

# CONSTRUCTION NOISE AND VIBRATION MANAGEMENT SUB-PLAN

St Marys Intermodal

Pacific National

SSD 7308

Rev #	Name	Organisation	Signed	Date
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## Amendment Record Sheet

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00	28/05/2020	Talitha Judge and Hadi Khairuddin	Initial draft for review
01	29/05/2020	Talitha Judge	Draft for consultation
02	30/06/2020	Talitha Judge	Response to DPIE Consultation
03	08/07/2020	Tim Stubbs	Response to DPIE comments
04	30/07/2020	Hadi Khairuddin	Response to DPIE comments
05	18/11/2020	Tim Stubbs	Updated to reflect Modification 2 and 3.
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08	16/02/21	Tim Stubbs	Updated to reflect DPIE review comments
09	10/03/2021	Tim Stubbs	Updated in response to DPIE comments

Talitha Judge is an experienced environmental manager who has managed noise and vibration issues on a range of SSI projects across NSW.

Hadi Khairuddin has over 12 years experience as an environmental manager and has up to four years experience as an acoustic consultant, including development of noise and vibration management plans, preparation of noise and vibration impact assessment and providing acoustic advice to a range of SSI and SSD projects in NSW.

*This document was prepared for the sole use by McMahon Services Group and the regulatory agencies that are directly involved in this project, the only intended beneficiaries of our work. No other party should rely on the information contained herein without the prior written consent of McMahon Services Group 2017.*

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## Acronym and Definitions

Acronym/ Definition	Expanded Text
A1055	Standards Australia AS1055–1997™ – Description and Measurement of Environmental Noise
AADT	Annual average daily traffic
AMMM	Additional Mitigation Measures Matrix
AVATG	NSW EPA guideline Assessing Vibration: A Technical Guideline
AS2436	Standards Australia AS 2436–2010™ – Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites.
BS 7385	British Standard BS7385: Part 2-1993 - Evaluation and Measurement for Vibration in Buildings – Part2 – Guide to Damage Levels from Ground-borne Vibration, dated 1993.
CCS	Community and Communication Strategy
CNVIS	Construction Noise and Vibration Impact Statement
CNVMSP	Construction Noise and Vibration Management Sub-Plan
CoC	Condition of Development Consent
Construction	<p>All physical work to enable operation including but not limited to the carrying out of works for the purposes of the development, including bulk earthworks and erection of buildings and other infrastructure permitted by this consent, but excluding the following:</p> <ul style="list-style-type: none"> <li>• building and road dilapidation surveys;</li> <li>• investigative drilling or investigative excavation;</li> <li>• Archaeological Salvage;</li> <li>• establishing temporary site offices (in locations identified by the conditions of this consent);</li> <li>• installation of environmental impact mitigation measures, fencing, enabling works; and</li> <li>• minor adjustments to services or utilities.</li> </ul> <p>However, where heritage items, or threatened species or threatened ecological communities (within the meaning of the <i>Biodiversity Conservation Act 2016</i> or <i>Environment Protection and Biodiversity Conservation Act 1999</i>) are affected or potentially affected by any physical work, that work is construction, unless otherwise determined by the Planning Secretary in consultation with EES Group or DPIE Fisheries (in the case of impact upon fish, aquatic invertebrates or marine vegetation)</p>
Day	The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays
DECC	NSW Department of Environment and Climate Change – NSW Interim Construction

	Noise Guideline, July 2009.
DECCW	NSW Department of Environment, Climate Change and Water
DPIE	NSW Department of Planning, Industry and Environment
EIS	The Environmental Impact Statement titled St Marys Freight Hub Environmental Impact Statement, prepared by Urbanco and SITE Planning + Design dated 21 May 2019, submitted with the application for consent for the development, including any additional information provided by the Applicant in support of the application
EM	Environment Manager
EMS	Environmental Management System
Environment	Includes all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her social groupings
EPA	NSW Environmental Protection Authority
EPL	Environmental Protection License under the POEO Act
ER	Environmental Representative
Evening	The period from 6pm to 10pm
ICNG	NSW Department of Environment and Climate Change – NSW Interim Construction Noise Guideline, July 2009.
IEC60942	Standards Australia AS/IEC 60942:2004/IEC 60942:2003 – Australian Standard™ – Electroacoustic – Sound Calibrators.
Incident	An occurrence or set of circumstances that causes, or threatens to cause, material harm and which may or may not be, or cause, a non-compliance <i>Note: “material harm” is defined in this consent</i>
INP	NSW Environment Protection Authority – NSW Environmental Noise Management – Industrial Noise Policy, January 2000 and relevant application notes.
LA90	Background Noise Level
LAeq	Equivalent Continuous Sound Level
LAeq, 15minute	Equivalent Continuous Sound Level, over a period of 15 minutes
LGA	Local Government Area
LP or SPL	Sound Pressure Level
LW or SWL	Sound Power Level
Material harm	Is harm that: a) involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial; or

	b) results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment
Minister, the	NSW Minister for Planning and Public Spaces (or delegate
Mitigation	Activities associated with reducing the impacts of the development prior to or during those impacts occurring
mm/s	Millimetres per second
m/s	Metres per second
NCA	Noise Catchment Area
Night	The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays
NPI	NSW Environment Protection Authority, Noise Policy for Industry. 2017
Non-compliance	An occurrence, set of circumstances, or development that results in a non-compliance or is non-compliant with Development Consent Conditions of Consent or EPBC Act Approval (EPBC 2011/6229) Conditions of Approval but is not an incident
Non-conformance	Observations or actions that are not in strict accordance with the CEMP and the aspect specific sub-plan.
NSW Vibration Guideline, the	NSW Department of Environment and Conservation – NSW Environmental Noise Management – Assessing Vibration: a Technical Guideline (the NSW Vibration Guideline), February 2006.
NVIA	Noise and Vibration Impact Assessment
NVSRs	Noise and Vibration Sensitive Receivers
OEH	Office of Environment and Heritage
OOHW	Out of Hours Works
PC	Principal Contractor
POEO Act	Protection of the Environment Operations Act 1997.
PPV	Peak Particle Velocity (in mm/s)
RBL	Rating Background Noise Level
Reasonable	Means applying judgement in arriving at a decision, taking into account: mitigation, benefits, costs of mitigation versus benefits provided, community views, and the nature and extent of potential improvements.
RMM	SSD 7308 Revised Management and Mitigation Measures
RNP	NSW Department of Environment, Climate Change and Water – NSW Road Noise Policy, March 2011.



SR	Sensitive Receiver
SSD	State Significant Development
TfNSW	Transport for New South Wales
the Project	St Marys Intermodal Development (Construction stage)
VDV	Vibration Dose Value (in m/s <sup>1.75</sup> )

## 1. Introduction

### 1.1. Background

Pacific National received approval for the construction and operation of St Marys Intermodal Freight Hub on 9 March 2020 (SSD 7308). Pacific National also received approval for Modification 2 to SSD-7308 on 21 September 2020 and Modification 3 to SSD-7308 on 29 October 2020. Modification 4 to SSD 7308 was approved on 17 December 2020 and Modification 1 was approved on 29 January 2021.

This Construction Noise and Vibration Management Sub-Plan (CNVMSP) has been developed to manage impacts to the existing acoustical environment during the construction of St Marys Intermodal Project (hereafter referred to as the Project). Within this plan, a strategy has been established to demonstrate the McMahon's approach to the management of construction noise and vibration impact. The CNVMSP also accounts for requirements of the Project. This CNVMSP addresses the relevant requirements of the Project Approvals, including the Environmental Impact Statement (EIS), Response to Submissions Report (RtS) and Minister's Conditions of Consent (CoC), and all applicable guidelines and standards specific to the management of noise and vibration during construction of the Project. It is noted that were there is inconsistency between the CoC and obligations under the EIS or RtS, the requirements of the CoC prevail.

#### 1.1.1. Project Overview

The Development includes Construction and operation of the St Marys intermodal (road and rail) terminal and container park.

The broader site is described as:

- Lot 2 DP 876781;
- Lot 3 DP 876781;
- Lot 196 DP 31912.
- Lot 2031 DP 815293

Construction activities including:

- hardstand area for container storage and laydown, rail and vehicle loading and unloading areas
- new internal access roads providing separate ingress and egress for light and heavy vehicles as follows:
  - to/from Lee Holm Road for light vehicles
  - to/from Forrester Road for heavy vehicles
- wash bay area
- office building pad site
- fuel storage area
- container workshop (repair bay) pad site
- transport workshop pad site staff and visitor light vehicle parking bays
- heavy vehicle parking bays
- re-lay the existing rail sidings (x2) within the existing rail corridor
- upgrade two existing level crossings and construct a 3.5 m wide one-way access track from the terminal level crossing adjacent to siding 2, to transport locomotive drivers and undertake maintenance inspections
- construct stormwater management facilities and discharge outlets
- establish a temporary construction compound to support rail refurbishment works

Ancillary development including:

- signage and landscaping
- utility services to support the proposed development including drainage, potable water, water (for firefighting purposes), power, data, security and sewerage
- minor realignment of a section of the Sydney Trains high voltage overhead power line at the southern end of the subject site
- minor clearing of areas of vegetation regrowth, remediation and minor earthworks
- electrical transformer.

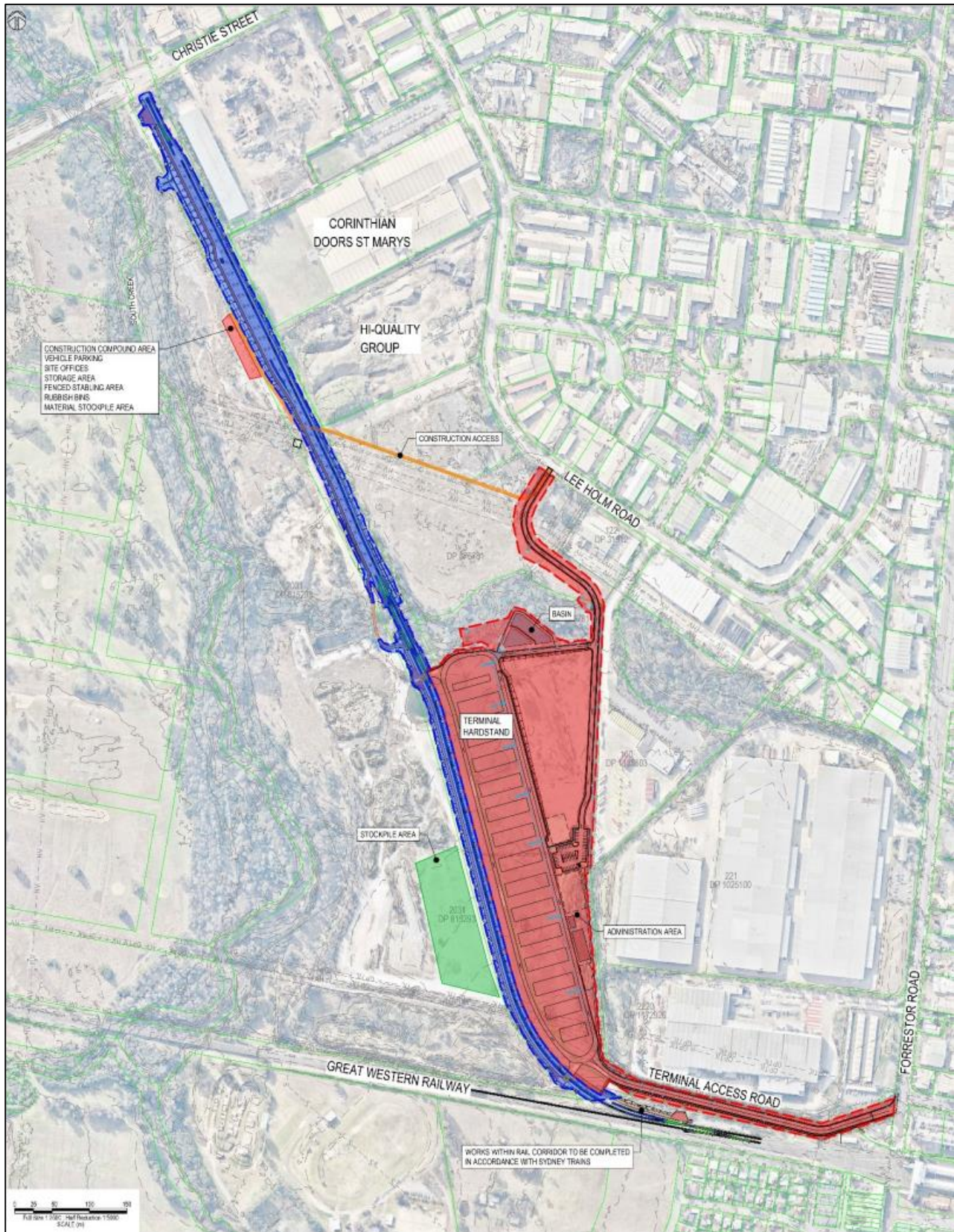


Figure 2 Development Layout

Source: Modification Proposal to SSD-7308, Appendix 1 Development Layout.



### 1.1.2. Environmental Planning Approval

The Project has been assessed by the Department of Planning, Industry and Environment (DPIE) under Division 4.38 of the Environmental Planning and Assessment Act 1979 (EP&A Act) as State Significant Development (SSD). The Minister for Planning and Public Spaces granted Approval for the Project on 9 March 2020 and is subject to the Minister's Conditions of Consent (CoC) SSD 7308.

The development may only be carried out in accordance with CoC A2 and as per Development layout provided in Annexure A, Compliance with the conditions of the Consent, in accordance with all written directions of the Planning Secretary and generally in accordance with the EIS and Response to Submissions.

The Project, its impacts, consultation and mitigation were documented in the following documents relevant to construction noise and vibration:

- State Significant Development Application SSD 7308
- St Marys Freight Hub Environmental Impact Statement, prepared for Pacific National by Urbanco May 2019 (EIS)
- St Marys Freight Hub Noise and Vibration Impact Assessment, prepared for Pacific National by Aecom on dated March 2019 (NVIA).
- St Marys Freight Hub Noise and Vibration Impact Assessment – Post Response to Submissions – prepared for Pacific National by Aecom on dated February 2020
- St Marys Freight Hub Response to Submissions Report, prepared for Pacific National by Urbanco October 2019 (RtS)

The St Marys Freight Hub EIS (Urbanco 2019) assessed the impacts of construction and operation of the Project on Noise and Vibration, within Section 9.5 (Noise and Vibration).

The EIS identified that although no residents will be highly affected, construction noise levels are predicted to exceed construction noise management levels. This is anticipated to affect nearby residents (Kalang Avenue and Camira Street) during construction of the Project.

The CoC requirements relevant to this Sub-Plan are summarised below in Section 3.4.

### 1.2. Modification 2 – Minor amendments to layout & office building

In accordance with section 5.25 of the EP&A Act, SSD 7308 issued for the Project was modified to:

- incorporate construction and use of an administration office building in the approved site;
- swap the approved locations of the car park and future container repair workshop site;
- move the light vehicle entry at Lee Holm Road approximately 50 metres to the northwest; and
- change the required tree pot container size requirements under condition B33.

The modification assessment report included assessment of the potential noise and vibration impacts associated with the proposed changes. The assessment identified that there were no significant changes the previously assessed noise impacts.

### 1.3. Modification 3 – Stockpile site and development layout boundary

In accordance with section 5.25 of the EP&A Act, SSD 7308 issued for the Project was modified to:

- revise the development layout boundary of the intermodal facility (see Figure 2);
- include a stockpile site; and
- include additional land owned by Pacific National.

The modification assessment report included assessment of the potential noise and vibration impacts associated with the proposed changes. Construction noise for the stockpile area was assessed as part of the initial EIS which identified that there were no significant impacts on nearby residential receivers for the stockpile site.

#### **1.4. Modification 4 – Revise condition B36 to the development consent**

In accordance with section 4.55 (1A) of the EP&A Act, SSD 7308 issued for the Project was modified to:

- revise condition B36 of the development consent.

B36 is a stormwater related condition and so its modification has no relevance for noise and vibration impacts.

#### **1.5. Modification 1 – Rail refurbishment works**

In accordance with section 4.55 (2) of the EP&A Act, SSD 7308 issued for the Project was modified to include the following amendments:

- re-lay the existing rail sidings (x2) within the existing rail corridor
- upgrade an existing level crossing and construct a 3.5 m wide one-way access track from the terminal level crossing adjacent to siding 2, to transport locomotive drivers and undertake maintenance inspections
- construct stormwater management facilities and discharge outlets
- establish a temporary construction compound to support rail refurbishment works
- revise the development layout boundary to include the rail refurbishment works area.

The Modification 1 Assessment Report indicates that the Department considers that construction noise associated with the rail refurbishment works can be actively managed through implementation of best practice management measures set out in this CNVMSP as originally approved.

#### **1.4. Context**

This CNVMSP forms part of the Construction Environmental Management Plan (CEMP) for the St Marys Intermodal Project (the Project). The CEMP is the overarching document in the Environmental Management System (EMS) for the Project.

This Plan has been prepared to address the requirements of the Minister's Conditions of Consent (CoC), the St Marys Freight Hub EIS, the Revised Management and Mitigation Measures (RMM) listed in the St Marys Freight Hub Response to Submissions Reports and all applicable guidance and legislation. It is noted that were there is inconsistency between the CoC and obligations under the EIS or RtS, the requirements of the CoC prevail.

Implementing the CEMP and sub-plans effectively will enable the Project to meet the requirements of the Minister's CoC, and the RMMs.

#### **1.5. Scope**

The scope of this Plan is to describe how McMahon Services proposes to manage noise and vibration impacts during construction of the Project. Operational noise and vibration management measures do not fall within the scope of this Plan and therefore are not included within the processes contained within this Plan.

## 2. Purpose and Objectives

### 2.1. Purpose

The CEMP and associated sub-plans have been prepared to outline and describe how McMahon's will, during construction of the Project, comply with the NSW Minister for Planning's Conditions of Consent (CoC). Additionally, it outlines how McMahon's will minimise environmental risks and achieve environmental outcomes on the Project by providing a structured approach to ensure appropriate Environmental management measures and controls are implemented.

Per the requirements under CoC B14, this CNVMSP will include:

- Description of procedures for achieving the noise management levels in EPA's *Interim Construction Noise Guideline* (DECC, 2009);
- Description of measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;
- Strategies that have been developed with the community for managing high noise generating works;
- Description of the community consultation undertaken to develop the strategies in CoC B14(d);
- Complaints management system that would be implemented for the duration of the construction; and
- Program to monitor and report on the impacts and environmental performance of the development and the effectiveness of the management measures in accordance with the requirements outlined under CoC B10.

This plan has been prepared to be in accordance with the Environmental Management Plan Guideline: *Guideline for Infrastructure Projects* (DPIE, April 2020).

### 2.2. Environmental Objectives

The key objective of this CNVMSP is to ensure all CoC, RMMs and license/permit requirements relevant to noise and vibration management are described, scheduled and assigned responsibility as outlined in:

- The EIS prepared for St Mary's Intermodal,
- The response to submissions prepared for St Mary's Intermodal,
- Conditions of Consent granted to the Project on 7 May 2020,
- MOD 2 - SSD-7308 approved 21 September 2020
- MOD 3 - SSD-7308 approved 29 October 2020
- MOD 4 - SSD-7308 approved 17 December 2020
- MOD 1 - SSD-7308 approved 29 January 2021
- All relevant legislation and other requirements described in Section 3.1 of this Plan.

It is noted that were there is inconsistency between the CoC and obligations under the EIS or RtS, the requirements of the CoC prevail.

### 2.3. Environmental Performance Outcomes and Targets

The desired environmental performance outcome for noise and vibration management, as outlined and addressed in the EIS, is that noise and vibration impacts generated during the construction of the Project are managed and mitigated in a manner that protects environmental values.

To achieve this outcome, McMahon Services is committed to the following high level performance outcome objectives see Table 1.

Table 1 Performance objectives and outcomes

Objective	Target Outcome
Ensure that reasonable and feasible mitigation measures are implemented to manage impacts on surrounding residents and commercial stakeholders.	Compliance with noise and vibration requirements for all works within standard approved hours of work and/ or outside of hours
Ensure that affected residents and other stakeholders are kept informed of upcoming works, out of hours works (if required) and mitigation measures to ensure “no surprises”	Ongoing Communication of Project specific Environmental mitigation measures e.g. toolboxes, Environmental Control Maps
Regularly identify and implement opportunities for improved environmental performance.	Regular Environmental Inspections carried out to identify room for improvement
Promote within the Project team and sub-contractors a culture of shared responsibility for positive Environmental Performance and compliance.	Reporting of any incidents, non conformances and or non compliances
Ensure all works, where possible, are undertaken during standard approved hours of work.	Any noise and vibration related actions raised e.g. from inspections, audits, incidents have been addressed within required timeframes.
	No structural or cosmetic damage to nearby buildings or structures due to Project related vibration.
	Complaints made by the community regarding noise or vibration are minimal and are resolved in a timely manner.
	No show cause requests and/or prosecutions
	Regular CEMP and SubPlan reviews to capture learnings, updates and improvements



### 3. Environmental Requirements

#### 3.1. Legislation

In NSW, noise pollution is typically regulated through the Protection of the Environment Operations Act 1997 (POEO Act) as the key piece of environment protection legislation. Noise pollution is defined under the POEO Act as:

‘the emission of offensive noise, which means noise that by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances, is harmful (or is likely to be harmful) to or interferes unreasonably (or is likely to interfere unreasonably) with the comfort or repose of a person outside the premises from which the noise is emitted’.

Under the POEO Act, the ‘POEO (Noise Control) Regulation 2008’ does not specify noise limits and an applicable approach for the assessment of construction noise. Various construction noise and vibration assessment guidelines (and policy) are endorsed by NSW regulators and provide a framework and methodology for deriving acceptable levels and standard methods for assessing, managing and measuring construction noise and vibration impacts with due regard to the POEO Act. For the CNVMSP the applicable policy and guidelines are presented in Section 3.3 below. Relevant provisions of the above legislation are explained in the legal and compliance tracking register included in Annexure A1 of the CEMP.

#### 3.2. Environmental Protection License

No Environmental Protection license will be issued by NSW EPA for this Project.

#### 3.3. Guidelines and Standards

The CNVMSP has been prepared with due regard to and in accordance with the NSW Department of Environment and Climate Change – NSW Interim Construction Noise Guideline (ICNG), July 2009. The ICNG is the key guideline relating to construction noise and vibration in NSW. The CNVMSP has also considered and applied the following additional policy, guidelines and standards as relevant:

- NSW EPA’s Interim Construction Noise Guideline (ICNG, 2009);
- NSW EPA – Noise Policy for Industry (NPI), October 2017;
- NSW DECCW – NSW Road Noise Policy (RNP), March 2011;
- NSW DPIE – Environmental Management Plan Guideline 2020
- Standards Australia AS 2436–2010™ (AS2436) – Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites;
- Standards Australia AS1055–1997™ (AS1055) – Description and Measurement of Environmental Noise;
- NSW DEC – Environmental Noise Management – Assessing Vibration: a Technical Guideline (the NSW Vibration Guideline), February 2006.
- Standards Australia AS IEC 61672.1–2004™ (AS61672) – Electro Acoustics - Sound Level Meters Specifications Monitoring or Standards Australia AS1259.2-1990™ (AS1259) – Acoustics – Sound Level Meters – Integrating/Averaging as appropriate to the device;
- Standards Australia AS/IEC 60942:2004/IEC 60942:2003 (IEC60942) – Australian Standard™ – Electroacoustic – Sound Calibrators;

- DIN 4150-3 (1992-02) Structural vibration – Effects of vibration on structures (German Institute for Standardization, 1999);
- British Standard BS7385: Part 2-1993 (BS 7385) - Evaluation and Measurement for Vibration in Buildings — Part 2 – Guide to Damage Levels from Ground-borne Vibration, dated 1993.

### 3.4. Minister's Conditions of Consent

The requirements of the Planning Approval relevant to this plan are shown in Table 2 CoC requirements for this plan, with cross reference to indicate where requirements are addressed.

Table 2 CoC Requirements for this plan

CoC	Requirement	Document Reference																																				
A1	In addition to meeting the specific performance measures and criteria in this consent, all reasonable and feasible measures must be implemented to prevent, and, if prevention is not reasonable and feasible, minimise any material harm to the environment that may result from the construction and operation of the development.	Section 8																																				
A2	<p>The development may only be carried out:</p> <ul style="list-style-type: none"><li>(a) in compliance with the conditions of this consent;</li><li>(b) in accordance with all written directions of the Planning Secretary;</li><li>(c) generally in accordance with the EIS and Response to Submissions;</li><li>(d) in accordance with the Development Layout in <b>Appendix 1</b>; and</li><li>(e) in accordance with the revised management and mitigation measures in <b>Appendix 3</b>;</li><li>(f) <a href="#">in accordance with the approved plans in the table below</a>:</li></ul> <table><tr><th colspan="4"><a href="#">Architectural Drawings prepared by Kit Handley Architects Pty Ltd</a></th></tr><tr><th><a href="#">Dwg No.</a></th><th><a href="#">Rev</a></th><th><a href="#">Name of Plan</a></th><th><a href="#">Date</a></th></tr><tr><td><a href="#">A101</a></td><td><a href="#">1</a></td><td><a href="#">Proposed Site &amp; Roof Plan</a></td><td><a href="#">17/04/20</a></td></tr><tr><td><a href="#">A102</a></td><td><a href="#">1</a></td><td><a href="#">Proposed G &amp; L1 Floor Plan</a></td><td><a href="#">17/04/20</a></td></tr><tr><td><a href="#">A103</a></td><td><a href="#">1</a></td><td><a href="#">Proposed Electrical Plan</a></td><td><a href="#">17/04/20</a></td></tr><tr><td><a href="#">A104</a></td><td><a href="#">1</a></td><td><a href="#">Proposed Elevations</a></td><td><a href="#">17/04/20</a></td></tr><tr><td><a href="#">A105</a></td><td><a href="#">1</a></td><td><a href="#">Proposed Elevation &amp; Sections</a></td><td><a href="#">17/04/20</a></td></tr><tr><td><a href="#">A106</a></td><td><a href="#">1</a></td><td><a href="#">Proposed Group 1 Furniture Plans</a></td><td><a href="#">17/04/20</a></td></tr><tr><td><a href="#">A107</a></td><td><a href="#">1</a></td><td><a href="#">Proposed Group 2 &amp; 3 FF&amp;E</a></td><td><a href="#">17/04/20</a></td></tr></table>	<a href="#">Architectural Drawings prepared by Kit Handley Architects Pty Ltd</a>				<a href="#">Dwg No.</a>	<a href="#">Rev</a>	<a href="#">Name of Plan</a>	<a href="#">Date</a>	<a href="#">A101</a>	<a href="#">1</a>	<a href="#">Proposed Site &amp; Roof Plan</a>	<a href="#">17/04/20</a>	<a href="#">A102</a>	<a href="#">1</a>	<a href="#">Proposed G &amp; L1 Floor Plan</a>	<a href="#">17/04/20</a>	<a href="#">A103</a>	<a href="#">1</a>	<a href="#">Proposed Electrical Plan</a>	<a href="#">17/04/20</a>	<a href="#">A104</a>	<a href="#">1</a>	<a href="#">Proposed Elevations</a>	<a href="#">17/04/20</a>	<a href="#">A105</a>	<a href="#">1</a>	<a href="#">Proposed Elevation &amp; Sections</a>	<a href="#">17/04/20</a>	<a href="#">A106</a>	<a href="#">1</a>	<a href="#">Proposed Group 1 Furniture Plans</a>	<a href="#">17/04/20</a>	<a href="#">A107</a>	<a href="#">1</a>	<a href="#">Proposed Group 2 &amp; 3 FF&amp;E</a>	<a href="#">17/04/20</a>	<p>(a), (b), (c), (d), (e) Section 1.1.2</p> <p>(a) this table and Section 8</p> <p>(e) Section 8 and Annexure S</p>
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	<ul style="list-style-type: none"> <li>(g) in accordance with modification application SSD-7308-Mod-2 and supporting documentation; and</li> <li>(h) in accordance with modification application SSD-7308-Mod-3 and supporting documentation.</li> </ul>	
A11	<p>Where conditions of this consent require consultation with an identified party, the Applicant must:</p> <ul style="list-style-type: none"> <li>(a) consult with the relevant party prior to submitting the subject document for information or approval; and</li> <li>(b) provide details of the consultation undertaken including: <ul style="list-style-type: none"> <li>(i) the outcome of that consultation, matters resolved and unresolved; and</li> <li>(ii) details of any disagreement remaining between the party consulted and the Applicant and how the Applicant has addressed the matters not resolved.</li> </ul> </li> </ul>	Section 8
A23	<p>At least 48 hours before the commencement of construction until the completion of all works under this consent, or such other time as agreed by the Planning Secretary, the Applicant must:</p> <ul style="list-style-type: none"> <li>(a) make the following information and documents (as they are obtained or approved) publicly available on its website: <ul style="list-style-type: none"> <li>(i) the documents referred to in condition A2 of this consent;</li> <li>(ii) all current statutory approvals for the development;</li> <li>(iii) all approved strategies, plans and programs required under the conditions of this consent;</li> <li>(iv) regular reporting on the environmental performance of the development in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent;</li> <li>(v) a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs;</li> <li>(vi) a summary of the current stage and progress of the development;</li> <li>(vii) contact details to enquire about the development or to make a complaint;</li> <li>(viii) a complaints register, updated monthly;</li> </ul> </li> </ul>	CEMP (a)(v) & (b) Section 9.2.3 (a)(vii & viii) Section 8.1.3

## CONSTRUCTION NOISE AND VIBRATION MANAGEMENT SUB-PLAN

	<ul style="list-style-type: none"> <li>(ix) audit reports prepared as part of any independent audit of the development and the Applicant's response to the recommendations in any audit report;</li> <li>(x) any other matter required by the Planning Secretary; and</li> <li>(b) keep such information up to date, to the satisfaction of the Planning Secretary.</li> </ul>	
A24	The Applicant must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this consent relevant to activities they carry out in respect of the development.	Sections 9.1 & 8.1
A25	The Planning Secretary must be notified through the major projects portal immediately after the Applicant becomes aware of an incident. The notification must identify the development (including the development application number and the name of the development if it has one), and set out the location and nature of the incident.	Section 9.3
A26	Subsequent notification must be given and reports submitted in accordance with the requirements set out in <b>Appendix 4</b> .	Section 9.3
A27	The Planning Secretary must be notified through the major projects portal within seven days after the Applicant becomes aware of any non-compliance. The Certifier must also notify the Planning Secretary through the major projects portal within seven days after they identify any non-compliance.	Section 9.5
A28	The notification must identify the development and the application number for it, set out the condition of consent that the development is non-compliant with, the way in which it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.	Section 9.5
A29	A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.	Section 9.5
A30	<p>Within three months of:</p> <ul style="list-style-type: none"> <li>(a) the submission of a compliance report under condition B42;</li> <li>(b) the submission of an incident report under condition A25;</li> <li>(c) the submission of an Independent Audit under condition C37;</li> <li>(d) the approval of any modification of the conditions of this consent; or</li> <li>(e) the issue of a direction of the Planning Secretary under condition A3 which requires a review,</li> </ul>	Sections 9.3 & 9.7

	the strategies, plans and programs required under this consent must be reviewed, and the Planning Secretary and the Certifier must be notified in writing that a review is being carried out.	
B7	<p>No later than two weeks before the commencement of construction, or within another timeframe agreed with the Planning Secretary, a <b>Community Communication Strategy</b> must be submitted to the Planning Secretary for approval. The Community Communication Strategy must provide mechanisms to facilitate communication between the Applicant, the relevant Council and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the design and construction of the development and for a minimum of 12 months following the completion of construction.</p> <p>The Community Communication Strategy must:</p> <ul style="list-style-type: none"> <li>(a) identify people to be consulted during the design and construction phases;</li> <li>(b) set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development;</li> <li>(c) provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development;</li> <li>(d) set out procedures and mechanisms <ul style="list-style-type: none"> <li>(i) through which the community can discuss or provide feedback to the Applicant;</li> <li>(ii) to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.</li> </ul> </li> <li>(e) include any specific requirements around traffic, noise and vibration, visual impacts, amenity, flora and fauna, soil and water, contamination, heritage.</li> </ul>	Section 8.1.3
B10	<p>Management plans required under this consent must be prepared in accordance with relevant guidelines, including but not limited to the <i>Environmental Management Plan Guideline: Guideline for Infrastructure Projects</i> (DPIE, April 2020).</p> <p><b>Note:</b> The Guideline is available on the Planning Portal at:  <a href="https://www.planningportal.nsw.gov.au/major-projects/assessment/post-approval">https://www.planningportal.nsw.gov.au/major-projects/assessment/post-approval</a></p>	This Plan
B14	<p>The <b>Construction Noise and Vibration Management Sub-Plan (CNVMSP)</b> must address, but not be limited to, the following:</p> <ul style="list-style-type: none"> <li>(a) be prepared by a suitably qualified and experienced noise expert;</li> </ul>	<p>(a) Author</p> <p>(b) Sections 5.0, 7.2 &amp; 8</p>

# CONSTRUCTION NOISE AND VIBRATION MANAGEMENT SUB-PLAN

	<ul style="list-style-type: none"> <li>(b) describe procedures for achieving the noise management levels in EPA's <i>Interim Construction Noise Guideline</i> (DECC, 2009);</li> <li>(c) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;</li> <li>(d) include strategies that have been developed with the community for managing high noise generating works;</li> <li>(e) describe the community consultation undertaken to develop the strategies in condition B14(d);</li> <li>(f) include a complaints management system that would be implemented for the duration of the construction; and</li> <li>(g) include a program to monitor and report on the impacts and environmental performance of the development and the effectiveness of the management measures in accordance with the requirements outlined under condition B10.</li> </ul>	<p>(c) Sections 8.1, 3.6, 7.1</p> <p>(d) Sections 8.1, 3.6, 8.1.3</p> <p>(e) Sections 3.6, 8.1.3</p> <p>(f) Section 8.1.3</p> <p>(g) Sections 8.1, 9.2.1 – 9.2.3, 9.6 &amp; 9.7</p>
B14A	<p>Within one month of the approval of SSD-7308-MOD-1 the Construction Noise and Vibration Management Sub-Plan (CNVMSP) referred to in condition B14 is to be updated to the satisfaction of the Certifier to include any changes required to address the amendments to the development as modified by SSD-7308-MOD-1</p>	
B19	<p>A <b>Driver Code of Conduct</b> must be prepared and communicated by the Applicant to heavy vehicle drivers and must address the following:</p> <ul style="list-style-type: none"> <li>(a) minimise the impacts of earthworks and construction on the local and regional road network;</li> <li>(b) minimise conflicts with other road users;</li> <li>(c) minimise road traffic noise; and</li> <li>(d) ensure truck drivers use specified routes.</li> </ul>	<p>TPMSP with reference to in Sections 8.1</p>
B20	<p>Prior to the commencement of construction, the Applicant must provide sufficient parking facilities on-site, including for heavy vehicles and for site personnel, to ensure that construction traffic associated with the development does not utilise public and residential streets or public parking facilities.</p>	<p>Section 8.1</p>
C1	<p>A site notice(s):</p> <ul style="list-style-type: none"> <li>(a) must be prominently displayed at the boundaries of the site during construction for the purposes of informing the public of project details including, but not limited to the details of the Builder, Certifier and Structural Engineer is to satisfy the following requirements;</li> <li>(b) minimum dimensions of the notice must measure 841 mm x 594 mm (A1) with any text on the notice to be a</li> </ul>	<p>Section 8.1</p>

## CONSTRUCTION NOISE AND VIBRATION MANAGEMENT SUB-PLAN

	<p>minimum of 30-point type size;</p> <p>(c) the notice is to be durable and weatherproof and is to be displayed throughout the works period;</p> <p>(d) the approved hours of work, the name of the site/ project manager, the responsible managing company (if any), its address and 24-hour contact phone number for any inquiries, including construction/ noise complaint must be displayed on the site notice; and</p> <p>(e) the notice(s) is to be mounted at eye level on the perimeter hoardings/fencing and is to state that unauthorised entry to the site is not permitted.</p>	
C2	All construction plant and equipment used on site must be maintained in a proper and efficient condition and operated in a proper and efficient manner.	Section 8.1
C4	<p>Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:</p> <p>(a) between 7am and 6pm, Mondays to Fridays inclusive; and</p> <p>(b) between 8am and 1pm, Saturdays.</p> <p>No work may be carried out on Sundays or public holidays.</p>	Sections 7.1 & 8.1
C5	<p>Construction activities may be undertaken outside of the hours in condition C4 if required:</p> <p>(a) by the Police or a public authority for the delivery of vehicles, plant or materials; or</p> <p>(b) in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or</p> <p>(c) where the works are inaudible at the nearest sensitive receivers; or</p> <p>(d) where a variation is approved in advance in writing by the Planning Secretary or his nominee if appropriate justification is provided for the works.</p>	Sections 7.1, 7.2 & 8.1
C6	Notification of such construction activities as referenced in condition C5 must be given to affected residents before undertaking the activities or as soon as is practical afterwards.	Sections 8.1 and 8.1.3
C7	<p>Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:</p> <p>(a) 9am to 12pm, Monday to Friday;</p> <p>(b) 2pm to 5pm Monday to Friday; and</p> <p>(c) 9am to 12pm, Saturday.</p>	Section 7.1
C8	The Applicant must carry out the construction of the development in accordance with the most recent version of the approved CEMP (including Sub-Plans).	Sections 8.1 & 9.8



# CONSTRUCTION NOISE AND VIBRATION MANAGEMENT SUB-PLAN

C9	All construction vehicles are to be contained wholly within the site, except if located in an approved on-street work zone, and vehicles must enter the site or an approved on-street work zone before stopping.	Section 8.1
C10	Construction vehicles (including staff vehicles) shall be managed to: <ul style="list-style-type: none"> <li>a) minimise parking or queuing on public roads;</li> <li>b) minimise idling and queuing in local residential streets where practicable;</li> <li>c) adhere to the nominated haulage routes identified in the Construction Traffic and Pedestrian Management Sub-Plan required under condition B13; and</li> <li>d) ensure access and egress from construction compounds is undertaken in a safe and lawful manner.</li> </ul>	Section 8.1
C12	The development must be constructed to achieve the construction noise management levels detailed in <i>the Interim Construction Noise Guideline</i> (DECC, 2009). All feasible and reasonable noise mitigation measures must be implemented and any activities that could exceed the construction noise management levels must be identified and managed in accordance with the management and mitigation measures identified in the approved Construction Noise and Vibration Management Plan.	(b) Sections 5.0, 7.2 & 8
C13	The Applicant must ensure construction vehicles (including concrete agitator trucks) do not arrive at the site or surrounding residential precincts outside of the construction hours of work outlined under condition C4.	Section 8.1
C14	The Applicant must implement, where practicable and without compromising the safety of construction staff or members of the public, the use of 'quackers' to ensure noise impacts on surrounding noise sensitive receivers are minimised.	Section 8.1
C15	Vibration caused by construction at any residence or structure outside the site must be limited to: <ul style="list-style-type: none"> <li>(a) for structural damage, the latest version of <i>DIN 4150-3 (1992-02) Structural vibration - Effects of vibration on structures</i> (German Institute for Standardisation, 1999); and</li> <li>(b) for human exposure, the acceptable vibration values set out in the <i>Environmental Noise Management Assessing Vibration: a technical guideline</i> (DEC, 2006) (as may be updated or replaced from time to time).</li> </ul>	Sections 3.3, 5.2, 7.4.4 & 8.1.2
C16	Vibratory compactors must not be used closer than 30 metres from residential buildings unless vibration monitoring confirms compliance with the vibration criteria specified in condition C15.	Section 8.1
C17	The limits in conditions C15 and C16 apply unless otherwise outlined in a Construction Noise and Vibration Management Plan, approved as part of the CEMP required by condition B11 of this consent.	Section 5.2, 7.4.4 & 8.1.2



### 3.5. Revised Management and Mitigation Measures

Please refer to Table 3 for a list of the revised management and mitigation measures for the Project, per the RtS Section 7.2.

*Table 3 Relevant Revised Management and Mitigation Measures*

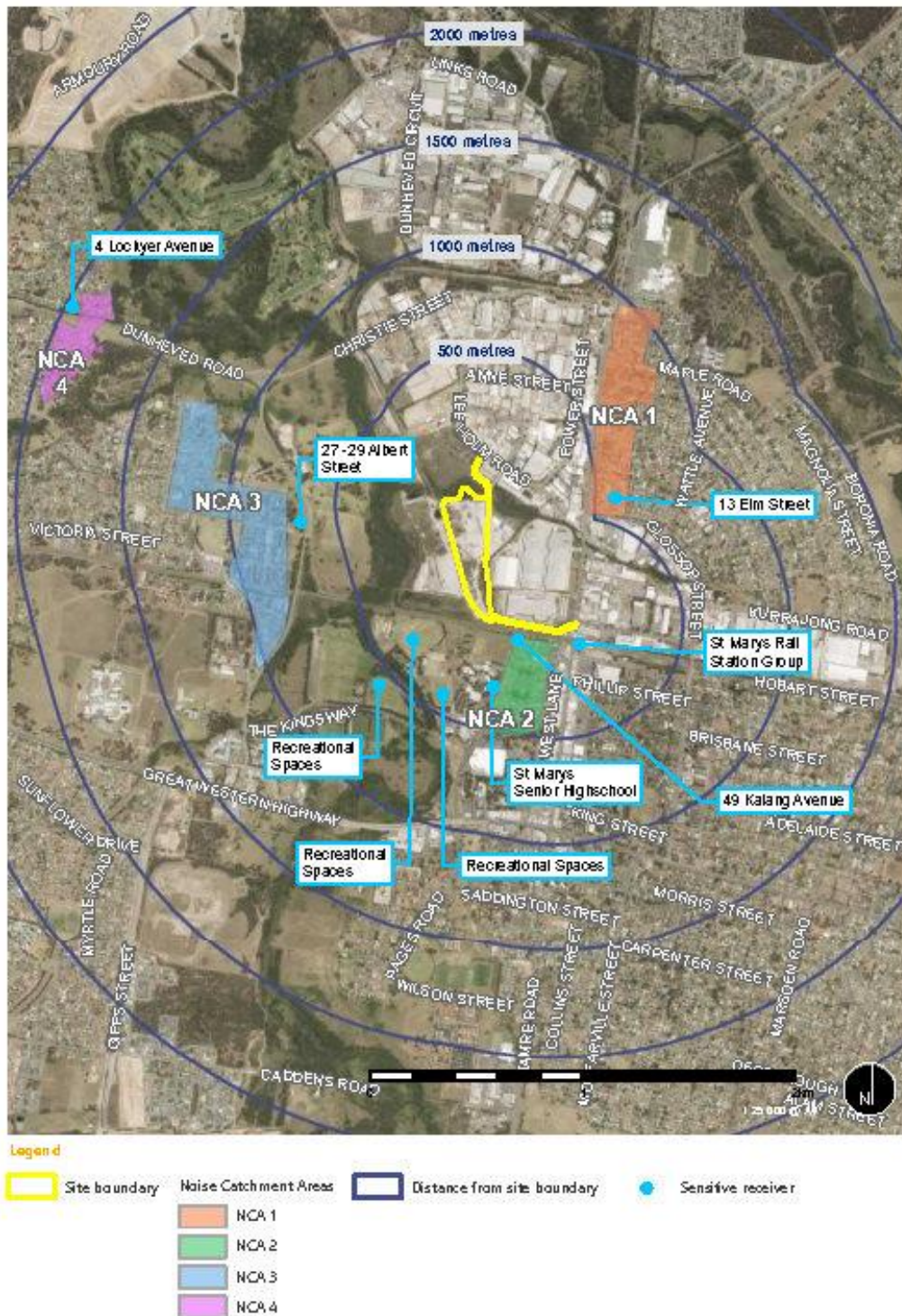
CoC	Requirement	Document Reference
RMM 1.1	All practical and reasonable measures to prevent and/or mitigate significant adverse impacts on the environment will be implemented.	Section 8.1
RMM 1.2	All practical and reasonable measures to protect human health and safety for staff, visitors, contractors, construction workers and the general public will be implemented.	Section 8.1 & 9.1, 9.3
RMM 2.1	Inductions of contractors and construction workers will include management and mitigation measures outlined in this Table where relevant.	Section 8.1 & 9.1
RMM 2.3	Management during the construction cycle will monitor potential environmental impacts (i.e. noise, dust, Aboriginal and non-Aboriginal heritage, erosion and sediment control, etc.) to ensure impacts on the environment are minimised.	Section 8.1 & 9.2
RMM 2.4	A Construction Environmental Management Plan will be prepared prior to commencement of construction activities and implemented throughout the construction cycle.	Section 1.2 and 8.1
RMM 4.3	Site construction access will be from Lee Holm Road and Forrester Road.	Sections 4.1, 8.1
RMM 7.6	The Construction Environmental Management Plan is to be prepared and will include reasonable and feasible safeguards to manage and mitigate any noise emissions and include a framework to manage any complaints from construction noise. Adoption and implementation of noise mitigation measures in the Construction Environmental Management Plan.	Sections 8.1, 9.3

## 4. Existing Acoustic Environment

### 4.1. Site Description

The Project is located within a mainly industrial environment.

*The Project site has a total area of 9.6 ha and forms part of a broader 43 ha site see*



## CONSTRUCTION NOISE AND VIBRATION MANAGEMENT SUB-PLAN

Figure 1. The site comprises predominantly flat cleared land and an existing rail siding and is zoned IN1 General Industrial. The broader site is surrounded by industrial properties to the north and east, parkland to the west and the main western railway line to the south.

The site has three road frontages, Forrester Road, Lee Holm Road and Christie Street. Heavy vehicle access is proposed to be via Forrester Road and light vehicle access is proposed to be via Lee Holm Road.

Christie Street and Forrester Road to the north and east of the Project respectively, are considered to be sub-arterial roads as per categories within the Environment Protection Authority's (EPA) NSW *Road Noise Policy*. Also, the Main Western Railway line is located to the south of the site.



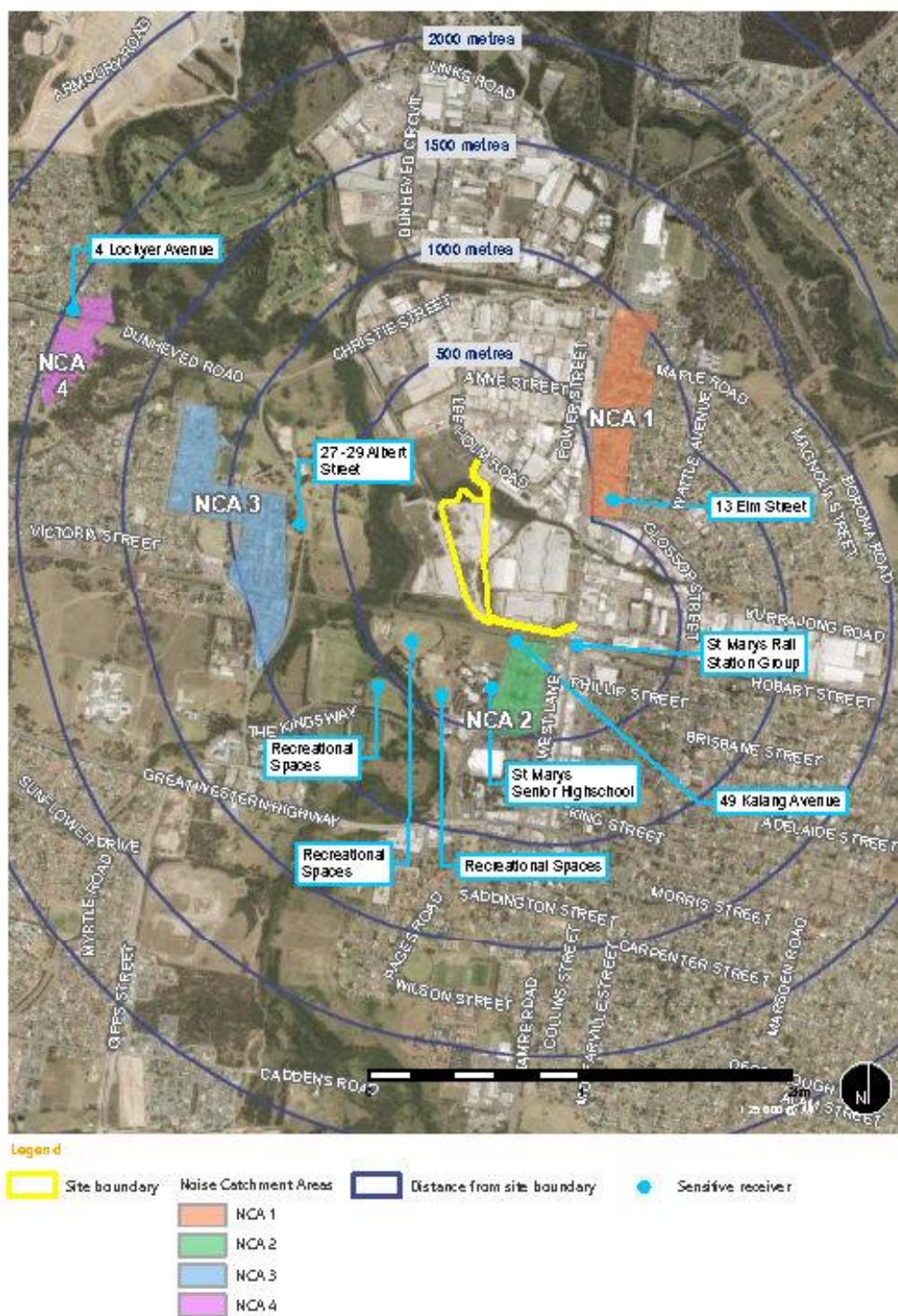


Figure 1 Site Map with Residential NCAs and other Sensitive Receivers

Source: NVIA Rev D - St Marys Intermodal Development

## 4.2. Sensitive Receivers

The Noise and Vibration Impact Assessment (NVIA) identified residential and non- residential sensitive receivers (SRs) in the surrounding area to the project. These are discussed as follows.



Residential sensitive receivers represented in

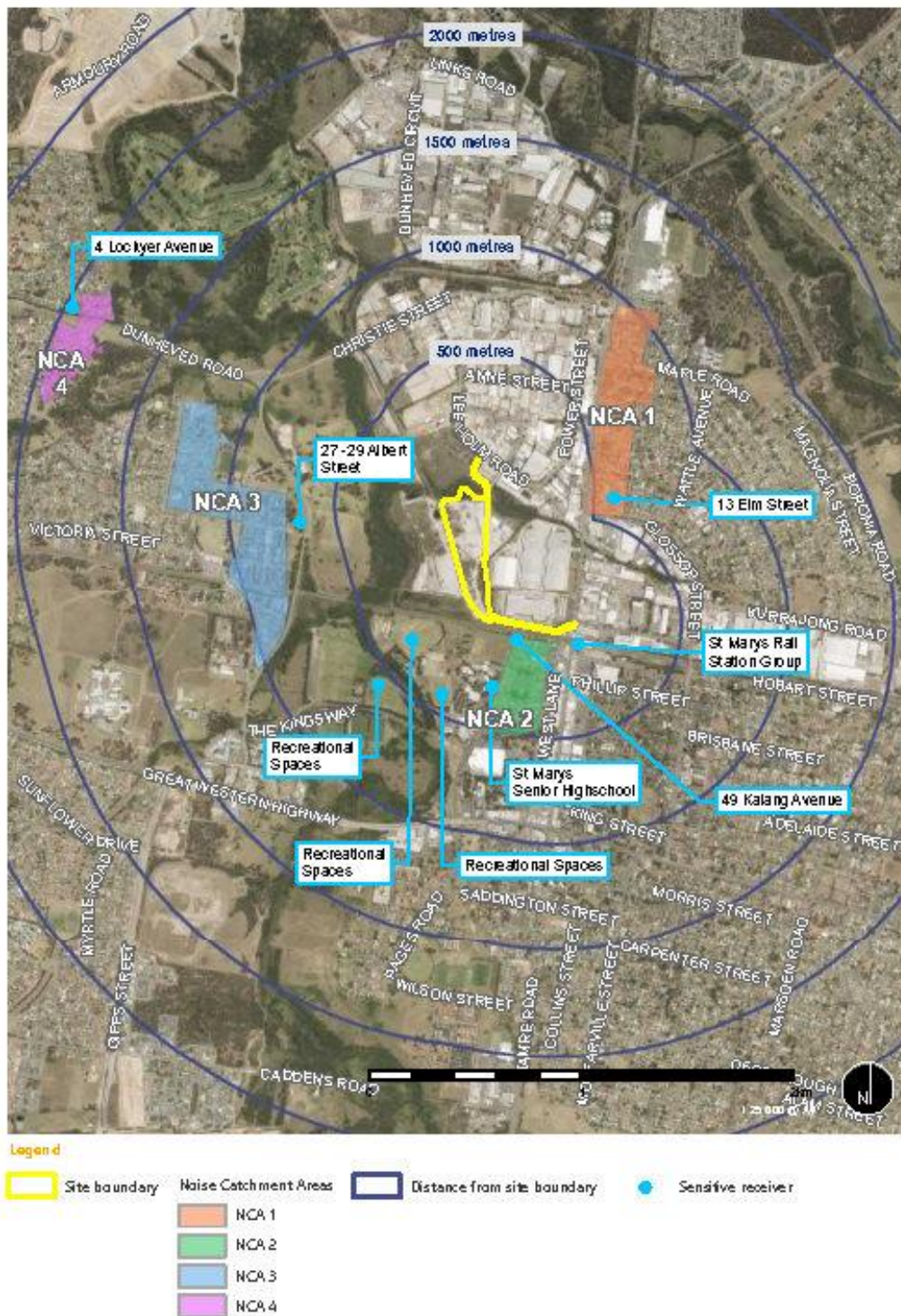


Figure 1 as Noise Catchment Areas (NCA):

- the east on Forrester Road, St Marys (NCA1)
- the south on Kalang Avenue and Camira Street, St Marys (NCA2)
- the north west in Werrington County (NCA 4)
- the west in Werrington (NCA 3)

## CONSTRUCTION NOISE AND VIBRATION MANAGEMENT SUB-PLAN

The closest noise sensitive receivers are located 200 m to the south (NCA 2).

Other Non-residential Sensitive Receivers:

- St Mary's Senior High School is located to the south of the site (200m) and there are active recreational spaces in this vicinity (200m – 300m) and to the west of site.
- St Marys Railway Station Group is listed under the Penrith LEP 2010 as an item of heritage significance. The Station Group includes the station building, goods shed, signal box, crane and footbridge substructure and is located to the south east of the site (150m from site access – Forrester Road).



### 4.3. Background Noise Levels

To assist in determining noise criteria for the receivers surrounding the Project, four noise catchment areas (NCA) were identified as described in Table 4. The NCAs are shown in

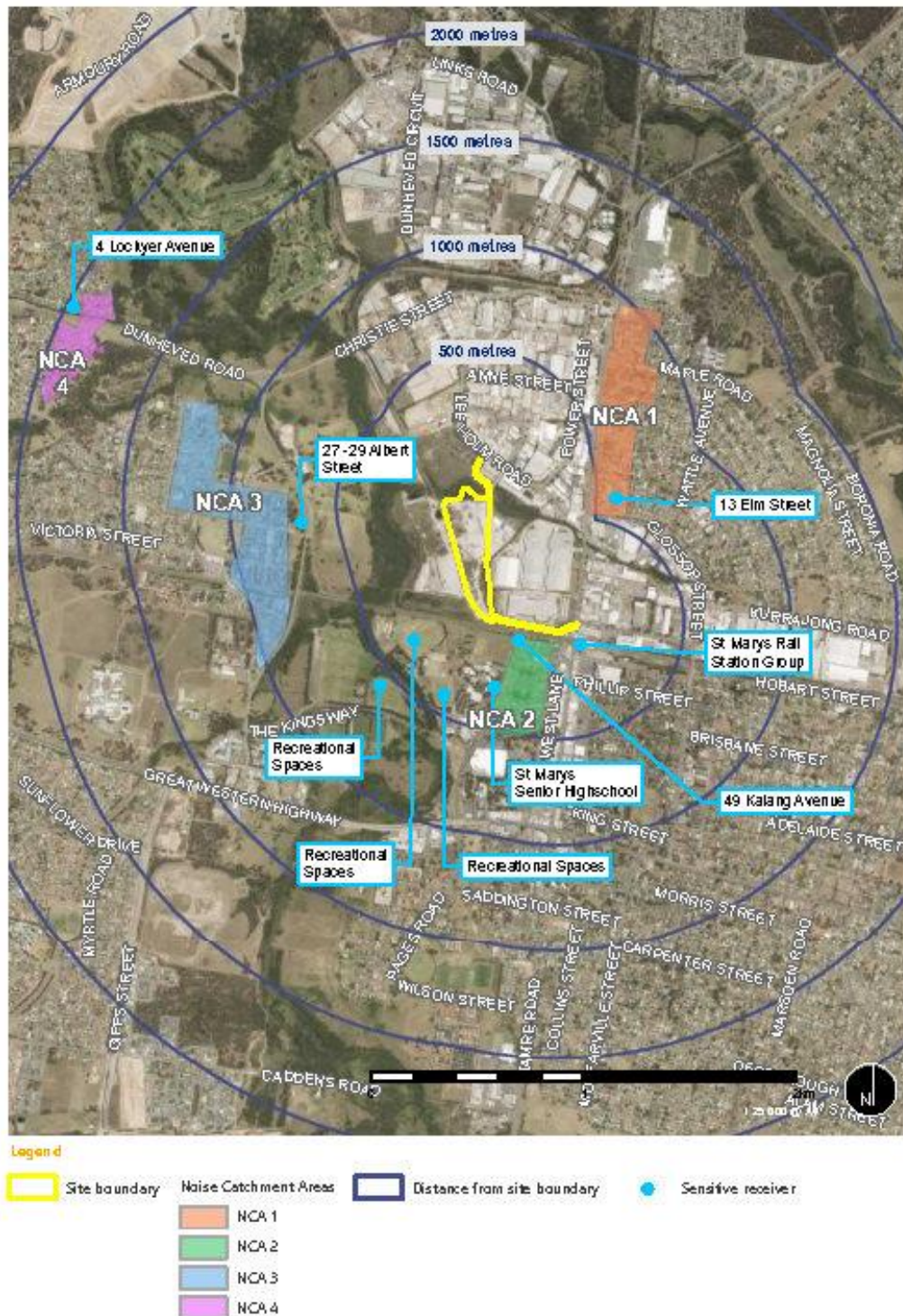


Figure 1 and relevant background noise levels detailed in Table 5.

## CONSTRUCTION NOISE AND VIBRATION MANAGEMENT SUB-PLAN

Table 4 Noise Catchment Areas

NCA	Location
NCA 1	13 Elm Street, North St Marys
NCA 2	49 Kalang Avenue, St Marys
NCA 3	27 – 29 Albert Street, Werrington County
NCA 4	4 Lockyer Avenue, Werrington County

Source: NVIA Rev D

Table 5 Rating Background Noise Levels

Location	RBL L <sub>A90</sub> dB(A)		
	Day <sup>1</sup>	Evening <sup>2</sup>	Night <sup>3</sup>
NCA 1	43	39	34
NCA 2	39	38	37
NCA 3	47	45	36
NCA 4	48	45	33

Source: NVIA Rev D, Construction noise management levels Table 7, column RBL (final RBLs)

Note 1: Day is defined as 7:00 am to 6:00 pm, Monday to Saturday and 8:00 am to 6:00 pm Sundays & Public Holidays.

Note 2: Evening is defined as 6:00 pm to 10:00 pm, Monday to Sunday & Public Holidays.

Note 3: Night is defined as 10:00 pm to 7:00 am, Monday to Saturday and 10:00 pm to 8:00 am Sundays & Public Holidays

The acoustic environment of NCA 1 is dominated by traffic on Forrester Road and Glossop Street. Natural sounds such as wind and bird noise are also audible along with some industrial noise.

The acoustic environment of NCA 2 is dominated by traffic. Intermittent rail noise and industrial noise is also audible at this location.

The acoustic environment of NCA 3 is dominated by traffic on Werrington Road. Natural sounds such as bird noise are also audible.

The acoustic environment of NCA 4 is dominated by traffic on Dunheved Road. Natural sounds such as bird noise are also audible.

All four NCAs also have local traffic with intermittent traffic flows and some limited commerce or industry. These characteristics are typical of a suburban environment.



## 5. Noise and Vibration Guidelines

The *Interim Construction Noise Guideline* (ICNG) set out guidance for establishing construction noise and vibration levels for assessing and managing noise impacts on residences and other sensitive land uses.

For residential receptors, the noise management levels are established based on existing background noise levels i.e. thresholds above which the background noise level may be exceeded. For other sensitive receptors the management levels are fixed values.

For residential and other sensitive receptors (human) and potentially sensitive structures (buildings) vibration management levels are fixed values established for either human comfort or structural/cosmetic damage. The levels vary depending on the potential sensitivity of the receptor and do not rely on existing conditions.

### 5.1. Construction Noise

#### 5.1.1. Sleep Disturbance

The ICNG recommends that where construction works are planned to extend over more than two consecutive nights, maximum noise levels and the extent and frequency of maximum noise level events exceeding the RBL should be considered. In line with the ICNG, further guidance is taken from the NSW Environmental Criteria for Road Traffic Noise (ECRTN, Environment Protection Authority 1999), now the NSW Road Noise Policy (RNP, Department of Environment, Climate change and Water 2011).

The EPA's Noise Policy for Industry (NPfI, EPA 2017) provides a method to assess the likelihood of sleep disturbance, which is considered relevant to reviewing potential impacts from construction noise using an initial screening level of  $L_{Amax}$  or  $L_{A1(1min)} \leq L_{A90(15min)} + 15 \text{ dB(A)}$ .

Where noise events are found to exceed the initial screening level, further analysis will be made to identify:

- The likely number of events that might occur during the night assessment period
- whether events exceed the 'awakening reaction' level of 55 dB(A)  $L_{Amax}$  or  $L_{A1(1min)}$  (internal) that equates to NML of 65 dB(A)

### 5.2. Construction Vibration

Vibration caused by construction activities at any residence or structure outside the site is to be limited during construction to the criteria set out in the following guidelines:

- for structural damage, the latest version of *DIN 4150-3 (1992-02) Structural vibration - Effects of vibration on structures* (German Institute for Standardisation, 1999); and
- for human exposure, the acceptable vibration values set out in the *Environmental Noise Management Assessing Vibration: a technical guideline* (DEC, 2006) (as may be updated or replaced from time to time).

Impacts from vibration will be considered both in terms of effects on building occupants (human comfort) and the effects on the building structure (structural/cosmetic damage). Of these considerations, the human comfort limits are the most stringent. Therefore, for occupied buildings, if compliance with human comfort limits is achieved, it will follow that compliance will be achieved with the building damage objectives. In accordance with CoC C17, the above guidelines are adopted for during construction of this Project.

## 6. Noise Management Levels and Vibration Criteria

### 6.1. Noise Management Levels

Based on the ICNG, Table 6 provides the project specific construction Noise Management Levels (NMLs) for residential receivers nearby the development. Note that NMLs for out of hours periods have been included in Table 6 below for future guidance on mitigation in the event out of hours works are carried out in accordance with CoC C5, and as described in Sections 7.1 and 7.2 below.

Table 6 Construction noise management levels for Residential receivers

Noise Catchment Area	Period	RBL, L <sub>A90</sub> , dB(A)	Standard hours NMLs, L <sub>Aeq</sub> , 15min, dB(A)
NCA 1	Day <sup>1</sup>	43	53
	Evening <sup>2</sup>	39	-
	Night <sup>3</sup>	34	-
NCA 2	Day	39	49
	Evening	38	-
	Night	37	-
NCA 3	Day	47	57
	Evening	45	-
	Night	36	-
NCA 4	Day	48	58
	Evening	45	-
	Night	33	-

Note 1: Day is defined as 7:00 am to 6:00 pm, Monday to Saturday and 8:00 am to 6:00 pm Sundays & Public Holidays.

Note 2: Evening is defined as 6:00 pm to 10:00 pm, Monday to Sunday & Public Holidays.

Note 3: Night is defined as 10:00 pm to 7:00 am, Monday to Saturday and 10:00 pm to 8:00 am Sundays & Public Holidays

Table 7 below presents the NMLs applicable to other noise sensitive receivers such as educational facilities and commercial receivers. As per Section 4.1.2 of the ICNG, in circumstances where the internal noise levels cannot be measured, a conservative correction of 10 dB(A) has been applied to derive external noise levels. Where noise management levels have not been identified within the ICNG, noise management levels have been adopted from the EIS and Submissions report.

Table 7 Construction noise management levels for other receivers

Land use	Noise management levels, L <sub>Aeq,15min</sub> (applies when properties are in use)	
	Internal	External
Classrooms at schools and other educational institutions	45 dB(A)	55 dB(A) <sup>1</sup>

Places of worship	45 dB(A)	55 dB(A) <sup>1</sup>
Childcare centres	45 dB(A)	55 dB(A) <sup>2</sup>
Community Hall	45 dB(A)	55 dB(A) <sup>2</sup>
Active recreation	-	65 dB(A)
Commercial premises (incl, offices, retail outlets)	-	70 dB(A)
Industrial premises	-	75 dB(A)

Note 1: External noise level derived from internal level plus 10 dB as per ICNG Section 4.1.2

Note 2: External noise level adopted from EIS and Submissions Report

In accordance with CoC C5(c), any works undertaken outside the standard hours of construction that do not meet the requirements of CoC C5(a) and (b), are to be inaudible at the nearest receiver. Where out of hours works are proposed, the process described in Section 7.2 must be implemented as per CoC C5(d).

## 6.2. Sleep Disturbance

The Project specific noise management levels adopted here are based on the NVIA measured background noise levels during the night and the sleep disturbance criteria screening level for the nearest noise sensitive residential receivers. Table 8 contains the background noise levels and resulting sleep disturbance criteria screening levels.

Table 8 Sleep Disturbance screening levels

Noise Catchment Area	Background noise Levels (L <sub>A90</sub> ), dB(A)	Sleep disturbance criteria Screening level	L <sub>A1</sub> (1 minute), dB(A) Awakening reaction
NCA 1	34	49	65
NCA 2	37	52	65
NCA 3	36	51	65
NCA 4	33	48	65

## 6.3. Construction Road Traffic Noise

The NVIA found that impacts from project related road traffic noise is expected to have a minor impact on existing road traffic noise, however consideration has been made during the planning phase to manage construction traffic impacts through the Conditions of Consent (inc. which ones) and mitigation measures provided for in Section 8 of this CNVMSP.

## 6.4. Vibration Criteria

The relevant standards/guidelines for the assessment of construction vibration are summarised in Table 9.

Table 9 Standards/ guidelines used for assessing construction vibration

Item	Standard/ guideline
Structural damage	German Standard DIN 4150 – Part 3 – Structural Vibration in Buildings – Effects on Structures (DIN 4150)

Human comfort (tactile vibration)	Assessing Vibration: A Technical Guideline (AVATG)
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Vibration, at a high enough level, has the potential to cause damage to structures and to disrupt human comfort. Vibration and its associated effects are usually classified as continuous, impulsive or intermittent as follows:

- continuous vibration continues uninterrupted for a defined period and includes sources such as machinery and continuous construction activities
- impulsive vibration is a rapid build-up to a peak followed by a damped decay. It may consist of several cycles at around the same amplitude, with durations of typically less than two seconds and no more than three occurrences in an assessment period. This may include occasional dropping of heavy equipment or loading activities
- intermittent vibration occurs where there are interrupted periods of continuous vibration, repeated periods of impulsive vibration or continuous vibration that varies significantly in magnitude. This may include intermittent construction activity, impact pile driving, jack hammers.

#### 6.4.1. Human Comfort

The assessment of intermittent vibration outlined in the AVATG is based on Vibration Dose Values (VDVs). The VDV accumulates the vibration energy received over the daytime and night-time periods. Maximum and preferred VDVs for intermittent vibration arising from construction activities are listed in Table 10. The VDV criteria are based on the likelihood that a person would be annoyed by the level of vibration over the entire assessment period.

Table 10 Preferred and maximum vibration dose values for intermittent vibration ( $m/s^{1.75}$ )

Location	Daytime <sup>1</sup>		Night-time <sup>2</sup>	
	Preferred	Maximum	Preferred	Maximum
Critical Areas	0.10	0.20	0.10	0.20
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

Source: NVIA Rev D, Preferred and maximum vibration values for intermittent vibration Table 13

Notes:

1. Day is defined as 7:00 am to 10:00 pm.
2. Night is defined as 10:00 pm to 7:00 am

#### 6.4.2. Structural Damage

At present, no Australian Standards exist for the assessment of building damage caused by vibration. As per CoC C15, the recommended maximum levels of vibration provided in the German standard (DIN 4150), to reduce the likelihood of building damage caused by vibration, have been adopted and presented in Table 11 below.

Table 11 Building Damage Vibration Management Levels (DIN4150:3) – Peak Particle Velocity

Group	Type of structure	At foundation - <10 Hz	At foundation - 10 Hz to 50 Hz	At foundation - 50 Hz to 100 Hz <sup>1</sup>	Vibration at the horizontal plane of the highest
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					floor for all frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20 mm/s	20 to 40 mm/s	40 to 50 mm/s	40 mm/s
2	Dwellings and buildings of similar design and/or use	5 mm/s	5 to 15 mm/s	15 to 20 mm/s	15 mm/s
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in lines 1 or 2 and have intrinsic value (e.g. buildings under a preservation order/ heritage listed)	3 mm/s	3 to 8 mm/s	8 to 10 mm/s	8 mm/s

Source: NVIA Rev D, Vibration management level – Structural damage for Building damage Table 12

## Notes:

1. At frequencies above 100 Hz, the values given in this column may be used as minimum values

## 7. Aspects, Impacts and Risks

This section outlines relevant aspects of the construction methodology and the predicted construction noise and vibration impacts. The predicted noise and vibration impacts are discussed as relative to the surrounding community or nearby structures.

### 7.1. Hours of Work

Construction, including the delivery of materials to and from the site, may only be carried out in accordance with CoC C4 within Standard hours as follows:

- (a) between 7am and 6pm, Mondays to Fridays inclusive; and
- (b) between 8am and 1pm, Saturdays.

No work may be carried out on Sundays or public holidays.

Construction activities may be undertaken outside of the standard hours as described by CoC C5:

- (a) by the Police or a public authority for the delivery of vehicles, plant or materials; or
- (b) in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or
- (c) where the works are inaudible at the nearest sensitive receivers; or
- (d) where a variation is approved in advance in writing by the Planning Secretary or his nominee if appropriate justification is provided for the works.

High noise generating activities (e.g. rock breaking, rock hammering, sheet piling, pile driving or similar) working hours are to be restricted to the following as per CoC C7

- (a) 9am to 12pm, Monday to Friday;
- (b) 2pm to 5pm Monday to Friday; and
- (c) 9am to 12pm, Saturday.

### 7.2. Out of Hours of Work

Works outside of standard hours can occur under CoC C5 as discussed above.

It is anticipated that specific activities may be required to be undertaken outside of standard construction hours, including pavement construction. Where out of hours works are proposed that do not meet the requirements of CoC C5(a) to (c), application for variation will be submitted to the Planning Secretary for approval prior to commencement of the activities in accordance with CoC C5(d).

The application for variation of out of hours works would include a description of proposed activities, prediction of noise impacts, justification for the proposed works and mitigation measures (if required).

Where it can be demonstrated that proposed out of hours works are inaudible at the nearest receivers in accordance with CoC C5(c), evidence of the noise prediction will be documented and an appropriate monitoring strategy is to be developed and implemented throughout the works to verify inaudibility.

### 7.3. Construction Methodology

#### 7.3.1. Work packages

There are seven distinct work packages, each consisting of a number of construction activities, for the Project. These would be confirmed by McMahon prior to construction commencing and further assessment would be undertaken if required. These work packages are described in Table 12. These work packages have been assessed.

Construction works are expected to be undertaken during standard construction hours over a duration of seven months.

Table 12 Construction work packages (standard construction hours)

Work Package	Activities	Description
1	Site establishment and delivery of materials	Site set up including installation of environmental controls
2	Bulk earthworks	Including spoil removal
3	Trenches/ utilities	-
4	Pavement/ hardstand construction	-
5	Building delivery and installation	Building delivery and installation, pavement and landscaping
6	Rail refurbishment works package	Re-lay existing rail sidings, upgrade level crossings and stormwater facilities construction

The construction works schedule is provided below:

- Pre-site works commencing in Month 1
- Month 2 to Month 6 – Construction of heavy vehicle access road, bulk earth works and hard stand areas. The Stage 1 works enable the St Marys Freight Hub to commence operation at a reduced capacity whilst other parts of the project are still under construction
- Month 3 to Month 8 – Construction of administration building site, fuel storage, wash bay, transport workshop and container repair workshop sites. These works are estimated to take 4 months with completion in Month 8 and approvals for the office/administration buildings and workshop buildings will be progressed separately
- Month 2 to Month 3 – Light vehicle access road and associated parking
- Month 5 to Month 7 – Finishing works including landscaping, lighting, fencing, signage
- Rail works will be completed within a 16 week period withing this program period

#### 7.3.2. Plant and Equipment

The NVIA provided a detailed breakdown of the key construction work packages, the associated equipment, and their source noise emission (Sound Power Levels, LW or SWL). The sound power levels used are

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typical values taken from data provided in Australian Standard AS2436-2010, Guide to noise and vibration control on construction, demolition and maintenance sites and British Standard 5228: Part 1 2009 Code of practice for noise and vibration control on construction and open sites, 2009. The assumption is made that plant and equipment is modern and in good working order. These values and the predicted LAeq, 15minute noise levels from the NVIA (determined via modelling for each scenario) are presented below in Table 13.

Table 13 Equipment indicative sound power levels per work package

Equipment	Sound power level dB(A)	Work package
Trucks	108	1, 5
Tipper trucks	108	1, 2
Mobile cranes	106	1
Front end loader	104	1,
Scraper	106	2
Grader	106	2
Excavator	98	2
Backhoe	96	3
Crane truck	106	3, 5
Vibrating roller	105	4
Steel drum roller	106	4
Concrete trucks	106	4
Power tools	104	5
Hand tools	94	5
Light towers	95	5
Tamping machine	101	MOD 1

Source: NVIA Rev D - Equipment sound power levels per construction work package Table 20 and industry standard for Tamping machine

Notes:



1. Sound power levels are time weighted (i.e. expected equipment levels per 15 minute period)

## 7.4. Predicted Construction Noise and Vibration Impacts

The NVIA found that the predicted construction noise levels exceed the construction noise management levels for all scenarios at the closest noise sensitive receivers during standard hours. Subsequent noise assessments for MOD-1 found that predicted construction noise levels exceeded the construction noise management level at the closest receiver under the worst case scenario.

### 7.4.1. Potential Noise Impacts

The NVIA found that the predicted construction noise levels exceed the construction noise management levels for all scenarios at 125 residential receivers, one school (St Marys Senior High School) and eight industrial receivers during standard hours. Table 14 contains the number of residential receivers predicted to be impacted during various construction activities. These results represent the worst-case scenario when the works are occurring during the southern portion of the site, during site establishment and pavement/hardstand construction. The largest impacts would be experienced by residences along Camira Street and Kalang Avenue. The NVIA found however, that no residential receivers are predicted to be 'highly affected' during standard construction hours.

Table 14 Number of residential properties where construction noise levels exceed NMLs during Standard hours

Activities	Exceedance above NML, dB			
	1 – 10 dB(A) Clearly audible	11 – 20 dB(A) Moderately Intrusive	>20 dB(A) Highly intrusive	Highly affected > 75 dB(A)
Site establishment and delivery of materials	78	30	13	0
Bulk earthworks	61	21	1	0
Trenches/ utilities	40	23	0	0
Pavement/hardstand construction	81	31	13	0
Building delivery and installation	6	0	0	0

Source: NVIA Rev D – Residential properties where construction noise exceeds NMLs During standard hours Table 21

Noise exceedances are generally unavoidable given the proposed works and proximity to receivers, notwithstanding the implementation of feasible and reasonable noise mitigation measures. During construction it is likely that not all equipment will be operating simultaneously all the time or in the same location, which can result in a reduced noise levels compared with the predicted levels. As each construction work package would be occurring discretely a cumulative noise impact is considered to be unlikely. Mitigation measures have been specified in Section 8 of this CNVMSP, which may further reduce impacts on sensitive receivers.

Where proposed works are not consistent with the construction methodology described in this CNVMSP, including work packages, location, timing and plant/equipment, further noise assessment is required prior to the works to predict the level of construction noise impact at surrounding receivers and identify appropriate mitigation. Note that any proposed change to construction methodology will require consultation with DPIE and consideration of a modification.

It is noted that the use of an impact roller and stabiliser will likely be necessary to complete the works, however as these items have not been considered in the St Mary's Freight Hub Noise and Vibration Impact Assessment – Post Exhibition Version (AECOM, 2020), further assessment is required prior to use.

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Differences between predicted and measured noise levels are possible, due to variations in instantaneous operating conditions, equipment in operation during the measurement and location of the equipment. The acoustic shielding calculated due to fixed building structures in the assessment model, could also vary as construction equipment moves around the site.

The noise assessment for MOD-1 and the rail refurbishment works predicted exceedances of 19dBA above the noise management level (NML) at the closest sensitive receiver (NCA 2), under the worst case scenario if all plant and equipment operated simultaneously. NCA 1, NCA 3 and NCA 4 were predicted to be below the relevant construction NML. The Department acknowledged that the likelihood of all plant operating at the same time at the same location is low, noting that the rail refurbishment works area extends over a 1300 m alignment. The Department also noted that the noisiest equipment would likely be the rail resurfacing machine (tamping machine), which would likely be operated 5% of the time. The indicative timeline for rail refurbishment works is 16 weeks.

The Department considered that construction noise associated with the rail refurbishment works could be actively managed through implementation of best practice management measures set out in this approved CNVMSP for the development.

Therefore the mitigation measures as outlined in Table 16 of this CNVMSP will be applied to ensure no sensitive receivers have NML exceedances. In addition to this mitigation measure NV40 will also be implemented.

Rail refurbishment works must comply with the standard construction work hours outlined under condition C4 of the development consent, except where allowed for the reasons outlined under condition C5.

### 7.4.2. Sleep Disturbance Impacts

In the event of proposed out of hours activities, sleep disturbance impacts would be assessed as per the criteria discussed in Section 5.1.1, and included in the application for variation to the Planning Secretary as per CoC C5(d).

### 7.4.3. Construction Traffic Impacts

The following roads were assessed as part in the NVIA for providing access to the site; Christie Street, Forrester Road, Glossop Street, Great Western Highway and Mamre Road. These roads are classified as arterial and sub-arterial and are listed in Table 15. Use of these roads is limited to the CoC and with mitigation measures in place as described in Section 8.

Table 15 Roads used by construction activity as part off the NVIA

Road	Type	Residential receivers	Estimated AADT
Christie Street	Sub-arterial Road	No	>15,000
Forrester Road	Sub-arterial Road	Yes	>15,000
Glossop Street	Sub-arterial Road	Yes	>24,000
Great Western Highway	Arterial Road	Yes	>30,000
Mamre Road	Arterial Road	Yes	>30,000

Source: NVIA Rev D, Roads used by construction traffic Table 10

The numbers of construction vehicle movements have been estimated to be up to 80 light and 140 heavy vehicles per day (up to 12 per hour) during peak construction periods. Vehicles would access the site by Christie Street, Forrester Road, Glossop Street, Great Western Highway and Mamre Road. The existing traffic flow on all the roads listed above is substantially greater than the proposed construction traffic numbers. Therefore, the additional traffic is considered to have a minor impact on existing road traffic noise in the area. The NVIA predicting traffic noise levels during construction are expected to increase by less than 2 dB.

### 7.4.4. Potential Vibration Impacts

(NVIA) Vibration intensive works may include the use of the following items of equipment, including vibratory rollers. If minimum safe working distances established in Section 8.1.2 below are complied with, then no adverse impacts from vibration intensive works are likely in terms of human comfort or structural damage.. Based on the indicative construction activities assessed for the Project, it is not considered likely that works would occur within the minimum working distances. If, however, vibration intensive works are required within these minimum working distances, mitigation measures to control excessive vibration would be implemented as outlined in Section 8 Mitigation and Management Measures.

It is noted that the use of an impact roller may be necessary to complete the works, however as these items have not been considered in the St Mary's Freight Hub Noise and Vibration Impact Assessment – Post Exhibition Version (AECOM, 2020), further assessment is required prior to use.

### 7.4.5. Impacts to Heritage Structures

St Marys Railway Station Group is listed under the Penrith LEP 2010 as an item of heritage significance. The Station Group includes the station building, goods shed, signal box, crane and footbridge substructure. The As the Main Western railway is an operational railway line, the Railway Station Group is considered to not be particularly sensitive to vibration. The minimum working distances for residential/commercial receivers shown in Table 17 are recommended for this structure. If works are undertaken in accordance with the minimum safe working distances and mitigation measures as per Section 8, then this heritage item is not expected to be impacted by the Project.

Monitoring requirements are described Section 9.2 of this CNVMSP.

## 8. Mitigation and Management Measures

This CNVMSP has been developed to include all reasonable and feasible safeguards to manage construction related noise and vibration impacts and any complaints which may occur due to construction noise and/or vibration. This section describes the overall approach to managing and mitigating predicted noise and vibration impacts identified in the EIS, NVIA.

### 8.1. Noise and Vibration Mitigation Measures

The mitigation and management measures discussed in this section are based on the environmental requirements and control measures identified in the CoC, EIS, NVIA and SSD relevant to the works described. Mitigation measures have been recommended in line with the ICNG as per CoC A1, RMM 1.1 and RMM 1.2 in order to minimise and manage the impact of construction noise on nearby noise sensitive receivers.

Construction works should be planned and carried out during standard construction hours wherever possible. Below Table 16 contains the specific control measures to be implemented during construction to mitigate impacts to the environment.

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Table 16 Noise and Vibration Management and Source Mitigation Measures Adopted for this Project

Item	Measure	Requirement	Timing	Responsibility	Reference	Evidence
NV1	Management	As part of the CEMP, this CNVMSP has been developed and includes safeguards to mitigate noise emissions (Table 18) and a framework for managing construction noise complaints (Section 9.3). This CNVMSP is to be implemented throughout construction.	Pre-construction and during construction	Environment Manager	CoC B14, CoC C17 CoC B10 RMM 2.4 RMM 7.6 ICNG	This plan
NV2	Management	The CNVSMP will be reviewed as required in accordance with Section 16 of the CEMP	During construction	Environment Manager	CoC A30	Review records
NV3	Management	Works will be carried out in accordance with the most recent approved version of the CNVMSP	During construction	Environment Manager	CoC C8 RMM 2.4	Audit
NV4	Management	A Community Communication Strategy has been developed to provide mechanisms to facilitate communication between Pacific National, Penrith City Council and the community for the design and construction period.	Pre-construction and during construction	Community Relations Manager	RMM 1.2 CoC B7 CoC C6 ICNG	CCS
NV5	Management	<p>Project related information will be publicly available by website including:</p> <ul style="list-style-type: none"> <li>• Development layout</li> <li>• Mitigation measures</li> <li>• Statutory approvals</li> <li>• Approved strategies, plans and programs</li> <li>• Ongoing environmental reporting and monitoring results</li> <li>• Development progress updates</li> <li>• Contact details</li> <li>• Updated complaints register</li> </ul>	Pre-construction and during construction	<p>Environment Manager</p> <p>Project Director</p> <p>Community Relations Manager</p>	CoC A23 ICNG	Website in place

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Item	Measure	Requirement	Timing	Responsibility	Reference	Evidence
		<ul style="list-style-type: none"> <li>Audit reports</li> </ul>				
NV6	Management	Notification of all OOHW construction activities will be given to affected residents before undertaking the activities or as soon as is practical afterwards.	During construction	Community Relations Manager Project Engineer	CoC C6 ICNG	Notification undertaken
NV7	Management	<p>Where out of hours works are proposed that do not meet CoC C5(a) to (c), application for variation will be submitted to the Planning Secretary for approval prior to commencement of the activities in accordance with CoC C5(d).</p> <p>The application for variation of out of hours works would include a description of proposed activities, prediction of noise impacts, justification for the proposed works and mitigation measure (if required).</p>	During Construction	Environment Manager	C5	Procedure developed
NV8	Management	When there are noise management level exceedances identified, works will be reviewed to and additional mitigation would be applied in accordance with Section 6 of the ICNG..	During construction	Community Relations Manager Project Engineer Site Supervisor	RMM 1.2 ICNG NVIA	Monitoring results/evidence of review
NV9	Source	<p>Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:</p> <ul style="list-style-type: none"> <li>9am to 12pm, Monday to Friday</li> <li>2pm to 5pm Monday to Friday</li> <li>9am to 12pm Saturday</li> </ul>	During construction	Environment Manager Project Engineer Site Supervisor	C7	Inspection Complaints Construction program
NV10	Management	All potentially noise impacted residents will be informed of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.	During construction	Community Relations Manager Project Engineer	RMM 1.2 ICNG	Notification



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Item	Measure	Requirement	Timing	Responsibility	Reference	Evidence
NV11	Management	<p>A site-specific induction will be provided to all site personnel, contractors, sub-contractors with an emphasis on understanding and managing noise impacts from the work activities being undertaken.</p> <p>The induction will include:</p> <ul style="list-style-type: none"> <li>• All relevant project specific and standard noise and vibration mitigation measures</li> <li>• Relevant licence and approval conditions</li> <li>• Approved working hours as per Condition C4</li> <li>• Restriction on construction vehicles arrival to site and surrounding residential precincts to within the working hours as per Condition C4</li> <li>• Location of nearest sensitive receivers</li> <li>• No high noise generating activities</li> <li>• Construction employee parking areas</li> <li>• Designated loading/unloading areas and procedures</li> <li>• Environmental incident procedures</li> </ul>	Pre-construction and during construction	Environment Manager	CoC A24 CoC B19 RMM 2.1 RMM 1.2 NVIA	Induction and induction records
NV12	Management	To be included in sub-contractor contracts – A requirement to comply with, the conditions of this consent relevant to activities they are carrying out in respect of the development will be included in all sub-contractor contracts. All sub-contractors will be provided with access to the CEMP and sub-plans.	During construction	Environment Manager Commercial Manager	CoC A24	Sub-contractor contracts
NV13	Source	<p>All unnecessary noise will be kept to a minimum. For example:</p> <ul style="list-style-type: none"> <li>• No swearing or unnecessary shouting or loud stereos/radios on site</li> <li>• No dropping of materials from height, throwing of metal items and slamming of doors</li> <li>• No excessive revving of plant and vehicle engines</li> <li>• Controlled release of compressed air</li> <li>• Equipment and plant will not be left idling for extended time and switched off when not in use</li> </ul>	During construction	Site Supervisor	NVIA	Inspections

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Item	Measure	Requirement	Timing	Responsibility	Reference	Evidence
NV14	Management	<p>A site notice(s):</p> <ul style="list-style-type: none"> <li>(a) Will be prominently displayed at the boundaries of the site during construction for the purposes of informing the public of project details including, but not limited to the details of the Builder, Certifier and Structural Engineer is to satisfy the following requirements;</li> <li>(b) minimum dimensions of the notice will measure 841 mm x 594 mm (A1) with any text on the notice to be a minimum of 30-point type size;</li> <li>(c) the notice is to be durable and weatherproof and is to be displayed throughout the works period;</li> <li>(d) the approved hours of work, the name of the site/ project manager, the responsible managing company (if any), its address and 24-hour contact phone number for any inquiries, including construction/ noise complaint will be displayed on the site notice; and</li> <li>(e) the notice(s) mounted at eye level on the perimeter hoardings/fencing and stating unauthorised entry to the site is not permitted.</li> </ul>	Pre-construction and during construction	Project Director Project Engineer	CoC C1 RMM 1.2 ICNG	Site notice
NV15	Source	All construction vehicles will be contained wholly within the site, except if located in an approved on-street work zone, and vehicles must enter the site or an approved on-street work zone before stopping in accordance with the CTPMSP	During construction	Project Engineer Site Supervisor	CoC C9 RMM 1.2 ICNG NVIA	Inspections

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Item	Measure	Requirement	Timing	Responsibility	Reference	Evidence
NV16	Source	Site construction access will be limited to Lee Holm Road and Forrester Road in accordance with the CTPMSP.	During construction	Project Engineer Site Supervisor	RMM 4.3 ICNG NVIA	Inspections
NV17	Management	High noise generating activities are not planned during construction. Should this change, community consultation is required and will be undertaken prior to high noise generating works commencing. The consultation is to determine additional mitigation measures (e.g. working around local Highschool exam times). Details of the consultation and required mitigation measures will then be captured in this CNVMSP	During construction	Project Engineer Site Supervisor	CoC C14 NVIA	Consultation
NV18	Source	Construction vehicles (including concrete agitator trucks) are prohibited from arriving at the site or surrounding residential precincts outside of the construction hours of work outlined under condition C4.	During construction	Project Engineer Site Supervisor	CoC C13	Inspections
NV19	Source	Heavy vehicle access will be from Forrester Road and Lee Holm Road during construction as outlined in the CTPMSP	During construction	Project Engineer Site Supervisor	RMM4.4 ICNG NVIA	Inspections
NV20	Management	<p>A Driver Code of Conduct has been prepared as part of the CTPMSP and will be communicated to heavy vehicle drivers (induction and compliance with included within contracts). It addresses the following:</p> <ul style="list-style-type: none"> <li>(a) minimise the impacts of earthworks and construction on the local and regional road network;</li> <li>(b) minimise conflicts with other road users;</li> <li>(c) minimise road traffic noise; and</li> <li>(d) ensure truck drivers use specified designated routes and access (NV30)</li> </ul>	Pre-construction and during construction	Environment Manager Project Engineer	CoC B19 RMM 1.2NVIA	Code of Conduct and records of communication

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Item	Measure	Requirement	Timing	Responsibility	Reference	Evidence
		(e) Parking locations (f) Minimise idling and use of engine brakes (g) Use of straps rather than chains where possible (h) Working hours that deliveries and access to site are allowed (i) No arriving to site and or surrounding residential areas before the approved project construction hours.				
NV21	Source	Construction vehicles (including staff vehicles) will be managed to: a) minimise parking or queuing on public roads; b) minimise idling and queuing in local residential streets where practicable; c) adhere to the nominated haulage routes identified in the Construction Traffic and Pedestrian Management Sub-Plan; and d) ensure access and egress from construction compounds is undertaken in a safe and lawful manner e) schedule and route vehicle movements away from sensitive receivers and during less sensitive times (e.g. St Marys Senior High School exam times) f) limit the speed of vehicles and avoid the use of engine compression brakes g) maximise on-site storage capacity to reduce truck movements See CTPMSP	During construction	Project Director Site Supervisor	CoC C10 CoC B20 RMM1.2 NVIA	inspections
NV22	Source	Prior to the commencement of construction, the Pacific National will provide sufficient parking facilities on-site, including for heavy vehicles and for site personnel, to ensure that construction	Pre-construction and during construction	Project Director Site Supervisor	CoC B20 NVIA	Parking available

# CONSTRUCTION NOISE AND VIBRATION MANAGEMENT SUB-PLAN

Item	Measure	Requirement	Timing	Responsibility	Reference	Evidence
		traffic associated with the development do not need to utilise public and residential streets or public parking facilities (see CTPMSP)				
NV23	Management	Prefabrication of materials off site will be undertaken where reasonable to do so. Materials can then be delivered to site for installation.	During construction	Project Engineer	NVIA	Sub-contracts
NV24	Source	Static noise sources, such as generators, pumps and lighting towers, will be located as far as possible from sensitive receivers.	During construction	Site Supervisor	NVIA	Inspections
NV25	Source	Plant and equipment (including rental plant and equipment) will be selected to have operating sound Power levels compliant with values presented in Table 13 of this plan to ensure predicted noise levels are not exceeded.	During construction	Environment Manager Project Engineer Site Supervisor	RMM1.2 NVIA	Inspections
NV26	Source	Structures to shield sensitive receivers from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where practicable) will be used to minimise construction noise impact.  Guidance for noise reducing shielding will be taken from AS2436 or other relevant standards where necessary.	During construction	Site Supervisor Project Engineer	NVIA	Site layout
NV27	Source	Regular noise monitoring will be undertaken during proposed construction hours at a representative receiver location	During construction	Environment Manager	RMM 2.3 CNVIS	Monitoring records
NV28	Management	Periodic Noise monitoring will be undertaken at Sensitive Receivers and in response to complaints being received.  All measurements will be undertaken in accordance with Australian Standard 1055.1-1997 – <i>Acoustics</i> –	During construction	Environment Manager	RMM 2.3 NVIA	Monitoring records



# CONSTRUCTION NOISE AND VIBRATION MANAGEMENT SUB-PLAN

Item	Measure	Requirement	Timing	Responsibility	Reference	Evidence
		<i>Description and measurement of environmental noise, Part 1: General procedures.</i>				
NV29	Source	Simultaneous operation of noisy plant within discernible range of a sensitive receiver will be avoided. The offset distance between noisy plant and adjacent sensitive receivers will be maximised.	During construction	Site Supervisor	NVIA	Complaints/inspections
NV30	Source	All construction and plant and equipment used on site is to be maintained in a proper and efficient condition and operated in a proper and efficient manner. Equipment will be regularly inspected and maintained to ensure it is in good working order.	During construction	Site Supervisor	CoC C2 RMM1.2 & 1.1	Inspections
NV31	Source	Where practicable and without compromising the safety of construction staff or members of the public, Non tonal reversing alarms 'quackers' will be used on all construction vehicles and mobile plant to minimise noise impacts on surrounding sensitive receivers. This includes during out of hours work, including delivery vehicles to site.	Pre-construction	Site Supervisor	CoC C14 ICNG RMM1.2NVIA	Vehicles have quackers
NV32	Source	Where the predicted or measured L Aeq (15 min) is greater than the noise affected level, Pacific National/McMahons will apply all feasible and reasonable work practices to meet the noise affected level.	During construction	Environment Manager Project Engineer Site Supervisor	RMM1.2 ICNG	Evidence of reasonable and feasible actions
NV33	Source	Safe minimum working distances for vibratory intensive activities (Vibratory Roller) will be adhered to as outlined in Section 8.1.2	During construction	Environment Manager	RMM1.2	Inspections
NV34	Source	Vibration intensive works (vibration rollers) will be limited to more than 30m from residences. If vibration intensive works need to be undertaken within 30m, vibration monitoring will be undertaken to ensure vibration does not exceed the limits provided in Sections 6.4.1. and 6.4.2 of this Plan.	During construction	Project Engineer Site Supervisor	CoC C15 CoC C16	Monitoring records

# CONSTRUCTION NOISE AND VIBRATION MANAGEMENT SUB-PLAN

Item	Measure	Requirement	Timing	Responsibility	Reference	Evidence
NV35	Source	If vibration intensive works (vibratory rollers) are required <i>within</i> the minimum safe working distances provided in Table 17 of this Plan, works will not proceed until unattended vibration monitoring is installed permanent vibration monitoring is installed approximately one meter from the building footprint with a system that warns operators (e.g. via flashing light, audible alarm, SMS) when vibration levels are approaching the peak particle velocity objective. This is to ensure vibration does not exceed limits provided in Sections 6.4.1. and 6.4.2 of this plan.	During construction	Project Engineer Site Supervisor	CoC C15	Monitoring records
NV36	Management	An incident notification process is in place for reporting incidents to the Planning Secretary (Incident Response Plan).	Pre-construction and during construction	Environment Manager Project Director	CoC A25 CoC A26	Incident Response Plan
NV37	Management	A non-compliance notification process is in place for reporting non-compliances to the Planning Secretary..	During construction	Environment Manager Project Director	CoC A27 CoC A28 CoC A29	CEMP
NV38	Management	Management during the construction cycle will monitor potential environmental impacts (i.e. noise, dust, Aboriginal and No Aboriginal heritage, erosion and sediment control, etc.) to ensure impacts on the environment are minimised	During construction	Environment Manager Site Supervisor	RMM2.3	Monitoring records
NV39	Management	Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:  (a) between 7am and 6pm, Mondays to Fridays inclusive; and  (b) between 8am and 1pm, Saturdays.  Any variations need to be approved in advance in writing by the Planning Secretary or his nominee if appropriate justification is provided for works during extended construction hours	During construction	Environment Manager	RMMM 2.5	Monitoring records Correspondence with DPIE

# CONSTRUCTION NOISE AND VIBRATION MANAGEMENT SUB-PLAN

Item	Measure	Requirement	Timing	Responsibility	Reference	Evidence
NV40	Source	To prevent NML exceedances at the closest sensitive receiver in NCA2 at no time will all machinery be operated simultaneously in the areas of the project closest to NCA2 (southern end of site).	During Construction	Environment Manager	-	Monitoring records

### 8.1.1. Exceedance of Management Levels

In accordance with CoC C12, construction activities are to achieve the NMLs and vibration criteria specified in Section 6.1 and vibration criteria specified in Section 6.4. Where activities are predicted or found to exceed the NMLs, in addition to strict compliance with the mitigation measures presented in Table 16 above, all feasible and reasonable noise mitigation measures are to be implemented as per the ICNG and as follows::

- Alternate work methodologies and plant will be investigated and considered to lower noise and vibration levels of construction works at the relevant sensitive receivers.
- Excessively noisy or vibration generating activities will cease or be reduced. Remedial measures would be implemented prior to recommencing works, and monitoring undertaken to verify noise or vibration levels if necessary.
- Plant and machinery condition will be checked and verified for noise levels as required.
- In the event of high vibration levels, measures would be put in place to reduce vibration to within acceptable levels. Such measures may include reducing equipment size, changing operational settings, using other plant in lieu of that which is generating the vibration.

Refer also to Section 9.3 of this Plan for management of Enquiries, complaints and incidents and Section 9.5 Non-compliances and actions.

### 8.1.2. Vibration Minimum Working Distance

Table 17 presents the typical safe working distances for proposed vibration intensive activities. These safe working distances are applicable for structural damage (DIN 4150-3) and human comfort (AVATG).

Table 17 Minimum working distance of vibration intensive equipment to be used during Project

Plant	Rating/ description	Pipework and infrastructure (DIN 4150-3)	Buildings used for commercial purposes, industrial buildings , and buildings of similar design (DIN 4150-3)	Dwellings and buildings of similar design and/or occupancy (DIN 4150-3)	Human comfort (AVATG)
Vibratory roller	< 50 kN (typically 1-2t)	1 m	2 m	6 m	15 to 20 m
	< 100 kN (typically 2-4t)	1 m	2 m	8 m	20 m
	< 200 kN (typically 4-6t)	1 m	3 m	15 m	40 m
	< 300 kN (typically 7-13t)	1 m	4 m	19 m	100 m
	< 300 kN (typically 13-18t)	1 m	4 m	25 m	100 m
	< 300 kN (typically >18t)	1 m	10 m	31 m	100 m

Vibratory compactors must not be used closer than 30 metres from residential buildings, unless vibration monitoring (see below) confirms compliance with the vibration criteria specified in Section 6.4.

If vibratory compactors need to be used within the above safe working distances identified Table 19 above or

within 30 metres from residential buildings, works will not proceed until vibration monitoring is carried out in accordance with Section 9.2.2.

Where safe working distances are not specified in Table 17 for potential high vibratory plant/equipment (e.g. impact rollers), vibration monitoring should be carried out in accordance with Section 9.2.2.

### 8.1.3. Community consultation and complaints handling

McMahons will adhere to the Pacific National Community Communication Strategy (CSS) to ensure Project compliance with CoC B7, B14 and A23 (a)(vii & viii). The CCS provides mechanisms to facilitate communication between the Applicant, the relevant Council and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the design and construction of the development.

The CCS will:

- (a) identify people to be consulted during the design and construction phases;
- (b) set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development;
- (c) provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development;
- (d) set out procedures and mechanisms
  - (i) through which the community can discuss or provide feedback to the Applicant;
  - (ii) to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.
  - (iii) Inc. that of CoC C6 for notification of Out of Hours Works to be given to affected residents before the works are undertaken
- (e) A complaints management system as per CoC B14, will be implemented for the duration of construction along with maintaining a live complaints register with complaints recorded when received and responded to (Section 3.4.5 of CCS). This complaints register is to be made publicly available on the Project website with monthly updates provided/ uploaded to the website (CoC A23). Reasonable and feasible safeguards to manage and mitigate noise emissions (also refer to Section 8 of this CNVMSP);
- (f) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;
- (g) include strategies that have been developed with the community for managing high noise generating works;
- (h) describe the community consultation undertaken to develop the strategies in condition B14(d);

All residents and sensitive receivers impacted by noise from the Project which are expected to exceed the NML will be consulted prior to the commencement of the particular activity, with the highest consideration given to those that are predicted to be most affected as a result of the works (NCA 2). The information provided to the residents will include:

- programmed times and locations of construction work
- the duration of proposed works
- construction noise and vibration impact predictions
- construction noise and vibration mitigation measures being implemented on site.



High noise generating works are not planned during construction, as evidenced by the construction noise predictions presented in Section 7.4.1. Construction noise monitoring will be conducted at the commencement of new activities to verify noise impacts on the community and check compliance with predictions, as per Section 9.2.1. Should high noise generating works be proposed or observed through noise monitoring, all affected stakeholders will be consulted in accordance with Community Consultation Strategy and CoC B14(d) and (e).

Should this change and high noise generating activities are needing to be carried out, strategies to mitigate noise impacts from high noise generating works will be developed in consultation with the community prior to these works. St Marys Senior Highschool is 200m south of the works site. The NVIA has recommended in particular that this school be consulted with in regard to mitigation measures for activities that are high noise generating. The Pacific National Community Communications Strategy, Section 3.4.4 provides a procedure for this consultation requirement.

This Plan, the CCS, contact details and the complaints register will be made publicly accessible by Pacific National on its Project website.

## 9. Compliance Management

### 9.1. Training

All project personnel, contractors and sub-contractors working on site will undergo site induction training relating to Project specific construction noise and vibration issues. The induction training will include:

- Existence of this CNVMSP within the CEMP,
- Requirement (CoC A24) for Compliance with the conditions of the SSD Consent as relates to their work
- Standard construction hours
- Site specific Acoustic environment
- Noise and Vibration Sensitive Receivers
- Project specific likely Noise and Vibration Impacts
- Project specific Noise and Vibration Mitigation measures
- Roles and responsibilities
- Incident response, management and reporting,

Targeted training in the form of toolbox talks and pre-starts will also be provided to site personnel on an ongoing basis.

A Site-specific Environmental Controls Map containing location of works, sensitive receivers and mitigation measures to manage potential impacts will be produced and displayed on site for reference.

Further details regarding staff induction and training are outlined in Section 5.1 of the CEMP.

### 9.2. Monitoring and Reporting Requirements

Noise and vibration monitoring will be undertaken throughout the construction phase of the Project to verify the predicted noise and vibration impacts. This will assist in identifying impacts to sensitive receivers, quantifying and reporting compliance, determining if mitigation measures are effective and if any further mitigation measures are required to reduce and manage noise and vibration impacts.

Monitoring compliance with the requirements of this CNVMSP, its implementation and effectiveness will be achieved through:

- Daily site observations and site diaries by works Supervisors
- Regular McMahon Environmental inspections of worksite and activities (weekly, wet weather and incident triggered), refer to CEMP Section 9 for inspection frequencies.
- Recording noise and vibration measurements,
- Internal and external regular audits,
- Compliance Tracking Report (6 monthly).

Details of the nature and frequency of inspections are documented in Section 9 of the CEMP.

#### 9.2.1. Noise Monitoring Program

The following noise monitoring will be undertaken throughout the Project:

- **Verification monitoring upon commencement** – upon commencement of a new activity to verify the

accuracy of predictions in Section 7 or a CNVIS, at the nearest sensitive receiver

- **Monthly verification monitoring** – monthly attended noise monitoring at the four ambient noise survey locations identified EIS and Table 18 below, to determine effectiveness of mitigation measures throughout the duration of construction
- **Potential high noise impact works** – where works are predicted to exceed the highly affected noise level (>75dB(A)), verification of predictions at the nearest sensitive receivers to confirm reasonable and feasible mitigation
- **Complaint investigation** – in response to complaints being received, additional noise monitoring will be undertaken at sensitive receivers to determine if noise levels are appropriate and if further mitigation measures/ review of construction works are needed.

If noise monitoring identifies an exceedance of the established specific noise goals (e.g. NMLs or noise predictions), the protocol detailed in Section 8.1.1 above will be implemented.

Table 18 Construction noise monitoring locations

ID	NCA	Noise monitoring location
1	NCA 1	13 Elm Street, St Marys
2	NCA 2	49 Kalang Avenue, St Marys
3	NCA 3	27-29 Albert Street, Werrington
4	NCA 4	4 Lockyer Avenue, Werrington County

All noise measurements will be attended noise measurements, conducted by appropriately trained personnel in the measurement and assessment of construction noise.

Monitoring will be undertaken in accordance with Australian Standard 1055.1-1997 – *Acoustics – Description and measurement of environmental noise, Part 1: General procedures*.

Acoustic instrumentation employed in the noise monitoring surveys will comply with the requirements of Australian Standard AS IEC 61672.1—2004 – *Electroacoustics—Sound level meters, Part 1: Specifications* and carry current NATA (or manufacturer) calibration certificates.

All attended environmental noise measurements will be taken with the following meter settings:

- Time Constant - FAST (i.e. 125 milliseconds)
- Frequency Weightings - A-weighting
- Sample Period - 15 minutes.

Outdoor noise monitoring is to be undertaken at least 3.5 m from any reflecting structure other than the ground. The preferred measurement height is 1.2 to 1.5m above the ground. Where the noise monitors are placed within 3.5 m of building facades, walls or cliffs, then a reflection correction of up to -2.5dB(A) shall be applied to remove the effect of increased noise due to sound reflections from such structures.

Measurements inside buildings (if required) will be at least 1 m from the walls or other major reflecting surfaces, 1.2 to 1.5 m above the floor, and about 1.5 m from windows.

### 9.2.2. Vibration Monitoring Program

The following Vibration monitoring may need to be undertaken throughout the Project. Circumstances where this may be required include:

- **Commencement of new vibratory activities near sensitive receivers** – at receiver attended vibration monitoring at the commencement of new vibratory activities within safe working distances

(Section 8.1.2) o, to confirm that vibration levels are within the acceptable range to prevent structural damage or are predicted to be greater than the maximum values for human comfort

- **Commencement of new vibratory activities with unknown safe working distances** – at receiver attended vibration monitoring at the commencement of new vibratory activities where safe working distances are unknown, to confirm that vibration levels are within the acceptable range to prevent structural damage or are predicted to be greater than the maximum values for human comfort
- **Unattended vibration monitoring** – based on the findings of attended vibration monitoring, where vibratory activities are to be undertaken within safe working distances (Section 8.1.2) and potentially exceed the relevant vibration criteria, or safe working distances are unknown, unattended vibration monitoring to be undertaken at the potentially impacted building or structure.
- **Complaint investigation** – vibration monitoring will be carried out in response to complaints, exceedances, or for the purpose of refining construction methods or techniques to minimise vibrations.

A detailed vibration testing methodology will be established by a suitably experienced person and/or in consultation with a qualified technical specialist in accordance with the vibration measurement requirements stipulated in the legislative standards and guidelines, and will include the following:

- Vibration monitoring equipment will be placed outside at the footings or foundations of the building of interest, closest to the vibrating plant
- Surface will be solid and rigid to best represent the vibration entering the structure of the building under investigation
- Vibration sensor or transducer shall not be mounted on loose tiles, loose gravel or other resilient surfaces
- Vibration sensor or transducer shall be directly mounted to the vibrating surface using either bees wax or a magnetic mounting plate onto a steel washer, plate or bracket which shall be either fastened or glued to the surface of interest
- Where a suitable mounting surface is unavailable, then a metal stake of at least 300mm in length shall be driven into solid ground adjacent to the building of interest, and the vibration sensor or transducer shall be mounted on that.
- Unattended vibration monitors include a system that warns operators (e.g. via flashing light, audible alarm, SMS) when vibration levels are approaching the peak particle velocity and/or vibration dose values (VDVs) objectives.

In the event of an exceedance of vibration criteria, the protocol detailed in Section 8.1.1 above will be implemented.

### 9.2.3. Monitoring Reports

As per CoC A23, reports from noise and vibration monitoring will be prepared to be made regularly publicly accessible. These monitoring reports will capture detail including, but not limited, to:

- The location and time of monitoring and location of Sensitive receiver/s;
- Description of monitoring e.g. complaint response, OOHW;
- Details of site activity and equipment in use;
- Instantaneous noise levels for all noted noise emission sources (extraneous or otherwise)
- meteorological conditions (wind speed, temperature, humidity, cloud cover etc.)

- Dominant and extraneous noise sources;
- Tabulated results;
- Summary of any measurements exceeding the nominated criteria;
- Descriptions of the plant or operations causing any exceedances;
- Detail of improvement actions with appropriate timeframes to action;

Reporting requirements and responsibilities are documented in Section 13.1 of the CEMP.

A comprehensive summary of the monitoring results will be kept up to date throughout the Project;

### **9.3. Enquiries, Complaints and Incident Management**

Enquiries, complaints and incident management will be undertaken as per the Community Communications Strategy, relevant to noise and vibration.

McMahons will record any enquiries and complaints made, in accordance with the Project Community Consultation Strategy. Information to be recorded will include location of complainant, time/s of occurrence of alleged noise or vibration impacts (including nature of impact particularly with respect to vibration), perceived source, prevailing weather conditions and similar details that could be utilised to assist in the investigation of the complaint.

All resident complaints will be responded to in the required timeframe and action taken recorded in accordance with the Strategy.

Incidents will be managed in accordance with the Incident Response Plan in Annexure H or the CEMP.

### **9.4. Roles and Responsibilities**

The McMahon team's organisational structure and overall roles and responsibilities are outlined in Section 4.3 of the CEMP. Specific responsibilities for the implementation of environmental mitigation measures are detailed in Section 8 of this Plan.

### **9.5. Non-compliances and Actions**

Non-compliance management is outlined in Section 15.2 of the CEMP.

### **9.6. Auditing**

Audits will be undertaken to assess the effectiveness of environmental controls, compliance with this Plan, CoC, RMMs and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 13 of the CEMP.

### **9.7. Corrective and Preventative Actions**

Corrective and preventative actions that will be applied to this plan are outlined in Section 15 of the CEMP.

### **9.8. Review and Revision**

The review and revision process for the CEMP and sub-plans (including this plan) is outlined in Section 16 of the CEMP.

Following any community consultation undertaken to determine appropriate mitigation measures for high noise generating works (in the case that high noise generating works are required), then this plan is to be



updated to incorporate mitigation measures developed from the consultation. Any revisions as a result of community consultation would also be subject to the review and revision process outlined in Section 16 of the CEMP.

## 10. References

NSW Government – DPIE: St Marys Intermodal Freight Hub Development – Conditions of Consent (CoC), dated 9 March 2020 (SSD 7308)

British Standard BS7385: Part 2-1993 (BS 7385) - Evaluation and Measurement for Vibration in Buildings — Part 2 – Guide to Damage Levels from Ground-borne Vibration, dated 1993

German Institute for Standardisation – DIN 4150 (1999-02) Part 3 (DIN4150:3) – Structural Vibration - Effects of Vibration on Structures

NSW Department of Environment and Climate Change – NSW Interim Construction Noise Guideline (ICNG), July 2009

NSW Department of Environment and Conservation – NSW Environmental Noise Management – Assessing Vibration: a Technical Guideline (the NSW Vibration Guideline), February 2006

NSW Department of Environment, Climate Change and Water – NSW Road Noise Policy (RNP), March 2011

NSW DPIE – Environmental Management Plan Guideline 2020

St Marys Freight Hub – Environmental Impact Statement, prepared for Pacific National by Urbanco, dated May 2019 (EIS)

St Marys Freight Hub - Noise and Vibration Impact Assessment Post exhibition version Rev D, prepared for Pacific National by Aecom Wilkinson Murray on behalf of Hyder Consulting Pty Ltd, dated Feb 2020 (NVIA)

St Marys Freight Hub – Response to Submissions Report, prepared for Pacific National by Urbanco, dated October 2019 (RtS)

Standards Australia AS 2436–2010™ (AS2436) – Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites

Standards Australia AS IEC 61672.1–2004™ (AS61672) – Electro Acoustics - Sound Level Meters Specifications Monitoring or Standards Australia AS1259.2-1990™ (AS1259) – Acoustics – Sound Level Meters – Integrating/Averaging as appropriate to the device

Standards Australia AS1055–1997™ (AS1055) – Description and Measurement of Environmental Noise

## Annexure A SSD 7308 Development Layout

