AIR QUALITY IMPACT ASSESSMENT

MIDCOAST REGIONAL ORGANICS PROCESSING SOLUTION

MRA Consulting Group

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Job Number 25021846

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MidCoast Regional Organics Processing Solution

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1 INTRODUCTION

Todoroski Air Sciences has prepared this report for MRA Consulting Group on behalf of NALG in collaboration with Kanadevia Inova (KVI), for MidCoast Council (MCC). It presents an assessment of the potential air quality impacts associated with the proposed MidCoast Regional Organics Processing Solution (MC ROPS) at 48 Midge Orchid Road, Darawank, New South Wales (NSW) (hereafter referred to as the Project).

The Project seeks to allow the receival and processing of up to 146,000 tonnes per annum (tpa) of food organics and garden organics (FOGO) at the facility. Composting of the FOGO material would occur utilising in-tunnel composting, a dry anaerobic digestion system and be able to produce green energy.

This assessment has been prepared in general accordance with the NSW Environment Protection Authority (EPA) document *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW EPA, 2022**) using a methodology based on a Level 2 / 3 Odour Impact Assessment as described in the *Technical Framework – Assessment and Management of Odour from Stationary Sources in NSW* (**NSW DEC, 2006**).

This report comprises:

- A background to the Project and description of the site and operations;
- A review of the existing meteorological and air quality environment surrounding the site;
- A description of the dispersion modelling approach and emission estimation used to assess potential air quality impacts;
- Presentation of the predicted results and discussion of the potential air quality impacts; and,
- A discussion on the proposed air quality mitigation and management measures.

2 PROJECT BACKGROUND

2.1 Local setting

The Project is located at Midge Orchid Rd, Darawank, (Lot 5 DP 1089990), within the MidCoast Council Local Government Area. It is approximately 8.7km northwest of Hawks Nest and approximately 4.5km north of Tuncurry.

Surrounding land use is predominantly bushland with isolated residences and the Tuncurry Waste Management Facility located immediately to the east of the site. The site has an area of approximately 5.82 hectares (ha).

Table 2-1 presents the address of each of the residential receptor locations considered in this assessment.

Table 2-1: Receptors considered in this assessment

Receptor ID	Address	Type
R1	758 The Lakes Way	Residential
R2	31 Manns Road	Residential
R3	43 Manns Road	Residential
R4	83 Manns Road	Residential
R5	661 The Lakes Way	Residential

Figure 2-1 presents the location of the Project and the receptor locations considered in this assessment.

Figure 2-2 presents a pseudo three-dimensional visualisation of the topography in the general vicinity of the Project location. The area is characterised by gently undulating terrain which flattens to the east as it approaches the coast.

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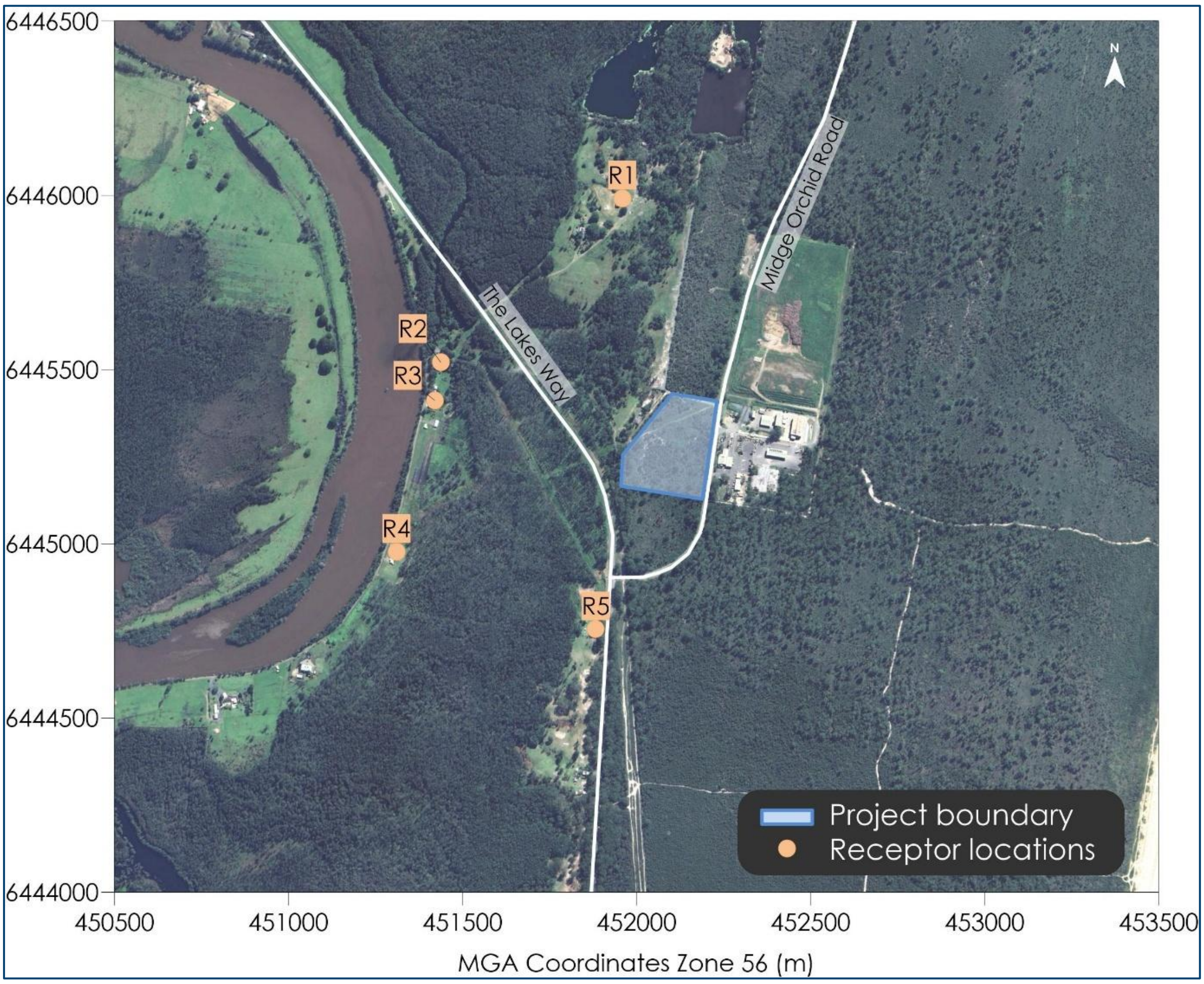

Figure 2-1: Project location

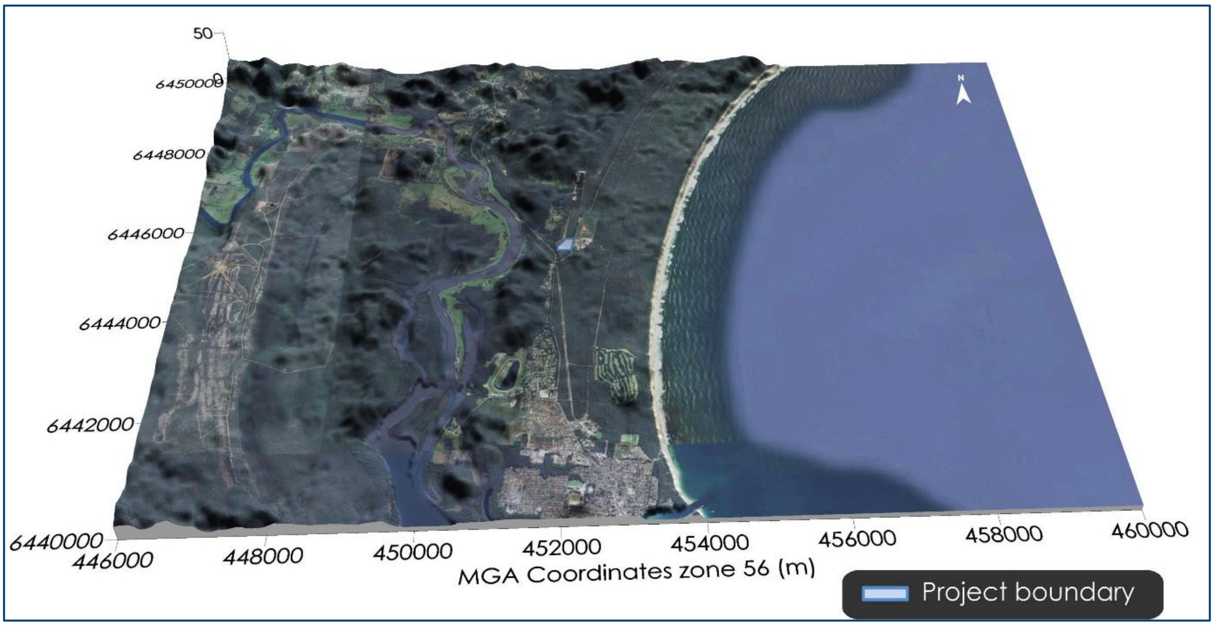

Figure 2-2: Representative visualisation of the local topography surrounding the Project

2.2 Project description

The MC ROPS is an organics processing facility that incorporates NALG In-vessel Composting (IVC) tunnels, KVI's Kompogas® Dry Anaerobic Digestion (AD) system, a semi-enclosed maturation area, and a comprehensive air handling system comprising extraction, scrubbing, and biofiltration to manage odours.

It is initially proposed to have an operational capacity of 146,000tpa. The facility is designed to process organics from MidCoast Council's FOGO collection, self-hauled materials, and additional organic waste from commercial and industrial sources.

Figure 2-3 presents a high-level process flow chart of the process.

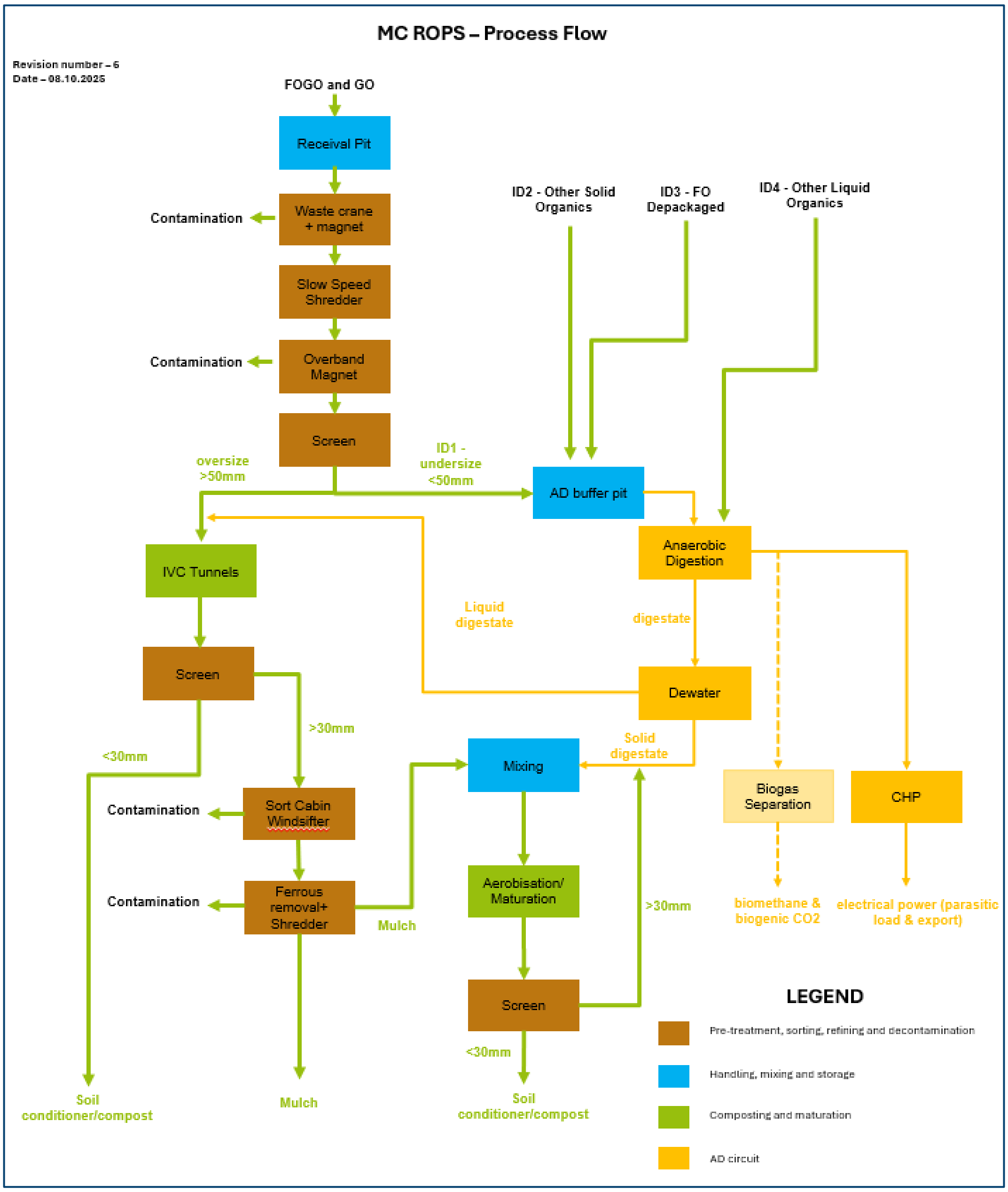

Figure 2-3: Process flow chart

Incoming material is received at the site within a collection bunker located inside the fully enclosed receival building under negative pressure with point extraction at odour generating sources. The building is equipped with pressure sensors and centrifugal fans, which extract air via overhead ducts. The extracted odorous air from point extraction (collection bunker, shredder, screen and other waste storage area(s)) is routed to the IVC tunnel system as an air supply, which is exhausted and sent to the odour control system. This includes a two stage scrubber and biofilter, additional air from the receival building from non-odorous areas bypasses the IVC tunnels directly to the odour control system. The extraction system is designed to deliver approximately three air exchanges per hour, ensuring containment and treatment of odorous emissions.

The incoming material is visually inspected in the receival building. An overhead gantry crane loads the material into a feed hopper for shredding and screening. The undersized fraction (<50 millimetre [mm], this is predominately food and other odour contributing materials) is sent to the dry AD system, this is an enclosed processing system. The oversize fraction (>50mm) is mixed with liquid digestate/leachate to moisturise feedstock targeting 56-60 percent (%) moisture then loaded into the IVC tunnels.

The NALG IVC tunnels feature forced aeration floor with nozzles that inject air into the organic material. Leachate is collected in a leachate management system which can be utilised to provide moisture to the tunnels. Following pasteurisation in the tunnels at >55 degrees Celsius (ºC) for 72 hours, pasteurised material is screened, and the undersized fraction is sold as a soil conditioner/compost. Oversize fraction is decontaminated via a sorting cabin/wind shifter then decontaminated material is shredded and sold either as mulch or used as a reflow material to provide structure to solid digestate. The mixture of solid digestate and shredded oversize is place on aerated maturation floor for drying. After drying material is screened, <30mm is sold as soil conditioner/composted, >30mm is used as reflow material.

The Dry AD system operates in thermophilic conditions (>55ºC) with a retention time of 21 days, where microorganisms break down organic matter to produce nutrient-rich digestate and biogas. The digester is a steel structure, organic material is fed directly via a plug screw conveyer. Pasteurised digestate from the AD system is dewatered by a screw press with the solid digestate sent to the Mixing Bunker and combined with oversize material to improve the structure. The mixture is piled in aerated bays for further maturation, and later screened to produce a soil conditioner/compost product.

The AD process generates biogas, which is used to produce renewable energy in a Combined Heat and Power (CHP) unit. The top of the digester serves as a storage buffer for biogas, enabling consistent supply to the biogas utilisation systems. The biogas is extracted from the digester via stainless steel pipes and directed to the desulphurisation system (activated carbon filter), the biogas storage bladder or the emergency flare as needed.

An emergency gas flaring system ensures any excess biogas is safely released. The CHP plant includes a combustion control system to ensure an optimal air/fuel ratio under all operating conditions, minimising exhaust emissions and ensuring stable operation.

Safety devices on the digester include a biogas overpressure valve connected directly to the digester and is used for the over-and-under pressure protection of the digester. The safety valve consists of a diaphragm valve which is opened according to set pressure. The valve is divided into an inner and outer chamber for the over-and under-set pressure. The safety valve is set at an opening pressure of 55 millibar (mbar). In addition, the gas exhaust line is equipped with a lockable bypass flap valve allowing a manual digester pressure relief through a blow-out pipe. The pressure measurement and flow measurement are installed in-pipe leading to the gas utilisation unit.

The digester structure is safeguarded by a bursting disc to a pressure of 100 ± 20 mbar. In case all other safety equipment would fail, this membrane ruptures, and the biogas escapes into the open air in a controlled way. The bursting disc is also used as overflow protection. If all measuring instruments fail and the feeding of the digester continues, then the organic substrate can escape at this point.

All process air and dust from the receival building and digestate press area is captured and treated before being vented. The air handling system includes a two stage chemical scrubber that removes particulates and pre-treats odorous air, which is then directed to a specially engineered biofilter. The biofilter is equipped with an inflatable roof to enhance treatment efficiency.

Figure 2-4 presents an indicative layout of the Project.

The hours of operation for the Project are 24 hours per day, 7 days per week.

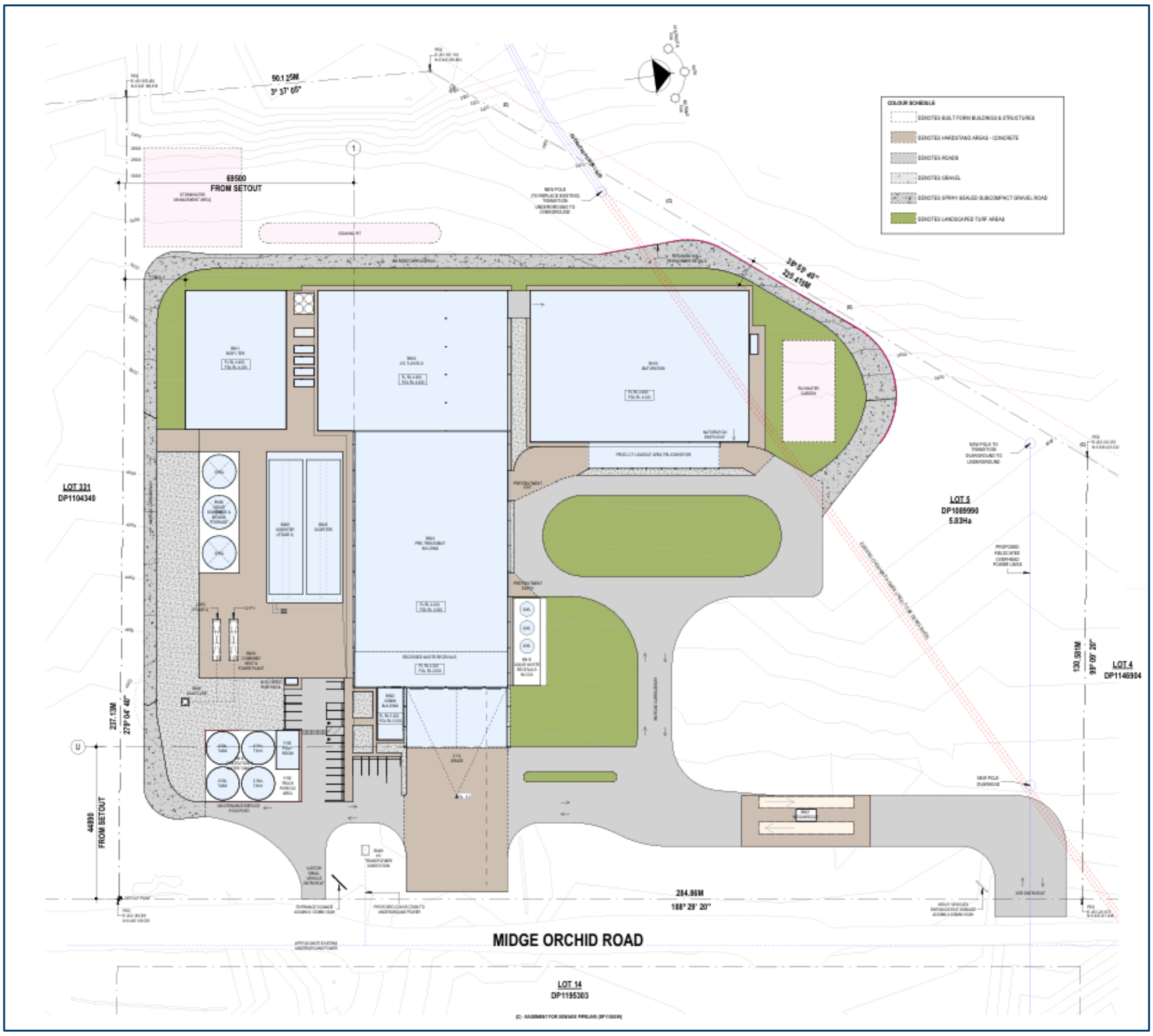

Figure 2-4: Indicative site layout

3 STUDY REQUIREMENTS

The purpose of this report is to provide an assessment of the likely Project-related effects on air quality over the life of the Project. The assessment presented in this report addresses planning and regulatory agency requirements, as set out below.

3.1 Planning Secretary's Environmental Assessment Requirements

In preparing this Air Quality Impact Assessment, the Planning Secretary's Environmental Assessment Requirements (SEARs), which were issued for the Project (SSD-84090218) by the Department of Planning Housing and Infrastructure (DPHI) on 18 June 2025, have been addressed and the key matters raised for consideration in the Air Quality Impact Assessment are outlined in **Table 3-1** along with a reference to where the requirements are addressed in the report.

Table 3-1: Secretary's Environmental Assessment Requirements (SSD-84090218)

Key issue	Requirements	Section
Air quality and Odour	a quantitative assessment of the potential air quality, dust and odour impacts of the development (construction and operation) on surrounding landowners, businesses and sensitive receptors, in accordance with relevant Environment Protection Authority guidelines, including	This report
	– details of how waste would be contained, transferred and processed to avoid or minimise air pollutants	Section 2.2
	– details of buildings and air handling systems and strong justification for any material handling, processing or stockpiling external to buildings	Section 2.2
	– details of proposed mitigation, management and monitoring measures	Section 9
	– details of appropriate meteorological data for use in dispersion modelling, using real and local meteorological data where possible	Section 5 & Appendix A
	– inclusion of worst-case emission scenarios and sensitivity analysis	Section 7.3
	– contingency plan to address unpredicted operational odour impacts.	Section 2.2 & 9

3.2 NSW EPA Requirements

This Air Quality Impact Assessment has been prepared in general accordance with the NSW EPA document *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW EPA, 2022**) and the specific requirements outlined therein as well as the SEARs requested by the NSW EPA as outlined in **Table 3-2**.

Table 3-2: NSW EPA SEARs input

Specific issue	Input	Section
Air Issues	The EIS must demonstrate the proposal's ability to comply with the relevant regulatory framework, specifically the POEO Act and the *Protection of the Environment Operations (Clean Air) Regulation 2022*. This consideration should include section 129 of the POEO Act concerning control of "offensive odour".	Section 4.4 & 8
	The EIS must include an air quality impact assessment (AQIA). The AQIA must be carried out in accordance with the document, *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (2022). These are available at: https://www.epa.nsw.gov.au/yourenvironment/ air/industrial-emissions/approved-methods-for-the-modelling-and-assessmentof-air-pollutants	This report

Specific issue	Input	Section
	The EIS must detail emission control techniques/practices that will be employed at the site and identify how the proposed control techniques/practices will meet the requirements of the POEO Act, *POEO (Clean Air) Regulation* (2022) and criteria within *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (2022).	Section 2.2 & 9

3.3 MidCoast Council

Comments by MidCoast Council as input to the SEARs include:

It is noted that the development is proposed to be adjacent to the existing waste transfer facility. As such, you are advised to ensure that the Air Quality Impact assessment and the Odour Impact assessment provide an analysis of the cumulative impacts for all surrounding developments in conjunction with the proposed development.

This assessment provides a quantitative assessment of the potential air quality impacts associated with the Project and the Tuncurry Waste Management Facility with predicted results in **Section 8**.

4 AIR QUALITY CRITERIA

Air quality criteria are benchmarks set to protect the general health and amenity of the community in relation to air quality. The sections below identify the potential air emissions from the Project and the applicable air quality criteria.

4.1 Odour

4.1.1 Introduction

Odour in a regulatory context needs to be considered in two similar, but different ways depending on the situation.

NSW legislation prohibits emissions that cause odour, including offensive odour, to occur at any off-site receptor. Offensive odour is evaluated in the field by authorised officers, who are obliged to consider the odour in the context of its receiving environment, frequency, duration, character etc. and to determine whether the odour would interfere with the comfort and repose of the normal person unreasonably. The POEO Act defines the term *offensive odour* to mean an odour—

> "*(a) that, by reason of its strength, nature, duration, character or quality, or the time at which it is emitted, or any other circumstances—*
>
> > *(i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or*
> >
> > *(ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or*
>
> *(b) that is of a strength, nature, duration, character or quality prescribed by the regulations or that is emitted at a time, or in other circumstances, prescribed by the regulations.*"

In this context, the concept of offensive odour is applied to operational facilities and relates to actual emissions in the air.

However, in the approval and planning process for proposed new operations or modifications to existing projects, no actual odour exists and it is necessary to consider hypothetical odour. In this context, odour concentrations are used and are defined in odour units. The number of odour units represents the number of times that the odour would need to be diluted to reach a level that is just detectable to the human nose. Thus, by definition, odour less than an odour unit (1 OU), would not be detectable to most people.

The range of a person's ability to detect odour varies greatly in the population, as does their sensitivity to the type of odour. The wide-ranging response in how any particular odour is perceived by any individual poses specific challenges in the assessment of odour impacts and the application of specific air quality goals related to odour. The *Technical Framework* (**NSW DEC, 2006**) sets out a framework specifically to deal with such issues.

It needs to be noted that the term "odour" refers to complex mixtures of odours, and not "pure" odour arising from a single chemical. Odour from a single, known chemical rarely occurs (when it does, it is best to consider that specific chemical in terms of its concentration in the air). In most situations odour will be comprised of a cocktail of many substances that is referred to as a complex mixture of odour, or more simply odour.

For activities with potential to release significant odour it may be necessary to predict the likely odour impact that may arise. This is done by using air dispersion modelling which can calculate the level of dilution of odours emitted from the source at the point that such odour reaches surrounding receptors. This approach allows the air dispersion model to produce results in terms of odour units.

The NSW criteria for acceptable levels of odour range from 2 to 7OU, with the more stringent 2OU criteria applicable to densely populated urban areas and the 7OU criteria applicable to sparsely populated rural areas, as outlined below.

4.1.2 Complex Mixtures of Odorous Air Pollutants

Table 4-1 presents the assessment criteria as outlined in the NSW EPA document *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW EPA, 2022**). This criterion has been refined to take into account the population densities of specific areas and is based on a 99th percentile of dispersion model predictions calculated as 1-second averages (nose-response time).

Table 4-1: Impact assessment criteria for complex mixtures of odorous air pollutants (nose-response-time average, 99th percentile)

Population of affected community	Impact assessment criteria for complex mixtures of odorous air pollutants (OU)
Urban (≥~2000) and/or schools and hospitals	2.0
~500	3.0
~125	4.0
~30	5.0
~10	6.0
Single rural residence (≤~2)	7.0

Source: **NSW EPA, 2022**

The NSW odour goals are based on the risk of odour impact within the general population of a given area. In sparsely populated areas, the criteria assume there is a lower risk that some individuals within the community would find the odour unacceptable, hence higher criteria apply.

Peak-to-mean factors are applied to account for any odour fluctuation above and below the mean odour level of the 1-hour averaging time. The criteria in **Table 4-1** are compared with modelled results which include peaking factors to account for the time-averaging limitations of air dispersion models. The peak-to-mean factors developed by **Katestone Scientific Pty Ltd** (**1995, 1998**) for the NSW EPA are applied to convert the modelled (1-hour) averaging time to 1-second peak concentrations.

A summary of the peak-to-mean values is provided in **Table 4-2**.

Table 4-2: Peak-to-mean values

Source Type	Pasquill-Gifford stability class	Near field P/M 60*	Far field P/M 60*
Area	A, B, C, D	2.5	2.5
	E, F	2.3	1.9
Line	A-F	6	6
Surface point	A, B, C	12	4
	D, E, F	25	7
Tall wake-free point	A, B, C	17	3

Source Type	Pasquill-Gifford stability class	Near field P/M 60*	Far field P/M 60*
	D, E, F	35	6
Wake-affected point	A-F	2.3	2.3
Volume	A-F	2.3	2.3

*Ratio of peak 1-second average concentrations

4.2 Particulate matter

Particulate matter consists of dust particles of varying size and composition. Air quality goals refer to measures of the total mass of all particles suspended in air defined as the Total Suspended Particulate matter (TSP).

The upper size range for TSP is nominally taken to be 30 micrometres (µm) as in practice particles larger than 30 to 50µm will settle out of the atmosphere too quickly to be regarded as air pollutants. Two sub-classes of TSP are also included in the air quality goals, namely PM_{10}, particulate matter with equivalent aerodynamic diameters of 10µm or less, and $PM_{2.5}$, particulate matter with equivalent aerodynamic diameters of 2.5µm or less.

Particulate matter, typically in the upper size range, that settles from the atmosphere and deposits on surfaces is characterised as deposited dust. The deposition of dust on surfaces may be considered a nuisance and can adversely affect the amenity of an area by soiling property in the vicinity.

Table 4-3 summarises the air quality goals that are relevant to this assessment as outlined in the NSW EPA document *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW EPA, 2022**).

The air quality goals for total impact relate to the total pollutant burden in the air and not just the contribution from the Project. Consideration of background pollutant levels needs to be made when using these goals to assess potential impacts.

Table 4-3: NSW EPA air quality impact assessment criteria for particulate matter

Pollutant	Averaging Period	Impact	Criterion
TSP	Annual	Total	90 µg/m³
PM_{10}	Annual	Total	25 µg/m³
	24 hour	Total	50 µg/m³
$PM_{2.5}$	Annual	Total	8µg/m³
	24 hour	Total	25 µg/m³
Deposited dust	Annual	Incremental	2 g/m²/month
		Total	4 g/m²/month

Source: **NSW EPA, 2022**
µg/m³ = micrograms per cubic metre
g/m²/month = grams per square metre per month

4.3 Other air pollutants

The combustion of biogas in the CHP unit and flare at the Project would release typical combustion pollutants, including carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2) and volatile organic compounds (VOCs) assessed as benzene.

These pollutants are commonly emitted from combustion sources and have distinct characteristics; CO is a colourless and odourless gas, SO_2 has a sharp smell due to its sulphur component, NO_2 is a reddish-brown gas and benzene is colourless with a sweet, aromatic odour.

Table 4-4 summarises the air quality goals for these air pollutants as outlined in the NSW EPA document *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW EPA, 2022**).

Like particulate matter, the air quality goals for total impact relate to the total pollutant burden in the air and not just the contribution from the Project. Consideration of background pollutant levels needs to be made when using these goals to assess potential impacts.

Table 4-4: NSW EPA air quality impact assessment criteria for other air pollutants

Pollutant	Averaging Period	Impact	Criterion
CO	8 hour	Total	10 mg/m^3
	1 hour	Total	30 mg/m^3
	15 minute	Total	100 mg/m^3
SO_2	24 hour	Total	57 µg/m^3
	1 hour	Total	215 µg/m^3
NO_2	Annual	Total	31 µg/m^3
	1 hour	Total	164 µg/m^3
Benzene	1 hour	99.9th percentile - at or beyond the boundary of the facility	29 µg/m^3

Source: **NSW EPA, 2022**
mg/m^3 = milligrams per cubic metre

4.4 Protection of the Environment Operations Act, 1997

The general obligations of the NSW *Protection of the Environment Operations Act, 1997* and it associated Regulations, specifically the *Protection of the Environment Operations (Clean Air) Regulation, 2022* [POEO], would be followed for the Project. The Project would operate in accordance with the relevant regulatory framework for air quality to ensure compliance with this legislation.

The applicable standards of concentration for emissions from the CHP unit and flare, as specified in the POEO is outlined **Table 4-5**.

Table 4-5: Applicable POEO standards of concentration

Air impurity	Standard of concentration
Solid particles (Total)	50 mg/m^3
Nitrogen dioxide (NO_2) or nitric oxide (NO) or both nitrogen dioxide and nitric oxide, as NO2 equivalent	450 mg/m^3
Volatile organic compounds (VOCs), as n-propane equivalent	40mg/m^3 VOCs or 125mg/m^3 CO

5 EXISTING ENVIRONMENT

This section describes the existing environment including the climate and meteorology in the area surrounding the Project.

5.1 Local climate

Long-term climatic data from the nearest Bureau of Meteorology weather station with available data at Taree Airport Automatic Weather Station (AWS) (Site No. 060141) were analysed to characterise the local climate in the proximity of the Project site. The Taree Airport AWS is located approximately 26.5km north of the Project. The Taree Airport AWS is the nearest BoM weather station with suitable available long-term data used to select the meteorological year for the dispersion modelling as outlined in **Appendix A**.

Table 5-1 and **Figure 5-1** present a summary of data from Taree Airport AWS collected over an approximate 13 to 28-year period for the various meteorological parameters.

The data indicate that January is the hottest month with a mean maximum temperature of 29.0 degrees Celsius (°C), July is the coldest month with mean minimum temperatures of 6.7°C.

Rainfall is highest during the summer months and declines during winter, with an average annual rainfall of 1158.6 millimetres (mm) over 86.7 days. The data show March is the wettest month with an average rainfall of 194.12mm over 10.8 days and August is the driest month with an average rainfall of 44.6mm over 5.5 days.

Relative humidity levels exhibit some variability over the year and seasonal fluctuations. Mean 9am relative humidity levels range from 63% in October to 86% in March. Mean 3pm humidity levels vary from 50% in August and September to 63% in February.

The mean 9am wind speeds range from 9.1 kilometres per hour (km/hr) in February to 11.7km/hr in October. The mean 3pm wind speeds vary from 13.3km/hr in June to 21.5km/hr in January.

Table 5-1: Monthly climate statistics summary – Taree Airport AWS

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
Temperature													
Mean max. temp. (°C)	29.0	28.4	26.9	24.4	21.4	18.9	18.7	20.3	23.2	24.8	26.0	27.8	24.2
Mean min. temp. (°C)	18.5	18.3	16.9	13.7	10.1	7.9	6.7	6.9	9.4	12.0	15.0	16.9	12.7
Rainfall													
Rainfall (mm)	98.1	154.1	194.1	104.5	79.5	93.2	66.3	44.6	49.0	83.6	105.0	87.8	1158.6
No. of rain days (≥1mm)	9.8	9.9	10.8	9.7	8.0	8.1	6.7	5.5	6.0	7.9	9.8	9.1	101.3
9am conditions													
Mean temp. (°C)	23.3	22.5	20.4	18.9	15.3	12.6	11.8	13.3	17.3	19.8	20.5	22.6	18.2
Mean R.H. (%)	74	81	86	79	78	80	77	70	65	63	73	71	75
Mean W.S. (km/h)	10.0	9.1	9.2	10.4	11.2	10.7	11.1	11.4	10.9	11.7	10.9	10.2	10.6
3pm conditions													
Mean temp. (°C)	27.1	26.7	25.2	22.6	20.0	17.8	17.2	18.6	20.9	22.3	23.5	25.7	22.3
Mean R.H. (%)	60	63	62	62	58	59	56	50	53	55	62	60	58
Mean W.S. (km/h)	21.5	19.9	17.8	15.4	13.7	13.3	14.5	16.6	19.4	20.8	20.8	20.9	17.9

Source: **Bureau of Meteorology, 2025**

RH = Relative Humidity, WS = Wind speed

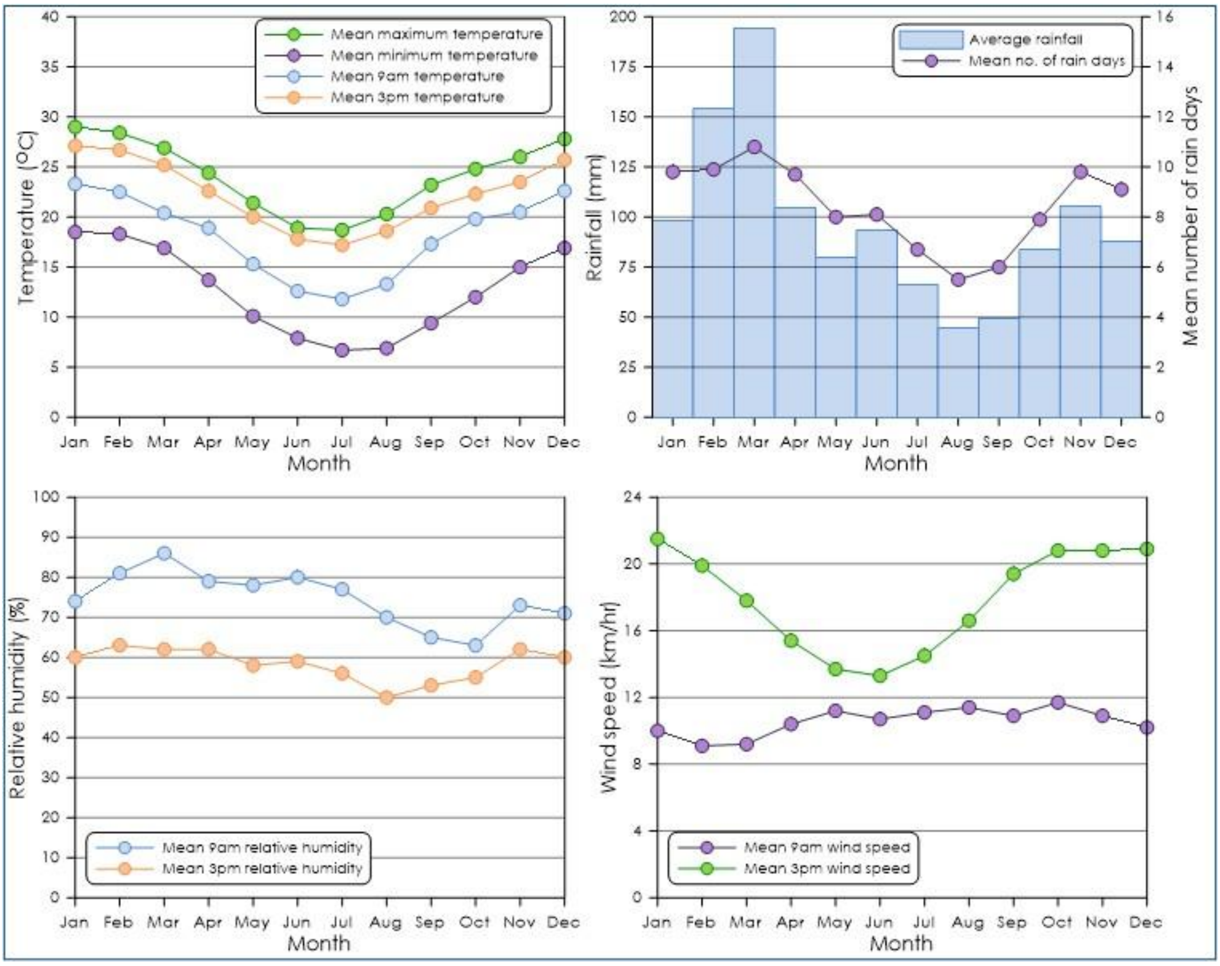

Figure 5-1: Monthly climate statistics summary – Taree Airport AWS

5.2 Local meteorological conditions

Annual and seasonal windroses generated from data collected at the Bureau of Meteorology Taree Airport AWS station during 2024 are presented in **Figure 5-2**.

The 2024 calendar year was selected as the meteorological year for the dispersion modelling based on an analysis of trends in meteorological data recorded for the area. Further detail is presented **Appendix A**.

Analysis of the windroses shows that the wind directions are predominately from the west across the year. In summer, winds from the northeast to the east are most frequent. The autumn windrose shows a similar distribution pattern as the annual windrose with the largest portion of winds from the west. During winter, winds from the west are most frequent. In spring wind directions are generally spread from the west and the northeast to the east sectors.

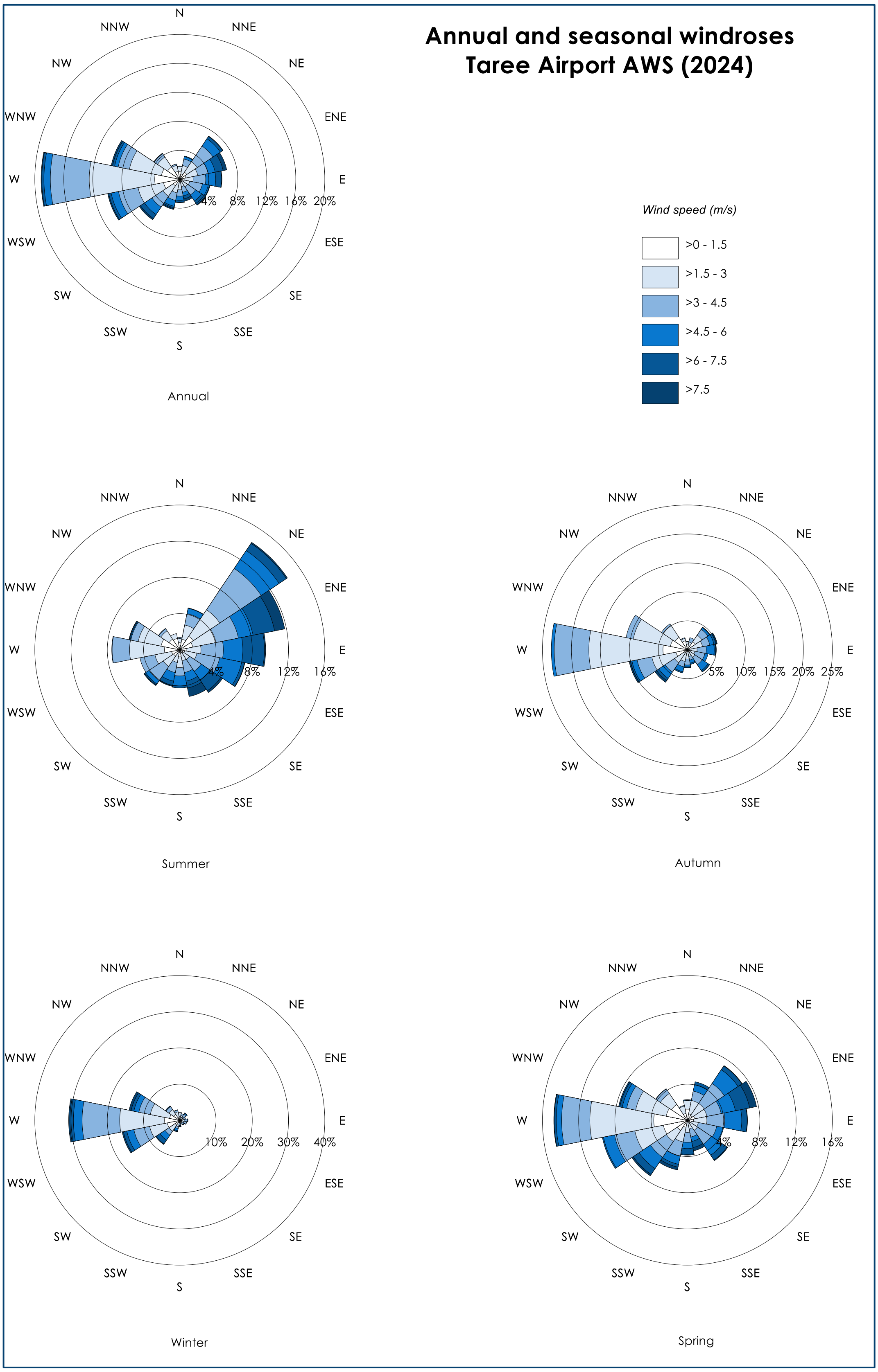

Figure 5-2: Annual and seasonal windroses for Taree Airport AWS (2024)

5.3 Local air quality monitoring

The main sources of particulate matter in the area surrounding the Project include agricultural activities, emissions from local anthropogenic activities such as motor vehicle exhaust, vehicles on unsealed roads and domestic wood heaters and sea spray. Events such as bushfires and dust storms are also a potential source of air pollution in the surrounding area.

Available ambient monitoring data collected from the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) Port Macquarie and Coffs Harbour air quality monitoring stations for the 2020 to 2024 period have been reviewed to quantify the background levels for the Project site.

The Port Macquarie monitoring station is located approximately 83km north and the Coffs Harbour monitoring station located approximately 112km north of the Project site.

5.3.1 PM_{10} monitoring

A summary of the available PM_{10} monitoring data from 2020 to 2024 is presented in **Table 5-2**. Recorded 24-hour average PM_{10} concentrations are presented in **Figure 5-3**.

A review of **Table 5-2** indicates that the annual average PM_{10} concentrations were below the relevant criterion of 25µg/m^3 for all years. The maximum 24-hour average PM_{10} concentrations were found to exceed the relevant criterion of 50µg/m^3 on occasion and are likely attributable to regional dust events, dust from local sources and bushfires.

It is noted that there was a significant increase in the frequency of exceedances of the 24-hour average PM_{10} criterion in the 2019/ 2020 summer, predominately due to smoke associated with the widespread bushfires occurring at this time (**DPIE, 2021**) (refer to **Figure 5-3**).

Table 5-2: Summary of PM_{10} levels from DCCEEW monitoring stations (µg/m³

Year	Port Macquarie	Coffs Harbour	Criterion
	Annual average		
2020	14.4	11.9	**25**
2021	10.8	10.0	**25**
2022	9.1	9.3	**25**
2023	11.9	10.5	**25**
2024	11.2	10.5	**25**
Year	**Maximum 24-hour average**		**Criterion**
2020	**249.9**	**65.2**	**50**
2021	31.9	26	**50**
2022	31.5	32.1	**50**
2023	36.2	34.5	**50**
2024	**57.9**	25.4	**50**

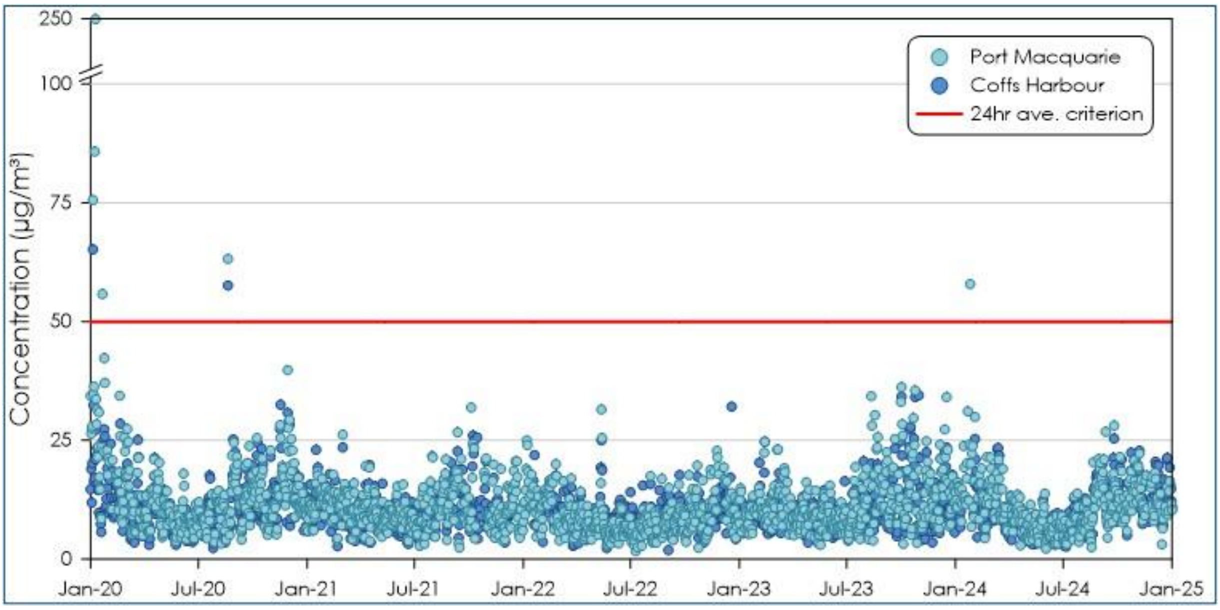

Figure 5-3: 24-hour average PM_{10} concentrations

5.3.1 $PM_{2.5}$ monitoring

A summary of the available $PM_{2.5}$ monitoring data from 2020 to 2024 is provided in **Table 5-3**, and presented graphically in **Figure 5-4**.

Table 5-3 indicates that the annual average $PM_{2.5}$ concentrations were below the relevant criterion of 8µg/m^3 for the review period. The maximum 24-hour average $PM_{2.5}$ concentrations exceeded the relevant criterion of 25µg/m^3 at times during the review period.

Similarly to the PM_{10} monitoring data, elevated periods can be attributed to regional events, notably the mass bushfires event affecting NSW in the 2019/ 2020 summer.

Table 5-3: Summary of $PM_{2.5}$ levels from DCCEEW monitoring station (µg/m³)

Year	Port Macquarie	Coffs Harbour	Criterion
	Annual average		
2020	6.5	5.3	**8**
2021	4.6	3.9	**8**
2022	3.3	3.2	**8**
2023	5.1	4.3	**8**
2024	4.6	4.5	**8**
Year	**Maximum 24-hour average**		**Criterion**
2020	**220.5**	**44.9**	**25**
2021	14.7	12.6	**25**
2022	9.4	9.7	**25**
2023	**30.5**	17.7	**25**
2024	**38.7**	15.2	**25**

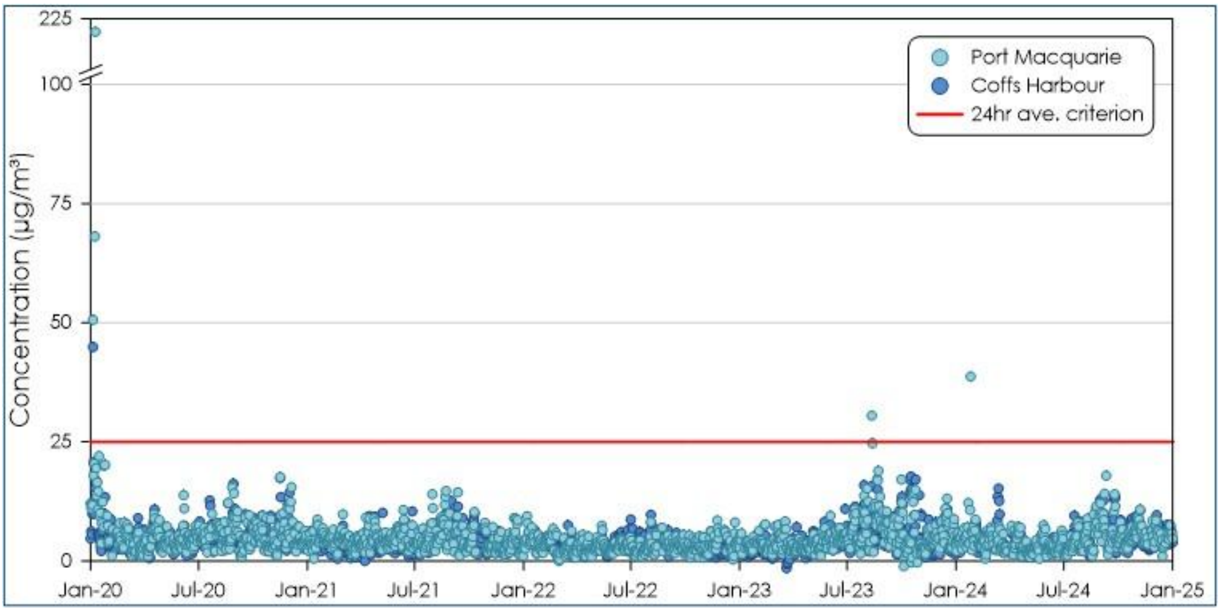

Figure 5-4: 24-hour average $PM_{2.5}$ concentrations

5.3.2 SO_2 monitoring

Figure 5-5 presents the daily maximum 1-hour average SO_2 monitoring data from the Port Macquarie monitoring site. The data show that the measured levels of SO_2 were well below the 1-hour average criterion of 215µg/m^3 for all years at the monitors.

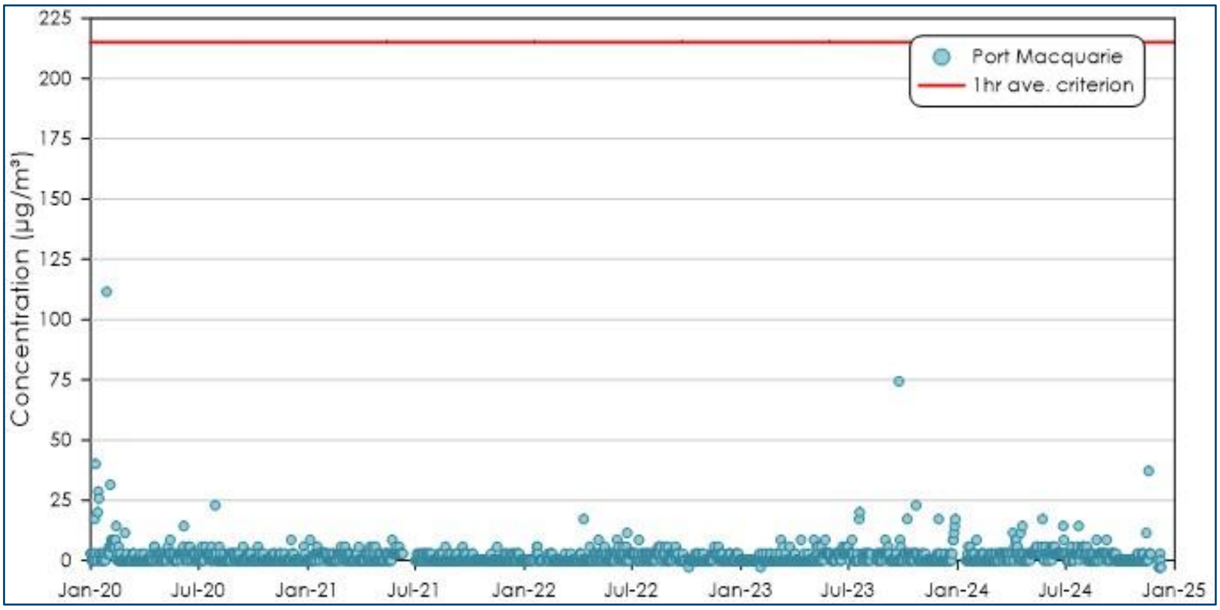

Figure 5-5: Daily maximum 1-hour average SO_2 concentrations

5.3.3 NO_2 monitoring

Figure 5-6 presents the daily maximum 1-hour average NO_2 monitoring data from the Port Macquarie and Coffs Harbour monitoring sites. The data show that the measured levels were below the NSW EPA 1-hour average criterion of 164µg/m^3 for all years at the monitors.

A seasonal trend can be seen in the ambient NO_2 monitoring data at the stations with higher levels occurring in the cooler months of the year.

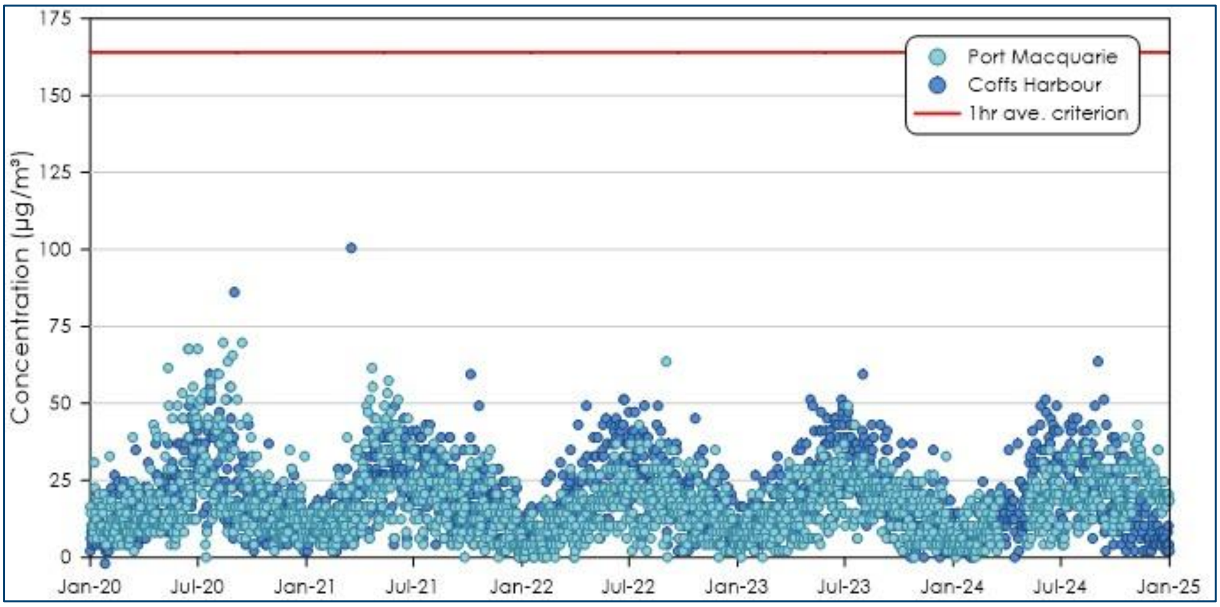

Figure 5-6: Daily maximum 1-hour average NO_2 concentrations

5.3.4 CO monitoring

Figure 5-7 presents the daily maximum 1-hour average CO monitoring data from the Port Macquarie and Coffs Harbour monitoring sites. The data show that the levels were well below the NSW EPA 1-hour average criterion of 30mg/m^3 for all years at the monitors.

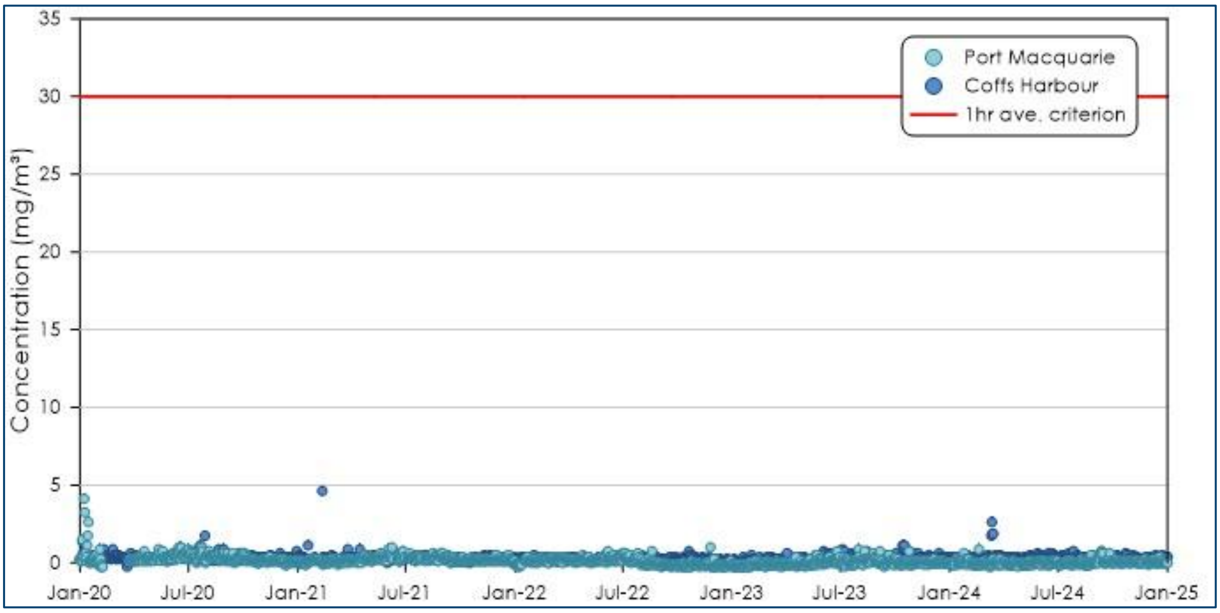

Figure 5-7: Daily maximum 1-hour average CO concentrations

5.3.5 Estimated background levels

The background air quality levels from the DCCEEW monitor for the 2024 calendar year were used to represent the background levels for the Project.

In the absence of available data, estimates of the annual average background TSP and deposited dust can be determined from a relationship between TSP and deposited dust and the measured PM_{10} levels. This relationship assumes that an annual average PM_{10} concentration of 25µg/m^3 corresponds to a TSP concentration of 90µg/m^3 and deposited dust level of 4g/m^2/month. This assumption is based on the NSW EPA air quality impact criteria. Applying this relationship with the measured annual average PM_{10} concentration of 11.2µg/m^3 indicates an approximate annual average TSP concentration of 40.3µg/m^3 and deposited dust level of 1.7g/m^2/month.

The background air quality levels applied in this assessment are summarised in **Table 5-4**.

Table 5-4: Summary of background levels

Pollutant	Background level	Units
Annual average TSP	40.3	µg/m^3
24-hour average PM_{10}	Daily varying	µg/m^3
Annual average PM_{10}	11.2	µg/m^3
24-hour average $PM_{2.5}$	Daily varying	µg/m^3
Annual average $PM_{2.5}$	4.6	µg/m^3
Annual average deposited dust	1.7	g/m^2/month
24-hour average SO_2	2.9	µg/m^3
1-hour average SO_2	37.2	µg/m^3
Annual average NO_2	10.3	µg/m^3
1-hour average NO_2	43.1	µg/m^3
1-hour average CO	0.9	mg/m^3

6 CONSTRUCTION IMPACTS

The construction activities associated with the Project have the potential to generate some dust emissions primarily generated from the handling of material, vehicle movements, exhaust emissions from diesel powered equipment and windblown dust generated from exposed areas.

Dust emissions from construction activities will arise from a small construction area and be effectively managed through standard mitigation measures such as water sprays. Given the relatively minor scale of construction activities and the distances to receivers, these emissions and potential impacts would be insignificant and are not practical to model in detail. Dust management would be managed by on-site decisions made on a day by-day basis, depending on specific activities.

The approach to assess construction impacts is thus a qualitative risk-based assessment. This method identifies activities that pose the greatest air quality risks during construction, allowing targeted control measures to mitigate potential impacts proactively.

The assessment follows the methodology outlined in the Institute of Air Quality Management (IAQM) *Guidance on the assessment of dust from demolition and construction* (**IAQM, 2024**). This guidance evaluates dust risks based on the scale and nature of activities, proximity to receptors, and the level of mitigation required to manage impacts effectively.

The potential dust emission magnitude associated with the construction activity for the Project is outlined in **Table 6-1**.

Table 6-1: Potential dust emission magnitude

Activity	Dust emission magnitude	Comment
Earthworks	Medium	Earthworks involve site clearing and excavation. Total site area is approximately <58 hectares with <5 heavy earth moving vehicles active at any one time.
Construction	Medium	Total building volume >75,000m³, construction material with low potential for dust release.
Track-out	Medium	Unpaved road length >100 with 20-50 heavy duty vehicle movements in any one day.

The sensitivity of the area surrounding the construction activity is defined in **Table 6-2**.

Table 6-2: Outcome of defining the sensitivity of the area

Potential impact	Sensitivity of the surrounding area	Comment
Dust soiling	Low	High sensitivity area with 1-10 receptors located <250m from source
Human health	Low	High sensitivity area with 1-10 receptors located <250m from source and annual mean PM_{10} <24µg/m³
Ecological	Medium	High sensitivity area located <50m

The dust emission magnitude is combined with the sensitivity of the area to determine the unmitigated risk of impact. The risk of dust impact for the construction activity is summarised in **Table 6-3**. A low risk is identified for dust soiling and human health, while a medium risk is identified for ecological receptors due to their proximity. Based on the outcomes of the risk assessment, it is considered that appropriate mitigation measures will be sufficient to manage the potential impacts, and quantitative dispersion modelling of the construction activities is not warranted.

Table 6-3: Summary of dust risk to define site-specific mitigation

Potential impact	Risk		
	Earthworks	Construction	Track-out
Dust soiling	Low Risk	Low Risk	Low Risk
Human health	Low Risk	Low Risk	Low Risk
Ecological	Medium Risk	Medium Risk	Medium Risk

The following mitigation measures outlined in **Table 6-4** are recommended to be implemented for the Project to minimise the risk of dust impacts occurring.

Table 6-4: Summary of potential mitigation measures during construction phase

Activity	Mitigation measure
Communications	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
	Display the head or regional office contact information.
Dust management	Develop and implement a Construction Dust Management Plan (DMP) which will include, but are not limited to, measures to prevent dust from affecting the amenity of the surrounding area, all materials to be stored or stockpiles at suitable locations and stockpile size height managed, and regular cleaning of haul roads.
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. Any complaints, investigation details and actions will be logged into Downers Event Management System in Control (INX).
	Make the complaints log available to the local authority when asked.
	Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book.
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, and make the log available to the local authority when asked. Weekly inspection of equipment and recording results.
	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
Site layout	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
	Fully enclose specific operations through solid screens, tarps or barriers where there is a high potential for dust production and the site is active for an extensive period.
	Avoid site runoff of water or mud.
	Keep site fencing, barriers and scaffolding clean using wet methods.

Activity	Mitigation measure
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on-site. If they are being re-used on-site cover as described below.
	Cover, seed or fence stockpiles to prevent wind whipping.
	Use of dust suppressants, place stockpiles in sheltered areas away from wind. Use of concrete blocks to bunker stockpiled material.
Operating vehicle/machinery 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 25km/h on surfaced and 15km/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, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site.
	Ensure vehicles entering and leaving sites 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
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
	Use enclosed chutes and conveyors and covered skips.
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever 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.
Waste management	Do not burn waste materials.

7 DISPERSION MODELLING APPROACH

The following sections are included to provide the reader with an understanding of the model and modelling approach applied for the assessment.

Modelling was undertaken using a combination of the CALPUFF Modelling System and the Weather Research and Forecasting model (WRF). The CALPUFF Modelling System includes three main components: CALMET, CALPUFF and CALPOST, and a large set of pre-processing programs designed to interface the model to standard, routinely available meteorological and geophysical datasets. WRF is a prognostic air model used to simulate meteorological data for input into CALMET.

The model was set up in general accordance with the NSW EPA *Generic Guidance and Optimum Model Settings for the CALPUFF Modeling System for Inclusion into the 'Approved Methods for the Modeling and Assessments of Air Pollutants in NSW, Australia'* (**TRC Environmental Corporation**, **2011**).

7.1 Meteorological modelling

The meteorological modelling methodology applied a 'hybrid' approach which includes a combination of prognostic model data from WRF with surface observations.

The WRF model was applied to the available data to generate a three-dimensional upper air data file for use in CALMET. The centre of analysis for the WRF modelling used is 452000mE and 6445000mN. The simulation involved an outer grid of 750 km with 15 km grid spacing, with two nested grids with 3 km and 1 km grid spacing.

The CALMET domain was run on a 10 x 10km grid with a 0.1km grid resolution. The 2024 calendar year was selected as the meteorological year for the dispersion modelling based on analysis of the latest five years of data trends in meteorological data from the Taree Airport weather station as outlined in **Appendix A**.

The seven critical parameters used in the CALMET modelling are presented in **Table 7-1**.

Table 7-1: Seven critical parameters used in CALMET

Parameter	Value
TERRAD	10
IEXTRP	-4
BIAS (NZ)	-1, -0.5, -0.25, 0, 0, 0, 0, 0, 0, 0, 0, 0
R1 and R2	5, 5
RMAX1 and RMAX2	12, 12

7.2 Meteorological modelling evaluation

The outputs of the CALMET modelling are evaluated using visual analysis of the wind fields and extract data. **Figure 7-1** presents a visualisation of the wind field generated by CALMET for a single hour of the modelling period (i.e. example only). The wind fields follow the terrain well and indicate the simulation produces realistic fine scale flow fields (such as terrain forced flows) in surrounding areas.

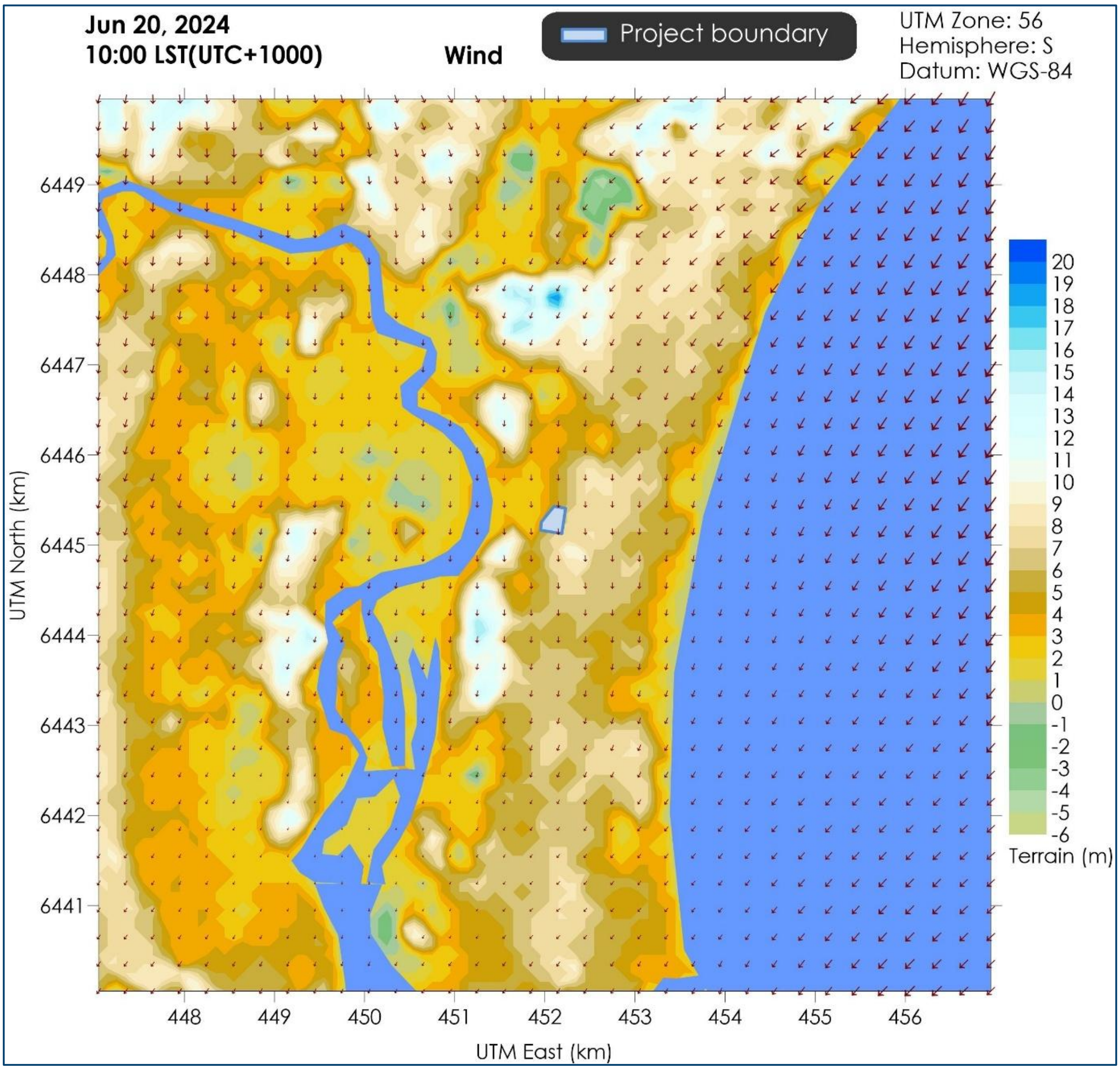

Figure 7-1: Representative snapshot of wind field for the Project

CALMET generated meteorological data were extracted from a point within the CALMET domain and are graphically represented in **Figure 7-2** and **Figure 7-3**.

Figure 7-2 presents the annual and seasonal windroses from the CALMET data. Overall, the windroses generated in the CALMET modelling reflect the expected wind distribution patterns in the area as determined based on the available measured data and the expected terrain effects on the prevailing winds.

Figure 7-3 includes graphs of the temperature, wind speed, mixing height and stability classification over the modelling period for each modelled year and shows sensible trends considered to be representative of the area.

The annual temperature pattern exhibits a clear seasonal trend, with the highest temperatures occurring during the summer months and lowest temperatures observed in winter. The wind speed statistics shows a fairly even distribution of wind speeds. The mixing height trends follow expected patterns, varying throughout the day due to changes in solar radiation and atmospheric stability. The stability classification indicates a high percentage of E and F-class periods combined, characterised by stable, calm conditions typically occurring at night.

In conclusion, the CALMET generated meteorological data are considered suitable for use in the air dispersion modelling for the Project.

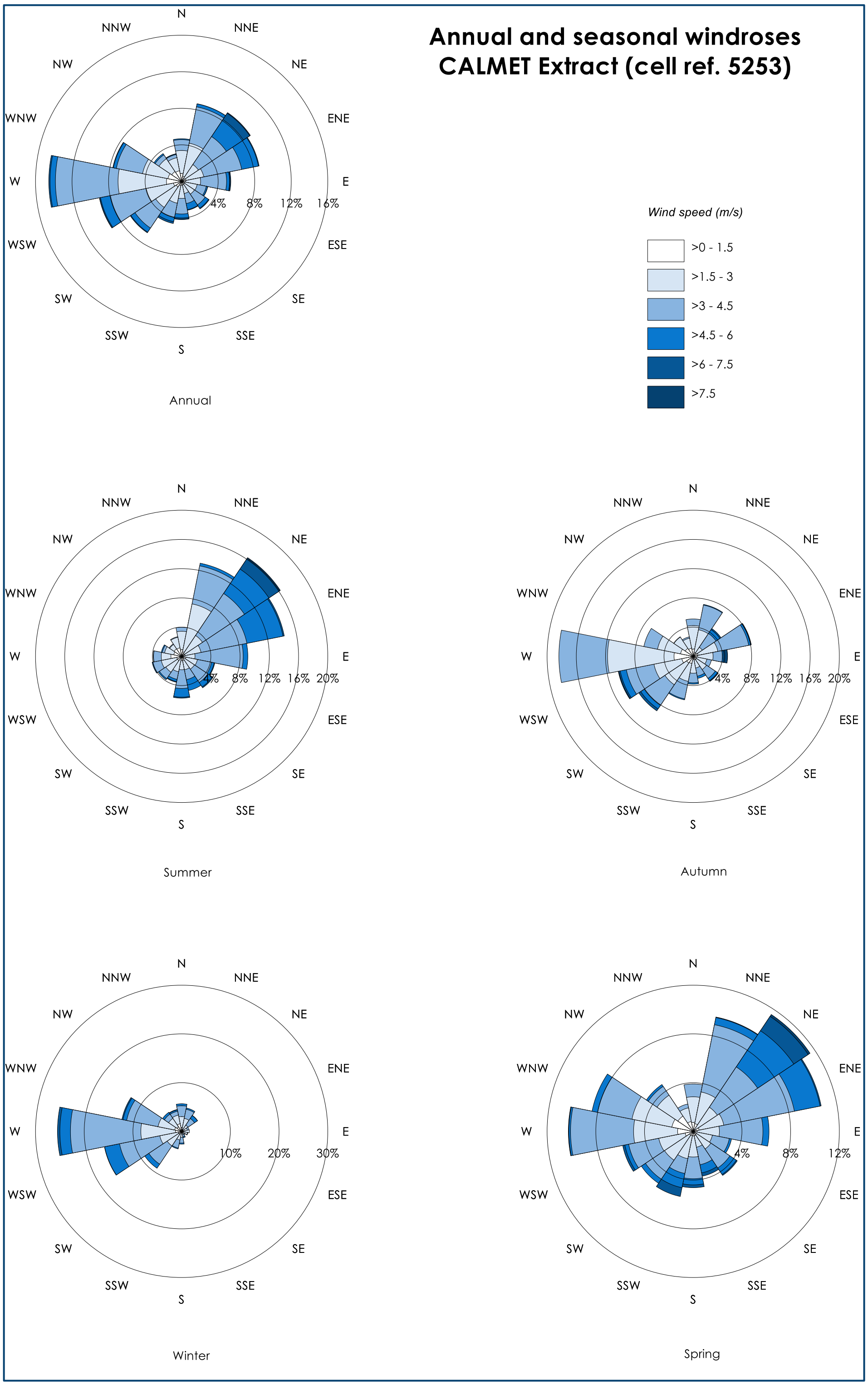

Figure 7-2: Annual and seasonal windroses from CALMET (cell ref 5253)

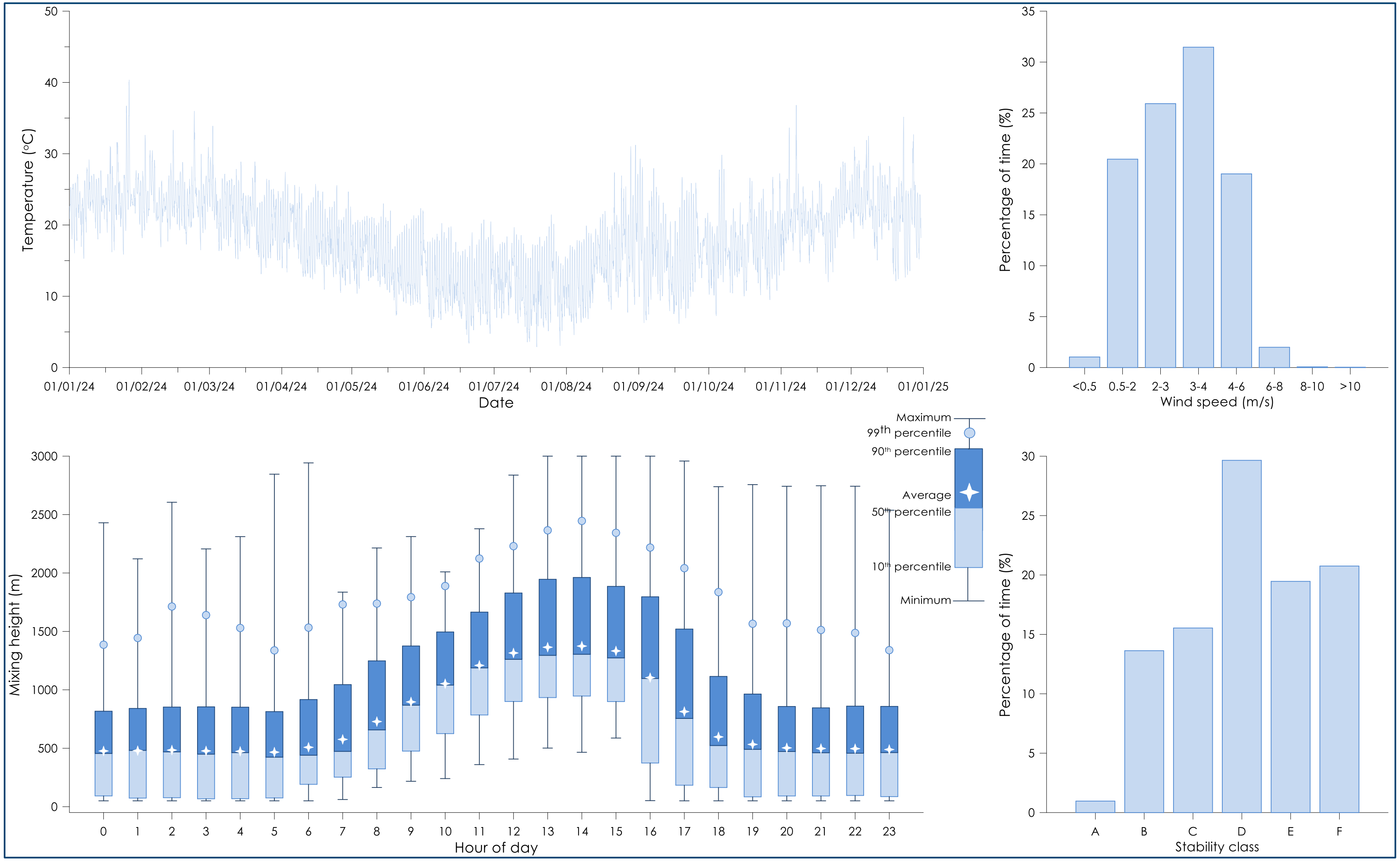

Figure 7-3: Meteorological analysis CALMET (cell ref 5253)

7.3 Dispersion modelling

The CALPUFF air dispersion model has been used to predict the potential air pollutant levels in the ambient air in the wider area around the site.

Modelling of the key air and odour emission sources was conducted using the emissions rates and parameters outlined in the following section and utilising the meteorological data described in the previous section.

7.3.1 Odour sources

The composting operation occurs within an enclosed building maintained under negative pressure, with no potential for fugitive odour emissions.

Material is unloaded in the pretreatment building which is connected to the AD system and IVC tunnels with all odorous air from within the building is directed to the biofilter for treatment prior to release to the atmosphere. The biofilter media consists of woodchips, which allow the air to pass through while providing a surface for microorganisms that remove odours from the ventilation air. The total surface emission concentration from the biofilter is not expected to exceed 500 OU.

Although biofilter emissions are generally regarded as innocuous due to having a natural earthy or forest smell, and are thus not always modelled, in this case the biofilter has been modelled as a series of four identical large diameter, low velocity point sources distributed across the emitting surface area.

Potential odour may also arise from the enclosed maturation area. Mature compost typically has a natural, earthy soil-like smell and is not expected to be offensive. Unlike other areas of the facility, the maturation area is not maintained under negative pressure, and therefore there is potential for fugitive emissions. Odour emissions are estimated using the area of the maturation stockpile and applying a Specific Odour Emission Rate (SOER) of 1.2 OU.m^3/m^2/s for mature compost.

Parameters for the modelled odour sources are provided in **Table 7-2**. Odour emissions from these sources are modelled as emitting continuously during the modelling period.

Table 7-2: Modelled odour source parameters

Parameter	Biofilter	Maturation area	Unit
Number of sources	4	1	-
Release height	3	-	m
Diameter	19.5	-	m
Velocity	0.1	-	m/s
Temperature	313	-	K
Odour Concentration	500	-	OU
SOER	-	1.2*	OU.m^3/m^2/s
Area	1,200	2,951	m^2
Odour Emission Rate	21,568	3,541	OU.m^3/s

*Source: **Todoroski Ari Sciences (2015)**

The adjacent Tuncurry Waste Management Centre has the potential to generate odour emissions in the vicinity of the Project and therefore has been considered in the assessment of potential cumulative impacts. It is understood that the Tuncurry Waste Management Centre currently accepts most forms of waste not suitable for kerbside collection. While the landfill at the site ceased operations in 2022, it still accepts small household loads. Facilities at the site includes a Community Recycling Centre for problem waste, a tip shop, a Materials Recovery Facility, a Men's Shed, a bicycle repair workshop and a community garden.

We note that the character of the odours from the Tuncurry Waste Management Centre would be relatively different, if not distinctly different, to those emitted from the Project. It is therefore expected that the receiver would generally be able to distinguish whether an odour originates from landfill-related activities or from composting operations. For the purposes of this assessment, however, cumulative odour impacts have been evaluated by considering the combined effect of odours from both the proposed operations and the landfill.

In the absence of any site-specific odour measurements for the landfill operations, odour emissions were estimated based on odour measurements used in the *Air Quality Impact Assessment Albury Waste Management Centre* (**Todoroski Air Sciences, 2018**) for capped landfill areas.

Figure 7-4 presents the location of the modelled odour emission sources for the Project.

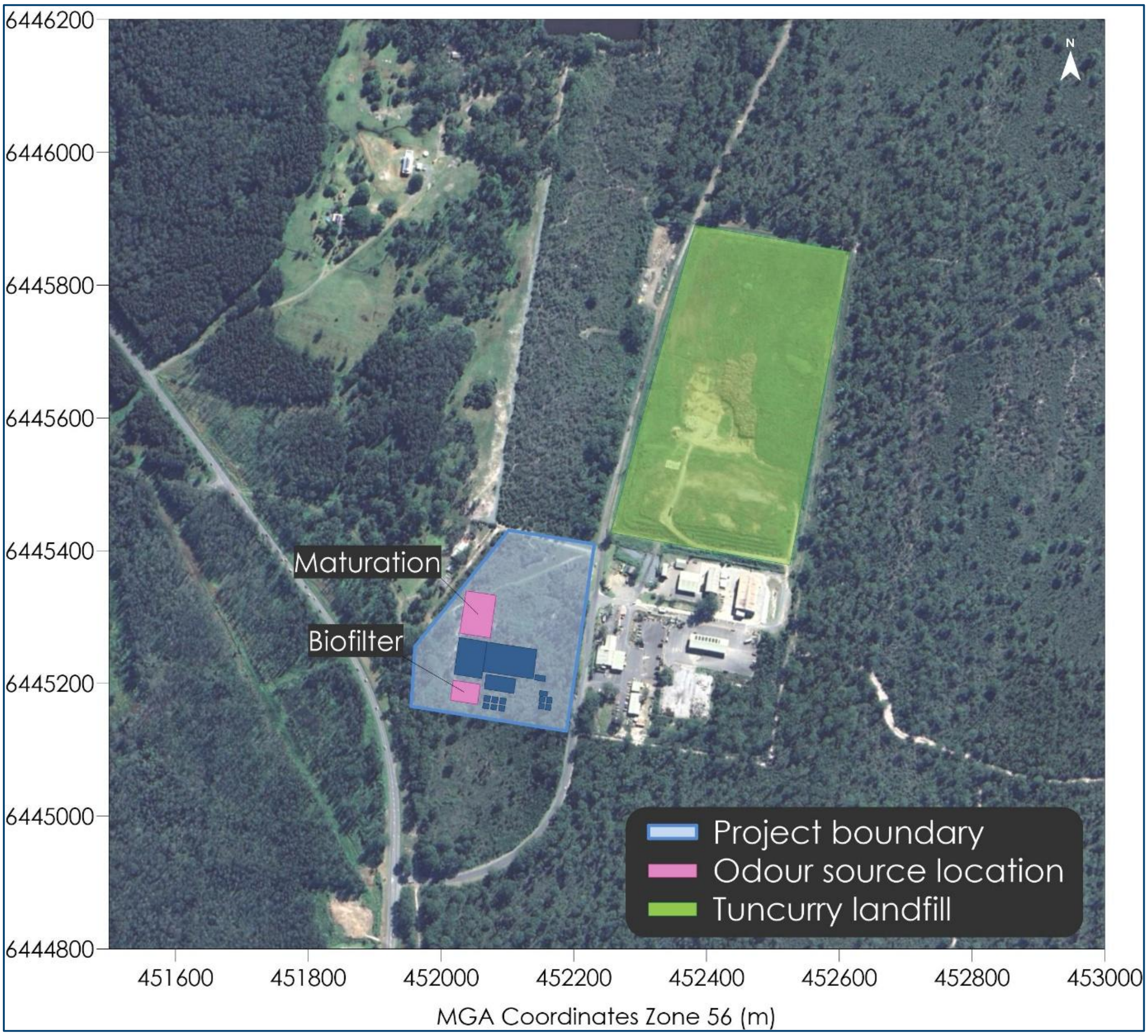

Figure 7-4: Modelled odour sources for the Project

7.3.2 Dust sources

Dust emissions have been estimated by analysing the dust generating activities and utilising suitable emission factors. The emission factors were sourced from both locally developed and United States Environmental Protection Agency developed documentation as approved by the NSW EPA. These factors are based on handling earth materials, which generally have a higher propensity to generate dust compared with the organic materials proposed. As the organic material is expected to be moister and less dust-prone, the use of these emission factors is considered to be conservative.

A summary of the estimated annual TSP emissions is presented in **Table 7-3**. Detailed calculations of the dust emission estimates are provided in **Appendix B**.

Dust emissions were represented by a series of volume sources and were included in the CALPUFF model via an hourly varying emission file. Meteorological conditions associated with dust generation (such as wind speed) and levels of dust generating activities were considered in calculating the hourly varying emission rate for each source.

Table 7-3: Summary of estimated dust emissions for the Project (kg/year)

Activity	TSP emissions	PM_{10} emissions	$PM_{2.5}$ emissions
Hauling material onsite	1,124	216	52
Unloading material at receival building	276	130	20
Loading material to shredder	276	130	20
Shredding material	88	39	7
Unloading material to tunnels	276	130	20
Loading material to screen	276	130	20
Screening material	161	54	4
Screening material	161	54	4
Loading material to maturation area	85	40	6
Screening material	50	17	1
Loading material to screen	85	40	6
Hauling material offsite	353	68	16
Exhaust emissions	424	424	412
Total emissions (kg/yr)	**3,633**	**1,474**	**587**

Other sources of dust emissions at the Project include the CHP, Flare and Maturation scrubber, which are modelled as point sources with parameters provided in **Table 7-4**. The model included consideration of potential 'building' wake effects on air dispersion that arise due to the effect of winds passing over the buildings at the site. Emission rates for the CHP and Flare are provided by the Proponent. For the Maturation scrubber, the activities occurring in the maturation area, as estimated in **Table 7-3**, have been used to infer emissions from the point source.

Modelled dust source locations are presented in **Figure 7-5**.

Table 7-4: Modelled dust point source parameters

Parameter	CHP	Flare	Maturation scrubber	Unit
Number of point sources	2	1	1	-
Release height	10	7.5	14	m
Diameter	0.36	1.5	1.5	m
Velocity	19.6	8.3	16.5	m/s
Temperature	423	1,123	298	K

Parameter	CHP	Flare	Maturation scrubber	Unit
Flow rate	2.0	14.7	29.2	m^3/s
Concentration	10	10	0.26	mg/m^3
Emission rate	0.013	0.036	0.00696	g/s

Figure 7-5: Modelled dust sources for the Project

7.3.3 Other air pollutants

Other air pollutants would arise from the combustion of biogas at the Project. The modelled pollutant concentrations, provided by the Proponent, assume the implementation of appropriate controls to ensure compliance with the relevant standard concentrations under the POEO. The modelled parameters in **Table 7-2** are used in conjunction with pollutant concentrations in **Table 7-5**.

Table 7-5: Modelled pollutant concentrations

Pollutant concentration	CHP	Flare	Unit
NO_2	438	50	mg/m^3 at 7% O_2
CO	125	125	mg/m^3 at 7% O_2
SO_2	11	11	mg/m^3 at 7% O_2
VOC	40	40	mg/m^3 at 7% O_2

8 DISPERSION MODELLING RESULTS

8.1 Predicted odour impacts

The spatial distribution of the dispersion modelling predictions for the incremental impact and cumulative impact (with Tuncurry Waste Management Facility) is presented as isopleth diagrams showing the 99th percentile nose-response ground level odour concentrations in **Figure 8-1** and **Figure 8-2**, respectively.

Table 8-1 presents the discrete dispersion modelling results at each of the assessed receptor locations. The results indicate that odour levels due for all scenarios are below the applicable criteria at all receptor locations.

Table 8-1: 99th percentile nose-response average ground level odour concentrations

Receptor ID	Incremental impact	Cumulative impact	Criterion
R1	<1	1	**7**
R2	<1	<1	**7**
R3	<1	<1	**7**
R4	<1	<1	**7**
R5	1	1	**7**

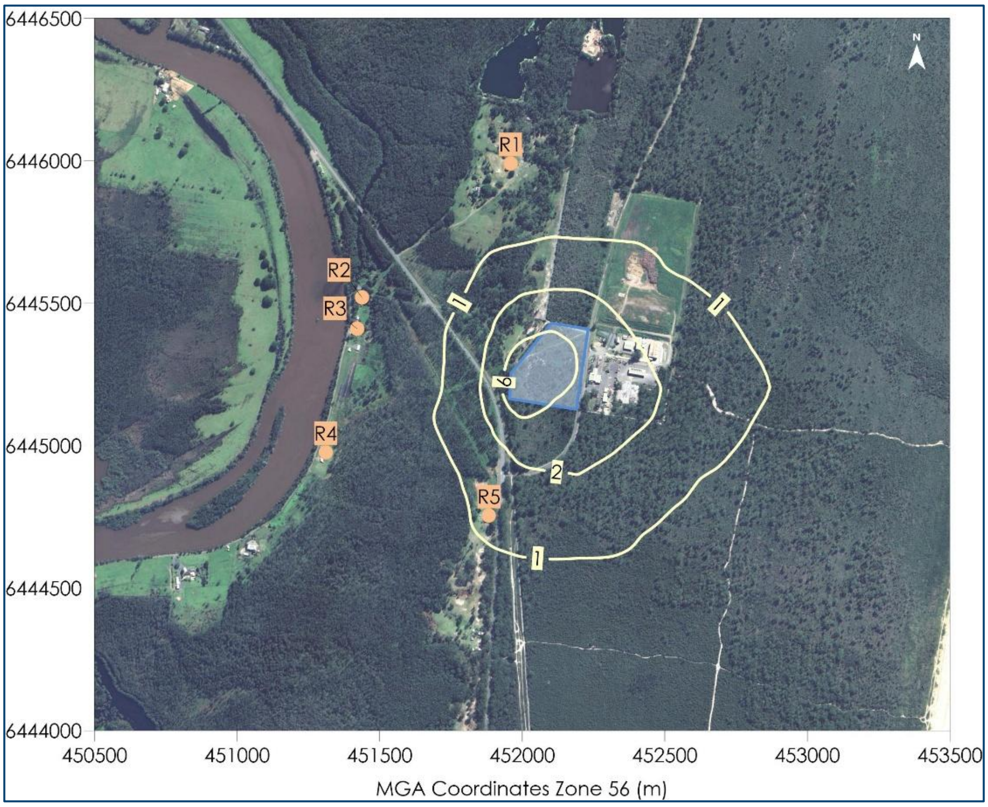

Figure 8-1: Predicted 99th percentile nose-response average ground level odour concentrations (OU) – Incremental impact

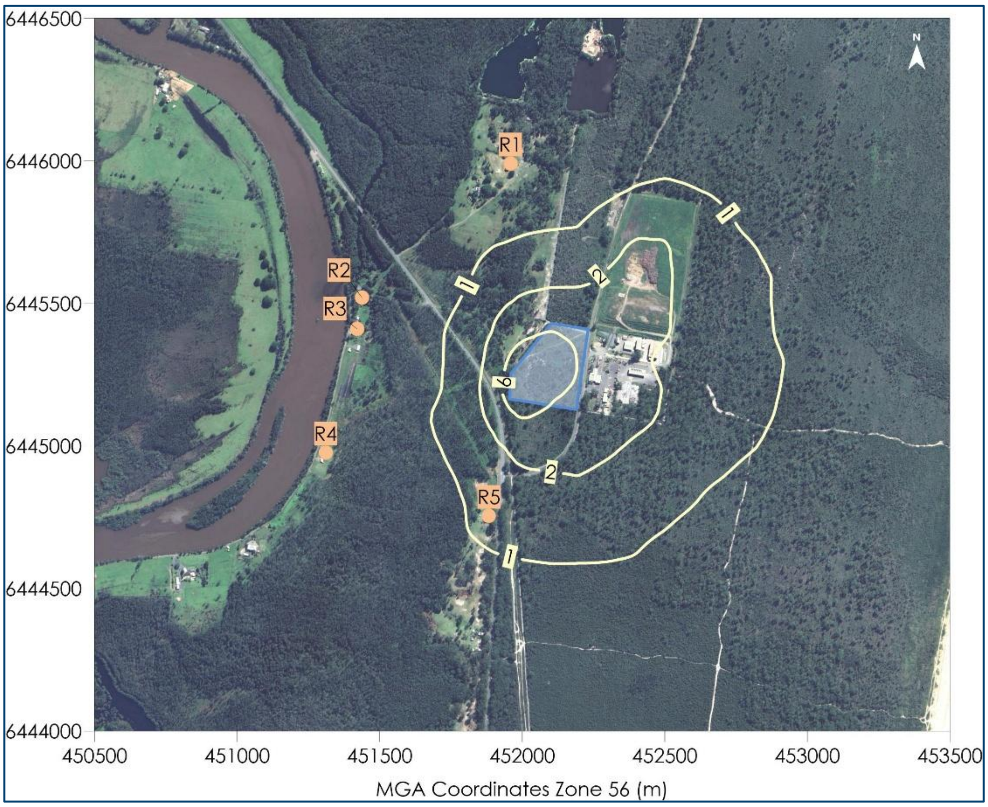

Figure 8-2: Predicted 99th percentile nose-response average ground level odour concentrations (OU) – Cumulative impact

8.2 Predicted dust impacts

Isopleth diagrams of the dispersion modelling results showing the predicted incremental maximum 24-hour average $PM_{2.5}$ and PM_{10} concentrations, annual average $PM_{2.5}$, PM_{10} and TSP concentrations and, annual average dust (insoluble solids) deposition rates are presented in **Figure 8-3** to **Figure 8-8**.

Table 8-2 presents the predicted incremental and cumulative particulate concentrations at each assessed receptor location. The results indicate that the Project would comply with the relevant criteria at all assessed receptor locations.

Table 8-2: Predicted dust modelling results

Receptor ID	$PM_{2.5}$ (µg/m³)		PM_{10} (µg/m³)		TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Incremental						Cumulative			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria									
	-	-	-	-	-	2	8	25	90	4
R1	0.2	<0.1	0.4	<0.1	<0.1	<0.1	4.6	11.6	40.3	1.7
R2	0.2	<0.1	0.4	<0.1	0.1	<0.1	4.6	11.6	40.3	1.8
R3	0.3	<0.1	0.5	<0.1	0.1	<0.1	4.6	11.7	40.3	1.8
R4	0.1	<0.1	0.2	<0.1	0.1	<0.1	4.6	11.4	40.3	1.8
R5	0.3	0.1	0.6	0.1	0.1	<0.1	4.7	11.8	40.4	1.8

DD = dust deposition

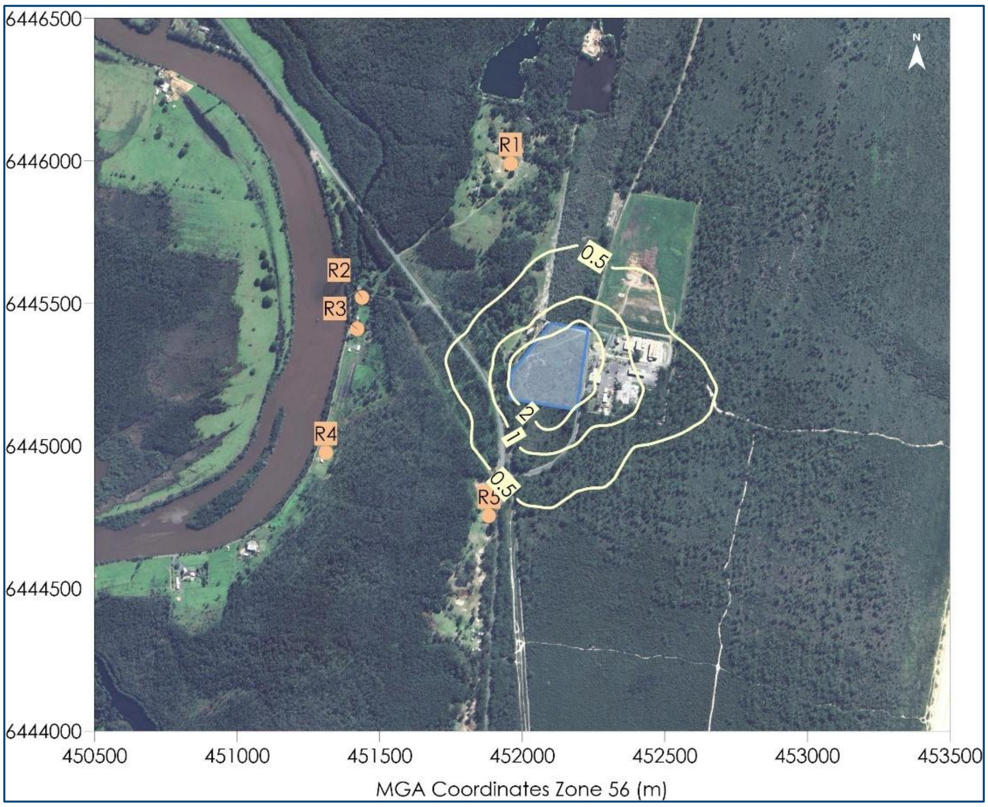

Figure 8-3: Predicted incremental 24-hour average $PM_{2.5}$ concentrations (µg/m³)

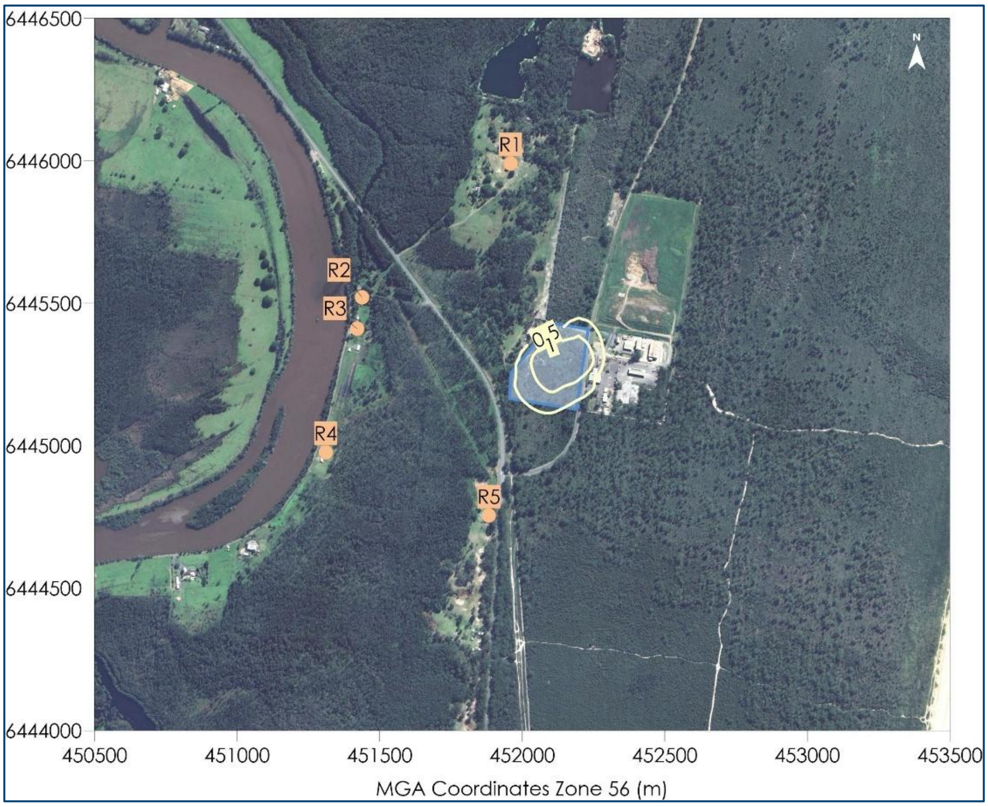

Figure 8-4: Predicted incremental annual average $PM_{2.5}$ concentrations (µg/m³)

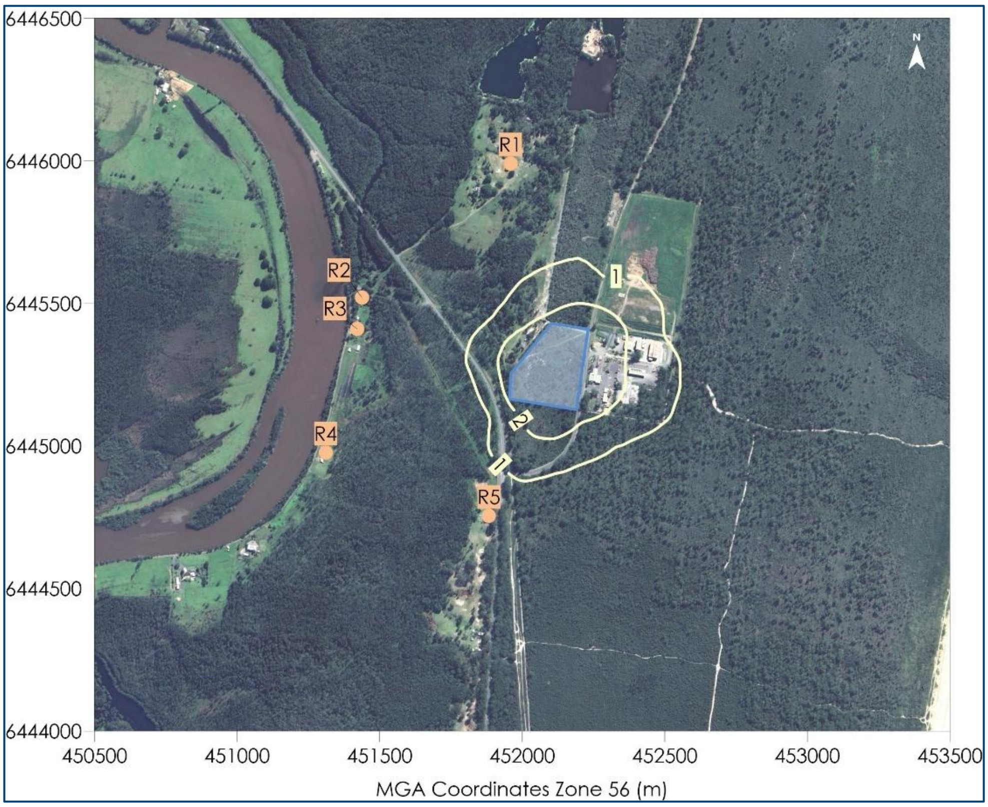

Figure 8-5: Predicted incremental 24-hour average PM_{10} concentrations (µg/m³)

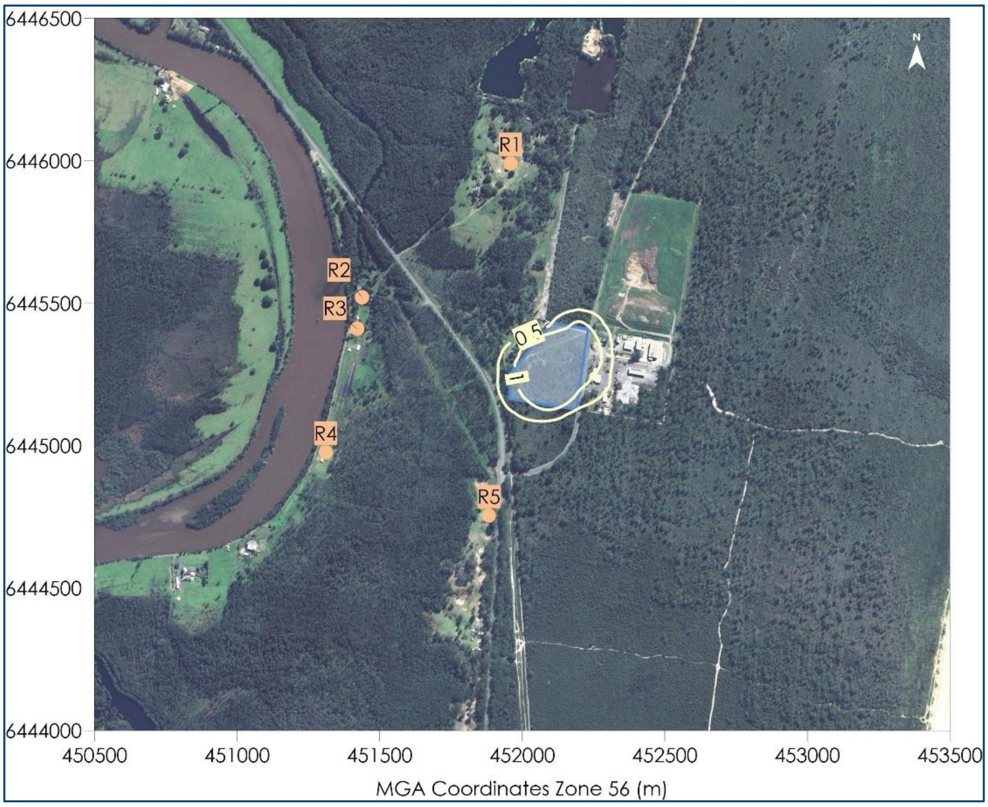

Figure 8-6: Predicted incremental annual average PM_{10} concentrations (µg/m³)

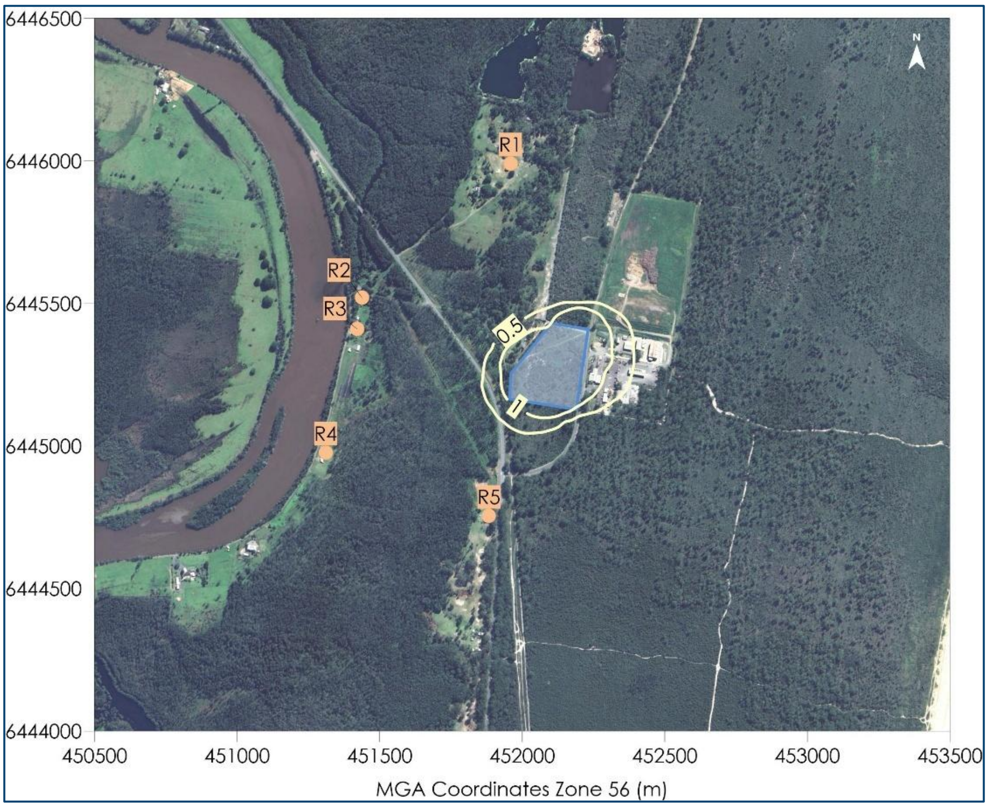

Figure 8-7: Predicted incremental annual average TSP concentrations (µg/m³)

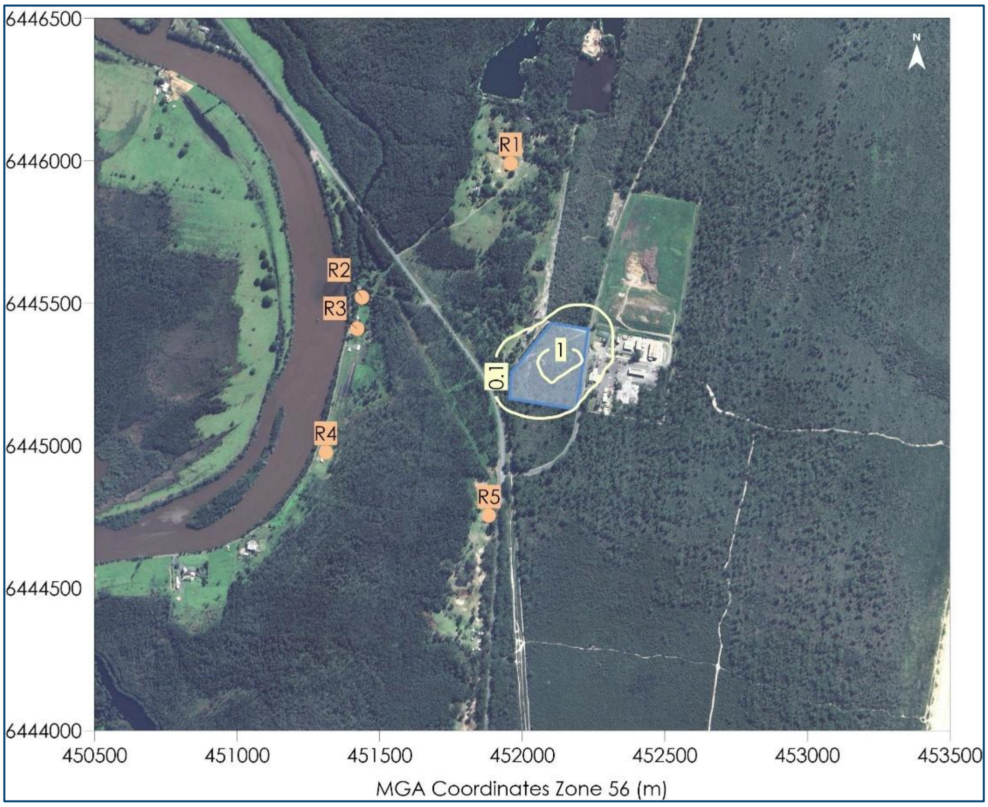

Figure 8-8: Predicted incremental annual average dust deposition levels (g/m²/month)

When assessing the cumulative 24-hour average impacts based on model predictions, challenges arise with identification and quantification of emissions from non-modelled sources over the 365 separate 24-hour periods modelled in the year.

Due to these factors, an assessment of cumulative 24-hour average $PM_{2.5}$ and PM_{10} impacts was undertaken in accordance with Section 11.2 of the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW EPA**, **2022**). The "Level 2 assessment - Contemporaneous impact and background approach" was applied to assess potential impacts. In simple terms, the Level 2 assessment involves matching one year of ambient air quality monitoring data with meteorological data representing the same period.

Table 8-3 provides a summary of the findings from the Level 2 assessment at the receptor locations. Detailed tables of the assessment results are provided in **Appendix C**. The results in **Table 8-3** indicate that the Project will not increase the number of days above the 24-hour average criterion and thus meets the EPA cumulative impact assessment criteria.

Table 8-3: NSW EPA contemporaneous assessment - maximum number of additional days above 24-hour average criterion

Receptor ID	$PM_{2.5}$	PM_{10}
R1	0	0
R2	0	0
R3	0	0
R4	0	0
R5	0	0

8.3 Other air pollutant impacts

Isopleth diagrams of the dispersion modelling results showing the predicted incremental maximum 1-hour average NO2, annual average NO2, 1-hour average CO and SO_2 and 99.9th percentile 1-hour average VOC (as benzene) in **Figure 8-9** to **Figure 8-13**, respectively.

Table 8-2 presents the predicted incremental and cumulative concentrations at each assessed receptor location. The results indicate that the Project would comply with the relevant criteria at all assessed receptor locations.

Table 8-4: Predicted dust modelling results

Receptor ID	NO_2 (µg/m³)		CO (µg/m³)			SO2 (µg/m³)		VOC (as benzene) (µg/m³)	NO_2 (µg/m³)		CO (µg/m³)	SO2 (µg/m³)	
	Incremental								Cumulative				
	1-hr ave.	Ann. ave.	15-min ave.	1-hr ave.	8-hr ave.	1-hr ave.	24-hr ave.	99.9th percentile 1-hr ave.	1-hr ave.	Ann. ave.	1-hr ave.	1-hr ave.	24-hr ave.
	Air quality impact criteria												
	-	-	-	-	-	-	-	29	164	31	30000	215	57
R1	33.9	0.4	19.9	15.1	9.9	1.3	0.2	3.8	77.0	10.7	915.1	38.5	3.1
R2	31.3	0.4	17.7	13.4	8.8	1.1	0.2	3.4	74.4	10.7	913.4	38.3	3.1
R3	32.5	0.5	19.0	14.4	9.5	1.2	0.2	3.6	75.6	10.8	914.4	38.4	3.1
R4	24.7	0.4	11.9	9.0	5.9	0.8	0.1	2.0	67.8	10.7	909.0	38.0	3.0
R5	40.5	1.4	21.5	16.3	10.8	1.4	0.3	3.5	83.6	11.7	916.3	38.6	3.2

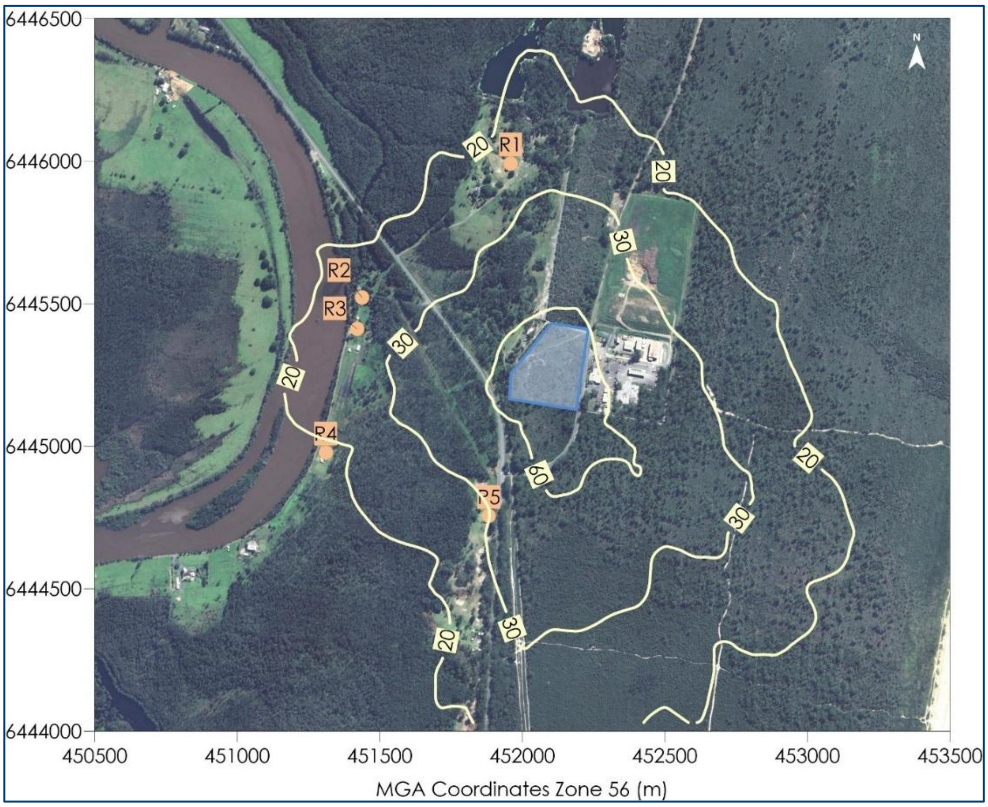

Figure 8-9: Predicted incremental 1-hour average NO_2 concentrations (µg/m³)

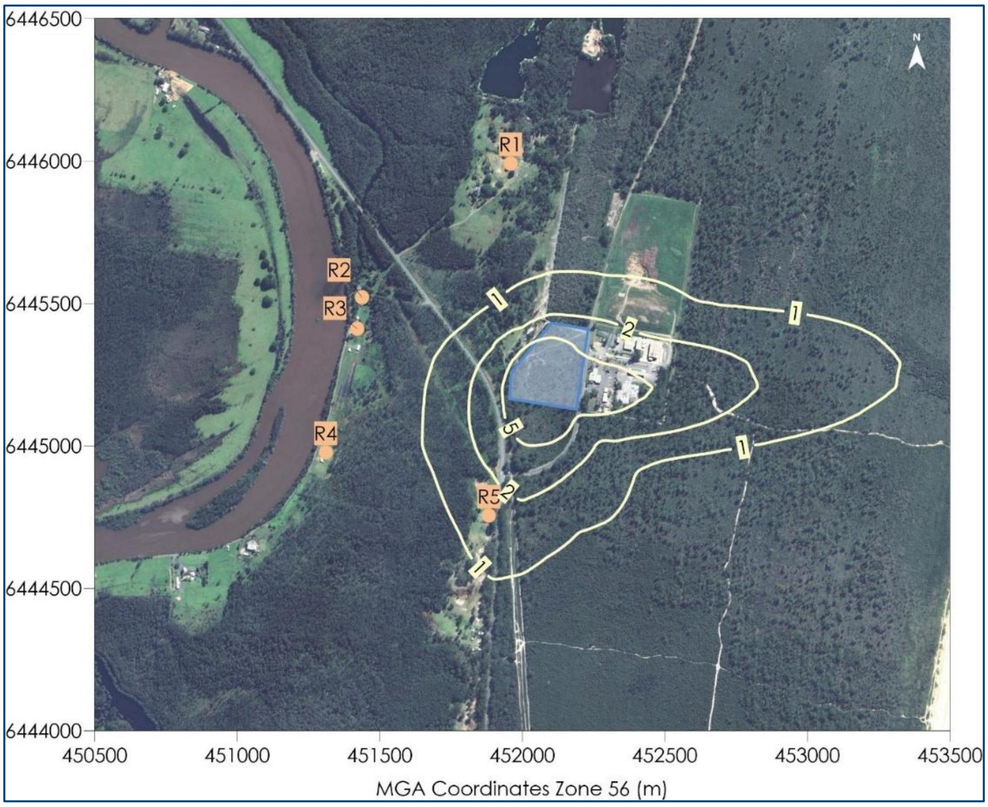

Figure 8-10: Predicted incremental annual average NO_2 concentrations (µg/m³)

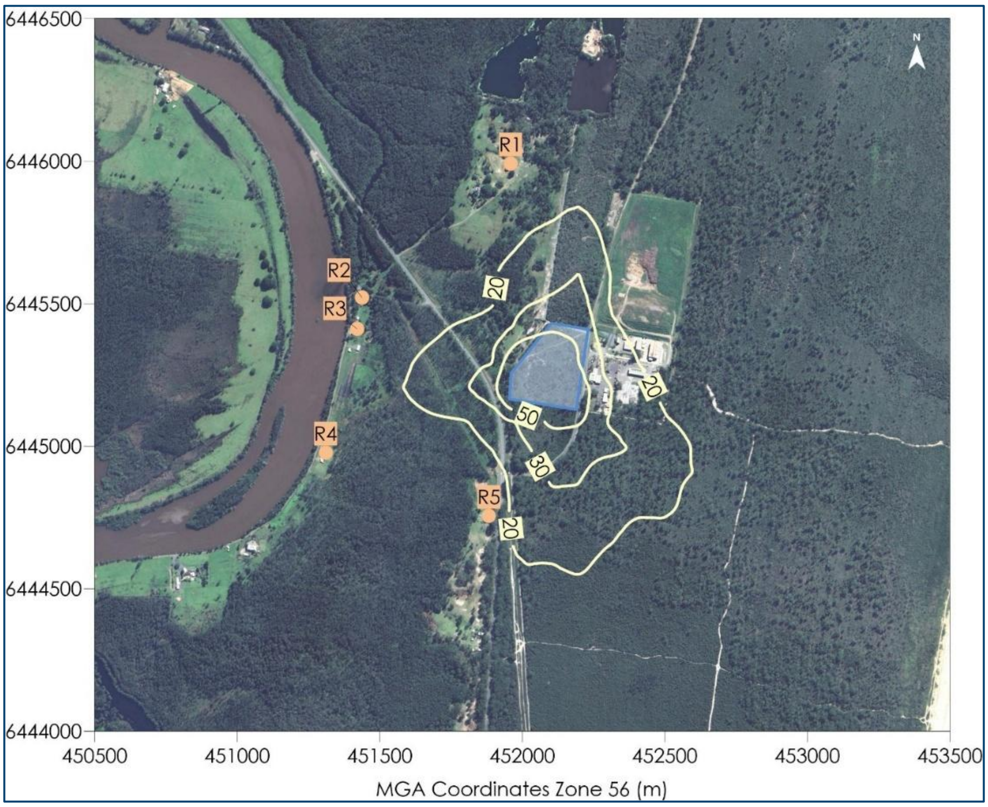

Figure 8-11: Predicted incremental 1-hour average CO concentrations (µg/m³)

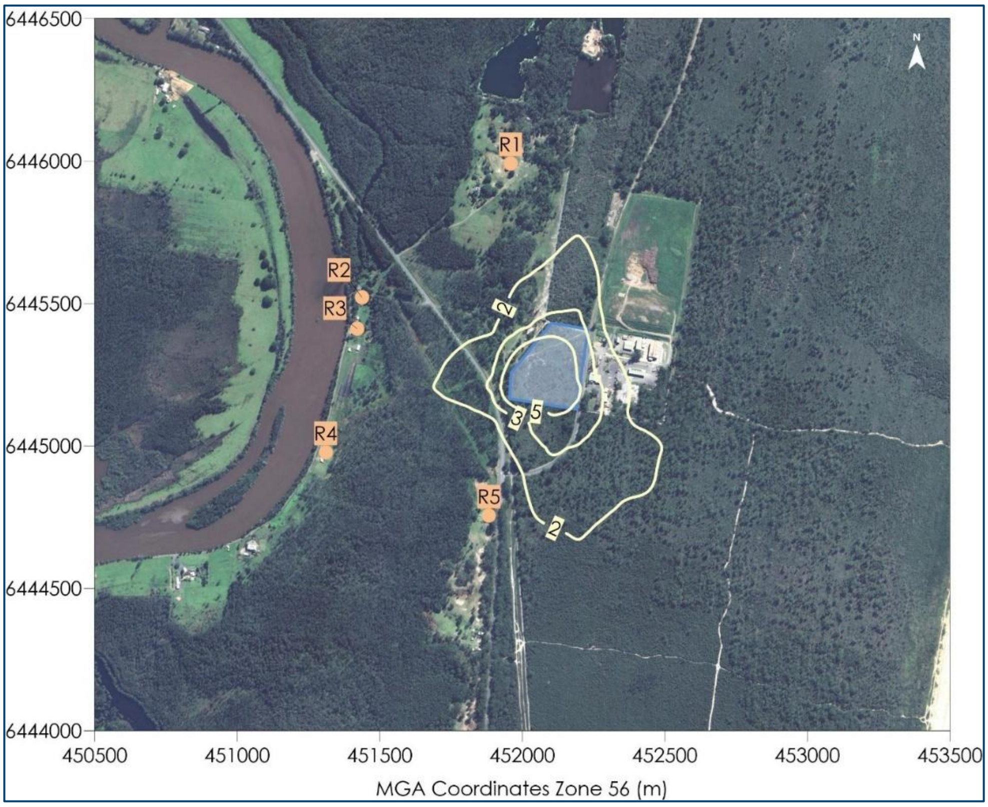

Figure 8-12: Predicted incremental 1-hour average SO_2 concentrations (µg/m³)

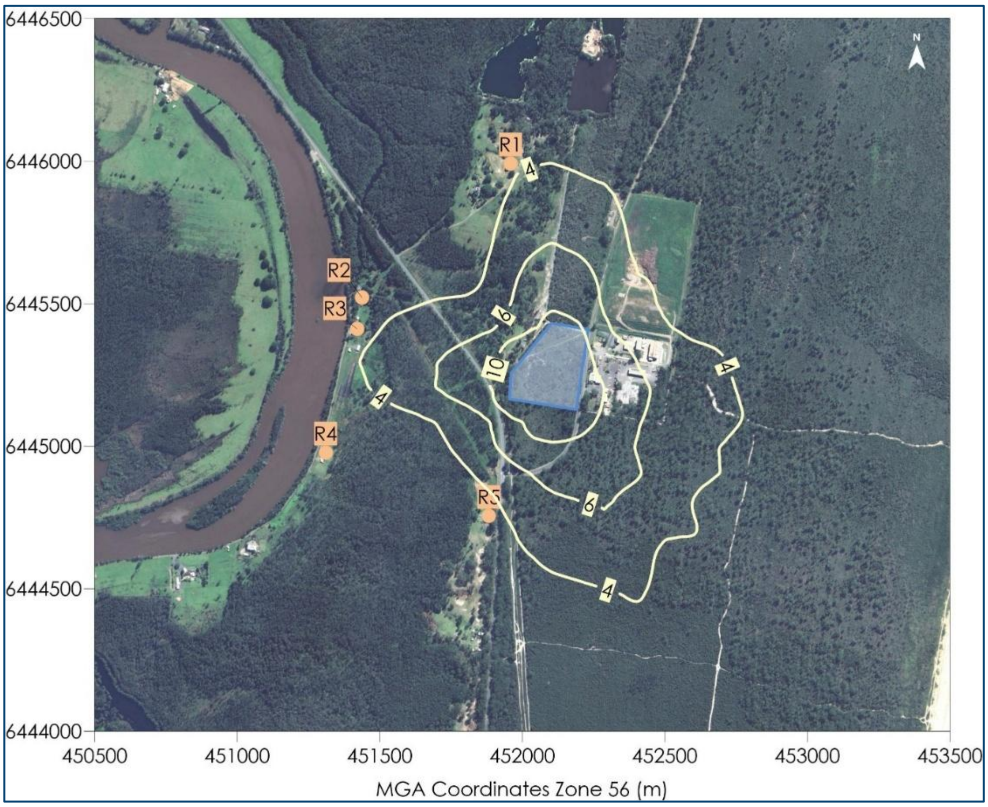

Figure 8-13: Predicted 99.9th percentile 1-hour average VOC concentrations (µg/m³)

9 MITIGATION AND MANAGEMENT MEASURES

The inherent design of the Project incorporates mitigation measures aimed at minimising the potential for adverse air quality and odour emissions. These measures, together with the selected composting technology, specifically the use of IVC tunnels and a building operated under negative pressure, serve to reduce the risk of air quality impacts in the surrounding area.

The modelling predictions for the Project do not indicate any exceedance of the relevant air quality impact assessment criteria at the residential receptors and indicate results well below the criteria. Given this situation, there are no specific ambient air quality monitoring recommendation for Project at the receptors.

Regular daily odour monitoring and visual inspection of dust plumes would be conducted by on-site personnel to identify any significant odours or dust and take appropriate action to control these.

It is anticipated that the Project would develop a suitable Operational Management Plan for the site which includes details on complaints management. The complaints management procedure would document the following information of each complaint:

- Date and time complaint was lodged;
- Method by which the complaint was made;
- Details of complainant (if provided);
- Nature of the complaint;
- Likely cause of the complaint;
- Action taken and reasoning behind action; (if no action was taken, the reasoning behind no action); and,
- Follow up with the complainant.

The complaint record will be kept for at least five years after the complaint was made.

It is anticipated that stack sampling would be conducted as part of the commissioning phase to verify the potential emissions from the CHP and Flare and to ensure there are no excess unexpected emissions. Should there be, the commissioning phase will be extended to install controls to remove any such excess emissions.

Once operational it is proposed to conduct two 6-monthly stack tests to confirm that the operation is stable and is operating correctly. It is anticipated that the results will be low, and thus further sampling would be discontinued if the post commissioning tests indicate compliance. Regular inspection of the control equipment and normal process monitoring would of course continue.

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10 SUMMARY AND CONCLUSIONS

This report outlines an assessment of the potential air quality impacts associated with FOGO composting operations at the MC ROPS at Tuncurry, NSW.

The air dispersion modelling methodology incorporates site-representative weather and local terrain data to evaluate the potential for any air quality impact.

The results indicate that predicted air pollutant and odour levels would be below the applicable criteria at all assessed receptor locations. Accordingly, the Project is not expected to result in any unacceptable air quality impacts in the surrounding environment.

Air quality control and management measures for the Project include conducting all composting activities within an enclosed building equipped with a biofilter to treat odorous air. This approach is consistent with best practice and is expected to provide effective odour control during operations.

Overall, the assessment demonstrates that the Project is appropriately located and designed, and its operation is not anticipated to cause any unacceptable air quality impacts in the surrounding environment.

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Appendix A

Selection of Meteorological Year

Selection of meteorological year

An analysis of the of last five years of available meteorological data from the BoM Taree Airport AWS is presented in **Table A-1** and **Figure A-1**.

The analysis of the five years indicates that 2020, 2021, 2022 and 2024 are closest to the average for wind speed, 2020, 2022 and 2024 are the closest to the average for wind direction, 2020 is closest to the average for temperature, 2021 is closest to the average for relative humidity and 2024 is closest for rainfall.

On the basis of this analysis, 2024 was found to be generally representative and is suitable as the selected year for the purpose of the modelling.

Table A-1: Analysis results for Taree Airport AWS

Year	Wind speed	Wind direction	Temperature	Relative humidity	Rainfall	Score
2020	0.3	0.1	0.1	0.6	0.3	1.5
2021	0.3	0.2	0.2	0.3	0.7	1.6
2022	0.3	0.1	0.3	0.4	0.8	1.8
2023	0.5	0.2	0.2	0.4	0.2	1.6
2024	0.3	0.1	0.3	0.5	0.1	1.4

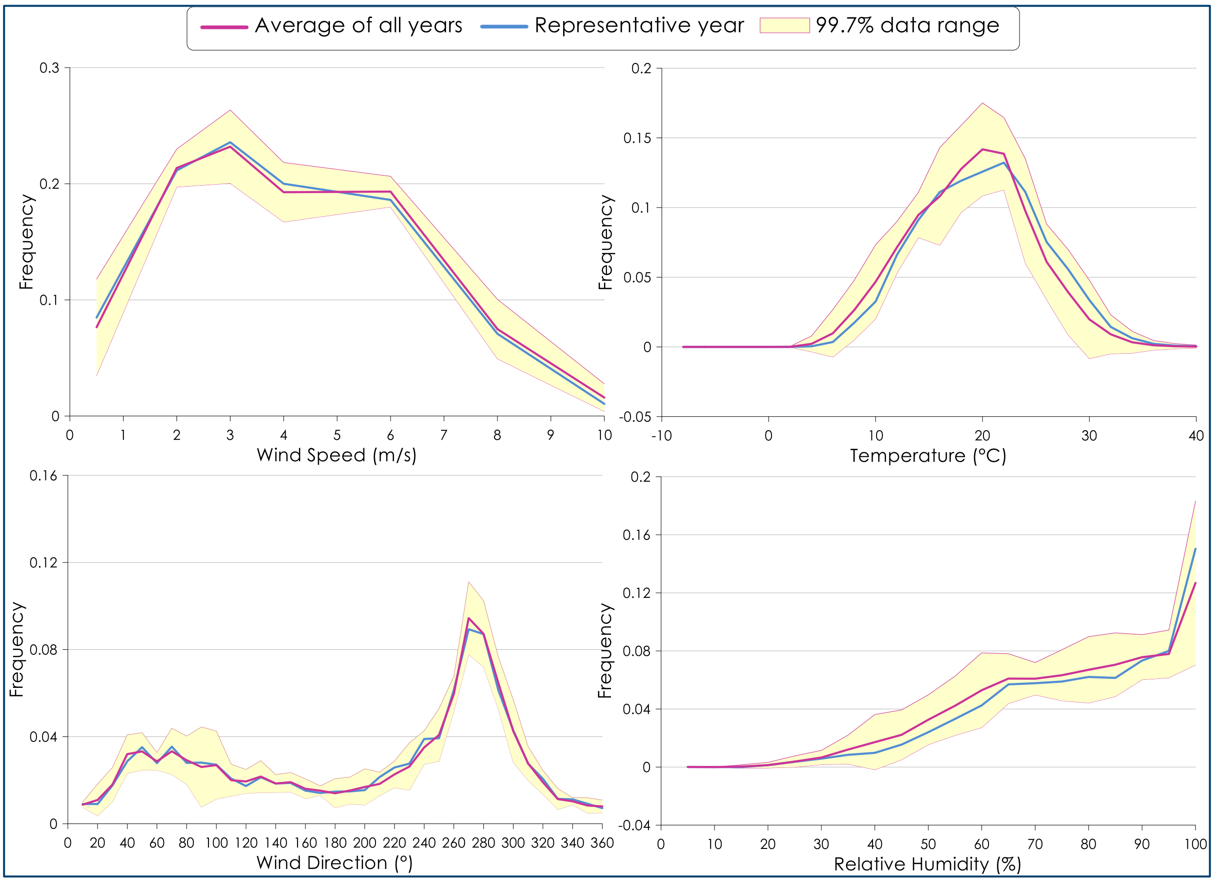

Figure A-1: Frequency distribution of meteorological parameters for Taree Airport AWS

Appendix B

Emission Calculations

Emission Calculations

The dust emissions from the Project have been estimated from the operational description of the proposed activities provided by the Proponent and have been combined with emissions factor equations that relate to the quantity of dust emitted from particular activities based on intensity, the prevailing meteorological conditions and composition of the material being handled.

Emission factors and associated controls have been sourced from:

- United States (US) EPA AP42 Emission Factors (**US EPA, 1995 and Updates**);
- National Pollutant Inventory document, Emission Estimation Technique Manual for Mining, Version 3.1 (**NPI, 2012**); and,
- NSW EPA document, NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining, prepared by Katestone Environmental (**Katestone Environmental, 2011**).

The emission factor equations used for each dust generating activity are outlined in **Table B-1** below. A detailed emission inventory is presented in **Table B-2**.

Air emissions associated with the operation of the diesel-powered equipment have been estimated based on the number of equipment, power rating, hours of operation and emission factors sourced from the NSW EPA document *NSW Coal Mining Benchmarking Study Best-practice measures for reducing non-road diesel exhaust emissions* (**NSW EPA, 2014**). Emission factors are based on Tier 2 equipment in all three assessed Project years.

Table C-1: Emission factor equations

Activity	Emission factor equation		
	TSP	PM_{10}	$PM_{2.5}$
Loading / emplacing material & conveyor transfer	$EF = 0.74 \times 0.0016 \times \left(\frac{U}{2.2}^{1.3} / \frac{M}{2}^{1.4}\right) kg/tonne$	$EF = 0.35 \times 0.0016 \times \left(\frac{U}{2.2}^{1.3} / \frac{M}{2}^{1.4}\right) kg/tonne$	$EF = 0.053 \times 0.0016 \times \left(\frac{U}{2.2}^{1.3} / \frac{M}{2}^{1.4}\right) kg/tonne$
Hauling on sealed surfaces	$EF = 3.23 \times (sL)^{0.91} \times (1.1023 \times W)^{1.02}\, kg/VKT$	$EF = 0.62 \times (sL)^{0.91} \times (1.1023 \times W)^{1.02}\, kg/VKT$	$EF = 0.15 \times (sL)^{0.91} \times (1.1023 \times W)^{1.20}\, kg/VKT$
Shredding	$EF = 0.0006\, kg/tonne$	$EF = 0.00027\, kg/tonne$	$EF = 0.00005\, kg/tonne$
Screening	$EF = 0.0011\, kg/tonne$	$EF = 0.00037\, kg/tonne$	$EF = 0.000025\, kg/tonne$

EF = emission factor, U = wind speed (m/s), M = moisture content (%), s = silt content (%), VKT = vehicle kilometres travelled (km), sL = silt loading (g/m^2), W = average vehicle weight (t)

Table C-2: Emissions inventory

Activity	TSP emission	PM10 emission	PM25 emission	Intensity	Units	EF - TSP	EF - PM10	EF - PM25	Units	Var 1	Units	Var 2	Units	Var 3 - TSP / PM10 / PM25	Units	Var 4	Units	Var 5	Units
Hauling material onsite	1,124	216	52	146,000	t/yr	0.0077	0.00148	0.000358	kg/t	8	t/l	1.0	km/rt	0.06 / 0.01 / 0.003	kg/VKT	2	S.L. g/m2	9	Ave weight (t)
Unloading material at receival building	276	130	20	146,000	t/yr	0.00189	0.00089	0.00014	kg/t	1.60	ave. ws (r	2	M.C. %						
Loading material to shredder	276	130	20	146,000	t/yr	0.00189	0.00089	0.00014	kg/t	1.60	ave. ws (r	2	M.C. %						
Shredding material	88	39	7	146,000	t/yr	0.00060	0.00027	0.00005	kg/t										
Unloading material to tunnels	276	130	20	146,000	t/yr	0.00189	0.00089	0.00014	kg/t	1.60	ave. ws (r	2	M.C. %						
Loading material to screen	276	130	20	146,000	t/yr	0.00189	0.00089	0.00014	kg/t	1.60	ave. ws (r	2	M.C. %						
Screening material	161	54	4	146,000	t/yr	0.0011	0.00037	0.000025	kg/t										
Screening material	161	54	4	146,000	t/yr	0.0011	0.00037	0.000025	kg/t										
Loading material to maturation area	85	40	6	45,000	t/yr	0.00189	0.00089	0.00014	kg/t	1.60	ave. ws (r	2	M.C. %						
Screening material	50	17	1	45,000	t/yr	0.0011	0.00037	0.000025	kg/t										
Loading material to screen	85	40	6	45,000	t/yr	0.00189	0.00089	0.00014	kg/t	1.60	ave. ws (r	2	M.C. %						
Hauling material offsite	353	68	16	45,000	t/yr	0.0078	0.00151	0.000364	kg/t	20	t/l	1.0	km/rt	0.16 / 0.03 / 0.01	kg/VKT	2	S.L. g/m2	22	Ave weight (t)
Exhaust emissions	424	424	412																
Total emissions (kg/yr.)	**3,633**	**1,474**	**587**																

Appendix C

Further Detail Regarding 24-hour $PM_{2.5}$ and PM_{10} Analysis

<u>Further detail regarding 24-hour average $PM_{2.5}$ and PM_{10} analysis</u>

The analysis below provides a cumulative 24-hour $PM_{2.5}$ and a 24-hour PM_{10} impact assessment in accordance with the NSW EPA Approved Methods; refer to the worked example on Page 50 to 51 of the Approved Methods.

The <u>background</u> level is the ambient level at the Port Macquarie monitoring stations.

The <u>increment</u> is the predicted level to occur at the receptor due to the Project.

The <u>total</u> is the sum of the background level and the predicted level. The totals may have minor discrepancies due to rounding.

Tables C-1 to **C-10** assesses the receptors and shows the predicted maximum cumulative levels at the selected receptors. The left half of the table examines the cumulative impact during the periods of highest background levels and the right half of the table examines the cumulative impact during the periods of highest contribution from the Project.

The green shading represents days ranked per the highest background level but below the criteria.

The blue shading represents days ranked per the highest predicted increment level but below the criteria.

The orange shading represents days where the measured background level is already over the criteria.

Any value above the $PM_{2.5}$ criterion of 25µg/m^3 or above the PM_{10} criterion of 50µg/m^3 is in **bold red.**

Table C-1: 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R1

Ranked by Highest to Lowest Predicted Background Concentration				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Increment	Total cumulative 24-hr average level	Date	Measured background level	Increment	Total cumulative 24-hr average level
26/01/2024	38.7	0.0	38.7				
11/09/2024	17.9	0.0	17.9	28/05/2024	7.5	0.2	7.7
8/09/2024	14.1	0.0	14.1	27/05/2024	4.3	0.2	4.5
25/09/2024	14.0	0.0	14.0	24/02/2024	5.5	0.2	5.7
22/01/2024	12.2	0.1	12.3	27/06/2024	4.3	0.2	4.5
1/09/2024	12.1	0.0	12.1	24/05/2024	4.4	0.2	4.6
25/08/2024	11.5	0.0	11.5	8/10/2024	6.6	0.1	6.7
26/09/2024	11.5	0.1	11.6	26/10/2024	5.5	0.1	5.6
7/11/2024	10.8	0.1	10.9	4/03/2024	3.5	0.1	3.6
25/01/2024	10.7	0.0	10.7	14/05/2024	2.7	0.1	2.8
24/09/2024	10.4	0.0	10.4	8/02/2024	3.8	0.1	3.9

Table C-2: 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R2

Ranked by Highest to Lowest Predicted Background Concentration				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Increment	Total cumulative 24-hr average level	Date	Measured background level	Increment	Total cumulative 24-hr average level
26/01/2024	38.7	0.0	38.7				
11/09/2024	17.9	0.0	17.9	22/07/2024	4.3	0.2	4.5
8/09/2024	14.1	0.0	14.1	10/08/2024	8.9	0.2	9.1
25/09/2024	14.0	0.0	14.0	24/06/2024	3.5	0.2	3.7
22/01/2024	12.2	0.0	12.2	31/03/2024	5.5	0.2	5.7
1/09/2024	12.1	0.0	12.1	23/01/2024	3.7	0.2	3.9
25/08/2024	11.5	0.1	11.6	29/03/2024	5.5	0.2	5.7
26/09/2024	11.5	0.0	11.5	28/01/2024	2.3	0.2	2.5
7/11/2024	10.8	0.0	10.8	11/07/2024	3.0	0.2	3.2
25/01/2024	10.7	0.0	10.7	11/02/2024	4.9	0.2	5.1
24/09/2024	10.4	0.0	10.4	15/05/2024	3.8	0.1	3.9

Table C-3: 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R3

Ranked by Highest to Lowest Predicted Background Concentration				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Increment	Total cumulative 24-hr average level	Date	Measured background level	Increment	Total cumulative 24-hr average level
26/01/2024	**38.7**	0.0	**38.7**				
11/09/2024	17.9	0.0	17.9	22/07/2024	4.3	0.3	4.6
8/09/2024	14.1	0.0	14.1	28/01/2024	2.3	0.2	2.5
25/09/2024	14.0	0.0	14.0	9/05/2024	2.8	0.2	3.0
22/01/2024	12.2	0.0	12.2	31/03/2024	5.5	0.2	5.7
1/09/2024	12.1	0.0	12.1	23/01/2024	3.7	0.2	3.9
25/08/2024	11.5	0.1	11.6	29/03/2024	5.5	0.2	5.7
26/09/2024	11.5	0.0	11.5	11/07/2024	3.0	0.2	3.2
7/11/2024	10.8	0.0	10.8	11/02/2024	4.9	0.2	5.1
25/01/2024	10.7	0.0	10.7	10/08/2024	8.9	0.2	9.1
24/09/2024	10.4	0.0	10.4	24/06/2024	3.5	0.2	3.7

Table C-4: 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R4

Ranked by Highest to Lowest Predicted Background Concentration				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Increment	Total cumulative 24-hr average level	Date	Measured background level	Increment	Total cumulative 24-hr average level
26/01/2024	**38.7**	0.0	**38.7**				
11/09/2024	17.9	0.0	17.9	7/09/2024	8.6	0.1	8.7
8/09/2024	14.1	0.0	14.1	10/03/2024	4.6	0.1	4.7
25/09/2024	14.0	0.0	14.0	31/01/2024	4.2	0.1	4.3
22/01/2024	12.2	0.0	12.2	22/08/2024	7.6	0.1	7.7
1/09/2024	12.1	0.0	12.1	16/02/2024	4.5	0.1	4.6
25/08/2024	11.5	0.0	11.5	13/01/2024	3.8	0.1	3.9
26/09/2024	11.5	0.0	11.5	20/11/2024	3.5	0.1	3.6
7/11/2024	10.8	0.0	10.8	16/01/2024	5.0	0.1	5.1
25/01/2024	10.7	0.0	10.7	9/12/2024	5.5	0.1	5.6
24/09/2024	10.4	0.0	10.4	29/09/2024	2.8	0.1	2.9

Table C-5: 24-hour average $PM_{2.5}$ concentration (µg/m³) – Receptor R5

Ranked by Highest to Lowest Predicted Background Concentration				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Increment	Total cumulative 24-hr average level	Date	Measured background level	Increment	Total cumulative 24-hr average level
26/01/2024	38.7	0.2	38.9				
11/09/2024	17.9	0.2	18.1	17/05/2024	2.8	0.3	3.1
8/09/2024	14.1	0.0	14.1	9/07/2024	2.2	0.3	2.5
25/09/2024	14.0	0.1	14.1	31/05/2024	6.7	0.3	7.0
22/01/2024	12.2	0.0	12.2	13/08/2024	2.3	0.3	2.6
1/09/2024	12.1	0.0	12.1	15/12/2024	1.0	0.3	1.3
25/08/2024	11.5	0.0	11.5	5/02/2024	5.5	0.3	5.8
26/09/2024	11.5	0.0	11.5	30/11/2024	3.9	0.3	4.2
7/11/2024	10.8	0.1	10.9	14/08/2024	2.1	0.2	2.3
25/01/2024	10.7	0.2	10.9	4/02/2024	5.5	0.2	5.7
24/09/2024	10.4	0.1	10.5	27/11/2024	6.4	0.2	6.6

Table C-6: 24-hour average PM_{10} concentration (µg/m³) – Receptor R1

Ranked by Highest to Lowest Predicted Background Concentration				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Increment	Total cumulative 24-hr average level	Date	Measured background level	Increment	Total cumulative 24-hr average level
26/01/2024	57.9	0.0	57.9				
22/01/2024	31.1	0.1	31.2	28/05/2024	11.7	0.4	12.1
3/02/2024	29.9	0.0	29.9	27/05/2024	8.0	0.3	8.3
25/09/2024	28.1	0.0	28.1	24/05/2024	8.5	0.3	8.8
11/09/2024	26.8	0.0	26.8	27/06/2024	8.0	0.3	8.3
25/01/2024	24.1	0.0	24.1	24/02/2024	15.9	0.2	16.1
15/01/2024	23.8	0.0	23.8	4/03/2024	16.8	0.2	17.0
30/01/2024	23.8	0.0	23.8	8/10/2024	18.5	0.2	18.7
29/01/2024	22.2	0.0	22.2	14/05/2024	7.8	0.2	8.0
7/11/2024	22.2	0.1	22.3	26/10/2024	14.6	0.2	14.8
23/02/2024	21.5	0.0	21.5	12/10/2024	13.0	0.2	13.2

Table C-7: 24-hour average PM_{10} concentration (µg/m³) – Receptor R2

Ranked by Highest to Lowest Predicted Background Concentration				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Increment	Total cumulative 24-hr average level	Date	Measured background level	Increment	Total cumulative 24-hr average level
26/01/2024	57.9	0.0	57.9				
22/01/2024	31.1	0.0	31.1	22/07/2024	8.1	0.4	8.5
3/02/2024	29.9	0.1	30.0	24/06/2024	6.6	0.4	7.0
25/09/2024	28.1	0.0	28.1	31/03/2024	13.2	0.3	13.5
11/09/2024	26.8	0.0	26.8	11/07/2024	5.4	0.3	5.7
25/01/2024	24.1	0.0	24.1	10/08/2024	12.2	0.3	12.5
15/01/2024	23.8	0.2	24.0	15/05/2024	9.5	0.3	9.8
30/01/2024	23.8	0.0	23.8	26/05/2024	8.6	0.3	8.9
29/01/2024	22.2	0.0	22.2	23/01/2024	12.5	0.2	12.7
7/11/2024	22.2	0.0	22.2	28/01/2024	6.8	0.2	7.0
23/02/2024	21.5	0.0	21.5	28/06/2024	9.3	0.2	9.5

Table C-8: 24-hour average PM_{10} concentration (µg/m³) – Receptor R3

Ranked by Highest to Lowest Predicted Background Concentration				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Increment	Total cumulative 24-hr average level	Date	Measured background level	Increment	Total cumulative 24-hr average level
26/01/2024	57.9	0.0	57.9				
22/01/2024	31.1	0.0	31.1	22/07/2024	8.1	0.5	8.6
3/02/2024	29.9	0.1	30.0	11/07/2024	5.4	0.3	5.7
25/09/2024	28.1	0.0	28.1	31/03/2024	13.2	0.3	13.5
11/09/2024	26.8	0.0	26.8	28/06/2024	9.3	0.3	9.6
25/01/2024	24.1	0.0	24.1	7/04/2024	5.8	0.3	6.1
15/01/2024	23.8	0.1	23.9	24/06/2024	6.6	0.3	6.9
30/01/2024	23.8	0.0	23.8	9/05/2024	6.9	0.3	7.2
29/01/2024	22.2	0.0	22.2	4/08/2024	7.8	0.3	8.1
7/11/2024	22.2	0.0	22.2	23/01/2024	12.5	0.3	12.8
23/02/2024	21.5	0.0	21.5	28/01/2024	6.8	0.3	7.1

Table C-9: 24-hour average PM_{10} concentration (µg/m³) – Receptor R4

Ranked by Highest to Lowest Predicted Background Concentration				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Increment	Total cumulative 24-hr average level	Date	Measured background level	Increment	Total cumulative 24-hr average level
26/01/2024	57.9	0.0	57.9				
22/01/2024	31.1	0.0	31.1	22/08/2024	13.1	0.2	13.3
3/02/2024	29.9	0.1	30.0	13/04/2024	10.5	0.2	10.7
25/09/2024	28.1	0.0	28.1	10/03/2024	13.4	0.2	13.6
11/09/2024	26.8	0.0	26.8	7/09/2024	15.0	0.2	15.2
25/01/2024	24.1	0.1	24.2	31/01/2024	10.9	0.1	11.0
15/01/2024	23.8	0.0	23.8	8/03/2024	8.5	0.1	8.6
30/01/2024	23.8	0.1	23.9	16/02/2024	12.9	0.1	13.0
29/01/2024	22.2	0.0	22.2	13/01/2024	11.6	0.1	11.7
7/11/2024	22.2	0.1	22.3	29/09/2024	9.2	0.1	9.3
23/02/2024	21.5	0.0	21.5	9/12/2024	13.2	0.1	13.3

Table C-10: 24-hour average PM_{10} concentration (µg/m³) – Receptor R5

Ranked by Highest to Lowest Predicted Background Concentration				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level	Increment	Total cumulative 24-hr average level	Date	Measured background level	Increment	Total cumulative 24-hr average level
26/01/2024	57.9	0.2	58.1				
22/01/2024	31.1	0.0	31.1	17/05/2024	7.1	0.6	7.7
3/02/2024	29.9	0.1	30.0	9/07/2024	4.8	0.5	5.3
25/09/2024	28.1	0.1	28.2	31/05/2024	13.8	0.5	14.3
11/09/2024	26.8	0.2	27.0	30/05/2024	11.0	0.3	11.3
25/01/2024	24.1	0.2	24.3	13/08/2024	9.5	0.3	9.8
15/01/2024	23.8	0.0	23.8	14/08/2024	6.8	0.3	7.1
30/01/2024	23.8	0.1	23.9	8/07/2024	5.8	0.3	6.1
29/01/2024	22.2	0.2	22.4	11/06/2024	6.0	0.3	6.3
7/11/2024	22.2	0.1	22.3	30/11/2024	9.9	0.3	10.2
23/02/2024	21.5	0.1	21.6	26/07/2024	11.0	0.3	11.3