Operational Air Quality Management Plan

Caringbah Child Care Centre

Aliro

13 Endeavour Road, Caringbah, NSW

Prepared by:

SLR Consulting Australia

SLR Project No.: 630.031866.000000

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Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
2.0	3 Oct 2024	K Barker	M Pickett	M Pickett
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1.0	30 Aug 2024	K Barker	M Pickett	M Pickett

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 Aliro (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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Table of Contents

Tables in Text

Figures in Text

Acronyms and Abbreviations

AQIA	Air Quality Impact Assessment
AQC	Air Quality Category
AQMP	Air Quality Management Plan
AQMS	Air Quality Monitoring Station
CO	carbon monoxide
DA	Development Application
DP&E	Department of Planning and Environment
EPA	Environment Protection Authority
g	gram
km	kilometre
m	Metre
NO_2	nitrogen dioxide
NOx	oxides of nitrogen
$PM_{2.5}$	particulate matter 2.5 micrometres or less in diameter
PM_{10}	particulate matter 10 micrometres or less in diameter
PoM	Plan of Management
SO_2	sulfur dioxide
Council	Southerland Shire Council
Site	13 Endeavour Road, Caringbah, NSW
µg	micrograms
$\mu g/m^3$	micrograms per cubic metre
VOCs	Volatile Organic Compounds

1.0 Roles and Responsibilities

Centre Director

- Ensuring all staff are aware of the contents of this Air Quality Management Plan (AQMP)
- Ensuring the Air Quality Categories (AQC) for East Sydney and **Table 3** of this AQMP are displayed in the reception area as required by this AQMP
- Nominating a staff member e.g. Room Leader(s), Assistant Director, Director, to regularly review the AQCs throughout the day to identify if air quality is becoming degraded
- Ensuring the centre is signed up for air quality alerts from NSW EPA
- Logging the start and end times of when outdoor play was modified/stopped due to poor air quality.
- Annual review of this AQMP in consultation with, and sign-off from, an appropriately qualified air quality specialist.

All Staff

- Modifying or ceasing outdoor play and closing doors and windows etc. as per the triggers and actions outlined in **Table 3**.

2.0 Introduction

This Air Quality Management Plan (AQMP) has been developed to manage and minimise the potential exposure of staff and children at the child care centre at 13 Endeavour Road, Caringbah, NSW, to poor air quality. This AQMP addresses the relevant requirements of the Development Approvals, and forms part of the Plan of Management for the site operations.

2.1 Background

In September 2023, JBS&G Australia Pty Ltd (JBS&G) prepared an Air Quality Impact Assessment (AQIA) for the child care centre planned as part of the Masterplan for 13 Endeavour Road, Caringbah, NSW (the Site). The AQIA was prepared to inform a Development Application (DA) that was submitted to Sutherland Shire Council ('the Council'), for the child care centre. The modelling of traffic effects was undertaken using the USEPA air pollutant dispersion modelling software CAL3QHC (including CALINE–4).

The purpose of the AQIA was to:

- Characterise and document the environmental conditions at the site and within the surrounding area;
- Assess the air quality issues relevant to the proposed operation of a child care centre at the site; and
- Provide an assessment of the suitability of the site for use as child care centre in relation to air quality, and make recommendations, if required, regarding the development and operation of the child care centre.

Sutherland Shire Council (SSC) reviewed the JBS&G report and issued a Request for Information (RFI). The air quality component of the SSC RFI included a request to provide an Air Quality Management Plan (AQMP); i.e., this AQMP.

The findings of the JBS&G assessment and review by SLR are summarised in **Section 6.0**.

2.2 Objective of the AQMP

The objective of this AQMP is to document the physical and administrative measures that are to be employed by the child care centre to minimise the risk of any exposure of children (and staff) to poor ambient (outdoor) air quality during operation of the Site.

3.0 Site Description

The site is located on land zoned as SP4 Enterprise Zone under the Sutherland Shire Local Environmental Plan (Sutherland Shire, 2015) and bounded by Woolooware Bay to the north-east (zoned as W1- Natural Waterways). Captain Cook Drive is located within 50m of the site, and less than 100m from the proposed child care centre. This close proximity means that vehicle emissions from Captain Cook Drive are a source of air pollutant emissions potentially impacting users of the proposed child care centre.

Captain Cook Drive is classified as a Secondary Road under the NSW Roads Act 1993 (Gazetted Road Number: 2075). The NSW State Roads Act 1986 No. 85 defines a Classified Road as a main road, a secondary road, a state highway, a tourist road, a state work, a freeway or a controlled access road. Captain Cook Drive is a two-way divided carriageway with two lanes in each direction.

The child care centre location is shown in

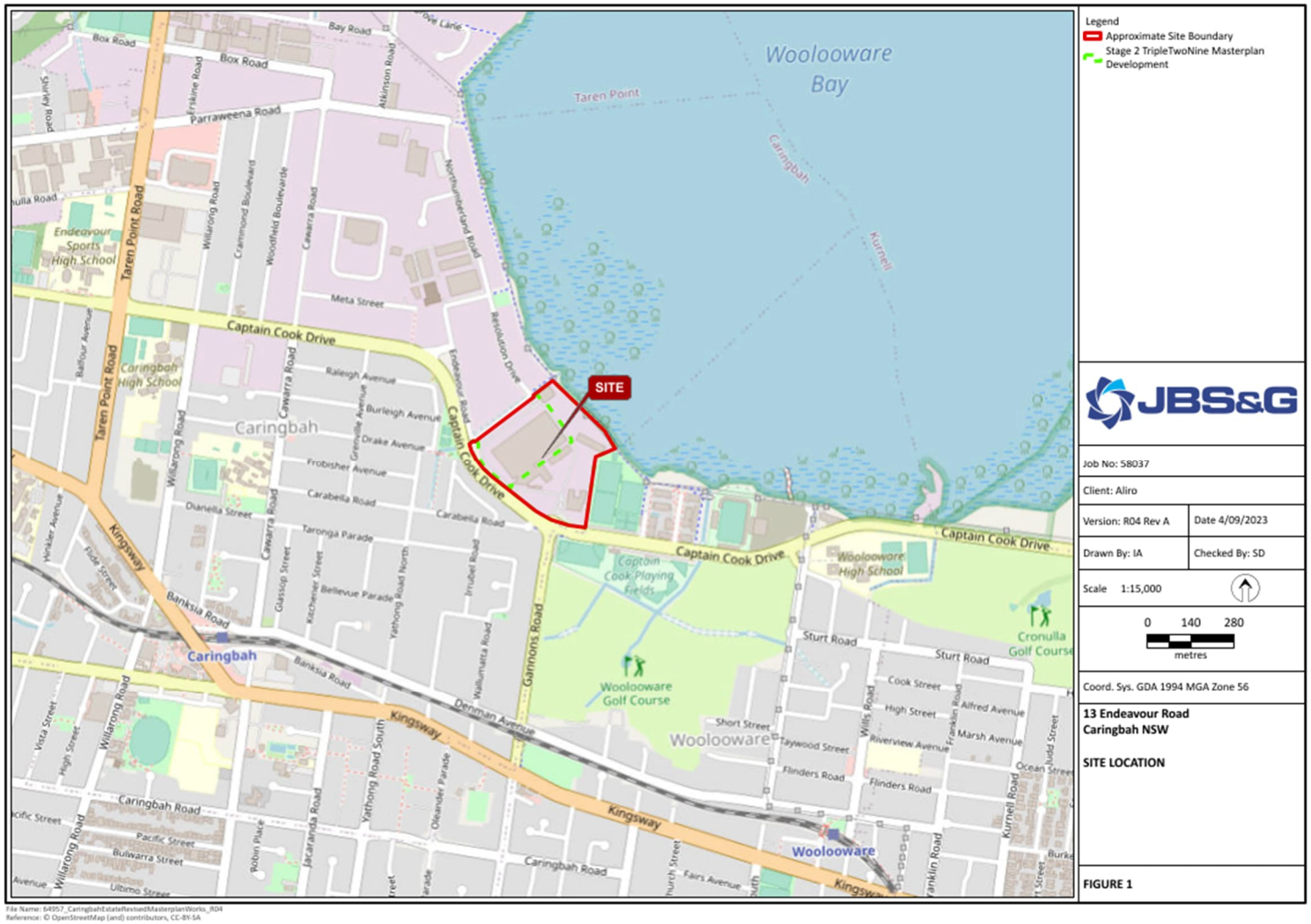
Figure 1.

The current land uses of adjacent properties or properties across adjacent roadways are summarised below.

- North – Woolooware Bay and associated mangroves, and to northwest there are commercial/industrial premises including automotive workshops, welding workshops, packaging and air conditioning companies;
- East – The site is bound to the east by the Solander Playing Fields and Cronulla RSL Youth Soccer Club. Further afield is Dune Walk, across which are residential apartments then Shark/Toyota Park and leagues club;
- South – The site is bound to the south and southwest by Captain Cook Drive, across which are low density residential lands, with playing fields and Woolooware Golf Club to the southeast; and
- West – The site is bound to the west and northwest by Endeavour Road with commercial facilities and Captain Cook Drive beyond. Further afield are some commercial/industrial premises and low-density residential lands.

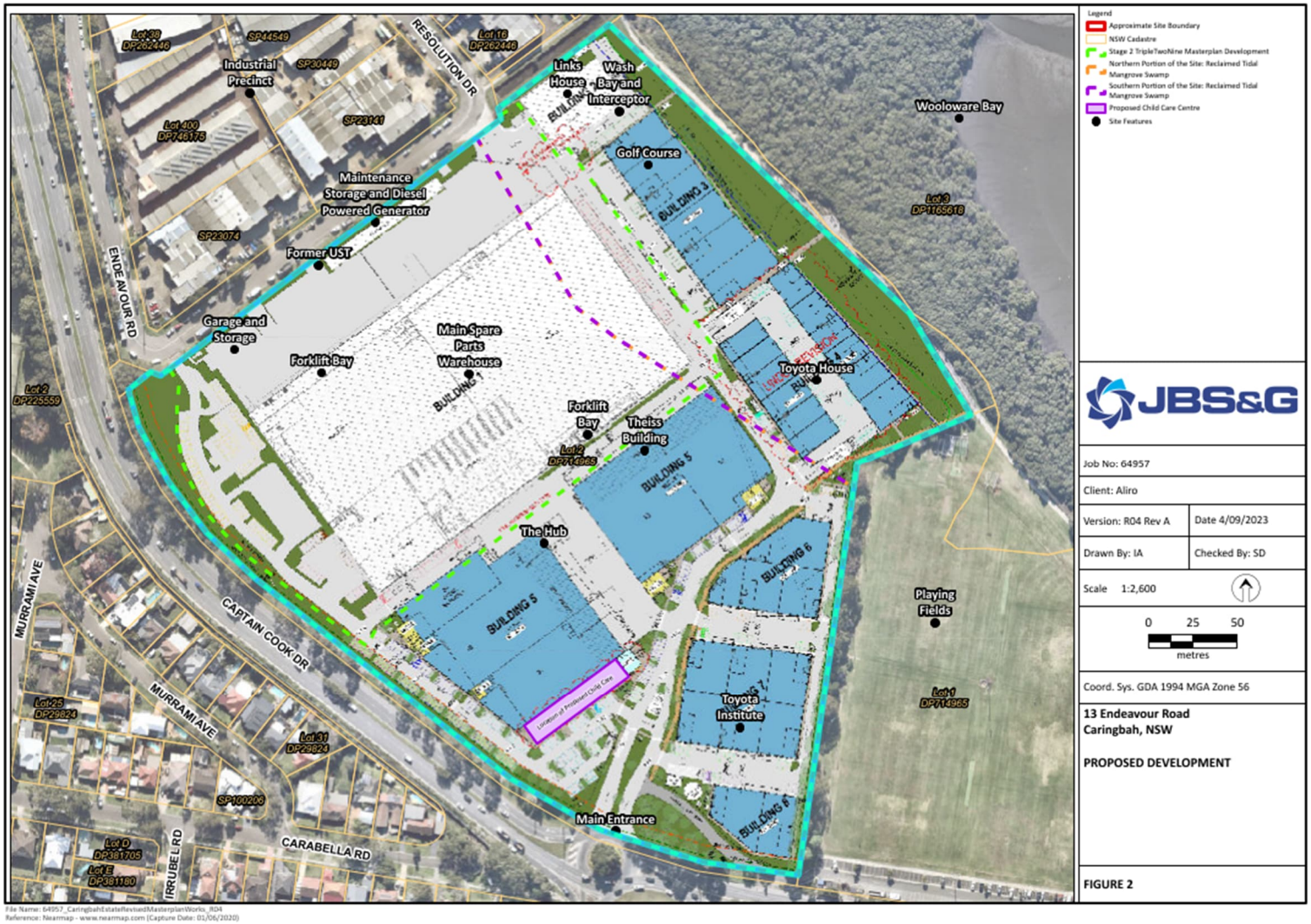
The site is to be redevelopment for mixed land uses (commercial/industrial and community uses) which includes the child care facility at the southern end of Building 5, The child care centre location is shown in **Figure 2**.

Figure 1: Location of the Site



Source: JBS&G Australia, Air Quality Impact Assessment, Proposed Child Care Facility, 13 Endeavour Road, Caringbah, NSW. Ref: 64957/154,406 Rev B, September 2023.

Figure 2: Site Layout



Source: JBS&G Australia, Air Quality Impact Assessment, Proposed Child Care Facility, 13 Endeavour Road, Caringbah, NSW. Ref: 64957/154,406 Rev B, September 2023.

4.0 Factors Affecting Air Quality

Potential sources of air emissions in the area are identified to be the emissions due to road traffic on Captain Cook Drive. Also, air quality experienced at the Site will be influenced by other local pollution sources and regional background levels of air pollutants.

A review of the National Pollutant Inventory Emission Estimation Technique Manual (NPI EET) for Combustion Engines (DSEWPC, 2008) identifies the primary pollutants from combustion engines as:

- Carbon monoxide (CO)
- Oxides of nitrogen (NO_x)
- Particulate matter less than 10 µm in aerodynamic diameter (PM_{10})
- Particulate matter less than 2.5 µm in aerodynamic diameter ($PM_{2.5}$)
- Sulfur dioxide (SO_2)
- Volatile Organic Compounds (VOCs) (example: benzene)

Other substances are also emitted in trace amounts as products of incomplete combustion, such as metallic additives which contribute to the particulate content of the exhaust (DSEWPC, 2008).

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

4.1 Carbon Monoxide

Carbon monoxide (CO) is an odourless, colourless gas formed from the incomplete burning of fuels in motor vehicles. CO bonds to the haemoglobin in the blood and reduces the oxygen carrying capacity of red blood cells, thus decreasing the oxygen supply to the tissues and organs, in particular the heart and the brain.

CO in urban areas results almost entirely from vehicle emissions and its spatial distribution follows that of traffic flow. The highest concentrations are found at the kerbside, with concentrations decreasing rapidly with increasing distance from the road.

4.2 Oxides of Nitrogen

Oxides of nitrogen (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 form NO_2 which can have significant health effects, including damage to the respiratory tract and increased susceptibility to respiratory infections and asthma. Long term exposure to NO_2 can lead to lung disease. NO will be converted to NO_2 in the atmosphere after leaving a car exhaust.

4.3 Suspended 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 term “particulate

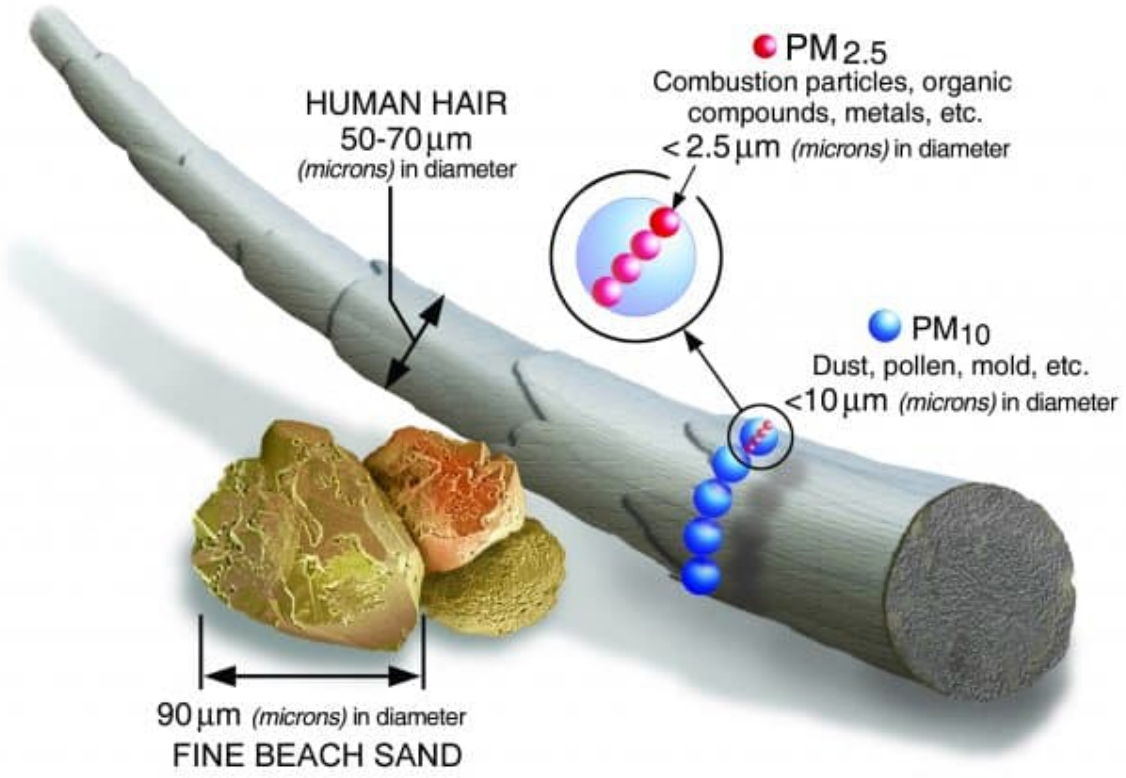
matter" refers to a category of airborne particles and liquid droplets, typically less than 30 microns (µm) in diameter and ranging down to 0.1 µm and is termed total suspended particulate (TSP). Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope.

Emissions of particulate matter less than 10 µm and 2.5 µm in diameter (referred to as PM_{10} and $PM_{2.5}$ respectively) are considered important pollutants due to their ability to penetrate into the respiratory system. In the case of the $PM_{2.5}$ category, recent health research has shown that this penetration can occur deep into the lungs.

Airborne particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some are emitted directly from a source, such as construction sites, unpaved roads, fields, chimneys and stacks or bushfires. Most particles form in the atmosphere as a result of complex reactions of chemicals such as sulfur dioxide and nitrogen oxides, which are pollutants emitted from power plants, industries and automobiles.

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.

Figure 3: Size Comparisons for PM Particles



SOURCE: https://www.epa.gov/pm-pollution/particulate-matter-pm-basics

4.4 Sulphur Dioxide

Sulphur dioxide (SO2) is a colourless, pungent gas with an irritating smell. When present in sufficiently high concentrations, exposure to SO2 can lead to impacts on the upper airways

in humans (i.e. the noise and throat irritation). SO2 can also mix with water vapour to form sulphuric acid (acid rain) which can damage vegetation, soil quality and corrode materials.

Main sources of SO2 in the air are industries that process materials containing sulphur (i.e. wood pulping, paper manufacturing, metal refining and smelting, textile bleaching, wineries etc.). SO2 is also present in motor vehicle emissions, however since Australian fuels are relatively low in sulphur, high ambient concentrations are not common.

4.5 Volatile Organic Compounds

Volatile Organic Compounds (VOCs) are organic compounds (i.e. contain carbon) that have high vapour pressure at normal room-temperature conditions. Their high vapour pressure leads to evaporation from liquid or solid form and emission release to the atmosphere.

VOCs are emitted by a variety of sources, including motor vehicles, chemical plants, automobile repair services, painting/printing industries, and rubber/plastics industries. VOCs that are often typical of these sources include benzene, cyclohexane, ethylbenzene, toluene and xylenes. Biogenic (natural) sources of VOC emissions are also significant (e.g. vegetation).

Impacts due to emissions of VOCs can be health or nuisance (odour) related. Benzene is a known carcinogen and a key VOC linked with the combustion of motor vehicle fuels.

5.0 Relevant Policy and Guidance

5.1 State Environmental Planning Policy (Transport and Infrastructure) 2021

The Transport and Infrastructure SEPP consolidated multiple repealed policies in 2021, including the State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017 and State Environmental Planning Policy (Infrastructure) 2007.

Chapter 2 of the Transport and Infrastructure SEPP refers to guidelines that must be considered where development is proposed on land that is in, or adjacent to, a railway corridor, under clauses 2.98. Additional provisions for development proposed in, or adjacent to, specific roads and railway corridors, are set in clauses 2.100, 2.119 and 2.120. The objective of clause 2.119 is to ensure that new development does not compromise the effective and ongoing operation and function of classified roads, and to reduce the potential for impacts from traffic noise and vehicle emissions on development adjacent to classified roads. The Development near Rail Corridors and Busy Roads – Interim Guideline (NSW DoP 2008) fulfills the purpose of the guidelines referred to by clause 2.98.

Chapter 3 of Transport and Infrastructure SEPP 2021 aims to facilitate the effective delivery of educational establishments and early education and care facilities across the State. Reference is also made to the Child Care Planning Guideline (NSW DPE, 2017) in clauses 3.23 and 3.27. Clause 3.23 outlines that applicable provisions of the guideline must be taken into consideration by consent authorities before determining a development.

Development near Rail Corridors and Busy Roads – Interim Guideline

An aim of the Rail and Road Guideline (NSW DoP 2008) is to assist in reducing the health impacts of adverse air quality from road traffic on sensitive adjacent development and assists in the planning, design and assessment of development adjacent to busy roads. Section 4.4 of the Rail and Road Guideline provides the following guidance on when air quality should be a design consideration and some of the principles that should be considered at the design stage to achieve improved air quality:

When air quality should be a design consideration:

- within 10 m of a congested collector road (traffic speeds of less than 40 km/hr at peak hour) or a road grade > 4% or heavy vehicle percentage flows > 5%
- within 20 m of a freeway or main road (with more than 2,500 vehicles per hour, moderate congestion levels of less than 5% idle time and average speeds of greater than 40 km/hr)
- within 60 m of an area significantly impacted by existing sources of air pollution (road tunnel portals, major intersection / roundabouts, overpasses or adjacent major industrial sources)
- as considered necessary by the approval authority based on consideration of site constraints, and associated air quality issues.

Air quality design considerations:

- Minimising the formation of urban canyons that reduce dispersion. Having buildings of different heights interspersed with open areas, and setting back the upper stories of multi-level buildings helps to avoid urban canyons.
- Incorporating an appropriate separation distance between sensitive uses and the road using broad-scale site planning principles such as building siting and

orientation. The location of living areas, outdoor space and bedrooms and other sensitive uses (such as child care centres) should be as far as practicable from the major source of air pollution.

- Ventilation design and openable windows should be considered in the design of development located adjacent to roadway emission sources. When the use of mechanical ventilation is proposed, the air intakes should be sited as far as practicable from the major source of air pollution.
- Using vegetative screens, barriers or earth mounds where appropriate to assist in maintaining local ambient air amenity. Landscaping has the added benefit of improving aesthetics and minimising visual intrusion from an adjacent roadway.

In relation to the siting of the child care centres, Section 2.4.2 of the Rail and Road Guideline states:

> *"Strategic site selection from perspective of road and rail corridors for schools and child care centres is particularly important as young peoples are generally more sensitive to the effects of noise and adverse air quality than adults.*
>
> *In addition, very young children and babies are more sensitive to these effects than older children. The child care day often extends beyond the typical school day to include both morning and afternoon peak hour traffic, making child care centres particularly vulnerable to adverse noise and air quality effects.*
>
> *Where new schools and child care centres are being considered, the design should ensure that there is sufficient separation from 'busy' roads and rail corridors to avoid adverse noise and air quality impacts."*

The Child Care Planning Guideline: Delivering quality child care for NSW, (NSW DPHI 2021), (the Child Care Planning Guideline)

An aim of the Child Care Guideline is to assist in ensuring air quality is acceptable where child care facilities are proposed close to external sources of air pollution such as major roads and industrial development. For proposed child care facilities close to major roads or industrial developments, Section 3.6 of the Child Care Guideline requests for an air quality assessment report to be prepared by a suitably qualified air quality professional, which evaluates design considerations to minimise air pollution such as:

- creating an appropriate separation distance between the facility and the pollution source. The location of play areas, sleeping areas and outdoor areas should be as far as practicable from the major source of air pollution
- using landscaping to act as a filter for air pollution generated by traffic and industry. Landscaping has the added benefit of improving aesthetics and minimising visual intrusion from an adjacent roadway
- incorporating ventilation design into the design of the facility

6.0 Summary of Air Quality Assessments

The potential for air quality impacts at the Site due to traffic emissions from Captain Cook Drive were assessed by JBS&G using the USEPA air pollutant dispersion modelling software CAL3QHC (including CALINE–4). The CALINE 4 model was developed by the California Department of Transportation to predict air concentrations near roadways of the pollutants CO, NO_2, and suspended particles. The CAL3QHC model estimates total air pollutant concentrations near highways of CO or PM, from moving and idling vehicles.

The pollutants modelled included PM_{10}, $PM_{2.5}$, NO_2, CO, and VOCs. Estimated emission rates from vehicles are required in CALINE-4 for each pollutant under assessment to predict the ground level concentration at the specified receptor locations i.e. the Building 5 area. Vehicle emission factors were taken from the 'Air Emissions Inventory for the Greater Metropolitan Region in New South Wales, 2013 Calendar Year' published by the NSW EPA, which represented emission rates for vehicles travelling along roads. Meteorological data from the Bureau of Meteorology monitoring station at Sydney Airport were used in the modelling.

Background (existing air pollutant) data used in the model was based on maximum site measurements during monitoring conducted by JBS&G, to provide a cumulative air quality impact assessment. Receptor locations associated with the Caringbah 'Building 5', were assessed. SLR's interpretation of the JBS&G model results is:

- Maximum 1-hour NO_2 concentrations at the assessed receptor locations comply with the current Approved Methods assessment criterion.
- Maximum 1-hour CO concentrations at the assessed receptor locations comply with the current Approved Methods assessment criterion.
- Maximum 24-hour PM_{10} concentrations at the assessed receptor locations comply with the current Approved Methods assessment criterion.
- Maximum 24-hour $PM_{2.5}$ concentrations at the assessed receptor locations would exceed with the current Approved Methods assessment criterion.

Previously, SLR had completed a modelling assessment for the nearby, and similar, Woolooware project. Additionally, to check the outcomes of the JBS&G results, SLR completed new sensitivity tests using a Transport for NSW screening calculation tool, with Caringbah project data as input. This (conservative) sensitivity testing with RAQST, using the current Caringbah project plans and traffic estimates, supported the outcomes of the more detailed modelling assessments completed by JBS&G (2023) and SLR (2023).

SLR's RAQST sensitivity tests demonstrated that while NO_2 and PM_{10} due to traffic emissions are not expected to exceed their NSW air quality criteria, relatively high $PM_{2.5}$ concentrations are an issue for the Caringbah site, (and everywhere in the Sydney region and elsewhere). However, the higher $PM_{2.5}$ concentrations are due to exceptional events such as bushfires creating smoke across wide regions. For these reasons SLR concluded the emphasis on environmental assessment and management for the Caringbah project should be on the AQMP for the site.

7.0 Mitigation Measures

This section outlines the physical and administrative controls that are to be established and maintained at the Site to manage air quality related risks.

7.1 Physical Controls

Physical controls to be implemented at the Site are outlined in **Table 1**.

Table 1: Physical Controls

Air Quality Design Considerations		Mitigation Measure
Separation	**Rail and Road Guideline:** Incorporating an appropriate separation distance between sensitive uses and the road/pollution source using broad scale site planning principles such as building siting and orientation. The location of living areas, outdoor space and bedrooms and other sensitive uses (such as child care centres) should be as far as practicable from the major source of air pollution. **Child Care Guideline:** Creating an appropriate separation distance between the facility and the pollution source. The location of play areas, sleeping areas and outdoor areas should be as far as practicable from the major source of air pollution	A reasonable separation distance of approximately 35m exists between the child care centre play area and the denser traffic flows on Captain Cook Drive. Traffic on the roads adjacent the child care centre serving the Caringbah commercial areas, including some truck traffic, is closer to the child care centre, (as close as approximately 7 metres in some cases), but the traffic flows are lighter. At peak traffic times children should be moved indoors to avoid inhalation of emissions, especially from diesel engine powered vehicles.
Ventilation	**Rail and Road Guideline:** Ventilation design and open-able windows should be considered in the design of development located adjacent to roadway emission sources. When the use of mechanical ventilation is proposed, the air intakes should be sited as far as practicable from the major source of air pollution. **Child Care Guideline:** incorporating ventilation design into the design of the facility	All mechanical air intakes will be located as far away as practicable from the roadsides.
Barriers Landscaping	**Rail and Road Guideline:** Using vegetative screens, barriers or earth mounds where appropriate to assist in maintaining local ambient air amenity. Landscaping has the added benefit of improving aesthetics and minimising visual intrusion from an adjacent roadway. **Child Care Guideline**: Using landscaping to act as a filter for air pollution generated by traffic and industry. Landscaping has the added benefit of improving aesthetics and minimising visual intrusion from an adjacent roadway	A solid balustrade will be constructed along the southern balcony of the outdoor play area.

7.2 Administrative Controls

The key administrative control that will be used to manage air quality related risks at the Site is the avoidance of outdoor play during periods of adverse background air quality. It is noted the air quality assessments showed predicted exceedances of ambient air quality criteria at the Site were mainly driven by high background levels. When regional background air quality is good, the traffic emissions will have less potential to cause air quality impacts.

7.2.1 Monitoring of Regional Background Air Quality

Monitoring of regional background air quality will be performed by review of real-time monitoring data available from the NSW Department of Planning and Environment (DP&E) website:

https://www.airquality.nsw.gov.au/air-quality-in-my-area/concentration-data/daily-air-quality-data

A screenshot of the current live data page is provided in **Figure 4**. The AQMP will use the Air Quality Categories (AQCs) reported for the Sydney East Region to identify conditions unsuitable for outdoor play, as highlighted by the red box. The AQCs are colour indicators used to summarise air quality measurements. In New South Wales, five colour indicators are used to classify air quality as either 'Good', 'Fair', 'Poor', 'Very Poor' or 'Extremely Poor'. The colour code is determined by comparing the hourly measurement for each parameter against a series of cut-off values for each pollutant.

The NSW EPA provides general health recommendations based on the AQCs via an ‘activity guide’ to assist the public in taking steps to limit their exposure to air pollution. For example, if the AQC at the nearest station is ‘Very Poor’ (red), the health advice in the activity guide is designed to provide information on how this might affect a person’s health and the recommended actions to take. The guidance for sensitive groups (which include people with heart or lung conditions including asthma, people over the age of 65, infants and children) is shown in **Table 2**.

It is noted that the NSW Government is in the process of developing a dedicated air quality website and a release of the of the new website is available and is currently running parallel with the old website. Screenshots of the new Sydney East Region AQC webpage are shown in **Figure 5** (https://www.airquality.nsw.gov.au/east-sydney) and include a map-based display, however the format of the data presentation may change as the new website is developed. Either website may be used for the purposes of this AQMP.

The selected AQC website is to be displayed on a screen at the reception area in view of staff and visitors at all times when the centre is operating and checked regularly to identify if the regional air quality is deteriorating, and action is required to be taken.

The centre will also subscribe to the Air Quality Alert system to receive a daily SMS or email update for air quality ratings and forecasts (https://www.dpie.nsw.gov.au/air-quality/subscribe-to-air-quality-updates).

Figure 4: Screenshot of the DPE Live Data Page

Wednesday
28 August 2024
Previous | Next | Select

GOOD | FAIR | POOR | VERY POOR | EXTREMELY POOR

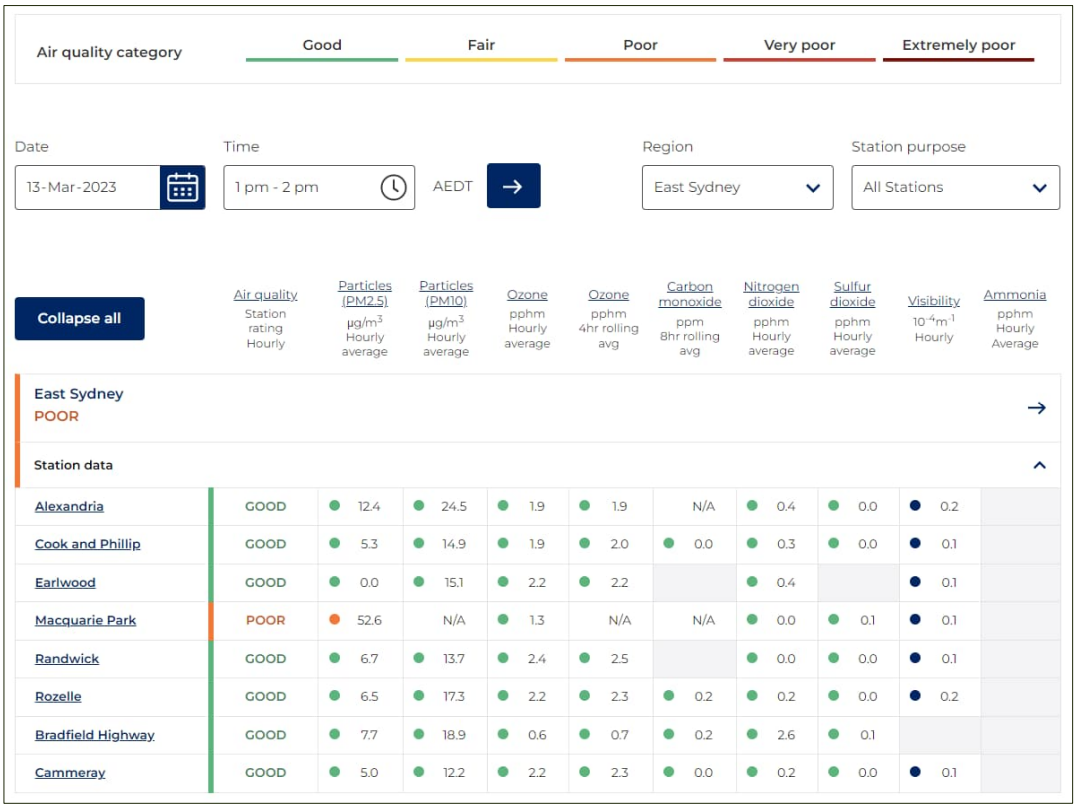
Pollutants		Ozone O3	Ozone O3	Nitrogen dioxide NO2	Visibility NEPH	Carbon monoxide CO	Sulfur dioxide SO2	Particles PM10	Particles PM2.5
Averaging Periods		max 1-hour average	max rolling 4-hour average	max 1-hour average	max 1-hour average	max rolling 8-hour average	max 1-hour average	24-hour average	24-hour average
Units		pphm	pphm	pphm	$10^{-4}m^{-1}$	ppm	pphm	$\mu g/m^3$	$\mu g/m^3$
Sydney East	Alexandria	3.1	3.0	2.3	0.13	0.1		15.2	3.1
	Cook And Phillip	2.7	2.6	3.5	0.13	0.0		13.4	5.3
	Earlwood	3.2	3.1	2.1	0.12			18.3	3.7
	Lidcombe	3.3	3.2	1.7	0.12	0.2	0.0	16.6	4.5
	Macquarie Park	3.4	3.4	1.8	0.10	0.0	0.0	13.4	2.6
	Randwick	3.3	3.2		0.14		0.1	18.0	3.2
	Rozelle	3.4	3.3	1.0	0.09	0.2	0.1	15.9	3.2
Sydney North-west	Parramatta North	3.1	3.0	2.4	0.13	0.1	0.0	17.4	4.6
	Penrith	3.4	3.2	0.7	0.09	0	0.1	14.4	3.0
	Prospect	3.4	3.3	1.2	0.10	0.0	0.1	17.6	3.8
	Richmond	3.4	3.3	0.3	0.09		0.0	13.6	2.9
	Rouse Hill	3.3	3.2	1.0	0.10	0.0	0.1	15.9	3.1
	St Marys	3.4	3.3	1.6	0.09			16.9	2.8
Sydney South-west	Bargo	3.3	3.3	0.5	0.16		0.1	25.4	3.9
	Bringelly	3.3	3.2	0.4	0.20		0.2	17.5	1.6
	Camden	3.4	3.3	0.9	0.10	0.1		15.3	1.3
	Campbelltown West	3.2	3.2	3.3	0.17	0.2	0.1	18.6	3.2
	Liverpool	3.2	3.1	0.9	0.12	0	0.2	24.5	3.4
	Oakdale	3.4	3.5	0.0	0.10				
Illawarra	Wollongong	3.3	3.3	0.4	0.12	0.4	0.0	17.9	2.2
	Kembla Grange	3.6	3.5	0.7	0.39			75.6	6.3
	Albion Park South	3.4	3.3	0.7	0.10		0.3	16.7	3.1
Lower Hunter	Newcastle	3.5	3.4	2.2	0.13	0.3	0.5	21.7	3.9
	Beresfield	3.4	3.3	1.7	0.19		0.7	23.0	4.4
	Wallsend	3.7	3.6	1.7	0.17		0.7	19.4	4.8
Central Coast	Wyong	3.3	3.2	1.9	0.13	0.1	0.1	18.1	2.9
Lake Macquarie	Morisset	3.5	3.5	0.7	0.08	0.1	0.2	9.2	3.3
Central Tablelands	Bathurst	3.1	3.0					11.2	4.8
	Orange	3.3	3.2		0.49				
Mid-north Coast	Coffs Harbour	3.9	3.8	2.4	0.65	0.3		16.7	11.1
	Port Macquarie	3.1	3.0	1.5	0.55	0	0.1		
Northern Tablelands	Armidale				0.52			14.2	8.1
North-west Slopes	Gunnedah	3.3	3.0	1.9				19.7	8.6
	Narrabri							14.4	8.9
	Tamworth	3.5	3.3	1.3				20.0	7.4
Southern Tablelands	Goulburn	3.3	3.2	0.1	0.15			6.8	1.9
South-west Slopes	Albury	3.3	3.2	0.2				15.6	5.3
	Wagga Wagga North	3.4	3.3	0.1				17.0	4.2
Muswellbrook	Muswellbrook			1.8			0.2	36.6	5.8
Singleton	Singleton			1.1			0.4	31.6	5.4
Merriwa	Merriwa	3.3	3.2	0.1	0.15	0.1	0.0	12.0	3.2

Gaps indicate that an instrument was not online for that period OR an average could not be calculated as there were not enough valid hourly data values OR that a pollutant is not measured at the site. Data from monitoring sites is collected, stored and shown in reports using Australian Eastern Standard time (AEST). Normally data for any hour should be available approximately 30 minutes later. During daylight saving, please be aware that the actual local time equals the displayed time plus 1 hour

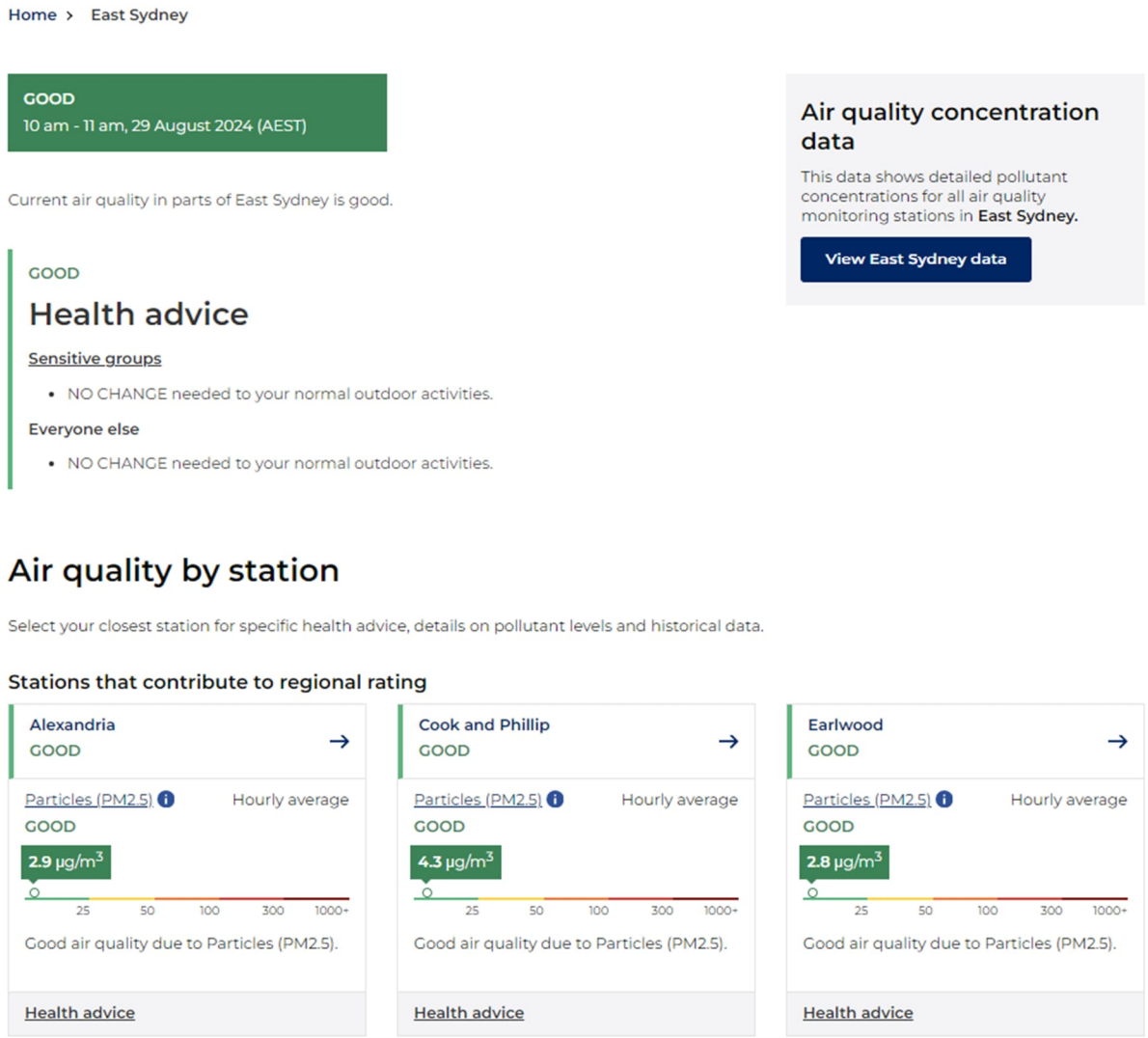
Table 2: NSW EPA General Advice – Air Quality Categories

AQC Rating	EPA's General Advice for Groups Sensitive to Air Pollution
Good	• No change needed to your normal outdoor activities.
Fair	• REDUCE outdoor physical activity if you develop symptoms such as cough or shortness of breath. • Consider closing windows and doors until outdoor air quality is better. • Follow the treatment plan recommended by your doctor. • If you are concerned about symptoms call the 24-hour HealthDirect helpline on 1800 022 222 or see your doctor. • In a health emergency, call triple zero (000) for an ambulance.
Poor	• AVOID outdoor physical activity if you develop symptoms such as cough or shortness of breath. • When indoors, close windows and doors until outdoor air quality is better. • Follow the treatment plan recommended by your doctor. • If you are concerned about symptoms call the 24-hour HealthDirect helpline on 1800 022 222 or see your doctor. • In a health emergency, call triple zero (000) for an ambulance.
Very Poor	• STAY INDOORS as much as possible with windows and doors closed until outdoor air quality is better. • If you feel that the air in your home is uncomfortable, consider going to a place with cleaner air (such as an air-conditioned building like a library or shopping centre) if it is safe to do so. • Actively monitor symptoms and follow the treatment plan recommended by your doctor. • If you are concerned about symptoms call the 24-hour HealthDirect helpline on 1800 022 222 or see your doctor. • In a health emergency, call triple zero (000) for an ambulance.
Extremely Poor	• STAY INDOORS with windows and doors closed until outdoor air quality is better and reduce indoor activity. • If you feel that the air in your home is uncomfortable, consider going to a place with cleaner air (such as an air-conditioned building like a library or shopping centre) if it is safe to do so. • Actively monitor symptoms and follow the treatment plan recommended by your doctor. • If you are concerned about symptoms call the 24-hour HealthDirect helpline on 1800 022 222 or see your doctor. • In a health emergency, call triple zero (000) for an ambulance.

Figure 5: Screenshots of the NSW Government AQC Live Data Pages



	Air quality Station rating Hourly	Particles (PM2.5) µg/m³ Hourly average	Particles (PM10) µg/m³ Hourly average	Ozone pphm Hourly average	Ozone pphm 4hr rolling avg	Carbon monoxide ppm 8hr rolling avg	Nitrogen dioxide pphm Hourly average	Sulfur dioxide pphm Hourly average	Visibility $10^{-4}m^{-1}$ Hourly	Ammonia pphm Hourly Average
Alexandria	GOOD	12.4	24.5	1.9	1.9	N/A	0.4	0.0	0.2	
Cook and Phillip	GOOD	5.3	14.9	1.9	2.0	0.0	0.3	0.0	0.1	
Earlwood	GOOD	0.0	15.1	2.2	2.2		0.4		0.1	
Macquarie Park	POOR	52.6	N/A	1.3	N/A	N/A	0.0	0.1	0.1	
Randwick	GOOD	6.7	13.7	2.4	2.5		0.0	0.0	0.1	
Rozelle	GOOD	6.5	17.3	2.2	2.3	0.2	0.2	0.0	0.2	
Bradfield Highway	GOOD	7.7	18.9	0.6	0.7	0.2	2.6	0.1		
Cammeray	GOOD	5.0	12.2	2.2	2.3	0.0	0.2	0.0	0.1	



Home > East Sydney

GOOD
10 am - 11 am, 29 August 2024 (AEST)

Current air quality in parts of East Sydney is good.

Air quality concentration data

This data shows detailed pollutant concentrations for all air quality monitoring stations in **East Sydney.**

View East Sydney data

GOOD

Health advice

Sensitive groups

- NO CHANGE needed to your normal outdoor activities.

Everyone else

- NO CHANGE needed to your normal outdoor activities.

Air quality by station

Select your closest station for specific health advice, details on pollutant levels and historical data.

Stations that contribute to regional rating

Alexandria
GOOD

Particles (PM2.5) Hourly average
GOOD
2.9 µg/m³
25 50 100 300 1000+
Good air quality due to Particles (PM2.5).

Health advice

Cook and Phillip
GOOD

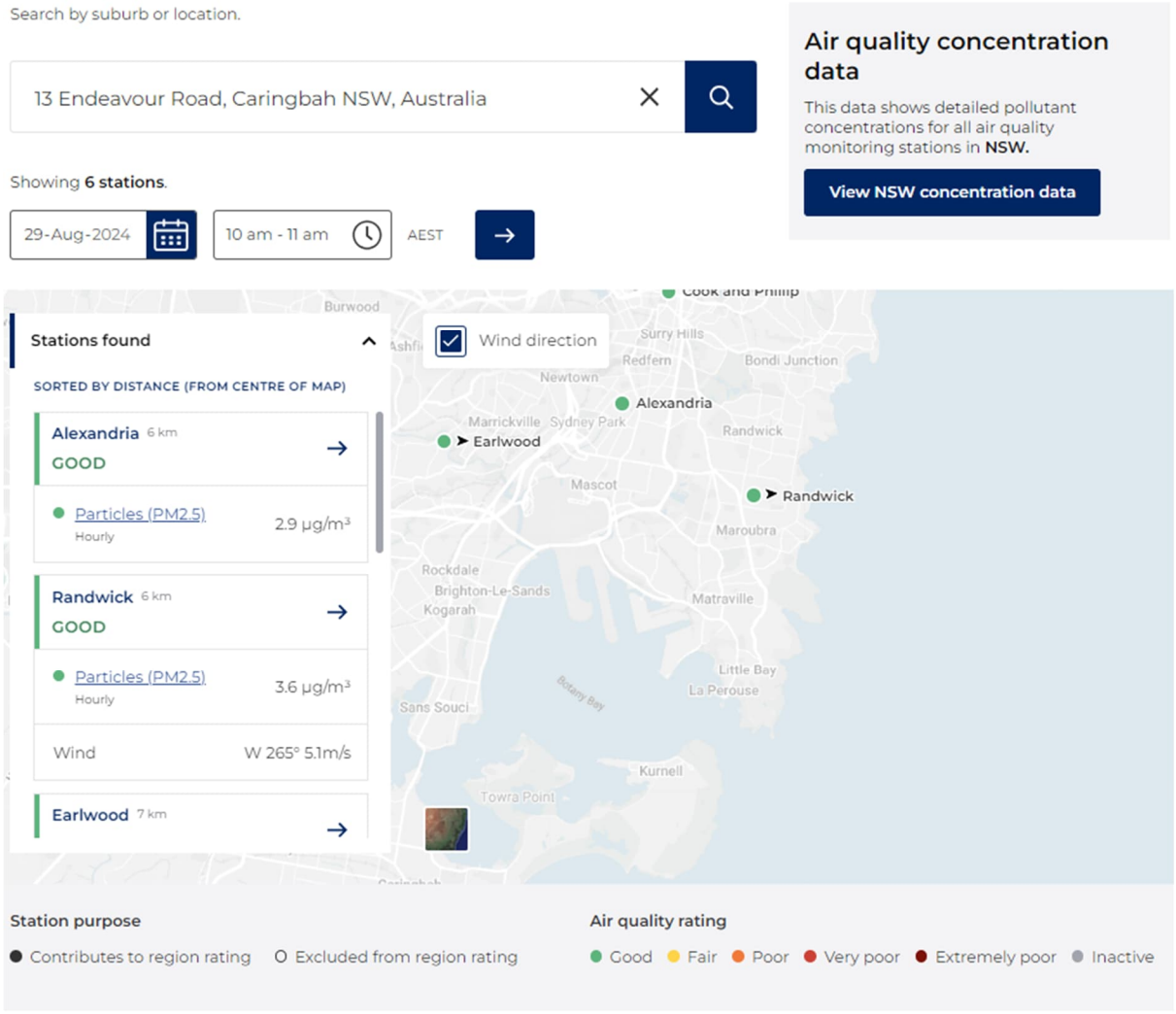
Particles (PM2.5) Hourly average
GOOD
4.3 µg/m³
25 50 100 300 1000+
Good air quality due to Particles (PM2.5).

Health advice

Earlwood
GOOD

Particles (PM2.5) Hourly average
GOOD
2.8 µg/m³
25 50 100 300 1000+
Good air quality due to Particles (PM2.5).

Health advice



7.2.2 Trigger Levels and Actions

The trigger levels and actions to be taken to minimise the exposure of children at the centre to poor air quality are outlined in **Table 3**. The following is noted:

- The AQC rating triggers apply to all pollutants (not just $PM_{2.5}$)
- Earlwood AQMS and Randwick AQMS, currently the nearest stations to the Site, are to be used to determine the background air quality

A copy of **Table 3** must be displayed adjacent to the screen displaying the AQC website data at all times, as a quick reference for staff. The size should be prominent as a visual reminder, and at least A3 in size.

Table 3: DPE Air Quality Categories and Site Actions

AQC Rating	AQMP Response
Good	• Follow normal procedures.
Fair	• Limit play to the outdoor area during the peak traffic periods i.e. between the hours of 7am - 9am and 4pm - 7pm.
Poor	• Do not permit outdoor play. • Close windows and doors and operate appropriate mechanical ventilation system (eg air conditioners, air filters). • Record start/end times of event and actions taken in a daily logbook.
Very Poor Extremely Poor	• Do not permit outdoor play. • Close windows and doors and operate appropriate mechanical ventilation system (eg air conditioners, air filters). • Record start/end times of event and actions taken in a daily logbook. • Inform parents of air quality and actions taken. • Observe children for signs of distress associated with breathing difficulty, especially those known to suffer from asthma or other respiratory conditions. • Follow centre procedures for children who feel unwell.

7.2.3 Impact on Operations

A review of air pollutant data reported by the Randwick AQMS for the year ending 31 December 2023 showed that the air quality was classified as 'Good' for more than 99% of the time as determined by analysis of results for each of the pollutants. A summary of the data analysis is provided in **Table 4**. As shown in the table:

- The recorded SO_2 and NO_2 concentrations aligned with the 'Good' AQC 100% of the time (where data is available).
- The ozone concentrations aligned with the '*Good*' AQC 99.7% of the time (where data is available), with 22 hours categorised as '*Fair*' and no hours categorised as *'Poor'*, '*Very Poor*' or '*Extremely Poor*'.
- The PM_{10} concentrations aligned with the '*Good*' AQC 99.2% of the time (where data is available), with 59 hours categorised as *'Fair'*, 5 hour categorised as '*Poor*', 3 hour categorised as '*Very Poor*', and no hours categorised as *'Extremely Poor*'.
- The $PM_{2.5}$ concentrations aligned with the '*Good*' AQC 99.2% of the time (where data is available), with 47 hours categorised as '*Fair'*, 15 hour categorised as '*Poor*', 4 hour categorised as '*Very Poor*', and 2 hour categorised as '*Extremely Poor*'.

Table 4: Randwick AQMS Air Quality Categories for 2023

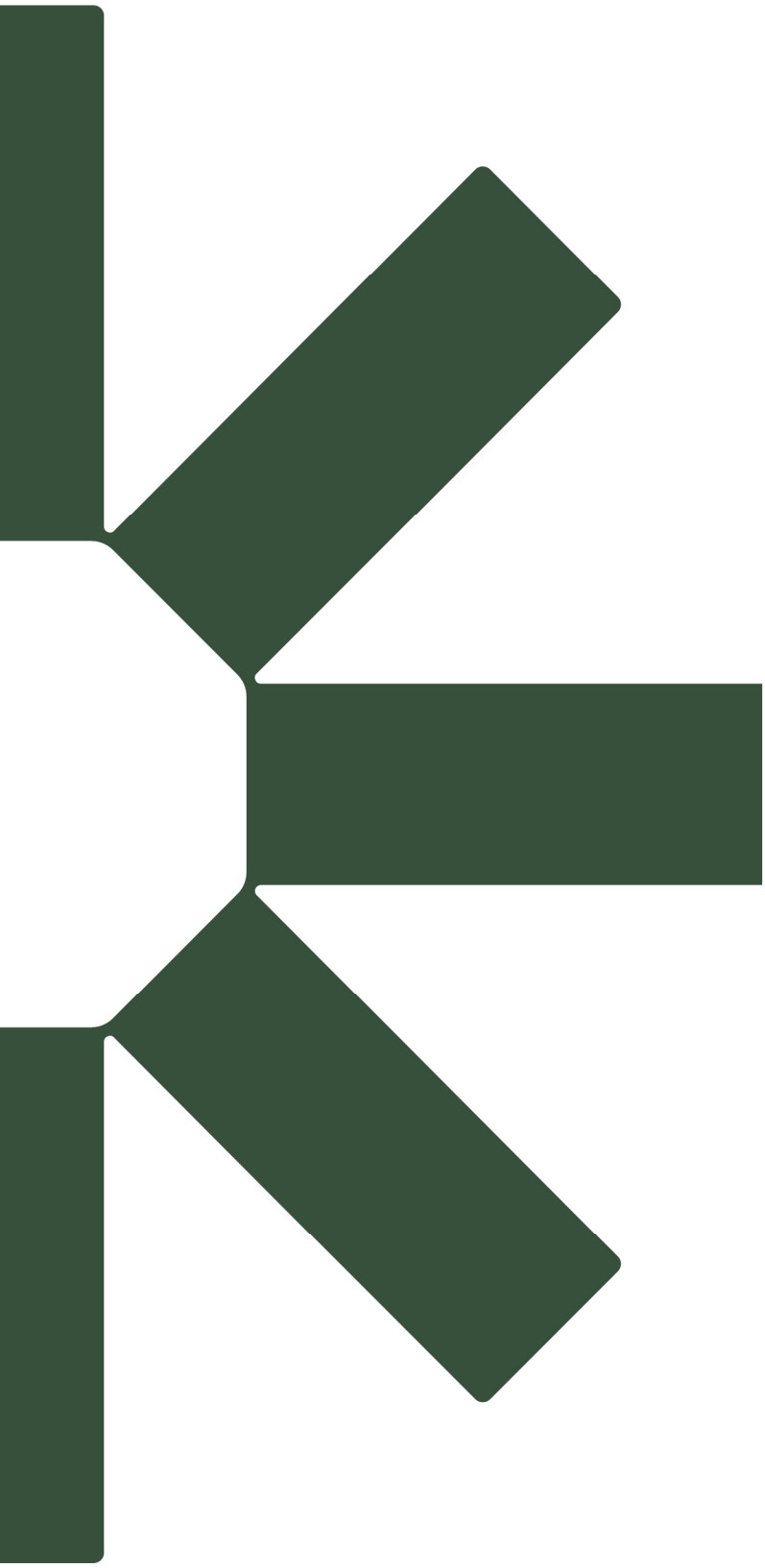
Air Quality Category	SO_2	NO_2	Ozone	PM_{10}	$PM_{2.5}$
Hours Per Year Recording Each AQC					
Good	7935	8061	8493	8489	8460
Fair	0	0	22	59	47
Poor	0	0	0	5	15
Very Poor	0	0	0	3	4
Extremely Poor	0	0	0	0	2
Total hours of data	7935	8061	8515	8556	8528
Missing Hours	825	699	8760	245	204
Percentage of Time Recording Each AQC					
Good	100%	100%	99.7%	99.2%	99.2%
Fair	0%	0%	0.3%	0.7%	0.6%
Poor	0%	0%	0%	0%	0.18%
Very Poor	0%	0%	0%	0%	0%
Extremely Poor	0%	0%	0%	0%	0%
Total % of Recorded Hours	100%	100%	100%	100%	100%
% of Total time	91%	92%	97%	98%	98%

8.0 Review and Improvement

This AQMP will be reviewed on an annual basis by the Centre Director and improved if/as required. This review process will include:

- A review of the frequency that outdoor play activities need to be modified due to poor air quality.
- The most common times of day that outdoor play activities need to be modified due to poor air quality.
- Whether the periods of poor air quality when outdoor play activities need to be modified were due to extreme events, such as bushfires or dust storms, or were related to general degraded air quality, such as during poor dispersion conditions.
- Perform a review of the year's hourly AQC ratings against the records of when outdoor play was modified, to confirm that action was taken as required by this AQMP.

Continuous improvement will be achieved by optimising the centre schedule to time outdoor play when air quality is consistently good.



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