REPORT

PROPOSED MULTI-LEVEL WAREHOUSE DEVELOPMENT

15-21 BRITTON STREET SMITHFIELD, NSW 2164

AIR QUALITY ASSESSMENT
RWDI # 2402424
28 October 2024

SUBMITTED TO

Lendlease Real Estate Investments

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EXECUTIVE SUMMARY

This Air Quality Impact Assessment report has been prepared by RWDI Australia Pty Ltd to accompany a detailed State Significant Development Application (SSDA) for a proposed multi-level warehouse development at 15-21 Britton Street and 28-54 Percival Road, Smithfield, NSW 2164. The site is legally described as Lot 1 and Lot 34 in Deposited Plan (DP) 597082 and 617521 respectively.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the project (SSD-67368956).

The report assessed the potential construction and operational air quality impacts associated with the proposed industrial development in general accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (NSW EPA, 2022).

A risk-based approach was adopted to assess dust emissions from the construction of the proposed development in accordance with the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) "Guidance on the Assessment of Dust from Demolition and Construction" (EPUK & IAQM, 2024). The assessment concluded that there would be a medium risk of dust impacts from demolition, low risk of dust impacts from all other activities (earthworks, construction and track-out), and with the implementation of recommended mitigation measures, no significant air quality impacts are expected to occur during the construction of the proposed development.

A quantitative approach was adopted to assess air quality impacts on nearby receptors during the operation of the Project. The results of the dispersion modelling indicate that particulate matter (PM) and nitrogen dioxide (NO_2) concentrations due to the operation of the proposed development would comply with the established criteria at all sensitive receptors except for 24-hour average fine PM ($PM_{2.5}$) concentrations. The exceedances of the 24-hour average $PM_{2.5}$ criterion are mainly driven by elevated background concentrations, which exceed the 24-hour average $PM_{2.5}$ criterion without contributions from the proposed facility. No additional exceedances of the criteria are predicted to occur as results of operation of the Proposal and not anticipated to significantly exacerbate existing elevated background concentrations. Therefore, operation of the Proposal is not expected to adversely affect sensitive receptors.

Therefore, no adverse air quality impacts associated with the construction and operation of the proposed industrial development are expected.

1 INTRODUCTION

RWDI Australia Pty Ltd (RWDI) has been commissioned by Lendlease Investment Management Pty Ltd to provide an air quality impact assessment of the proposed industrial development of a multi-storey warehouse and distribution facility (the Project) located at 15-21 Britton Street (Lot 1 DP597082) and 28-54 Percival Road (Lot 34 DP617521), Smithfield, NSW 2164 (the Site).

This Air Quality Impact Assessment report provides the following details:

- the existing environment;
- the land zoning of the Site and neighbouring area;
- the closest existing residential and industrial receivers;
- relevant air quality criteria;
- construction and operational air quality predictions for the warehouse and distribution facility and assumptions used in the assessment; and
- recommendations to minimise the air quality impact on the affected receivers, if required.

This Air Quality impact assessment has been completed with reference to relevant guidelines and policies:

- Environmental Protection Authority (EPA) guideline entitled "Approved Methods for the Modelling and Assessment of Air Pollutants in NSW" (NSW EPA, 2022); and
- Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) "Guidance on the Assessment of Dust from Demolition and Construction" (EPUK & IAQM, 2024).

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 25 October 2023 and issued for the SSDA (SSD-63664708). Specifically, this report has been prepared to respond to the SEARs requirements (Table 1-1).

Table 1-1 SEARs

Item	Description of Requirement	Section Reference (This Report)
10. AirQuality	Identify significant air emission sources at the proposed development (during construction and operation).	Section 2.3
	Assess their potential to cause adverse off-site impacts, and detailed proposed management and mitigation measures that would be implemented.	Section 5 assesses air quality impacts from construction works, and Section 6 assesses air quality impacts from operational activities. Section 7 provides proposed mitigation measures.
	Where air emissions during operation have the potential to cause adverse off-site impacts, provide a quantitative air quality impact assessment prepared in accordance with the relevant NSW Environment Protection Authority (EPA) guidelines.	Operational activities were assessed quantitatively in accordance with the relevant NSW EPA guidelines.

2 PROJECT DESCRIPTION

2.1 Project Location

The Site is identified as 15-21 Britton Street and 28-54 Percival Road, which is made up of the following land holdings identified in Table 2-1:

Table 2-1 Site Identification

Site Address	Legal Description	Land Area (approx.)
15 - 21 Britton Street, Smithfield	Lot 1 DP 597082	3.22 hectares
28 – 54 Percival Road, Smithfield	Lot 34 DP 617521	5.53 hectares
Total:		**8.75 hectares**

The Site is located within the eastern portion of the Smithfield Industrial Estate and is bound by established warehouse buildings and industrial land uses. The Site is made up of two allotments which currently operate independently. The western allotment (Lot 1 DP 597082) has frontage to Britton Street and comprises a warehouse building currently operating as a food processing and packaging facility and associated offices. Ancillary buildings and structures are positioned towards the northeastern boundary. The western boundary comprises a landscaped area of mature trees, which extend along the entire Britton Street frontage. An area of hard standing provides at-grade car parking at the southern end of the Site. Vehicular access to the Site is provided via Britton Street to the northeast via a controlled gate with egress provided to the southwest of the Site. A separate vehicle access to the car park is also provided via Britton Street to the south.

The eastern allotment (Lot 34 DP 617521) has frontage to Percival Road and comprises two warehouse buildings and a separate two-storey office building. An area of hard stand provides at-grade car parking at the northern end of the Site, and a landscaped area of mature trees exists at the southern edge. Primary vehicular access to the Site is provided via an entrance off Percival Road for both heavy vehicles and visitors. A secondary entrance is provided at the southern edge of the Site.

Whilst topography at each allotment is relatively flat, the eastern allotment sits higher than the western allotment and is currently separated by a retaining wall.

The Site is situated approximately 24 km from the Sydney CBD. It is within close proximity to transport infrastructure routes, including the Cumberland Highway, which has direct access from Percival Road to the south. Public transport options are also available, with the Liverpool-Parramatta Transitway located directly north of the Site.

In accordance with the Cumberland Local Environmental Plan 2021 (CLEP2021), the Site is zoned E4 General Industrial, as illustrated in Figure 2-1 below. Land uses surrounding the Site comprise the following zoning categories, including:

- E4 General Industrial;
- SP2 Infrastructure (Water Supply System and Strategic Bus Corridor);
- SP2 Infrastructure (Classified Road); and

- RE1 Public Recreation.

The nearest sensitive land uses comprise the R2 Low Density Residential zone located 560 m north of the Site and 590 m east of the Site. The Site and surrounding context are illustrated in Figure 2-2 and Figure 2-3 below.

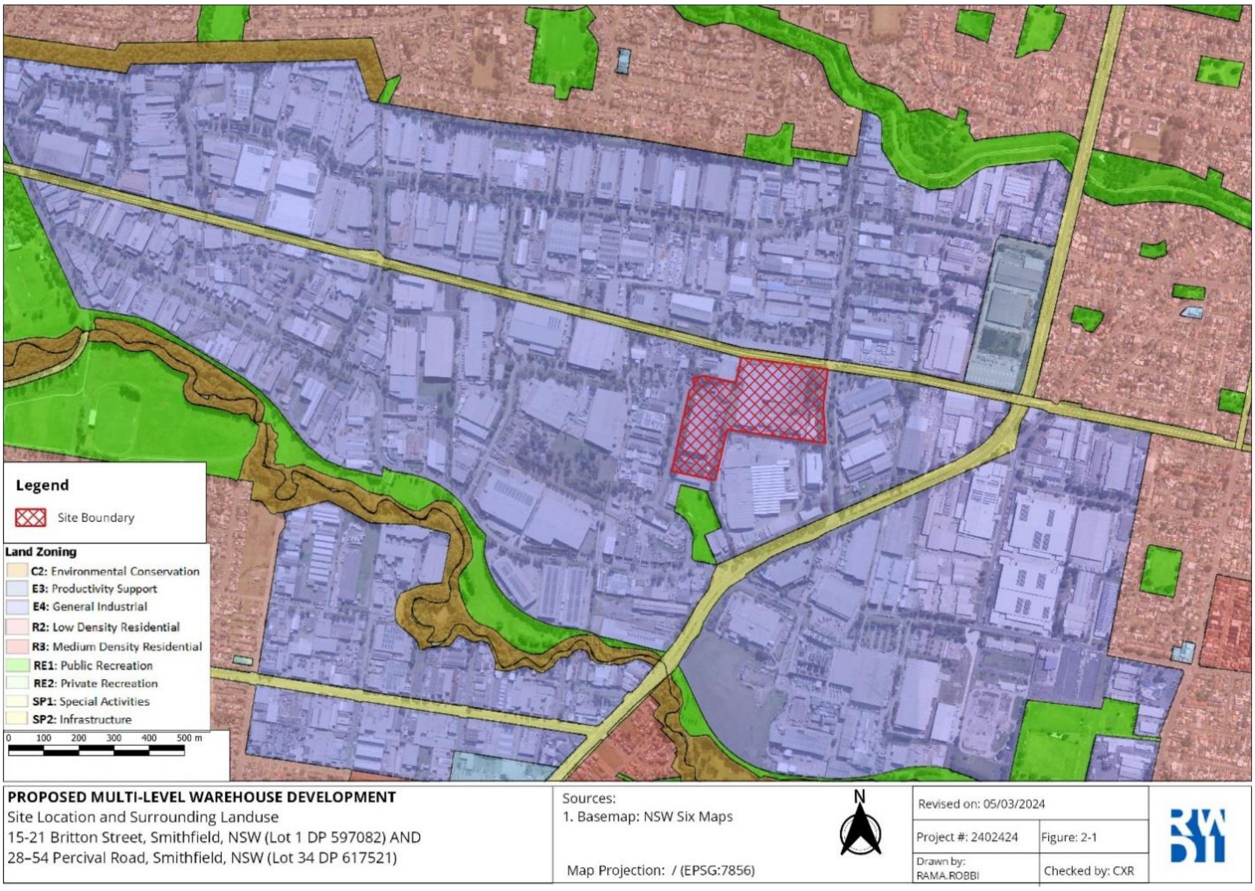

Figure 2-1 Site Location and Surrounding Land Use

Figure 2-2 Aerial: Existing Site Context and Surrounding Area (Source: NearMap, 2023)

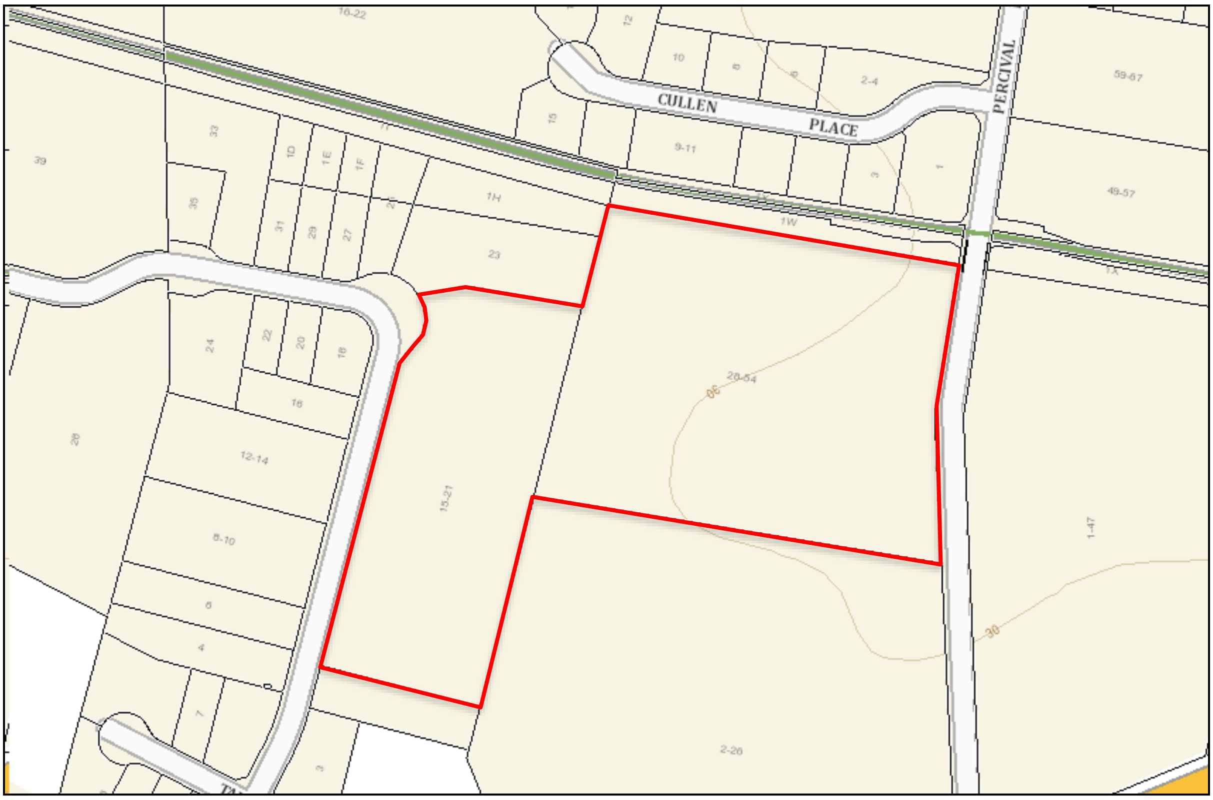

Figure 2-3 Cadastral Map: Existing Site Context (Source: SIX Maps, 2023)

2.2 Proposed Development

The proposed development consists of three warehouse buildings, with frontage to both Britton Street and Percival Road. Warehouse A and B will be located on Lot 34 DP 617521 (Percival Road frontage) at an RL of 33.75. Each building will be two-storey, with a maximum height of 28.6 m (including roof plant).

Warehouse C will be located on Lot 1 DP 597082 (Britton Street frontage) at an RL of 23.75. Warehouse C accommodates an additional storey at lower ground level, due to the 10 m difference in proposed Site levels. Whilst this building height is 38.6 m (including roof plant), the height of all three (3) buildings is consistent at RL 62.35. The three warehouses will be connected at ground level and level 1 via a hardstand that allows for vehicle circulation across the whole Site.

Each building will involve individual warehouse units, with ancillary office at mezzanine level. On the first floor, each building will have access to a shared outdoor amenity area. A café will be located at lower ground level within Warehouse C to accommodate the needs of employees.

The Gross Floor Area (GFA) for each building and each tenancy is outlined in Table 2-2.

Table 2-2 Gross Floor Areas

Building No.	Warehouse GFA	Office GFA	Other Facilities	Total GFA
Building A	29,630 m^2	2,297 m^2	Shared amenities: 132 m^2	32,059 m^2
Building B	30,122 m^2	2,300 m^2	Shared amenities: 133 m^2 End of Trip Facilities: 110 m^2	32,665 m^2
Building C	29,224 m^2	2,439 m^2	Cafe: 71 m^2 End of Trip Facilities: 110 m^2	31,844 m^2
Total	**88,976 m^2**	**7,036 m^2**	**556 m^2**	**96,568 m^2**

The proposal involves new vehicle crossings, which will provide separate ingress and egress for heavy vehicles at both Britton Street and Percival Road. Ingress is provided at Britton Street, whilst egress is provided at both Britton Street and Percival Road. Ramps are provided in each location to allow vehicle circulation to the upper levels. Each warehouse is connected via a hardstand that will allow for vehicle circulation, loading and unloading for each warehouse tenancy. Separate vehicle crossings are provided for cars, enabling access to the at-grade parking at Percival Road, as well as southern end of Britton Street. A third vehicle crossing is provided at the northern end of Britton Street, which provides access to a carparking area at ground floor, mezzanine level. A total of 482 carparks are provided across the three (3) carparking areas.

The proposal will require the removal of several trees across the whole Site and will incorporate landscaping and tree planting at the side boundaries, as well as along Britton Street and Percival Road.

The proposal involves the construction and operation of a multi-level warehouse estate comprising:

- Site preparation and establishment works, including:
  - Demolition of all existing buildings and structures;
  - Clearing of nominated vegetation within the proposed development area;
  - Bulk earthworks to create proposed site levels;

    - Decommissioning of existing vehicle crossings; and
    - In-ground building services and utility work.
- Construction and operation of three (3) multi-level warehouse buildings across the two (2) allotments, comprising the following:
    - Two (2) two-storey warehouse buildings located on Lot 34 DP 617521 (Warehouse A and B), comprising of 12 individual warehouse units and ancillary office;
    - A three-storey building located on Lot 1 DP 597082 (Warehouse C), comprising of 9 individual warehouse units, ancillary office, and a café;
    - Shared outdoor amenity areas provided for employees on level 1;
    - Connected hardstand on ground floor and level 1 that will allow for vehicle circulation across the whole site;
    - A total of 482 carparking spaces within three separate carparking areas;
    - A total GFA of 96,568 m^2, including 88,976 m^2 of warehouse, 7,036 m^2 of office, 71 m^2 of café, 220 m^2 of end of trip facilities and 265 m^2 of shared amenities;
    - Four (4) new vehicle crossings on Percival Road and four (4) new vehicle crossings on Britton Street to provide separate entry and exit for heavy and light vehicles; and
    - Extensive ground and on-building landscaping works.

The layout of the proposal is shown in Figure 2-4**,** and a 3D Section View of the Project is presented in Figure 2-5.

Figure 2-4 Site Layout

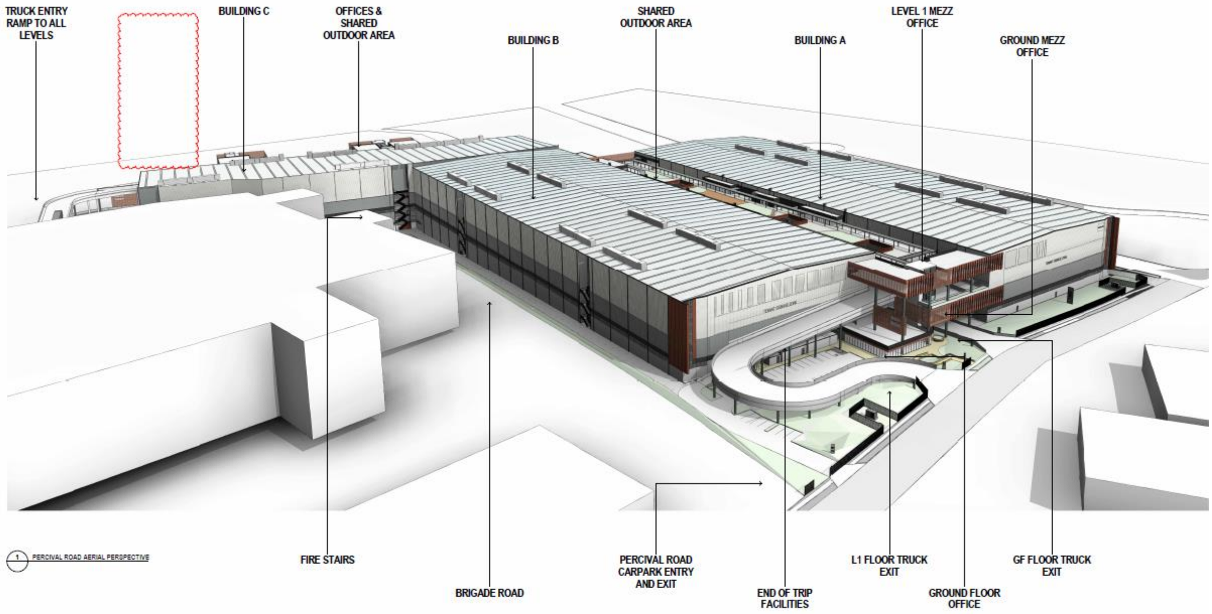

Figure 2-5 Proposed 3D Section View

2.3 Potential Sources of Air Emissions

Air emissions are likely during construction and operation of the multi-storey multi-unit warehouse facility. The most likely sources are summarised in the following sections.

2.3.1 Construction phase

At the time of preparing this assessment a detailed construction programme had not been developed, yet, but the following stages and typical activities can be expected from this project:

Demolition:

- Likely to be the shortest activities;
- Existing buildings/structures to be removed using trucks, excavators, and hand tools; and
- Clearing works.

Earthworks:

- Bulk earthworks required (for creating level building pads for each warehouse) that will involve trucks, excavators, dozers, and associated equipment.

Construction of warehouses and internal road network:

- Likely to be the longest stage of works and of most impact;
- Building works likely to involve many truck movements, cranes, and power tools; and
- Typical equipment includes concrete trucks, asphalt pavers and vibratory rollers.

During the earthwork activities, which include moving of material and truck movements along haul roads (wheel generated dust), short-term periods of elevated dust levels are likely.

Dust or airborne particles at elevated levels can be hazardous to human health or cause nuisance. Potential health effects of airborne particles are closely related to particle size. The most common particle size distributions considered in air quality studies are:

- $PM_{2.5}$: Particulate matter (PM) consisting of particles less than 2.5 µm (micrometres) in diameter – for assessment against health-based criteria;
- PM_{10}: PM consisting of particles less than 10 µm in diameter – for assessment against health-based criteria;
- TSP: total suspended particulates, generally up to 100 µm in diameter – for assessment against predominantly nuisance-based criteria; and
- Deposited dust particles – for assessment of dust nuisance.

PM_{10} and $PM_{2.5}$ are typically invisible, while larger particulates are typically visible to the naked eye.

During the temporary phase of construction earthwork activities, including moving of material and truck movements along haul roads (wheel generated dust), short-term elevated levels of PM_{10} and $PM_{2.5}$ are likely to occur.

2.3.1 Operational phase

At the time of preparing this assessment, the end users were not known; however, based on typical warehouse usage, the following activities can be expected from this project:

- Off-site and on-site vehicular movements including trucks idling; and
- Forklift movements.

These operations will result in wheel-generated dust from vehicles travelling (on sealed roads) within the complex and on the local road network. In addition, contaminant emissions from vehicle exhaust include:

- PM_{10} and $PM_{2.5}$; and
- Oxides of nitrogen (NO_x), particularly as nitrogen dioxide (NO_2).

3 AIR QUALITY CRITERIA

3.1 Introduction

The Environmental Protection Authority (EPA) developed a guideline ("the Approved Methods") that sets out applicable impact assessment criteria for several air pollutants (NSW EPA, 2022).

3.2 Impact Assessment Criteria

Air quality criteria are benchmarks set to protect the general health and amenity of the community in relation to air quality. The criteria presented in the Approved Methods (NSW EPA, 2022) are consistent with the *National Environment Protection Council's National Environment Protection (Ambient Air Quality) Measure* (NEPC, 2021). Table 3-1 summarises the air quality goals for NO_2 and PMs that are relevant to this study. The air quality goals relate to total ambient concentrations of dust and PMs and not only impacts from the project. Therefore, some consideration of background levels needs to be made when using these goals to assess impacts.

Table 3-1 Impact Assessment Criteria – Dust, PM and NO_2

Pollutant	Averaging Period	Impact Criteria (µg/m³)
Total suspended particulates (TSP)	Annual	90
Particulate matter ≤10 µm (PM_{10})	Annual	25
	24-hour	50
Particulate matter ≤2.5 µm ($PM_{2.5}$)	Annual	8
	24-hour	25
Nitrogen dioxide (NO_2)	Annual	31
	1 hour	164

4 EXISTING ENVIRONMENT

4.1 Local Meteorology

Meteorological conditions strongly influence air quality. Most significantly, wind speed, wind direction, temperature, relative humidity, and rainfall affect the dispersion of air pollutants. The following sub-sections discuss the local meteorology near the Project Site and identify a representative set of meteorological data for use in the dispersion modelling to be undertaken for this assessment.

4.1.1 Long-Term Climate

Long-term meteorological data for the area surrounding the Site is available from the Prospect Reservoir operated by the Bureau of Meteorology (BoM). The Prospect Reservoir is located approximately 4.3 km north-west of the Site and records observations of several meteorological parameters including wind speed, wind direction, temperature, humidity and rainfall.

Long-term climate statistics are presented in Table 4-1. Temperature data recorded at the Prospect Reservoir indicate that January is the hottest month of the year with a mean daily maximum temperature of 28.5°C. July is the coolest month with a mean daily minimum temperature of 6.1°C. March is the wettest month with an average rainfall of 103 mm falling over 9 days. There are, on average, 85 rain days per year, delivering 880 mm of rain.

Table 4-1 Climate Averages for Prospect Reservoir

Obs.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
9 am Mean Observations													
Temp (°C)	21.3	21.0	19.6	16.9	13.5	10.7	9.6	11.1	14.5	17.4	18.4	20.6	16.2
Hum (%)	75	79	79	77	80	79	76	70	65	65	70	70	74
3 pm Mean Observations													
Temp (°C)	26.8	26.3	24.8	22.4	19.2	16.5	15.9	17.4	19.6	22.1	23.4	25.9	21.7
Hum (%)	52	54	55	52	57	55	50	45	45	46	50	49	51
Daily Minimum and Maximum Temperatures													
Min (°C)	17.7	17.8	16.2	13.0	9.9	7.5	6.1	6.8	9.4	12.1	14.4	16.4	12.3
Max (°C)	28.5	28.1	26.4	23.8	20.4	17.4	16.9	18.7	21.5	24.0	25.6	27.6	23.2
Rainfall													
Rain (mm)	95.2	99.2	103.1	75.5	68.5	75.5	57.8	50.2	46.3	59.9	73.0	75.7	879.9
Rain (days)	8.1	8.3	8.6	7.1	6.4	7.0	5.7	5.7	6.1	6.9	7.3	7.6	84.8

4.1.2 Wind

The dispersion of dust emissions is primarily influenced by the following meteorological factors:

- wind speed and direction;
- wind profile and turbulence intensity (which are affected by terrain);
- temperature gradient, which affects atmospheric stability and is determined from wind speed, cloud cover and solar radiation; and
- mixing height, which is the depth of the atmospheric boundary layer, where most of the dispersion occurs.

Wind speed and atmospheric stability are examined with respect to flow direction to investigate typical flow regimes and directions of poor dispersion.

Observations of wind speed and direction from the Office of Environment and Heritage (OEH) Air Quality Monitoring Station (AQMS) at Prospect are selected to represent typical wind patterns in the area surrounding the Site and have been incorporated into the dispersion modelling for this assessment. Prospect AQMS is located at approximately 6.1 km north-west of the Site.

Figure 4-1 through Figure 4-6 present annual and seasonal wind roses for Prospect AQMS for the period from 2019 to 2023. As can be seen, winds from the south-west and north-west are most common in the annual wind roses. The 2023 wind roses are in good agreement with the multi-year average wind roses and have therefore been adopted for modelling purposes.

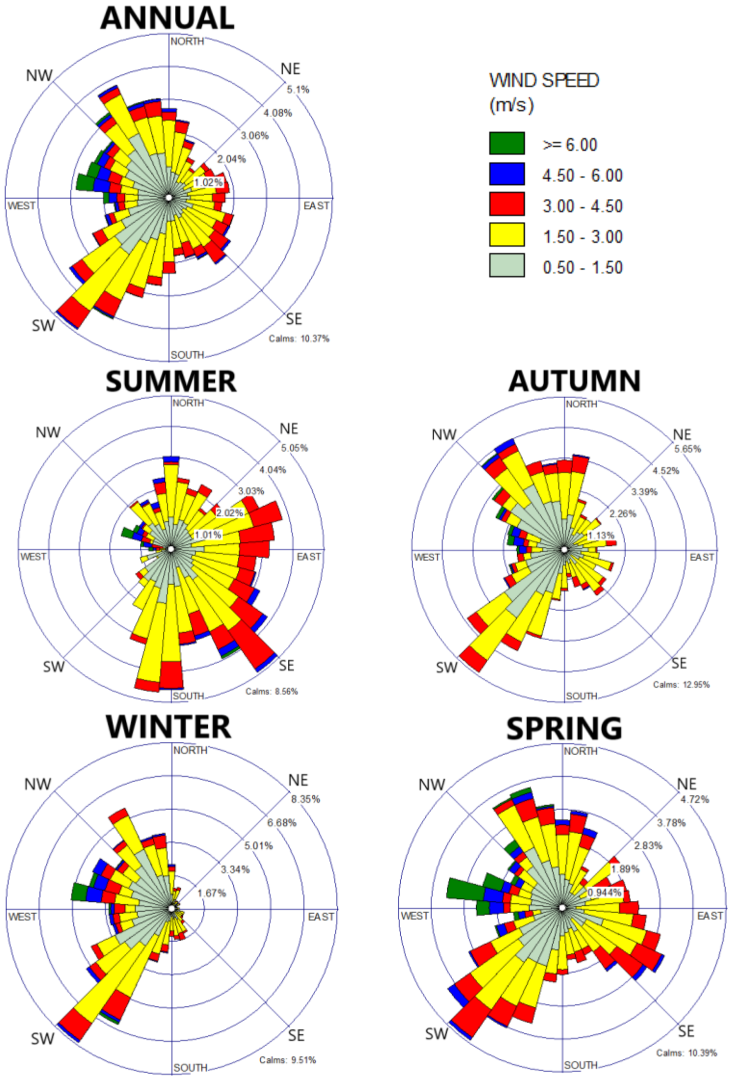

Figure 4-1: Prospect AQMS Wind Roses, 2019

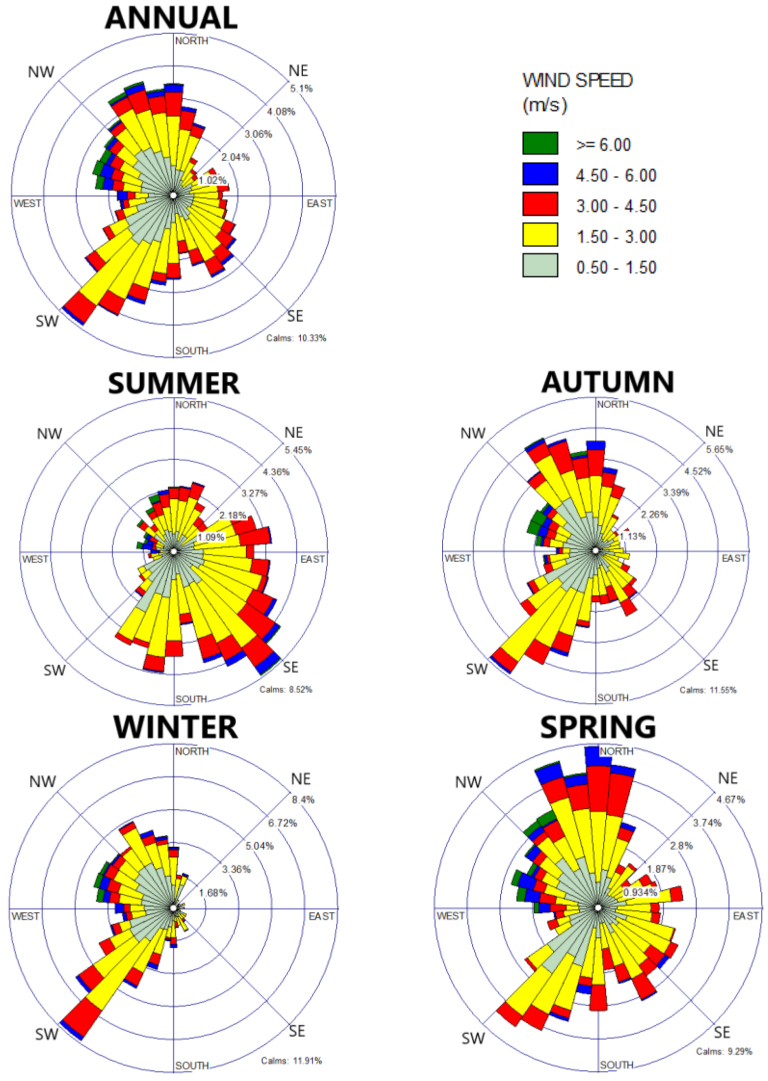

Figure 4-2: Prospect AQMS Wind Roses, 2020

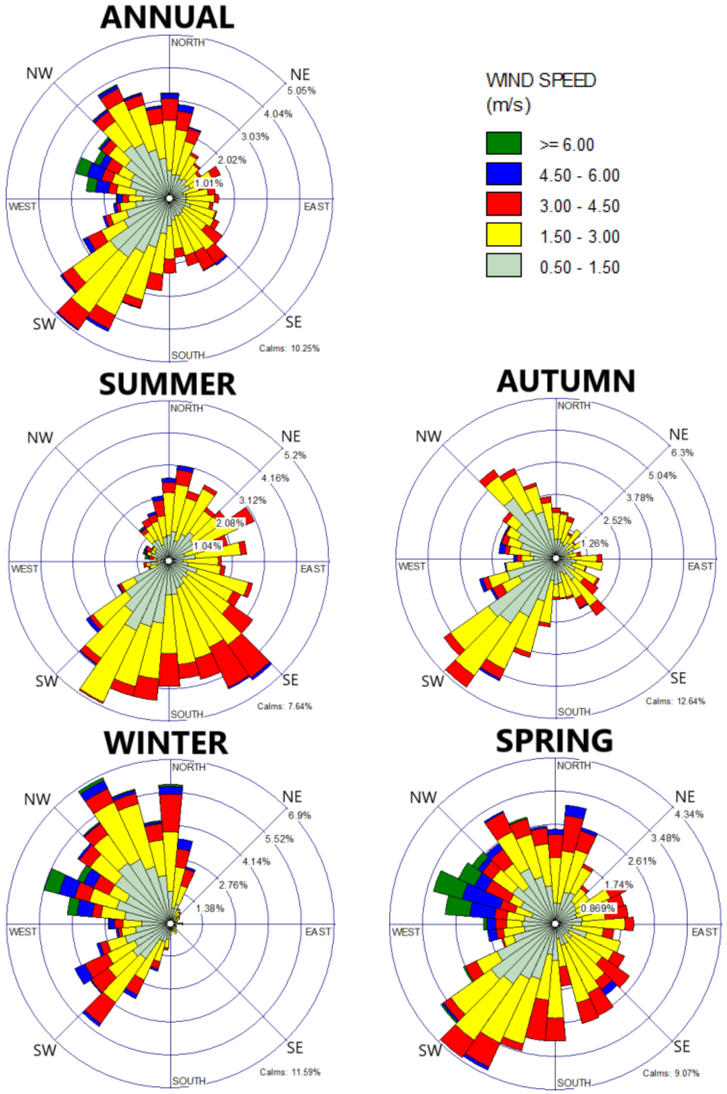

Figure 4-3: Prospect AQMS Wind Roses, 2021

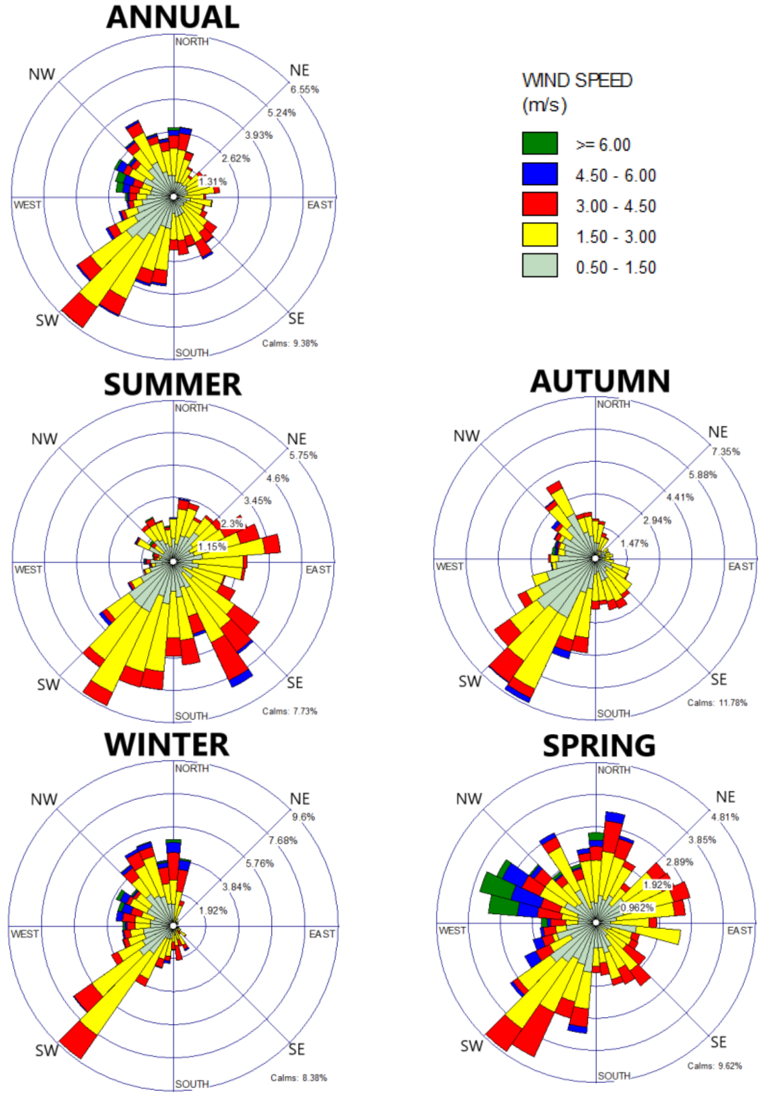

Figure 4-4: Prospect AQMS Wind Roses, 2022

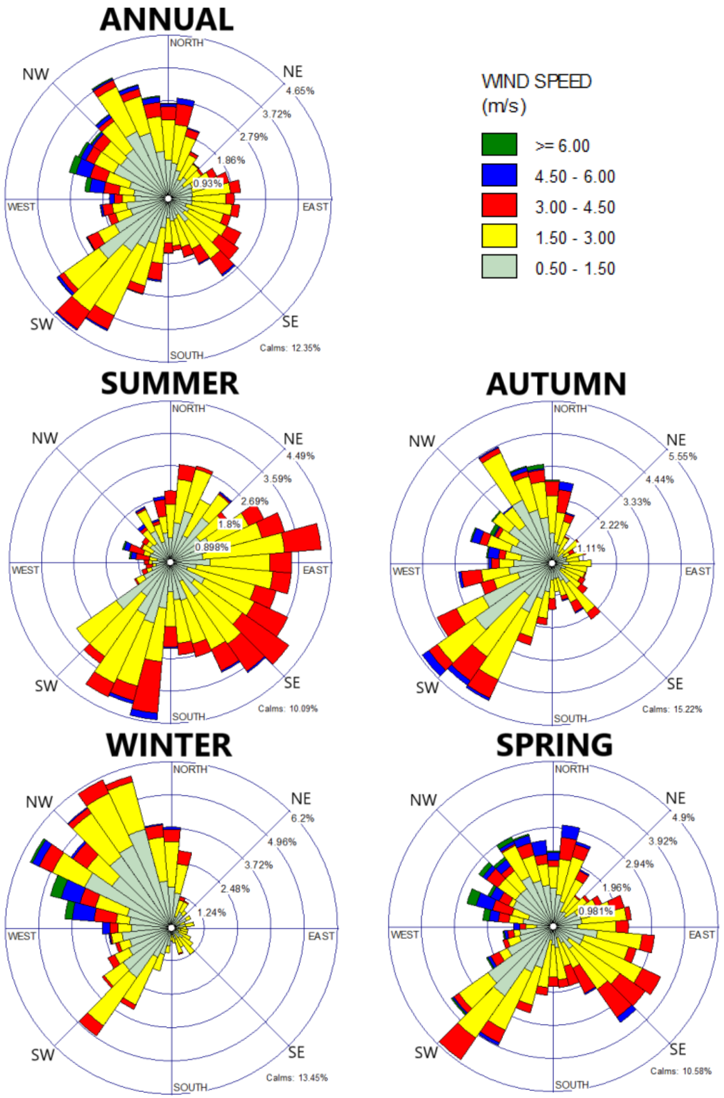

Figure 4-5: Prospect AQMS Wind Roses, 2023

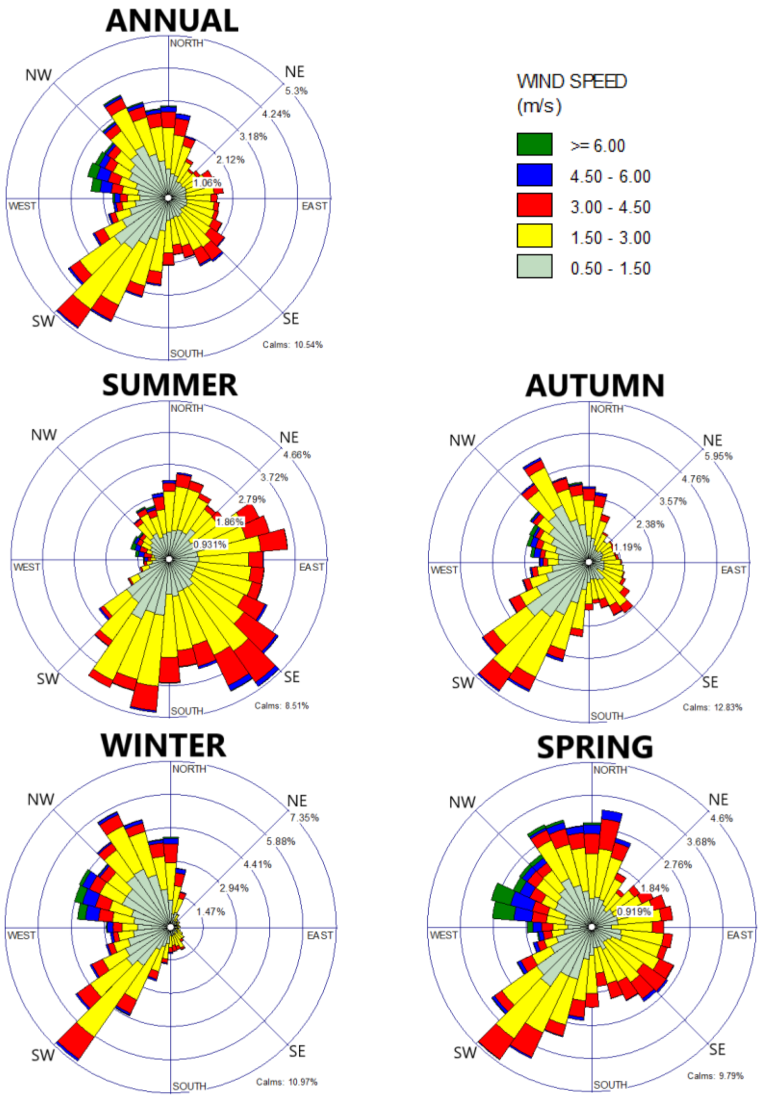

Figure 4-6: Prospect AQMS Wind Roses, 2019 - 2023

4.2 Local Ambient Air Quality

No site-specific data are available to determine the existing concentrations of air pollutants at sensitive receptors near the proposed development. Data on existing background pollution concentrations were obtained from the NSW Department of Planning and Environment (DPE) Air Quality Monitoring network. The DPE operates a network of AQMS across NSW. The nearest AQMS measuring the selected pollutants is located at Prospect approximately 6.1 km north-west of the proposed development.

A summary of the ambient air quality monitoring data collected for year 2023 at Prospect AQMS is presented in Table 4-2. Note that Total Suspended Particulates (TSP) and deposited dust are not monitored at the station. Instead, annual average background TSP concentrations were estimated from a relationship with measured PM_{10} concentrations. This relationship assumes that 40% of the TSP is PM_{10} and was established as part of a review of ambient monitoring data collected by co-located TSP and PM_{10} monitors operated for reasonably long periods of time in the Hunter Valley (NSW Minerals Council, 2000).

Table 4-2 Ambient air quality monitoring concentrations used in the AQ Assessment

Pollutant	Averaging Period	Concentration (µg/m³)	Impact Criteria (µg/m³)	Ambient Air Quality Concentration as a % of Criteria
Total suspended particulates (TSP)	Annual[1]	37.3	90	41%
Particulate matter ≤10 µm (PM_{10})	Annual[2]	16.4	25	66%
	24-hour[3]	41.3	50	83%
Particulate matter ≤2.5 µm ($PM_{2.5}$)	Annual[2]	7.5	8	94%
	24-hour[3]	29.8	25	119%
Nitrogen dioxide (NO_2)	Annual[2]	15.0	31	48%
	1-hour[4]	92.1	164	56%

Note
1. Calculated assuming 40% of the TSP is PM_{10}
2. Average of 1-hour data over the year
3. Maximum of 24-hour data over the year
4. Maximum of 1-hour data over the year

As seen in Table 4-2, the ambient concentrations of all the pollutants are well below criteria except for 24-hour average $PM_{2.5}$, which exceeded the criterion three times. As per the NSW annual air quality statement for 2023[1], 24-hour average $PM_{2.5}$ levels exceeded the criteria at 27 of the 46 monitoring stations that recorded 24-hour average $PM_{2.5}$ levels, mainly caused by smoke from hazard-reduction burns.

[1] https://www.environment.nsw.gov.au/topics/air/nsw-air-quality-statements/annual-air-quality-statement-2023/pm2-5

5 ASSESSMENT OF AIR QUALITY DURING CONSTRUCTION WORKS

5.1 Assessment Methodology

The EPA does not provide guidance specific to dust from construction sites in terms of a risk assessment and management approach. It has developed a guideline, the Approved Methods (NSW EPA, 2022). However, this guideline considers detailed modelling approaches and is not specifically relevant to construction dust impacts. A detailed modelling approach is not necessary for short-term construction impacts that can be managed.

A risk-based approach was developed in the UK by the IAQM as per the guideline EPUK & IAQM (2024). This approach has been widely used for performing qualitative assessments of dust emissions from construction sites and has been used in NSW by RWDI and other consultants. Furthermore, it has been accepted as a suitable approach in the absence of any guidance by Australian regulatory authorities. This section presents a qualitative assessment of potential air quality impacts associated with the proposed works and has been conducted in general accordance with the methodology described in the IAQM guideline (EPUK & IAQM, 2024).

This approach presents the risk of dust soiling and human health impacts associated with four types of activities that occur on construction sites (demolition, earthworks, construction and trackout) and involves the following steps:

- Step 1: Screen the need for a detailed assessment;
- Step 2: Assess the risk of dust impacts arising, based on:
  - The potential magnitude of dust emissions from the works; and
  - The sensitivity of the surrounding area.
- Step 3: Identify site-specific mitigation; and
- Step 4: Consider the significance of residual impacts, after the implementation of mitigation measures.

For this project, the process outlined above will be applied to the worst-case on-site and off-site activities that are likely to result in the highest generation of dust. This approach will result in a conservative assessment of the potential risks for human health and dust soiling impacts.

5.2 Risk Assessment of Dust Impacts

The following qualitative risk assessment of potential dust impacts has been conducted for the proposed construction activities.

5.2.1 Step 1 – Screen the Need for a Detailed Assessment

The IAQM guidance recommends that a risk assessment of potential dust impacts from construction activities be undertaken when human receptors are located within:

- 250 m of the boundary of the site; or,
- 50 m of the route(s) used by construction vehicles on public roads up to 250 m from the site entrance(s).

The locations of sensitive receptors near the Site are listed below in Table 5-1.

Table 5-1 Representative Sensitive Receptors

Receptor	Address	Receiver Type	Distance to Site (m)	UTM Coordinates (Zone 56 H)	
				X (m E)	Y (m S)
R01	3 Tait St, Smithfield NSW	Recreational	50 m	309,976	6,252,900
R02	2-26 Percival Road, Smithfield, NSW	Industrial	50 m	310,230	6,253,098
R03	1-47 Percival Road, Smithfield, NSW	Industrial	50 m	310,452	6,253,211
R04	2/9-11 Cullen Pl, Smithfield NSW	Industrial	50 m	310,168	6,253,493
R05	12-14 Britton Street, Smithfield, NSW	Industrial	50 m	309,809	6,253,242
R06	27 Britton Street, Smithfield, NSW	Industrial	50 m	309,900	6,253,394
R07	4 Low Street, Smithfield, NSW	Residential	650 m	309,826	6,252,459
R08	18 Iris Street, Guildford, NSW	Residential	970 m	311,155	6,252,698
R09	123 Fairfield Road, Guildford, NSW	Hospital	1000 m	311,341	6,252,595
R10	6 Wiley Place, Guildford West, NSW	Residential	970 m	311,276	6,253,091
R11	4 Vale Street, Woodpark, NSW	Residential	600 m	310,932	6,253,339
R12	7 Cumberland Road, Greystanes, NSW	Educational	970 m	310,324	6,254,387
R13	157 Gardenia Parade, Greystanes, NSW	Recreational	600 m	310,222	6,253,997
R14	145 Gardenia Parade, Greystanes, NSW	Residential	600 m	310,017	6,254,049
R15	17 Rhondda Street, Smithfield, NSW	Residential	1200 m	308,683	6,253,077

As can be seen in Figure 5-1, the nearest recreational and industrial receivers are located within 250 m of the proposed Site and therefore, an assessment of dust impacts is considered necessary under the guideline.

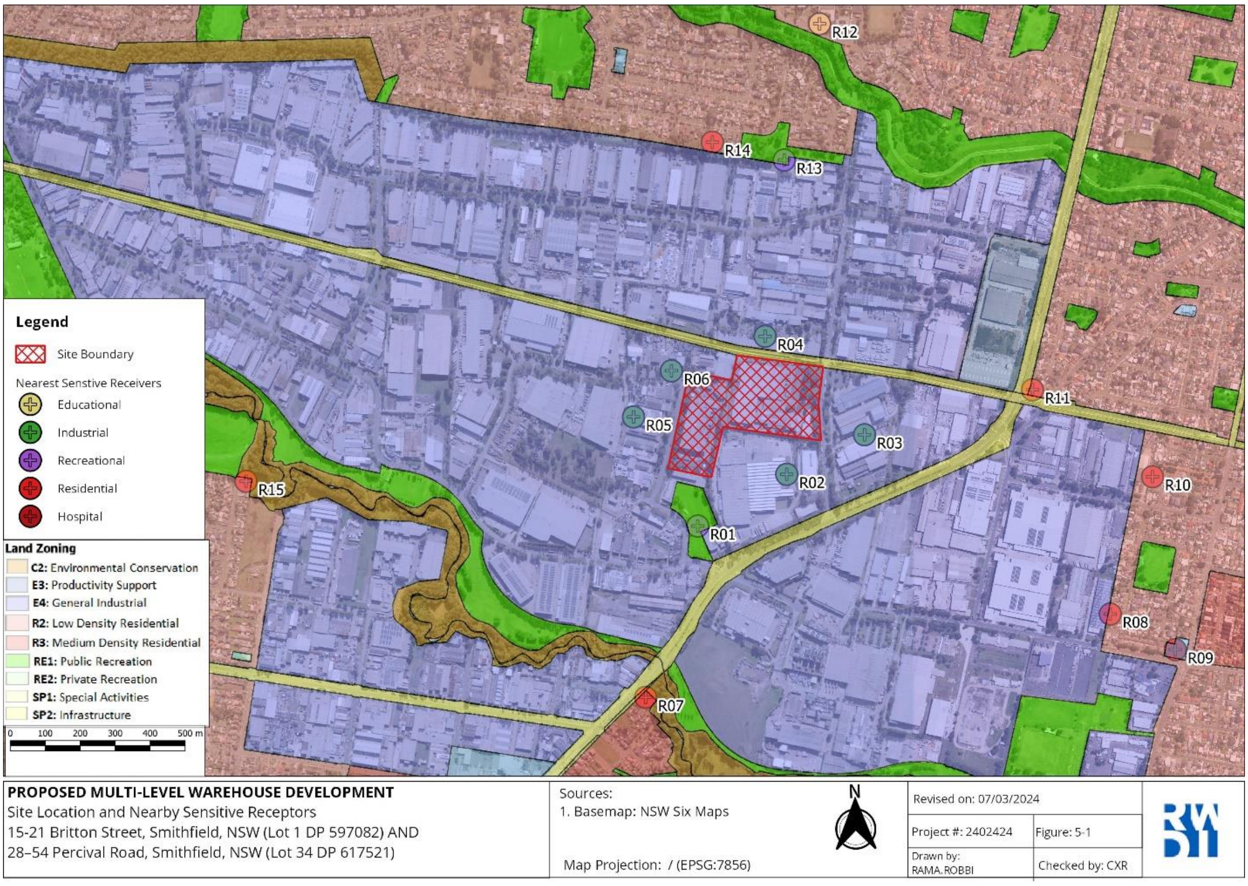

Figure 5-1: Locations of Identified Sensitive Receptors

5.2.2 Step 2A – Potential Dust Emission Magnitude

5.2.2.1 Demolition

In accordance with the IAQM guidance (Section 7, Step 2: Assess the Risk of Dust Impacts), dust emission magnitudes from demolition may be defined as:

- 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; and
- 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.

The demolished building volume is more than 75,000 m^3, and demolition activities are more than 12 m above ground. The potential magnitude of demolition is therefore assessed as **Large**.

5.2.2.2 Earthworks

Regarding dust from earthworks, dust emission magnitudes may be defined as:

- Large: Total site area > 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 18,000-110,000 m^2, moderately dusty soil type (e.g., silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3-6 m in height; and
- Small: Total site area <18,000 m^2, soil type with large grain (e.g., sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <3 m in height.

The areas affected by the proposed earthworks are less than 110,000 m^2, but at any one time, more than 10 heavy earth moving vehicles would be active. It is therefore conservatively assumed that the potential magnitude of earthworks is **Large**.

5.2.2.3 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. The dust emission magnitude from construction activities can be defined as:

- 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; and
- Small: Total building volume <12,000 m^3, construction material with low potential for dust release (e.g., metal cladding or timber).

The constructed building volume is more than 75,000 m^3; therefore, the potential magnitude of construction is assessed as **Large**.

5.2.2.4 Trackout

Regarding dust from trackout associated with haulage activities, dust emission magnitudes may be defined as:

- Large: >50 heavy vehicle (>3.5 t) outward movements per day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m;
- Medium: 20-50 heavy vehicle (>3.5 t) outward movements per day, moderately dusty surface material (e.g. high clay content), unpaved road length 50-100 m; and
- Small: <20 heavy vehicle (>3.5 t) outward movements per day, surface material with low potential for dust release, unpaved road length <50 m.

Trackout is expected to result in more than 50 heavy vehicle movements per day leaving the Site (this would not occur for the entire duration), and all on-site haulage would include unpaved sections of road more than 100 m long. The potential magnitude of Trackout is therefore assessed as **Large**.

5.2.2.5 Summary of Dust Emission Magnitudes

The estimated dust emission magnitudes are summarized in Table 5-2:

Table 5-2: Summary of Dust Emission Magnitudes

Activity	Dust Emission Magnitude
Demolition	Large
Earthworks	Large
Construction	Large
Trackout	Large

5.2.3 Step 2B – Sensitivity of Surrounding Area

The sensitivity of the surrounding area to dust impacts considers several factors, including:

- specific receptor sensitivities;
- the number of receptors and their proximity to the works;
- existing background dust concentrations; and
- site-specific factors that may reduce impacts, such as trees that may reduce wind-blown dust.

The following subsections provide the descriptions for sensitivities of different types of receptors to dust soiling and human health effects.

5.2.3.1 Dust Soiling Effects

High sensitivity receptor:

- Users can reasonably expect an 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.
- Indicative examples include dwellings, museum, and other culturally important collections, medium- and long-term car parks and car showrooms.

Medium sensitivity receptor:

- Users would expect 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 would not reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.
- Indicative examples include parks and places of work.

Low sensitivity receptor:

- 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 to be present only for limited periods of time as part of the normal pattern of use of the land.
- Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks, and roads.

5.2.3.2 Human Health Effects

For the sensitivity of people to the health effects of PM_{10}, the IAQM provides the following assessment criteria.

High sensitivity receptor:

- 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).
- 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.

Medium sensitivity receptor:

- 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).
- Indicative examples may 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.

Low sensitivity receptor:

- Locations where human exposure is transient.
- Indicative examples include public footpaths, playing fields, parks, and shopping streets.

5.2.3.3 Summary of Sensitivities of Surrounding Area

In accordance with the IAQM guideline, the following receptor sensitivities have been determined:

Industrial Receivers

- Medium sensitivity to dust soiling.
- Medium sensitivity to human health.

Residential Receivers

- High sensitivity to dust soiling.
- High sensitivity to human health.

Recreational Receivers

- Low sensitivity to dust soiling.

- Low sensitivity to human health.

Hospital

- High sensitivity to dust soiling.
- High sensitivity to human health.

Educational

- High sensitivity to dust soiling.
- High sensitivity to human health.

Considering the above receptor sensitivities, Table 5-3 and Table 5-4 are reproduced from the IAQM (showing the "high", "medium" and "low" receptor sensitivity) to determine the sensitivity of the area. For human health impacts, the mean background PM_{10} concentration of 16.7 μg/m3 was chosen from Table 4-2. Also, the Residential, Hospital, and Educational Receivers are not considered in the area sensitivity as they are more than 250 m from the proposed Site.

Table 5-3: Area Sensitivity Decision Matrix – Dust Soil

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

Industrial receivers

Recreational receivers

Table 5-4: Area Sensitivity Decision Matrix – Human Health

Receptor sensitivity	Annual Mean PM_{10} concentration[1]	No. of receptors	Distance from the source (m)			
			<20	<50	<100	<250
High	> 20 µg/m³	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	17.5 - 20 µg/m³	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	15 – 17.5 µg/m³	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	< 15 µg/m³	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	> 20 µg/m³	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	17.5 - 20 µg/m³	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	15 – 17.5 µg/m³	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	< 15 µg/m³	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	≥ 1	Low	Low	Low	Low

Industrial receivers

Recreational receivers

Note 1: The PM_{10} values have been adjusted from the IAQM guidance according to the ratio between the Australian and UK annual mean standards (25 and 40 µg/m³ respectively). There is some inherent uncertainty in this adjustment. The upper PM_{10} threshold in the IAQM guidance is based on an annual mean concentration at which an exceedance of the UK's 24-hour objective of 50 µg/m³ is likely, allowing for 35 exceedances per year. In other words, for the UK the annual average approximately corresponds to the 90th percentile of the 24-hour values. However, there are far fewer allowed exceedances in Australia and New Zealand and therefore, there is no direct comparison. Nevertheless, experience with the adjusted values has shown that they work reasonably well for Australian conditions. The values are also taken to be appropriate for New Zealand. Although New Zealand has a lower annual mean guideline than the Australian standard, the 24-hour standards are numerically equivalent.

The sensitivity of the surrounding area (both recreational and industrial receivers) is summarized in Table 5-5:

Table 5-5: Summary of Surrounding Area Sensitivity

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low	Low	Low	Low
Human Health	Low	Low	Low	Low

5.2.4 Step 2C – Define the Risk of Impacts

To define the risk of impacts, the dust emission magnitude ("medium" and "large" for this Site) is combined with the sensitivity of the area, as per Table 5-6, Table 5-7, Table 5-8 and Table 5-9 for demolition, earthworks, construction and trackout, respectively.

Table 5-6: Risk of Dust Impacts – Demolition

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 5-7: Risk of Dust Impacts – Earthworks

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 5-8: Risk of Dust Impacts – Construction

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 5-9: Risk of Dust Impacts – Trackout

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

In accordance with Table 5-6 through Table 5-9, demolition has medium risk and all the other activities (earthworks, construction and trackout) are considered to have a low risk of dust soiling and human health impacts.

It is important to note that the above risks assume that dust mitigation measures are not implemented.

5.2.5 Step 3 – Site-Specific Mitigation

The IAQM guidance document identifies a range of appropriate dust mitigation measures that should be implemented as a function of the risk of impacts. These measures are presented in Section 7.1.

5.2.6 Step 4 – Significance of Residual Impacts

In accordance with the IAQM guidance document, the final step in the assessment is to determine the significance of any residual impacts, following the implementation of mitigation measures. To this end, the guidance states:

> *For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be "not significant".*

Based on the proposed works, and the advice in the IAQM guidance document, it is considered unlikely that these works would result in unacceptable air quality impacts if the mitigation measures outlined in Section 7.1 are implemented.

6 OPERATION PHASE ASSESSMENT

6.1 Assessment Methodology

The operational air quality assessment considers typical warehouse operations, which would generate additional traffic movements along Cumberland Highway and potentially adversely affect ambient air quality.

The approach taken for the operational air quality assessment is as follows:

1. Determine meteorological parameters required for dispersion modelling.
2. Estimate annual dust emissions of each activity associated with the warehouse operations.
3. Provide emissions and meteorological information to a computer-based dispersion model to predict pollutant concentrations at nearest sensitive receptors.
4. Compare predicted concentrations with applicable air quality criteria.

6.2 Meteorological Modelling

6.2.1 TAPM

No meteorological observations are available for the Site. Therefore, site-specific meteorological data was generated using a prognostic model. The prognostic model used was The Air Pollution Model (TAPM), developed and distributed by the Commonwealth Scientific and Industrial Research Organisation (CSIRO).

TAPM is an incompressible, non-hydrostatic, primitive equations prognostic model with a terrain-following vertical coordinate for three-dimensional simulations. It predicts the flows important to local scale air pollution, such as sea breezes and terrain induced flows, against a background of large-scale meteorology provided by synoptic analyses. TAPM benefits from having access to databases of terrain, vegetation and soil type, leaf area index, sea-surface temperature, and synoptic scale meteorological analyses for various regions around the world.

The prognostic modelling domain was centred at 33.842° S, 150.950° E and involved four nesting grids of 30 km, 10 km, 3 km and 1 km with 41 grids in the lateral dimensions and 25 vertical levels.

The TAPM model included assimilation of wind data collected at Prospect AQMS during 2023.

6.2.2 AERMET

The TAPM results, including predictions of wind speed, wind direction, temperature, humidity, cloud cover, solar radiation, and rainfall, were used as inputs to AERMET – AERMOD's meteorological pre-processor. AERMET uses the TAPM data, along with land use data, to calculate mixing heights and velocity scaling parameters.

The wind-rose plots generated by AERMET using TAPM modelling results are shown in Figure 6-1. The AERMET wind roses reproduce the distribution of wind directions observed at the Prospect AQMS very well. Wind speeds tend to be somewhat lower than observed. Overall, the meteorological data used in the model can be considered sufficiently representative of the Proposal Site.

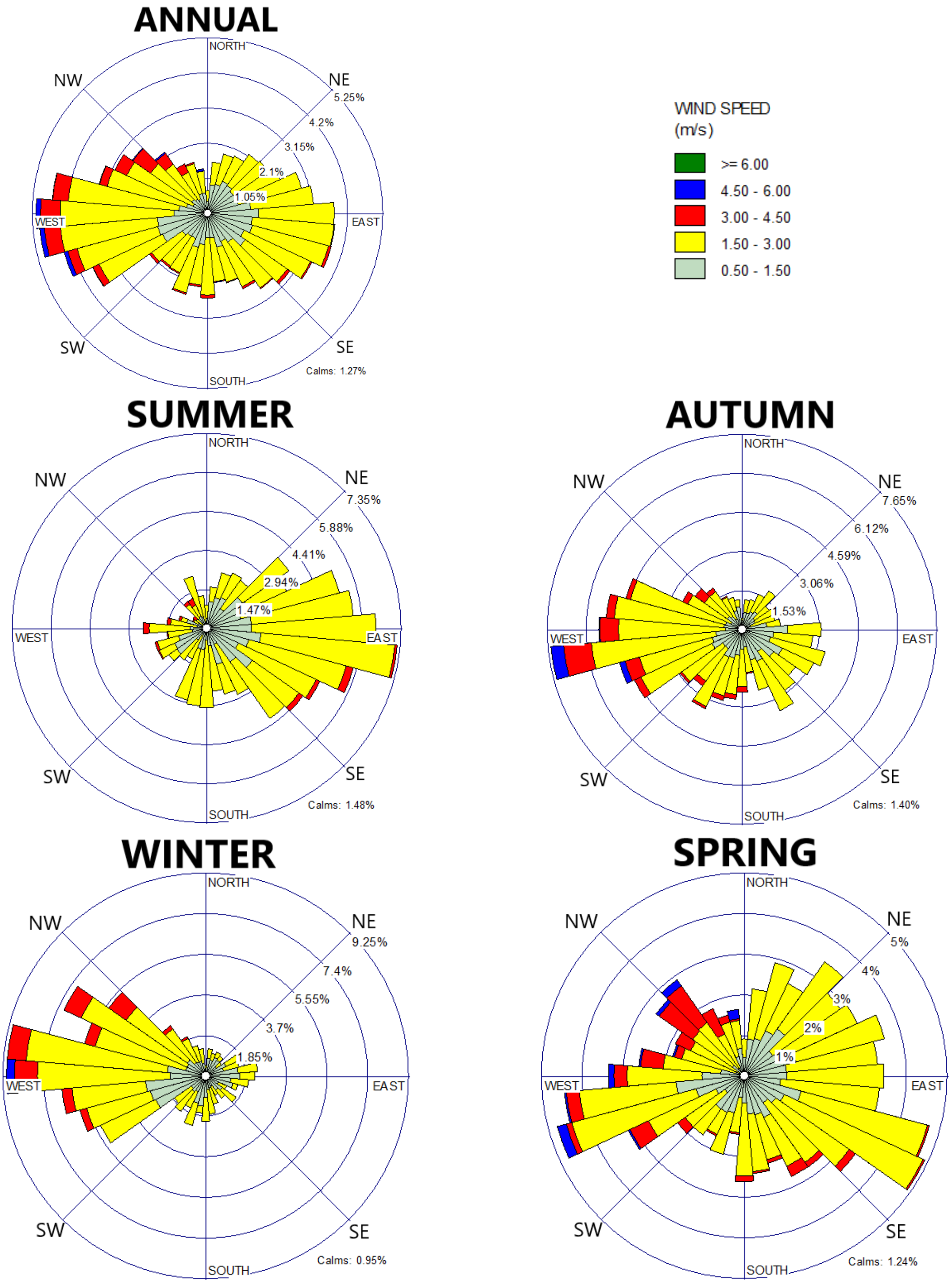

Figure 6-1: AERMET wind rose plots using TAPM modelling results

6.2.3 AERMOD

The dispersion model chosen for this assessment was AERMOD – the US EPA regulatory Gaussian plume air dispersion model. AERMOD is a steady state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts. It includes treatment of both surface and elevated sources, and both simple and complex terrain. AERMOD is accepted by NSW EPA for use in air quality impact assessments.

6.3 Operational Air Emissions

Emissions during operation of the Proposal have been estimated based on information provided by the client and emission factors sourced from US EPA developed documentation. The significant sources of emissions associated with the operation of the Proposal are identified as:

- Truck movements on paved roads; and,
- Diesel exhaust from idling vehicles.

No material handling, processing, or stockpiling would occur outside the buildings. Therefore, windblown dust emissions would be negligible. The emission rate development methodology for each source is presented in the following sections. Additional details and sample calculations are provided in the Appendices.

6.3.1 Truck Movements on Paved Roads

Estimates of the re-entrained road PM emission rates from vehicle movements were obtained using the United States Environmental Protection Agency AP-42 document, Section 13.2.1 (USEPA, AP42). This document provides a reasonable general estimate of emission rates in dry conditions on paved roads.

To determine the roadway PM emissions from re-entrained road PM, the required inputs include number of vehicles, average weight of vehicles, roadway length and road surface silt loading (for paved roads). Traffic distribution data was obtained from the Transport Impact Assessment (dated March 1, 2024). The data was processed to average the traffic movements over a 24-hour day. As a result, 5,206 movements were considered in a 24-hour period: 3,715 light vehicles (LV) and 1,491 heavy vehicles (HV). An average vehicle weight of 20 ton for LV and 50 ton for HV were used for this facility. Default silt loading values for limited access roadways, as provided in in USEPA, AP-42 Chapter 13.2.1, were used. The values used in the assessment are summarized in Appendix A**.**

In addition to these inputs, the AP-42 equation requires the use of a “k” factor, which adjusts the equation to represent the various particle sizes (TSP, PM_{10} and $PM_{2.5}$). However, the maximum “k” factors published in AP-42 Chapter 13.2.1 and 13.2.2 are representative of PM_{30}. Conservatively, the AP-42 “k” factor for TSP was scaled up logarithmically from the published PM_{30} “k” factor to the PM_{44} value of 4.79 for paved roads.

6.3.2 Diesel Exhaust from Idling Vehicles

To account for emissions of NO_x/NO_2 and PM resulting from idling vehicles at the delivery bays at each warehouse unit and other idling spots at the facility, emissions were estimated using emission factors adopted from the US EPA document “Idling Vehicle Emissions for Passenger Cars Light-Duty Trucks, and Heavy-Duty Trucks” (USEPA, 2008). Conservative assumptions were made that all bays would be occupied simultaneously and that the vehicles would be idling for a period of 10 minutes within each hour, 24 hours a day. The values used in the assessment are summarized in Appendix B.

6.4 Assessment of Impacts

This section presents the dispersion modelling results and discusses the likely off-site air quality impacts associated with the operation of the Proposal.

6.4.1 Particulate Matter (as TSP)

Table 6-1 presents the incremental and cumulative annual average TSP concentrations predicted at surrounding representative sensitive receptors. The results indicate compliance with the impact assessment criterion at all receptors.

Table 6-1 Predicted Annual Average TSP Concentrations at Closest Receptors

Receptor	Annual Averaging Time (Criterion: 90 µg/m³)	
	Incremental Impact (µg/m³)	Cumulative Impact (µg/m³)
R01	0.4	37.7
R02	0.9	38.2
R03	1.0	38.3
R04	0.9	38.3
R05	1.6	38.9
R06	1.7	39.0
R07	0.1	37.5
R08	0.1	37.4
R09	0.1	37.4
R10	0.2	37.5
R11	0.3	37.6
R12	0.1	37.4
R13	0.2	37.5
R14	0.1	37.4
R15	0.1	37.5

6.4.2 Coarse Particulate Matter (as PM_{10})

Table 6-2 presents a summary of the results at the closest representative receptors. Incremental and cumulative 24-hour average and annual average PM_{10} concentrations predicted at each surrounding sensitive receptor as a result of operational emissions are below the applicable criteria.

Table 6-2 Predicted Maximum 24-Hour and Annual Average PM_{10} Concentrations at Closest Receptors

Receptor	24-Hour Averaging Time (Criterion: 50 µg/m³)		Annual Averaging Time (Criterion: 25 µg/m³)	
	Incremental Impact (µg/m³)	Cumulative Impact (µg/m³)	Incremental Impact (µg/m³)	Cumulative Impact (µg/m³)
R01	0.75	41.33	0.10	16.51
R02	0.82	41.45	0.21	16.63
R03	1.19	41.59	0.22	16.64
R04	1.27	41.58	0.30	16.71
R05	2.10	41.49	0.40	16.82
R06	1.72	41.72	0.43	16.85
R07	0.53	41.32	0.03	16.45
R08	0.24	41.32	0.02	16.44
R09	0.20	41.31	0.02	16.44
R10	0.39	41.39	0.04	16.46
R11	0.48	41.47	0.07	16.49
R12	0.21	41.34	0.02	16.44
R13	0.50	41.38	0.05	16.47
R14	0.32	41.38	0.04	16.46
R15	0.42	41.31	0.03	16.45

6.4.3 Fine Particulate Matter (as $PM_{2.5}$)

Table 6-3 presents a summary of the incremental and cumulative 24-hour average and annual average $PM_{2.5}$ concentrations predicted at each surrounding sensitive receptor.

Table 6-3 Predicted Maximum 24-Hour and Annual Average $PM_{2.5}$ Concentrations at Closest Receptors

Receptor	24-Hour Averaging Time (Criterion: 25 µg/m³)		Annual Averaging Time (Criterion: 8 µg/m³)	
	Incremental Impact (µg/m³)	Cumulative Impact (µg/m³)	Incremental Impact (µg/m³)	Cumulative Impact (µg/m³)
R01	0.38	29.85	0.06	7.59
R02	0.51	29.91	0.13	7.66
R03	0.67	29.88	0.13	7.66
R04	0.92	29.94	0.21	7.74
R05	1.41	30.16	0.24	7.77
R06	1.11	29.99	0.27	7.80
R07	0.24	29.79	0.02	7.55

Receptor	24-Hour Averaging Time (Criterion: 25 µg/m³)		Annual Averaging Time (Criterion: 8 µg/m³)	
	Incremental Impact (µg/m³)	Cumulative Impact (µg/m³)	Incremental Impact (µg/m³)	Cumulative Impact (µg/m³)
R08	0.12	29.78	0.01	7.54
R09	0.10	29.77	0.01	7.54
R10	0.21	29.78	0.02	7.55
R11	0.27	29.85	0.04	7.57
R12	0.14	29.77	0.01	7.54
R13	0.31	29.79	0.03	7.56
R14	0.22	29.78	0.02	7.55
R15	0.20	29.80	0.01	7.54

Predicted cumulative concentrations of $PM_{2.5}$ for the 24-hour averaging period are expected to exceed the criterion at all sensitive receptors. This is a result of the elevated background concentration of 29.8 µg/m³ which exceeds the criterion without any contribution from the facility. Modelled concentrations from the facility are below 1.41 µg/m³ (less than 6% of the criterion of 25 µg/m³) and are not expected to significantly increase existing exceedances due to background. Operation of the facility is not anticipated to significantly exacerbate existing elevated background concentrations.

A contemporaneous assessment for 24-hour average $PM_{2.5}$ Concentration is shown in Appendix C. There are no additional exceedances of $PM_{2.5}$ concentration at the receptors. Therefore, the operation of the Proposal is not expected to have any significant impact.

The results for the annual averaging period indicate compliance with the impact assessment criterion at all receptors.

6.4.4 Nitrogen Dioxide (NO_2)

Results are presented in this section for the predictions of nitrogen dioxide (NO_2). The averaging periods associated with the criteria for this pollutant are 1-hour and annual. Emissions of NO_x have been estimated, with ground-level concentrations predicted using US EPA AERMOD dispersion modelling. Given that NO_x is mostly a mixture of NO_2 and nitric oxide (NO), conversion of NO_x predictions to NO_2 concentrations was conservatively estimated using a total conversion, i.e., it was assumed that all NO is converted to NO_2 before reaching the receptors.

The predicted maximum 1-hour and annual average NO_2 concentrations resulting from the Proposal's operations are presented in Table 6-4 below.

Table 6-4 Predicted Maximum 1-Hour and Annual Average NO_2 Concentrations at Closest Receptors

Receptor	1-Hour Averaging Time (Criterion: 164 µg/m³)		Annual Averaging Time (Criterion: 31 µg/m³)	
	Incremental Impact (µg/m³)	Cumulative Impact (µg/m³)	Incremental Impact (µg/m³)	Cumulative Impact (µg/m³)
R01	43.6	126.2	1.5	16.5
R02	34.3	119.3	3.2	18.3
R03	54.3	99.6	3.1	18.1
R04	56.7	114.9	5.6	20.7
R05	77.3	130.6	6.1	21.1
R06	60.1	120.6	7.0	22.0
R07	16.6	99.0	0.4	15.5
R08	11.6	92.3	0.3	15.3
R09	9.9	92.3	0.2	15.2
R10	15.1	92.3	0.5	15.5
R11	27.4	92.5	1.0	16.0
R12	16.3	92.2	0.3	15.3
R13	22.4	92.6	0.8	15.8
R14	21.5	92.5	0.6	15.6
R15	13.5	92.3	0.3	15.3

The results in Table 6-4 indicate that predicted incremental concentrations of NO_2 are below the criteria at surrounding receptor locations.

7 RECOMMENDED MITIGATION AND MANAGEMENT

7.1 Construction Dust Mitigation Measures

The assessment of potential dust impacts from the proposed works indicate that the proposed project will have a **medium risk** for demolition activity and a **low risk** for all the other activities (earthworks, construction and trackout) for both dust soiling and human health impacts if dust mitigation measures are not implemented.

To ensure best practice management, the following mitigation measures are recommended so that construction dust impacts are minimised.

- **Communications:**
  - Develop and implement a stakeholder communications plan that includes community engagement before work commences on Site.
  - Display the name and contact details of the Responsible Person accountable for air quality and dust issues on the Site boundary.
  - Display the head or regional office contact information.
  - Develop and implement a Dust Management Plan (DMP) that considers, as a minimum, the measures identified herein.
- **Site Management:**
  - 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.
  - Make the complaints log available to relevant authorities (Council, EPA, etc).
  - Record exceptional incidents that cause dust and/or air emissions, on or off site, and the actions taken to resolve the situation in the logbook.
  - Hold regular liaison meetings with other high risk construction sites within 250 m of the Site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised.
- **Monitoring:**
  - Undertake daily on-site and off-site inspections at nearby receptors to monitor dust. Record inspection results and make available to relevant authorities. This should include regular dust soiling checks of surfaces such as street furniture, cars, and windows. Continuous real-time dust monitoring is not necessary for this project.
  - Increase the frequency of site inspections by the person accountable for air quality and dust issues on the Site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- **Preparing & Maintaining the Site:**
  - Plan site layout so that dust generating activities are located as far away as possible from receptors.
  - Erect solid screens or barriers around dusty activities or the Site boundary that are at least as high as any stockpiles on Site.
  - Fully enclose Site or specific operations where there is a high potential for dust production and the Site is actives for an extensive period.
  - Avoid Site runoff of water or mud.

  - Keep Site fencing, barriers and scaffolding clean using wet methods.
  - Remove materials that have a potential to produce dust from Site as soon as possible, unless being re-used on Site. If being re-used, keep materials covered or contained in a way which prevents dust, for example dust suppression.
  - Cover, seed, or fence stockpiles to prevent wind erosion.
- **Construction Vehicles and Sustainable Travel:**
  - Ensure all vehicles switch off engines when stationary – no idling vehicles.
  - Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
  - Impose and signpost a maximum-speed-limit of 25 km/h on surfaced and 15 km/h on unsurfaced haul roads and work areas (if long haul routes are required, these speeds may be increased with suitable additional control measures provided).
  - Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
  - Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
- **Measures for General Construction Activities:**
  - Ensure an adequate water supply on the Site for effective dust/PM suppression/mitigation, using non-potable water where possible and appropriate.
  - 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.
- **Measures Specific to Demolition:**
  - Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
  - Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
  - Avoid explosive blasting, using appropriate manual or mechanical alternatives.
  - Bag and remove any biological debris or damp down such material before demolition.
- **Measures Specific to Earthworks:**
  - Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
  - Only remove the cover in small areas during work and not all at once.
- **Measures Specific to Construction:**
  - Avoid scabbling (roughening of concrete surfaces) if possible.
  - 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.
  - 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.
  - For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

- **Measures Specific to Haulage:**
  - Use water-assisted dust sweeper(s) on the access and local roads, as necessary.
  - Avoid dry sweeping of large areas.
  - Ensure vehicles entering and leaving the Site are covered to prevent escape of materials during transport.
  - Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
  - Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the Site where reasonably practicable).
  - Access gates to be located at least 10 m from receptors where possible.

7.2 Operational Mitigation Measures

Although predicted air quality impacts from operational activities do not indicate that mitigation measures are required, it would be sensible to:

- Limit unnecessary idling of truck engines on-site; and
- Ensure truck maintenance is up to date.

8 CONCLUSION

RWDI was engaged by Tactical Group to conduct an air quality impact assessment to form part of a State Significant Development Application (SSDA) for the 15-21 Britton Street, Smithfield, NSW 2164. The application seeks approval for the construction and operation of a multi-storey multi-unit warehouse facility.

The assessment concludes:

- The construction phases can be adequately managed so that the short-term and temporary dust related impacts will be medium risk for demolition activity and low risk for all other activities (earthworks, construction and trackout).
- The results of the dispersion modelling indicate that most pollutants concentrations due to the operation of the proposed facility would comply with the established criteria at nearby residential receptors. Although there are predicted exceedances at sensitive receptors for the 24-hour average $PM_{2.5}$ criterion, the predicted maximum concentration is dominated by the background concentrations, which exceed the 24-hour average $PM_{2.5}$ criterion without contributions from the proposed facility. Operation of the Proposal is predicted to contribute less than 6% of the impact assessment criterion. It is not anticipated to significantly exacerbate existing elevated background concentrations, and no additional exceedances of the criteria are predicted to occur as result of operation of the Proposal. Therefore, operation of the Proposal is not expected to adversely affect sensitive receptors.

As such, it is expected that the air quality impacts from the development of the Project are low.

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USEPA, AP42 (United States Environmental Protection Agency AP-42 document, Section 13.2.): "USEPA Air Emissions Factors and Quantification, AP 42, Fifth Edition, Volume I Chapter 13: Miscellaneous Sources". Accessible at: https://www3.epa.gov/ttnchie1/ap42/ch13/

10 STATEMENT OF LIMITATIONS

This report *PROPOSED MULTI-LEVEL WAREHOUSE DEVELOPMENT,* dated 28 October 2024, was prepared by RWDI Australia Pty Ltd ("RWDI") for Lendlease Investment Management Pty Ltd ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.

APPENDIX A

ONSITE MOBILE EQUIPMENT EMISSIONS SPREADSHEET - FUGITIVE DUST

Appendix A: On-Site Mobile Equipment Emissions Spreadsheet - Fugitive Dust

Project #2402424

28-54 Percival Road, 15-21 & 23 Britton Street, Smithfield, NSW

UNPAVED ROAD SECTIONS - AP-42 Section 13.2.2
PAVED ROAD SECTIONS - AP-42 Section 13.2.1

Paved Roads: $E = k\,(sL)^{0.91}\,(W)^{1.02}$
Unpaved Roads - Industrial: $E = 281.9\,k\,(s / 12)^{a}\,(W / 3)^{b}$
Unpaved Roads - Public: $E = 281.9\,k\,(s / 12)^{a}\,(S / 30)^{d} / (M / 0.5)^{c} - C$

E particulate emission factor (g/VKT)
k particle size multiplier (see below)
sL road surface silt loading (g/m²)
W average weight of the vehicles traveling the road (US short tons)
s surface material silt content (%)
C emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear
M surface material moisture content (%)
S mean vehicle speed (mph)
a,b,c,d constants (see below)

Route ID	Route Description	Traffic Passes [2] Hourly (#/h)	Daily (#/d)	Annual (#/a)	Segment Length [2] (m)	Road Surface [3]	Roadway Type [4]	Mean Vehicle Speed (km/h)	(mph)	Average Vehicle Weight [5] (tons)	Surface Material Moisture Content [6] (%)	Surface Silt Content [7] (%)	Road Surface Silt Loading [8] (g/m²)	Base AP-42 Emission Factor TSP (g/VKT)	PM_{10} (g/VKT)	$PM_{2.5}$ (g/VKT)	Base Emission Rate TSP (g/s)	PM_{10} (g/s)	$PM_{2.5}$ (g/s)
HV_01LG_IN	Heavy Vehicles 01 Lower Ground - In	16	1491		195	Paved	Industrial	25	16	50			0.015	5.7E+00	7.3E-01	1.8E-01	4.76E-03	6.16E-04	1.49E-04
HV_02LG_OUT	Heavy Vehicles 02 Lower Ground - Out	16			107	Paved	Industrial	25	16	50			0.015	5.7E+00	7.3E-01	1.8E-01	2.62E-03	3.40E-04	8.22E-05
HV_03G_IN	Heavy Vehicles 03 Ground - In	16			682	Paved	Industrial	25	16	50			0.015	5.7E+00	7.3E-01	1.8E-01	1.67E-02	2.16E-03	5.22E-04
HV_04G_OUT	Heavy Vehicles 04 Ground - Out	16			244	Paved	Industrial	25	16	50			0.015	5.7E+00	7.3E-01	1.8E-01	5.96E-03	7.72E-04	1.87E-04
HV_051L_IN	Heavy Vehicle 05 Level 1 - In	16			678	Paved	Industrial	25	16	50			0.015	5.7E+00	7.3E-01	1.8E-01	1.66E-02	2.15E-03	5.19E-04
HV_061L_OUT	Heavy Vehicle 06 Level 1 - Out	16			421	Paved	Industrial	26	16	50			0.015	5.7E+00	7.3E-01	1.8E-01	1.03E-02	1.33E-03	3.22E-04
LV_01_IN	Light Vehicles 01 - In	39	3715		350	Paved	Industrial	25	16	20			0.015	2.2E+00	2.9E-01	7.0E-02	8.38E-03	1.08E-03	2.62E-04
LV_02_OUT	Light Vehicles 02 - Out	39			216	Paved	Industrial	26	16	20			0.015	2.2E+00	2.9E-01	7.0E-02	5.17E-03	6.69E-04	1.62E-04
LV_03_IN	Light Vehicles 03 - In	30			94	Paved	Industrial	27	17	20			0.015	2.2E+00	2.9E-01	7.0E-02	1.74E-03	2.26E-04	5.46E-05
LV_04_OUT	Light Vehicles 04 - Out	30			94	Paved	Industrial	28	17	20			0.015	2.2E+00	2.9E-01	7.0E-02	1.74E-03	2.26E-04	5.46E-05
LV_05_IN	Light Vehicles 05 - In	26			127	Paved	Industrial	29	18	20			0.015	2.2E+00	2.9E-01	7.0E-02	2.00E-03	2.58E-04	6.25E-05
LV_06_OUT	Light Vehicles 06 - Out	26			127	Paved	Industrial	30	19	20			0.015	2.2E+00	2.9E-01	7.0E-02	2.00E-03	2.58E-04	6.25E-05
			5206																

Constants for Mobile Emission Equations

Roadway Type	Contaminant	k	a	b	c	d	Quality
Paved Roads:	$PM_{2.5}$	0.15	-	-	-	-	-
	PM_{10}	0.62	-	-	-	-	-
	PM_{30}	3.23	-	-	-	-	-
	TSP	4.79	-	-	-	-	-

[2] Length of a specific road segment. A separate segment should be used whenever one or more parameters change.
[3] Paved surfaces include asphalt, concrete, and recycled asphalt (if it forms a relatively consistent surface)
[4] Publicly accessible and dominated by light vehicles, or industrial, and dominated by heavy vehicles
[5] The average vehicle weight reflects the average of the empty and loaded vehicle weight, for travel in both directions
[6] Required only for publicly accessible unpaved roads.
[7] Required only for unpaved roads (public and industrial).
[8] Required only for industrial paved roads.

Sample calculation for uncontrolled TSP emission factor for Source HV_01LG_IN: Heavy Vehicles 01 Lower Ground - In

EF = 281.9 x (4.9) x [(0% / 12)]^(0.7) x [(50 tons) / 3]^(0.45) = 5.7 g TSP / vehicle kilometer travelled (vkt)

Sample calculation for TSP emission rate for Source HV_01LG_IN: Heavy Vehicles 01 Lower Ground - In

16 vehicles	195 m	1 km	6 g_{TSP}	1 h	1 $g_{TSP\ uncontrolled}$		
1 h		1000 m	1 vehicle km	3600 s	1 g_{TSP}	=	4.76E-03 g_{TSP} / s

APPENDIX B

SUMMARY OF COMBUSTIBLE EXHAUST EMISSIONS (IDLING SOURCES)

Appendix B: Summary of Combustion Exhaust Emissions (Idling Sources)

Project #2402424

28-54 Percival Road, 15-21 & 23 Britton Street, Smithfield, NSW

Source ID	Description	Number Of Units	Max. Hourly Traffic (#/h)	Tailpipe Emission Factor				Tailpipe Emission Rate [1]			
				TSP (g/h)	PM10 (g/h)	PM2.5 (g/h)	NOx (g/h)	TSP (g/s)	PM10 (g/s)	PM2.5 (g/s)	NOx (g/s)
V01WHA1	Heavy Truck Idiling - Warehouse A1	8	53		1.196	1.10	3.38E+01	4.19E-04	4.19E-04	3.86E-04	1.18E-02
V01WHA2	Heavy Truck Idiling - Warehouse A2	8	53		1.196	1.10	3.38E+01	4.19E-04	4.19E-04	3.86E-04	1.18E-02
V01WHA3	Heavy Truck Idiling - Warehouse A3	5	53		1.196	1.10	3.38E+01	2.67E-04	2.67E-04	2.45E-04	7.53E-03
V01WHA4	Heavy Truck Idiling - Warehouse A4	5	53		1.196	1.10	3.38E+01	2.67E-04	2.67E-04	2.45E-04	7.53E-03
V01WHA5	Heavy Truck Idiling - Warehouse A5	5	53		1.196	1.10	3.38E+01	2.67E-04	2.67E-04	2.45E-04	7.53E-03
V01WHA6	Heavy Truck Idiling - Warehouse A6	5	53		1.196	1.10	3.38E+01	2.67E-04	2.67E-04	2.45E-04	7.53E-03
V01WHB1	Heavy Truck Idiling - Warehouse B1	8	53		1.196	1.10	3.38E+01	4.19E-04	4.19E-04	3.86E-04	1.18E-02
V01WHB2	Heavy Truck Idiling - Warehouse B2	8	53		1.196	1.10	3.38E+01	4.19E-04	4.19E-04	3.86E-04	1.18E-02
V01WHB3	Heavy Truck Idiling - Warehouse B3	5	53		1.196	1.10	3.38E+01	2.67E-04	2.67E-04	2.45E-04	7.53E-03
V01WHB4	Heavy Truck Idiling - Warehouse B4	5	53		1.196	1.10	3.38E+01	2.67E-04	2.67E-04	2.45E-04	7.53E-03
V01WHB5	Heavy Truck Idiling - Warehouse B5	5	53		1.196	1.10	3.38E+01	2.67E-04	2.67E-04	2.45E-04	7.53E-03
V01WHB6	Heavy Truck Idiling - Warehouse B6	5	53		1.196	1.10	3.38E+01	2.67E-04	2.67E-04	2.45E-04	7.53E-03
V01WHC1	Heavy Truck Idiling - Warehouse C1	6	18		1.196	1.10	3.38E+01	3.32E-04	3.32E-04	3.06E-04	9.38E-03
V01WHC2	Heavy Truck Idiling - Warehouse C2	6	18		1.196	1.10	3.38E+01	3.32E-04	3.32E-04	3.06E-04	9.38E-03
V01WHC3	Heavy Truck Idiling - Warehouse C3	6	18		1.196	1.10	3.38E+01	3.32E-04	3.32E-04	3.06E-04	9.38E-03
V01WHC4	Heavy Truck Idiling - Warehouse C4	8	53		1.196	1.10	3.38E+01	4.19E-04	4.19E-04	3.86E-04	1.18E-02
V01WHC5	Heavy Truck Idiling - Warehouse C5	8	53		1.196	1.10	3.38E+01	4.19E-04	4.19E-04	3.86E-04	1.18E-02
V01WHC6	Heavy Truck Idiling - Warehouse C6	8	53		1.196	1.10	3.38E+01	4.19E-04	4.19E-04	3.86E-04	1.18E-02
V01WHC7	Heavy Truck Idiling - Warehouse C7	5	53		1.196	1.10	3.38E+01	2.67E-04	2.67E-04	2.45E-04	7.53E-03
V01WHC8	Heavy Truck Idiling - Warehouse C8	5	53		1.196	1.10	3.38E+01	2.67E-04	2.67E-04	2.45E-04	7.53E-03
V01WHC9	Heavy Truck Idiling - Warehouse C9	5	53		1.196	1.10	3.38E+01	2.67E-04	2.67E-04	2.45E-04	7.53E-03

[1] Conservative assumption of each vehicle Idling 10 minutes per hour

Sample Calculations

Heavy Truck Exhaust NOx Emissions:

$$\frac{33.763\ \text{g}}{\text{h}} \times \frac{1\ \text{h}}{3600\ \text{s}} \times \frac{10\ \text{min}}{60\ \text{min}} = 1.6\text{E-03}\ g_{NOx}/s \quad x \quad 8\ \text{units}$$

$$= 1.18\text{E-02}\ g_{NOx}/s$$

APPENDIX C

CONTEMPORANEOUS ASSESSMENT OF 24-HOUR AVERAGE $PM_{2.5}$ CONCENTRATION

Summary of Contemporaneous Impact and Background – Days with Highest Background at Each Sensitive Receptor

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R01 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R01	
11/06/2023	23.70	0.09446	23.79
11/09/2023	23.40	0.04673	23.45
19/12/2023	22.55	0.19346	22.75
12/06/2023	22.42	0.17907	22.60
13/09/2023	21.27	0.05238	21.32
15/09/2023	20.78	0.20535	20.99
29/07/2023	19.45	0.02989	19.48
04/08/2023	16.59	0.17721	16.77

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R02 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R02	
11/06/2023	23.70	0.16807	23.86
11/09/2023	23.40	0.11402	23.52
19/12/2023	22.55	0.12809	22.68
12/06/2023	22.42	0.23404	22.65
13/09/2023	21.27	0.15347	21.42
15/09/2023	20.78	0.28159	21.06
29/07/2023	19.45	0.27079	19.72
04/08/2023	16.59	0.46121	17.05

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R03 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R03	
11/06/2023	23.70	0.1071	23.80
11/09/2023	23.40	0.12675	23.53
19/12/2023	22.55	0.02059	22.57
12/06/2023	22.42	0.1632	22.58
13/09/2023	21.27	0.25456	21.53
15/09/2023	20.78	0.20983	20.99
29/07/2023	19.45	0.43591	19.89
04/08/2023	16.59	0.20421	16.80

Summary of Contemporaneous Impact and Background – Days with Highest Background at Each Sensitive Receptor

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R04 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R04	
11/06/2023	23.70	0.25165	23.95
11/09/2023	23.40	0.17895	23.58
19/12/2023	22.55	0.0452	22.60
12/06/2023	22.42	0.20046	22.62
13/09/2023	21.27	0.15362	21.42
15/09/2023	20.78	0.08747	20.87
29/07/2023	19.45	0.05749	19.51
04/08/2023	16.59	0.07506	16.67

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R05 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R05	
11/06/2023	23.70	0.4667	24.16
11/09/2023	23.40	0.27155	23.68
19/12/2023	22.55	0.05952	22.61
12/06/2023	22.42	0.40127	22.82
13/09/2023	21.27	0.28684	21.56
15/09/2023	20.78	0.08183	20.87
29/07/2023	19.45	0.05384	19.50
04/08/2023	16.59	0.07095	16.66

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R06 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R06	
11/06/2023	23.70	0.5283	24.22
11/09/2023	23.40	0.36838	23.77
19/12/2023	22.55	0.04902	22.60
12/06/2023	22.42	0.22471	22.64
13/09/2023	21.27	0.34135	21.61
15/09/2023	20.78	0.0976	20.88
29/07/2023	19.45	0.06414	19.51
04/08/2023	16.59	0.08265	16.67

Summary of Contemporaneous Impact and Background – Days with Highest Background at Each Sensitive Receptor

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R07 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R07	
11/06/2023	23.70	0.025	23.72
11/09/2023	23.40	0.01272	23.42
19/12/2023	22.55	0.09291	22.65
12/06/2023	22.42	0.08385	22.50
13/09/2023	21.27	0.01442	21.29
15/09/2023	20.78	0.11678	20.90
29/07/2023	19.45	0.00541	19.46
04/08/2023	16.59	0.05685	16.65

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R08 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R08	
11/06/2023	23.70	0.01367	23.71
11/09/2023	23.40	0.00729	23.41
19/12/2023	22.55	0.00269	22.56
12/06/2023	22.42	0.01694	22.43
13/09/2023	21.27	0.00887	21.28
15/09/2023	20.78	0.006	20.79
29/07/2023	19.45	0.02363	19.47
04/08/2023	16.59	0.07642	16.67

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R09 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R09	
11/06/2023	23.70	0.01032	23.71
11/09/2023	23.40	0.0054	23.41
19/12/2023	22.55	0.00203	22.56
12/06/2023	22.42	0.01271	22.43
13/09/2023	21.27	0.00657	21.28
15/09/2023	20.78	0.00425	20.79
29/07/2023	19.45	0.01752	19.47
04/08/2023	16.59	0.05915	16.65

Summary of Contemporaneous Impact and Background – Days with Highest Background at Each Sensitive Receptor

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R10 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R10	
11/06/2023	23.70	0.01384	23.71
11/09/2023	23.40	0.02996	23.43
19/12/2023	22.55	0.00273	22.56
12/06/2023	22.42	0.03429	22.45
13/09/2023	21.27	0.06243	21.33
15/09/2023	20.78	0.05576	20.84
29/07/2023	19.45	0.11051	19.56
04/08/2023	16.59	0.00439	16.60

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R11 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R11	
11/06/2023	23.70	0.02919	23.73
11/09/2023	23.40	0.03988	23.44
19/12/2023	22.55	0.0049	22.56
12/06/2023	22.42	0.06273	22.48
13/09/2023	21.27	0.1598	21.43
15/09/2023	20.78	0.12189	20.91
29/07/2023	19.45	0.14966	19.60
04/08/2023	16.59	0.00773	16.60

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R12 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R12	
11/06/2023	23.70	0.00373	23.70
11/09/2023	23.40	0.00229	23.41
19/12/2023	22.55	0.00064	22.55
12/06/2023	22.42	0.00326	22.42
13/09/2023	21.27	0.00241	21.27
15/09/2023	20.78	0.00123	20.78
29/07/2023	19.45	0.00089	19.45
04/08/2023	16.59	0.00104	16.59

Summary of Contemporaneous Impact and Background – Days with Highest Background at Each Sensitive Receptor

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R13 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R13	
11/06/2023	23.70	0.02947	23.73
11/09/2023	23.40	0.01697	23.42
19/12/2023	22.55	0.00557	22.56
12/06/2023	22.42	0.02607	22.44
13/09/2023	21.27	0.01871	21.29
15/09/2023	20.78	0.01036	20.79
29/07/2023	19.45	0.0064	19.46
04/08/2023	16.59	0.0088	16.60

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R14 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R14	
11/06/2023	23.70	0.02286	23.72
11/09/2023	23.40	0.01314	23.42
19/12/2023	22.55	0.00436	22.56
12/06/2023	22.42	0.02021	22.44
13/09/2023	21.27	0.01471	21.29
15/09/2023	20.78	0.00807	20.79
29/07/2023	19.45	0.00506	19.46
04/08/2023	16.59	0.00691	16.60

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R15 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R15	
11/06/2023	23.70	0.02156	23.72
11/09/2023	23.40	0.00608	23.41
19/12/2023	22.55	0.00222	22.56
12/06/2023	22.42	0.05101	22.47
13/09/2023	21.27	0.00666	21.28
15/09/2023	20.78	0.00392	20.79
29/07/2023	19.45	0.0025	19.45
04/08/2023	16.59	0.00349	16.60

Summary of Contemporaneous Impact and Background – Days with Highest Predicted Increment at Each Sensitive Receptor

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R01 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R01	
03/08/2023	12.85	0.37962	13.23
18/02/2023	9.80	0.36346	10.16
30/10/2023	6.35	0.33919	6.69
28/04/2023	6.91	0.33562	7.25
08/06/2023	4.46	0.33254	4.79
11/03/2023	6.06	0.32554	6.38
22/06/2023	15.17	0.3138	15.48
06/03/2023	5.27	0.27096	5.54

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R02 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R02	
30/08/2023	12.38	0.50786	12.89
22/08/2023	9.16	0.46833	9.63
04/08/2023	16.59	0.46121	17.05
08/06/2023	4.46	0.44561	4.90
29/04/2023	7.77	0.41782	8.19
13/06/2023	7.32	0.41575	7.74
30/10/2023	6.35	0.39919	6.75
05/07/2023	5.28	0.39121	5.67

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R03 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R03	
30/07/2023	12.95	0.67064	13.62
16/03/2023	5.44	0.60839	6.05
30/05/2023	7.92	0.58996	8.51
31/05/2023	10.61	0.5865	11.19
02/05/2023	6.95	0.54572	7.50
15/06/2023	9.29	0.54092	9.83
10/07/2023	6.36	0.52548	6.89
01/05/2023	4.54	0.51886	5.06

Summary of Contemporaneous Impact and Background – Days with Highest Predicted Increment at Each Sensitive Receptor

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R04 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R04	
08/08/2023	8.97	0.92267	9.89
07/08/2023	7.55	0.91739	8.46
05/04/2023	4.29	0.86666	5.15
15/08/2023	4.57	0.80615	5.38
14/04/2023	4.71	0.76304	5.48
23/04/2023	9.38	0.73845	10.12
06/08/2023	4.95	0.71413	5.66
22/04/2023	7.02	0.71205	7.73

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R05 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R05	
06/06/2023	11.95	1.40591	13.35
28/08/2023	9.61	0.90795	10.52
06/02/2023	8.36	0.8591	9.22
04/07/2023	10.04	0.79565	10.83
25/02/2023	4.54	0.78741	5.33
22/03/2023	4.28	0.7858	5.06
20/10/2023	9.58	0.76234	10.34
07/11/2023	7.74	0.75736	8.49

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R06 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R06	
14/05/2023	5.93	1.10894	7.03
15/11/2023	7.12	0.98998	8.11
21/01/2023	4.23	0.9716	5.20
24/04/2023	5.31	0.93808	6.25
03/03/2023	6.61	0.92301	7.54
06/11/2023	2.85	0.9182	3.77
24/02/2023	5.14	0.90229	6.04
27/08/2023	10.71	0.88883	11.60

Summary of Contemporaneous Impact and Background – Days with Highest Predicted Increment at Each Sensitive Receptor

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R07 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R07	
03/08/2023	12.85	0.24333	13.09
30/10/2023	6.35	0.16272	6.51
07/09/2023	15.60	0.12485	15.72
22/06/2023	15.17	0.11686	15.28
15/09/2023	20.78	0.11678	20.90
28/04/2023	6.91	0.11327	7.03
03/10/2023	9.88	0.11156	9.99
06/03/2023	5.27	0.11126	5.38

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R08 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R08	
25/06/2023	4.42	0.12312	4.54
30/08/2023	12.38	0.10948	12.49
24/06/2023	5.60	0.09753	5.70
14/07/2023	10.85	0.08245	10.93
30/04/2023	2.18	0.0813	2.26
28/07/2023	6.13	0.07968	6.21
04/08/2023	16.59	0.07642	16.67
08/07/2023	6.09	0.0741	6.17

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R09 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R09	
25/06/2023	4.42	0.10416	4.52
30/08/2023	12.38	0.08709	12.47
24/06/2023	5.60	0.07747	5.68
14/07/2023	10.85	0.06559	10.92
30/04/2023	2.18	0.0636	2.24
08/07/2023	6.09	0.06143	6.15
28/07/2023	6.13	0.06066	6.19
04/08/2023	16.59	0.05915	16.65

Summary of Contemporaneous Impact and Background – Days with Highest Predicted Increment at Each Sensitive Receptor

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R10 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R10	
30/07/2023	12.95	0.20595	13.15
30/05/2023	7.92	0.14787	8.07
28/06/2023	10.93	0.14417	11.07
10/07/2023	6.36	0.14326	6.51
16/03/2023	5.44	0.13668	5.58
15/06/2023	9.29	0.12777	9.42
27/12/2023	6.17	0.12605	6.30
01/05/2023	4.54	0.11656	4.65

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R11 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R11	
16/06/2023	10.91	0.26862	11.18
23/05/2023	16.00	0.2399	16.24
06/05/2023	11.06	0.23861	11.30
13/07/2023	11.86	0.23293	12.10
11/08/2023	10.44	0.22107	10.66
14/10/2023	4.36	0.20117	4.56
30/11/2023	2.93	0.19575	3.12
08/03/2023	4.60	0.18962	4.79

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R12 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R12	
06/08/2023	4.95	0.14343	5.09
07/08/2023	7.55	0.11336	7.66
08/08/2023	8.97	0.10821	9.08
29/04/2023	7.77	0.10745	7.88
15/08/2023	4.57	0.095	4.67
11/10/2023	0.00	0.0941	0.09
02/03/2023	3.91	0.09152	4.00
21/04/2023	6.50	0.08611	6.59

Summary of Contemporaneous Impact and Background – Days with Highest Predicted Increment at Each Sensitive Receptor

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R13 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R13	
07/08/2023	7.55	0.3113	7.86
06/08/2023	4.95	0.258	5.21
08/08/2023	8.97	0.21446	9.19
15/08/2023	4.57	0.18683	4.76
21/04/2023	6.50	0.16766	6.67
28/02/2023	3.65	0.15428	3.80
05/04/2023	4.29	0.15355	4.44
22/04/2023	7.02	0.15353	7.17

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R14 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R14	
17/07/2023	8.61	0.2159	8.83
17/04/2023	4.88	0.17807	5.06
07/08/2023	7.55	0.13826	7.68
02/08/2023	15.40	0.13394	15.53
20/01/2023	3.08	0.13231	3.21
14/05/2023	5.93	0.12714	6.05
18/10/2023	4.71	0.12336	4.84
01/04/2023	6.50	0.12045	6.62

Date	Background – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Predicted Increment at R15 – $PM_{2.5}$ 24-hour average (µg/m3) less than criteria	Total
		R15	
06/06/2023	11.95	0.20344	12.15
06/02/2023	8.36	0.09028	8.45
12/01/2023	5.98	0.08817	6.07
24/12/2023	4.65	0.08539	4.74
06/04/2023	4.27	0.08455	4.36
28/03/2023	4.35	0.08306	4.43
24/01/2023	5.03	0.08225	5.11
05/02/2023	7.30	0.08153	7.39