REPORT

COMPASS 2 WAREHOUSE & DISTRIBUTION CENTRE

LOT 1 DP1274322 WITHIN BLACKTOWN

NOISE AND VIBRATION IMPACT ASSESSMENT
RWDI # 2201656
9 February 2022

SUBMITTED TO

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1 INTRODUCTION

RWDI Pty Limited has been commissioned to undertake a noise and vibration impact assessment for the Compass 2 Warehouse & Distribution Centre (the Project) to be located at Lot 1 Eastern Creek Drive, Eastern Creek, NSW (the site).

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) (SSD-30923027) for the Proposal, issued by NSW Department of Planning, industry and Environment (DPIE).

Table 1-1 provides a summary of the relevant SEARs which relate to Noise, and where these have been addressed in this report.

Table 1-1 SEARs Requirement Compliance (SSD-30923027)

Key Issue No. & Description	Issue & Assessment Requirements	How It Is Addressed	Location Within This Report
11. Noise	Provide a noise and vibration assessment prepared in accordance with the relevant EPA guidelines. The assessment must detail construction and operational noise and vibration impacts on nearby sensitive receivers and structures and outline the proposed management and mitigation measures that would be implemented.	This assessment details the methodology and criteria specified in the NSW EPA's Noise Policy for Industry, 2017 (NPfI, 2017). Construction and operational noise and vibration impacts are assessed against project specific noise trigger levels. No management or mitigation measures are required for compliance against the determined criteria.	**Section 3.1** **Section 3.8**

1.1 Project Description

Approval is sought for the construction and 24/7 operation of a warehouse and distribution centre at Lot 1 Eastern Creek Drive, Eastern Creek. The Proposal comprises:

- minor earthworks involving cut and fill works;
- site preparation works and servicing;
- warehouse, main office, ancillary office, dock office, loading docks, carparking, forklift charging room; and
- external hardstands and landscaping;

The site is located within the Blacktown City LGA, approximately 35km west of the Sydney CBD. It is in close proximity to major transport infrastructure including the Westlink M7 and M4 Western Motorway.

The site is surrounded by similar industrial and warehouse developments to the north, south, east, and west. Nearest noise sensitive receivers include a childcare facility located approximately 750 m south east and Pinegrove Memorial Park located more than 1.4 km to the north.

The nearest residential area is Minchinbury located on the northern side of the M4 Motorway (west of the M7 Interchange), approximately 1.5m to the north and Erskine Park approximately 2.5km to the west. Rural residential land uses are located approximately 1.8km to the south of the site. Layout for the proposed warehouse is presented in Table 1-2. The location of the Project site and surrounding land uses are shown in Table 1-3.

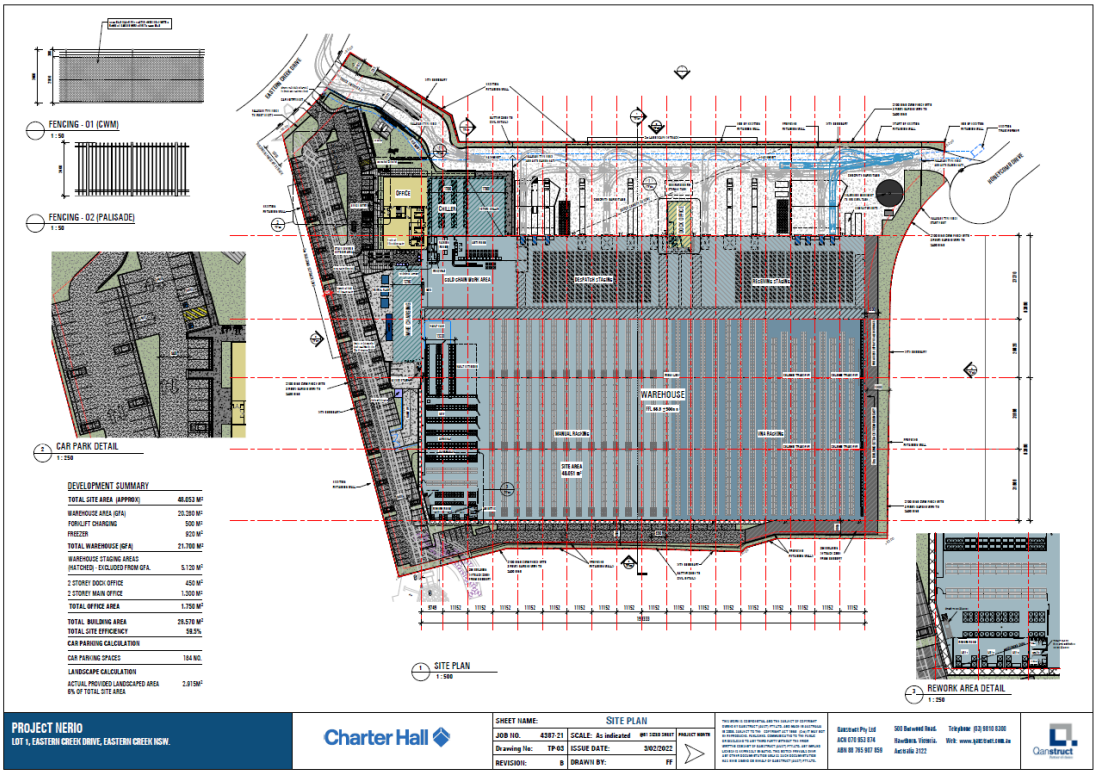

Table 1-2 Site Layout

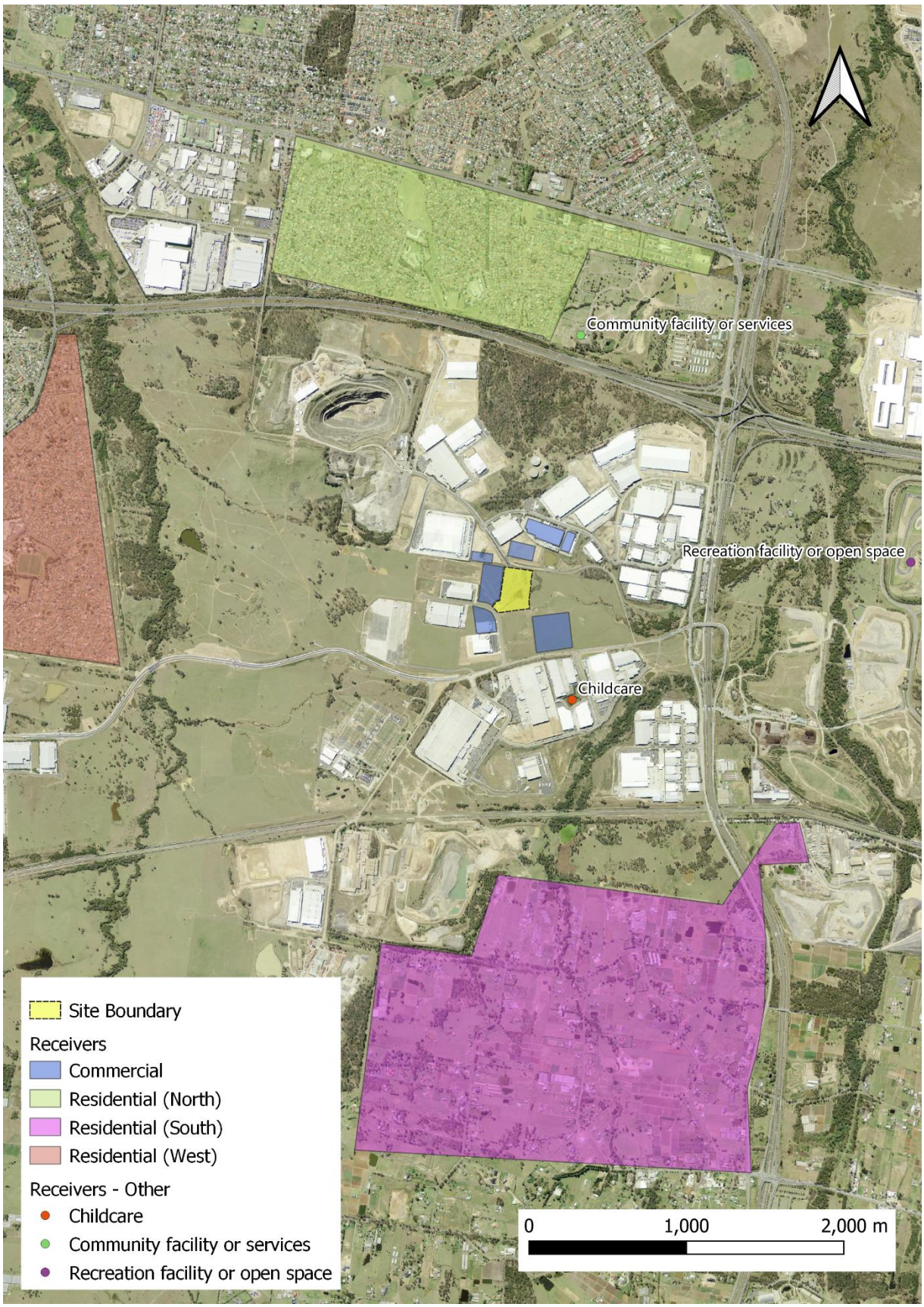

Table 1-3 Site Layout and Surrounding Land Use

2 EXISTING NOISE ENVIRONMENT

The environment immediately surrounding the project site is occupied by existing or developing industrial premises to the north, south, east and west.

The surrounding road network carries a high percentage of heavy vehicles. The noise environment is controlled by noise emissions from road traffic, in particular heavy vehicles. Background noise levels are controlled by the nearby M7 and M4 Motorways.

Given the remote location of residential receivers in relation to the proposed development, ambient noise monitoring was not considered warranted. Noise criteria was conservatively determined by applying the minimum assumed Rating Background Level (RBL) for residential receivers, as per NPfI methodology. The minimum assumed RBLs as recommended by the NPfI are:

- Day 35dBA L_{A90};
- Evening 30dBA L_{A90}; and
- Night 30dBA L_{A90}.

3 ASSESSMENT OF OPERATIONAL NOISE

The Noise Policy for Industry (NPfI) (EPA, 2017) provides a framework for assessing environmental noise impacts from industrial premises and industrial development proposals in New South Wales (NSW).

The NPfI recommends the development of project noise trigger levels, which provide a benchmark for assessing a proposal or site. The project noise trigger levels should not be interpreted as mandatory noise criteria but, rather, as noise levels that, if exceeded, would indicate a potential noise impact on the community.

The project noise trigger level is the lower value of the project intrusiveness noise level and the project amenity noise level; each explained further below. The project intrusiveness noise level assesses the likelihood of noise being intrusive above the ambient noise level and is applied to residential receivers only. The project amenity noise level ensures the total industrial noise from all sources in the area does not rise above a maximum acceptable level.

3.1 Project Intrusiveness Noise Levels

The intrusiveness noise level is the noise level five decibels dBA above the background noise level for each time period (daytime, evening or night time) of interest at a residential receiver. The background noise level is derived from the measured L_{A90} noise levels.

The NPfI stipulates that project intrusiveness noise levels should not be set below 40 dBA during the daytime and 35 dBA in the evening and night time. Additionally, the NPfI recommends that the project intrusiveness noise level for the evening is set at no greater than that for the daytime, and that the project intrusiveness level for night time is set at no greater than that for the evening and daytime.

Intrusiveness noise levels for the project are calculated from the RBLs in Section 2 of this report and are presented in **Table 3-1**.

Table 3-1: Project Intrusiveness Noise Levels

Receiver	Time of Day [a]	RBL (dBA)	Project Intrusiveness Noise Level (dBA)
Minchinbury (North of the Site)	Day	35	40
	Evening	30	35
	Night	30	35
Erskine Park (West of the Site)	Day	35	40
	Evening	30	35
	Night	30	35
Rural Area to the south	Day	35	40
	Evening	30	35
	Night	30	35

a. Day = 7.00am – 6.00pm; Evening = 6.00pm – 10.00pm; Night = 10.00pm – 7:00am

3.2 Project Amenity Noise Levels

Project amenity noise levels aim to set a limit on continuing increases in noise levels from all industrial noise sources affecting a variety of receiver types; that is, the ambient noise level in an area from all industrial noise sources remains below recommended amenity noise levels.

The amenity assessment is based on noise criteria specific to land use and associated activities. The criteria relate only to industrial-type noise and do not include transportation noise (when on public transport corridors), noise from motor sport, construction noise, community noise, blasting, shooting ranges, occupational workplace noise, wind farms, amplified music/patron noise.

The amenity noise level aims to limit continuing increases in noise levels which may occur if the intrusiveness level alone is applied to successive development within an area.

The recommended amenity noise level represents the objective for total industrial noise at a receiver location. The project amenity noise level represents the objective for noise from a single industrial development at a receiver location.

To prevent increases in industrial noise due to the cumulative effect of several developments, the project amenity noise level for each new source of industrial noise is set at 5dBA below the recommended amenity noise level.

- The following exceptions apply to determining the project amenity noise level:
- For high-traffic areas the amenity criterion for industrial noise becomes the $L_{Aeq,period\ (traffic)}$ minus 15dBA.
- In proposed developments in major industrial clusters.
- If the resulting project amenity noise level is 10dB or more, lower than the existing industrial noise level, the project amenity noise level can be set at 10dB below existing industrial noise levels if it can be demonstrated that existing industrial noise levels are unlikely to reduce over time.
- Where cumulative industrial noise is not a consideration because no other industries are present in, or likely to be introduced into the area, the relevant amenity noise level is assigned as the project amenity noise level for the development.

Amenity noise levels are not used directly as regulatory limits. They are used in combination with the project intrusiveness noise level to assess the potential impact of noise, assess mitigation options and determine achievable noise requirements.

The project amenity noise levels for the Proposal have been based on the recommended amenity noise levels presented in **Table 3-2**

Table 3-2: Recommended Amenity Noise Levels

Receiver	Noise Amenity Area	Time of Day [a]	Recommended Amenity Noise Level ($L_{Aeq,period}$ dBA)
Residential	Rural	Day	50
		Evening	45
		Night	40
	Suburban	Day	55
		Evening	45
		Night	40
	Urban	Day	60
		Evening	50
		Night	45
Hotels, motels, caretakers' quarters, holiday accommodation, permanent resident caravan parks	See column 4	See column 4	5dB(A) above the recommended amenity noise level for a residence for the relevant noise amenity area and time of day.
School classroom-internal	All	Noisiest 1-hour period when in use	35
Hospital ward internal external	All	Noisiest 1-hour	35
	All	Noisiest 1-hour	50
Place of worship-internal	All	When in use	40
Area specifically reserved for passive recreation (e.g. national park)	All	When in use	50
Active recreation area (e.g. school playground, golf course)	All	When in use	55
Commercial premises	All	When in use	65
Industrial premises	All	When in use	65
Industrial interface (applicable only to residential noise amenity areas)	All	All	Add 5dB(A) to recommended noise amenity area

a. Day = 7.00am – 6.00pm; Evening = 6.00pm – 10.00pm; Night = 10.00pm – 7:00am

Recommended amenity noise levels presented in **Table 3-2** represent the objective for total industrial noise at a receiver location. In the case of a single new noise source being proposed, the project amenity noise level represents the objective for noise from a single industrial development at the receiver location. This is calculated as the recommended amenity noise level minus 5 dBA.

Due to different averaging periods for the $L_{Aeq,15min}$ and $L_{Aeq,period}$ noise descriptors, the values of project intrusiveness and amenity noise levels cannot be compared directly when identifying noise trigger levels i.e.; the most stringent values of each category. In order to make a comparison between descriptors, the NPfI assumes that the $L_{Aeq,15min}$ equivalent of an $L_{Aeq,period}$ noise level is equal to the $L_{Aeq,15min}$ level plus 3 dB.

Project amenity noise levels for sensitive receivers near the Proposal are presented in **Table 3-3**. Minchinbury is considered urban as it is next to a freeway and the existing background noise levels reflect that of an urban environment as recommended in the NPfI. Erskine Park is considered suburban because it is zoned R2 low density residential and the existing background noise levels reflect that of a suburban environment as recommended in the NPfI

Table 3-3: Project Amenity Noise Levels

Receiver	Noise Amenity Area	Time of Day [a]	Recommended Amenity Noise Level ($L_{Aeq,period}$)	Project Amenity Noise Level ($L_{Aeq,15min}$)
Minchinbury	Urban	Day	60	58
		Evening	50	48
		Night	45	43
Erskine Park	Suburban	Day	55	53
		Evening	45	43
		Night	40	38
Rural Area	Rural	Day	50	48
		Evening	45	43
		Night	40	38
Childcare Centre		When in use	35 (inside) 45[b]	43
Industrial		When in use	70	68

a. Day = 7.00am – 6.00pm; Evening = 6.00pm – 10.00pm; Night = 10.00pm – 7:00am:

b. b. A conservative 10dB reduction has been assumed for a partially opened window.

3.3 Project Noise Trigger Levels

The project noise trigger levels for sensitive receivers for a project are the lowest criteria developed from the project intrusive noise levels and the project amenity levels. **Table 3-4** below shows the project noise trigger levels for sensitive receivers, with the project noise trigger levels shown in bold.

Table 3-4: Project Noise Trigger Levels

Receiver	Time of Day [a]	Project Intrusiveness Noise Levels ($L_{Aeq,15min}$)	Project Amenity Noise Levels ($L_{Aeq,period}$)
Minchinbury	Day	**40**	58
	Evening	**35**	48
	Night	**35**	43
Erskine Park	Day	**40**	53
	Evening	**35**	43
	Night	**35**	38
Rural Area	Day	**40**	48
	Evening	**35**	43
	Night	**35**	38
Childcare Centre	When in use	**43**	
Industrial	When in use	**68**	

b. Day = 7am – 6pm; evening = 6pm – 10pm; night = 10pm – 7am.

3.4 Operational Activity

Trucks will enter the site via Eastern Creek Drive and manoeuvre across hardstand, reversing into loading docks. Once on site the trucks would be loaded/unloaded via electric forklifts and exit Honeycomb Drive cul-de-sac. Predicted breakdown of daily heavy vehicle trip generation has been provided by the traffic consultant and is reproduced below in Table 3-5. The heavy vehicle volumes estimated in Table 3-5 would include 30% refrigerated trailers.

Table 3-5 Daily Truck Movements

Type	Inbound (Receiving)	Outbound (Dispatch)
B-Double	8	12
Semi	16	4
Rigid	10	8
Van	8	20

Light vehicles will enter and exit the site via Eastern Creek Drive with a dedicated carpark located along the southern boundary and rear of warehouse. The carpark is proposed to facilitate a maximum of 184 light vehicles. Indicative mechanical plant has been provided by the contractor which is described as a Fusion HVAC system and includes 14 rooftop units.

3.5 Noise Modelling

Noise modelling of the development site was undertaken using the CONCAWE noise prediction algorithm in SoundPLAN V8.2 modelling software.

The noise model was constructed from a combination of aerial photography, existing ground topography and design ground topography for the development. The local terrain, design of the development, receiver buildings and structures have been digitised in the noise model to develop a three-dimensional representation of the operations of the development and surrounding environment.

Noise modelling was conducted for day, evening and night time as the warehouses would be operating 24 hours per day.

3.6 Acoustic Data

The following noise level data for vehicle-related noise sources has been used for the assessment. These noise levels are taken from RWDI's internal database and external assessments of similar subject sites.

Table 3-6: Sound Power Reference Levels

Noise Source	Noise Characteristic	Sound Power Level SWL, dBA
Forklift operational on hardstand	Quasi-steady	93 L_{Aeq}
Light Vehicles on site, up to speed of 40 km/h	Quasi-steady	90 L_{Aeq}
Medium Vehicle @ 10 km/h	Quasi-steady	91 L_{Aeq}
Medium Vehicle reversing @ 5 km/h	Quasi-steady	96 L_{Aeq}
Heavy Vehicle[1] @ 25 km/h	Quasi-steady	106 L_{Aeq}
Heavy Vehicle[1], unloaded @ 10 km/h	Quasi-steady	106 L_{Aeq}
Heavy Vehicle[1], loaded @ 10 km/h	Quasi-steady	107 L_{Aeq}
Heavy Vehicle[1], reversing[2] @ 5 km/h	Quasi-steady	111 L_{Aeq}
Truck Idling	Quasi-steady	95 L_{Aeq}
Truck Engine Starting	Instantaneous	100 L_{Amax}
Truck Airbrake Release[2]	Instantaneous	115 L_{Amax}

Note 1: Heavy vehicle defined as any cargo vehicle with three or more axles with gross vehicle weight > 12,000 kg.

Note 2: Assume that reversing operation will not take more than 30 seconds for each vehicle, includes reversing alarm and air brake release.

3.7 Modelled Onsite Vehicle Movements

The following 'worst case' 15-min traffic volumes during the day, evening, and tight time periods were derived from the traffic data supplied as detailed in Table 3-5.

The vehicle movements have been modelled to reflect realistic operations, with heavy vehicles accessing and manoeuvring hardstand areas to load and unload items via forklift and light vehicles utilising carparking facilities.

Summary of vehicle movements is presented below in Table 3-7.

Table 3-7 : Onsite vehicle movements

Assessment Period[1]	Light Vehicles per 15min[2]	Heavy Vehicles per 15min	Heavy Vehicle (HV) Breakdown			
			B-double	Semi-trailer	Rigid	Van
Day	92	6	2	2	1	1
Eve	-	4	1	1	1	1
Night	92	4	2	1	1	0

Note 1: Daytime (7am – 6pm), Evening (6pm – 10pm), Night-time (10pm – 7am).
Note 2: Assume 50% of total LV carparking activity occurs with 15-minutes.

3.8 Modelled Line Sources

Light vehicles are represented as line sources travelling 40 km/hr with a sound power level (SWL) of 90 dBA and a height of 0.5 m.

Heavy vehicle traffic movements are represented as line sources travelling 25 km/hr with a SWL of 106 dBA.

Heavy vehicle movements over hardstand and loading areas within each lot have been modelled travelling at 5 km/hr with a sound power level of 105 dBA. Locations where heavy vehicles require greater engine capacity, such as accelerating from a stationary position, cornering, or accessing entry/exit ramps have been modelled as line sources travelling 5 km/hr with a SWL of 111 dBA.

Heavy vehicles reversing into delivery docks, including reversing alarm and airbrake release have been modelled as a single line source with a SWL of 115 dBA at the location most affecting the nearest sensitive receiver within each lot. Duration of heavy vehicle reversing is assumed to be not greater than 30 seconds and includes reversing alarm and air-break release events.

Source height for heavy vehicles is 1.5 m with the exception of the reversing alarm and air-brake release modelled at 1 m.

3.9 Modelled Fixed Sources

Fixed noise sources such as mechanical plant and forklifts have been modelled throughout the development. To account for indicative mechanical plant items, 14 point sources with a reference sound power level (80 SWL) have been modelled on rooftop with 24/7 operation.

External gas powered forklifts have been modelled as point sources with a SWL of 93 dBA at 1 m in height. It has been assumed that forklifts would operate continuously during any one 15-minute period. One forklift for every two heavy vehicles onsite has been modelled operating externally in the hardstand areas for each of the warehouses.

To account for noise emissions from refrigerated trailers an additional point source (80 SWL) has been included within the hardstand.

3.10 Predicted Operational Noise Impacts

Noise contours for the daytime, evening, night time periods are presented in Table 3-8, Table 3-9 and Table 3-10 respectively.

As shown in Table 3-8, Table 3-9 and Table 3-10 noise levels generated by the Project will be well below the PTNLs presented in Table 3-4 during all time periods.

Given the distance and the proximity of major roadways, operational noise from the proposed facility will be inaudible above the prevailing ambient noise at all surrounding residential receivers.

Operational noise emissions to surrounding industrial sites will achieve the amenity level recommended under the NPfI.

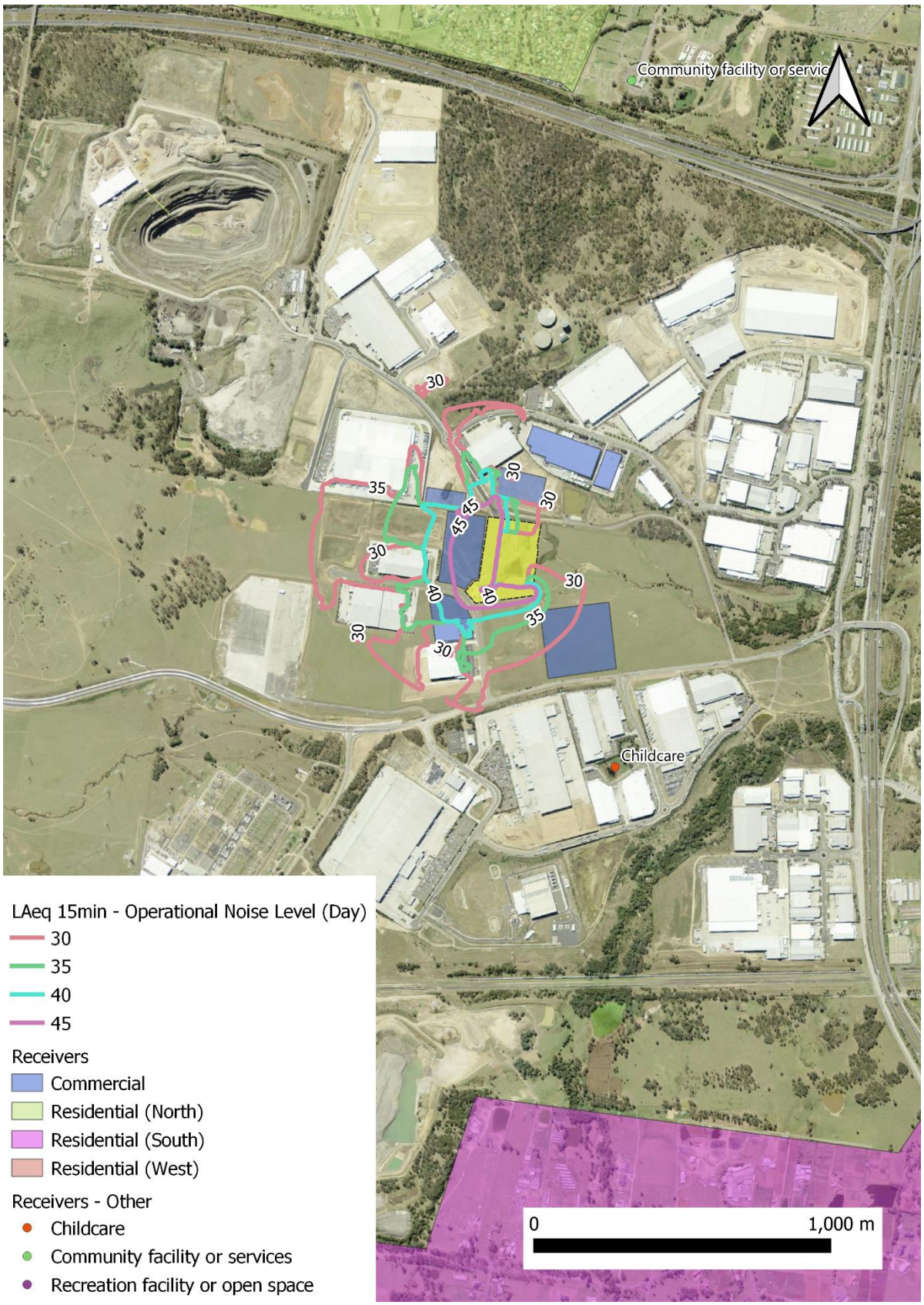

Table 3-8 Operational Levels – Day

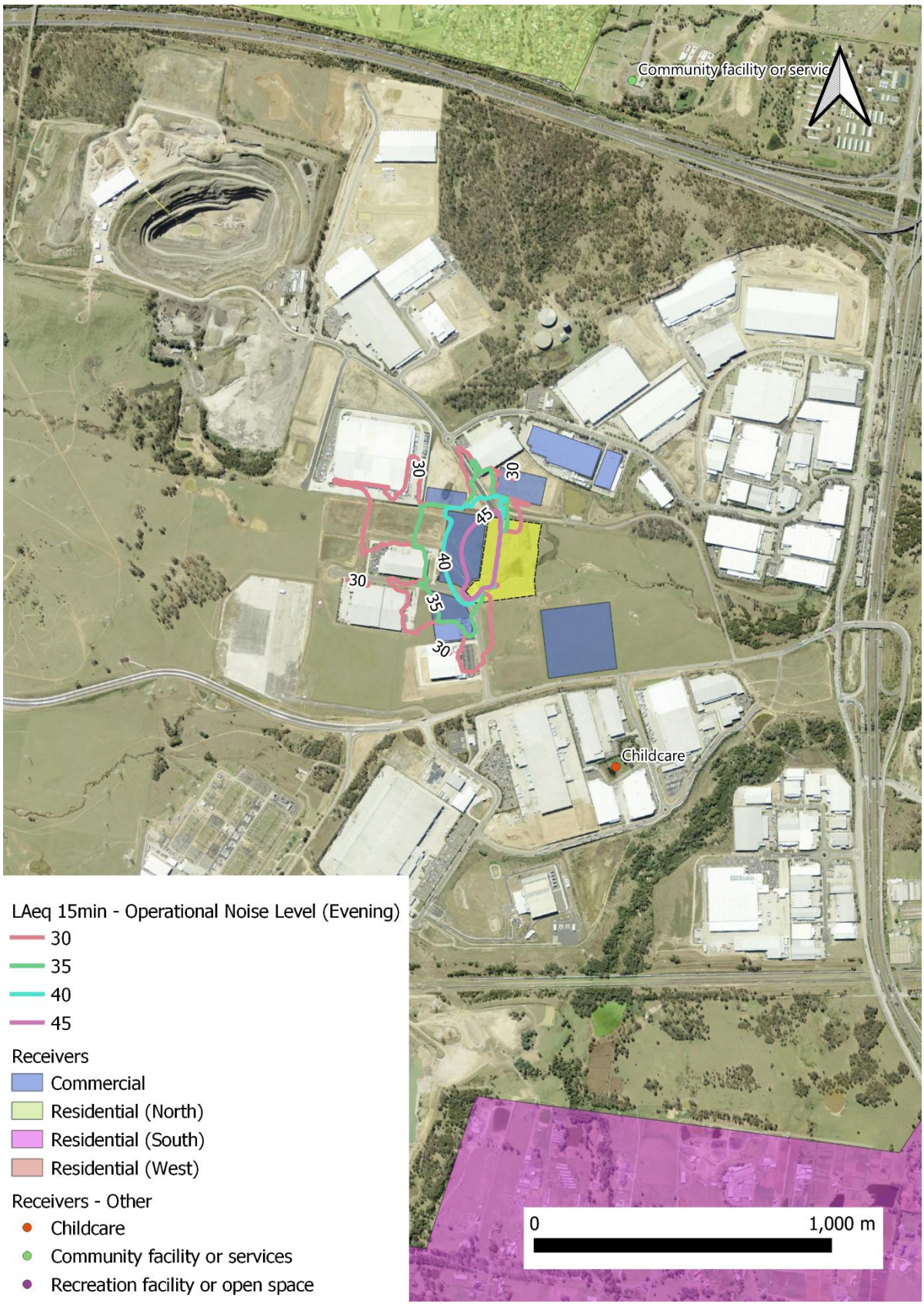

Table 3-9 Operational Levels - Eve

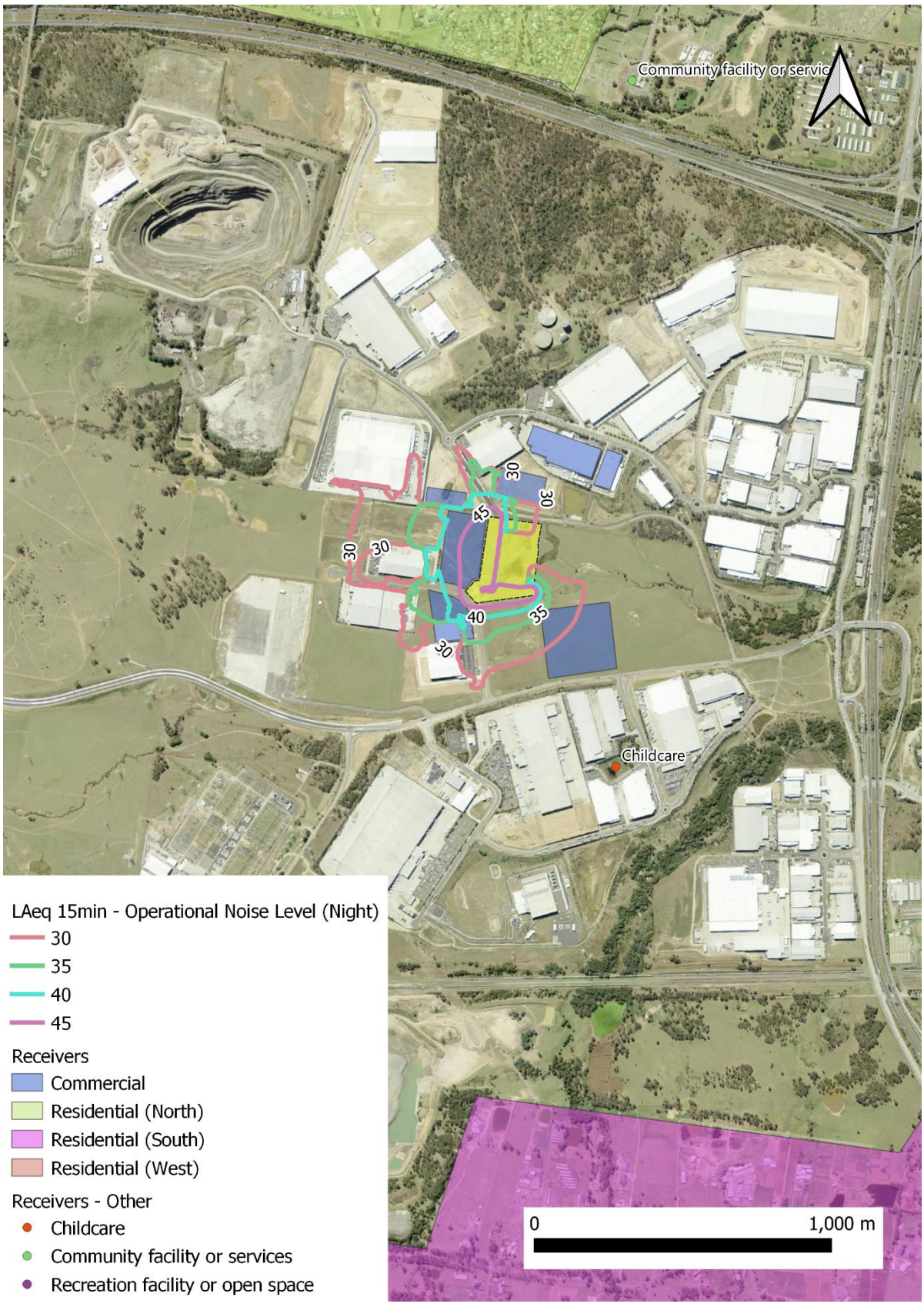

Table 3-10 Operational Levels - Night

3.11 Assessment Criteria for Road Traffic Noise

The NSW Road Noise Policy (2011) was released by the EPA to replace the Environmental criteria for road traffic noise (1999) from 1 July 2011. The key provisions of the policy are an emphasis on the use of land use planning, better road design and vehicle noise emission control to avoid or minimise road traffic noise impacts. The assessment criteria for residences potentially affected by additional traffic generated by land use developments on arterial and sub-arterial roads are summarised in Table 3-11

Table 3-11 Road traffic noise assessment criteria for residential land uses

Road category	Type of project/land use	Assessment criteria – dB(A)	
		Day (7 a.m.–10 p.m.)	Night (10 p.m.–7 a.m.)
Freeway/ arterial/ sub-arterial roads	1. Existing residences affected by noise from **new** freeway/arterial/sub-arterial road corridors	$L_{Aeq, (15\ hour)}$ 55 (external)	$L_{Aeq, (9\ hour)}$ 50 (external)
	2. Existing residences affected by noise from **redevelopment** of existing freeway/arterial/sub-arterial roads 3. Existing residences affected by **additional traffic** on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq, (15\ hour)}$ 60 (external)	$L_{Aeq, (9\ hour)}$ 55 (external)
Local roads	4. Existing residences affected by noise from **new** local road corridors 5. Existing residences affected by noise from **redevelopment** of existing local roads 6. Existing residences affected by **additional traffic** on existing local roads generated by land use developments	$L_{Aeq, (1\ hour)}$ 55 (external)	$L_{Aeq, (1\ hour)}$ 50 (external)

Where predicted noise levels exceed the project-specific noise criteria, an assessment of all feasible and reasonable mitigation options should be considered. The RNP states that an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person.

3.12 Road Traffic Noise Assessment

The traffic study prepared for a warehousing development of similar size (over 26,000m2) projected a traffic generation of 52vtph based on the RMS Technical Direction TDT 2013-4b.

Road traffic generated by the proposal travels directly between the site and the arterial road network (M4 and M7 motorways) via Honeycomb Drive and Wonderland Drive and in the future Archibold Road. There are no residential or other noise sensitive assessment locations located along these roads.

Based upon the estimated traffic projection, the additional traffic generated by the proposed warehouse development will not result in any significant increase in the existing levels of road traffic noise on the road network surrounding the project.

4 CONSTRUCTION NOISE AND VIBRATION IMPACT ASSESSMENT

People are usually more tolerant to noise and vibration during the construction phase of proposals than during normal operation. This response results from recognition that the construction emissions are of a temporary nature – especially if the most noise-intensive construction impacts occur during the less sensitive daytime period. For these reasons, acceptable noise and vibration levels are normally higher during construction than during operations.

Construction often requires the use of heavy machinery which can generate high noise and vibration levels at nearby buildings and receivers. For some equipment, there is limited opportunity to mitigate the noise and vibration levels in a cost-effective manner and hence the potential impacts should be minimised by using feasible and reasonable management techniques.

At any particular location, the potential impacts can vary greatly depending on factors such as the relative proximity of sensitive receivers, the overall duration of the construction works, the intensity of the noise and vibration levels, the time at which the construction works are undertaken and the character of the noise or vibration emissions.

The following section details the assessment of potential noise and vibration impacts associated with the construction of the Project. Construction noise goals have been determined based on the relevant government guidelines and industry standards. Potential noise levels have been predicted at sensitive receivers for expected activities and where levels are above the goals, feasible and reasonable noise mitigation measures are considered.

4.1 Interim Construction Noise Guideline (DECC, 2009)

The NSW EPA *Interim Construction Noise Guideline (ICNG)* requires project-specific Noise Management Levels (NMLs) to be established for noise affected receivers. In the event construction noise levels are predicted to be above the NMLs, all feasible and reasonable work practices are investigated to minimise noise emissions.

Having investigated all feasible and reasonable work practices, if construction noise levels are still predicted to exceed the NMLs then the potential noise impacts would be managed via site specific construction noise management plans, to be prepared in the detailed design phase.

Table 4-2 details the *ICNG* noise management levels.

Table 4-1: Interim Construction Noise Guideline criteria

Time of day	Management level $L_{Aeq\ (15\ min)}$ *	How to apply
Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured $L_{Aeq\ (15\ min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences 2. if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected RBL + 5 dB	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community. • For guidance on negotiating agreements see section 7.2.2.

In addition, the following construction noise management levels $L_{Aeq,15min}$ are recommended for other receivers in the area:

- Industrial premises: external $L_{Aeq,15min}$ 75dBA
- Passive recreation areas: external $L_{Aeq,15min}$ 60dBA
- Classrooms at schools and other educational institutions internal $L_{Aeq,15min}$ 45dBA

Based on the above, Table 7-1 presents the applicable noise management levels for construction activities at surrounding receivers that have been adopted for all applications.

Table 4-2 Site-specific construction Noise Management Levels

Location	Construction Noise Management Level (NMLs) - $L_{Aeq,15min}$				Highly Noise Affected Noise Level – $L_{Aeq,15min}$
	Day Standard Hours[1]	Day OOH	Evening OOH[2]	Night OOH[3]	
Residential	45	40	35	35	75
Industrial	75 external	-	-	-	-
Community facility	60 external	-	-	-	-
Childcare	45 internal	-	-	-	-

Note 1: Standard Hours (7am – 6pm Monday to Friday, 8am – 1am Saturday with no work on Sundays or Public Holidays)

Note 2: Evening OOH (6pm – 10pm)

Note 3: Night OOH (10pm – 7am

4.2 Proposed Construction Activities

This report provides an assessment of the potential noise and vibration impacts associated with the proposed activities required for the construction of the project and supporting road network. Site-specific construction and traffic management plan is to be prepared by the Civil Contractor prior to commencing works.

4.2.1 Proposed Works

The construction noise and vibration assessment has considered the following construction activities:

Stage 1 - *Site Clearing*

Large excavators, dozers, loaders and trucks will be used during the site clearing period.

Stage 2 - *Bulk Earthworks*

Large excavators, dozers, loaders and trucks will be used for the bulk excavation period. It is estimated that approximately 60 truck movements will be required per day during this period.

Stage 3 - *Road and Hardstand Construction*

Road and hardstand construction equipment including loaders, graders, backhoes, rollers and asphalt pavers will be used to construct the hardstands, internal driveways and parking areas. Piling rigs will be used during this phase.

Stage 4 - *Warehouse Construction*

Warehouse construction will include the use of concrete trucks, concrete pumps, forklifts, cranes, hand tools and other equipment.

4.2.2 Construction Hours

It is our understanding that all construction work will be conducted during standard daytime construction hours of Monday to Friday 7.00am to 6.00pm and Saturday 8.00am to 1.00pm. If Out-of-Hours Works (OOHWs) are required (for emergency works, oversized equipment delivery, etc) it is likely that they would require separate approval and will be assessed on a case-by-case basis.

4.3 Construction Noise Modelling

Noise modelling of the development site was undertaken using the CONCAWE noise prediction algorithm in the SoundPLAN V8.2 modelling package.

Maximum sound power levels (SWLs) for the typical operation of construction equipment applied in the modelling are listed in Table 4-3. To assess construction noise levels against the NMLs, the maximum noise levels have been converted to equivalent $L_{Aeq,15min}$ noise emissions.

Table 4-3 Construction Noise Sources

Phase	Equipment	Operating minutes in 15-min period	No. of Items	Sound Power Level (dB)		
				Maximum Item (SWL)	L_{Aeq} Activity	L_{Amax} Activity
Site Clearing	Excavator – Breaker[1]	7.5	1	124	**118**	120
	Excavator (20-30T)	15	4	100		
	Loader	15	3	106		
	Dozer	15	3	110		
	Graders	15	2	108		
	Watercart	15	1	98		
	Truck and Dog	15	10	98		
Bulk Earthworks	Excavator – Breaker[1]	7.5	1	124	**121**	124
	Excavator (20-30t)	15	5	100		
	Loader	15	5	106		
	Dozer	15	4	110		
	Grader	15	4	108		
	Watercart	15	1	98		
Road and Hardstand Construction	Loader	15	1	106	**116**	119
	Graders	15	2	108		
	Backhoe (7.5t)	15	3	102		
	Watercart	15	1	98		
	Road Profiler	15	1	107		

Phase	Equipment	Operating minutes in 15-min period	No. of Items	Sound Power Level (dB)		
				Maximum Item (SWL)	L_{Aeq} Activity	L_{Amax} Activity
	Asphalt Paver	15	1	111		
	Truck and Dog	15	5	98		
Warehouse Construction	Concrete Truck / Pump	7.5	3	106	**111**	119
	Crane Truck	15	2	100		
	Forklift	15	3	101		
	Hand Tools	7.5	5	97		

Note 1: Includes a 5 dB correction as classed 'annoying' under the *ICNG.*

Consistent with the requirements of the *ICNG*, and to inform the scheduling of construction activity and management of noise during the detailed design phase, the construction noise impacts are based on a worst-case assessment. The *ICNG* recommends that the realistic worst-case or conservative noise levels from the source should be predicted for assessment locations representing the most noise exposed residences or other sensitive land uses. For each receiver area the noise levels are predicted at the most noise-exposed location, which would usually be the closest receiver.

For most construction activities, it is expected that the construction noise levels would frequently be lower than predicted at the most-exposed receiver as the noise levels presented in this report are based on a realistic worst-case assessment.

4.4 Predicted Construction Noise Impacts

In the area surrounding the development site, the noise impacts have been quantitatively assessed for several construction activities.

The typical $L_{Aeq,15min}$ noise levels at the surrounding noise sensitive receivers are provided in Table 4-3 for each of the construction activities and are representative of the 'noisiest' construction periods allowing for the simultaneous operation of noise intensive construction plant in close proximity.

Table 4-4 : Predicted construction noise impacts

Stage	Receiver	Noise Level – $L_{Aeq,15min}$ – dBA		
		NML Day Standard Hours	Worst-case Predicted	Exceedance
Site Establishment and Clearing	North	45	28	-
	South	45	29	-
	West	45	25	-
	Industrial	70	57	-
	Community facility	60	25	-
	Childcare	45	31	-
Bulk Excavation	North	45	31	-
	South	45	32	-
	West	45	28	-
	Industrial	70	60	-
	Community facility	60	28	-
	Childcare	45	34	-
Road and Hardstand Construction	North	45	26	-
	South	45	27	-
	West	45	23	-
	Industrial	70	55	-
	Community facility	60	23	-
	Childcare	45	29	-
Warehouse Construction	North	45	21	-
	South	45	22	-
	West	45	18	-
	Industrial	70	50	-
	Community facility	60	18	-
	Childcare	45	24	-

No exceedances are predicted at any receivers during all construction stages.

5 CONCLUSION

An assessment of the noise impact associated with the operation of a new warehouse development located at Lot 1 Eastern Creek Drive, Eastern Creek has been undertaken. This assessment has been carried out in accordance with NSW regulatory requirements and this report forms part of the SSDA submission (SSD-30923027).

The proposed warehouse facility is located within an industrial area consisting largely of warehousing operations. There are no residential receivers nearby, with the closest areas being located at a distance of approximately 1.5km from the site.

The site is located in close proximity to the M7 and M4 Motorways and the surrounding road network carries a high percentage of heavy vehicles due to the largely industrial nature of the area.

Operational noise emissions from the facility will be inaudible above the prevailing ambient at residential receiver areas to the north, south and west.

Operational noise emissions to surrounding industrial properties will achieve the amenity limits recommended under the NSW NPfI.

Road traffic on the surrounding road network is unlikely to increase as a result of the proposed warehouse operations.

Construction noise impacts are predicted to be below Noise Management Levels at all receivers, during all stages of construction.

In conclusion, the proposed development can be supported on the basis of acoustics.