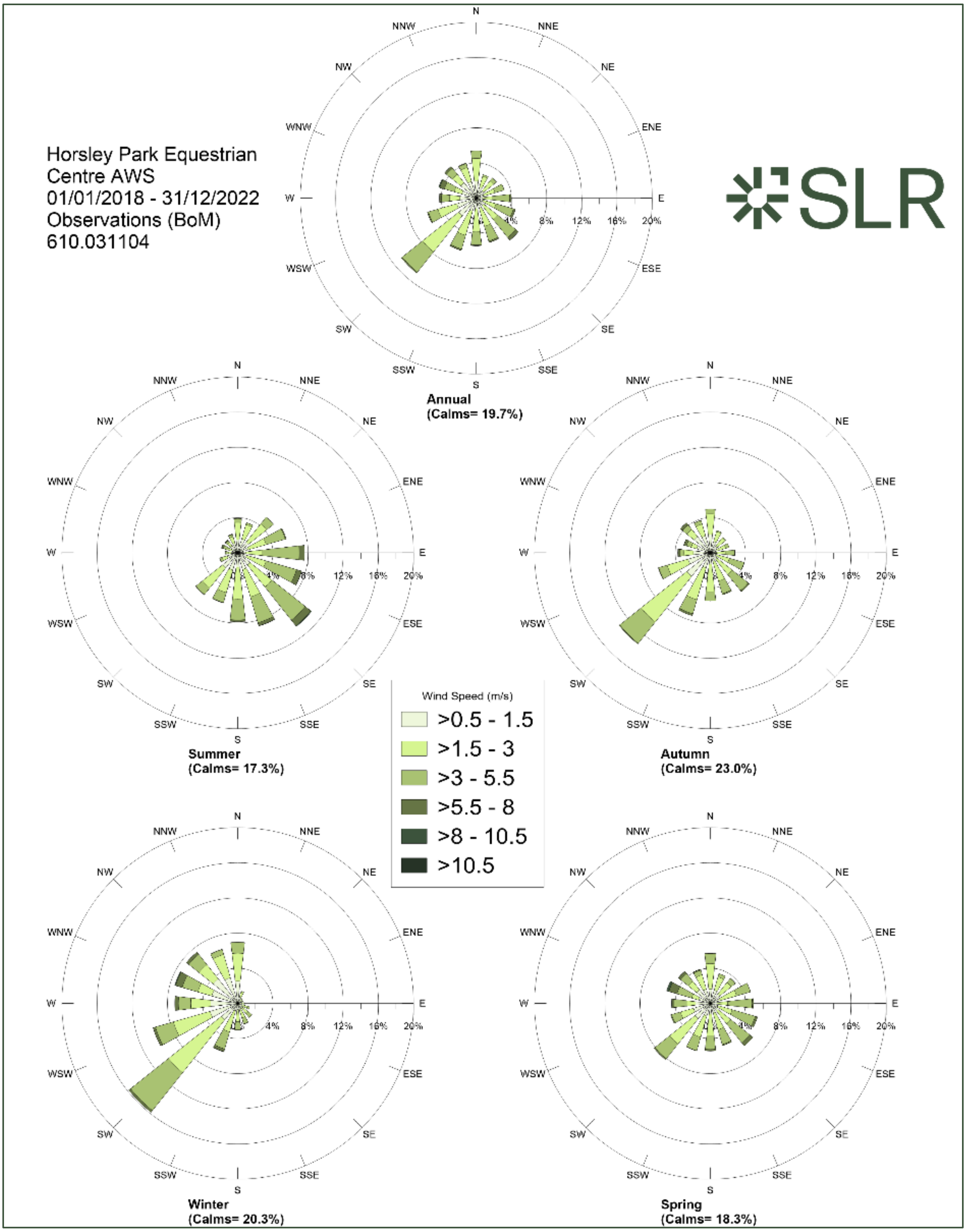
Annual and seasonal wind roses for the years 2018 to 2022 compiled from data recorded by the Horsley Park Equestrian Centre AWS are presented in **Figure 5**. Wind roses show the frequency of occurrence of winds by direction and strength. The bars correspond to the 16 compass points (degrees from North). The bar at the top of each wind rose diagram represents winds blowing from the north (i.e. northerly winds), and so on. The length of the bar represents the frequency of occurrence of winds from that direction, and the widths of the bar sections correspond to wind speed categories, the narrowest representing the lightest winds. Thus, it is possible to visualise how often winds of a certain direction and strength occur over a long period, either for all hours of the day, or for particular periods during the day.

The annual wind rose for the years 2018 to 2022 (**Figure 5**) indicate that the frequency of winds is generally even in each direction with more winds from south-western quadrant and less winds from north-eastern quadrant. The five-year frequency of calm wind conditions was recorded to be 19.7% for years 2018 and 2022.

The seasonal wind roses for the years 2018-2022 (**Figure 5**) indicate that:

- In summer, wind speeds ranged from calm to strong winds (between 0.5 m/s and 9.8 m/s). The majority of winds originated from southern and eastern quadrants, with very few winds from north-western direction. Calm wind conditions were recorded approximately 17% of the time during summer.
- In autumn, wind speeds ranged from calm to strong winds (between 0.5 m/s and 9.1 m/s). The majority of winds originated from southern and western quadrants, with very few winds from north-eastern quadrant. Calm wind conditions were observed to occur approximately 23% of the time during autumn.
- In winter, wind speeds ranged from calm to strong winds (between 0.5 m/s and 10.0 m/s). The majority of winds originated from western quadrant, with very few winds from north-eastern quadrant. Calm wind conditions were observed to occur approximately 20% of the time during winter.
- In spring, wind speeds ranged from calm to strong winds (between 0.5 m/s and 10.0 m/s). The frequency of winds is generally even in each direction with more winds from north and southwest directions. Calm wind conditions were observed to occur approximately 18% of the time during spring.

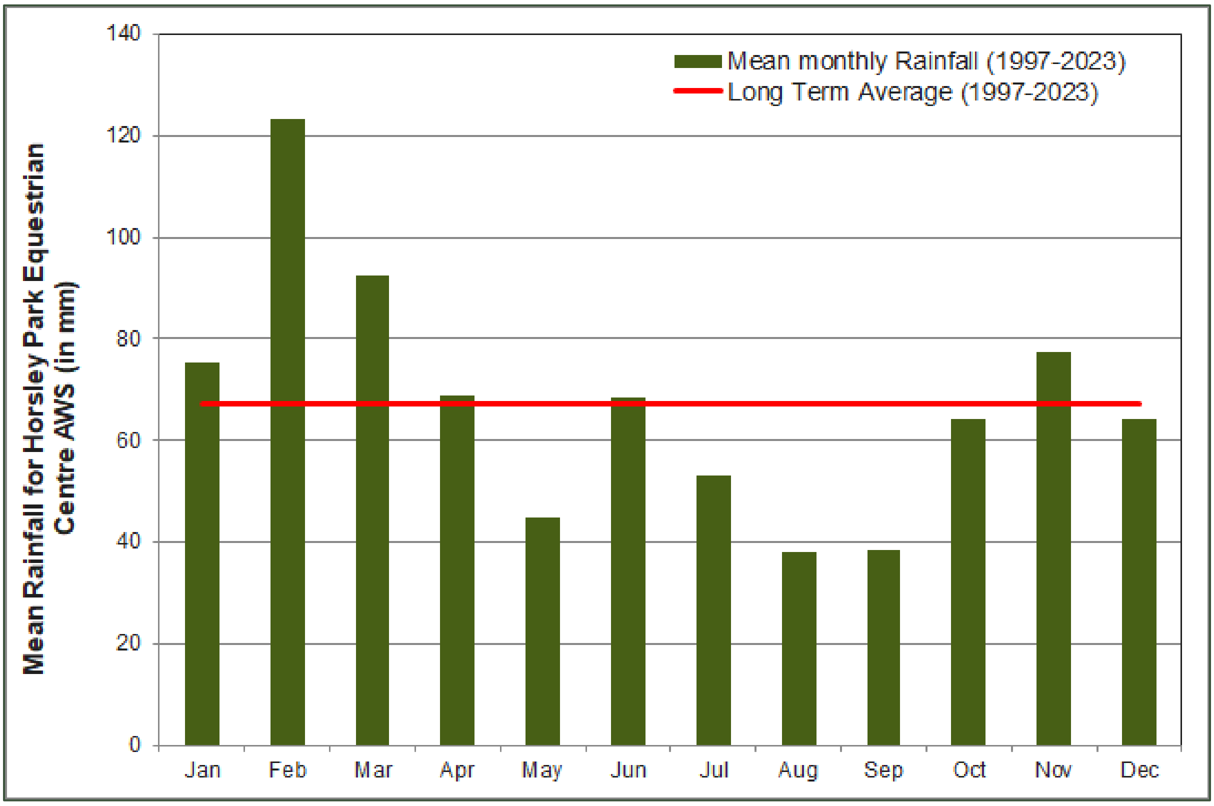
Figure 5 Annual Wind Roses for Horsley Park Equestrian Centre AWS (2018 to 2022)



4.3.2 Rainfall

Dry periods (no rainfall) have the greatest potential for fugitive dust emissions during construction. The long-term monthly rainfall averages recorded at Horsley Park Equestrian Centre AWS rain gauge are shown in **Figure 6**. It is noted that generally rainfall is relatively low in mid-winter to early spring periods. This rainfall pattern suggests that dust emissions from the construction activities at the Site have the greatest potential to impact on receptors for the period of late autumn to early spring.

Figure 6 Long term Mean Rainfall for Horsley Park Equestrian Centre AWS – 1997 to 2023



5.0 Air Quality Criteria

State air quality guidelines specified by the NSW Environmental Protection Agency (EPA) for the pollutants identified in **Section 3.3** are published in the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (NSW EPA 2022) [hereafter 'the Approved Methods']. The ground level air quality impact assessment criteria listed in Section 7 of the Approved Methods have been established by NSW EPA to achieve appropriate environmental outcomes and to minimise risks to human health. The criteria are the defining ambient air quality criteria for NSW, derived from a range of sources, and are considered to be appropriate for the setting. Those relevant to the identified emission sources at the Site are discussed below.

It is noted that a qualitative (risk-based) assessment has been performed for construction and operational stage impacts, to identify activities that have the potential for off-site air quality impacts if not adequately controlled, so that appropriate mitigation measures can be identified and incorporated into the project design and relevant environmental management plans. Therefore, the Project's compliance with criteria relevant to those activities is not able to be presented as part of this assessment report. The criteria have been used, however, to assess the existing background air quality in **Section 6.0**.

The impact assessment criteria listed in the Approved Methods for the pollutants identified in **Section 3.3** are shown in **Table 1**.

Table 1 NSW EPA Impact Assessment Criteria

Pollutant	Averaging Period	Assessment Criteria	Units
Sulfur dioxide (SO_2)	1 hour	215	$\mu g/m^3$
	24 hours	57	$\mu g/m^3$
Nitrogen dioxide (NO_2)	1 hour	164	$\mu g/m^3$
	Annual	31	$\mu g/m^3$
Particulate Matter ($PM_{2.5}$)	24 hours	8	$\mu g/m^3$
	Annual	25	$\mu g/m^3$
Particulate Matter (PM_{10})	24 hours	25	$\mu g/m^3$
	Annual	50	$\mu g/m^3$
Total Suspended Particulate (TSP)	Annual	90	$\mu g/m^3$
Deposited Dust	Annual	2 a	$g/m^2/month$
		4 b	$g/m^2/month$
Carbon monoxide (CO)	1 hour	30	mg/m^3
	8 hours	10	mg/m^3

[a] maximum increase in deposited dust level.
[b] maximum total deposited dust level.

6.0 Background Air Quality

Air quality monitoring is performed by the NSW Department of Planning and Environment (DPE) at a number of monitoring stations across NSW. The nearest such station is located at Liverpool, approximately 9 km southeast of the Site. The Liverpool AQMS was commissioned in 1991 and is located in Rose Street at an elevation of 22 m. The following air pollutants are monitored at this station:

- NO, NO_2 and NO_x
- SO_2
- CO
- $PM_{2.5}$
- PM_{10}

A summary of the monitored pollutant concentrations for the last five years (2020-2024) is presented in **Table 2** and the data are presented graphically in **Figure 7** to **Figure 12**.

Exceedances of the 24-hour average PM_{10} and $PM_{2.5}$ criteria were recorded by the Liverpool AQMS each year over the period analysed except for 2022 and 2024. A review of the available compliance monitoring reports indicates that these exceedances were primarily due to exceptional events such as bushfires, dust storms or hazard reduction burns. Very elevated PM_{10} and $PM_{2.5}$ concentrations were recorded along the east coast of Australia in early 2020 during the 'Black Summer' bushfire event.

Exceedances of the annual average $PM_{2.5}$ criterion were also recorded for the year 2020 only; these exceedances were primarily due to the above-mentioned bush fires, which impacted much of the state in early 2020.

Ambient concentrations of the gaseous pollutants SO_2, NO_2, and CO were all well below the relevant criteria for all years investigated.

Table 2 Summary of Air Quality Monitoring Data at Liverpool AQMS (2020-2024)

Pollutant	PM_{10}		$PM_{2.5}$		CO	NO_2		SO_2	
Averaging Period	Maximum 24-hour	Annual	Maximum 24-hour	Annual	Maximum 1-hour	Maximum 1-hour	Annual	Maximum 1-hour	Maximum 24-hour
Units	µg/m³	µg/m³	µg/m³	µg/m³	mg/m³	µg/m³	µg/m³	µg/m³	µg/m³
2020	195.1 (7)	20.8	73.6 (7)	9.1	2.8	90.2	20.2	39.3	7.86
2021	82.8 (4)	18.1	52.2 (6)	7.9	2.4	79.0	18.3	44.5	7.86
2022	36.1	14.6	21.9	5.5	1.6	67.7	14.9	34.1	5.24
2023	76.4 (2)	19.3	66.2 (4)	7.7	1.8	118.4	17.4	62.9	10.48
2024	46.0	19.1	17.2	6.7	2.6	71.4	16.1	39.3	10.48
Criteria	**50**	**25**	**25**	**8**	**30**	**164**	**31**	**215**	**57**

* Red font denotes exceedances of the relevant criterion

*Numbers in brackets represent number of exceedances of relevant criteria recorded each year

Figure 7 Observed Maximum 1-Hour Average CO Concentrations at Liverpool AQMS (2020-2024)

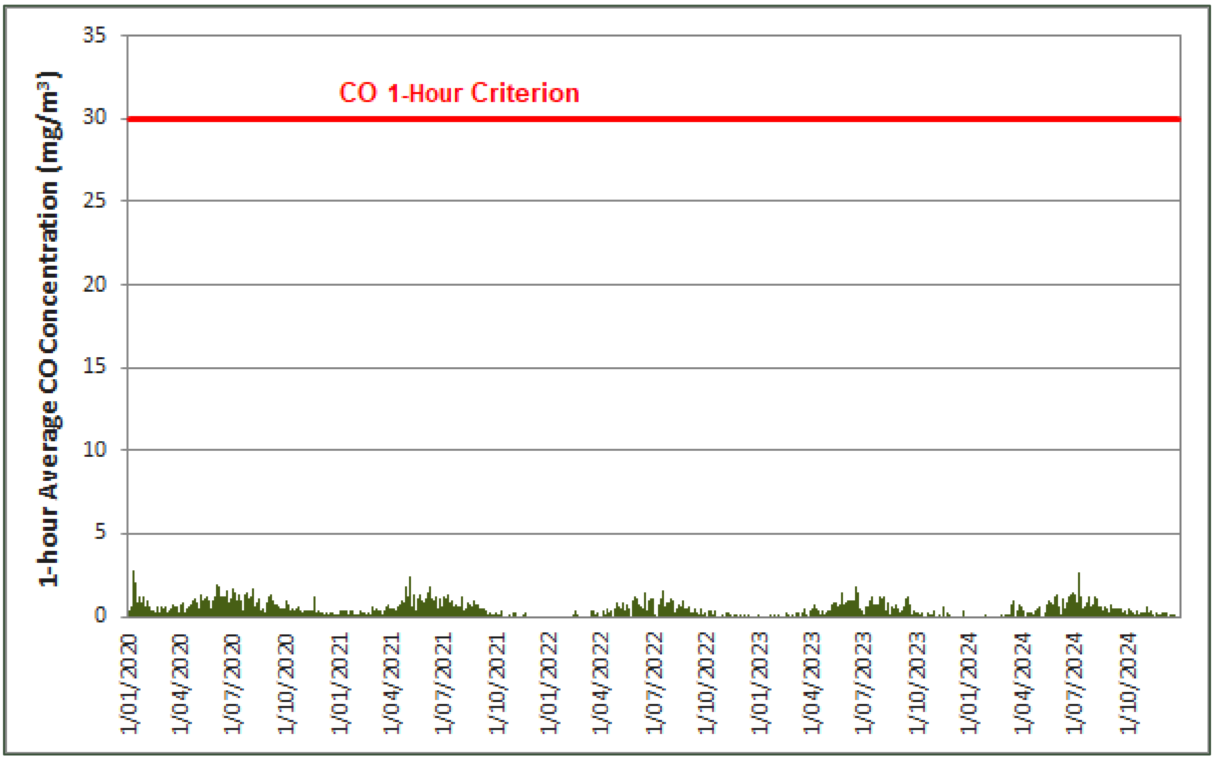


Figure 8 Observed Maximum 1-Hour Average NO_2 Concentrations at Liverpool AQMS (2020-2024)

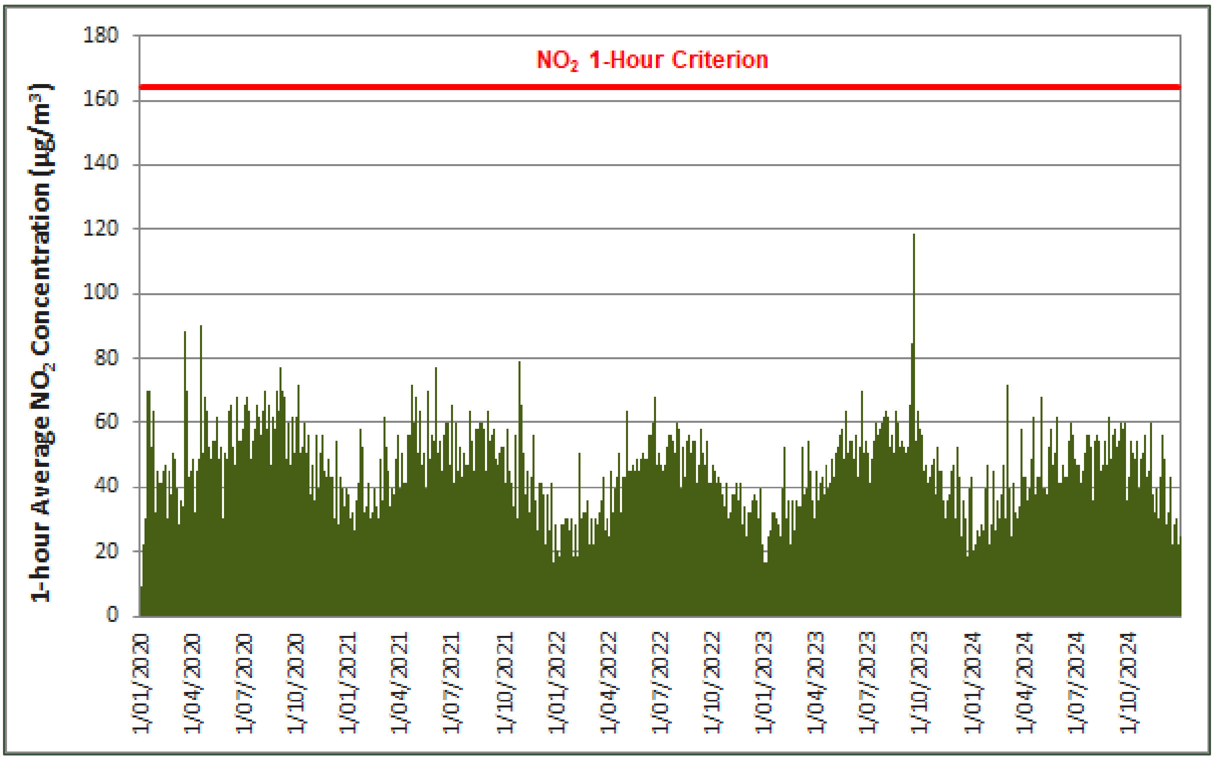


Figure 9 Observed Maximum 1-Hour Average SO_2 Concentrations at Liverpool AQMS (2020-2024)

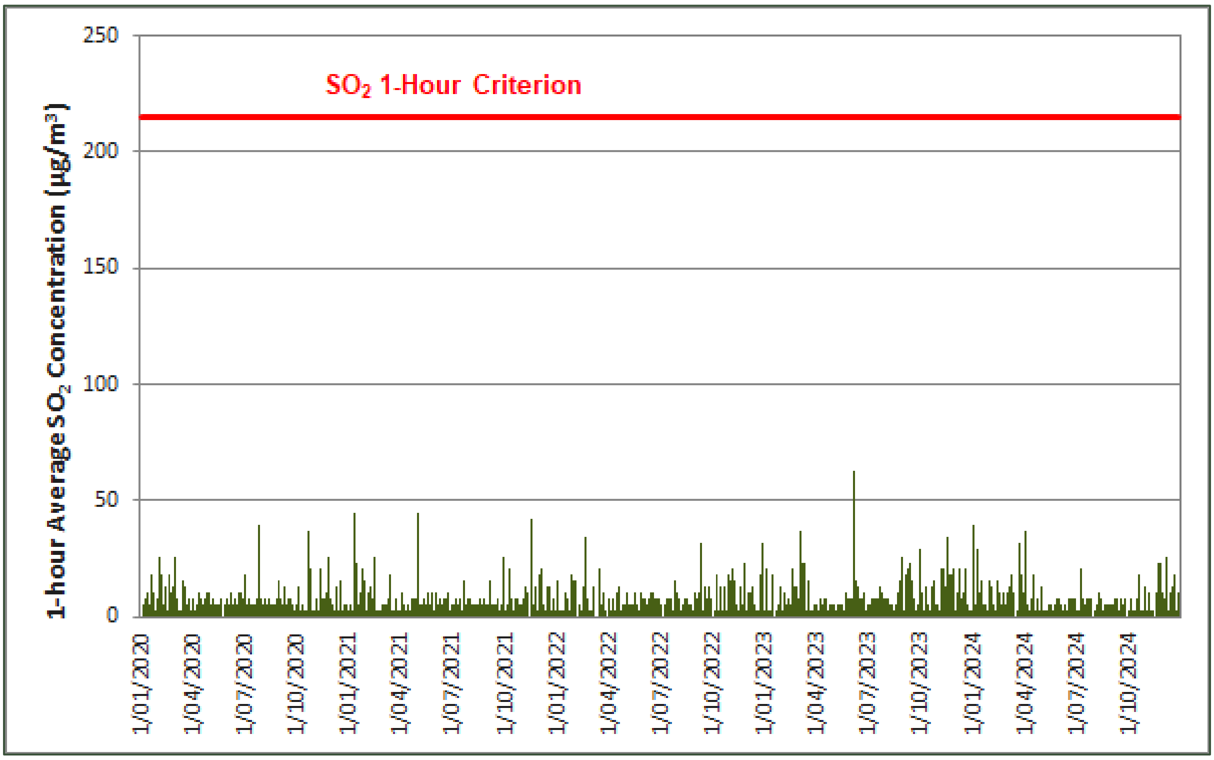


Figure 10 Observed 24-Hour Maximum SO_2 Concentrations at Liverpool AQMS (2020-2024)

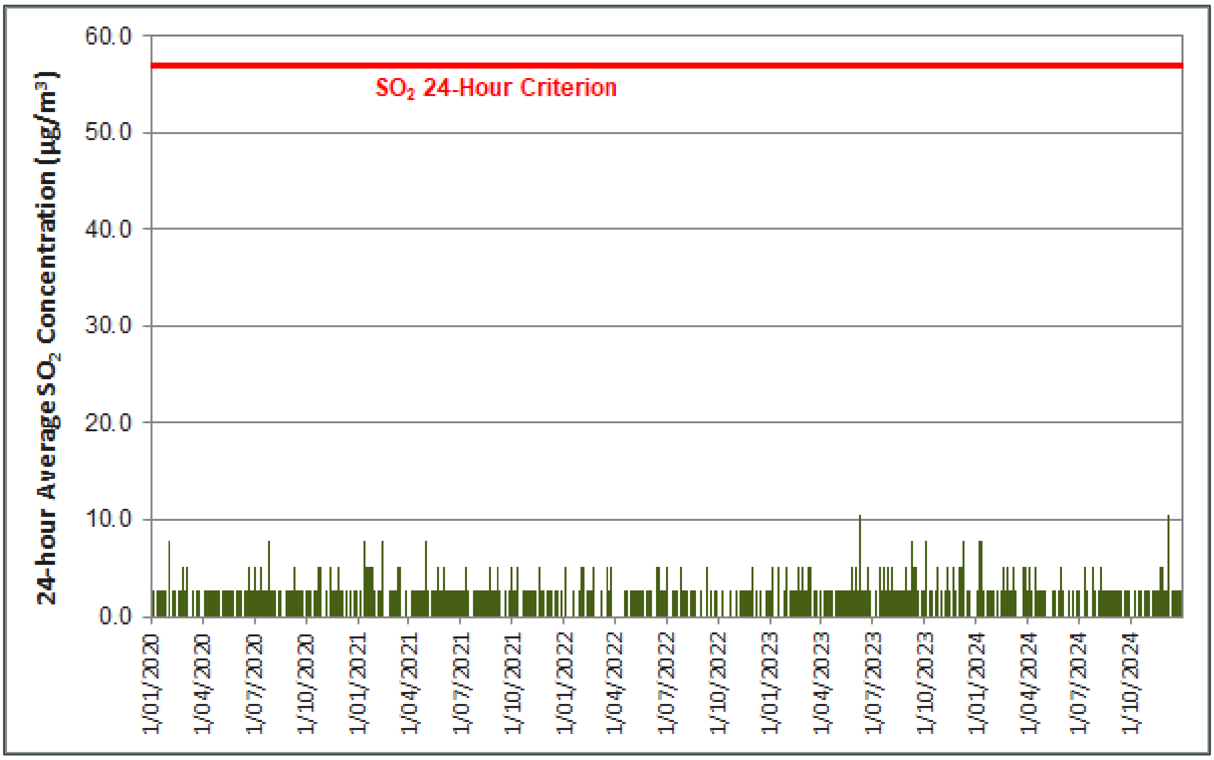


Figure 11 Observed 24-Hour Average PM_{10} Concentrations at Liverpool AQMS (2020-2024)

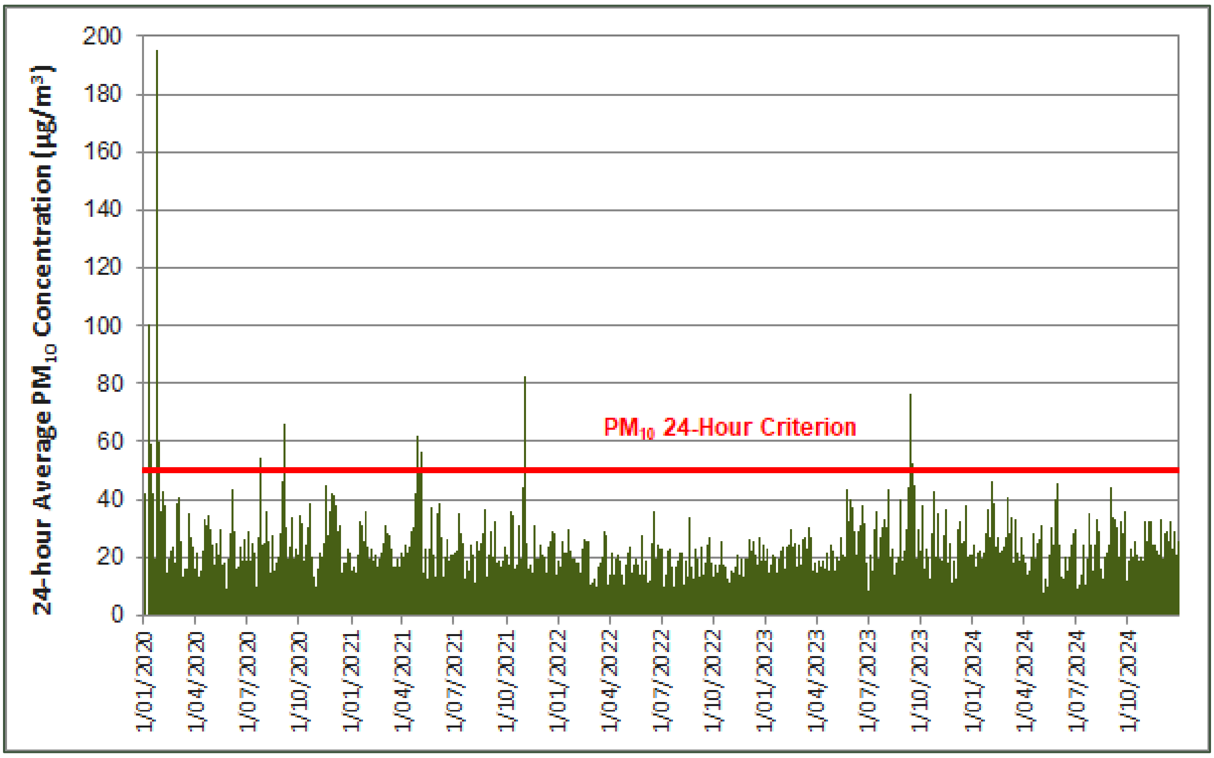
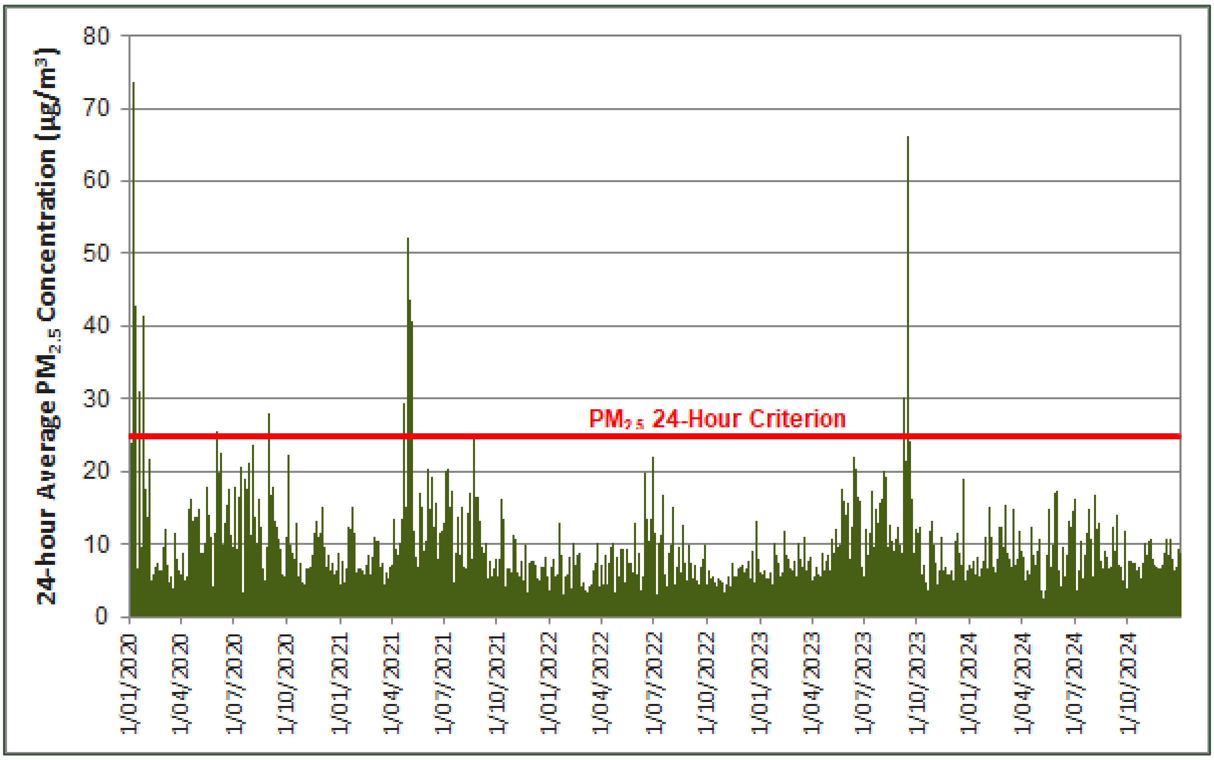


Figure 12 Observed 24-Hour Average $PM_{2.5}$ Concentrations at Liverpool AQMS (2020-2024)



7.0 Assessment of Air Quality Impacts – Construction Phase

7.1 Products of Combustion due to Fuel Combustion

Ambient air quality monitoring performed in the Sydney area over the last few decades has shown that the city's air quality has typically improved and is continuing to improve. A major driver of this improvement in urban air quality is the fact that newer vehicles produce significantly less emissions than older vehicles. This is in part a result of improvements in the quality and composition of fuels, as well as improved engine designs and fuel efficiency.

The results from the background air quality monitoring at the Liverpool AQMS show that the monitored concentrations have been below the respective criteria for CO, NO_2 and SO_2 during the period assessed (2020-2024) (see **Section 6.0**).

Given the nature of the construction works, it is considered that the emissions generated due to the combustion of fuel in construction plant and machinery will be of limited duration and small compared to the emissions generated by road traffic on the surrounding road network. Given the short-term nature and low-level intensity of emissions of these pollutants from the Site during the construction works, they are considered unlikely to have significant impacts on local air quality and have not been considered any further in this assessment.

7.2 Dust Impacts from Construction Works

The key potential air pollution and amenity issues associated with fugitive dust emissions from the proposed construction activities at the Site are:

- Annoyance due to dust deposition (soiling of surfaces) and visible dust plumes
- Elevated suspended particulate concentrations (PM_{10}).

Modelling of dust from construction activities is generally not considered appropriate, as emission rates can vary significantly depending on a combination of the activity and prevailing meteorological conditions (i.e. rainfall and wind speed), which cannot be reliably predicted. The following sections therefore present a qualitative assessment of the potential risks to air quality associated with dust from construction activities at the Project. Details of the IAQM methodology used to perform the risk assessment are provided in **Appendix A**.

7.2.1 Step 1 – Screen the Need for a Detailed Assessment

As noted in **Section 4.1**, the nearest sensitive receptor (industrial/commercial) is located adjacent to the Site boundary.

An assessment will normally be required where there is:

- A 'human receptor' within:
  - 250 m of the boundary of the site; or
  - 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).
- An 'ecological receptor' within:
  - 50 m of the boundary of the site; or
  - 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).

As a 'human receptors' are located within 250 m of the boundary of the Site, further assessment is required. Step 2a – Define the Potential Dust Emission Magnitude

Based upon the above assumptions and the IAQM definitions presented in **Appendix A**, the dust emission magnitudes for each phase of the construction works have been categorised as presented in **Table 3**. Given that no demolition is planned as part of the construction works, this stage is not assessed further.

Table 3 Categorisation of Dust Emission Magnitude

Activity	Dust Emission Magnitude	Basis
Earthworks	Large	**IAQM Definition:** Total site area greater than 10,000 m^2, potentially dusty soil type (eg clay, which will be prone to suspension when dry due to small particle size), more than 10 heavy earth moving vehicles active at any one time, formation of bunds greater than 8 m in height, total material moved more than 100,000 t. **Relevance to this Project:** *Total area of the Site is estimated to be approximately 113,250 m^2.*
Construction	Large	**IAQM Definition:** Total building volume greater than 100,000 m^3, piling, on site concrete batching; sandblasting. **Relevance to this Project:** *The building footprints is approximately 35,500 m^2. Assuming an average floor height of 25 m, the total building volume will be approximately 888,000 m^3.*
Trackout	Large	**IAQM Definition:** Between 10 and 50 heavy vehicle movements per day, surface materials with a moderate potential for dust generation, between 50 m and 100 m of unpaved road length. **Relevance to this Project:** *It is anticipated that more than 50 heavy vehicles movements per day will occur during the peak construction period.*

7.2.2 Step 2b – Define the Sensitivity of the Area

According to the IAQM methodology, the sensitivity of the area is determined by several factors, including the specific sensitivities of receptors, their proximity to the site, the number of receptors present, and, in the case of PM_{10}, the local background concentration. The assessment should consider the types of receptors located at varying distances from the site boundary.

The IAQM guidance does not require an exact count of human receptors. Instead, professional judgement should be applied to estimate the approximate number of receptors within each distance band, noting that a single residential unit is considered one receptor. For non-residential receptors, professional judgement should also be used to estimate the number of human receptors likely to be present.

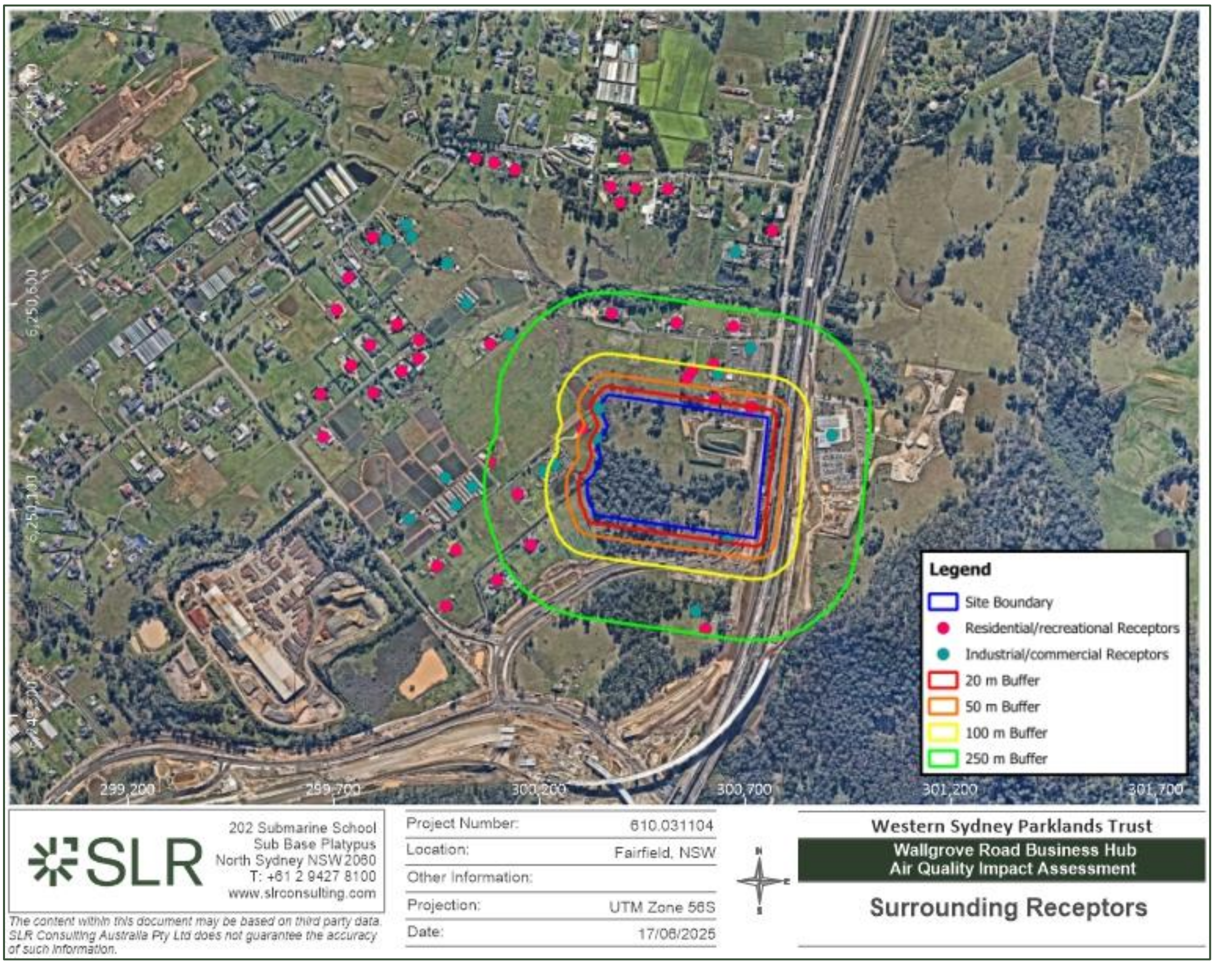
Receptor Sensitivity

Based on the criteria listed in **Table A1** in **Appendix A**, the sensitivity of the industrial/commercial receptors in this study is concluded to be medium for both health impacts and dust soiling and the sensitivity of the residential/recreational receptors in this study is concluded to be high for both health impacts and dust soiling.

The Number of Receptors

For the purpose of this assessment, it is estimated that between 1 and 10 residential/recreational, and industrial/commercial receptors are located within 20 metres of the Site boundary (see **Figure 13**).

Figure 13 Density of Sensitive Receptors in the Vicinity of the Site



Sensitivity of Area

Based on the classifications shown in **Table A2** and **Table A3** in **Appendix A**, the sensitivity of the area to both dust soiling and health effects may be classified as medium for residential/recreational receptors and medium to dust soiling and low to health effects for industrial/commercial receptors. This categorisation has been made taking into account the individual receptor sensitivities derived above, the 5-year mean background PM_{10} concentration of 18.4 µg/m^3 recorded at Liverpool AQMS (see Section 6.0) and the existing number of sensitive receptors present in the vicinity of the Site (i.e. between 1-10 residential/recreational and industrial/commercial receptors within 20 m).

7.2.3 Step 2c – Define the Risk of Impacts

Given the sensitivity of the general area and the dust emission magnitudes for the various construction phase activities as shown in **Table 3**, the resulting risk of air quality impacts is as presented in **Table 4**.

Table 4 Preliminary Risk of Air Quality Impacts from Construction Activities (Uncontrolled)

Receptor Type	Impact	Sensitivity of Area	Dust Emission Magnitude			Preliminary Risk		
			Earthworks	Construction	Trackout	Earthworks	Construction	Trackout
Residential or Recreational	Dust Soiling	Medium	Large	Large	Large	Medium	Medium	Medium
	Human Health	Medium				Medium	Medium	Medium
Industrial or Commercial	Dust Soiling	Medium				Medium	Medium	Medium
	Human Health	Low				Low	Low	Low

The results indicate a ***medium*** risk of adverse dust soiling and human health effects for residential/recreational receptors during all construction stages. For industrial/commercial receptors, there is a ***medium*** risk of dust soiling and a ***low*** risk of health effects throughout all phases of construction.

Based on the IAQM methodology, the overall air quality risk from the project construction activities is rated as ***medium*** for both industrial/recreational and industrial/commercial receptors.

7.2.4 Step 3 - Mitigation Measures

A reappraisal of the predicted unmitigated air quality impacts on sensitive receptors has been performed to demonstrate the opportunity for minimising risks associated with the use of mitigation strategies. These are termed ‘residual impacts’.

Table 5 presents the mitigation measures aimed at addressing potential impacts arising from earthworks, construction, and trackout. In accordance with the IAQM methodology, a development identified as having a medium risk of adverse dust soiling and human health effects during all construction stages should implement these measures to reduce associated risks. Specifically, the implementation of these controls may reduce both dust soiling and human health impacts for residential/recreational receptors from ***medium*** to ***low***; dust soiling impacts for industrial/commercial receptors from ***medium*** to ***low***; and human health impacts for industrial/commercial receptors from ***low*** to ***negligible***. These measures are classified as highly recommended (H) or desirable (D) under the IAQM dust guidance.

Table 5 Mitigation Measures Specific to Earthworks

Activity	Highly recommended or Desirable
Earthworks	
Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.	D
Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.	D
Only remove the cover in small areas during work and not all at once.	D
Construction	
Avoid scabbling (roughening of concrete surfaces) if possible.	D
Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.	H
Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.	D
For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.	D
Trackout	
Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.	H
Avoid dry sweeping of large areas.	H
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	H
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	H
Record all inspections of haul routes and any subsequent action in a site log book.	H
Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	H
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	H
Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	H
Access gates to be located at least 10 m from receptors where possible.	H

D = Desirable, H = Highly recommended

Appendix B lists the relevant general mitigation measures designated by the dust IAQM method for a development shown to have a medium risk of adverse impacts.

7.2.5 Step 4 - Residual Impacts

A reappraisal of the predicted unmitigated air quality impacts on sensitive receptors has been performed to demonstrate the opportunity for minimising risks associated with the use of mitigation strategies. These are termed 'residual impacts'. The results of the reappraisal are presented below in **Table 6**.

Table 6 Residual Risk of Air Quality Impacts from Construction

Receptor Type	Impact	Sensitivity of Area	Preliminary Risk		
			Earthworks	Construction	Trackout
Residential or Recreational	Dust Soiling	Medium	Low	Low	Low
	Human Health	Medium	Low	Low	Low
Industrial or Commercial	Dust Soiling	Medium	Low	Low	Low
	Human Health	Low	Negligible	Negligible	Negligible

With the implementation of appropriate mitigation measures, the residual dust soiling and human health impacts for residential/recreational receptors are anticipated to be ***low***. For industrial/commercial receptors, residual dust soiling impacts are expected to be ***low***, while human health impacts are anticipated to be ***negligible***.

In accordance with the IAQM methodology, the overall air quality risk associated with the proposed construction activities—accounting for earthworks, construction, and trackout phases—is considered ***low***, provided that the recommended mitigation measures are effectively applied.

8.0 Assessment of Potential Impacts – Operational Phase

As discussed in **Section 3.2**, air quality issues associated with the proposed warehouse operations predominantly relate to emissions of products of combustion and particulate matter from trucks and other vehicles accessing and idling at the Site.

These emissions will be of a similar nature to existing emissions from traffic on Wallgrove Road and other local roads. The scale and magnitude of vehicle emissions associated with the Project is anticipated to be significantly lower compared to the estimated annual average daily traffic on the abovementioned roads. To assess the risk of air emissions from the Site impacting on surrounding sensitive receptors during the operational phase, the following "risk based" approach has been adopted.

The risk-based assessment takes account of a range of impact descriptors, including the following:

- **Nature of** Impact: does the impact result in an adverse, neutral or beneficial environment?
    - The nature of impact is anticipated to be ***adverse*** to the environment.
- **Receptor** Sensitivity**:** how sensitive is the receiving environment to the anticipated impacts?
    - The nearest residential receptors to the Site are located approximately 20 m to the north of the Site (see **Section 4.1**). There are a number of commercial and industrial receptors 12 m from the boundary of the Site. In terms of the methodology in **Appendix B**, the sensitivity of the adjacent land is considered to be ***medium***, while the sensitivity of the lands west of the Site and the more distant residential areas is considered to be ***high***.
- **Magnitude:** what is the anticipated scale of the impact?
    - In order to obtain an indication of potential offsite emissions from the Project, a first-pass screening of the potential air quality impacts associated with the Project-related operational traffic was done using the Roadside Air Quality Screening Tool (RAQST) assessment tool (refer **Appendix D**). The screening was done based a conservative scenario considering all traffic travelling at a low speed of 10 km/hr.
    - The results indicate that:
        - For sensitive residential/recreational receptors, the emissions from the Project would contribute less than 3% of the relevant criteria at 20 m from the kerb for all pollutants and averaging periods. Furthermore, winds which would blow air emissions from the Site towards the nearest residential receptors, occur less than 8% of the time (refer **Section 4.3**). Therefore, the magnitude of the impact from the Project is considered to be ***negligible*** at the nearest residential areas.
        - For the surrounding industrial/commercial receptors, the emissions from the Project would contribute less than 14% of the relevant criteria at 10 m from the kerb (ranging from 7% to 13% for the various pollutants modelled) for all pollutants and averaging periods. Considering the relatively small incremental increase in ground level concentration of pollutants modelled and the conservative assumptions made for the RAQST modelling, the magnitude of the impact from the Project is considered to be ***negligible*** at the nearest industrial/commercial areas.

Given the above considerations, the potential impact of the Project on the surrounding receptors (both residential and industrial/commercial) is concluded to be ***neutral*** (see **Table 7**) for all pollutants and averaging periods.

Table 7 Impact Significance for all Pollutants and Averaging Periods

Magnitude / Sensitivity	Substantial Magnitude	Moderate Magnitude	Slight Magnitude	Negligible Magnitude
Very High Sensitivity	Major Significance	Major/ Intermediate Significance	Intermediate Significance	Neutral Significance
High Sensitivity	Major/ Intermediate Significance	Intermediate Significance	Intermediate/Minor Significance	Neutral Significance
Medium Sensitivity	Intermediate Significance	Intermediate/Minor Significance	Minor Significance	Neutral Significance
Low Sensitivity	Intermediate/Minor Significance	Minor Significance	Minor/Neutral Significance	Neutral Significance

9.0 Assessment of Odour Emissions During Construction and operation

To assess the odour nuisance risk, a qualitative odour assessment methodology has been adopted for this assessment. The following broad risk-based approach prescribed by the Institute of Air Quality Management (IAQM 2018) has been adopted:

- **Nature of Impact**: does the impact result in an adverse or beneficial environment?
- **Receptor Sensitivity**: how sensitive is the receiving environment to the anticipated impacts? This may be applied to the sensitivity of the environment in a regional context or specific receptor locations.
- **Magnitude**: what is the anticipated scale of the impact?

The integration of sensitivity with impact magnitude is used to derive the predicted significance of that change. Full details of the methodology can be found in **Appendix C**.

In regard to the odour nuisance impacts, by addressing the FIDOL (Frequency, Intensity, Duration, Offensiveness and Location) factors, the potential for odour impacts from this source at the sensitive receptors may be evaluated, namely:

- Frequency - the surrounding sensitive receptors located to the north, south, and west of the Site (see **Section 4.1**) have a low potential to experience odour impacts since no obvious odour sources are available within the Site. All southerly, northerly, and easterly winds occur less than 8% of the time, therefore there is a ***low*** likelihood that the surrounding receptors would experience frequent potential odour impacts from the Site.
- Intensity – based on the activities within the Site, the odour intensity from the Site is expected to be negligible at the surrounding receptors. Given this, odours from the Site are likely to be of ***low*** intensity and generally of intermittent nature.
- Duration - Given that conducive wind directions only occur approximately 8% of the time, the potential duration of any odour impacts is concluded to be ***low***.
- Offensiveness – Given the nature of the activities held at the Site, the very low intensity odours that may be detectable beyond the boundary of the Site would be expected to have a ***low*** level of offensiveness.
- Location - the impact of location on the acceptability of odours from the Site has been accounted for by the surrounding receptors sensitivity classifications detailed above in this section (***high***).

Given the above, the potential impact of odour emissions from the Site is considered to be ***negligible*** (ie impact is predicted to cause no significant consequences) for the Site (see **Table 8**).

Table 8 Impact Significance – Odour from the Site

Potential Odour Exposure Impact	Receptor Sensitivity		
	Low	Medium	High
Very Large	Moderate adverse	Substantial adverse	Substantial adverse
Large	Slight adverse	Moderate adverse	Substantial adverse
Medium	Negligible	Slight adverse	Moderate adverse
Small	Negligible	Negligible	Slight adverse
Negligible	Negligible	Negligible	Negligible

In line with the IAQM method, it is concluded that the overall effect is '***negligible***'.

10.0 Conclusion

The main potential sources of air emissions were identified as fugitive particulate matter during the construction phase and products of combustion from traffic during the operational phase of the Project.

The potential for off-site dust impacts were assessed using a qualitative risk-based approach prescribed by the IAQM. The results of this assessment indicate that dust impacts due to the construction works can be adequately managed with the implementation of site-specific mitigation measures. The residual impacts are likely to be of ***low risk*** for nearest residential/recreational receptors and ***negligible risk*** for nearest industrial/commercial receptors.

Based on the nature and scale of proposed activities (general warehousing, storage and distribution) at the Site, the potential for offsite air impacts from the operations is concluded to be ***neutral*** and the Project operations is not expected to result in a substantial increase in cumulative air quality impacts at the nearest sensitive receptors. Signage and training should be provided to ensure that drivers turn off engines if they are parked at the Site for extended periods (e.g., more than 2 minutes) in order to minimise emissions.

Based on the above, air quality issues are not considered to represent a constraint during the construction and operation of the Project.

11.0 References

Bitzios Consulting. 2023. “Wallgrove Business Hub Traffic Impact Assessment .”

IAQM. 2024. *Guidance on the assessment of dust from demolition and construction, Version 2.2.* London: Institute of Air Quality Management .

IAQM. 2018. “Guidance on the assessment of odour for planning.”

NSW EPA. 2022. *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales.* New South Wales Environment Protection Authority.

SLR. 2024. “Wallgrove Road Business Hub Air Quality and Odour Assessment.”

Appendix A Construction Phase Risk Assessment Methodology

Wallgrove Road Business Hub

Air Quality and Odour Assessment

Western Sydney Parklands Trust

SLR Project No.: 610.031104.00001

11 July 2025

Step 1 – Screen the Need for a Detailed Assessment

The Step 1 screening criteria provided by the IAQM guidance suggests screening out any assessment of impacts from construction activities where sensitive receptors are located more than 250 m from the boundary of the site, more than 50 m from the route used by construction vehicles on public roads up to 250 m from the site entrance. This step is noted as having deliberately been chosen to be conservative and will require assessments for most projects.

Step 2a – Define the Potential Dust Emission Magnitude

The dust emission magnitude is based on the scale of the anticipated works and should be classified as Small, Medium, or Large. The following are examples of how the potential dust emission magnitude for different activities can be defined. Note that, in each case, not all the criteria need to be met, and that other criteria may be used if justified in the assessment. Where relevant, multiple screening assessments may be completed for different development phases (or even sub-phases where demolition may be brief or there is a very short period of intense activity, for example). This may particularly be the case for linear schemes (i.e. new roads, railways).

Example definitions for Demolition are as follows. Alternative screening values may be used here this is justified based on a particular scheme:

- ***Large***: Total building volume >75,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12 m above ground level
- ***Medium***: Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material, demolition activities 6-12 m above ground level
- ***Small***: Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6 m above ground, demolition during wetter months.

Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. This may also involve levelling the site and landscaping. Example definitions for earthworks are:

- ***Large***: Total site area >110,000 m^2, potentially dusty soil type (e.g., clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >6 m in height
- ***Medium***: Total site area 18,000 m^2 – 110,000 m^2, moderately dusty soil type (e.g., silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3 m – 6 m in height
- ***Small***: Total site area <18,000 m^2, soil type with large grain size (e.g., sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height.

Construction: The key issues when determining the potential dust emission magnitude during the construction phase include the size of the building(s)/infrastructure, method of construction, construction materials, and duration of build. Example definitions for Construction are:

- ***Large:*** Total building volume >75,000 m^3, on site concrete batching, sandblasting
- ***Medium:*** Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material (e.g., concrete), on site concrete batching
- ***Small:*** Total building volume <12,000 m^3, construction material with low potential for dust release (e.g., metal cladding or timber).

Trackout: Factors which determine the dust emission magnitude are vehicle size, vehicle speed, vehicle numbers, geology and duration. As with all other potential sources, professional judgement must be applied when classifying trackout into one of the dust emission magnitude categories. Example definitions for trackout are:

- ***Large:*** >50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g., high clay content), unpaved road length >100 m
- ***Medium:*** 20-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g., high clay content), unpaved road length 50 m – 100 m
- ***Small:*** <20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m.

Step 2b – Define the Sensitivity of the Area

Step 2b of the assessment process requires the sensitivity of the area to be defined. The sensitivity of the area takes into account:

- the specific sensitivities of receptors in the area
- the proximity and number of those receptors
- in the case of PM_{10}, the local background concentration
- site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

The type of receptors at different distances from the site boundary or, if known, from the dust generating activities, should be included. Consideration also should be given to the number of ‘human receptors’. Exact counting of the number of ‘human receptors’, is not required. Instead, it is recommended that judgement is used to determine the approximate number of receptors (a residential unit is one receptor) within each distance band. For receptors which are not dwellings professional judgement should be used to determine the number of human receptors for use in the tables, for example a school is likely to be treated as being in the >100 receptor category.

The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in STEP 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

A number of attempts have been made to categorise receptors into high, medium and low sensitivity categories; however, there is no unified sensitivity classification scheme that covers the quite different potential effects on property, human health and ecological receptors.

Table A1 provides guidance on the sensitivity of different types of receptor to dust soiling, health effects, and ecological effects.

Table A1 IAQM Guidance for Categorising Receptor Sensitivity

Value	High Sensitivity Receptor	Medium Sensitivity Receptor	Low Sensitivity Receptor
Dust Soiling	• Users can reasonably expect enjoyment of a high level of amenity; or • The appearance, aesthetics or value of their property would be diminished by soiling; and • The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land.	• Users would expect a to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or • The appearance, aesthetics or value of their property could be diminished by soiling; or • The people or property wouldn't reasonably be expected a to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.	• The enjoyment of amenity would not reasonably be expected; or • Property would not reasonably be expected to be diminished in appearance, aesthetics, or value by soiling; or • There is transient exposure, where the people or property would reasonably be expected a to be present only for limited periods of time as part of the normal pattern of use of the land.
	Indicative examples include dwellings, museums, and other culturally important collections, medium- and long-term car parks and car showrooms.	Indicative examples include parks and places of work.	Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads.
Health Effects	Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).	Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).	Locations where human exposure is transient
	Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	Indicative examples include office and shop workers but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.	Indicative examples include public footpaths, playing fields, parks and shopping streets.

According to the IAQM methods, the sensitivity of the identified individual receptors (as described above) is then used to assess the *sensitivity of the area* surrounding the active construction area, taking into account the proximity and number of those receptors, and the local background PM_{10} concentration (in the case of potential health impacts) and other site-specific factors. Additional factors to consider when determining the sensitivity of the area include:

- any history of dust generating activities in the area
- the likelihood of concurrent dust generating activity on nearby sites
- any pre-existing screening between the source and the receptors
- any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant
- the season during which the works will take place
- any conclusions drawn from local topography
- duration of the potential impact, as a receptor may become more sensitive over time
- any known specific receptor sensitivities which go beyond the classifications given in this document.

The IAQM guidance for assessing the sensitivity of an area to dust soiling is shown in **Table A2**. The sensitivity of the area should be derived for each of activity relevant to the project (ie construction and earthworks).

Table A2 IAQM Guidance for Categorising the Sensitivity of an Area to Dust Soiling Effects

Receptor Sensitivity	Number of receptors	Distance from the source (m)			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Note: Estimate the total number of receptors within the stated distance. Only the *highest level* of area sensitivity from the table needs to be considered. For example, if there are 7 high sensitivity receptors < 20m of the source and 95 high sensitivity receptors between 20 and 50 m, then the total of number of receptors < 50 m is 102. The sensitivity of the area in this case would be high.

A modified version of the IAQM guidance for assessing the *sensitivity of an area* to health impacts is shown in **Table A3**. For high sensitivity receptors, the IAQM methods takes the existing background concentrations of PM_{10} (as an annual average) experienced in the area of interest into account and is based on the air quality objectives for PM_{10} in the UK. As these objectives differ from the ambient air quality criteria adopted for use in this assessment the IAQM method has been modified slightly.

Table A3 IAQM Guidance for Categorising the Sensitivity of an Area to Dust Health Effects

Receptor sensitivity	Annual mean PM_{10} conc.	Number of receptors [a,b]	Distance from the source (m)			
			<20	<50	<100	<250
High	>25 µg/m^3	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	21-25 µg/m^3	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	17-21 µg/m^3	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<17 µg/m^3	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>25 µg/m^3	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	21-25 µg/m^3	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	17-21 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<17 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low

Notes:

(a) Estimate the total within the stated distance (e.g. the total within 350 m and not the number between 200 and 350 m); noting that only the highest level of area sensitivity from the table needs to be considered.

(b) In the case of high sensitivity receptors with high occupancy (such as schools or hospitals) approximate the number of people likely to be present. In the case of residential dwellings, just include the number of properties.

Step 2c – Define the Risk of Impacts

The dust emission magnitude from Step 2a and the receptor sensitivity from Step 2b are then used in the matrices shown in **Table A4** (Demolition), **Table A5** (earthworks and construction) and **Table A6** (track-out) to determine the risk category with no mitigation applied.

Table A-4 Risk Category from Demolition Activities

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table A5 Risk Category from Earthworks and Construction Activities

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table A6 Risk Category from Track-out Activities

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Appendix B Operational Phase Risk Assessment Methodology

Air Quality and Odour Assessment

Western Sydney Parklands Trust

SLR Project No.: 610.031104.00001

11 July 2025

Nature of Impact

Predicted impacts may be described in terms of the overall effect upon the environment:

- **Beneficial:** the predicted impact will cause a beneficial effect on the receiving environment.
- **Neutral**: the predicted impact will cause neither a beneficial nor adverse effect.
- **Adverse**: the predicted impact will cause an adverse effect on the receiving environment.

Receptor Sensitivity

Sensitivity may vary with the anticipated impact or effect. A receptor may be determined to have varying sensitivity to different environmental changes, for example, a high sensitivity to changes in air quality, but low sensitivity to noise impacts. Sensitivity may also be derived from statutory designation which is designed to protect the receptor from such impacts.

Sensitivity terminology may vary depending upon the environmental effect, but generally this may be described in accordance with the following broad categories – Very high, High, Medium and Low.

Table B1 outlines the methodology used in this study to define the sensitivity of receptors to air quality impacts.

Table B1 Methodology for Assessing Sensitivity of a Receptor

Sensitivity	Criteria
Very High	Receptors of very high sensitivity to air pollution (e.g. dust or odour) such as: hospitals and clinics, and retirement homes.
High	Receptors of high sensitivity to air pollution, such as: schools, residential areas, food retailers, glasshouses and nurseries.
Medium	Receptors of medium sensitivity to air pollution, such as: farms / horticultural land, offices/recreational areas, painting and furnishing, hi-tech industries and food processing, and outdoor storage (ie new cars).
Low	All other air quality sensitive receptors not identified above, such as light and heavy industry.

Magnitude

Magnitude describes the anticipated scale of the anticipated environmental change in terms of how that impact may cause a change to baseline conditions. Magnitude may be described quantitatively or qualitatively. Where an impact is defined by qualitative assessment, suitable justification is provided in the text.

Table B2 Magnitude of Impacts

Magnitude	Description
Substantial	Impact is predicted to cause significant consequences on the receiving environment (may be adverse or beneficial)
Moderate	Impact is predicted to possibly cause statutory objectives/standards to be exceeded (may be adverse)
Slight	Predicted impact may be tolerated.
Negligible	Impact is predicted to cause no significant consequences.

Significance

The risk-based matrix provided below illustrates how the definition of the sensitivity and magnitude interact to produce impact significance.

Table B3 Impact Significance Matrix

Sensitivity / Magnitude		[Defined by Table B2]			
		Substantial Magnitude	Moderate Magnitude	Slight Magnitude	Negligible Magnitude
[Defined by TableB1]	Very High Sensitivity	Major Significance	Major/ Intermediate Significance	Intermediate Significance	Neutral Significance
	High Sensitivity	Major/ Intermediate Significance	Intermediate Significance	Intermediate/Minor Significance	Neutral Significance
	Medium Sensitivity	Intermediate Significance	Intermediate/Minor Significance	Minor Significance	Neutral Significance
	Low Sensitivity	Intermediate/Minor Significance	Minor Significance	Minor/Neutral Significance	Neutral Significance

Appendix C Odour Risk Assessment Methodology

Air Quality and Odour Assessment

Western Sydney Parklands Trust

SLR Project No.: 610.031104.00001

11 July 2025

Nature of Impact

Predicted impacts may be described in terms of the overall effect upon the environment:

- **Beneficial**: the predicted impact will cause a beneficial effect on the receiving environment.
- **Neutral**: the predicted impact will cause neither a beneficial nor adverse effect.
- **Adverse**: the predicted impact will cause an adverse effect on the receiving environment.

Receptor Sensitivity

Sensitivity may vary with the anticipated impact or effect. A receptor may be determined to have varying sensitivity to different environmental changes, for example, a high sensitivity to changes in air quality, but low sensitivity to noise impacts. Sensitivity may also be derived from statutory designation which is designed to protect the receptor from such impacts.

Sensitivity terminology may vary depending upon the environmental effect, but generally this may be described in accordance with the following broad categories - Very high, High, Medium and Low.

Table C1 outlines the methodology used in this study to define the sensitivity of receptors to air quality impacts.

Table C1 Receptor Sensitivity to Odours

Sensitivity	Criteria
High	Surrounding land where: • users can reasonably expect enjoyment of a high level of amenity; and • people would reasonably be expected to be present here continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. Examples may include residential dwellings, hospitals, schools/education and tourist/cultural.
Medium	Surrounding land where: • users would expect to enjoy a reasonable level of amenity, but wouldn't reasonably expect to enjoy the same level of amenity as in their home; or • people wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. Examples may include places of work, commercial/retail premises and playing/recreation fields.
Low	Surrounding land where: • the enjoyment of amenity would not reasonably be expected; or • there is transient exposure, where the people would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Examples may include industrial use, farms, footpaths and roads.

Magnitude

Magnitude describes the anticipated scale of the anticipated environmental change in terms of how that impact may cause a change to baseline conditions. Magnitude may be described quantitatively or qualitatively. Where an impact is defined by qualitative assessment, suitable justification is provided in the text.

Table C2 Magnitude of Impacts

Magnitude	Description
Very Large	Impact is predicted to cause significant consequences on the receiving environment (may be adverse or beneficial)
Large	Impact is predicted to possibly cause statutory objectives/standards to be exceeded (may be adverse)
Medium	Predicted impact may be tolerated for most of the days, but maybe intolerable for some days.
Small	Predicted impact may be tolerated.
Negligible	Impact is predicted to cause no significant consequences.

Significance

The risk-based matrix provided below illustrates how the definition of the sensitivity and magnitude interact to produce impact significance.

Table C3 Impact Significance Matrix

Potential Odour Exposure Impact	Receptor Sensitivity		
	Low	Medium	High
Very Large	Moderate adverse	Substantial adverse	Substantial adverse
Large	Slight adverse	Moderate adverse	Substantial adverse
Medium	Negligible	Slight adverse	Moderate adverse
Small	Negligible	Negligible	Slight adverse
Negligible	Negligible	Negligible	Negligible

Where the overall effect is greater than “slight adverse”, the effect is likely to be considered significant. Note that this is a binary judgement: either it is “significant”, or it is “not significant”. Concluding that an effect is significant should not mean, of itself, that a development proposal is unacceptable, and the planning application should be refused; rather, it should mean that careful consideration needs to be given to the consequences, scope for securing further mitigation, and the balance with any wider environmental, social and economic benefits that the proposal would bring

Appendix D RAQST Assessment

Air Quality and Odour Assessment

Western Sydney Parklands Trust

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As discussed in **Section 3.2** the main potential operational air emissions have been identified as vehicle emissions from trucks etc accessing and idling at the Site.

Pollutants Assessed

RAQST provides predictions of NO_2, PM_{10}, and $PM_{2.5}$ concentrations at various distances from the road kerb. It does not provide predictions of the other traffic-related pollutants identified in **Section 3.2**, namely SO_2 and VOCs. Given the low level of SO_2 emissions from vehicles and the low ambient concentrations recorded in the region (see **Section 6.0**), it is reasonable to assume that SO_2 emissions from road traffic are unlikely to result in any exceedances of the relevant criteria at locations beyond the road kerb. SLR's experience in modelling VOC emissions from roads has also shown that kerbside concentration of VOCs is typically well below the relevant air quality guidelines.

Dispersion Model Configuration

RAQST requires a number of inputs to describe the Proposal environment and emissions to air, including:

- Background pollutant concentrations
- Daily or peak hour traffic volumes and vehicle speeds
- Traffic mix (heavy vehicle percentage)
- Road type, number of lanes and gradient
- Year of assessment (vehicle fleet)

The sources of the required data and assumptions made for the purpose of this assessment are summarised in **Table D1**.

Table D1 TRAQ Input Data

Parameter	Value	Description
Assessment Year	2025	Assumed
Electric vehicle projections	Included	-
Number of Lanes	1	-
Road Type	Commercial Arterial	Based on land use of the area
Road Gradient	0.5%	Average gradient estimated from the modelled road section
Level for traffic composition	Level 2	20% HDV and 80% LDV (refer **Section 3.2)**
Traffic Speed	10 km/hr	-
Hourly Traffic Volumes	**AM Peak:** 290 vph **PM Peak:** 328 vph	The traffic generation estimate (vehicles/day) based on traffic generation rates (refer **Section 3.2**)

Modelling Results

Given that the closest residential receptor is located approximately 20 m and the closest industrial/commercial receptor is located 12 m from the Site boundary, the predicted concentrations at 20 m from the road are considered as the potential impacts from the Project on the residential/recreational receptors and the predicted concentrations at 10 m from the road are considered as the potential impacts from the Project on the industrial/commercial receptors. Results are summarised in **Table D3** for all pollutants and averaging periods assessed. As shown in the table, none of the predicted concentrations exceed the relevant criteria. given that RAQST is a highly conservative screening model, which will overestimate actual impacts it can be concluded that the Project would not result in any increase in incremental air quality impacts at the nearest sensitive receptors, and air quality is not considered to be a constraint for the Project.

Table D3 RAQST Model Results

Pollutant and Averaging Period	Residential/recreational Receptors($\mu g/m^3$)		Industrial/commercial Receptors ($\mu g/m^3$)		Criteria
	AM Peak	PM Peak	AM Peak	PM Peak	
Maximum 1-hour NO_2 concentrations	Not applicable [a]				**164**
Annual NO_2 concentrations	2.1 (7%)	2.3 (7%)	3.5 (11%)	3.9 (13%)	**31**
Maximum 24-hour PM_{10} concentrations	0.7 (1%)	0.7 (1%)	1.1 (2%)	1.3 (3%)	**50**
Annual PM_{10} concentrations	0.3 (1%)	0.3 (1%)	0.4 (2%)	0.5 (2%)	**25**
Maximum 24-hour $PM_{2.5}$ concentrations	0.5 (2%)	0.5 (2%)	0.8 (3%)	0.9 (4%)	**25**
Annual $PM_{2.5}$ concentrations	0.2 (3%)	0.2 (3%)	0.3 (4%)	0.4 (5%)	**8**

[a] The model does not allow for incremental 1-hour NO_2 concentrations.
The numbers in brackets show the incremental impact as a percentage of the relevant criteria.

Appendix E General Air Quality Mitigation Measures for Construction Sites

Wallgrove Road Business Hub

Air Quality and Odour Assessment

Western Sydney Parklands Trust

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Table E1 lists the relevant general mitigation measures designated as highly recommended (H) or desirable (D) by the dust IAQM method for a development shown to have a low risk of adverse impacts. Not all these measures would be practical or relevant to the Project therefore a detailed review of the recommendations should be performed, and the most appropriate measures be adopted as part of the Construction Environmental Management Plan (CEMP).

Table E1 Site-Specific Management Measures Recommended by the IAQM

Mitigation measure	Low Risk	Medium Risk	High Risk
1. Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	N	H	H
2. Display the name and contact details of person(s) account-able for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.	H	H	H
3. Display the head or regional office contact information	H	H	H
4. Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Council. The level of detail will depend on the risk and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.	D	H	H
Site Management			
5. Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	H	H	H
6. Make the complaints log available to the Local Council when asked.	H	H	H
7. Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the logbook.	H	H	H
8. Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.	N	N	H
Monitoring			
9. Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the Local Council when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.	D	D	H
10. Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the Local Council when asked	H	H	H
11. Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	H	H	H
12. Agree dust deposition, dust flux, or real-time PM continuous monitoring locations with the Local Council. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase	N	H	H

Mitigation measure	Low Risk	Medium Risk	High Risk
commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.			
Preparing and maintaining the site			
13. Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	H	H	H
14. Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	H	H	H
15. Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period	D	H	H
16. Avoid site runoff of water or mud.	H	H	H
17. Keep site fencing, barriers and scaffolding clean using wet methods.	D	H	H
18. Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.	D	H	H
19. Cover, seed or fence stockpiles to prevent wind whipping.	D	H	H
Operating vehicle/machinery and sustainable travel			
21. Ensure all vehicles switch off engines when stationary - no idling vehicles.	H	H	H
22. Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.	H	H	H
23. Impose and signpost a maximum-speed-limit of 25 kph on surfaced and 15 kph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the Local Council, where appropriate)	D	D	H
24. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	N	H	H
25. Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)	N	D	H
Operations			
26. Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	H	H	H
27. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	H	H	H
28. Use enclosed chutes and conveyors and covered skips.	H	H	H
29. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	H	H	H
30. Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	D	H	H
Waste management			
31. Avoid bonfires and burning of waste materials.	H	H	H

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