



# northstar



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## Air Quality Opportunities and Constraints Report

### Appin Road Development

Addressee(s):	Ingham Rural Property Group Pty Ltd
Site Address:	345 Appin Road, Appin NSW
Report Reference:	23.1103.FR1V2
Date:	14 June 2023
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## Quality Control

Study	Status	Prepared by	Checked by	Authorised by
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THE PROPOSAL	Final	Northstar Air Quality	MD	MD
LEGISLATION, REGULATION AND GUIDANCE	Final	Northstar Air Quality	MD	MD
EXISTING ENVIRONMENT	Final	Northstar Air Quality	MD	MD
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AIR POLLUTION EMISSION SOURCES	Final	Northstar Air Quality	MD	MD
CONCLUSION	Final	Northstar Air Quality	MD	MD

## Report Status

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Based upon the above, the specific reference for this version of the report is:				23.1103.FR1V2

## Final Authority

This report must be regarded as draft until the above study components have been each marked as final, and the document has been signed and dated below.



Martin Doyle

14 June 2023

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## Non-Technical Summary

Northstar Air Quality Pty Ltd was engaged by Ingham Rural Property Group Pty Ltd, to prepare an air quality constraints and opportunities assessment report for the proposed rezoning of land in the North Appin Precinct located at 345 Appin Road, Appin NSW.

A review was performed using assessment of published separation distances from existing or potential future sources of air emissions to existing or future locations of sensitive land uses.

Based on the high-level assessment undertaken, it has been determined that the existing identified sources of air quality and odour will not form a significant constraint on the rezoning and proposed development of the Proposal site. The proposed Greater Macarthur Transit Corridor, if developed, will run through the Proposal site, adjacent to Appin Road, which may be located within the recommended separation distances for a major road to sensitive receptors. Whilst the neighbourhood land uses adjacent to the proposed Transit Corridor are not yet known, appropriate setback distances, in addition to consideration of design measures would ameliorate potential air quality impacts.

Given the above, it is anticipated that with appropriate land use planning and design consideration of appropriate regulatory standards and guidelines, potential air quality impacts resulting from both existing identified sources and the proposed Transit Corridor can be appropriately managed and will not form a significant constraint on the rezoning of the site.

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## 1. INTRODUCTION

Northstar Air Quality Pty Ltd (Northstar) have been engaged by Ingham Rural Property Group Pty Ltd (IPG) to prepare an air quality opportunities and constraints review to support the proposed rezoning of an area of land in the North Appin Precinct (the Proposal) located at 345 Appin Road, Appin NSW, known as the North Appin (part) Precinct (Proposal site).

### 1.1. Purpose of the Report

The purpose of this high-level review is to identify and review potential constraints and potential opportunities associated with the proposed urban land use rezoning with respect to air quality, and identify constraints from existing and proposed sources of emissions to air proximate to the proposed land rezoning within the North Appin (part) Precinct site.

This report has been prepared to accompany a rezoning application for the Proposal site which is to be developed into a new mixed use urban and residential community as outlined in Section 2.2.

### 1.2. Scope of Assessment

This report presents information and data that summarises and characterises the existing environmental conditions and identified potential air quality pollutants associated with both the existing and proposed nature of the Proposal. It examines the potential risk of both scenarios and provides commentary on the suitability (or otherwise) for the land to be rezoned for urban development land uses.

## 2. THE PROPOSAL

### 2.1. Environmental Setting

The Proposal is located at 345 Appin Road, Appin NSW, approximately 1.5 kilometres (km) north of the township of Appin as shown in Figure 1. The North Appin (part) Precinct site is predominantly located within the Wollondilly Shire Council Area, while a small portion of the north-western corner lies within the Campbelltown Local Government Area (LGA).

### 2.2. Project Overview

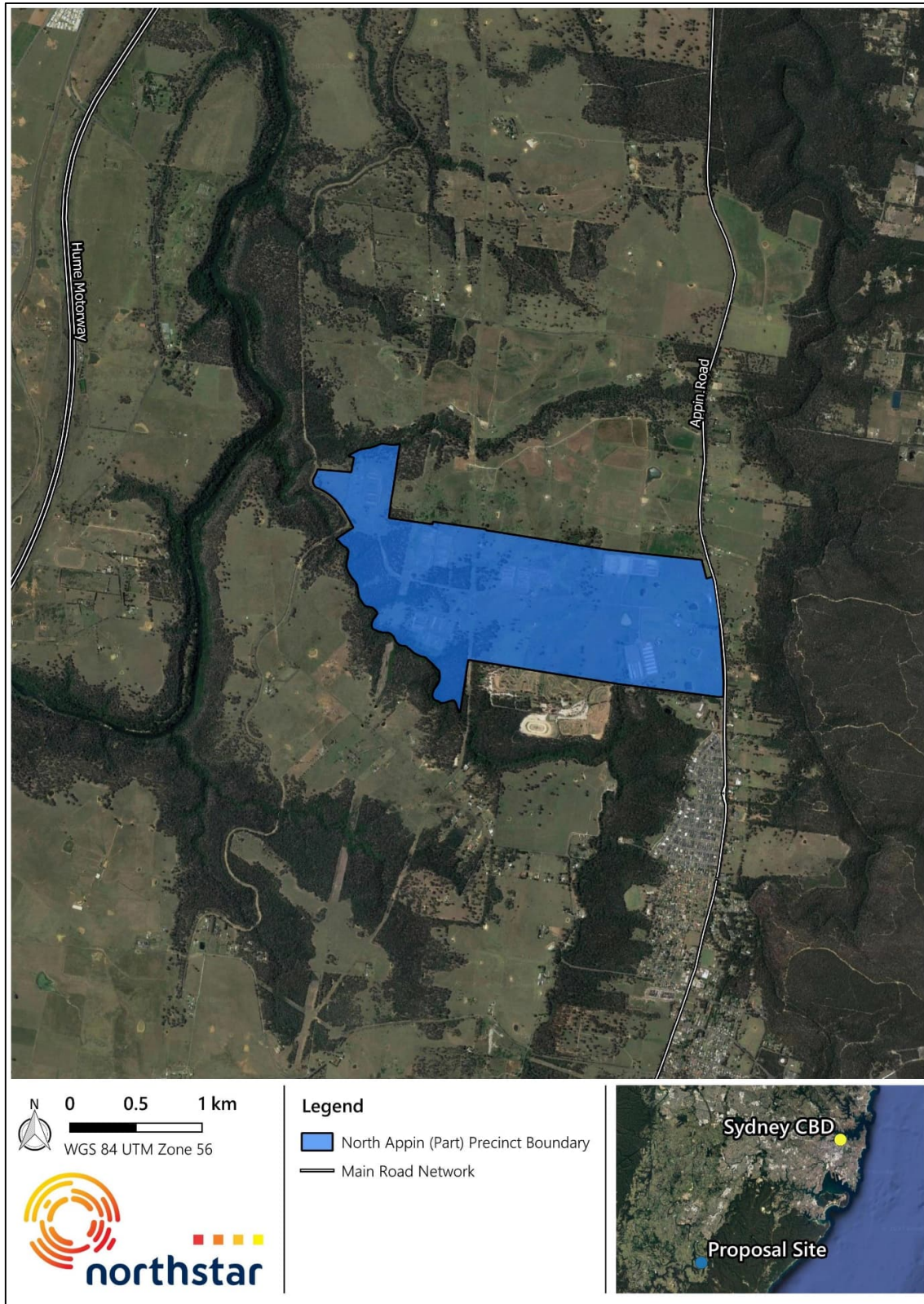
The Proposal is seeking to rezone approximately 300.8 hectares (ha) of land in the North Appin Precinct. In November 2022, the NSW Government announced that the Department of Planning and Environment will be responsible for assessing the Proposal, with the site key to unlocking housing supply in the Greater Macarthur Growth Area.

The NSW Government has identified the North Appin Precinct to deliver up to 5 000 new homes and secure and implement a Koala Corridor along Ousedale Creek. The site is under the single ownership of IPG and forms the majority of the North Appin Precinct, allocated by the Greater Macarthur 2040 Structure Plan.

The North Appin (part) Precinct presents an immediate opportunity to deliver 3 000 new homes as part of an integrated and holistically planned precinct. A layout of the proposed structure plan is provided in Figure 2.



Figure 1 Proposal site location



Source: Northstar



Figure 2 Proposed structure plan



Source: Ingham Rural Property Group Pty Ltd

### 3. LEGISLATION, REGULATION AND GUIDANCE

#### 3.1. NSW Government Air Quality Planning

NSW Environment Protection Authority (EPA) has formed a comprehensive strategy with the objective of driving improvements in air quality across the State. This comprises several drivers, including:

- Legislation: formed principally through the implementation of the *Protection of the Environment Operations Act 1997*, and the Protection of the Environment Operations (Clean Air) Regulations 2022. The overall objective of this legislative instruments is to achieve the requirements of the National Environment Protection (Ambient Air Quality) Measure;
- Clean Air for NSW: The 10-year plan for the improvement in air quality;
- Inter-agency Taskforce on Air Quality in NSW: a vehicle to co-ordinate cross-government incentives and action on air quality;
- Managing particles and improving air quality in NSW; and
- Diesel and marine emission management strategy.

In regard to the relevance of the NSW Government's drive to improve air quality across the State and this air quality assessment, it is imperative that this Proposal demonstrates leadership in the development of the NSW economy (in terms of activity and employment) and concomitantly not cause a detriment in achieving its objectives.

#### 3.2. Air Quality Criteria – Criteria Air Pollutants

The NSW EPA document 'Approved Methods for the Modelling and Assessment of Air Quality in NSW' (NSW EPA, 2022) (the Approved Methods) lists the statutory methods that are to be used to model and assess emissions of criteria air pollutants from stationary sources in NSW. Section 7.1 of the Approved Methods clearly outlines the impact assessment criteria for the Proposal. The criteria listed in the Approved Methods are derived from a range of sources (including National Health and Medical Research Council (NHMRC), National Environment Protection Council (NEPC), Department of Environment (DoE), World Health Organisation (WHO), and Australian and New Zealand Environment and Conservation Council (ANZECC)). The following criteria as set out in Section 7.1 of NSW EPA (2022) is outlined in Table 1 below for reference within this report.

Table 1 NSW EPA air quality standards and goals

Pollutant	Averaging period	Units <sup>(e)</sup>	Criterion	Notes
Nitrogen dioxide (NO <sub>2</sub> )	1 hour	µg·m <sup>-3</sup> <sup>(a)</sup>	164	Numerically equivalent to the AAQ NEPM <sup>(b)</sup> standards and goals.
	Annual	µg·m <sup>-3</sup>	31	
Particulates (as PM <sub>10</sub> )	24 hours	µg·m <sup>-3</sup>	50	
	1 year	µg·m <sup>-3</sup>	25	
Particulates (as PM <sub>2.5</sub> )	24 hours	µg·m <sup>-3</sup>	25	
	1 year	µg·m <sup>-3</sup>	8	
Particulates (as TSP)	1 year	µg·m <sup>-3</sup>	90	
Particulates (as dust deposition)	1-year <sup>(c)</sup>	g·m <sup>-2</sup> ·month <sup>-1</sup>	2	Assessed as insoluble solids as defined by AS 3580.10.1
	1-year <sup>(d)</sup>	g·m <sup>-2</sup> ·month <sup>-1</sup>	4	
Ozone (O <sub>3</sub> )	8 hours	µg·m <sup>-3</sup>	139	

Notes: (a): micrograms per cubic metre of air  
(b): National Environment Protection (Ambient Air Quality) Measure  
(c): Maximum increase in deposited dust level  
(d): Maximum total deposited dust level

Air quality criteria are not specifically adopted within this assessment but are presented for context.

### 3.3. Air Quality Criteria - Odour

Experience gained through odour assessments from proposed and existing facilities in NSW indicates that an odour performance goal of 7 odour units (OU) is likely to represent the level below which “offensive” odours should not occur (for an individual with a ‘standard sensitivity’ to odours). Therefore, the Odour Technical Framework (DECC, 2006) recommends that, as a design goal, no individual be exposed to ambient odour levels of greater than 7 OU. In modelling and assessment terms, this is expressed as the 99<sup>th</sup> percentile value, as a nose response time average (approximately one second).

Odour assessment criteria need to consider the range in sensitivities to odours within the community to provide additional protection for individuals with a heightened response to odours. This is addressed in the Technical Framework (DECC, 2006) by setting a population dependant odour assessment criterion, and in this way, the odour assessment criterion allows for population size, cumulative impacts, and anticipated odour levels during adverse meteorological conditions and community expectations of amenity. A summary of odour performance goals for various population sizes, as referenced in the Odour Technical Notes (DECC, 2006) is shown in Table 2. This table shows that in situations where the population of the affected community lies between 125 and 500 people, an odour assessment criterion of 4 OU at the nearest residence (existing or any likely future residences) is to be used. For isolated residences, an odour assessment criterion of 7 OU is appropriate.

Table 2 NSW EPA odour impact criterion

Population of affected community	Complex mixture of odours (OU)
Urban area ( $\geq 2000$ )	2.0
500 – 2000	3.0
125 – 500	4.0
30 – 125	5.0
10 – 30	6.0
Single residence ( $\leq 2$ )	7.0

Source: The Odour Technical Notes, (DECC, 2006)

### 3.3.1. Odour Control under the POEO Act

The POEO Act is applicable to scheduled activities in NSW and emphasises the importance of preventing 'offensive odour'. The operations at the Proposal site are likely to be non-scheduled activities under the POEO Regulations, they would be regulated by Council and the principles contained within the POEO framework are applicable.

For reference, 'offensive odour' is defined within the POEO Act as:

*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.*

### 3.4. Greater Macarthur 2040

The Greater Macarthur 2040 plan (DPE, 2018) was developed as a land use and infrastructure implementation plan (LUIIP) to help set the vision for the planned Greater Macarthur Growth Area as it develops and changes. The plan is based on five themes that collectively encompass an area, as experienced by people: place; land use; movement; landscape; and built form. Matters relating to air quality are found within the 'landscape' theme, which outlines relevant planning principles to consider as part of the development.

The planning principles relevant to this review include:

- Set back residential and other sensitive uses, such as childcare centres and schools away from existing and likely future sources of air pollution, such as busy roads, with Annual Average Daily Traffic (AADT) flows, or likely AADT of above 20 000 movements, and rail corridors;
- Incorporate setbacks to minimise exposure and odours from agricultural uses; and
- Utilise best practice emissions controls to minimise air pollution from industrial and commercial uses.

The above have been considered within this review and how they may present limitations or otherwise on development types and locations within the Proposal site.

### 3.5. Child Care Centre Planning Guideline

The NSW Child Care Centre Planning Guideline (DPE, 2017) is generally used to reference and inform appropriate design to maximise the safety, health and overall care of young children. Clause 28 of the Child Care Guidelines outlines the requirements for an air quality assessment to ensure that air quality is acceptable where childcare facilities are proposed close to external sources of air pollution such as major roads and industrial development:

*A suitably qualified air quality professional should prepare an air quality assessment report to demonstrate that proposed child care facilities close to major roads or industrial developments can meet air quality standards in accordance with relevant legislation and guidelines. The air quality assessment report should evaluate 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.*

Reference is also made to the NSW Department of Planning document "*Development Near Rail Corridors and Busy Roads – Interim Guideline*" (NSW DoP, 2008) (the Roads Guideline) which supports the specific rail and road provisions of the NSW State Environmental Planning Policy (Infrastructure) 2007. An aim of the Roads Guideline 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 in, or adjacent to busy roads (NSW DoP, 2008). The Roads Guideline also provides those situations in which air quality should be a design consideration:

- Within 10 m of a congested collector road (traffic speeds of less than 40 km·hr<sup>-1</sup> 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 congestions levels of less than 5 % idle time and average speeds of greater than 40 km·hr<sup>-1</sup>);
- 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); or
- As considered necessary by the approval authority based on consideration of site constraints, and associated air quality issues.

While specific development types within the Proposal site are not yet known, it is envisaged the masterplan will include childcare facilities within the proposed neighbourhoods. Appropriate location of these with due consideration of orientation, placement of outdoor areas and incorporation of appropriate ventilation design and landscaped areas as recommended in the above guideline would minimise any potential air quality impacts associated with major roads and industrial development.

### 3.6. Separation Distance Guidance

Separation distance guidelines provide recommended separation distances between various pollution emitters and sensitive land uses. They aim to ensure incompatible land uses are located in a way that minimises the impacts of odour and polluting air emissions when applied in the assessment of new development applications. While guidelines assist in the siting of new developments, they may also be used to ensure industrial activities in appropriate zones are protected from encroachment by residential and other sensitive land uses that would have a negative effect on the viability of industry (ACT EPSDD, 2018). Separation distance guidelines consider impacts of air pollutants including odour.

Based on the industry type and scale, separation distances from activities have been determined through review of guidelines presented in:

- Separation distance guidelines for air emissions (ACT EPSDD, 2018);
- Separation distance guidelines (Draft) (EPA Victoria, 2022); and
- Evaluation distances for effective air quality and noise management (EPA South Australia, 2016).

The NSW EPA or DPE do not publish separation distance guidelines. It is noted that the EPA Victoria have released a separation distance guideline for air emissions in December 2022, while still in Draft format, provides the most contemporary reference in regard to separation distances (EPA Victoria, 2022). Where a relevant category is not outlined in the EPA Victoria guidelines, the ACT Environment, Planning and Sustainable Development separation distance guidelines have been used (ACT EPSDD, 2018). Those separation distances relevant to relevant activities are outlined in Table 4.

### 3.7. Wollondilly Shire Council Development Control Plan 2016

The Wollondilly Shire Council Development Control Plan (DCP) outlines the specific controls and objectives for development undertaken within the Wollondilly Shire area. The purpose of the DCP is to provide guidance for future development within the Proposal site.

While the specific conditions relating to air quality management require air quality impact assessments for development or activities which are likely to emit odour or hazardous chemicals, Section 3.3 of the DCP outlines a minimum separation distance of 500 m setback for poultry farms from all residential zones. It is understood the current Ingham poultry farm located within the Proposal site will be decommissioned and redeveloped as part of the residential development. No other setback requirements for activities applicable to this Proposal are identified in the DCP.

### 3.8. Campbelltown City Council Development Control Plan 2015

Section 7.7.2 of the Campbelltown City Council Development Control Plan (DCP) outlines design requirements relating to air quality. Any development that is likely to generate levels of air emissions exceeding the POEO requirements are to demonstrate appropriate measures to mitigate against air pollution. No other specific requirements relating to air quality or separation distances are outlined in the Campbelltown DCP.

Section 6.4.5 of the DCP relates to residential interface and requires that all commercial buildings designed to accommodate the preparation of food from a commercial tenancy shall provide ventilation facilities to ensure that no odour is emitted in a manner that adversely impacts upon any residential premises. Any facilities within the future masterplan which have potential odour generating activities would be required to provide adequate ventilation facilities in line with the DCP requirements.



## 4. EXISTING ENVIRONMENT

### 4.1. Air Quality

The air quality experienced at any location will be a result of emissions generated by natural and anthropogenic sources on a variety of scales (local, regional and global). The relative contributions of sources at each of these scales to the air quality at a location will vary based on a wide number of factors including the type, location, proximity and strength of the emission source(s), prevailing meteorology, land uses and other factors affecting the emission, dispersion and fate of those pollutants.

The Proposal site is located proximate to an air quality monitoring station (AQMS) operated by NSW DPE. The closest active representative AQMS is noted to be located at Campbelltown West which has been operating since 2012. This AQMS is considered to be reflective of the conditions at the Proposal site. Data over the period 2018 to 2022 has been assessed, representing the last 5-years of data.

A summary of the air quality monitoring data is presented in Table 3 (mean, 99<sup>th</sup> percentile value and maximum for each year shown only). The measured values are compared to the air quality criteria as outlined in Section 3.2. Where there are measured exceedances of those criteria this is highlighted in red in Table 3.

The summary shows periodic exceedance (non-attainment) of the 24-hour average PM<sub>10</sub> and PM<sub>2.5</sub> criteria in most years between 2018 to 2022. This is not unexpected and is typical of most monitoring stations across NSW. The exceedances are typically associated with sporadic regional pollutant events, such as bushfires and dust storms.

Figure 3 indicates that periodic exceedance of 8-hour ozone (O<sub>3</sub>) was experienced at Campbelltown West AQMS, predominantly in December 2019. High temperatures can accelerate the formation of O<sub>3</sub> following the generation of precursor pollutants including NO<sub>2</sub> and VOCs. O<sub>3</sub> exceedances measured at Campbelltown AQMS in 2019 generally coincided with days of high temperatures.

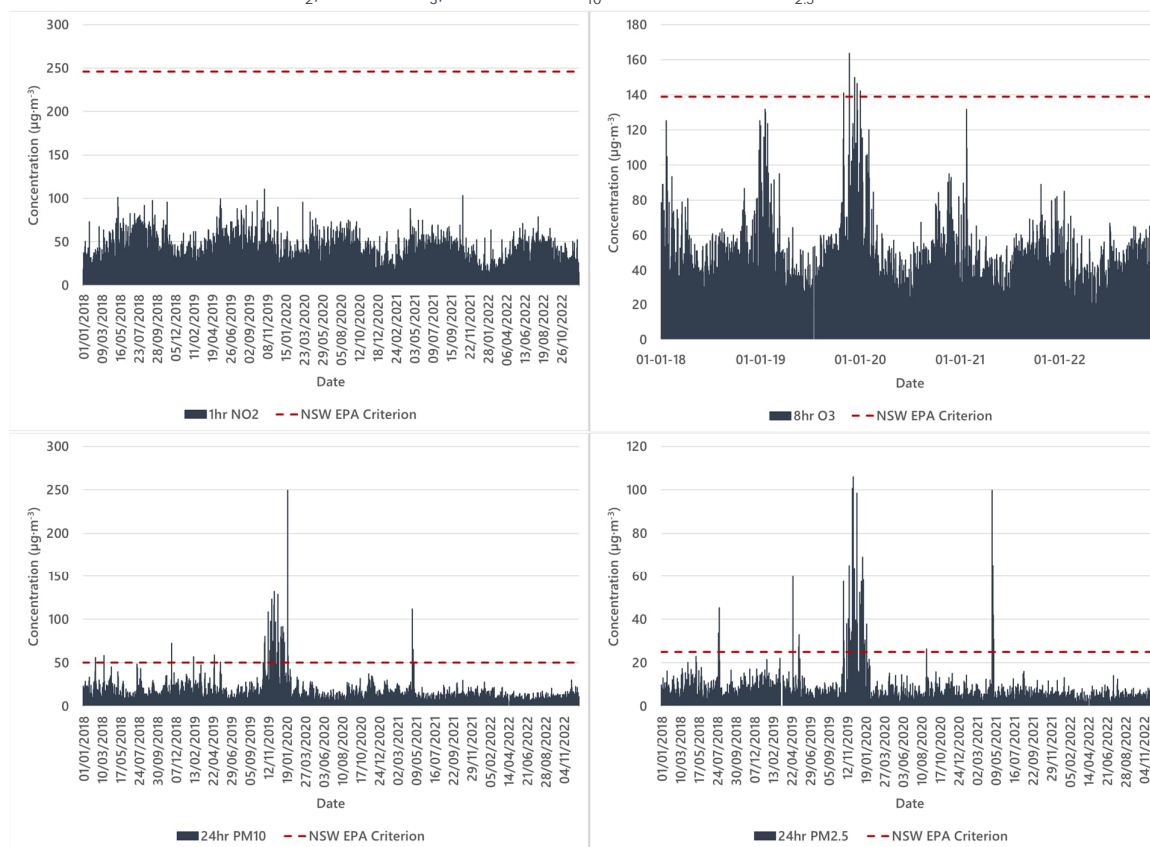
The time-series plots of measured concentrations of 1-hour NO<sub>2</sub>, 8-hour O<sub>3</sub>, 24-hour PM<sub>10</sub> and 24-hour PM<sub>2.5</sub> are provided in Figure 3.

Odour is not measured at the Campbelltown West AQMS, and is not measured routinely at any AQMS in NSW or Australia. Impacts associated with odour are required to be considered individually.

Table 3 Summary of background air quality monitoring data

Year	AQMS	Campbelltown West AQMS			
	Pollutant	NO <sub>2</sub>	O <sub>3</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
	Ave Period	1h	8h	24h	24h
	Units	µg·m <sup>-3</sup>	µg·m <sup>-3</sup>	µg·m <sup>-3</sup>	µg·m <sup>-3</sup>
	Criterion	164.0	139.0	50.0	25.0
All	Mean	17.2	31.4	16.5	7.7
	99%ile	63.9	95.1	73.6	45.4
	Max	110.9	163.7	249.7	106.0
2018	Mean	20.1	33.0	17.9	8.4
	99%ile	69.6	93.9	47.0	20.7
	Max	101.5	125.4	72.3	45.4
2019	Mean	20.1	33.8	22.3	11.8
	99%ile	69.6	116.1	111.8	69.8
	Max	110.9	163.7	132.0	106.0
2020	Mean	17.2	31.7	17.0	7.5
	99%ile	62.0	93.2	80.4	42.9
	Max	95.9	120.8	249.7	69.0
2021	Mean	15.1	29.5	13.8	6.3
	99%ile	56.4	80.5	34.5	30.1
	Max	103.4	131.8	111.9	99.9
2022	Mean	13.6	28.9	11.3	4.6
	99%ile	52.6	67.5	21.8	13.4
	Max	79.0	98.0	30.2	23.2

Figure 3 Time series plots of measured 1-hour  $\text{NO}_2$ , 8-hour  $\text{O}_3$ , 24-hour  $\text{PM}_{10}$  and 24-hour  $\text{PM}_{2.5}$

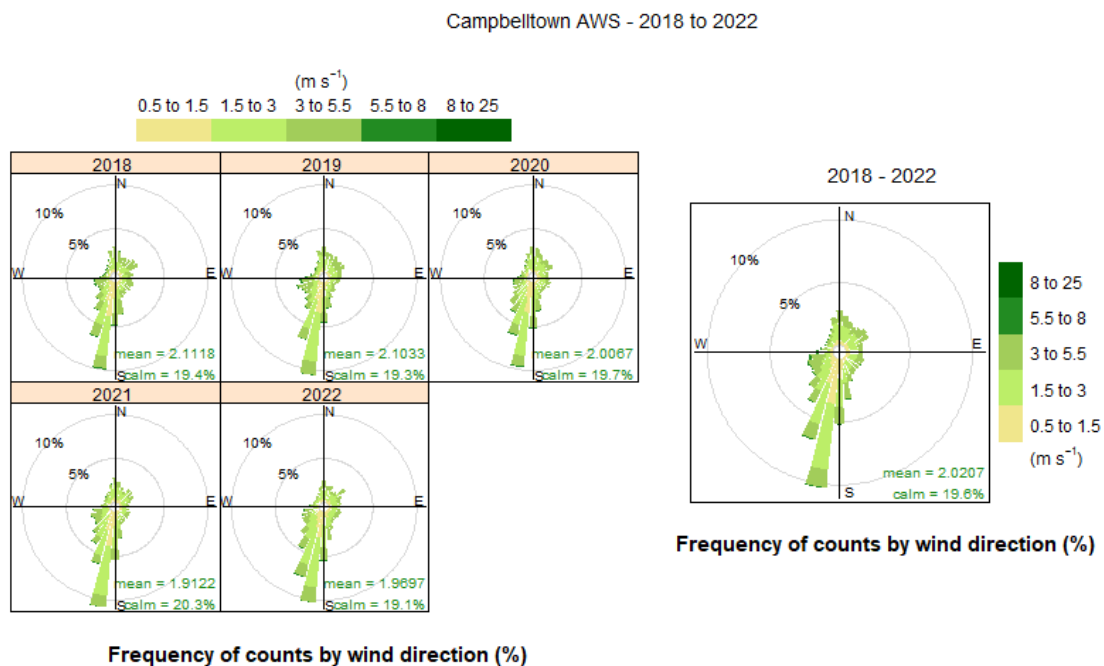


## 4.2. Meteorology

The meteorology experienced within an area can govern the generation (in the case of wind-dependent emission sources), dispersion, transport and eventual fate of pollutants in the atmosphere. The meteorological conditions surrounding the Proposal site have been characterised using data collected by the Australian Government Bureau of Meteorology (BoM) at a number of surrounding Automatic Weather Stations (AWS).

To adequately describe the prevailing meteorological conditions surrounding the Proposal site, measurements taken at the Campbelltown (Mount Annan) AWS, over a 5-year (2018-2022) period is provided as wind roses in Figure 4. The wind roses presented in Figure 4 indicate that from 2018 to 2022, winds at Campbelltown (Mount Annan) AWS show a predominant south south-westerly wind direction.

Figure 4 Wind roses 2018-2022, Campbelltown (Mount Annan) AWS



The majority of wind speeds experienced at Campbelltown (Mount Annan) AWS over the 5-year period 2018 to 2022 are generally in the range  $< 0.5$  metres per second ( $\text{m}\cdot\text{s}^{-1}$ ) to  $5.5 \text{ m}\cdot\text{s}^{-1}$  with the highest wind speeds (greater than  $8 \text{ m}\cdot\text{s}^{-1}$ ) occurring from westerly directions. Winds of this speed occur during less than 0.02 % of the observed hours over the 6-year period. Calm winds are more frequent, occurring on 19.6 % of observed hours.

## 5. METHODOLOGY

### 5.1. Overview

This assessment has been prepared to identify the potential risks or constraints associated with the development of the Proposal relating to air quality impacts.

The assessment of potential operational air quality risks is based on information provided at the time of the assessment for proposed future land uses on the Proposal site.

### 5.2. Construction Phase

Construction phase activities have the potential to generate short-term emissions of particulates. Generally, these are associated with uncontrolled (or 'fugitive') emissions and are typically experienced by neighbours as amenity impacts, such as dust deposition and visible dust plumes, rather than associated with health-related impacts. Localised engine-exhaust emissions from construction machinery and vehicles may also be experienced, but given the scale of the proposed works, fugitive dust emissions would have the greatest potential to give rise to downwind air quality impacts.

Modelling of dust from construction Proposals is generally not considered appropriate, as there is a lack of reliable emission factors from construction activities upon which to make predictive assessments, and the rates would vary significantly, depending upon local conditions.

Given that construction activities have not yet been determined, further assessment of the construction phase activities has not been undertaken for the Proposal. It is considered that any relevant mitigation measures to manage potential construction phase impacts would be outlined in a site-specific Construction Environmental Management Plan (CEMP) developed for the Proposal.

### 5.3. Operational Phase

This assessment has been prepared to address the potential air quality impacts / risks of the Proposal. The assessment of operational phase impacts / risks needs to account for:

- Air emissions from existing external sources (i.e. those not contained within the Proposal site) affecting sensitive land uses within the Proposal site;
- Air emissions from future (unknown) internal sources (i.e. those which may be contained within the Proposal site in the future) affecting sensitive land uses inside and outside of the Proposal site.

This has been performed using an assessment of published separation distances from existing or potential future sources to existing or future locations for sensitive land uses.

A review of the land uses and activities in the vicinity of the Proposal site was undertaken through a desktop mapping survey, online review of the relevant EPA Environment Protection Licence (EPL) register for facilities within proximity to the Proposal site and a search of relevant sources from the National Pollution Inventory (NPI) to determine potential sources of air (and odour) emissions within the vicinity of the Proposal site.

## 6. AIR POLLUTION EMISSION SOURCES

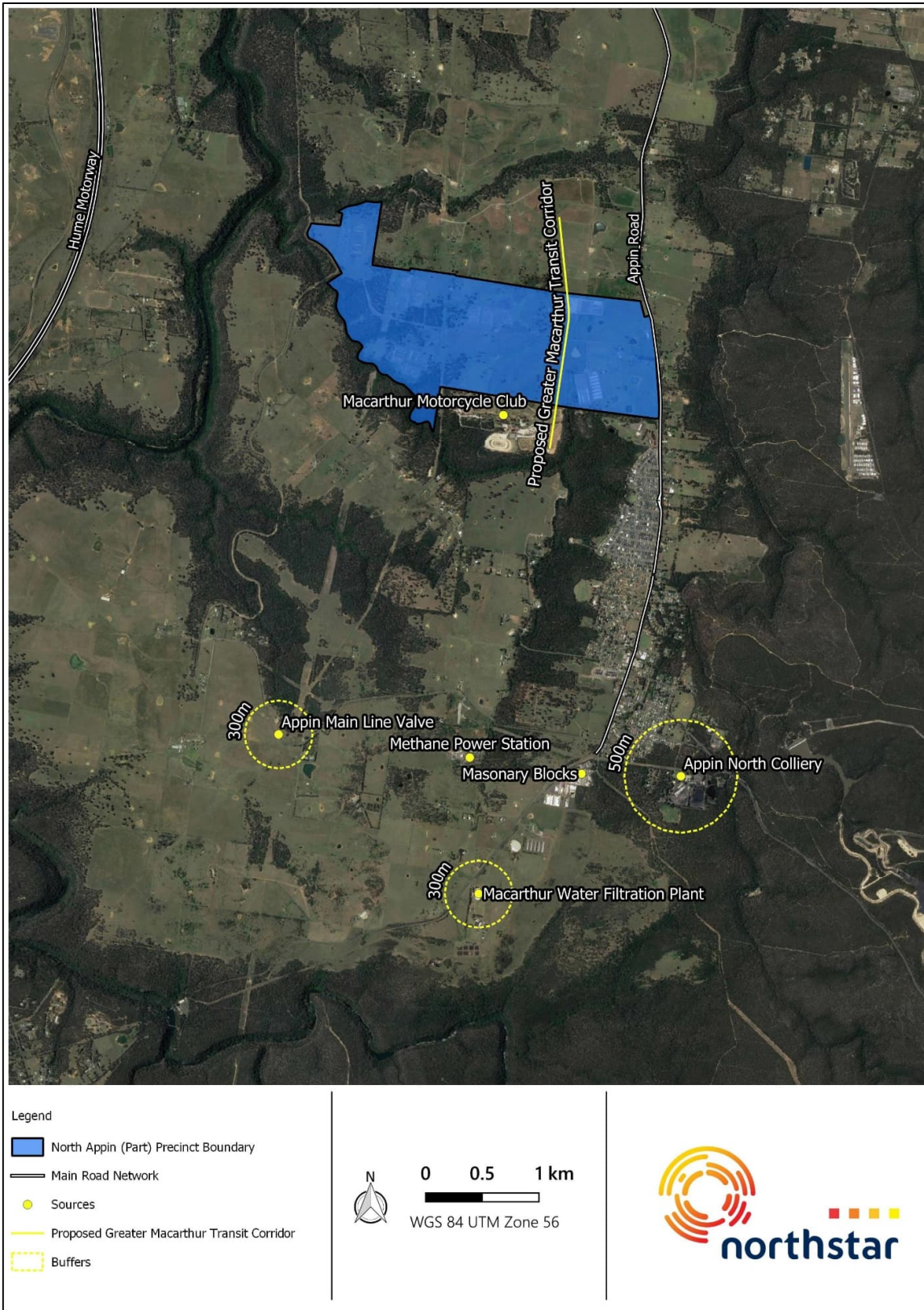
Through a review of identified sources of air and odour emission sources discussed in Section 5, those which may have the potential to impact upon air quality at the Proposal site have been identified as shown in Figure 5.

While the development types within the Proposal site are yet to be confirmed, it is assumed these would be typical of a populated suburban centre. As such, potential air emission sources from the future development would be expected to include kitchen exhaust outlets from cooking processes and emissions associated with road traffic, in line with a typical urban environment. Major sources of potential air pollutants, such as those resulting from industrial or manufacturing processes which may impact on receptors both within and outside of the Proposal site are considered unlikely.

As such, appropriate design in accordance with the relevant guidelines and Australian Standards would be appropriate to manage any potential impacts of these future sources of air emissions resulting from within the Proposal site.



Figure 5 Air quality sources and buffer distance



Source: Northstar

The following potential local air quality influences (see Table 4) have been identified around an approximate 5 km radius of the Proposal site, through either desktop mapping of the site and surrounds, and/or search results of the EPA EPL and NPI databases. The relevant buffer distances have been presented in Figure 5.

Table 4 Identified local air quality influences

Facility Name	Location	Category	Separation distance guidelines (m)	Approximate distance (m) from Proposal boundary	Main Pollutant of Concern
Appin Main Line Valve	Brooks Point Road, Appin	Gas distribution works	300 <sup>a</sup>	3 004 m south west	Odour
Appin Coal Seam Methane Power Station	Northampton Dale Road	Electricity generation	-	2 897 m south	VOCs, NO <sub>x</sub> , CO
Baines Masonry Blocks	900 Wilton Road, Appin	Concrete works	100 <sup>b</sup>	3 198 m south	Particulate matter
Macarthur Water Filtration Plant	550 Wilton Road, Wilton	Water filtration	300 <sup>c</sup>	4 108 m south	Odour
Appin North Colliery	Appin Road, Appin	Mining and extractive industry	50 <sup>a</sup>	3 170 m south east	Particulate matter
Hume Highway	Existing Hume Highway	Road traffic	100 <sup>d</sup>	2 460 m west	Particulate matter, NO <sub>x</sub>
Greater Macarthur Transit Corridor (proposed)	Parallel to Appin Road	Road traffic	100	Within Proposal site	Particulate matter, NO <sub>x</sub>

Notes: a) taken from Separation distance guidelines for air emissions, ACT Government  
b) taken from Recommended separation distances for industrial residual air emissions, EPA Victoria  
c) No specific distance provided for water filtration, therefore separation distance for sewage treatment works has been applied  
d) South Australia EPA 2019 *Evaluation distance for effective air quality and noise management*

Based on the separation distances outlined in Table 4, it has been determined that the Proposal site located outside of the recommended separation distance guidelines for each of the identified facilities with potential local air quality influences, with the exception of the proposed Greater Macarthur Transit Corridor.

It is noted the Macarthur Motorcycle Club is currently operating at the southern boundary of the Proposal site. While this type of facility is not classified as an activity under the separation distance guidelines, there is potential for dust impacts resulting from the use of motorcycles on the unpaved surfaces at the facility during operations. It is noted this a regulated track which operates intermittently for events and racing tournaments. While it is uncertain whether this would remain operational once the North Appin (part) Precinct is developed,

potential dust impacts during operation would likely be localised and managed along with other operational issues such as noise impacts whilst the track is being utilised.

Based on the above, it is not anticipated there are any existing operational sources identified which would adversely impact on the air quality and/or odour of the Proposal site.

According to the SA EPA (SA EPA, 2019), the recommended separation distance for sensitive receptors to a major road is 100 m, whilst the NSW DoP (NSW DoP, 2008) refer to air quality being a design consideration when development is to occur within 10 m to 20 m of a collector or main road. While the neighbourhood land uses adjacent to the proposed Greater Macarthur Transit Corridor are yet to be defined, appropriate separation from the roadway would be expected within the planning and design phase. Appropriate setback distances from the Transit Corridor would be included, in addition to a consideration of design measures to further ameliorate any potential air quality impacts, which would also be relevant to any identified acoustic issues. The requirements of the Child Care Centre Planning Guideline (see Section 3.5) would be required to be addressed during the selection of appropriate sites for that proposed use.

Given the above, it is anticipated that with appropriate land use planning and design consideration of appropriate regulatory standards and guidelines, potential air quality impacts resulting from the proposed Transit Corridor can be appropriately managed.

## 7. CONCLUSION

Northstar has been commissioned by IPG to prepare an air quality constraints and opportunities report for the proposed rezoning of a portion of land known as North Appin (part) Precinct, for the development of a new urban and mixed-use community.

This high-level review has been performed to identify and review potential constraints and opportunities associated with the proposed urban land use with respect to air quality and identify constraints from existing and proposed sources of emissions to air proximate to the proposed Proposal site.

A review was performed using assessment of published separation distances from existing or potential future sources to existing or future locations for sensitive land uses.

Based on the high-level assessment undertaken, it has been determined that the existing identified sources of air quality and odour will not form a significant constraint on the rezoning and proposed development of the Proposal site. The proposed Greater Macarthur Transit Corridor, if developed, will run through the Proposal site, adjacent to Appin Road, which may be located within the recommended separation distances for a major road to sensitive receptors. Whilst the neighbourhood land uses adjacent to the proposed Transit Corridor are not yet known, appropriate setback distances, in addition to consideration of design measures would ameliorate potential air quality impacts.

Given the above, it is anticipated that with appropriate land use planning and design consideration of appropriate regulatory standards and guidelines, potential air quality impacts resulting from the proposed Transit Corridor can be appropriately managed and will not form a significant constraint on the rezoning of the Proposal site.

## 8. REFERENCES

- ACT EPSDD. (2018). *Separation Distance Guidelines for Air Emissions, Environment, Planning and Sustainable Development Directorate*.
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- NSW EPA. (2022). *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*.