

EAGLE FARM PRECINCT

110 Links Ave South, 155 & 161 Fison Ave West, 364 Curtin Ave West

Air Quality & Noise Impact Assessment

Kingsmede

Date
19 November 2021

Report
217402.0109.R01V01

DOCUMENT CONTROL

Prepared by: Trinity Consultants Australia
 ABN 13 081 834 513
 A: Level 3, 43 Peel Street
 South Brisbane, QLD 4101
 T: +61 7 3255 3355
 E: brisbane@trinityconsultants.com

Reference	Date	Description	Prepared	Checked
217402.0109.R01V01	19/11/2021	Final Report	Bruno Coelho	Samuel Wong

Document Approval	
Approver Signature	
Name	Samuel Wong
Title	Environmental Manager

COPYRIGHT AND DISCLAIMERS

This report has been prepared by Trinity Consultants Australia Pty Ltd (TCA) ABN 13 081 834 513, with all reasonable skill, due care and diligence in accordance with TCA Quality Assurance Systems, based on ISO 9001:2015. This report and the copyright thereof are the property of TCA and must not be copied in whole or in part without the written permission of TCA.

This report takes account of the timescale, resources and information provided by the Client, and is based on the interpretation of data collected, which has been accepted in good faith as being complete, accurate and valid.

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

This report has been produced specifically for the Client and project nominated herein and must not be used or retained for any other purpose. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from TCA.

CONTENTS

1.	Introduction	1
1.1	Scope of Study	1
1.2	Study Area Description	2
1.3	Proposed Development	4
2.	Northshore Hamilton PDA Requirements	6
3.	Industrial Site Survey	8
3.1	Overview	8
3.2	Review Approach	8
3.3	Unstructured Interviews	10
3.4	Industrial Site Survey Outcome	10
3.5	Review of Separation Distances	14
3.6	Off-site Sensitive Uses	15
4.	Air Quality Assessment	16
4.1	Overview	16
4.1.1	Brisbane City Council Asphalt Plant	16
4.1.2	Boral Asphalt Whinstanes	18
4.1.3	Holcim Concrete Supplies	19
4.2	Discussion	19
4.3	Potential Impacts from On-Site Uses	20
5.	Industrial Amenity Noise Assessment	21
5.1	Overview	21
5.2	Noise Monitoring Survey	21
5.2.1	Noise Monitoring Methodology	22
5.2.2	Noise Monitoring Results	25
5.3	Discussion	28
6.	Airport Operation Considerations	29
7.	Conclusions and Recommendations	31

APPENDICES

APPENDIX A: Glossary

FIGURES

Figure 1.1	Scope of Study	1
Figure 1.2	Site Location	2
Figure 1.3	Road Access to Site Location (Rothe Lowman Property Pty. Ltd., 2021)	3
Figure 1.4	Norhshore Hamilton Development Area (PDA, Queensland Government, 2021) ¹	3
Figure 1.5	Proposed Development Masterplan Concept Approach (Rothe Lowman Property Pty. Ltd., 2021)	5
Figure 2.1	Fuel Storage Facilities Separate Distance to Site Location (Urban Land Development Authority, 2009 ²)	7

Figure 2.2	Asphalt and Concrete Batching Plants Separate Distance to Site Location (Urban Land Development Authority, 2009 ²)	7
Figure 3.1	Separation Distance from the Site and Surrounding Area	9
Figure 3.2	500 Meter Buffer	9
Figure 3.3	Industries identified surrounding the proposed development site	11
Figure 3.4	Front view of industries identified surrounding the proposed development: BCC Asphalt & Aggregates; b) Boral Asphalt; c) Boral Concrete; d) Holcim Concrete; e) SunPork Fresh Foods; f) CQ Diesel Fitting; g) JLG Industries; h) BP Whinstanes Terminals.....	12
Figure 3.5	Interviews taken on-site and off-site the proposed development	13
Figure 3.6	Separation distances from industry boundaries to proposed development	14
Figure 4.1	Separation Distance from the Boral Asphalt Boundary and from the Asphalt Mixing Machine to the Proposed Development Site	18
Figure 4.2	Separation Distance from the Holcim Concrete Boundary and from the Concrete Batching Machine to the Proposed Development Site	19
Figure 5.1	Environmental Noise Monitoring Sample Points	21
Figure 5.2	Sample Point #1	22
Figure 5.3	Sample Point #2	23
Figure 5.4	Sample Point #3	23
Figure 5.5	Sample Point #4	24
Figure 5.6	Sample Point #5	24
Figure 5.7	Noise sources identified during monitoring.....	27
Figure 5.8	Heavy Machinery Operating Near the Northwest Boundary of the Site:	27
Figure 5.9	Aircraft Noted During Noise Monitoring Measurements.	28
Figure 6.1	Site Location and Brisbane Airport ANEF Contours.....	29

TABLES

Table 3.1: Industries identified during the attended site visit	10
Table 3.2: Public Register of Environmental Authorities (DES, 2021)	11
Table 3.3: Actual Separation Distance and Minimum Separation Distance Concerning the Proposed Development Site to the Surrounding Industries.	15
Table 4.1: Pollution Control Devices (NPI, 2021).	17
Table 4.2: Pollution Control Devices (NPI, 2021)	18
Table 5.1: Weather Observations from Brisbane Airport Weather Station (BOM, 2021).	25
Table 5.2: Attended Noise Measurement Results.	26
Table 6.1: Building site acceptability based on ANEF zones (Table 2.1, AS 2021:2015).	29

1. INTRODUCTION

Trinity Consultants Australia (T/A Air Noise Environment) was commissioned by Kingsmede to provide air quality and environmental noise consultancy services for the Eagle Farm Precinct Development proposed for Lot 654 on SL2281, Lot 655 on SL4010, Lot 836 on SL8236, and Lot 724 on SL8236 at 110 Links Ave South, 155 & 161 Fison Ave West, and 364 Curtin Ave West, Eagle Farm QLD 4009.

The proposed development consists of an industrial and commercial uses, and is located within an existing industrial area, also within the Northshore Hamilton Priority Development Area (PDA). The air quality and environmental noise impact assessment was undertaken to identify the potential influence of surrounding pre-existing industries and activities on the proposed development. In addition, the potential impacts from proposed industrial uses on site onto off-site sensitive receivers has also been considered.

To aid in the understanding of the terms in this report a glossary is included in **Appendix A**.

1.1 Scope of Study

The scope of this study includes the description of the area and the requirements of the Northshore Hamilton Development Area (PDA) to receive the proposed development. As the proposed development is compatible with the PDA purposes, an industrial site survey was undertaken including the identification of pre-existing industries and activities surrounding the proposed development site, and review of the separation distance, verifying compliance and potential impacts from the development. Based on this survey, an assessment of potential air and noise impact assessment was conducted. The air quality impact assessment consists of the description of the identified industrial operations. The environmental noise impact assessment consists of monitoring the noise and site survey. Conclusions and recommendations were made and a final report was generated, as shown in **Figure 1.1**.

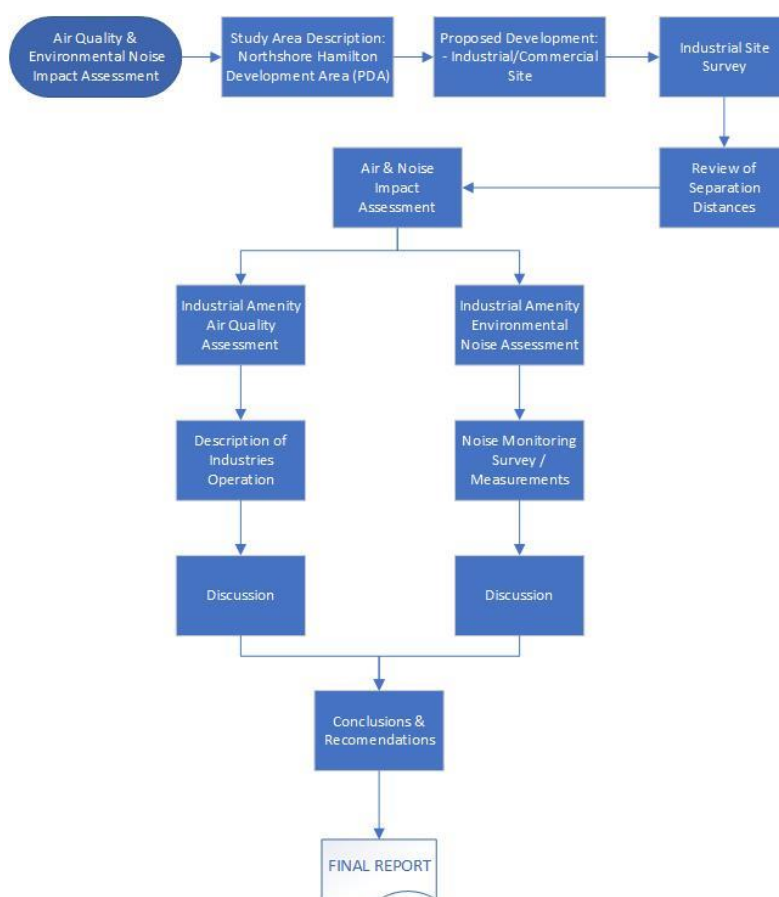


Figure 1.1 Scope of Study

1.2 Study Area Description

The proposed development is to be located at 110 Links Ave South, 155 & 161 Fison Ave West, and 364 Curtin Ave West, Eagle Farm QLD 4009. The site location is shown in **Figure 1.2**. The site occupies the following lots: Lot 724 & Lot 836 on SL8236; Lot 655 on SL4010; and Lot 654 on SL2281.

The site can be accessed, by road, driving through the Gateway Motorway, or from Brisbane Airport, and Kingsford Smith Drive, directly through Fison Avenue. **Figure 1.3** illustrates the road access map (drawing by Rothe Lowman Property Pty. Ltd., Project Vision, August 2021).

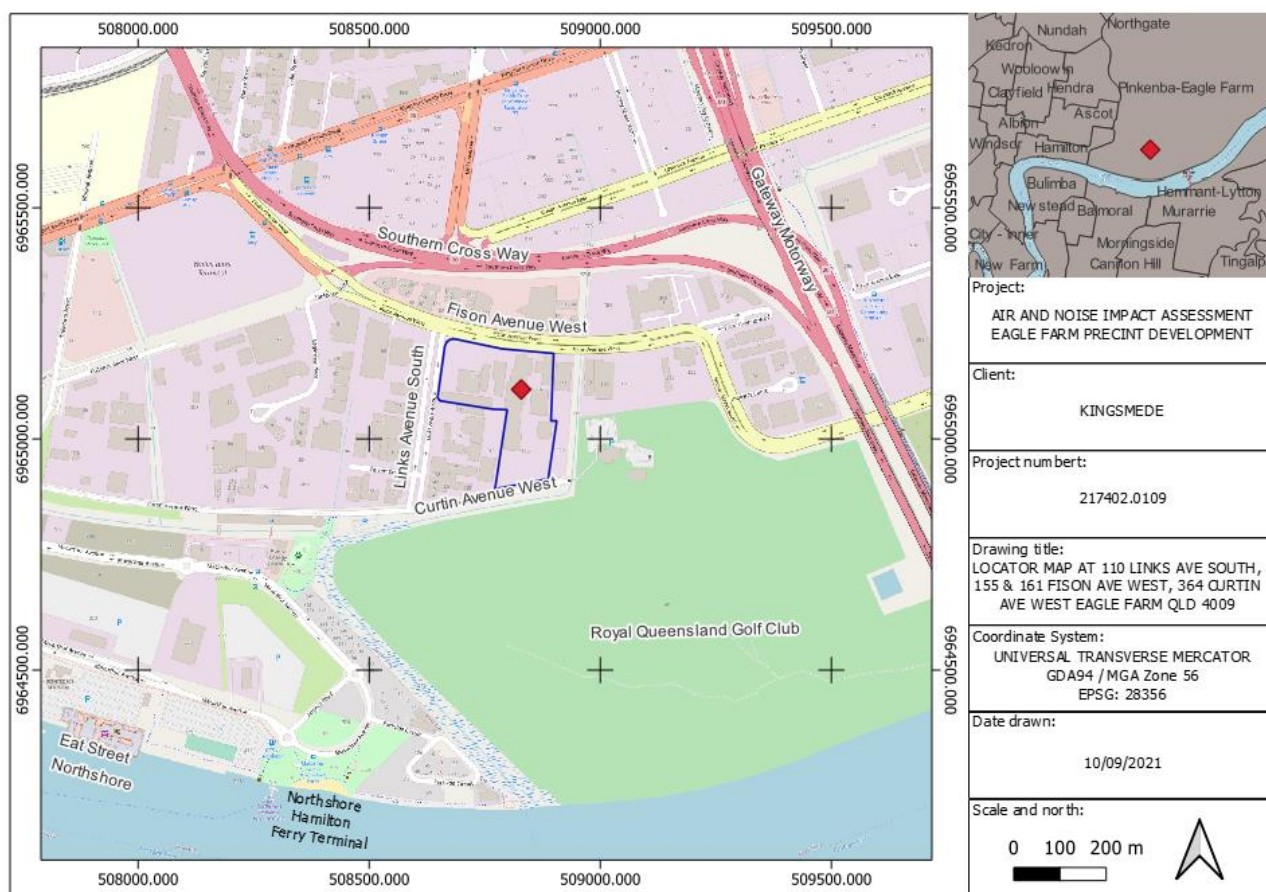


Figure 1.2 Site Location

The site is currently occupied by tenants associated with a broad range of industrial sites. The proposed development seeks to enhance the current use through the creation of modern facilities and amenities. The site is located within the Northshore Hamilton Development Area (PDA), within the Business Enterprise Park Precinct. According to Queensland Government¹, the PDA is a large urban renewal area that is being transformed into a vibrant, mixed-use precinct adjoining the Brisbane River and the suburb of Hamilton. It covers 304 hectares, has over three kilometres of river frontage, and is close to the Brisbane Airport and the Australian Trade Coast precinct. The PDA was declared on 27 March 2008, and it is illustrated in **Figure 1.44**.

¹ QUEENSLAND GOVERNMENT, 2021. **Northshore Hamilton**. Website: <<https://www.statedevelopment.qld.gov.au/economic-development-qld/priority-development-areas-and-projects/priority-development-areas/northshore-hamilton>>. Accessed in: 23/09/2021.

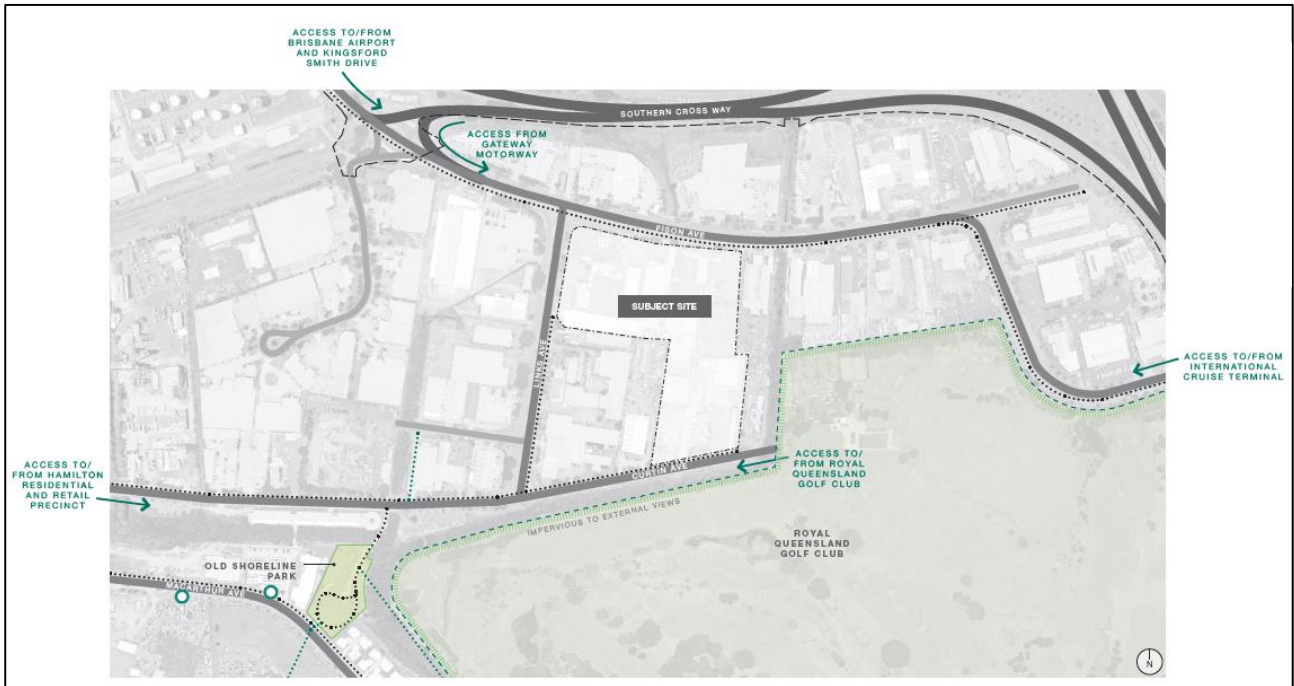


Figure 1.3 Road Access to Site Location (Rothe Lowman Property Pty. Ltd., 2021)



Figure 1.4 Northshore Hamilton Development Area (PDA, Queensland Government, 2021)¹

1.3 Proposed Development

The Eagle Farm Precinct includes the following components:

- 05 Buildings totaling 15,383 m²
- Communal area (1,797 m²)
- Indoor Sport and Recreation (Open Space and Wellness)
- Medium Industrial Area
- Large Industrial Area
- Logistics Warehouse
- Amenities (Commercial and Entertainment)
- Food and Beverage (cafe)
- 214 Carpark Spots

With regards to the sensitivity of the development site to air quality and noise impacts from off-site industrial uses, it is noted that there are no sensitive uses when considering the typical definition which includes residential uses, child care or medical centre. The site is proposed to incorporate its own industrial activities, which would be supported by on-site recreational uses primarily designed for workers (i.e. recreational building and outdoor areas).

The proposed building plans are illustrated in **Figure 1.5**. Recreational uses include a central communal/wellness area (including swimming pool and cafe), and an indoor sport/recreation building in the north-eastern corner of the site.

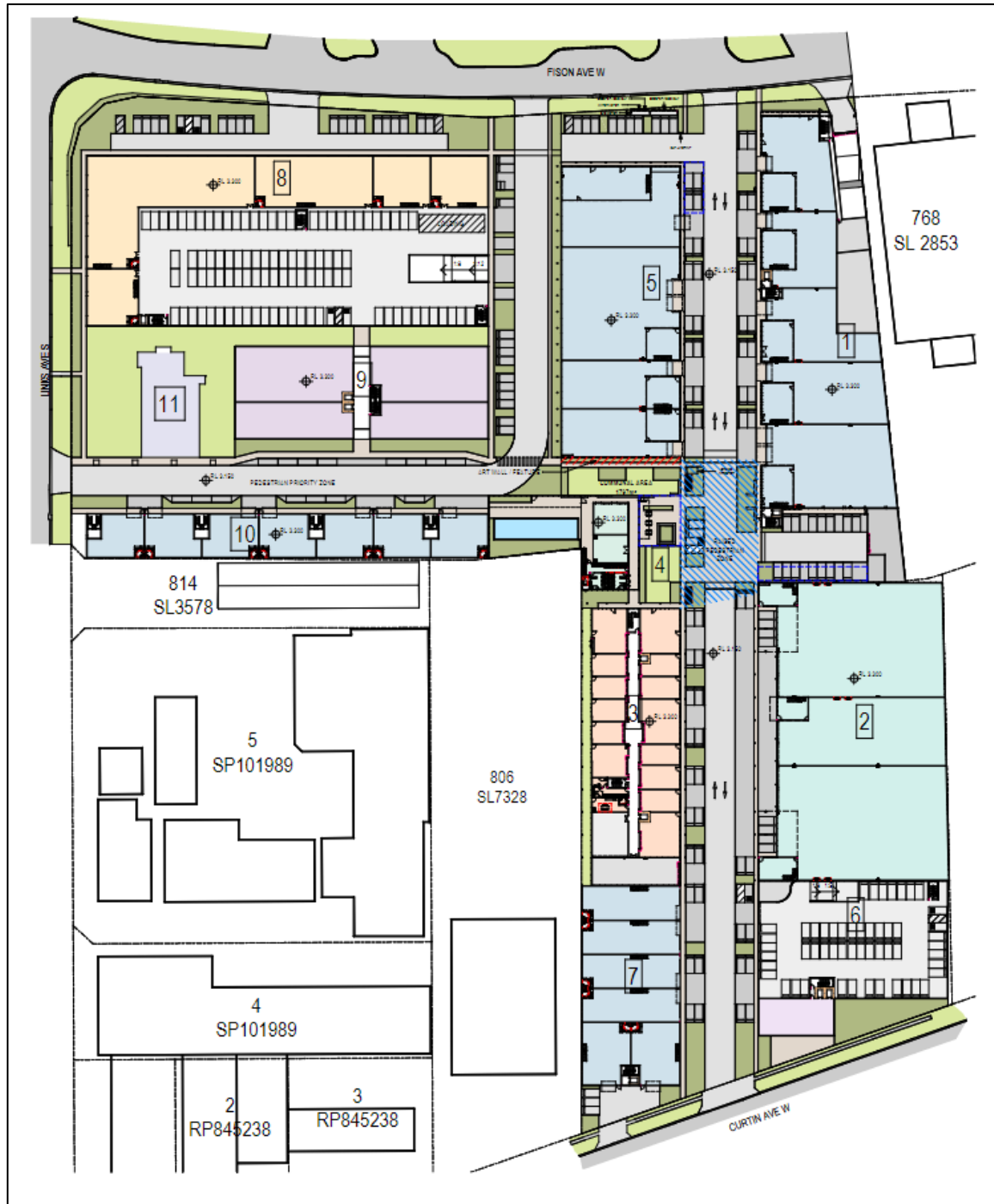


Figure 1.5 Proposed Development Site Plan - Ground (Rothe Lowman Property Pty. Ltd., drawing no. TP00.50 P4, 2021)

2. NORTHSHORE HAMILTON PDA REQUIREMENTS

The Urban Land Development Authority (2009)² provides general noise and general air quality requirements for proposed developments within the Northshore Hamilton PDA. Development should also give consideration to activities from airport operations. The PDA requirements are copied below from Section 3.9 of the Northshore Hamilton PDA:

General air quality

Development will limit exposure and risk associated with pollutants that could have a potentially adverse affect on human health.

Development for industrial uses will be in accordance with best practice air quality guidelines and standards¹³.

General noise requirements

The design, siting and layout of development must address noise impacts and where necessary incorporate appropriate noise mitigation measures.

Development achieves acceptable noise levels for noise sensitive uses in affected areas.

An acoustic report will be required to evaluate and address potential noise impacts and recommend appropriate noise mitigation measures.

Safety and risk

The following existing activities have the potential to adversely impact development. These activities and their impact areas are:

fuel storage facilities (Map 8)

asphalt and concrete batching plants (Map 9)

chrome plating facility (Map 10)

marine industry activities (Map 11)

aircraft operations⁹.

Development within the impact areas for the listed activities must demonstrate how the development will not be adversely affected by the potential environmental impacts associated with the above mentioned ongoing activities.

The general air quality requirements refer to Brisbane City Council's Air Quality Planning Scheme Policy and the Queensland EPA Guidelines on Odour Impact Assessment from Developments. The general noise requirements refer to *Environmental Protection (Noise) Policy 2008* (more recently updated in 2019).

Northshore Hamilton Urban Development Scheme (Queensland Government, 2009¹) presents the impact area for the fuel storage facilities (BP Whinstanes Terminal - **Figure 2.1**) and the asphalt and concrete batching plants located westerly (BCC Asphalt & Aggregates, and Boral Asphalt & Concrete Plants) from the proposed development site (**Figure 2.2**). Based on the details of the planning scheme presented above and associated maps, the assessment must give consideration to the asphalt and concrete batching plants.

With regards to aircraft operations, the planning scheme requires that these should be considered when a development is within the areas identified in the Brisbane Airport Corporation Masterplan. This is discussed further in **Section 6**. **Section 3** to **Section 5** discuss industrial air and noise impacts in further detail.

² URBAN LAND DEVELOPMENT AUTHORITY. 2009. **Northshore Hamilton Urban Development Area: Development Scheme**. Queensland Government. Available at: < https://www.statedevelopment.qld.gov.au/__data/assets/pdf_file/0017/12914/northshore-hamilton-development-scheme.pdf>. Accessed in: 23/09/2021.

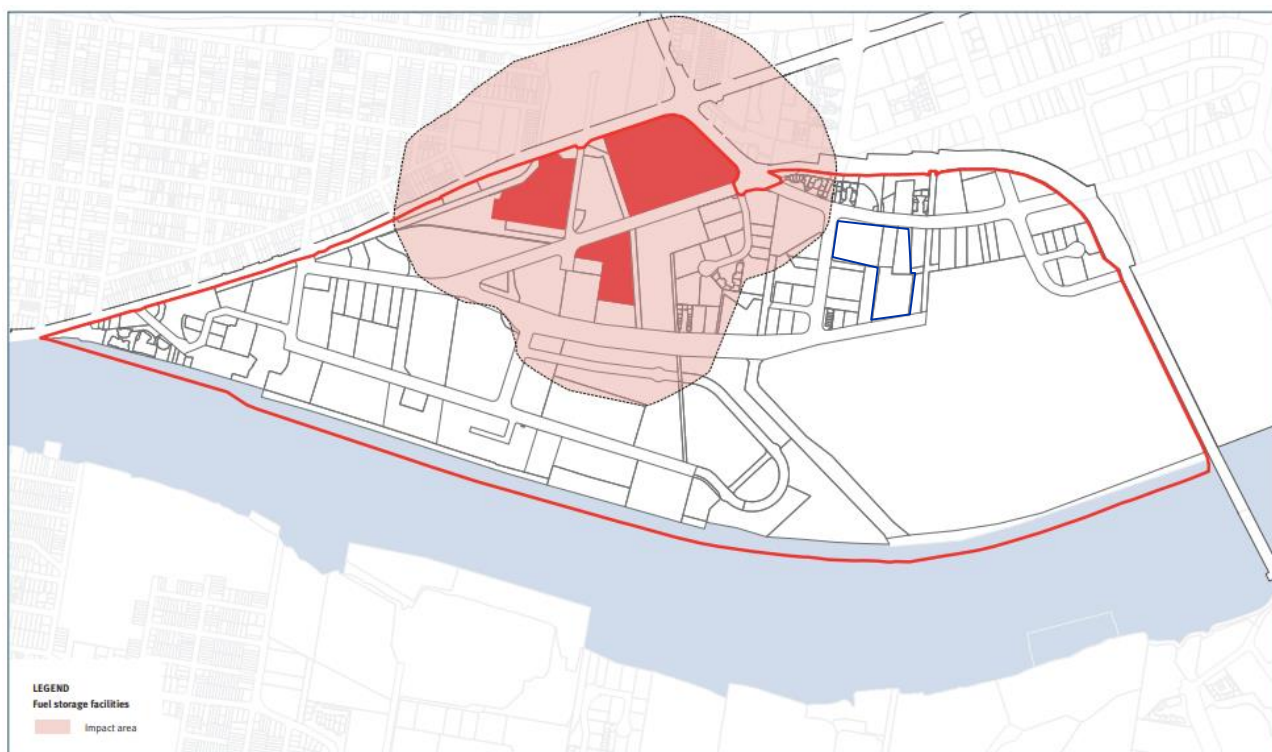


Figure 2.1 Fuel Storage Facilities Separate Distance to Site Location (Urban Land Development Authority, 2009²)



Figure 2.2 Asphalt and Concrete Batching Plants Separate Distance to Site Location (Urban Land Development Authority, 2009²)

3. INDUSTRIAL SITE SURVEY

3.1 Overview

As noted above, the Northshore Hamilton PDA Planning Scheme triggers a requirement for consideration impacts from nearby concrete batching and asphalt plants. Furthermore, an industrial site survey was performed giving consideration to typical setback distances defined in the Brisbane City Plan 2014³ as a guide. This is to ensure that there are no other industries that could have an impact on the site.

Following the evaluation of the industrial site survey, the operation of industries surrounding the proposed development site was identified during a site visit on 13th September 2021. The staff assessed the vicinity of the proposed development's site including visiting the industries with a potential to impact on air quality and sound levels and also included an unstructured interview with the operators of the relevant industrial sites with regards to operational details.

During the site visit, the background noise level was measured at the proposed development site to establish existing noise levels at the site and to identify noise sources.

The Environmental Authorities of the industries identified during the site visit were reviewed, as obtained from the Department of Environment and Science (DES) website, Queensland Government (<https://apps.des.qld.gov.au/public-register/search/ea.php>).

The National Pollutant Inventory (NPI) was accessed to identify relevant air emissions that potentially impact the ambient concentrations on the proposed development site.

3.2 Review Approach

In identifying potential air and noise sources from local industry, consideration was given to a 500 metres setback distance as a guide. The 500 m buffer distance around the site is illustrated in **Figure 3.1**. The surrounding area was analysed as shown in **Figure 3.2**.

The proposed development is located within the Northshore Hamilton Urban Development Area (Priority Development Area – PDA) under the Economic Development Act 2012. The site is located within a Medium Impact Employment Zone, according to the Northshore Hamilton Urban Development Scheme. The land use at the north of the Southern Cross, within the 500 metres buffer zone, is situated in an industrial area. The south area is situated within a Civic and Open Space Zone where the Royal Queensland Golf Club operates. The southwest area is situated in a Mixed Use Zone and Residential High Intensity Zone. The Medium Impact Employment Zone covers the east-west areas within the 500 metres buffer zone.

³ BRISBANE CITY PLAN 2014. 2021. **Part 8 Overlays / 8.2 Overlay codes / 8.2.13 Industrial Amenity Overlay Code**. Website: <https://cityplan.brisbane.qld.gov.au/epan/#Rules/0/151/1/0/0>. Accessed in: 23/09/2021.



Figure 3.1 Separation Distance from the Site and Surrounding Area



Figure 3.2 500 Metre Buffer

3.3 Unstructured Interviews

Industry operators were interviewed during the site survey, both with existing tenants at the proposed site development with the purpose to understand impacts from the surrounding industries/activities affecting on-site activities, and with the surrounding industrial operators to obtain information about their operations with respect to air quality and environmental noise emissions that might impact on the proposed development.

3.4 Industrial Site Survey Outcome

The main industries identified during the site visit with the potential to impact the proposed development are listed in **Table 3.1**. The address, the proposed use, and status and working hours were obtained by searching on the internet. The industries identified during the site audit are illustrated in **Figure 3.3** and **Figure 3.4**.

An online search at the Department of Environment and Science's public register was undertaken on 15th September 2021 and produced the information summarised in **Table 3.2**.

Table 3.1: Industries identified during the attended site visit

Industry	Address	Use	Status / Working Hours
a) Brisbane City Council Asphalt Plant	260 Curtin Avenue West, Eagle Farm, QLD 4009	Asphalt manufacturing	Operating Mon. – Sun. / 24 hours
b) Boral Asphalt Whinstanes	202 Cullen Avenue West, Whinstanes, QLD 4007	Asphalt manufacturing	Operating Mon. – Fri. / 8am – 4pm
c) Boral Concrete Whinstanes	208 Curtin Avenue West, Whinstanes QLD 4009	Concrete Batching Plant	Operating Mon. – Fri. / 5:30am – 4:45pm Sat. / 5:30am – 12:00pm
d) Holcim Australia	184 Fison Avenue West, Eagle Farm, QLD 4009	Concrete Batching Plant	Operating Mon. – Sun. / 24 hours
e) SunPork Fresh Foods	128 Fison Avenue West, Eagle Farm, QLD 4009	Refrigerated Food	Operating Mon. – Fri. / 6am – 4pm
f) CQ Diesel Fitting	87 Links Avenue South, Eagle Farm, QLD 4009	Mechanic Workshop	Operating Mon. – Fri. / 7am – 5pm
g) JLG Industries	23 Fison Avenue West, Eagle Farm QLD 4009	Equipment supplier / Spray Booth	Operating Mon. – Fri. / 7:30am – 5pm
h) Whinstanes Terminal	701 Kingsford Smith Drive, Eagle Farm, QLD 4009	Fuel Tankage / Terminal	Operating Mon. – Sun. / 24 hours

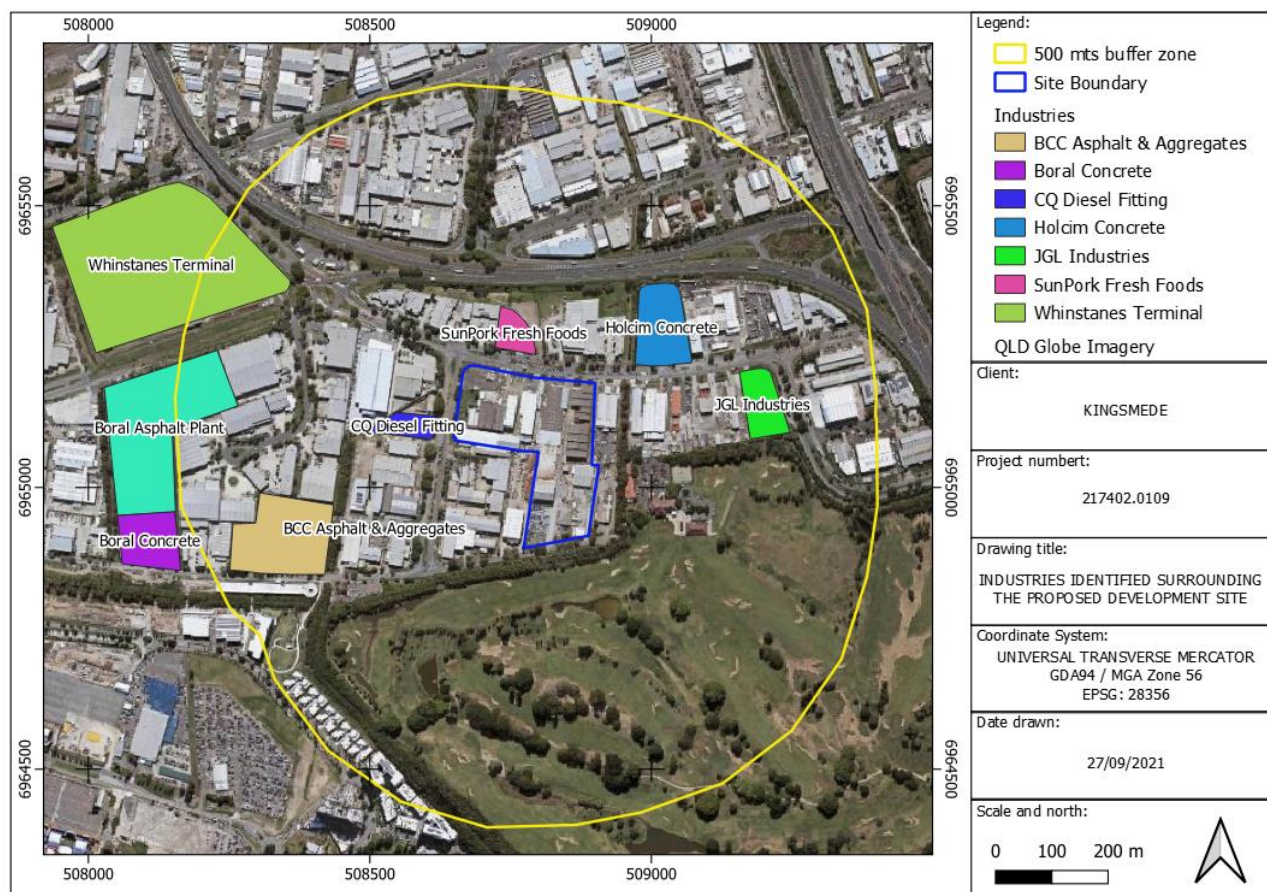


Figure 3.3 Industries identified surrounding the proposed development site

Table 3.2: Public Register of Environmental Authorities (DES, 2021)

Industry / Registered Activity/ies	Permit Number / Issue Date	Conditions to be overviewed
Brisbane City Council / ERA 6 Asphalt manufacturing Threshold (b) – manufacturing in a year 1,000t or more of asphalt.	Certificate of Registration ENRE00645007 31/10/2003	
Brisbane City Council / ERA 59 Asphalt manufacturing – manufacturing asphalt ERA 17 – Fuel burning – any process involving the use of fuel burning equipment (including, for example, a standby power generator) that is capable of burning (whether alone or in total) 500 kg or more of fuel an hour.	Amended Development Approval EPA Permit number: ENDC00628708 26/02/2007	Schedule B – Air Schedule F - Noise



Figure 3.4 Front view of industries identified surrounding the proposed development: BCC Asphalt & Aggregates; b) Boral Asphalt; c) Boral Concrete; d) Holcim Concrete; e) SunPork Fresh Foods; f) CQ Diesel Fitting; g) JLG Industries; h) BP Whinstanes Terminals

The interviews were taken with 12 off-site industry operators and eight (08) on-site industry operators (**Figure 3.5**). The interviews with the off-site industry operators were important to obtain information about their operations, and air quality and environmental noises aspects that might impact the proposed development. The interviews with on-site industry operators were primarily to obtain authorisation to access the site and measure the noise and to ask about complaints related to off-site air quality or noise impacts.



Figure 3.5 Interviews taken on-site and off-site the proposed development

3.5 Review of Separation Distances

The separation distances from the industries identified surrounding the proposed development site are illustrated in **Figure 3.6**.

Concerning the fuel storage facilities, the proposed development site is located outside the Northshore Hamilton PDA impact area (see **Figure 2.1**), and in relation to the western asphalt and concrete batching plants, the western boundary of the site is located within the impact area for all development, while the eastern side is located within the impact area for all development above 40 metres Australian Height Datum (AHD) (see **Figure 2.2**).

In conclusion, seven (07) industries were identified as being within the considered setback distances (using the Brisbane City Plan 2014 distances as a guide). After further consideration of the separation distances and based on site observations, three (03) industries have potential impacts regards air quality and two (02) have potential impacts pertain to environmental noise, as shown in **Table 3.3**.

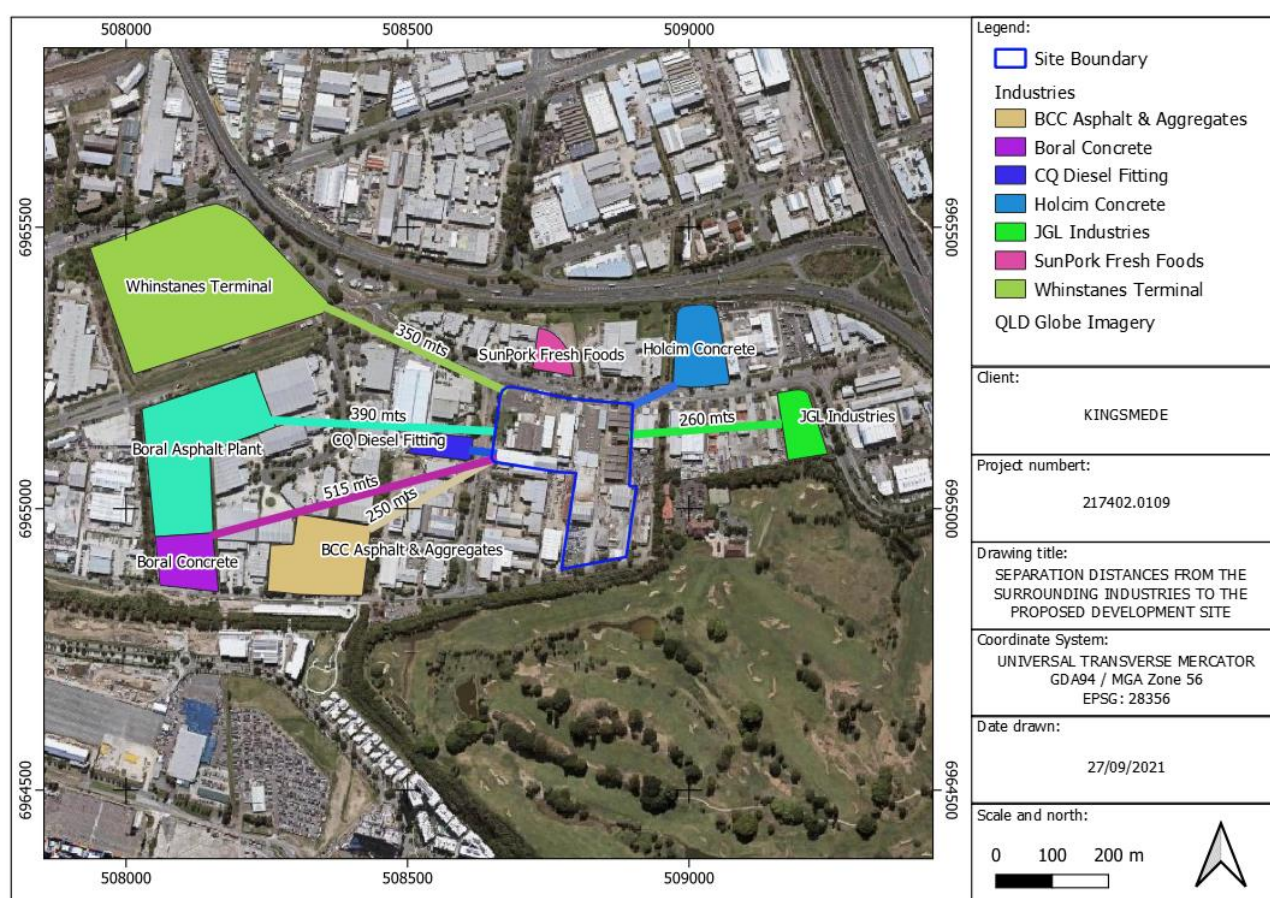


Figure 3.6 Separation distances from industry boundaries to proposed development

Table 3.3: Actual Separation Distance and Minimum Separation Distance Concerning the Proposed Development Site to the Surrounding Industries.

Industry	Actual Separation Distance to Boundary	Industry Category	Minimum Separation Distance	Further Investigation?	Potential Impact
Brisbane City Council Asphalt Plant	250 m	High Impact	500 m	Yes	Air
Boral Asphalt Whinstanes	390 m	High Impact	500 m	Yes	Air
Boral Concrete Whinstanes	515 m	High Impact	500 m	No	-
Holcim Australia	80 m	High Impact	500 m	Yes	Air
SunPork Fresh Foods	45 m	Low Impact	150 m	Yes	Noise
CQ Diesel Fitting	40 m	Low Impact	150 m	Yes	Noise
JLG Industries	260 m	Medium Impact	250 m	No	-
Whinstanes Terminal	350 m	High Impact	500 m	No	-

3.6 Off-site Sensitive Uses

The industrial site survey did not identify any sensitive uses such as residential areas within 500 meters buffer zone around the proposed development site boundary. It is noted that the Royal Queensland Golf Club existing south and south-east of the site. The separation distance from the nearest site boundary to the golf course boundary is 40 metres.

4. AIR QUALITY ASSESSMENT

4.1 Overview

The following sections present details of the air quality assessment conducted for the proposed development considering off-site emissions sources. As discussed in the previous section and summarised in Table 3.3, the following industries have been reviewed further with respect to air:

- BCC Asphalt Plant
- Boral Asphalt Plant
- Holcim Concrete

The methodology was based on the outcomes of the land use survey conducted on 13th September 2021, detailed above in the previous sections of this report. The developments identified during the site visit and their potential air emissions sources are described below.

4.1.1 Brisbane City Council Asphalt Plant

The Brisbane City Council Asphalt Plant is situated at 260 Curtin Avenue West, Eagle Farm QLD 4009, approximately 250 meters from the proposed development site, and have been operating since 2001. According to the Environmental Authority ENRE00645007 and ENDC00628707, the main activity is asphalt manufacturing, producing more than 1,000t in a year, involving fuel burning equipment that is capable of burning 500 kg or more of fuel an hour (including, for example, a standby power generator). The EPA Permit number ENDC0628707 includes a specific condition for air quality criteria, Schedule B – Air, as follows below:

Schedule B - Air

Release of Contaminants to the Atmosphere

- (B1) The release of contaminants to the atmosphere from a point source must only occur from a point source which is identified in the application for approval, or listed in table 1 of the air schedule.
- (B2) Contaminants resulting from the operation of the sources described in table 1 of the air schedule must only be released to the atmosphere from those release points specified in table 1 of the air schedule.
- (B3) Contaminants released from each release point specified in table 1 of the air schedule must be directed vertically upwards without any impedence or hindrance.
- (B4) Contaminants must be released to the atmosphere from a release point at a height not less than the corresponding height stated for that release point in table 1 of the air schedule.
- (B5) Contaminants must not be released to the atmosphere from a release point at a concentration, as measured at a monitoring point specified in schedule H, in excess of that stated in table 2 of the air schedule.

Schedule B - Table 1

RELEASE POINT NUMBER	SOURCE DESCRIPTION	MINIMUM RELEASE HEIGHT (metres)	MINIMUM EFFLUX VELOCITY (metres/second)
A1	ROTARY DRUM MIXER STACK	27.3	14 (at maximum production capacity)
A2	HEATER No. 1 STACK	4	Not specified
A3	HEATER No. 2 STACK	4	Not specified

Schedule B - Table 2

RELEASE POINT NUMBER	CONTAMINANT	RELEASE LIMIT	RELEASE LIMIT UNITS
A1	CO	1.0	g / m ³
	SO ₂	0.1	g / m ³
	H ₂ S	0.005	g / m ³
	NO _x	0.35	g / m ³
	Particulates	0.05	g / m ³

Fuel Burning

- (B6) The only fuel which is to be used in industrial fuel burning equipment is natural gas.

Fabric Filter Dust Collector (FFDC)

- (B7) All contaminants arising from the operation of the asphalt plant's rotary drum mixer and the filler silos must be treated in a fabric filter dust collector prior to release to the atmosphere at release point A1.
- (B8) An electrical interlock must prevent the filling of either of the filler silos unless Fabric Filter Dust Collector fan is operating.
- (B9) Except for the production of "Precoated Aggregate" the fabric filter dust collector serving the rotary drum mixer must operate at all times when the rotary drum mixer is in use.
- (B10) Except as provided by condition B9, an electrical interlock must prevent the operation of the rotary drum mixer unless the Fabric Filter Dust Collector fan is operating.
- (B11) A device which is capable of detecting filter medium breakthrough must be installed in the outlet of the Fabric Filter Dust Collector.
- (B12) An audible and visual two stage alarm system must warn the operator-in-charge of the Fabric Filter Dust Collector serving the rotary drum mixer of the possibility that filter medium breakthrough has occurred.
- (B13) An electrical interlock must commence the safe shut down of the rotary drum mixer served by the Fabric Filter Dust Collector not more than one (1) minute after activation of the "high-high" alarm.
- (B14) Replacement bags for all Fabric Filter Dust Collectors must be held on site at all times.
- (B15) In the event that any replacement bags for the Fabric Filter Dust Collectors are utilised then the stockpile of replacement bags must be replenished to the required quantity as soon as practicable.
- (B16) All collected material removed from the Fabric Filter Dust Collector must be removed and disposed of in a manner that will not cause the release of contaminants to the atmosphere or to waters.

Dust Control

- (B17) For the purpose of avoiding any release of dust or particulate matter from the approved place which could cause an environmental nuisance, the following measures must be taken:
- (i) stockpiles must be maintained using all reasonable and practicable measures to minimise the release of wind blown dust or particulate matter to the atmosphere. Reasonable and practicable measures may include, but are not limited to, anemometer switching systems which trigger operation of effective water spray systems during winds likely to generate such releases; use of approved dust suppressants; shielding and storage in bunkers; and revegetation of disturbed areas; and
 - (ii) trafficable areas must be maintained using all reasonable and practicable measures to minimise the release of windblown dust or traffic generated dust to the atmosphere. Reasonable and practicable measures may include, but are not limited to, sealing with bitumen or other suitable material; keeping surfaces clean; use of water sprays; adoption and adherence to speed limits; use of approved dust suppressants; and wind breaks; and
 - (iii) raw material preparation plants and external transfer conveyors must be operated and maintained using all reasonable and practicable measures to minimise the release of wind blown dust or particulate matter to the atmosphere. Reasonable and practicable measures may include, but are not limited to, transfer of materials in a moist state; enclosure or sealing of conveyors; use of water sprays at transfer points; shielding; and wind breaks.

END OF CONDITIONS FOR SCHEDULE B

The National Pollution Inventory (NPI, 2021a⁴) presents the pollution control devices for the BCC Asphalt & Aggregates facilities (**Table 4.1**),

Table 4.1: Pollution Control Devices (NPI, 2021).

Device	Installed (year)	Comments
Fabric filter/baghouse	1998	Updated December 2012
Cyclone/multiclone	1998	
Low NOx burner	2000	Also, implementation of new burner control system to improve efficiency mid 2011/2012 financial year
Dust monitor	2017	Installed particulate sensor

⁴ NATIONAL POLLUTANT INVENTORY. 2021a. **2019/2020 report for Brisbane City Council, Eagle Farm Asphalt Plant – Eagle Farm, QLD**. Australian Government. Department of the Environment and Energy. Available at: <<http://www.npi.gov.au/npidata/action/load/individual-facility-detail/criteria/state/QLD/year/2020/jurisdiction-facility/Q031BCC001>>. Accessed in: 17/09/2021.

The industry operator, Mr. Jamie Hall, was interviewed during the site survey and said there is no history of complaints about their operations.

4.1.2 Boral Asphalt Whinstanes

Boral Asphalt Whinstanes is a company that has been operating an asphalt plant at 220 Cullen Avenue, Whinstanes QLD 4053, for more than 30 years. The main activity at this facility is asphalt manufacturing. The NPI (2021b⁵) presents the pollution control devices installed at this facility (**Table 4.2**).

Table 4.2: Pollution Control Devices (NPI, 2021)

Device	Installed (year)	Comments
Fabric filter/baghouse	1990	Approximate date only

Although the separation distance from the boundary of Boral Asphalt Whinstanes to the proposed development site is 390 metres, the distance from the asphalt mixing machine to the proposed development is 570 metres, as shown in **Figure 4.1**.

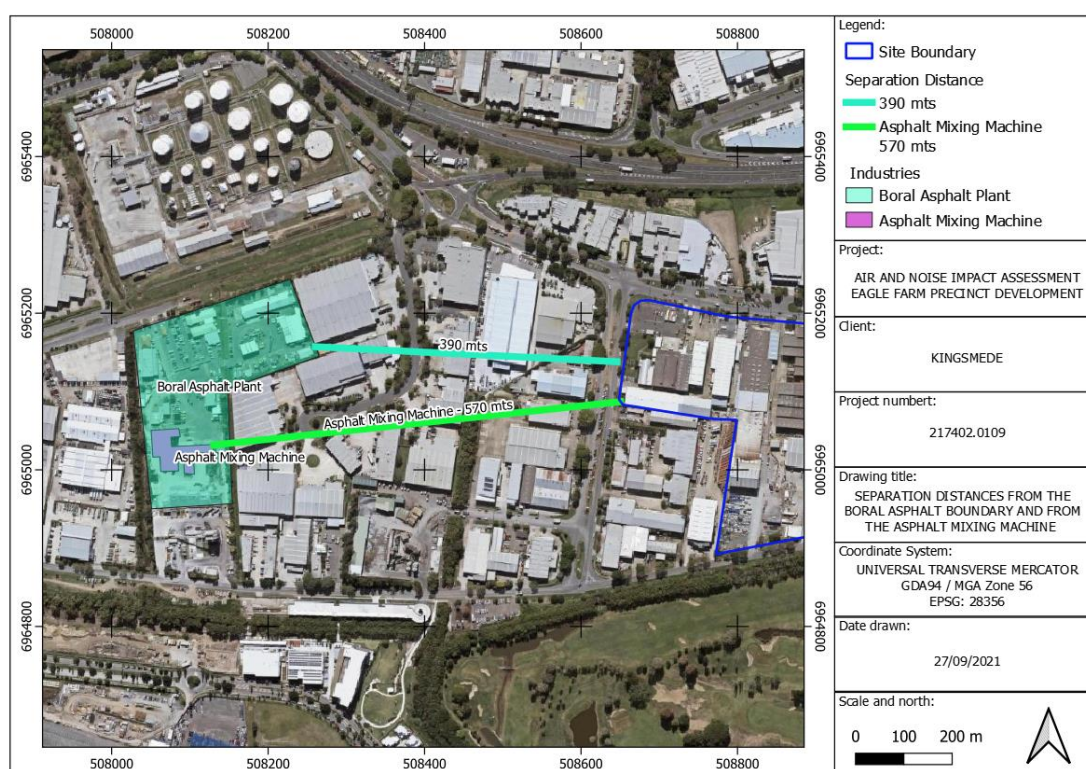


Figure 4.1 Separation Distance from the Boral Asphalt Boundary and from the Asphalt Mixing Machine to the Proposed Development Site

⁵ NATIONAL POLLUTANT INVENTORY. 2021b. **2019/2020 report for Boral Resources (QLD) Pty Limited, Boral Asphalt Whinstanes – Whinstanes, QLD**. Australian Government. Department of the Environment and Energy. Available at: < <http://www.npi.gov.au/npidata/action/load/individual-facility-detail/criteria/state/QLD/year/2020/jurisdiction-facility/Q031BOR002>>. Accessed in: 17/09/2021.

4.1.3 Holcim Concrete Supplies

Holcim Concrete operates a concrete batching plant in Eagle Farm which is located 80 metres northeast of the proposed development site. The Area Operations Manager BNEN Concrete, Mrs. Pauline Elliot, was interviewed during the site survey and confirmed the concrete batching plant operates 24 hours during 7 days a week, and it produces approximately 150,000 m³ of concrete per year. The concrete batching machine is located 280 metres from the wellness area situated within the proposed development site, as shown in **Figure 4.2**.



Figure 4.2 Separation Distance from the Holcim Concrete Boundary and from the Concrete Batching Machine to the Proposed Development Site

4.2 Discussion

The air quality impact assessment presented above leads to the following discussion:

- Three (03) industries were identified which activities potentially impact the proposed development: (1) BCC Asphalt & Aggregates Plant; (2) Holcim Concrete Plant; (3) Boral Asphalt Plant.
- BCC Asphalt & Aggregates Plant is located 250 m to the west, and operates under Queensland Government Environmental Authority, which means that the Department of Environment and Science (DES) regulates air emissions. It is unlikely that BCC Asphalt & Aggregates Plant will cause significant impact on the proposed development.
- Holcim Concrete Plant operates 80 metres to the northeast, operating 24/7 and producing approximately 150,000 m³ of concrete per year. The dust impacts are likely to be minimal on the proposed development given the recreational use building is enclosed and any outdoor wellness areas are more than 250 metres away from the main concrete batching machine.
- The main sources at Boral Asphalt are more than 500 metres away from the outdoor areas within the proposed development site.

As noted earlier, with regards to the sensitivity of the development site to air quality impacts, it is noted that there are no sensitive uses when considering the typical definition which includes residential uses, a child care or medical centre. The site is proposed to incorporate its own industrial activities, which would be supported by on-site recreational uses primarily design for workers. Therefore, giving consideration to the types of uses on the site combined with the separation distances to nearby industry, the potential for air quality impacts are expected to be absent.

To provide an optimum internal environment for workers utilising the recreational building, it is recommended that air filtration is provided to any air-conditioning air intakes.

4.3 Potential Impacts from On-Site Uses

There is a potential for industrial uses at the proposed development associated with air emission sources (e.g. coffee roastery, microbrewery). Given the large separation distance to residential areas (more than 500 metres), the air quality impacts of such uses are expected to be absent. It is noted that there is a golf course directly south and south-east of the site. Where possible, it is recommended to maximise the separation distance of such uses from the golf course so as to minimise potential odour impacts.

5. INDUSTRIAL AMENITY NOISE ASSESSMENT

5.1 Overview

An industrial amenity noise assessment has been undertaken to assess potential noise impacts from existing industrial operations in the surrounding area. As per Table 3.3, two adjacent industrial operations were noted to have potential noise impacts onto the site. To further review noise impacts from surrounding industry, noise monitoring was conducted as presented in the following sections.

5.2 Noise Monitoring Survey

Acoustic measurements consisted of attended noise measurements at five (05) sample points, during the day time on 13th September 2021. The sample points are positioned inside the boundary of the proposed development. The noise measurement locations are shown in **Figure 5.1**.

- Sample Point #1: Located on the southeastern boundary of Lot 724 on SL8236.
- Sample Point #2: Located on the southwestern boundary of Lot 724 on SL8236.
- Sample Point #3: Located on the western boundary of Lot 654 on SL2281.
- Sample Point #4: Located on the north boundary of Lot 654 on SL2281.
- Sample Point #5: Located on the northwestern boundary of Lot 836 on SL8236.

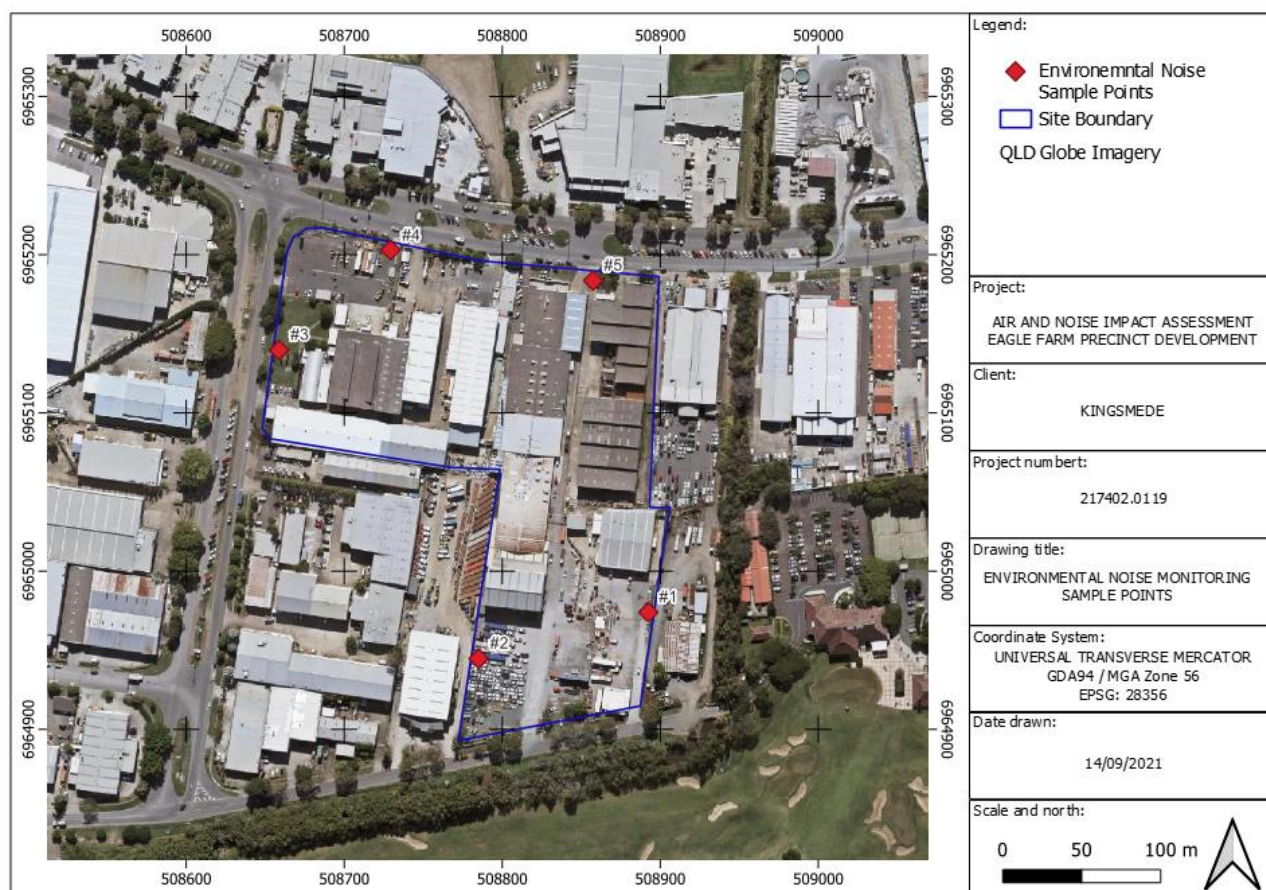


Figure 5.1 Environmental Noise Monitoring Sample Points

The noise monitoring was undertaken in general accordance with: Australian Standard AS1055 Acoustics – Description and measurement of environmental noise (2018)⁶, and: the DES Noise Measurement Manual (2020)⁷.

5.2.1 Noise Monitoring Methodology

The attended noise monitoring survey was conducted at sample points #1 (**Figure 5.2**), #2 (**Figure 5.3**), #3 (**Figure 5.4**), #4 (**Figure 5.5**), and #5 (**Figure 5.6**) during the daytime on 13th September 2021. Monitoring was completed using a handheld Norsonic NOR140 Sound Level Meter mounted on a tripod and fitted with a foam windshield, laboratory calibrated, and also calibrated before each measurement in the field using a Pulsar Model 105 acoustic calibrator, IEC 60942:2003 Class I. The microphone height was approximately 1.5 meters above the ground level and was located in the free field.



Figure 5.2 Sample Point #1

⁶ AUSTRALIAN STANDARD 1055. 2018. **Acoustics – Description and measurement of environmental noise**. Published: 08/04/2018.

⁷ DEPARTMENT OF ENVIRONMENT AND SCIENCE. 2020. **Noise measurement manual**. The State of Queensland. Available at: <https://environment.des.qld.gov.au/__data/assets/pdf_file/0027/88560/eis-tm-noise-measurement-manual.pdf>. Accessed in: 02/09/2021.



Figure 5.3 Sample Point #2



Figure 5.4 Sample Point #3



Figure 5.5 Sample Point #4



Figure 5.6 Sample Point #5

The weather observations were observed at the Bureau of Meteorology website for the Brisbane Airport weather station (2021)⁸, which is located approximately 6.4 km NE from the proposed development site for day-time measurement, and the results are presented in **Table 5.1**.

The weather at noon was fine, with a sunny day, temperature around 24 °C, humidity 51%, wind direction from NNE quadrant, and pressure at 1015.1 hPa. At 1 pm the sky was cloudy, with calm winds and the pressure increased to 1017.1 hPa. At 2 pm rainfall was noted and the noise measurements stopped just after #4 was completed. The wind was blowing from the south quadrant and the pressure increased to 1021.4 hPa. At 3:30 pm the rainfall ceased, with a breeze blowing from ESE quadrant, pressure at 1023.5, and the noise measurement at sample point #5 was taken.

Table 5.1: Weather Observations from Brisbane Airport Weather Station (BOM, 2021).

	Temp (°C)	Humidity (%)	Wind Direction	Wind Speed (km/h)	Wind Gust (km/h)	Pressure (hPa)	Rainfall since 9am (mm)
13/09/2021							
16:30 pm	21.5	80	S	9	15	1023.5	0.0
16:00 pm	22.0	85	ESE	13	19	1023.5	0.0
15:30 pm	22.7	88	S	15	24	1023.1	0.0
15:00 pm	22.5	91	SSW	6	11	1021.2	1.0
14:30 pm	23.6	89	ESE	11	17	1021.7	1.0
14:00 pm	23.9	88	SSE	7	15	1021.4	3.2
13:30 pm	23.7	56	S	9	13	1018.2	0.0
13:00 pm	25.3	48	CALM	0	11	1017.1	0.0
12:30 pm	24.7	51	NE	28	37	1015.1	0.0
12:00 pm	24.1	51	NNE	26	30	1015.5	0.0

The noise data gathered in the field was recorded by the sound level meter over 15-minute periods at each location. Observations of sounds perceived during the monitoring were registered using an environmental noise level record form via the staff writing down the source and the intensity. The sources were classified into two (2) factors: natural factors, e.g. vegetation, birds, dogs, insects, or body of water (waterfall, or waves); and anthropogenic factors, e.g. road traffic, rail traffic, airplane traffic, moving machinery, or stationary machinery. The notes of perceptive noises are a subjective analysis of the characteristic of the noise, if continuous or fluctuating, tonal, impulsive, high pitched, droning, and extraneous noises in the area.

At the office, the noise data recorded at the SLM was downloaded using a specific computational application, and the data registered at the form was inserted into a spreadsheet for posterior analysis. The results of the environmental noise level analysis are presented in the subsection below.

5.2.2 Noise Monitoring Results

The attended noise monitoring survey was conducted during daytime, on 13/09/2021, as per **Table 5.2** below:

⁸ BUREAU OF METEOROLOGY. 2021. **Latest weather observations for Brisbane Airport**. Australian Government. Available at: <<http://www.bom.gov.au/products/IDQ60801/IDQ60801.94578.shtml>>. Accessed on 14/09/2021

Table 5.2: Attended Noise Measurement Results.

SP	Date, Time, and Duration	Statistical Noise Levels (dBA)	Notes of Perceptive Noises
#1	13/09/2021 12:14 pm 15 minutes	L _{Aeq} 62.5 L _{AF} , 10% 63.9 L _{AF} , 90% 54.0 L _{AF} , max 87.9	Background - Industrial noise from alarm typical of heavy machinery reversing, during the whole monitoring period, coming from the company located on the eastern Lot of the sample point (high pitched): 57-64 dBA
#2	13/09/2021 12:49 pm 15 minutes	L _{Aeq} 54.5 L _{AF} , 10% 57.8 L _{AF} , 90% 49.2 L _{AF} , max 74.0	Background noise from Gateway Highway (fluctuating): 40-43 dBA Heavy machinery on the eastern Lot (fluctuating, impulsive): 52-58 dBA Airplane: 52-55 dBA.
#3	13/09/2021 13:15 pm 15 minutes	L _{Aeq} 65.1 L _{AF} , 10% 65 L _{AF} , 90% 58.7 L _{AF} , max 94.4	Background noise from heavy truck loading/unloading vehicles to a mechanic workshop located on the west side of the sample point (CQ Diesel Fitting), across Links Avenue South, during the whole period of noise monitoring (continuous): 58-64 dBA Road traffic from Links Avenue (fluctuating): 68-94 dBA. Airplane: 52-56 dBA
#4	13/09/2021 13:46 pm 15 minutes	L _{Aeq} 65.1 L _{AF} , 10% 65 L _{AF} , 90% 58.3 L _{AF} , max 78.1	Industrial noise from refrigerated freight company located on the north side of the site, across the Fison Avenue West (SunPork Fresh Food/continuous, droning): 57-60 dBA. Road traffic from Fison Avenue West: 64-78 dBA. Background from Gateway Highway and Southern Cross Way (fluctuating): 58-62 dBA. Airplane: 55 dBA
#5	13/09/2021 15:40 pm 15 minutes	L _{Aeq} 65.9 L _{AF} , 10% 69.3 L _{AF} , 90% 58.8 L _{AF} , max 79.7	Industrial noise from refrigerated freight company located on the north side of the site, across the Fison Avenue West (SunPork Fresh Food/continuous, droning): 57-60 dBA. Road traffic from Fison Avenue West: 64-84 dBA. Background from Gateway Highway and Southern Cross Way (fluctuating): 58-62 dBA. Airplane: 56 dBA

Note: The reported noise levels, excluding the statistical noise levels, are the instantaneous levels read from the sound level meter, and generally represent the range in noise levels or maximum noise levels for a particular noise source.

The main background environmental noises identified during the sampling are illustrated in **Figure 5.7**. The northwest side boundary was the noisiest area for the proposed development site due to the road traffic and heavy machinery operating in the area.



Figure 5.7 Noise sources identified during monitoring

The heavy machinery operating near the northwest boundary of the proposed development site was identified from two (02) different sources, as shown in **Figure 5.8**: (a) at the Links Avenue South, tow trucks were operating continuously during the noise monitoring survey; (b) refrigerated trucks operating continuously at loading bays inside an industrial side across Fison Avenue West.



Figure 5.8 Heavy Machinery Operating Near the Northwest Boundary of the Site:
a) Tow trucks at Links Avenue South; b) refrigerated trucks at industrial side across Fison Avenue West.

The proposed development site is located within the Australian Noise Exposure Forecast (ANEF) contour sub-category v. 20-25 (Brisbane City Plan 2014 / Part 8 Overlays / 8.2 Overlay codes / 8.2.2 Airport overlay code).

During the noise monitoring survey, airplanes were noted regularly flying over the sample points, as presented in **Figure 5.9**.



Figure 5.9 Aircraft Noted During Noise Monitoring Measurements.

5.3 Discussion

From the results above, the following discussion is made:

- The proposed development consists of an industrial area and therefore the impact of noise from the vicinity on the development is not related to sensitive uses noise criteria.
- Contemplating the off-site noise, there are no sensitive uses surrounding 500 metres from the proposed site development, so it is unlikely that the proposed development will generate complaints on the neighborhood.
- The main noise sources were situated at the northwest side of the proposed development site generated from heavy machinery (trucks) operating continuously during the noise measurements.
- The road traffic noise was higher at the Links Avenue South and the Fison Avenue West due to traffic of heavy trucks and loud small vehicles (like motorbikes), however the noise from the Gateway Highway and the Southern Cross Way also could be noted at the sample points located at the north boundary.
- The proposed development consists of industrial uses (including offices and recreational uses for workers) and therefore the impact of other off-site industrial noise onto the development is not expected to create a nuisance at the proposed site.
- Based on the measured L_{Aeq} noise levels of up to 65 dBA and an internal design level of 30-45 dBA for office and recreational areas as per AS 2107 Acoustics – Recommended design sounds levels and reverberation times for building interiors, a noise reduction of 20-35 dBA is required to achieve an appropriate internal environment. The final required noise reduction for construction materials would be dependent on room locations and it is recommended that acoustic details be investigated further during detailed design.
- Contemplating the off-site noise, there are no sensitive uses surrounding 500 metres from the proposed site development, so it is unlikely that the proposed development will generate complaints on the neighborhood.

6. AIRPORT OPERATION CONSIDERATIONS

The proposed development's site is located within the Australian Noise Exposure Forecast (ANEF) contour sub-category v. ANEF 20-25 as shown in **Figure 6.1** (Brisbane City Plan 2014 / Part 8 Overlays / 8.2 Overlay codes / 8.2.2 Airport environs overlay code).

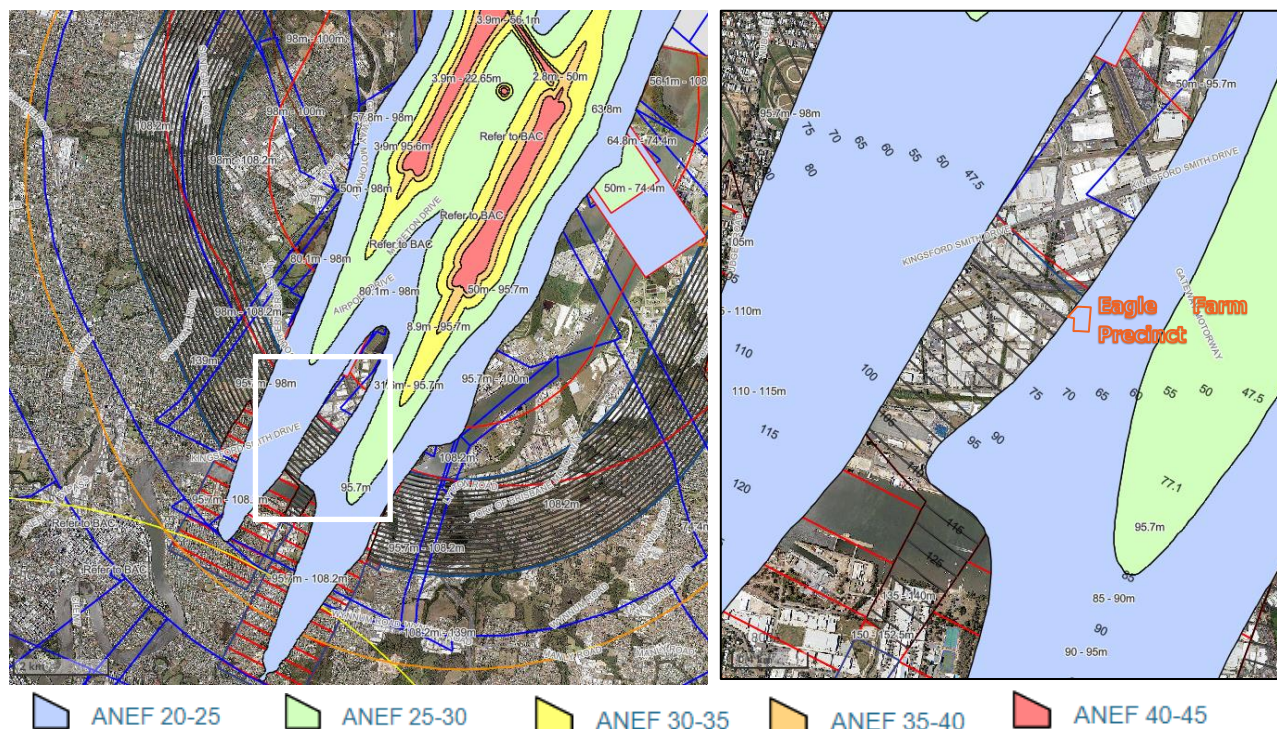


Figure 6.1 Site Location and Brisbane Airport ANEF Contours

Considering the proposed development and the expected land use, AS 2021:2015⁹ presents the determination of acceptability for particular building type under consideration, with respective building site acceptability for the ANEF zone in which it is to be located. As shown in **Table 6.1**, commercial and industrial sites affected by ANEF contours less than 25 are considered acceptable. Therefore, no further assessment is considered necessary.

Table 6.1: Building site acceptability based on ANEF zones (Table 2.1, AS 2021:2015).

Building type	ANEF zone of site		
	Acceptable	Conditionally acceptable	Unacceptable
Commercial building	Less than 25 ANEF	25 to 35 ANEF	Greater than 35 ANEF
Light industrial	Less than 30 ANEF	30 to 40 ANEF	Greater than 40 ANEF
Other industrial	Acceptable in all ANEF zones		

With respect to potential industrial operations at the development site with air emissions from a stack (e.g. a coffee roastery or brewery), it is important that air emissions do not impact on the airport operations. CASA

⁹ AUSTRALIAN STANDARD 2021: 2015. **Acoustics – Aircraft noise intrusion – Building siting and construction**. Sai Global. Licence 10520199.

released an Advisory Circular in January 2019 for Plume Rise Assessments¹⁰. The Advisory Circular from CASA applies to facilities generating a gas efflux or exhaust plume which may have a vertical exit velocity exceeding 6.1 m/s. The standard process followed for a plume rise assessment requires that a Form 1247 is submitted to CASA where the facility's proposed vertical velocity exceeds 6.1m/s. If exceeded, this should be reviewed in further detail. These requirements should be reviewed in further detail if applicable to any future industrial operations on site.

¹⁰ Civil Aviation Safety Authority, January 2019, Advisory Circular AC 139-05v3.0 Plume rise assessments. File ref D18/492979.

7. CONCLUSIONS AND RECOMMENDATIONS

The outcomes of the air quality and the environmental noise impact assessments are summarised as follows:

- The proposed development consists of commercial and industrial land uses, situated within an industrial area that is part of the Northshore Hamilton Priority Development Area (PDA) for the Queensland Government, and therefore it's operation is compatible with the purposes of the site.
- There are no sensitive uses proposed at the site, such as accommodation, medical centres or child cares. The site is proposed to incorporate it's own industrial activities, which would be supported by on-site recreational uses primarily design for workers (e.g. recreation building and outdoor areas). The main focus for the air quality and the environmental noise assessment is on the recreational use building and outdoor wellness areas.
- There are no nearby residential areas or any other sensitive uses that are of concern for the proposed development. There is noted to be a golf course located directly south and south-east of the site.
- Air quality:
 - Key air emission sources in the area with a potential to impact the site are:
 - Holcim concrete batching plant (80 metres to the northeast).
 - Brisbane Cityworks Asphalt Plant (240 metres to the southwest).
 - Boral Asphalt Plant (500 metres to the west).
 - For Holcim, dust impacts are likely to be minimal given the recreational use building is enclosed and any outdoor wellness areas are more than 250 metres away from the main concrete batching activity. To provide an optimum environment for the recreational use building, it is recommended that air filtration is to air-conditioning intakes.
 - For Brisbane Cityworks asphalt plant, the separation distance is also large (400 metres to nearest outdoor area and 500 metres to recreational use building). There is no history of complaints about asphalt odour on the proposed development site.
 - The main air sources at Boral asphalt are more than 500 metres away from the outdoor areas and it is unlikely a source of impact on the proposed development site.
 - Air quality impacts from uses such as a coffee roastery or brewery onto off-site uses are likely to be minimal. There are no sensitive uses such as a residential areas within 500 metres of the site. Where possible, it is recommended that such uses are located so as to maximise separation distance from the nearby golf course.
- Noise:
 - Off-site noise is defined by typical industrial activity and road traffic.
 - Due to the nature of the proposed use, there would naturally be industrial noise from on-site activity.
 - Noise impacts on to internal spaces (e.g. offices, recreation rooms) can be managed using appropriate construction materials. The relevant noise reduction for construction materials would be dependent on room types and locations, and it is recommended that acoustic details be investigated further during detailed design.
- Aircraft operation considerations:
 - The site is located in an ANEF 20-25 zone, and based on AS 2021, industrial and commercial uses are deemed acceptable within this zone.

-
- Any proposed operations with air emissions via a vertical stack should give consideration to the CASA requirements regarding plume rise impacts onto airport operation spaces. A plume rise assessment may be required.

APPENDIX A: GLOSSARY

Parameter or Term	Description
AIR QUALITY	
BoM	Bureau of Meteorology
CO	Carbon monoxide
CS ₂	Carbon disulphide
DES	Queensland Department of Environment and Science
EP	Equivalent person
EPA	Queensland Environmental Protection Act 1994
EPP(Air)	Queensland Environmental Protection (Air) Policy 2008
g/m ² /month	Grams per square metre per month
H ₂ S	Hydrogen sulphide
HCl	Hydrogen chloride
HCN	Hydrogen cyanide
m/s	Metres per second
mg/m ³	Milligrams per cubic metre
NPI	National Pollutant Inventory
NEPM	National Environmental Protection (Ambient Air Quality) Measure
NO _x	Oxides of nitrogen including nitric oxide and nitrogen dioxide
NO ₂	Nitrogen dioxide
ou	Odour units, the number of dilutions of the odour to reach the odour intensity at which a panel of qualified people can just detect it. Refer to AS4323.3 for a scientific definition.
PAHs	Polycyclic aromatic hydrocarbons
Partisols	A low-volume gravimetric (filter-based) sampler using mains power.
PWWF	Peak wet weather flow
pg/m ³	Picograms per cubic metre (pica = 10 ⁻¹²)
PM _{2.5}	Particulates suspended in air with aerodynamic diameter less than 2.5 microns
PM ₁₀	Particulates suspended in air with aerodynamic diameter less than 10 microns
ppb	Parts per billion by volume
ppm	Parts per million by volume
SEQ	South-east Queensland
SO ₂	Sulphur dioxide
SO ₃	Sulphur trioxide
STEL	Short term exposure limit
STP	Sewage treatment plant
TAPM	The Air Pollution Model developed by CSIRO and used by ASK for meteorological modelling
TEOM	Tapered element oscillating microbalance: an instrument for measuring particulates suspended in air
TWA	Time weighted average exposure limit

Parameter or Term	Description
AIR QUALITY	
TSP	Total particulates suspended in air
µg/m ³	Micrograms per cubic metre
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UTM	Universal Transverse Mercator coordinate system
NOISE	
dB	The decibel (dB) is the unit measure of sound. Most noises occur in a range of 20 dB (quiet rural area at night) to 120 dB (nightclub dance floor or concert).
dBA	Noise levels are most commonly expressed in terms of the 'A' weighted decibel scale, dBA. This scale closely approximates the response of the human ear, thus providing a measure of the subjective loudness of noise and enabling the intensity of noises with different frequency characteristics (e.g. pitch and tone) to be compared.
Day	The period between 7am and 6pm.
Evening	The period between 6pm and 10pm.
Night	The period between 10pm and 7am.
Free-field	The description of a noise receiver or source location which is away from any significantly reflective objects (e.g. buildings, walls).
L ₁	The noise level exceeded for 1% of the measurement period.
L ₁₀	The noise level exceeded for 10% of the measurement period. It is sometimes referred to as the average maximum noise level.
L ₉₀	The noise level exceeded for 90% of the measurement period. This is commonly referred to as the background noise level.
L _{eq}	The equivalent continuous sound level, which is the constant sound level over a given time period, which is equivalent in total sound energy to the time-varying sound level, measured over the same time period.
L _{eq,1hour}	As for L _{eq} except the measurement intervals are defined as 1 hour duration.
L _{max}	Maximum A-weighted sound pressure level.
L _{eq} (24 hour)	The average L _{eq} noise level over the 24-hour period from midnight to midnight.
L ₁₀ (18 hour)	The arithmetic average of the one-hour L ₁₀ values between 6am and midnight. This parameter is used in the assessment of road traffic noise.
R _w	Weighted Sound Reduction Index – is a single number evaluation of the property of a partition to attenuate sounds. For the majority of partitions, the value of R _w will be similar to the value for STC. Partitions with particularly poor performance at 100 Hz may have lower values for R _w than for STC. Conversely, partitions with poor performance at 4000 Hz may have higher R _w than for STC. (As per AS1276.1-1999).
Acoustically screened	Brisbane City Council 2014 City Plan definition: The source of noise is completely screened from view of habitable rooms (including balconies, patios, decks and verandas) of an adjoining sensitive use by solid, gap free material and construction e.g. acoustic fence, building, or enclosure.
Acoustic fence	Brisbane City Council 2014 City Plan definition: Solid, gap free fence with minimum panel surface density of 12.5kg/m ² .
Sensitive Uses	Brisbane City Council 2014 City Plan definition: A use that is child care centre, community care centre, community residence, dual occupancy, dwelling house, dwelling unit, educational establishment, health care services, hospital, multiple dwelling, relocatable home park, residential care facility, retirement facility, rooming accommodation, short term accommodation or tourist park.



BRISBANE

A: Level 3, 43 Peel Street
South Brisbane, QLD 4101
T: +61 7 3255 3355
E: brisbane@trinityconsultants.com

GLADSTONE (Vision Environment)

A: Unit 3, 165 Auckland Street
PO Box 1267
Gladstone, QLD, 4680
T: +61 7 4972 7530
E: office@visionenvironment.com.au

SYDNEY

A: Level 6, 69 Reservoir Street
Surry Hills, NSW 2010
T: +61 2 8217 0706
E: sydney@trinityconsultants.com