PUBLIC

Noise and Vibration Management Plan
EnergyConnect (NSW - Eastern Section)
Stage 2

45860-HSE-PL-D-0116

REV	DATE	GENERAL DESCRIPTION	PREPARED	REVIEWED	VERIFIED	VERIFIED	APPROVED
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Revision History	
Rev.	**Detailed Description**
A	Issued for internal review
B	Issued for Transgrid review
C	Issued for Environmental Representative review
0	Issued for DPE review
1	Revised to address DPE comments

Key Document Stakeholders
To be communicated with during reviews and revisions of this document

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Abbreviations

Acronym	Definition
AAAC	Association of Australian Acoustical Consultants
Amendment Report	*Amendment Report EnergyConnect (NSW – Eastern Section)*
AS/NZ	Australian Standard/New Zealand Standard
Base construction hours or extended (day) working hours	Construction work hours defined in the *Environmental Impact Statement EnergyConnect (NSW – Eastern Section)* as seven days per week (Monday to Sunday) between 7am and 7pm
CCS	Community Communication Strategy
CEMP	Construction Environmental Management Plan
Council	Relevant Council
CSSI	Critical State significant infrastructure
DAWE	Department of Agriculture, Water and the Environment, now known as Department of Climate Change, Energy, the Environment and Water
dB	Decibel
dBA	Decibel (A-weighted)
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DEC	(former) Department of Environment and Conservation
DECC	(former) Department of Environment and Climate Change
DECCW	(former) Department of Environment, Climate Change and Water
DPE or Department	NSW Department of Planning and Environment (formerly Department of Planning, Industry and Environment)
EIS	*Environmental Impact Statement EnergyConnect (NSW – Eastern Section)*
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPA	NSW Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPC	Engineering, procurement and construction
EPL	Environment Protection Licence
ER	Environmental Representative
HSSE	Health, safety, sustainability and environment
ICNG, the	*Interim Construction Noise Guideline* (Department of Environment and Climate Change 2009)
NML	Noise management level
NPfI	*Noise Policy for Industry* (EPA 2017)
NSW	New South Wales
NVMP	Noise and Vibration Management Plan
OOHW	Out of hours work
PAD	Potential archaeological deposit
Planning Secretary	Planning Secretary under the EP&A Act, or nominee
POEO Act	*Protection of the Environment Operations Act 1997*
project, the	EnergyConnect (NSW – Eastern Section)
Response to DPE Request for Information	EnergyConnect (NSW – Eastern Section) Response to Department of Planning and Environment Request for Information (30 August 2022)

Acronym	Definition
RBL	Rating background level
RMMs	Revised mitigation measures
RNP	Road Noise Policy
SA	South Australia
SAP	Sensitive area plan
SecureEnergy	Elecnor and Clough Projects Australia Pty Ltd have formed the SecureEnergy Joint Venture (SecureEnergy). SecureEnergy is the contractor who will be carrying out the project on behalf of Transgrid
SSI	State significant infrastructure
Stage 1	Stage 1 of construction of the project. This includes establishment of three accommodation camps, establishment and operation of five construction compounds, site establishment and construction works for the upgrade of Wagga Wagga substation and Dinawan substation and water supply points.
Stage 2	All construction activities associated with EnergyConnect (NSW – Eastern Section). Once approved the Stage 2 CEMP and the relevant Stage 2 CEMP sub-plans will supersede the existing Stage 1 CEMP and Stage 1 CEMP sub-plans. The Stage 2 CEMP and Stage 2 CEMP sub-plans do not address the operational phase of the project.
Submissions Report	*Submissions Report EnergyConnect (NSW – Eastern Section)*
Technical Paper 10 of the EIS	Technical Paper 10 of the *Environmental Impact Statement EnergyConnect (NSW – Eastern Section)* (Noise and vibration impact assessment)
WMS	Work method statement

1 Introduction

1.1 Context

This Noise and Vibration Management Plan (NVMP or this plan) forms part of the Construction Environmental Management Plan (CEMP) for Stage 2 of EnergyConnect (NSW – Eastern Section).

This plan has been prepared for construction activities undertaken during Stage 2 of the project. Once approved this plan will supersede the existing Stage 1 Noise and Vibration Management Plan. It does not address the operational phase of the project.

This plan has been prepared to address the relevant requirements of the Infrastructure Approval (SSI 9172452), the *Environmental Impact Statement EnergyConnect (NSW – Eastern Section)* (EIS), the *Submissions Report EnergyConnect (NSW – Eastern Section)* (Submissions Report) and the *Amendment Report EnergyConnect (NSW – Eastern Section)* (Amendment Report).

1.2 Background

On 29 August 2019 the New South Wales (NSW) Minister for Planning and Public Spaces declared the NSW component of EnergyConnect to be critical State significant infrastructure (CSSI) under the *Environmental Planning and Assessment Act 1979* (EP&A Act) on the basis that it is critical to the State for environmental, economic or social reasons. Within NSW, EnergyConnect is therefore subject to assessment under Part 5, Division 5.2 of the EP&A Act.

Transgrid have two environmental planning approval applications for the sections within NSW:

- EnergyConnect (NSW – Western Section) – South Australia (SA)/NSW border to Buronga and Buronga to the NSW/Victorian border; and
- EnergyConnect (NSW – Eastern Section) – Buronga to Wagga Wagga (the project).

A referral under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) was submitted on 25 August 2020. The Australian Department of Agriculture, Water and the Environment (DAWE) determined the project to be a controlled action on 30 September 2020 and thus, it would be assessed using the bilateral assessment process. As such, the project also requires approval from the Australian Minister for the Environment under the EPBC Act.

The EIS was prepared for the project in January 2022 and was placed on public exhibition from 19 January 2022 to 15 February 2022. A total of 75 submissions were received, with five from special interest groups, nine from local councils and 44 from the public. In addition, 17 government agencies also provided advice during this time.

The Submissions Report was prepared for the project in response to the submissions received during the public exhibition of the EIS and includes the final set of revised mitigation measures (RMMs) that are to be applied. The Submissions Report was finalised in May 2022.

Transgrid also prepared a separate Amendment Report to document design changes and additional environmental assessment undertaken since exhibition of the EIS. The Amendment Report was also finalised in May 2022.

On 2 June 2022, the Department requested additional information (Project EnergyConnect (NSW - Eastern Section) (SSI-9172452) Request for Additional Information (June 2022)) to assist with the assessment of the project. In response TransGrid prepared and provided the *EnergyConnect (NSW – Eastern Section) Response to Department of Planning and Environment Request for Information* (Response to DPE Request for Information) to address the various requests for information raised by the Department. The Response to DPE Request for Information was dated 30 August 2022.

Approval for the project under the EP&A Act was granted by the NSW Minister for Planning (Infrastructure Approval SSI 9172452). Approval for the project under the EPBC Act was granted by the Australian Minister for the Environment.

Transgrid have engaged SecureEnergy, a joint venture between Elecnor and Clough Projects Australia Pty Ltd to design and construct their portion of the EnergyConnect project.

1.3 Staging

Condition A8 allows preparation of plans on a staged basis, with the approval of the Planning Secretary. Where a plan is staged, the scope of works can be carried out without addressing requirements of the Infrastructure Approval that are not applicable to that stage. This NVMP is staged in accordance with condition A8. The two stages are as follows:

- Stage 1 – establishment of three accommodation camps, establishment and operation of five construction compounds, site establishment and construction works for the upgrade of Wagga Wagga substation and Dinawan substation, water supply points; and
- Stage 2 – Stage 1 and all other construction activities (i.e. all construction activities associated with EnergyConnect (NSW – Eastern Section).

The plans for Stage 2 incorporate and supersede the Stage 1 plans and cover the entire construction phase of the project.

This NVMP has been prepared specifically for EnergyConnect (NSW – Eastern Section) Stage 2 and will be implemented for the duration of Stage 2 of construction. The key project components of Stage 2 of construction include, but are not limited to, the activities provided in Table 1.1.

An overview of the project is provided as Figure 1.1.

Table 1.1 - Key project components of construction (Stage 2)

Key activity	Description of key activity
Pre-construction minor works permitted in accordance with the Infrastructure Approval	The definition of 'construction' within the Infrastructure Approval excludes these activities. They will therefore not be subject to the Stage 2 CEMP and CEMP sub-plans. Irrespective of this, these activities will occur in accordance with the relevant conditions of the Infrastructure Approval. Key activities include: • environmental investigations, including biodiversity and heritage protection, salvage and recordings; • Aboriginal heritage assessment, mitigation (e.g. exclusion zones) and salvage activities including subsurface testing/test excavation, additional survey, and consultation with RAPs; • other survey work, such as road dilapidation surveys, and surveys of the general alignment and existing utilities; • installing of environmental management measures (including erosion and sediment controls), fencing, signage and security measures, enabling works; and • connections and pre-commissioning of utilities (wastewater treatment plant, electrical power, lighting etc.).
Continuation of any outstanding Stage 1 construction activities	Construction activities undertaken during Stage 1 of the project will continue where required. This includes, but is not limited to continuation of the following activities: • any outstanding construction activities at Dinawan and Wagga Wagga substations; • operation of earthworks material site, including the crushing and screening plant, where required; • operation of the construction compound including offices and laydown areas; and • use of traffic access routes and access and egress points.
Establishment of ancillary facilities along the transmission line corridor	A number of minor staging, storage and laydown ancillary areas would be required within the project corridor for temporary storage of materials, plant and equipment required to construct the various elements of the proposal (in particular transmission line structures). Some temporary mobile batching plant locations may also need to be established to enable easy access to concrete.

Key activity	Description of key activity
	Upon completion of works, these ancillary sites would be cleared of any temporary infrastructure and equipment. These sites would be in place for shorter periods at locations suitable to support the construction works as they move along the alignment.
Property adjustment work, including adjustments to property fencing	Installation or adjustment of gates and fences would be required at some locations along the alignment to enable access from the nearest roadway to construction areas. These would be constructed in consultation with the relevant council and/or affected landholder.
Water supply points – establishment and/or use	A number of water supply points have been identified along the length of the project to support construction water needs for the project. The proposed water supply points which are to be established and / or used include: • Euston Coop*, Balranald Shire Council; • Lake Benanee*, Balranald Shire Council; • Sturt Highway/Meilman Road*, Balranald Shire Council; • Mylatchie Track*, Balranald Shire Council; • 159 Church Street, Balranald Shire Council; • Ravensworth, Hay Shire Council [Ravensworth in Amendment Report]; • Moulamein Rd 1*, Edward River Council; • Moulamein Rd 2, Edward River Council [Moulamein Road, Moulamein in Amendment Report]; • Burraburoon*, Edward River Council; • X5 Mabins Well*, Edward River Council; • Gala Vale*, Murrumbidgee Council; • Kidman Way*, Murrumbidgee Council; • Crosby Road*, Murrumbidgee Council; • Newell Highway, Morundah*, Federation Council; • Urana-Lockhart Road, Brookong*, Lockhart Shire Council; • Brookdale*, Lockhart Shire Council; • Federation Way/Coonong Road*, Federation Council; • Newell Highway/Arrawidgee Road*, Federation Council; • Federation Way*, Federation Council; • Coonong Road*, Federation Council; • Red Hill Road, Wagga Wagga, Wagga Wagga City Council [Glenfield in Amendment Report]; • 1254 Four Corners Road, Coleambally, Murrumbidgee Council [1254 Four Corners Road in Amendment Report]; • Cooinbil Water Bore, Coleambally, Murrumbidgee Council [Cooinbil, Four Corners Road, Coleambally in Amendment Report]; • Carrathool Road, Four Corners, Edward River Council [shown in Figure 6-9 of the Amendment Report, however, unclear of name in Table 6-5]; • Wonga Station, Four Corners Road, Edward River Council [Wonga in Amendment Report]; • Four Corners Road Mabins Well; Edward River Council [Four Corners Road, Mabins Well in Amendment Report]; • North Bundy Station, North Bundy Road, Booroorban, Edward River Council [North Bundy, Booroorban-Tchelery Road, Booroorban in Amendment Report]; • Booroorban-Tchelery Road*, Booroorban, Edward River Council; • Strongs Lane*, Lockhart, Lockhart Shire Council; • Strongs Lane/Ben Hoffmanns Lane*, Lockhart Shire Council; • Urana-Lockhart Road 2*, Brookong, Lockhart Shire Council; • Slys Lane*, Lockhart Shire Council; • The Rock - Collinguillie Road*, The Rock, Lockhart Shire Council;

Key activity	Description of key activity
	• Bullenbung-the-Rock Road*, Lockhart Shire Council; • Tuttys Lane*, Tootool, Lockhart Shire Council; • French Park-Bullenbung Road*, Lockhart Shire Council; • Napier Road*, Lockhart Shire Council; • Albury Road*, Lockhart, Lockhart Shire Council; • 3 Bencubbin Avenue, Coleambally, Murrumbidgee Council [3 Bencubbin Avenue in Amendment Report]; • Kerr Kerri Rd, Moulamein, Murray River Council [Keri Keri in Amendment Report]; • Urana (between Osborne Street and Stephen Street), Federation Council [Urana in Amendment Report]; • Federation Way* (near corner Federation Way and Stephen Street), Federation Council; • Cadell Road, Coleambally, Murrumbidgee Council [Cadell Road Coleambally in Amendment Report]; • Mclennons Bore Road, Coleambally, Murrumbidgee Council [Mclennons Bore Road in Amendment Report]; • 8955 Newell Highway Bundure, Murrumbidgee Council [Newell Highway, Bundure in Amendment Report]; • Commera Wilson Lane Urana*, Lockhart Shire Council; • Commera Wilson Lane/Urana-Lockhart Road*, Lockhart Shire Council; • Paraway at Four Corners Road*, Murrumbidgee Council; • Paraway at Cobb Highway*, Hay Shire Council; • North Boundary Road*; Murrumbidgee Council; • Tooleybuc*, Murray River Council; • Off Sturt Highway* Wentworth Shire Council; • 16 Mile Gums*, Hay Shire Council; • Cadell Street, Hay, Hay Shire Council; • Jerilderie Road*, Hay Shire Council; • Court Street/Sturt Highway*, Balranald Shire Council; • Boiling Down Road*, Wagga Wagga City Council; and • continued use of the Stage 1 water supply points. The water supply points may require works to the existing infrastructure to enable connection and use by the water supply vehicles. The definition of ‘construction’ within the Infrastructure Approval excludes these activities. They will therefore not be subject to the Stage 1 CEMP and CEMP sub-plans. Irrespective of this, these activities will occur in accordance with the relevant conditions of the Infrastructure Approval. * The water supply points denoted above with an asterisk are additional to the water supply points identified in the EIS. Section 6.9.2 of Appendix B of the Amendment Report identifies potential sources of water for the project and notes that the final water sources, including any additions, would be confirmed in consultation with the water suppliers. Consultation with potential water suppliers has progressed and the list of proposed water supply points above has been amended accordingly. Prior to the use of each additional water supply point, the project would: • confirm that the water supply point could be accessed using the approved access routes identified in Appendix 3 to the Infrastructure Approval, or otherwise obtain the Planning Secretary’s agreement in accordance with condition C32; • reach agreement with the water supplier regarding the use of the water supply point for the project; and • carry out any additional assessments which may be required (ie heritage or biodiversity).

Key activity		Description of key activity
Traffic access routes and access points		Construction vehicle movements will be required for a variety of activities (i.e. earthworks, clearing and grubbing activities). All construction vehicles associated with the development will travel via the access routes as identified in Appendix 3 of the Infrastructure Approval or as otherwise approved. The establishment of access points would include establishing vehicle access and egress points to ensure safe vehicle movements. Existing access points may also be used. The definition of construction within the Infrastructure Approval does not include road upgrades (which includes access points). Road upgrade works are, however, incorporated within the Traffic and Transport Management Plan as required by condition C35.
Construct access tracks		Access to each tower would be required during construction. Access tracks would be required to be traversable by a range of vehicles. Access tracks would fall into two broad groups: • un-improved access tracks - using existing roads or tracks, or driving on existing soil or ground surface with minimal or no prior preparation; • improved access track – using existing roads or tracks where minor modification (such as grading or widening of the existing track) is required; and • constructed access tracks – around six metres wide and would generally follow the natural contour of the land as far as practicable to minimise the amount of cut and fill and soil disturbance. Access tracks would also include drainage control features such as table drains or cross banks to minimise erosion. Constructed access tracks would be required in areas, outside identified heritage risk zones, where there are no existing roads or tracks, or where terrain conditions prevent continuous access along the line easement between road crossings. Local waterway spans and causeways may be required, where alternative access routes are impractical, along the length of the proposal.
Temporary works		The project will require a significant quantity of temporary works during construction. The temporary works will include, but not be limited to, the following: • earthworks, including trenches, excavations, temporary slopes, stockpiles, and embankments; • laydown and parking areas for the towers; • structures, such as formwork, shoring, edge protection, temporary bridges, solid fencing/guardrails/barriers and signage, temporary scaffold; and • equipment/plant foundations, such as work platforms, crane, and piling platforms.
Transmission line construction	Earthworks and transmission tower footing construction	Excavation works and establishment of construction pads at each tower site would be required for the installation of foundations, levelling around the individual tower foundations, drainage and grading or preparation for construction at the tower site. Excavations would typically be up to five metres in depth. Construction of footings and foundation works for the new transmission line towers includes: • piling. Typical transmission line tower piling depth would be generally up to 6-15 metres below ground level and would depend on ground conditions (e.g. greater piling depths would be required where soft soil types are present).The foundation type would also vary (subject to detailed design) but would consist of either: - bored pile (reinforced concrete); - driven or screw pile (concrete or steel); and - helical screw anchor or cast in-situ reinforced concrete; • excavation to create bench sites (stepped ground excavation) where required to provide a level platform for equipment setup, the erection of the tower and other construction activities. Benching would be constructed by use of earthing equipment such as graders and excavators; • steel fabrication works; and

Key activity		Description of key activity
		• concrete pours.
	Assembly and erection of transmission line towers	The transmission line towers would typically be erected by assembling in sections on the ground and hoisting or lifting successive sections into place using cranes. Alternatively, towers may be erected in place on the footings by installing individual members. These towers would include infrastructure such as step bolts, climbing attachment plates, ladders, platforms, climbing barriers, identification plates, warning plates, other fixtures and fittings for the attachment of earthwires and insulators.
	Stringing of transmission lines including conductors and overhead earth wires and optical ground wires	Following erection and securing of the tower, the transmission line would be strung by either a ground pulled draw wire (with brake/winch sites) or a line stringing drone. The area required for the construction of each tower would require access for tower assembly and stringing works. Where a transmission tower is proposed to allow for a direction change of the transmission line, a larger area would be required (to allow for brake and winching sites). At a typical site, this would include a temporary area of up around 60 metres by 80 metres at each transmission line tower location (for the 330kV tower). The transmission line would require spanning a series of major watercourses. The general construction methodology is to assemble and erect a transmission line structure on either side of each major river. A drone would then be used to take a lead wire over the river to allow cables to then be pulled and strung tower to tower. Similar methodology will be undertaken when stringing transmission line across major road networks and railway lines.
	Installation of earthing conductors and connection to substations	The following key activities will be undertaken: • installation of earthing conductors at each of the transmission tower arms; • installation of earthing or isolation sections of fences and gates where the transmission line crosses or closely runs parallels to a metallic fence; and • connection of incoming transmission lines at the Dinawan and Wagga Wagga substations.
Optical repeater sites		Three optical repeater site communication huts would need to be constructed at Balranald, Boorooban and Lockhart. The optical repeater sites are communication huts to ensure the stability of the communications system over great distances during the operation phase. The key activities for the construction of the optical repeater sites would consist of the following: • site establishment, including vegetation removal and establishment of temporary construction site office, if required; • earthworks and preparation of the site for concrete foundations; • construction of a new communication hut building at each site; • installation of new pole-mounted transformers; • installation of electrical cables and terminations (either through the installed conduits or stringing of the aboveground poles); • installation of site wiring and electrical control equipment within each building; • trenching for underground conduit between the Balranald optical repeater hut and transmission line; • installation of new above ground poles between the transmission line and the respective Booroorban and Lockhart optical repeater sites; • provision of power connections between the transmission line and associated optical repeater site; and • removal of waste and remediation of site areas.
Pre-commissioning phases		Pre-commissioning activities would form part of the final construction and installation works and would incorporate all tests and checks to confirm that construction quality assurance documentation, inspection and test plans, checklists and associated activities have been completed for each individual component of plant. This would be to ensure that it has been supplied and

Key activity	Description of key activity
	installed in accordance with the design and statutory standards and is safe to proceed to commissioning. The key pre-commissioning activities which would be undertaken would include: • testing and commissioning of the new substation equipment; • point to point testing of the new transmission lines and substation connections; • earthing testing; • high voltage testing; • high voltage equipment operational checks; • testing of the installed protection, metering, control, and communication systems; and • cut over (energisation) of electricity between the existing and new transmission lines (where required).
Utility adjustments and protection	General utility protection and adjustment works, where required, to allow for the Wagga Wagga substation expansion and upgrades works to occur, the optical repeater sites, the establishment and operation of the construction compounds and accommodation camps, and where else required.
Progressive site rehabilitation and landscaping	Site rehabilitation would be carried out progressively along completed sections of the transmission line as well as the substation sites. This phase would occur following the completion of construction and involve the removal of materials not required during the operation of the substation and/or transmission lines. This phase would include the removal/remediation of the construction compounds and camp sites, removal of temporary facilities and site buildings and temporary environmental controls. Works may also be undertaken to restore: • water infrastructure facilities to pre-existing conditions before arrival on site in consultation with landowners; • natural drainage in areas where temporary facilities were provided; and • fences, gates, etc., which may have been damaged during construction. Installation of the permanent Transgrid property boundary fence surrounding the substation sites would also likely occur during this phase.
Demobilisation	SecureEnergy will start to downsize the construction team with gradual demobilisation as particular key construction activities are completed.

Some activities nominated in this stage will have already commenced as part of Stage 1 and/or the pre-construction minor works permitted in accordance with the Infrastructure Approval.

The pre-construction minor works will remain excluded from the definition of ‘construction’ and will therefore not be subject to this NVMP.

Once approved, this NVMP will supersede the existing Stage 1 NVMP. Therefore the activities that were approved to be carried out under the Stage 1 NVMP will continue under this NVMP.

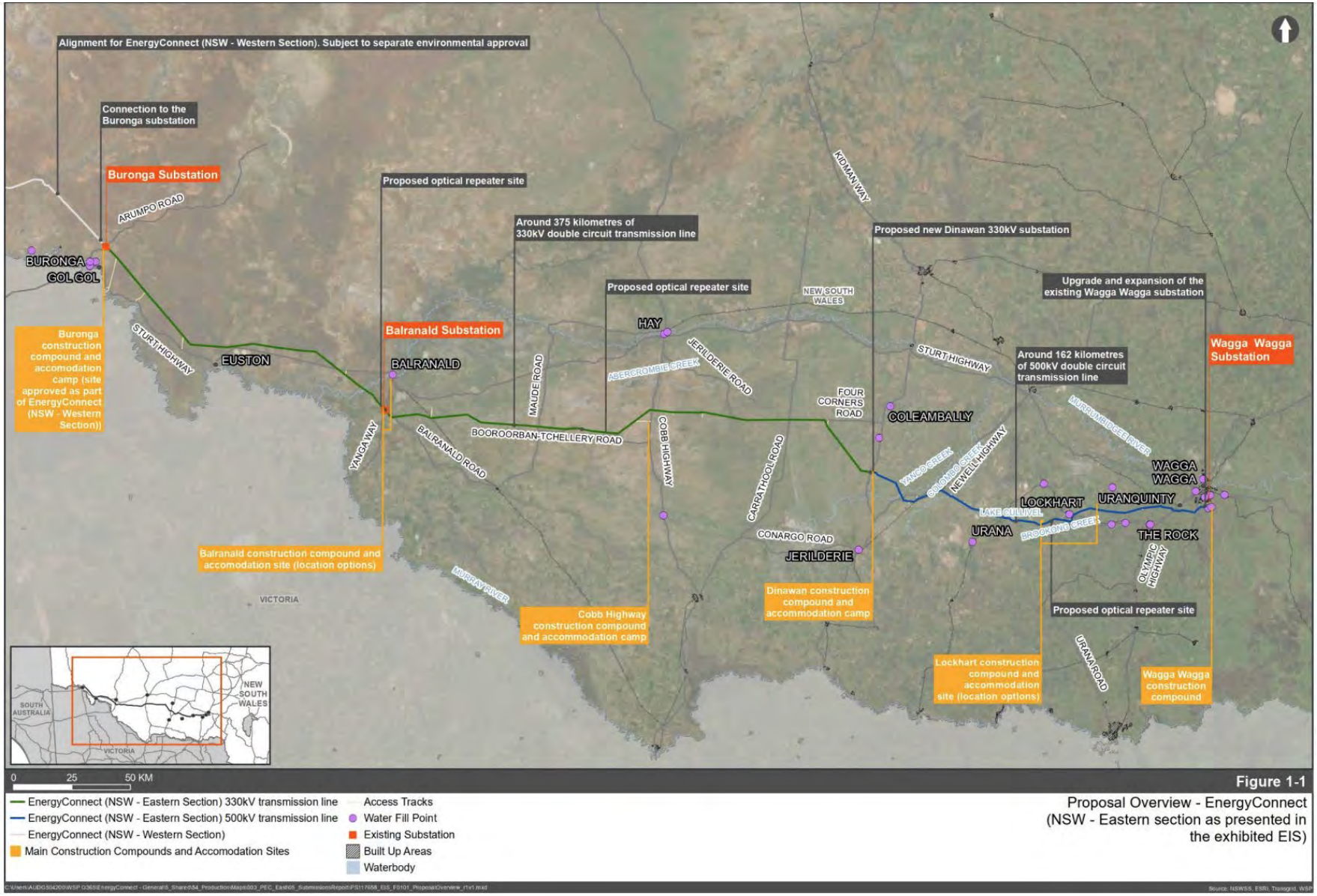

Figure 1.1 - Key features of EnergyConnect (NSW – Eastern Section) as shown in Figure 1-1 of the Amendment Report

1.4 Environmental management system

The overall environmental management system for the project is described in Section 4 of the CEMP.

This NVMP is a sub-plan that forms part of the CEMP and is also part of the environmental management framework for the project, as described in the CEMP. Figure 1.2 shows the CEMP framework for the project.

Management measures identified in this plan will be incorporated into relevant site-based documents including, but not limited to, site or activity specific work packs or work method statements (WMSs), the geographic information system (GIS)/sensitive area plans (SAPs) or training and awareness material.

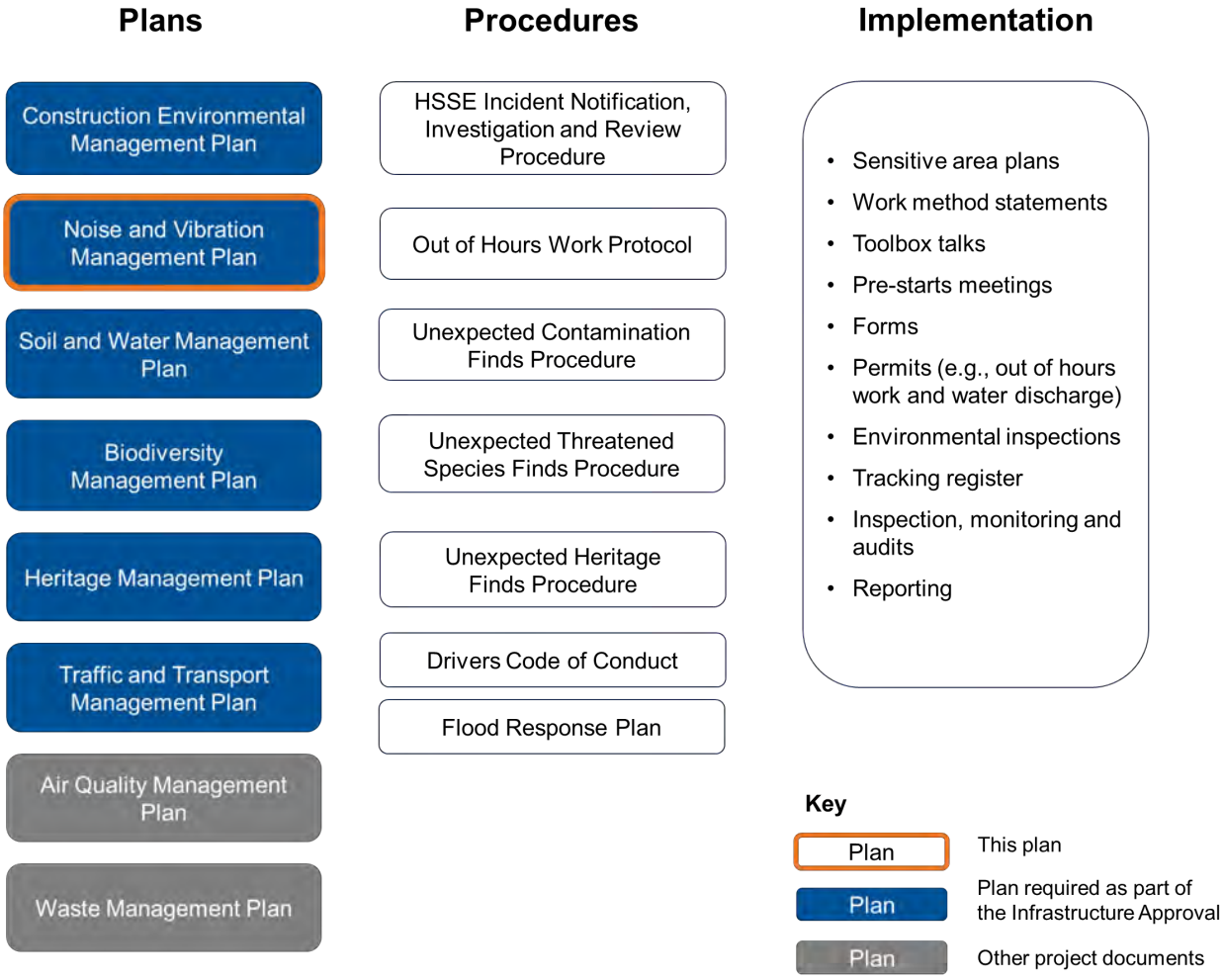

Figure 1.2 - CEMP framework

1.5 Purpose and objective

The purpose of this NVMP is to describe the approach to manage noise and vibration impacts that will be adopted during construction of the project.

The key objective of this plan is to detail management measures and inform site procedures for implementation so that noise and vibration impacts are minimised. To achieve this, the following will be undertaken:

- implement appropriate measures to address the requirements outlined in the Infrastructure Approval, EIS, Submissions Report and Amendment Report;
- implement appropriate measures during construction to minimise potential noise and vibration impacts to sensitive receivers; and

- implement appropriate measures to comply with relevant legislative requirements as described in Section 2.1 of this plan.

As a means of assessing environmental performance, environmental objectives (performance measures), targets (criteria) and performance indicators have been established for the project and are provided within Table 4.2 of the CEMP. All performance measures and indicators are applicable to the project, however, those most relevant to noise and vibration are detailed in Table 1.2.

Table 1.2 - Environmental objectives, targets and performance indicators relevant to noise and vibration

Aspect	Objectives (performance measures)	Targets (criteria)	Performance indicators
Compliance	Compliance with legislation, statutory approvals and the Infrastructure Approval	• Full compliance with statutory approvals. • No regulatory infringements (PINs or prosecutions). • No formal regulatory warning.	Number of regulatory infringements (PINs or prosecutions), formal regulatory warning, audits
	Implement and comply with the CEMP and associated management plans	• Zero non-compliances identified during each compliance audit of CEMP and sub-plans.	Number of non-compliances arising from each audit.
Engage with stakeholders and the broader community, minimise complaints and respond to any complaints within a suitable timeframe	Disseminate regular project updates and other information to keep the community informed of the project, particularly out of hours works. Record and respond to complaints, including noise and vibration complaints, within a timely manner.	• All project updates provided within the timeframes specified within the *Community Communication Strategy.* • All complaints are reviewed within the timeframes specified within the *Community Communication Strategy.*	Timeliness of project updates per project website; and timeliness of complaints response as recorded in the complaints register.
Training and improvement	Provide adequate training to ensure construction activities are undertaken safely and with minimal risk to the environment. Continuously improve environmental performance	• Regular environmental training that focuses on the specific project activities and associated environmental risks; • Regular pre-start meetings and toolbox talks in accordance with Section 6 of the CEMP.	Records of inductions, toolbox talks with environmental focus, daily pre-start meetings.

1.6 Preparation of this plan

In accordance with condition B1 of the Infrastructure Approval, this plan has been prepared and reviewed by a suitably qualified and experienced person. This plan was prepared by Katie Baxter and was reviewed by Rebecca Walker-Edwards.

1.7 Consultation

1.7.1 Development of the Out of Hours Work Protocol

In accordance with condition C10 f) of the Infrastructure Approval, the Out of Hours Work Protocol, which is required to form part of this NVMP, has been prepared in consultation with relevant councils (refer to Appendix A).

The Out of Hours Work Protocol applies to the entire construction phase (Stage 1 and Stage 2) and all associated activities required outside of standard construction hours. The Out of Hours Work Protocol was issued to the relevant councils for review and comment during consultation for the Noise and Vibration Management Plan associated with Stage 1 of construction (45860-HSE-PL-D-0110). Details of all consultation with the relevant councils will be submitted to the Department along with the submission of this plan. No changes were required in relation to Stage 2 of construction.

1.7.2 Ongoing communication and consultation

SecureEnergy will use a range of tools in accordance with the *Community Communication Strategy* (CCS) (45860-HSE-DOC-D-0024) to facilitate ongoing consultation and communication with the community and stakeholders (including government agencies where necessary) regarding the project. Communication tools include, but are not limited to, stakeholder briefings, project website, community drop-in sessions, door knocks and project factsheets. Notifications will be issued for, but not limited to the following commencement of construction, significant milestones and changes to the scope of work. Refer to the CCS for further information.

In accordance with condition D12 a) of the Infrastructure Approval, project documents including the EIS, approved strategies, plans or programs required under the conditions of approval and independent reports will be publicly available on the project website. The project website is https://www.transgrid.com.au/projects-innovation/energyconnect. A 24-hour toll-free telephone number (1800 490 666) is also available for any project enquiries. In accordance with condition D12 b) the information will be kept up to date.

1.7.3 Negotiated agreements

In accordance with condition C2 c) of the Infrastructure Approval, an agreement with sensitive receivers (owners and occupiers) may be negotiated to carry out works in accordance with the hours and noise limits specified in the agreement.

Where multiple receivers are affected by works, a substantial majority of the receivers must agree to the specified hours and noise limits proposed by the project.

All negotiated agreements will be in writing and will be finalised before the commencement of relevant works.

1.7.4 Complaints

Complaints will be managed by the Engagement Team with the use of Consultation Manager. Complaints will be received via phone calls, emails and letters. Any complaint received is regarded as a high priority and will be recorded, tracked and responded to in accordance with the CCS. Complaints will be investigated and dealt with impartially. The key principles of the complaint management process include:

- acknowledge - SecureEnergy staff should respect the communities' right to voice their concerns. All complaints received should be acknowledged to the complainant either by telephone or in writing;
- resolve - SecureEnergy staff should aim at first contact, resolution for all community concerns. SecureEnergy staff should investigate community concerns in detail before negotiating a resolution. All SecureEnergy staff should use their relevant discretions to achieve a mutually acceptable resolution to complaints;
- escalate - all SecureEnergy staff should aim to escalate the complaint if the community member remains dissatisfied with the investigation and/or resolution offered by their first point of contact at SecureEnergy. All complaints where a community member requests to speak to a higher-level representative, should also be escalated;
- record - SecureEnergy staff should aim, through the Engagement Team, to record all relevant information, on the community account in Consultation Manager, regarding customer concerns along with details of all discussions had with the community member in the process of investigating and/resolving the complaint. Detailed information on the resolutions offered to address community concerns should also be clearly recorded;
- communicate - SecureEnergy staff should remain in constant touch with the community member while their concerns are being investigated. The community member should be informed of all steps of the investigation and the resulting outcome at appropriate times;
- report - SecureEnergy should report on all complaints received to the SecureEnergy Management Team and Transgrid. The reporting should include information on the number as well as type of

complaints being received, the status of these complaints from time to time and the resulting outcomes or resolutions offered to close them;

- feedback - the SecureEnergy Engagement Team should aim at regular and intensive reviews to identify possible trends in the complaints being received. These reviews should be aimed at highlighting improvements required to avoid complaints being repeated;
- action - SecureEnergy should aim to effectively implement improvements suggested directly by the community or highlighted by complaint trends.

Wherever possible, complaints will be resolved directly between SecureEnergy and the stakeholder. If a complaints management process has been followed and the issue cannot be resolved, dispute resolution will be undertaken in accordance with the CCS. As part of this, a Community Complaints Mediator will be engaged to address any complaint where a member of the public is not satisfied by SecureEnergy's response. The escalated review process will include an assessment of the details of the complaint received, any findings of the investigation undertaken in response to the complaint, and any further matters raised by the complainant.

If a complaint requires referral to senior management and Transgrid, the complainant will be informed of this and the outcome of the review process. DPE may also request that the Environmental Representative (ER) assist in dispute resolution of community complaints.

All complaints will be provided to the ER in accordance with condition A13 on the day they are received, and a summary of complaints received, such as a complaints register, will be updated monthly on the project website in accordance with condition D12 vi).

1.8 Submission and approval

Prior to submission to DPE, the NVMP will be reviewed by the ER to ensure that the plan is consistent with the requirements of the Infrastructure Approval. A written statement to this effect will be prepared and submitted to DPE. This review will be undertaken in accordance with condition A12 of the Infrastructure Approval.

This NVMP will be submitted to DPE for review and approval by the Planning Secretary prior to commencing Stage 2 of construction.

Stage 2 of construction will not commence until the CEMP and all sub-plans required under condition B1, or where staging is proposed the plans required for that stage, have been approved by the Planning Secretary. The approved NVMP will then be implemented for the duration of the Stage 2 construction activities. The Department will be notified in writing via the Major Projects portal of the proposed date of commencement of Stage 2 of construction.

1.9 Periodic review

This NVMP will be reviewed at least annually and updated, if required, in accordance with Section 1.10 of the CEMP – Updating the CEMP. This includes the review and, if necessary, revision of this NVMP in accordance with condition D2 within three months of the following:

- submission of an incident report under condition D6 of the Infrastructure Approval;
- submission of an audit report under condition D11 of the Infrastructure Approval; or
- any modifications to the Infrastructure Approval.

Any updates to the NVMP will be approved as described in Section 1.10 of the CEMP.

2 Environmental requirements

2.1 Legislation

Legislation relevant to the management of noise and vibration includes:

- *Environmental Planning and Assessment Act 1979* (EP&A Act); and
- *Protection of the Environment Operation Act 1997* (POEO Act).

Relevant provisions of the above legislation are detailed within the register of legal and other requirements included in Appendix A1 of the CEMP.

2.2 Conditions of Approval

The conditions of the Infrastructure Approval relevant to noise and vibration are presented in Table 2.1. A cross reference is also included to indicate where the condition is addressed within this plan or other project management documents.

Table 2.1 - Conditions of Approval relevant to noise and vibration

<table>
<tr><th>Condition no.</th><th>Requirement</th><th>Where addressed</th><th>How addressed</th></tr>
<tr><td>B1</td><td>Prior to commencing construction, an Environmental Management Plan (EMP) comprising the Sub-plans listed in Table 1 must be prepared by a suitably qualified and experienced persons, to the satisfaction of the Planning Secretary.
Following the Planning Secretary's approval, the Proponent must implement the Environmental Management Plan.
Table 1: EMP Sub-plans
<table>
<tr><th></th><th>Required EMP Sub-plan</th><th>Relevant government agencies and stakeholders to be consulted for each EMP Sub-plan</th></tr>
<tr><td>(a)</td><td>Noise and Vibration</td><td>N/A</td></tr>
</table></td><td>Section 1.6
Section 1.8
The CEMP</td><td>The Construction Environmental Management Plan has been prepared to address the requirements of an EMP.
Construction of Stage 2 will not commence until this CEMP and the CEMP Sub-plans are approved, as detailed in Section 1.8.
Consultation for the CEMP subplans is addressed in Section 1.7.
There are no specific consultation requirements for this NVMP, however the Out of Hours Work Protocol required by condition C10 must be prepared in consulted with relevant councils (refer to condition C10 f) (i). As noted in Section 1.7.1, the Out of Hours Work Protocol covers all of construction (Stages 1 and 2) and the required consultation was completed during preparation of the Stage 1 documents CEMP and sub-plans. The protocol in Appendix A is unchanged and no additional consultation is required to satisfy condition C10 f) (i).</td></tr>
<tr><td rowspan="4">B2</td><td colspan="2">The EMP Sub-plans must be prepared in accordance with relevant guidelines and in consultation with the relevant government agencies identified for each Sub-plan in Table 1, and include:</td><td>Section 1.6
Section 1.7
Section 2.5</td><td>This NVMP has been jointly prepared in accordance with relevant guidelines.</td></tr>
<tr><td>a)</td><td>a summary of relevant background or baseline data;</td><td>Section 3</td><td>The existing known noise and vibration environment adjacent to the project is outlined in Section 3.</td></tr>
<tr><td>b)</td><td>details of:</td><td>-</td><td>-</td></tr>
<tr><td></td><td>(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);</td><td>Section 2
Section A1 of the CEMP</td><td>The relevant legislation, conditions, RMMs and guidelines applicable to noise and vibration are outlined in Section 2. Appendix A1 of the CEMP provides further detail on the relevant</td></tr>
</table>

Condition no.	Requirement	Where addressed	How addressed
			legislation applicable to noise and vibration.
	(ii) any relevant limits or performance measures and criteria;	Section 4 Section 1.5 Section 4.2 of the CEMP – Objectives and targets	Section 4 identifies specific noise and vibration criteria for the project. Further to this, the objectives (performance measures) and targets (criteria) relevant to noise and vibration management are outlined in Section 1.5 of this NVMP. The CEMP also provides project-wide environmental objectives (performance measures) and targets (criteria).
	(iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures; and	Section 1.5 Section 4.2 of the CEMP – Objectives and targets	The performance indicators relevant to noise and vibration management are outlined in Section 1.5 of this NVMP. The CEMP also provides project-wide performance indicators.
	(iv) any relevant commitments or recommendations identified in the EIS;	Section 2.3	Relevant noise and vibration commitments and recommendations identified in the EIS, have been outlined in Section 2.3.
	c) a description of the management measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Section 7	Specific noise and vibration related safeguards and management measures to address potential impacts associated with construction and comply with the relevant statutory requirements, limits and performance measures are outlined in Section 7.
	d) a program to monitor and report on the:	-	-
	(i) impacts and environmental performance of the development (including a table summarising all the monitoring and reporting obligations under the conditions of this approval); and	Section 8, including: Section 8.3 Section 8.4 Section 8.5 Section 8.6	Monitoring, inspections, auditing and reporting is outlined in Section 8 of this NVMP.
	(ii) effectiveness of the management measures set out pursuant to paragraph (c);	Section 8	Monitoring of the effectiveness of the management measures is outlined in Section 8 through compliance management process.
	e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Section 8.8 Section 8 of the CEMP- Incidents and emergencies Section 10 of the CEMP - Reporting Section 11 of the CEMP - Non-compliance, non-conformance, corrective and	Section 8.8 outlines a contingency plan in the event that unpredicted impacts are identified. The CEMP also provides additional detail regarding incidents and emergencies, reporting, non-compliance, non-conformance, corrective and preventative actions.

Condition no.	Requirement	Where addressed	How addressed
		preventative action	
	f) a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 1.9 Section 8 Section 1.9 of the CEMP - Continuous improvement	Section 8 of this NVMP outlines procedures for compliance management, including details for monitoring, inspections, auditing and reporting. Actions to undertake in the event that monitored noise levels exceed the modelling predictions are identified in Section 8.8 of this NVMP. This NVMP will reviewed at least annually as described in Section 1.9 of this NVMP. The Plan-Do-Check-Act model will be applied to the continuous improvement process, also outlined in Section 1.9 of the CEMP.
	g) a protocol for managing and reporting any: (i) incident, non-compliance or exceedance of any impact assessment criterion or performance criterion;	Section 8.7 Section 8.8 Section 8 of the CEMP - Incidents and emergencies Section 10 of the CEMP - Reporting Section 11 of the CEMP - Non-compliance, non-conformance, corrective and preventative action	Sections 8.7 and 8.8 describe the procedures for emergencies, incidents and non-compliances, including those related to noise and vibration. Actions to undertake in the event that monitored noise levels exceed the modelling predictions are identified in Section 8.8 of this NVMP. Additional detail for managing incidents and emergencies, non-compliances and non-conformances is included in the CEMP. The protocol for reporting any incidents, non-compliances or non-conformances is included in Section 10 of the CEMP.
	(ii) complaint; or	Section 1.7.4 Community Communication Strategy (CCS)	A summary of the complaints management procedure and reporting of complaints is included in Section 1.7.4 of this NVMP. The procedure for managing and reporting any complaints is described in the *Enquiries, Complaint and Dispute Resolution Management Procedure* provided in the CCS. The procedure includes a complaints management process which outlines how SecureEnergy will respond to complaints related to the project. In the event of a noise and vibration related complaint, the complaints management process will be implemented.
	(iii) failure to comply with other statutory requirements;	Section 8.7 Section 8 of the CEMP -	In the event of failure to comply with statutory requirements, the procedures summarised in Section 8.7 of this NVMP, and described in more detail in the CEMP, would be followed.

Condition no.	Requirement	Where addressed	How addressed
		Incidents and emergencies Section 10 of the CEMP - Reporting Section 11 of the CEMP - Non-compliance, non-conformance, corrective and preventative action	
	h) public sources of information and data to assist stakeholders in understanding environmental impacts of the development; and	Section 1.7 CCS	All public sources of information are available on the project's website (https://www.transgrid.com.au/projects-innovation/energyconnect) and detailed in Section 1.7.
	i) a protocol for periodic review of the EMP and EMP Sub-plans.	Section 1.9 Section 1.10 of the CEMP - Updating the CEMP	This NVMP will be reviewed at least annually in accordance with the CEMP.
	The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.	-	Noted
C1	Road upgrades, construction, upgrading and decommissioning activities may only be undertaken between: a) 7 am to 6 pm Monday to Friday; b) 8 am to 1 pm Saturdays; and c) at no time on Sundays and NSW public holidays; unless the Planning Secretary agrees otherwise.	Section 4.1	The standard construction hours for the project are identified in Section 4.1.
C2	The following activities may be carried out outside the hours specified in condition C1 above: a) the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons; b) emergency work to avoid the loss of life, property or to prevent material harm to the environment; or c) works carried out in accordance with the hours and noise limits specified in any negotiated agreements with sensitive receivers (owners and occupiers), provided the negotiated agreements are in writing and finalised before the commencement of works; d) activities that are inaudible at non-associated residences; e) road upgrades required by the relevant roads authority to be undertaken	Section 4.1 Section 1.7.3 Table 7.1 - N15 Appendix A – Out of Hours Work Protocol	The permitted variations to the standard construction hours are identified in Section 4.1. Agreements may be sought with sensitive receivers to undertake works in accordance with negotiated hours and noise limits as identified in Section 1.7.3 and/or in accordance with Appendix A – *Out of Hours Work Protocol*.

Condition no.	Requirement	Where addressed	How addressed
	outside the standard construction hours; or f) works carried out in accordance with an Out-of-Hours Work Protocol approved in accordance with condition C10.		
C3	The Proponent must take all reasonable and feasible steps to minimise the construction, upgrading or decommissioning noise of the development in the locations where the noise is audible to sensitive receivers, including any associated traffic noise.	This NVMP, particularly Section 7	Section 7 provides the management measures to minimise noise impacts on sensitive receivers.
C4	The Proponent must implement mitigation measures:	-	-
	a) to ensure that the noise generated by any construction, upgrading or decommissioning activities is managed in accordance with the requirements for construction 'noise affected' management levels established in accordance with *Interim Construction Noise Guideline* (DECC, 2009); and	Section 4.5 Section 6.2 Section 7	Construction 'noise affected' management levels are described as project 'noise management levels' throughout this NVMP and have been established in accordance with the Interim Construction Noise Guideline (ICNG) as identified in Section 4.5. In line with the ICNG, where predicted or measured noise levels exceed the noise management level (refer to construction noise impacts in Section 6.2), feasible and reasonable work practices will be identified and implemented, such as those included in Section 7.
	b) with the aim of achieving the road traffic noise assessment criteria for residential land uses from *NSW Road Noise Policy* (DECCW, 2011).	Section 4.7 Section 6.4 Table 7.1 – N6	The road traffic noise assessment criteria is described in Section 4.7. A consideration of construction road traffic noise is presented in Section 6.4. Measures to minimise the impacts of construction road traffic are identified in Table 7.1.
C5	The Proponent must comply with the following vibration limits: a) vibration criteria established using the Assessing vibration: a technical guideline (DEC, 2006) (for human exposure); b) BS 7385 Part 2-1993 "Evaluation and measurement for vibration in buildings Part 2" as they are "applicable to Australian conditions"; and c) vibration limits set out in the German Standard DIN 4150-3: Structural Vibration- effects of vibration on structures (for structural damage).	Section 4.6 Section 6.3	The nominated vibration criteria is described in Section 4.6. No exceedances of the nominated vibration criteria are expected as a result of the works as described in Section 6.3.
C6	Blasting may only be carried out on the site between 9 am and 5 pm Monday to Friday and between 9 am to 1 pm on Saturday. No blasting is allowed on Sundays or public holidays, unless approved in accordance with condition C1.	Section 4.1	Should blasting need to occur, the work would be carried out between 9 am and 5 pm Monday to Friday and between 9 am and 1 pm on Saturday. No blasting would be undertaken on Sundays or on public holidays unless the Planning Secretary agrees otherwise.

<table>
<tr><th>Condition no.</th><th>Requirement</th><th>Where addressed</th><th>How addressed</th></tr>
<tr><td>C7</td><td>The Proponent must ensure that any blasting carried out on the site does not exceed the criteria in Table 2.
Table 2: Blasting criteria
<table>
<tr><th>Location</th><th>Airblast overpressure (dB(Lin Peak))</th><th>Ground vibration (mm/s)</th><th>Allowable exceedance</th></tr>
<tr><td rowspan="2">Any non-associated residence</td><td>120</td><td>10</td><td>0%</td></tr>
<tr><td>115</td><td>5</td><td>5% of the total number of blasts or events over a rolling period of 12 months</td></tr>
</table></td><td>Section 4.7</td><td>Should blasting need to occur, the blasting will not exceed the criteria stipulated in Table 2.</td></tr>
<tr><td>C8</td><td>Except for corona discharge noise, the Proponent must ensure that the noise generated by the operation of the development does not exceed 35 dB(A) LAeq,15min, at the reasonably most affected point of the residence, in accordance with the NPfI, at any non-associated residence.</td><td>Section 5.4</td><td>Detailed design undertaken during Stage 2 will ensure that the project does not exceed 35 dB(A) LAeq,15min, at the reasonably most affected point of residence in accordance with the NPfI, at any non-associated residence.</td></tr>
<tr><td>C9</td><td>The Proponent must:
a) take all reasonable and feasible steps to minimise corona discharge noise during operation of the project;
b) identify residences predicted to experience corona discharge noise levels above 35 dB(A) LAeq, 15 min at the reasonable most affected point of the residence, determined in accordance with the NPfI, and how often corona noise is expected to be above this level per year;
c) implement all reasonable and feasible noise mitigation measures, determined in accordance with the NPfI, at receivers predicted to experience corona discharge noise levels that exceed the noise level identified in condition C8; and
d) prepare and implement a Research Program and allocate $150,000 to this program, prepared in consultation with EPA and be submitted to the Planning Secretary for approval prior to commencement of operation, which must provide further scientific and engineering understanding of corona discharge noise and best practice noise mitigation measures.</td><td>Section 7.1</td><td>Detailed design undertaken during Stage 2 will consider all reasonable and feasible steps to minimise the impacts of corona discharge noise that could occur during operation.
Detailed design will identify residences expected to exceed 35 dB(A) LAeq,15min and will determine how often these conditions would likely occur annually.
Detailed design will identify reasonable and feasible noise mitigation measures and these measures will be implemented.
Transgrid will prepare and implement a Research Program, prepared in consultation with the Environment Protection Authority (EPA). Transgrid will allocate $150,000 to this program and will submit the program to the Planning Secretary for approval prior to the commencement of operation.</td></tr>
<tr><td rowspan="3">C10</td><td>The Noise and Vibration EMP Sub-Plan required under condition B2 must:</td><td>-</td><td>-</td></tr>
<tr><td>a) ensure the requirements in conditions C1 to C9 are complied with;</td><td>Refer above for conditions C1 to C9.</td><td>Refer above for conditions C1 to C9.</td></tr>
<tr><td>b) include a description of the reasonable and feasible measures that would be implemented to minimise noise and vibration impacts of the development;</td><td>Table 7.1</td><td>Management and mitigation measures implemented to minimise noise and vibration impacts of the project are included in Section 7, particularly Table 7.1.</td></tr>
</table>

Condition no.	Requirement	Where addressed	How addressed
	c) include a detailed description of the noise and vibration management system for the development;	This NVMP, particularly Section 7 and Section 8	The noise and vibration management system is described throughout this NVMP, particularly the management and mitigation measures included in Section 7, and the compliance management process included in Section 8.
	d) include a protocol for the identification, notification and management of works that exceed the noise management levels; and	Section 7.1 Table 7.1 Section 8.3 CCS Appendix A	A protocol for the management of activities that could result in noise levels that exceed the noise management levels at sensitive receivers is identified in Section 7.1. Notification, as required, will be undertaken in accordance with the CCS. Works would be managed in accordance with the management measures identified in Table 7.1 and monitored as described in Section 8.3. Any works undertaken outside the hours identified in conditions C1 and C2, including those that could exceed the noise management levels, would be undertaken in accordance with the Out-of-Hours-Work Protocol in Appendix A.
	e) include a monitoring program that evaluates and reports on the effectiveness of the noise and vibration management system; and	Section 8.3 Section 8.4	The effectiveness of the management measures identified in Section 7 of this NVMP will be monitored and reported through the program provided in Sections 8.3 and 8.4.
	f) include an Out-of-Hours Work Protocol to identify a process for the consideration, management and approval of works that are outside the hours defined in conditions C1 and C6, which must: (i) be prepared in consultation with the relevant Council; (ii) identify low risk activities that can be undertaken without the approval of the Planning Secretary and with the approval of the ER; and (iii) identify high risk activities that must be approved by the Planning Secretary; and g) identify Department, Council and community notification arrangements for approved out of hours work.	Appendix A – Out of Hours Work Protocol	An Out of Hours Work Protocol has been prepared and is included in Appendix A. The protocol covers all construction activities (Stage 1 and Stage 2). Consultation with the relevant Councils was completed as part of consultation for the Stage 1 CEMP and sub-plans. The Protocol in Appendix A remains unchanged from the version in the Stage 1 NVMP.

2.3 Revised mitigation measures

The revised mitigation measures (RMMs) for the project are provided in Appendix B of the Submissions Report. The RMMs relevant to noise and vibration management are presented in Table 2.2.

A cross reference is also included to indicate where the measure is addressed within this plan or other project management documents. The management measures that will be implemented for the project are provided in Section 7 of this plan.

Table 2.2 - Revised mitigation measures relevant to noise and vibration

Ref	Revised mitigation measures	Application location(s)	Where addressed	How addressed
NV1	A Construction Noise and Vibration Management Plan (CNVMP) would be prepared by the construction contractor prior to construction works commencing and would (as a minimum) identify:	All locations	This plan	This plan has been prepared prior to Stage 2 construction works commencing.
	• all noise and vibration sensitive receivers;		Appendix B - Sensitive receivers Table 3.1	Sensitive receivers associated with Stage 2 works identified in Table 3.1 and visually represented in Appendix B.
	• feasible and reasonable noise mitigation where management levels are likely to be exceeded;		Section 7 Table 7.1	Feasible and reasonable mitigation measures are identified in Table 7.1.
	• feasible and reasonable noise measures to manage traffic noise impacts on public roads where impacts are identified at any sensitive receiver due to proposal–related traffic;		Section 7 Table 7.1	Mitigation measures to minimise noise levels associated with project construction road traffic are included in Table 7.1, as measure N4.
	• feasible and reasonable vibration mitigation where vibration criteria are likely to be exceeded;		Section 7 Table 7.1	Vibration management measures are included in Table 7.1, specifically measures N8 and N9.
	• describe associated noise and vibration monitoring programs;		Section 8.3	The monitoring program is presented in Section 8.3.
	• refer to complaint handling protocols for complaints related to construction noise and vibration; and		Section 1.7.4	Proactive strategies to prevent complaints include notification and consultation with sensitive receivers. Complaints management will be undertaken in accordance with the CCS.
	• outline community consultation measures including notification requirements.		Section 1.7	
	This CNVMP would be implemented for the duration of construction.		Section 1.3	This plan has been developed for Stage 2 and will be implemented for the duration of Stage 2 of construction.
NV2	Where noise from construction is likely to result in noise affected receivers, mitigation and management measures would be implemented where practicable and appropriate. This would include (but is not limited to) the following measures:	All locations	Section 7 Table 7.1	The mitigation measures listed in RMM NV2 have been included in Table 7.1 of this plan.
	• select quieter plant and equipment and use alternative construction methods to minimise noise levels;		Table 7.1	This requirement is included as management measure N6.

Ref	Revised mitigation measures	Application location(s)	Where addressed	How addressed
	• plan and schedule concurrent noisy activities to minimise the number of items of noisy plant operating at one time and cumulative noise levels;		Table 7.1	This requirement is included as management measure N7.
	• install screens or use barriers to mitigate noise from stationary noise sources;		Table 7.1	This requirement is included as management measure N6.
	• maximise the offset distance between noisy plant and orient equipment away from sensitive receivers;		Table 7.1	This requirement is included as management measure N6.
	• use noise source controls, such as residential class mufflers, to reduce noise from all regularly – used plant including cranes, excavators and trucks;		Table 7.1	This requirement is included as management measure N6.
	• use alternative reversing alarms in place of traditional beeper reversing alarms during works outside standard construction hours where noise impacts have been predicted;		Table 7.1	This requirement is included as management measure N6.
	• turn off machinery when not in use;		Table 7.1	This requirement is included as management measure N6.
	• ensure equipment is well maintained and not generating excessive noise;		Table 7.1	This requirement is included as management measure N3.
	• operate machinery in a manner which reduces maximum noise level events, such as shaking excavator buckets, loading trucks from a height, steel on steel contact and dragging materials across hard surfaces;		Table 7.1	This requirement is included as management measure N6.
	• provide awareness training regarding noise mitigation measures to be implemented;		Table 7.1	This requirement is included as management measure N1.
	• notify and consult with potentially affected receivers about upcoming noisy activities; and		Table 7.1 Section 1.7.2	This requirement is included as management measure N14 and N16.
	• ensure that noise affected receivers outside standard construction hours and highly noise affected sensitive receivers are provided with appropriate respite.		Appendix A	All works undertaken outside the hours defined in condition C1 and C2 will be undertaken in accordance with the Out of Hours Work Protocol.
NV3	Where construction is likely to result in vibration levels that exceed relevant criteria at sensitive receivers, mitigation and management measures would be implemented where practicable and appropriate. This would include (but is not limited to) the following measures:	All locations	Section 4.6 Section 7 Table 7.1	The mitigation measures listed in RMM NV3 have been included in Table 7.1 of this plan.
	• avoid the use of vibration–intensive plant at distances where human discomfort would result;		Table 7.1	This requirement is included as management measure N8.
	• substitute lower vibration–intensive plant and methods (for example use a smaller machine, lower power settings or alternative equipment);		Table 7.1	This requirement is included as management measure N8.

Ref	Revised mitigation measures	Application location(s)	Where addressed	How addressed
	• sequence operations to avoid or minimise concurrent vibration–intensive activities;		Table 7.1	This requirement is included as management measure N8.
	• schedule the use of vibration–sensitive equipment during the least sensitive times of the day;		Table 7.1	This requirement is included as management measure N8.
	• confirm any vibration–sensitive heritage structures that could be impacted by the proposal works. Develop site–specific measures to avoid vibration impacts and implement the measures during vibration–intensive activities in the vicinity; and		Table 7.1	No vibration-sensitive heritage structures have been identified in the vicinity of the Stage 2 disturbance area. In the event that vibration-sensitive heritage structures could be impacted, this requirement would be implemented as identified in management measure N9.
	• inform and consult with potentially affected receivers about upcoming vibration–intensive activities.		Table 7.1 Section 1.7.2	This requirement is included as management measure N16 and N14.
NV4	Where noise from construction–related traffic is likely to result in road traffic noise increases of more than 2 dB at affected receivers, mitigation and management measures would be implemented where practicable and appropriate. This would include (but is not limited to) the following measures: • minimise proposal–related traffic movements along the route; • minimise speeds for proposal–related traffic in the vicinity of affected receivers; • avoid compression braking and the use of air brakes in the vicinity of affected receivers; • implement driver training and measures to ensure driver awareness, speed limits, driver behaviour and designated routes are effectively communicated; and • limit traffic movements to daytime periods as far as possible and minimise traffic movements outside standard construction hours.	All locations	Section 4.7 Section 7 Table 7.1	The mitigation measures listed in RMM NV4 have been included in Table 7.1 of this plan, including N4 and N5.
NV5	Activities likely to generate noise levels that exceed applicable noise management levels at sensitive receivers would be scheduled during standard construction hours wherever practicable. Other activities required outside standard construction hours that are likely to generate noise levels that exceed applicable noise management levels at any nearby sensitive receivers would be carried out in accordance with an out of hours works protocol (Mitigation measure NV6).	All locations excluding the operation of the accommodation camps	Section 7 Table 7.1 Appendix A - *Out of Hours Work Protocol*	An Out of Hours Work Protocol has been prepared in line with condition C10 f) of the Infrastructure Approval and is included in Appendix A of this NVMP.
NV6	Develop and implement an out of hours works (OOHW) protocol that details how the proposal would identify, assess and approve	All locations excluding the operation	Section 1.7.2 Table 7.1	An Out of Hours Work Protocol has been prepared in line with

Ref	Revised mitigation measures	Application location(s)	Where addressed	How addressed
	out of hours works outside standard construction hours that are likely to generate noise levels that exceed the relevant noise management levels at sensitive receivers. The protocol would include provisions to: • carry out additional assessments for works proposed outside standard construction hours to confirm predicted noise levels • minimise noise levels outside standard construction hours • carry out the noisiest activities as early as possible in the work shift where practicable • identify appropriate respite for noise affected receivers (where required) • notify and engage with potentially affected receivers about upcoming works outside standard construction hours and address any associated complaints. The Out of Hours Work protocol would not apply to the operation of the accommodation camps. Prior to works outside standard construction hours, engagement and consultation would occur with potentially affected receivers regarding various mitigation and management measures. Based on this consultation, appropriate mitigation and management options would be considered and implemented where feasible and reasonable to minimise the impacts.	of the accommodation camps	Appendix A - Out of Hours Work Protocol	condition C10 f) of the Infrastructure Approval and is included in Appendix A of this NVMP.
NV7	Where residences or other sensitive receivers/structures are within the minimum working distances for vibration, different construction methods with lower source vibration levels would be investigated and implemented, where feasible. Attended vibration measurements would be undertaken at the start of the works to determine actual vibration levels at the structure. Works would cease if the monitoring indicates vibration levels are likely to, or do, exceed the relevant criteria.	All locations	Section 6.2.8	No sensitive receivers/ structures are within the minimum working distances for vibration as a result of the Stage 2 works.
NV8	Prior to the commencement of blasting, a Blast Management Strategy would be developed. The strategy would describe the process that would be used to design each blast (depths and Maximum Instantaneous Charge for each location etc) to comply with relevant noise and vibration criteria at any nearby sensitive receivers. The strategy would also detail noise and vibration monitoring and landholder notification requirements for blasting. The strategy would be implemented for all blasting.	Blasting locations	Section 6.2.8 Table 7.1	If blasting is proposed, a Blast Management Strategy would be developed in accordance with NV8 prior to the commencement of blasting.

Ref	Revised mitigation measures	Application location(s)	Where addressed	How addressed
NV9	Investigate any complaints regarding construction noise and vibration to determine if actual noise and vibration levels are as predicted and that appropriate mitigation measures have been implemented. Where required, identify and implement appropriate additional mitigation measures.	Blasting locations	Section 1.7.4 Section 7 Table 7.1	All complaints will be investigated in accordance with the CCS.
LP6	Procedures will be implemented so that potential impacts or conflicts between livestock and construction activities are appropriately managed. Procedures will be developed in consultation with affected landholders will include management of: • noise intensive activities during sensitive periods within the livestock production cycle (such as lambing and calving) • vehicle movements and other activities within the vicinity of livestock • movement of stock away from potential stressors created by construction activities.	Transmission line	Table 7.1	Landowners using disturbance areas for livestock grazing will be consulted prior to the commencement of works regarding alternatives for the management of their stock during these activities.

2.4 Licences and permits

Subject to the outcomes of geotechnical investigations, crushing and screening may be required. If necessary, an environment protection licence (EPL) will be obtained for the project for the scheduled activity of crushing and screening. The EPL will detail conditions which must be complied with when undertaking the crushing and screening activities.

2.5 Guidelines

The main guidelines, specifications and policy documents relevant to this plan include:

- NSW *Interim Construction Noise Guideline* (the ICNG), Department of Environment and Climate Change (DECC) 2009;
- *Noise Policy for Industry*, Environment Protection Authority 2017;
- *NSW Road Noise Policy* (RNP) (DECCW, 2011);
- *NSW Assessing Vibration – a technical guideline*, Department of Environment and Conservation 2006;
- British Standard BS 6472-2008, '*Evaluation of human exposure to vibration in buildings (1-80Hz)*;
- British Standard 7385: Part 2-1993 *'Evaluation and measurement of vibration in buildings'*;
- German Standard DIN4150-2016 *Structural vibration Part 3: Effects of vibration on Structures*;
- AS/NZS 2107:2016 *Acoustics – Recommended design sound levels and reverberation times for building interiors*; and
- Association of Australian Acoustical Consultants (AAAC): *Guideline for Child Care Centre Acoustic Assessment* (2013).

The documents identified above are considered by the project as described and referenced throughout this NVMP.

3 Existing environment

The following section summarises the existing noise and vibration environment within and adjacent to Stage 2 of the project. The key reference documents include:

- Chapter 18 of the EIS;
- Technical Paper 10 of the EIS (Noise and vibration impact assessment) (Technical Paper 10 of the EIS); and
- Section 6.6 of the Amendment Report.

Existing noise levels within and surrounding the project are influenced by the surrounding agricultural, industrial and rural residential land uses as well as local traffic and the operation of the existing Wagga Wagga substation.

Wagga Wagga is a rural township at the eastern extent of the project, in which noise levels are influenced by industrial, commercial and urban residential land uses and higher levels of local traffic.

3.1 Sensitive receivers

Sensitive residential receivers located within 1km of the project are listed in Table 3.1. All sensitive receivers located within 5km of the project are shown in Appendix B. All sensitive receivers specific to the water supply points are listed in Table 3.2.

At a broad scale, the project would only impact on a relatively small number of sensitive residential receivers for a majority of the alignment between Buronga and the proposed Dinawan substation. East of the proposed Dinawan substation, there would be smaller areas of more densely located sensitive receivers, typically around the following:

- the townships of Lockhart, Uranquinty and Wagga Wagga;
- a small cluster of receivers within the vicinity of Lake Benanee; and
- a cluster of receivers to the west of Lake Cullivel.

Table 3.1 - Sensitive residential receivers within 1km of the project

Receiver ID	Address	Nearest project element
188	The Rock	Transmission line
191	Valleyfield, 301 Boiling Down Rd, Rowan	
192	Belhaven, 233 Boiling Down Rd, Rowan	
202	Benlock, 83 Ashfords Rd, Gregadoo	Wagga Wagga construction compound
211	2 Mcgeachies Lane, The Rock	Transmission line
231	Caringa, 253 Rowan Rd, Rowan	
249	1066 Bullenbong Rd, Tootool	
259	517 Plumpton Rd, Rowan	
260	286 Boiling Down Rd, Rowan	
279	Uranquinty	
384	4353 Boree Creek Rd, Cullivel	
385	Cullivel	
414	Woodown, 5086 Albury Rd, Lockhart	
415	254 Lockhart The Rock Rd, Lockhart	
419	60 Dunleveys Lane, Lockhart	
432	128 Slys Lane, Milbrulong	

Receiver ID	Address	Nearest project element
450	128 Slys Lane, Milbrulong	
451	Holm Lea, 564 French Park-Bullenbung Rd, Milbrulong	
461	731 Hendersons Rd,Tootool	
468	The Rock	
500	Rowanfeyld, 6701 Holbrook Rd, Rowan	
501	Ubatuba, 6645 Holbrook Rd, Gelston Park	
502	6720 Holbrook Rd, Rowan	
503	6640 Holbrook Rd, Gelston Park	
504	6823 Holbrook Rd, Rowan	
546	2696 Lockhart Rd, Lockhart	Lockhart construction compound and accommodation camp
737	Arundel, 1504 Gregadoo East Rd, Gregadoo	Wagga Wagga construction compound
737	Arundel, 1504 Gregadoo East Rd, Gregadoo	Transmission line
738	Kismet, 1526 Gregadoo East Rd, Gregadoo	Wagga Wagga construction compound
738	Kismet, 1526 Gregadoo East Rd, Gregadoo	Transmission line
739	Kismet, 1526 Gregadoo East Rd, Gregadoo	Wagga Wagga construction compound
739	Kismet, 1526 Gregadoo East Rd, Gregadoo	Transmission line
740	551 Mitchell Rd, Gregado	Wagga Wagga construction compound
740	551 Mitchell Rd, Gregadoo	Transmission line
742	10 Butterbush Rd, Gregadoo	Wagga Wagga construction compound
743	36 Butterbush Rd, Gregadoo	
844	456 Plumpton Rd, Rowan	Transmission line
845	517 Plumpton Rd, Rowan	
846	Spring Creek, 21 Rowan Rd, Rowan	
847	511 Plumpton Rd, Rowan	
848	517 Plumpton Rd, Rowan	
851	688 Plumpton Rd, Rowan	
852	Valleyfield, 301 Boiling Down Rd, Rowan	
853	Mayfield, 202 Ashfords Rd,Gregadoo	Wagga Wagga construction compound
862	9 Ivydale Rd, Gregadoo	
1126	Milbrulong	Transmission line
1685	50985 Sturt Hwy, Euston	
1702	Lockhart	
1712	The Rock	
9996	St Johns, 672 French Park-Bullenbung Rd, Milbrulong	
10001	Milbrulong	
10006	Lockhart	
10007	Lockhart	

Receiver ID	Address	Nearest project element
10239	8955 Newell Hwy, Bundure	
11318	374 Barragunda Rd, Urana	
12296	747 Urana-Lockhart Rd, Lockhart	
14908	Woodlands, 4536 Boree Creek Rd, Urana	
15158	Euston	
20425	Connorton, 6879 Holbrook Rd, Rowan	
20426	Connorton, 6879 Holbrook Rd, Rowan	
20519	Thurrowa Road, Bundure	
20522	877 Coonong Rd, Morundah	
20523	877 Coonong Rd, Morundah	
20564	Il Bosco, 6643 Holbrook Rd, Gelston Park	
20571	6752 Holbrook Rd, Rowan	
20572	6823 Holbrook Rd, Rowan	
26749	6701-6739 Holbrook Rd, Gelston Park, Rowan	
26750	6701-6739 Holbrook Rd, Gelston Park, Rowan	
26865	2750 Lockhart Rd, Lockhart	Lockhart construction compound and accommodation camp
26868	2569-2569 Lockhart Collingullie Rd, Milbrulong	
26869	Collingullie Jerinderie Rd, Milbrulong	
26870	County Boundary Rd, Milbrulong	
26871	County Boundary Rd, Milbrulong	
26907	709-709 The Rock Collingullie Rd, The Rock	Transmission line
26908	709-709 The Rock-Collingullie Rd, The Rock	
26952	718-1040 Old Station Rd, Uranquinty	
27027	688 Plumpton Rd, Rowan	
27028	21-275 Rowan Rd, Rowan	
27032	456-456 Plumpton Rd, Lake Albert, Rowan	

Table 3.2 - Sensitive receivers for water supply points

Location	Owner	Local government area	Name in Amendment Report (if applicable)	Description of location	Distance to project site boundary	Distance to nearest EIS sensitive receiver (approximate)	Nearest sensitive receiver (approximate)
Euston Coop	Private	Balranald Shire Council	-	Morris Road, Euston	>1.5km	>1.5km	300m E
Lake Benanee	Private	Balranald Shire Council	-	-	>1.5km	>1.5km	200m NE
Sturt Highway/Meilman Road	Private	Balranald Shire Council	-	-	>1.5km	>1.5km	5km SE
Mylatchie Track	Private	Balranald Shire Council	-	-	>1.5km	>1.5km	13km SE
Court Street/Sturt Highway	TBD	Balranald Shire Council	-	-	>1.5km	>1.5km	50m NW
159 Church Street, Balranald	Balranald Shire Council	Balranald Shire Council	Church Street, Balranald	Note that the Amendment Report listed one Church Street water supply point within Table 6-5, however the mapping is unclear if two Church Street locations are included. It must be noted that the GIS mapping provided from the EIS process indicates two water supply points on Church Street.	>1.5km	>1.5km	70m NW
Church Street, Balranald	Balranald Shire Council	Balranald Shire Council	Church Street, Balranald	This water supply point uses existing infrastructure located in the south of Balranald township at the intersection between Church Street and Bank Street. It is indicated as a water supply point, however is connected direct to the camp via underground utilities.	>1.5km	>1.5km	50m SW
Ravensworth	Private	Hay Shire Council	Ravensworth	-	>1.5km	>1.5km	7.5km SW
Paraway at Cobb Highway	Private	Hay Shire Council	-	-	<1.5km	>1.5km	10km SE

Location	Owner	Local government area	Name in Amendment Report (if applicable)	Description of location	Distance to project site boundary	Distance to nearest EIS sensitive receiver (approximate)	Nearest sensitive receiver (approximate)
16 Mile Gums	LLS	Hay Shire Council	-	-	>1.5km	>1.5km	>20km
Cadell Street	Hay Shire Council	Hay Shire Council	Cadell Street		<1.5km	>1.5km	8.5km NE
Jerilderie Road	Private	Hay Shire Council	-	-	>1.5km	>1.5km	>20km
Tooleybuc	Murray River Council	Murray River Council	-	-	>1.5km	>1.5km	50m W
Kerri Kerri Road	Private	Murray River Council	Keri Road, Keri Keri		>1.5km	>1.5km	There are no receivers within 20km
137 Cadell Road, Jerilderie	TBC	Murrumbidgee Council	-	This water supply point is located on 137 Cadell Road.	>1.5km	>1.5km	5km S
Gala Vale	Private	Murrumbidgee Council	-	-	>1.5km	>1.5km	2km SE
Kidman Way	TBC	Murrumbidgee Council	-	-	>1.5km	>1.5km	2.3km SW
Crosby Road	TBC	Murrumbidgee Council	-	-	>1.5km	>1.5km	2km SE
Paraway at Four Corners Road	Private	Murrumbidgee Council	-	-	<1.5km	>1.5km	10km SE
North Boundary Road	Private	Murrumbidgee Council	-	-	<1.5km	>1.5km	14.5km
1254 Four Corners Road, Coleambally	Private	Murrumbidgee Council	1254 Four Corners Road	-	>1.5km	>1.5km	60m NE
Cooinbil Water Bore, Coleambally	Private	Murrumbidgee Council	Cooinbil Four Corners	-	>1.5km	>1.5km	9km SE
3 Bencubbin Avenue, Coleambally	Murrumbidgee Council	Murrumbidgee Council	3 Bencubbin Avenue, Coleambally	-	>1.5km	>1.5km	50m SW
Mclennons Bore Road, Coleambally	Private	Murrumbidgee Council	Mclennons Bore Road	-	<1.5km	>1.5km	2.5km SE

Location	Owner	Local government area	Name in Amendment Report (if applicable)	Description of location	Distance to project site boundary	Distance to nearest EIS sensitive receiver (approximate)	Nearest sensitive receiver (approximate)
8955 Newell Highway Bundure	Private	Murrumbidgee Council	Newell Highway, Bundure	-	<1.5km	>1.5km	2.5km SE
Boiling Down Road	Private	Wagga Wagga City Council	-	-	<1.5km	<1.5km	50m W
Red Hill Road, Wagga Wagga	Riverina Water	Wagga Wagga City Council	Glenfield	-	>1.5km	>1.5km	60m NE
Burraburoon	Private	Edward River Council	-	-	>1.5km	>1.5km	1.5km NE
X5 Mabins Well	Private	Edward River Council	-	-	<1.5km	>1.5km	400m N
Moulamein Road 1	Private	Edward River Council	-	-	<1.5km	>1.5km	2.5km SE
Moulamein Road 2	Private	Edward River Council	Moulamein	-	>1.5km	>1.5km	500m SE
Carrathool Road, Four Corners	Private	Edward River Council	Show in Figure 6-9 of the Amendment Report, but unclear of name in Table 6-5 of Amendment Report.		>1.5km	>1.5km	20km
North Bundy Station, North Bundy Road, Booroorban	Private	Edward River Council	North Bundy, Booroorban-Tchelery Road, Booroorban		>1.5km	>1.5km	20km
Booroorban-Tchelery Road	Private	Edward River Council	-	-	>1.5km	>1.5km	2.5km SW
Wonga Station, Four Corners Road	Private	Edward River Council	Wonga	-	>1.5km	>1.5km	400m NE
Four Corners Road Mabins Well	Private	Edward River Council	Four Corners Road Mabins Well	-	<1.5km	>1.5km	500m SE
Urana-Lockhart Road, Brookong	Private	Lockhart Shire Council	-	-	>1.5km	>1.5km	9km NW

Location	Owner	Local government area	Name in Amendment Report (if applicable)	Description of location	Distance to project site boundary	Distance to nearest EIS sensitive receiver (approximate)	Nearest sensitive receiver (approximate)
Brookdale	Private	Lockhart Shire Council	-	-	<1.5km	>1.5km	400m S
Strongs Lane, Lockhart	Private	Lockhart Shire Council	-	-	<1.5km	>1.5km	500m SE
Strongs Lane/Ben Hoffmanns Lane	Private	Lockhart Shire Council	-	-	<1.5km	>1.5km	2km SE
Urana-Lockhart Road 2, Brookong	Private	Lockhart Shire Council	-	-	<1.5km	>1.5km	800m SE
Slys Lane	Private	Lockhart Shire Council	-	-	<1.5km	>1.5km	350m SE
Commera Wilson Lane Urana	Private	Lockhart Shire Council	-	-	<1.5km	>1.5km	1.6km N
Commera Wilson Lane/Urana-Lockhart Road	Private	Lockhart Shire Council	-	-	<1.5km	>1.5km	2km N
The Rock - Collinguillie Road, The Rock	Private	Lockhart Shire Council	-	-	<1.5km	>1.5km	1km N
Bullenbung-the-Rock Road	Private	Lockhart Shire Council	-	-	>1.5km	>1.5km	1.7km NW
Tuttys Lane, Tootool	Private	Lockhart Shire Council	-	-	>1.5km	>1.5km	1.7km SE
Napier Road	Private	Lockhart Shire Council	-	-	>1.5km	>1.5km	1.6km NW
Albury Road, Lockhart	Private	Lockhart Shire Council	-	-	>1.5km	>1.5km	900m NW
Federation Way/Coonong Road	Private	Federation Council	-	-	>1.5km	>1.5km	>20km
Newell Highway/Arrawidgee Road	Private	Federation Council	-	-	>1.5km	>1.5km	>20km

Location	Owner	Local government area	Name in Amendment Report (if applicable)	Description of location	Distance to project site boundary	Distance to nearest EIS sensitive receiver (approximate)	Nearest sensitive receiver (approximate)
Coonong Road	Private	Federation Council	-	-	<1.5km	<1.5km	4.5km SE
Newell Highway, Morundah	Private	Federation Council	-	-	>1.5km	>1.5km	2km SE
Urana (between Osborne Street and Stephen Street)	Riverina Water	Federation Council	Urana		>1.5km	>1.5km	25m W
Federation Way* (near corner Federation Way and Stephen Street)	TBC	Federation Council	-	Near the corner of Federation Way and Stephen Street	>1.5km	<1.5km	1km SW
Off Sturt Highway	Private	Wentworth Shire Council	-	-	>1.5km	>1.5km	10km SE
812 Windomal Road, Balranald	Private	Balranald Shire Council	Lucerne at Balranald	This water supply point is located on 812 Windomal Road, Balranald.	>1.5km	>1.5km	25m S
6204 Yanga Way, Yanga	TBC	Murray River Council	-	This water supply point is located on 6204 Yanga Way and the access track off Balranald Road.	>1.5km	>1.5km	25m W
111 Jerilderie Street, Murrumbidgee	Murrumbidgee Council	Murrumbidgee Council	111 Jerilderie Street, Jerilderie	This water supply point uses existing infrastructure located in the centre of Jerilderie township on Jerilderie Street.	>1.5km	>1.5km	30m E
Dinawan Stock & Domestic	Private	Murrumbidgee Council	Red Swamp / Dinawan Station	This water supply point is located approximately 16km west of Bundure at the intersection between Bundure Road and Kidman Way.	>1.5km	2km	2km W
Dinawan Camp and Laydown	Private	Murrumbidgee Council	Red Swamp / Dinawan Station	This water supply point is located east of Dinawan construction compound and accommodation camp.	>1.5km	>1.5km	2.3km SW
50 Elizabeth Avenue, Forest Hill	TBC	Wagga Wagga City Council	-	This water supply point is located on 50 Elizabeth Avenue, Forest Hill.	>1.5km	>1.5km	30m E

Location	Owner	Local government area	Name in Amendment Report (if applicable)	Description of location	Distance to project site boundary	Distance to nearest EIS sensitive receiver (approximate)	Nearest sensitive receiver (approximate)
Ashfords Road, Wagga Wagga	Riverina Water	Wagga Wagga City Council	Ashfords Road	This water supply point is located southeast of Wagga Wagga township on Ashfords Road.	<1.5km	<1.5km	500m NE
Lake Albert (Plumpton Road), Wagga Wagga	Riverina Water	Wagga Wagga City Council	Lake Albert	This water supply point is located in the south of Wagga Wagga township adjacent to Plumpton Road.	>1.5km	>1.5km	50m E
394 Hay Rd, Deniliquin	Edward River Council	Edward River Council	394 Hay Road, Deniliquin	This water supply point is located on 394 Hay Rd, Deniliquin.	>1.5km	>1.5km	20m E
9 Lang Street, Wanganella	Edward River Council	Edward River Council	Wanganella	This water supply point is located on 9 Lang Street, Wanganella.	>1.5km	>1.5km	40m SW
39 Urana Street, The Rock	TBC	Lockhart Shire Council	The Rock	This water supply point is located on 39 Urana Street, The Rock.	>1.5km	>1.5km	25 W
2850 Lockhart the Rock Road, Tootool	Riverina Water	Lockhart Shire Council	Tootool	This water supply point is located on 2850 Lockhart the Rock Road, Tootool.	>1.5km	>1.5km	100m S
Bulgary (Rohan Road), Lockhart	Riverina Water	Lockhart Shire Council	Bulgary	This water supply point is located approximately 11km south of Bulgary on Rohans Road.	>1.5km	>1.5km	>1.5km
Lockhart - the Rock Road, Lockhart	Riverina Water	Lockhart Shire Council	Lockhart	This water supply point is located in the east of Lockhart township adjacent to Lockhart the Rock Road.	>1.5km	>1.5km	100m S
French Park-Bullenbung Road	Private	Lockhart Shire Council	-	-	>1.5km	>1.5km	300m NW
Richmond Street, Boree Creek	Riverina Water	Federation Council	Boree Creek	This water supply point is located on intersection of Richmond Road and Lachlan Street, Boree Creek.	>1.5km	>1.5km	100m NE

3.2 Aboriginal and historic heritage

Supplementary technical assessment 2 of the Submissions Report included the *Revised Non-Aboriginal and Aboriginal Cultural Heritage Assessment Report* which identifies the location of Aboriginal heritage features in the vicinity of the project. Aboriginal features include culturally modified trees, middens, scattered artefact finds and potential archaeological deposits (PADs).

The supplementary technical assessment identified the following Aboriginal features that have the potential to be impacted by the project:

- two PADs, PAD15 and PAD45, and two sites, PEC-E-18 and PEC-E-20 would be located less than 200m away from the Cobb Highway accommodation camp and compound and the nearby transmission line corridor;
- PAD38, which was refined into a larger PAD area, encompasses part of the alignment, a transmission line tower and an access track near the Lockhart alignment; and
- one PAD32 and one artefact scatter (PEC-E-60) which encompasses a transmission line tower Colombo Creek.

Technical Paper 10 of the EIS considered Aboriginal heritage items that are identified within the minimum safe working distances (refer Table 4.8). The technical paper stated that it does not implicitly follow that these items are sensitive to vibration on the basis of being classified as a heritage item alone, and that the items (trees, middens or scattered artefact finds) consist of typically non-vibration sensitive objects. The report concluded that none of these items were classified as structures and as such, no vibration heritage items are assumed to be within the safe working distances during construction. It is noted that Technical Paper 10 made no reference to PADs.

Additional information regarding the management of heritage sites near the Stage 2 works are included in the *Heritage Management Plan* (45860-HSE-PL-D-0119).

Further to above, no historic heritage structures were identified within the safe working distances for the Stage 2 works.

3.3 Measured noise levels

Unattended noise monitoring was undertaken at two locations during the assessment process of the EIS. Table 3.3 details the noise levels that were measured during the noise monitoring which occurred between 18 October and 4 November 2021 at 211 Liddles Lane, Jerilderie (referred to as noise monitoring location 1 (NM1)) and 83 Ashfords Road, Wagga Wagga (referred to as noise monitoring location 2 (NM2)).

The EIS advises that these noise monitoring locations were selected as they were considered representative of the existing background noise levels across the project and are located in the vicinity of the proposed Dinawan 330kV substation (NM1) and the existing Wagga Wagga substation (NM2).

Table 3.3 - Unattended noise measurement results

Noise monitoring location	Measured noise level (dBA)					
	Rating background level (RBL) dBA			Ambient noise level $L_{Aeq(15min)}$		
	Day(1)	Evening(1)	Night(1)	Day(1)	Evening(1)	Night(1)
NM1	35 (32)(2)	30	30 (27)(2)	52	51	48
NM2	35 (31)(2)	30 (29)(2)	30 (26)(2)	46	43	38

Notes (as per the EIS):

(1) Time periods defined as – Day: 7am to 6pm Monday to Saturday, 8am to 6pm Sunday; Evening: 6pm to 10pm; Night: 10pm to 7am Monday to Saturday, 10pm to 8am Sunday

(2) Where background levels are below the minimum assumed RBLs outlined in the NPfI, they have been adjusted to 35dBA during the day period, and 30dBA during the evening and night periods in accordance with the NPfI

To characterise the existing noise environment, short term (attended) noise measurements were also undertaken at each of the unattended noise monitoring locations during the daytime period as summarised in Table 3.4. Background noise levels were observed to be low during the daytime period and dominated by rural and natural sounds. The main noise sources observed during monitoring included birds, insects, motor vehicles, agricultural equipment, which is typical of rural and natural sounds and is expected to be generally consistent across the project area. Background noise levels were found to be consistent with the findings of the unattended noise monitoring program.

Table 3.4 - Attended noise measurement results

ID	Date and Time	Measured noise level			Comments
		$L_{A90(15min)}$	$L_{Aeq(15min\_}$	L_{Amax}	
NM1	20/10/2020 2:40 pm	33	42	62	Noise from a nearby tractor, insects, birds, local traffic
NM2	19/10/2020 2:55 pm	33	43	62	Local traffic, birds, electricity substation, insects

4 Noise and vibration criteria

The EPA recommends management levels and goals when assessing construction noise and vibration. These are outlined in:

- the ICNG (DECC, 2009); and
- *Assessing Vibration: a technical guideline* (DEC, 2006).

Relevant elements of these documents are summarised in the sections below.

4.1 Construction hours

4.1.1 Standard construction hours

In accordance with condition C1, and in line with the ICNG standard construction hours, road upgrades, construction, upgrading or decommissioning may only be undertaken between:

- 7am to 6pm – Monday to Friday;
- 8am to 1pm – Saturdays; and
- at no time on Sundays and NSW public holidays;

unless the Planning Secretary agrees otherwise.

In accordance with condition C6, blasting may only be carried out on the site between 9 am and 5 pm Monday to Friday and between 9 am to 1 pm on Saturday. No blasting is allowed on Sundays or public holidays, unless approved in accordance with condition C1.

4.1.2 Variation to standard construction hours

The following construction, upgrading and decommissioning activities may be carried out outside the hours specified above, as permitted in condition C2:

- the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons;
- emergency work to avoid the loss of life, property or to prevent material harm to the environment;
- works carried out in accordance with the hours and noise limits specified in any negotiated agreements with sensitive receivers (owners and occupiers), provided the negotiated agreements are in writing and finalised before the commencement of works;
- activities that are inaudible at non-associated residences;
- road upgrades required by the relevant roads authority to be undertaken outside the standard construction hours; or

works carried out in accordance with an Out-of-Hours Work Protocol approved in accordance with condition C10.Construction work is proposed seven days per week (Monday to Sunday) between 7am and 7pm (referenced in the EIS as the base construction hours). These work hours were assessed in the EIS, to enable an overall reduction in the duration of construction and were considered due to the limited number of nearby sensitive receivers and the proposed shift arrangements of the workforce given the remote nature of the project. Any works undertaken outside of the standard construction hours detailed within Section 4.1.1, except those allowable as detailed within this section, will be undertaken subject to the requirements of the Out of Hours Work Protocol (Appendix A).

4.2 Out of hours work protocol

An Out of Hours Work Protocol (required in accordance with condition C10 f)) is provided in Appendix A to identify the process for the consideration, management and approval of works to be undertaken outside the hours defined in conditions C1, C2 and C6 (which details blasting hours) of the Infrastructure Approval.

Works that comply with the conditions C1, C2 and C6 are not required to be undertaken in accordance with the processes outlined in the Out of Hours Work Protocol. Operation of the accommodation camps will not be subject to the Out of Hours Work Protocol as the definition of 'construction' within the Infrastructure Approval excludes the operation of the accommodation camps. The operation of the accommodation camps is addressed in their respective Accommodation Camp Management Plan required under condition C50.

4.3 Construction noise and assessment objectives

The ICNG provides guidelines for the assessment and management of construction noise. The ICNG focuses on applying a range of work practices to minimise construction noise impacts rather than focusing on achieving numeric noise levels.

The main objectives of the ICNG are to:

- identify and minimise noise from construction works;
- focus on applying all 'feasible' and 'reasonable' work practices to minimise construction noise impacts;
- encourage construction during the recommended standard hours only, unless approval is given for works that cannot be undertaken during these hours;
- reduce time spent dealing with complaints at the project implementation stage; and
- provide flexibility in selecting site-specific feasible and reasonable work practices to minimise noise impacts.

4.4 Quantitative noise assessment criteria

Construction noise assessment goals presented in the ICNG are referred to as noise management levels for residential, sensitive land uses and commercial/industrial premises.

4.4.1 Residential premises

Table 4.1 (reproduced from Table 2 of the ICNG) sets out the external noise management levels for construction noise at residences.

In Table 4.1 the rating background level (RBL) is used when determining the management level. The RBL is the overall single-figure background noise level measured in each relevant assessment period (during or outside the recommended standard hours). The term RBL is described in detail in the *Noise Policy for Industry* (NPfI) (EPA, 2017).

As a guide, the difference between the internal noise level and the external noise level is typically 10dB with windows open for adequate ventilation.

Table 4.1 - Noise at residents using quantitative assessment

Time of day	Noise Management Level $L_{Aeq(15min)}$ *	How to apply
Recommended standard hours: • Monday to Friday 7am to 6pm • Saturday 8am to 1pm • No work on Sundays or public holidays	Noise affected RBL + 10dB	The noise affected level represents the point above which there may be some community reaction to noise. • where the predicted or measured $L_{Aeq(15min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level; and • the proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise.

Time of day	Noise Management Level $L_{Aeq(15min)}$ *	How to apply
		• where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: – times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences; – if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected RBL + 5dB	• a strong justification would typically be required for works outside the recommended standard hours; • the proponent should apply all feasible and reasonable work practices to meet the noise affected level; and • where all feasible and reasonable practices have been applied and noise is more than 5dBA above the noise affected level, the proponent should negotiate with the community.

* Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5m above ground level. If the property boundary is more than 30m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30m of the residence. Noise levels may be higher at upper floors of the noise affected residence.

4.4.2 Other land uses (non-residential)

The ICNG provides noise management levels for commercial and industrial premises and 'other sensitive' land uses (ICNG, Table 3). The management levels for other noise sensitive receivers not listed in the ICNG, such as hotels, are derived from *AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors* and the Association of Australian Acoustical Consultants (AAAC) *Guideline for Child Care Centre Acoustic Assessment* (2013). The noise management levels from AS2107 are the upper range levels to account for the variable and short-term nature of construction noise.

Table 4.2 presents noise management levels for other non-residential land uses based on the principle that the characteristic activities for each of these land uses should not be unduly disturbed. The noise management levels apply when the premises are in use during any assessment period.

Internal noise levels are assessed at the centre of the occupied room. External noise levels are assessed at the most affected point within 50m of the area boundary. Where internal noise levels cannot be measured, external noise levels may be used. A conservative estimate of the difference between internal and external noise levels is 10dB for buildings other than residences. Some buildings may achieve greater performance, such as where windows are fixed (that is, cannot be opened).

Table 4.2 - Noise at sensitive land uses (non-residents) using quantitative assessment

Land use	Noise management level ($L_{Aeq(15min)}$)	Where noise management level applies	Assumed façade loss (conservative) (dBA)	External equivalent noise management level ($L_{Aeq(15min)}$)	Reference
Cinema space, theatre, auditorium	35	Internal noise level	20	55	AS2107 'maximum'
Hotel (sleeping areas: hotels near minor roads)	35	Internal noise level	20	55	AS2107 'maximum'

Land use	Noise management level ($L_{Aeq(15min)}$)	Where noise management level applies	Assumed façade loss (conservative) (dBA)	External equivalent noise management level ($L_{Aeq(15min)}$)	Reference
Classrooms at schools and other educational institutions	45	Internal noise level	10	55	AS2107 'maximum'
Childcare centre (sleeping areas)	40	Internal noise level	10	50	AAAC Guideline for Child Care Centre Acoustic Assessment
Hospital wards and operating theatres	45	Internal noise level	20	65	ICNG
Places of worship	45	Internal noise level	20	65	ICNG
Library (reading areas)	45	Internal noise level	20	65	AS2107 'maximum'
Community centres – municipal buildings	50	Internal noise level	10	60	AS2107 'maximum'
Restaurant, bar (bars and lounges/ restaurant)	50	Internal noise level	20	70	AS2107 'maximum'
Passive recreation (e.g. area used for reading, meditation)	60	External noise level	--	60	ICNG
Active recreation (e.g. sports fields)	65	External noise level	--	65	ICNG
Commercial premises (including offices and retail outlets)	70	External noise level	--	70	ICNG
Industrial premises	75	External noise level	--	75	ICNG

4.4.3 Sleep disturbance criteria

Where construction works are planned to extend over more than two consecutive nights, the potential for works to disturb sleep should be considered. Factors that may be important in assessing the extent of impact on sleep include how often high noise events occur at night, the predicted maximum noise levels, whether there are times when there is a clear change in the noise environment (such as during early morning shoulder periods), and the degree of maximum noise levels above the background noise level.

A night-time sleep disturbance 'screening criterion' noise goal of RBL + 15dB is used to identify the receivers where there is potential for sleep disturbance.

Where the sleep disturbance screening criterion is exceeded, further assessment is conducted to determine whether the 'awakening reaction' level of L_{Amax} 55dBA internal (i.e. 65dBA external assuming an open window or 75dBA external assuming a closed window) would be exceeded and the likely number of these events. The awakening reaction level is the level above which sleep disturbance is considered likely.

4.5 Project noise management levels for residential receivers

The project noise management levels presented in Table 4.3 are based on the existing background noise levels and are determined in accordance with the ICNG.

Table 4.3 - Noise management levels for residential receivers

Location	Rating background level (RBL) L_{A90}			Noise management level (NML) $L_{Aeq(15min)}$				Sleep disturbance $L_{A1(1min)}$
	Day (7am – 6pm)	Evening (6pm – 10pm)	Night (10pm – 7am)	Standard Hours[1] (RBL + 10dB)	Out of hours work (OOHW)[2] (RBL + 5dB)			
				Day (7am – 6pm)	Day	Evening	Night	RBL + 15dB
Dinawan	35 (32)[3]	30 [3]	30 (27)[3]	**45**	**40**	**35**	**35**	45
Wagga Wagga	35 (31)[3]	30 (29)[3]	30 (26)[3]					
All other receivers	35	30	30					

Notes:

(1) ICNG standard construction hours are defined as Monday – Friday: 7am – 6pm, Saturday: 8am – 1pm with no work on Sundays or public holidays.

(2) Out of hours work time periods are defined as:

Day: 7am to 8am Saturday, 1pm to 6pm Saturday and 8am to 6pm on Sunday and public holidays

Evening: 6pm to 10pm Monday to Sunday

Night: 10pm to 7am Monday to Saturday, 10pm to 8am Sunday

(3) Where background levels are below the minimum assumed RBLs outlined in the NPfI, they have been adjusted to 35dBA during the day period, and 30dBA during the evening and night periods in accordance with the NPfI.

4.6 Vibration criteria

Effects of ground vibration on buildings resulting from construction may be segregated into the following three categories:

- human exposure – disturbance to building occupants: vibration in which the occupants or users of the building are inconvenienced or possibly disturbed;
- effects on building contents – vibration where the building contents may be affected; and
- effects on building structures – vibration in which the integrity of the building or structure itself may be prejudiced.

4.6.1 Human comfort

Vibration criteria relating to human comfort that are applicable to this project are taken from the DEC (2006) document *Assessing Vibration – A Technical Guideline* and include the following:

- continuous vibration – from uninterrupted sources (Table 4.4);
- impulsive vibration – up to three instances of sudden impact e.g. dropping heavy items, per monitoring period (Table 4.5); and
- intermittent vibration – such as from drilling, compacting or activities that would result in continuous vibration if operated continuously (Table 4.6). All proposed vibration intensive activities are considered intermittent.

Table 4.4 - Human comfort - continuous vibration acceleration criteria (m/s^2) 1-80Hz

Location	Assessment period	Preferred Values		Maximum Values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Residences	Daytime	0.010	0.0071	0.020	0.014
	Night-time	0.007	0.005	0.014	0.010
Offices, schools, educational institutions and places of worship	Day or night-time	0.020	0.014	0.040	0.028
		0.04	0.029	0.080	0.058
Workshops	Day or night-time	0.04	0.029	0.080	0.058

Table 4.5 - Human comfort - impulsive vibration acceleration criteria (m/s^2) 1-80Hz

Location	Assessment period	Preferred values		Maximum values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Residences	Daytime	0.30	0.21	0.60	0.42
	Night-time	0.10	0.071	0.20	0.14
Offices, schools, educational institutions and places of worship	Day or night-time	0.64	0.46	1.28	0.92
Workshops	Day or night-time	0.64	0.46	1.28	0.92

Table 4.6 - Intermittent vibration impacts criteria (m/s1.75) 1-80Hz

Location	Daytime		Night-time	
	Preferred values	Maximum values	Preferred values	Maximum values
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

4.6.2 Structural damage

Two standards by which building damage from construction-induced vibration are commonly assessed include:

- British Standard 7385: Part 2-1993 *Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration* (BSI 1993); and
- German DIN 4150: Part 3 – 1999 *Effects of Vibration on Structure* (DIN 1999).

The German standard provides the most stringent criteria and will be used in this NVMP. The DIN guideline values for peak particle velocity (mm/s) measured at the foundation of the building are summarised in Table 4.7. The criteria are frequency dependent and specific to particular categories of structure.

Table 4.7 - Structural damage criteria

Type of structure	Peak Component Particle Velocity, mm/s			
	Vibration at the foundation at a frequency of			Vibration of horizontal plane of highest floor at all frequencies
	1Hz to 10Hz	10Hz to 50Hz	50Hz to 100Hz*	
Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
Structures that, because of their sensitivity to vibration, do not correspond to those listed in lines 1 and 2 and are of great intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

* For frequencies above 100Hz, at least the values specified in this column shall be applied.

4.6.3 Minimum working distances

The EIS (Table 5-10 of Technical Paper 10 of the EIS) identified minimum working distances for typical items of vibration intensive equipment to minimise potential for vibration related impacts. These are reproduced in Table 4.8.

Where vibration intensive equipment such as vibratory rollers, hydraulic hammers or bored piling rigs are used at a greater distance from sensitive receivers than the specified minimum working distance, there is negligible risk of structural damage or impacts on human comfort. Where recommended minimum working distances are not met, more detailed consideration of potential vibration impacts and the construction approach would occur during detailed design.

Table 4.8 - Minimum working distances for vibration intensive plant

Equipment	Rating/Description	Minimum working distance (m)		
		Human response (DEC, 2006)	Cosmetic damage to non-heritage structures (BSI, 1993)	Damage to heritage structures (DIN 4150-3:1999-02)
Vibratory roller	<100kN (typically 2-4t)	20	6	16
	>300kN (typically 13-18t)	100	20	54
Small hydraulic hammer	300kg – 5 to 12t excavator	7	2	5
Medium hydraulic hammer	900kg – 12 to 18t excavator	23	7	15
Large hydraulic hammer	1600kg – 18 to 34t excavator	73	22	44
Pile boring	≤800mm	N/A	2	5
Piling rig - hammer	12t down force	50	15	115

4.7 Blasting criteria

Table 4.9 reflects the blasting criteria stipulated for the project in accordance with condition C7. Any blasting undertaken on the project will meet the blasting criteria.

Table 4.9 - Blasting criteria

Location	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance
Any non-associated residence	120	10	0%
	115	5	5% of the total number of blasts or events over a rolling period of 12 months

4.8 Construction road traffic noise

Technical Paper 10 of the EIS notes that traffic impacts associated with construction vehicles are assessed using guidance from the *Road Noise Policy* (RNP). The RNP provides guidance on the assessment of noise impacts on sensitive receivers from additional road traffic generated by the proposal operating on a public road network.

The RNP makes a distinction between the assessment of freeway/arterial/sub-arterial roads and local roads. Freeway/arterial/sub-arterial roads are assessed over day (7am to 10pm) and night (10pm to 7am) periods.

Table 4.10 presents a summary of applicable road traffic criteria for residential receivers identified in Table 3 of the RNP.

Table 4.10 - Road traffic noise criteria for receivers on existing roads affected by the additional traffic from the project

Road type	External road traffic noise criteria[1]	
	Day 7am – 10pm	Night 10pm – 7am
Freeway/arterial/sub-arterial roads	60 dBA $L_{Aeq(15hour)}$	55 dBA $L_{Aeq(9hour)}$
Local roads	55 dBA $L_{Aeq(1hour)}$	50 dBA $L_{Aeq(1hour)}$

(1) Façade corrected noise levels

The application notes from the RNP detail the requirements for construction-generated traffic noise as follows:

> *For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level as a result of the development should be limited to 2dB above that of the noise level without the development. This limit applies where the noise level without the development is within 2dB of, or exceeds, the relevant day or night noise assessment criterion.*

Therefore, if the road traffic noise levels increase by more than 2dB as a result of the proposed construction traffic, and the criteria outlined in Table 4.9 are exceeded, mitigation options should be investigated.

4.9 Noise intensive equipment

SecureEnergy considers noise intensive equipment as having a sound power level above 115dBA (refer to Table B.1.1 of Technical Paper 10 of the EIS). Noise intensive equipment that may be used includes but is not limited to:

- piling rig;
- D8 dozer;
- excavator with hammer;
- pneumatic jackhammer;
- stump grinder; and/or
- mulcher/chipper.

5 Environmental aspects and impacts

5.1 Construction activities

An environmental aspect is an element of an organisation's activities, products, or services that has or may have an impact on the environment (ISO 14001 Environmental management systems). The relationship of aspects and impacts is one of cause and effect.

The key aspects that could result in adverse impacts to noise and vibration include the use of noise and/or vibration producing equipment for the following activities:

- vegetation clearing and grubbing activities;
- topsoil stripping;
- topsoil/material handling including stockpiling, material and spoil loading and material and spoil haulage;
- earthworks;
- surface grading and compaction;
- operating plant and equipment, including crushing and screening (as required);
- tower assembly and stringing;
- establishment of access points and water supply points;
- movement of vehicles including light and heavy vehicles;
- establishment and operation of the construction compounds at Wagga Wagga, Lockhart, Dinawan, Cobb Highway and Balranald;
- establishment of the accommodation camps at Lockhart, Dinawan and the Cobb Highway; and
- operation of the construction compounds.

Subject to a Blast Management Strategy in accordance with NV8, blasting may also be undertaken during construction.

5.2 Construction impacts

Potential impacts attributable to the works might include:

- loss of amenity for residential and non-residential sensitive receivers;
- reputational impacts due to complaints from the public; and
- disturbance of livestock.

Noise and vibration impacts will be intermittent and transient in nature, with some activities only occurring for a week at a time (e.g. access and clearing at tower sites).

Due to the location of the transmission line works and the distances to nearby receivers at the various sites, the works may exceed the noise management levels at a number of receivers along the alignment:

- up to and around 166 receivers are predicted to exceed the standard hours noise management levels during the access and clearing stage; and
- up to and around 139 receivers are predicted to exceed the standard hours noise management levels during the earthworks phase.

Construction activities associated with the Dinawan substation and Buronga sites are generally predicted to comply with noise management levels. At the Cobb Highway site a number of impacts are anticipated to occur at receivers:

- up to and around 26 residential receivers are predicted to exceed the standard hours noise management level (NML) during the predicted worst case (noisiest) works stage which is the earthworks stage. For the other work stages, up to six residential receivers are predicted to exceed the standard hours noise management levels; and
- up to and around 95 and 350 residential receivers are predicted to exceed the day and evening/night out of hours noise management levels respectively if out of hours earthworks are required at the Wagga Wagga substation.

There is also negligible risk of structural damage or impacts on human comfort due to the use of vibration intensive equipment (refer Section 6.2.7).

Further detail of the potential noise and vibration impacts resulting from specific proposed activities is provided within Section 6. The environmental management described in Section 7 (particularly the measures in Table 7.1) have been developed to address the potential noise and vibration impacts described here and in Section 5.3.

5.3 Blasting

Blasting may be required, depending on geotechnical conditions along the project alignment. The need for blasting will be confirmed during detailed development of the construction methodology, however it is expected that it will be limited to small areas as required at tower locations where shallow bedrock or hard geological conditions are identified.

Controlled blasting is a process used in road construction to break up hard rock that cannot be easily removed by typical excavation techniques or where typical excavation techniques (for example using excavators with hydraulic hammers) would result in poor amenity outcomes for adjacent sensitive receivers.

Controlled blasting may be required to be used in some locations along the alignment to loosen and break up existing rock to allow for creation of transmission tower pads and/or to facilitate excavation associated with the proposed Dinawan 330kV and/or Wagga 330kV substation works.

Controlled blasting will be used to loosen or sever the existing shallow rock in areas required so it can be removed by more traditional excavation methods. This would typically be undertaken by drilling a line of closely spaced holes within the area required (such as a transmission tower pad). Each hole would then be loaded with a small amount of explosives and a delayed detonation of the explosive would be carried out to limit the amount of energy being released at any particular moment. The energy generated as a result of detonating the explosive would break the harder rock formation(s) into smaller pieces to allow subsequent removal.

Following the controlled blasting activities, two options would be available for the removal of the rock material. These would include traditional excavation with excavation equipment or additional blasting. The technique to be used would be determined based on the success of the initial blasting activities.

Specific blasting and seismic details would be assessed on a site and blast specific basis. It is important that the actual buffer zone distances, associated specifically with this project, be identified and appropriate measures taken to limit overpressure and vibration to acceptable levels at critical locations.

5.4 Designing for corona discharge

Audible noise associated with the operation of high voltage transmission lines is primarily due to corona discharge from transmission lines. Such phenomenon is driven by conductor's Surface Voltage Gradient (SVG) and accumulation of pollution and water droplets on the transmission lines conductor surface. Corona discharge noise is therefore intermittent, typically occurring in certain atmospheric conditions such as during rain, mist or fog.

Such audible noise is understood to be typically characterised a broadband crackling noise with a possible more prominent tonal component at 100Hz. Such noise occurrence would apply to the new

transmission lines as well as existing transmission lines which run parallel to the new transmission lines, where cumulative noise impact requires consideration.

As outlined in Section 4 of the Response to DPE Request for Information (30 August 2022), options for at-source mitigation of potential operational noise from corona discharge to achieve the project trigger level of 35 dB(A) LAeq,15min are limited and not reasonable and feasible for this infrastructure. Only at-receiver treatments are likely to be reasonable and feasible to mitigate potential amenity impacts due to corona discharge in this context.

The operation of the project is not addressed in this Plan.

6 Construction noise and vibration assessment

6.1 Construction activities

Appendix B of Technical Paper 10 of the EIS includes a summary of the construction scenarios and noise levels for plant and equipment that were assessed to predict noise impacts associated with the project.

The scenarios relevant to construction that were assessed include:

- substation construction at Dinawan and expansion of Wagga Wagga substation:
  - enabling works;
  - earthworks and civil construction works;
  - electrical construction works;
  - pre-commissioning; and
  - demobilisation and rehabilitation;
- construction compounds and accommodation camps:
  - enabling works;
  - enabling works – site establishment;
  - operation of the compound – standard hours;
  - operation of the compound – outside standard hours; and
  - demobilisation / rehabilitation;
- transmission line construction:
  - enabling works;
  - site establishment and access tracks;
  - earthworks and civil construction works;
  - tower assembly;
  - tower erection;
  - tower stringing;
  - commissioning/energisation; and
  - demobilisation and rehabilitation.

Additional information regarding the types of activities included in each scenario and assessed equipment is included in Appendix C.

6.2 Construction noise impacts

Condition C4 of the Infrastructure Approval states that noise generated by any construction activities must be managed in accordance with the requirements for construction 'noise affected' management levels established in accordance with the ICNG.

Construction 'noise affected' management levels are described as project 'noise management levels' throughout this NVMP and have been established in accordance with the ICNG as identified in Section 4.5. In line with the ICNG, where predicted or measured noise levels exceed the noise management level, feasible and reasonable work practices will be identified and implemented, such as those included in Section 7.

The information in the following sections describes the potential noise impacts for Stage 2 activities compared to the noise management levels. The information is generally obtained from noise assessments presented in Chapter 18 and Technical Paper 10 of the EIS and Section 6.6 of the Amendment Report. The location of the nearest sensitive receivers referenced in this section are depicted on the maps included in Appendix B.

6.2.1 Wagga Wagga

Overview

The EIS assessed the upgrade and expansion of the Wagga Wagga substation site and the establishment and operation of a construction compound adjacent to the Wagga Wagga substation.

Potential impacts

Section 5.2.1.9 of Technical Paper 10 of the EIS found that construction works at the Wagga Wagga substation upgrade and expansion site and compound site would result in a number of predicted exceedances of the noise management level at the nearest sensitive receivers in close proximity to both sites. The predicted noise levels at the Wagga Wagga substation and construction compound sites during standard hours and out of hours work periods are listed within Table 6.1.

Table 6.1- Predicted noise levels – Wagga Wagga substation and construction compound

Construction work phase	Period[1]	Project NML $L_{eq(15min)}$ dBA	Predicted noise level range $L_{eq(15min)}$ dBA	Exceedance of project NMLs $L_{eq(15min)}$ dBA	Highly noise affected NML 75dBA or greater $L_{eq(15min)}$
Substation early and set out works	SH day	45	Up to 55	Up to 10	-
	OOHW day	40	Up to 60	Up to 20	-
	OOHW E/N	35	Up to 55	Up to 20	-
Earthworks and civil construction works	SH day	45	Up to 60	Up to 20	-
	OOHW day	40	Up to 70	Up to 30	-
	OOHW E/N	35	Up to 65	Up to 30	-
Electrical construction works	SH day	45	Up to 65	Up to 20	-
	OOHW day	40	Up to 60	Up to 20	-
	OOHW E/N	35	Up to 65	Up to 30	-
Construction of the compound	SH day	45	Up to 70	Up to 30	-
	OOHW day	40	Up to 60	Up to 20	-
	OOHW E/N	35	Up to 70	Up to 35	-
Operation of the compound	SH day	45	Up to 65	Up to 20	-
	OOHW day	40	Up to 60	Up to 20	-
	OOHW E/N	35	Up to 65	Up to 30	-
Pre-commissioning	SH day	45	Up to 55	Up to 10	-
	OOHW day	40	Up to 60	Up to 20	-
	OOHW E/N	35	Up to 65	Up to 20	-
Final completion	SH day	45	Up to 55	Up to 10	-
	OOHW day	40	Up to 60	Up to 20	-
	OOHW E/N	35	Up to 65	Up to 20	-

(1) SH day = ICNG standard construction hours, OOHW day = 7am to 8am and 1pm to 6pm Saturday, 8am to 6pm Sunday, OOHW E/N = 6pm to 7am Monday to Saturday and 6pm to 8am Sunday.

Note: Exceedance classes – Less than or meets noise management level (NML); NML+1–10 dB; NML+11 – 20 dB; NML+21 dB or more

The closest receivers are residential and are located approximately 330m south east of the Wagga Wagga substation, however the majority of receivers predicted to experience exceedances of the noise management levels are located in suburban districts to the north of the substation. No non-residential sensitive receivers were predicted to be impacted by the upgrade and expansion works at Wagga Wagga substation.

As noted in Section 7, reasonable and feasible measures would be implemented for works that are predicted to exceed the relevant NMLs or result in audible noise at sensitive receivers, in accordance with D4 and RMM NV2.

In accordance with condition C10 f), any works proposed to be undertaken outside the hours defined in conditions C1, C2 and C6 of the Infrastructure Approval, will be undertaken in accordance with the Out of Hours Work Protocol included in Appendix A.

As detailed in RMM NV5, activities likely to generate noise levels that exceed applicable noise management levels at sensitive receivers would be scheduled during standard construction hours, wherever practicable.

Stage 2 construction works at the Wagga Wagga sites would generally be conducted between 7 am and 7 pm. Where works are anticipated to result in impacts below the noise management levels, these works may be undertaken outside of these hours, in accordance with the Out of Hours Work Protocol (Appendix A).

6.2.2 Dinawan

Overview

The EIS assessed the Dinawan site for the establishment of a new substation and temporary construction compound and accommodation camp. The closest receiver was determined to be located at least four kilometres from the Stage 2 works.

Potential impacts

The EIS predicted the noise levels due to the Dinawan construction compound and accommodation camp during standard hours of work and out of hours work periods. These are listed within Table 6.2.

Table 6.2 - Predicted noise levels – Dinawan substation, construction compound and accommodation camp

Construction work phase	Period[1]	Project NML $L_{eq(15min)}$ dBA[2]	Predicted noise level range $L_{eq(15min)}$ dBA	Exceedance of project NMLs $L_{eq(15min)}$ dBA	Highly noise affected NML 75dBA or greater $L_{eq(15min)}$
All activities	SH Day	45	Less than 45	-	-
	OOHW D	40	Less than 40	-	-
	OOHW E/N	35	Less than 35	-	-

(1) SH day = ICNG standard construction hours, OOHW day = 7am to 8am and 1pm to 6pm Saturday, 8am to 6pm Sunday, OOHW E/N = 6pm to 7am Monday to Saturday and 6pm to 8am Sunday.

Note: Exceedance classes – Less than or meets noise management level (NML); NML+1–10 dB; NML+11 – 20 dB; NML+21 dB or more

No exceedances of construction noise management levels were predicted to occur near this site during any construction works at all hours.

In accordance with condition C10 f), any works proposed to be undertaken outside the hours defined in conditions C1, C2 and C6 of the Infrastructure Approval, will be undertaken in accordance with the Out of Hours Work Protocol included in Appendix A.

As detailed in RMM NV5, activities likely to generate noise levels that exceed applicable noise management levels at sensitive receivers would be scheduled during standard construction hours, wherever practicable.

Stage 2 construction works at the Dinawan substation sites would generally be conducted between 7 am and 7 pm. Where works are anticipated to result in impacts below the noise management levels, these works may be undertaken outside of these hours, in accordance with the Out of Hours Work Protocol (Appendix A).

6.2.3 Cobb Highway

Overview

The EIS assessed the Cobb Highway site as a construction compound and accommodation camp. The location of the combined construction facility was revised in the Amendment Report, to avoid impacts to a known PAD site. The Amendment Report considered that the change in location did not alter the noise assessment results from the EIS in the vicinity of the site.

Potential impacts

Section 5.2.1.5 of Technical Paper 10 of the EIS found that construction works at the Cobb Highway compound site would result in a number of predicted noise management level exceedances at the nearest sensitive receivers in close proximity to the site. The predicted noise levels at the Cobb Highway construction compound and accommodation camp site during standard hours and out of hours work periods are listed within Table 6.3.

Table 6.3 - Predicted noise levels – Cobb Highway construction compound and accommodation camp

Construction work phase	Period[1]	Project NML $L_{eq(15min)}$ dBA[2]	Predicted noise level range $L_{eq(15min)}$ dBA	Exceedance of project NMLs $L_{eq(15min)}$ dBA	Highly noise affected NML 75dBA or greater $L_{eq(15min)}$
Construction of the compound and camp	SH Day	45	Up to 50	Up to 5	-
	OOHW D	40	Up to 45	Up to 5	-
	OOHW E/N	35	Up to 45	Up to 10	-
Operation of the compound	SH Day	45	Less than 45	-	-
	OOHW D	40	Less than 40	-	-
	OOHW E/N	35	Less than 35	-	-
Decommissioning	SH Day	45	Less than 45	-	-
	OOHW D	40	Less than 40	-	-
	OOHW E/N	35	Up to 40	Up to 5	-

(1) SH day = ICNG standard construction hours, OOHW day = 7am to 8am and 1pm to 6pm Saturday, 8am to 6pm Sunday, OOHW E/N = 6pm to 7am Monday to Saturday and 6pm to 8am Sunday.

Note: Exceedance classes – Less than or meets noise management level); NML+1–10 dB; NML+11 – 20 dB; NML+21 dB or more

One residential property located approximately 1.5km north from the construction compound (Receiver ID 1777) was predicted to experience exceedances of the noise management levels during the Stage 2 works. These exceedances are anticipated to be limited to less than 5dB during both the standard and out of hours day works (OOHW D) and less than 10dB during works undertaken during evening and night periods (OOHW E/N).

As noted in Section 7, reasonable and feasible measures would be implemented for works that are predicted to exceed the relevant NMLs or result in audible noise at sensitive receivers, in accordance with D4 and RMM NV2.

In accordance with condition C10 f), any works proposed to be undertaken outside the hours defined in conditions C1, C2 and C6 of the Infrastructure Approval, will be undertaken in accordance with the Out of Hours Work Protocol included in Appendix A.

As detailed in RMM NV5, activities likely to generate noise levels that exceed applicable noise management levels at sensitive receivers would be scheduled during standard construction hours, wherever practicable.

Stage 2 construction works at the Cobb Highway sites would generally be conducted between 7 am and 7 pm. Where works are anticipated to result in impacts below the noise management levels, these works may be undertaken outside of these hours, in accordance with the Out of Hours Work Protocol (Appendix A).

6.2.4 Lockhart (County-Boundary Road)

Overview

The EIS assessed the Lockhart site as a construction compound and accommodation camp.

Potential impacts

Section 5.2.1.8 of Technical Paper 10 of the EIS found that construction works at the Lockhart construction compound and accommodation camp would result in a number of predicted exceedances of the noise management levels at the nearest sensitive receivers in close proximity to the site. The predicted noise levels at the Cobb Highway site during standard hours and out of hours work periods are listed within Table 6.4.

Table 6.4 - Predicted noise levels – Lockhart construction compound and accommodation camp

Construction work phase	Period[1]	Project NML $L_{eq(15min)}$ dBA	Predicted noise level range $L_{eq(15min)}$ dBA	Exceedance of project NMLs $L_{eq(15min)}$ dBA	Highly noise affected NML 75dBA or greater $L_{eq(15min)}$
Construction of the compound and camp	SH day	45	Up to 45	Up to 10	-
	OOHW day	40	Up to 60	Up to 20	-
	OOHW E/N	35	Up to 55	Up to 20	-
Operation of the compound	SH day	45	Up to 45	-	-
	OOHW day	40	Up to 40	-	-
	OOHW E/N	35	Up to 45	Up to 10	-

(1) SH day = ICNG standard construction hours, OOHW day = 7am to 8am and 1pm to 6pm Saturday, 8am to 6pm Sunday, OOHW E/N = 6pm to 7am Monday to Saturday and 6pm to 8am Sunday.

Note: Exceedance classes – Less than or meets noise management level (NML); NML+1–10 dB; NML+11 – 20 dB; NML+21 dB or more

Nine residential receivers are predicted to experience exceedances of the noise management levels, with one receiver (Receiver ID 546) located approximately 630 metres northeast of the Lockhart site, predicted to a maximum exceedance of 19 dBA during the out of hours evening/night time period during the Stage 2 works to establish the construction compound. The EIS noted this receiver would also experience an exceedance of the noise management level of up to 10dB during the evening and night period, however this is likely associated with the operation of the camp (as the EIS grouped the operational noise assessment for these facilities), which is not included in the Stage 2 scope of works.

As noted in Section 7, reasonable and feasible measures would be implemented for works that are predicted to exceed the relevant NMLs or result in audible noise at sensitive receivers, in accordance with D4 and RMM NV2.

In accordance with condition C10 f), any works proposed to be undertaken outside the hours defined in conditions C1, C2 and C6 of the Infrastructure Approval, will be undertaken in accordance with the Out of Hours Work Protocol included in Appendix A.

As detailed in RMM NV5, Activities likely to generate noise levels that exceed applicable noise management levels at sensitive receivers would be scheduled during standard construction hours, wherever practicable.

Stage 2 construction works at the Lockhart sites would generally be conducted between 7 am and 7 pm. Where works are anticipated to result in impacts below the noise management levels, these works may be undertaken outside of these hours, in accordance with the Out of Hours Work Protocol (Appendix A).

6.2.5 Balranald

Overview

The EIS assessed the Balranald site as a construction compound and accommodation camp.

Potential impacts

No receivers are predicted to experience exceedances of the noise management levels during any work stages at the construction compound at Balranald (1.1 kilometres northwest of existing Balranald substation).

In accordance with condition C10 f), any works proposed to be undertaken outside the hours defined in conditions C1, C2 and C6 of the Infrastructure Approval, will be undertaken in accordance with the Out of Hours Work Protocol included in Appendix A.

Stage 2 construction works at the Balranald sites would generally be conducted between 7 am and 7 pm. Where works are anticipated to result in impacts below the noise management levels, these works may be undertaken outside of these hours, in accordance with the Out of Hours Work Protocol (Appendix A).

6.2.6 Buronga - operation of construction compound

Section 3 of the Technical Paper 10 of the EIS noted that the project would use the proposed construction compound and accommodation camp at Buronga which was approved under the EnergyConnect NSW – Western Section project approval. No new activities are required at this facility and as a result no new noise impacts were predicted. Based on noise assessments undertaken for the NSW – Western Section, no receivers are predicted to experience exceedances of the nose management levels during operation of the construction compound at Buronga. Therefore no exceedances of construction noise management levels were identified for this facility for the Stage 2 works.

6.2.7 Transmission line

Overview

Technical Paper 10 of the EIS identified that based on the indicative duration of works along the transmission line corridor, it is expected that for each key activity stage, the duration would generally be limited to less than one week with periods of no work between each stage of the transmission line construction (varying between one and 15 weeks).

Potential impacts

The construction of the transmission line has the potential to result in the exceedance of noise management levels for all assessed construction scenarios. The predicted noise levels for the transmission line construction works presented in Table 6.5 are conservative, as the assessment did not include screening impacts from terrain and assumed all plant identified in Appendix C of this NVMP was operational at any one time. As described in Section 5.2.1.1 of Technical Paper 10 of the EIS, actual noise levels experienced during construction are expected to be generally well below the predicted noise levels in at any identified receiver.

Due to the progressive nature of works at different locations along the transmission line corridor, all receivers would not be impacted for the entire duration of works.

Table 6.5 - Predicted noise levels – transmission line construction (source WSP)

Construction work phase	Period[1]	Project NML $L_{eq\ 15\ min}$ dBA	Predicted noise level range $L_{eq\ 15\ min}$ dBA	Exceedance of project NMLs $L_{eq\ 15\ min}$ dBA	Highly noise affected NML 75dBA or greater $L_{eq\ 15\ min}$
Enabling works	SH day	45	Up to 75	Up to 30	-
	OOHW day	40	Up to 70	Up to 30	-
	OOHW E/N	35	Up to and >65	>30	-
Site establishment and access tracks	SH day	45	Up to and >75	>30	2 receivers
	OOHW day	40	Up to and >70	>30	-
	OOHW E/N	35	Up to and >65	>30	-
Earthworks and civil construction works	SH day	45	Up to and >75	>30	2 receivers
	OOHW day	40	Up to and >70	>30	-
	OOHW E/N	35	Up to and >65	>30	-
Tower assembly	SH day	45	Up to 75	Up to 30	-
	OOHW day	40	>70	>30	-
	OOHW E/N	35	Up to and >65	>30	-
Tower erection	SH day	45	Up to 75	Up to 30	-
	OOHW day	40	Up to and >70	>30	-
	OOHW E/N	35	Up to and >65	>30	-
Tower stringing	SH day	45	Up to 75	Up to 30	-
	OOHW day	40	Up to and >70	>30	-
	OOHW E/N	35	Up to and >65	>30	-
Commissioning / energisation	SH day	45	Up to 65	Up to 20	-
	OOHW day	40	Up to and >70	>30	-
	OOHW E/N	35	Up to 65	Up to 30	-
Demobilisation and rehabilitation	SH day	45	Up to 75	Up to 30	-
	OOHW day	40	Up to and >70	>30	-
	OOHW E/N	35	Up to and >65	>30	-

Note: Exceedance classes – Less than or meets noise management level (NML); NML+1–10 dB; NML+11 – 20 dB; NML+21 dB or more

(1) SH day = ICNG standard construction hours, OOHW day = 7am to 8am and 1pm to 6pm Saturday, 8am to 6pm Sunday, OOHW E/N = 6pm to 7am Monday to Saturday and 6pm to 8am Sunday.

6.2.8 Blasting

Estimated maximum instantaneous charges to comply with the objectives outlined below have been provided in Figure 6.1 to provide some indication of acceptable blast sizes, however further assessment would be undertaken and incorporated into site specific blast management plans to ensure that the vibration and overpressure objectives can be met. It should be noted that the assessment conducted are preliminary in nature and should be confirmed once tower locations and blasting methodology are finalised as part of detailed design.

Vibration formula:

and

$$V = 1140\left(\frac{R}{Q^{1/2}}\right)^{-1.6}$$

Overpressure formula: OP = 165 − 24 *(LogR − 0.33LogQ)

Where:

V = ground vibration as peak particle velocity in mm/s

R = distance between charge and point of measurement in metres

Q = effective charge mass per delay or maximum instantaneous charge in kilograms.

The distance limits per nominated Maximum Instantaneous Charge (MIC) may vary significantly depending on the geological conditions, local shielding and meteorological factors at the site.

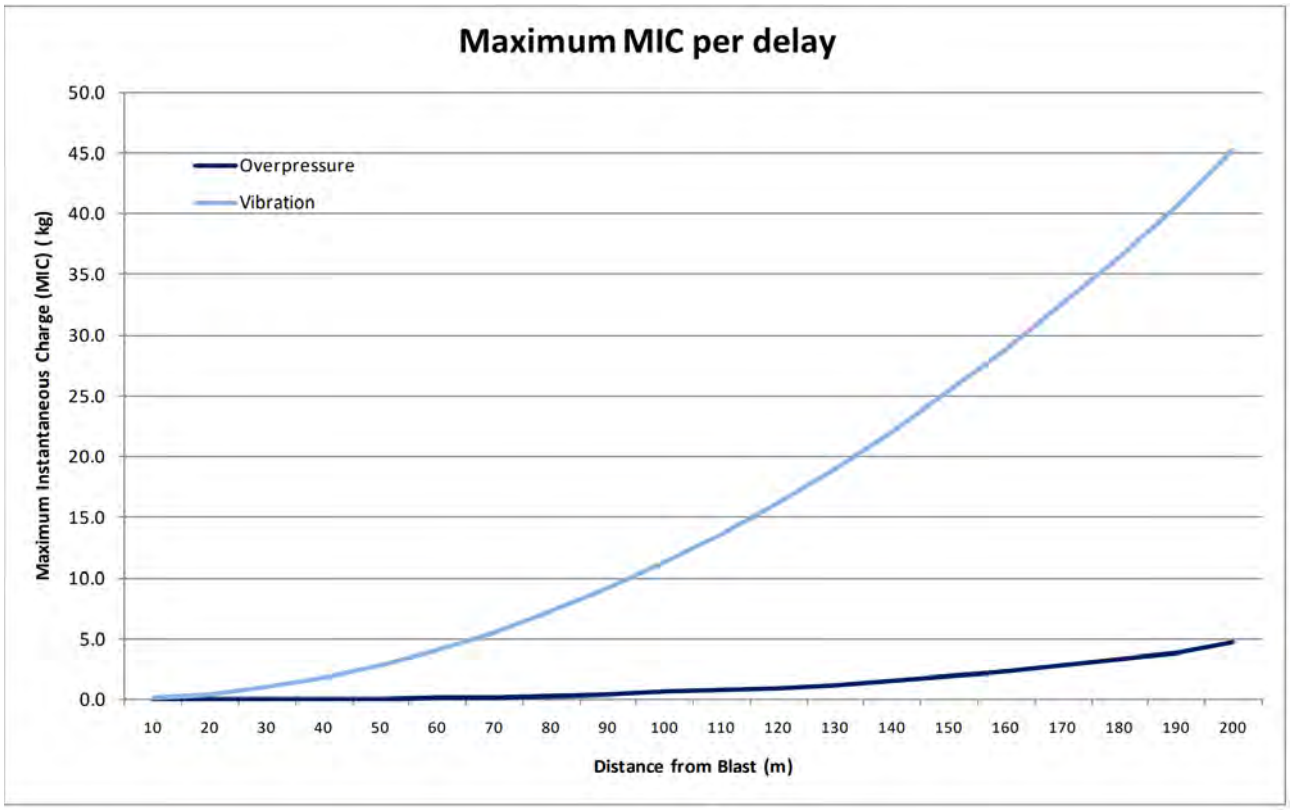

Figure 6.1 - Estimated effective mass charges to minimise annoyance (source: WSP)

Based on the outcomes of this assessment, the need for management and mitigation is dependent upon the maximum MIC proposed for use and the separation distance to the nearest affected sensitive receivers. These would be developed on a site specific basis in a Blast Management Strategy in accordance with RMM NV8.

Areas where blasting may be required are provided in Figure 6.2.

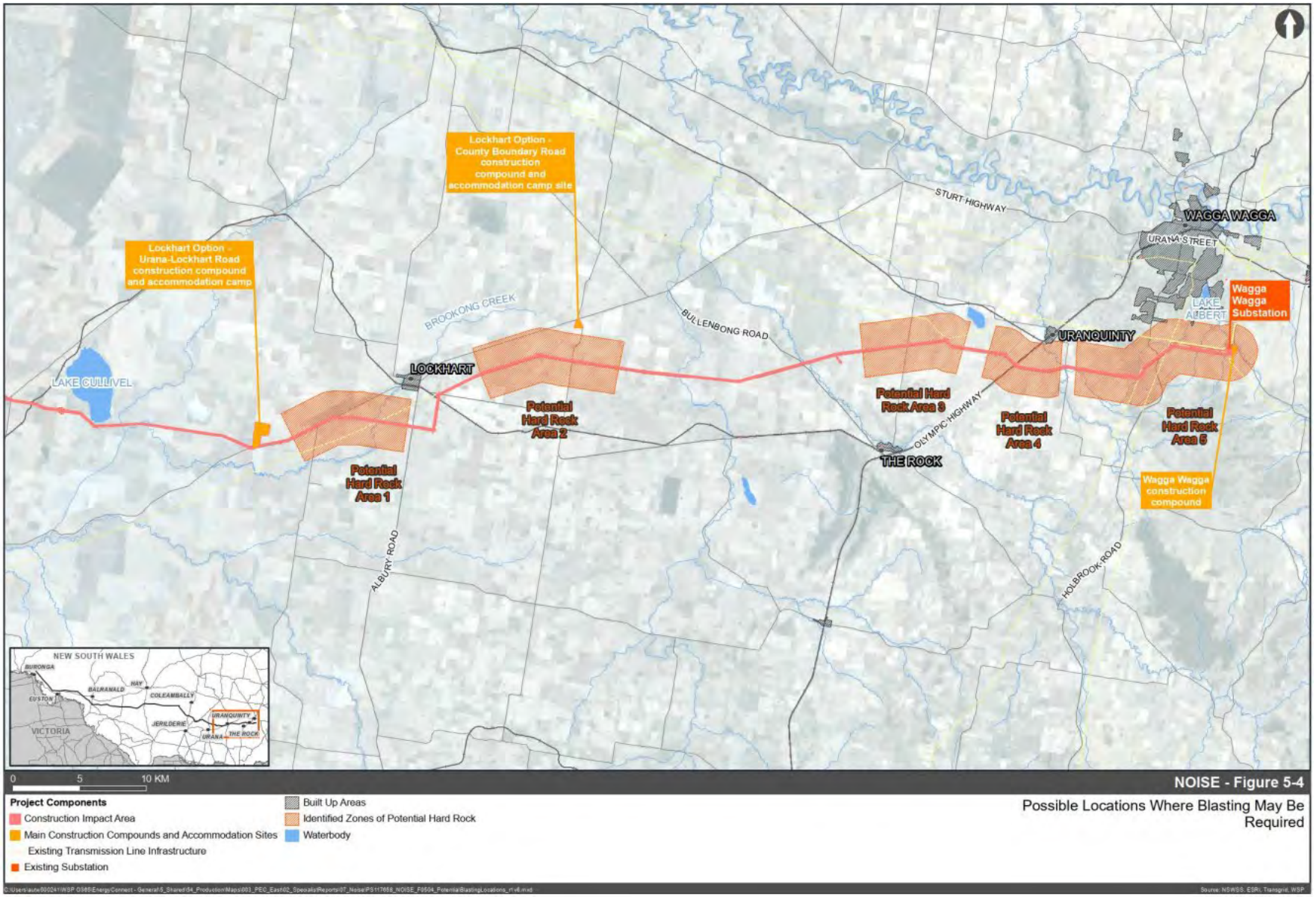

Figure 6.2 - Areas identified in the Final BDAR where potential blasting may be required (source: WSP)

6.2.9 Corona discharge

As outlined in Technical Paper 10 of the EIS, the transmission line audible noise risk zone is based on the setback distances from the transmission line centreline where the operational noise trigger level of Leq, 15min 35 dBA is met for both the project's contribution and cumulative impact (where relevant). These distances are summarised in Table 6.6. Based on these distances, the number of potential residential receivers within each of these audible noise risk zones has been calculated. The results are provided in Table 6.7.

The 'significance' of the predicted noise impact has been determined based on guidance provided in NPfI, as discussed in Technical Paper 10 of the EIS, is summarised in Table 6.8.

Table 6.6 - Transmission line audible noise risk zones (distance from new transmission line centreline) (source: WSP)

	Transmission line scenarios	Project only (metres)	Cumulative impact scenario	Cumulative impact risk zone (metres) (north/south)
1	330kV (Base) Buronga substation to Dinawan 330kV substation; and	442	Dinawan substation to Wagga Wagga substation: • Section 3.A; and • Section 3.B.	505/433
	500kV (Base) Dinawan 330kV substation to Wagga Wagga substation	358		432/401
2	330kV (Base + 1% SVG) Buronga substation to Dinawan 330kV substation; and	548	Dinawan substation to Wagga Wagga substation: • Section 3.A; and • Section 3.B.	569/512
	500kV (Base + 1% SVG) Dinawan 330kV substation to Wagga Wagga substation	451		510/535

Table 6.7 - Number of residential receivers within transmission line audible noise risk zones (source: WSP)

	Transmission line scenarios	No. of sensitive receivers within audible risk zone	No. of additional sensitive receivers within audible risk zone (cumulative impacts)	Cumulative impact risk zone (metres) (north/south)
1	330kV (Base) Buronga substation to Dinawan 330kV substation; and	8	6	14 (up to 8 dB exceedance)
	500kV (Base) Dinawan 330kV substation to Wagga Wagga substation			
2	330kV (Base + 1% SVG) Buronga substation to Dinawan 330kV substation; and	12	11	23 (up to 9 dB exceedance)
	500kV (Base + 1% SVG) Dinawan 330kV substation to Wagga Wagga substation			

Table 6.8 - Significance of audible noise impact per NPfI (source: WSP)

Significance of noise impact	No. of receivers	List of receivers (ID)
330kV (Base) Buronga substation to Dinawan substation and 500kV (Base) Dinawan substation to Wagga Wagga substation		
Negligible (≤ 2 dB(A) above trigger level)	6	20522, 12942, 450, 313, 500, 259
Moderate (≥ 3 but ≤ 5 dB(A) above trigger level)	6	422, 208, 26750, 504, 27028, 202
Significant (≥ 5 dB(A) above trigger level)	2	385, 26749

Significance of noise impact	No. of receivers	List of receivers (ID)
Total	**14**	-
330kV (Base + 1% SVG) Buronga substation to Dinawan substation and 500kV (Base + 1% SVG) Dinawan substation to Wagga Wagga substation		
Negligible (≤ 2 dB above trigger level)	12	20519, 461, 468, 26908, 26907, 211, 279, 313, 186, 20533, 500, 259
Moderate (≥ 3 but ≤ 5 dB above trigger level)	9	422, 20522, 12942, 450, 208, 26750, 504, 27028, 202
Significant (≥ 5 dB above trigger level)	2	385, 26749
Total	**23**	-

In fair weather conditions all sensitive receivers are expected to be compliant with the project Noise Trigger Level (PNTL). This assumes that all sensitive receivers would be located outside of the easement which is an operational requirement (that is, all sensitive receivers would be greater than 40 metres from the transmission line).

Based on analysis conducted by Beca on historical meteorological data (Appendix D of Technical Paper 10 of the EIS), audible noise corona discharge noise is not expected to be a constant occurrence but is only present during wet and misty conditions. Based on the meteorological conditions identified for the area, the expected annual frequency of these conditions is between 20–40 per cent of the time. During heavier rain events, general ambient noise levels in the environment would likely be higher and therefore potentially have a masking effect over any possible corona discharge noise. Noise disturbance under such circumstances is therefore likely to be low risk.

Appropriate operational mitigation measures will be identified during detailed design and implemented accordingly.

6.3 Construction vibration

At sufficient levels, vibration can lead to cosmetic (and possibly structural) building damage and can cause disturbance to occupants. Vibration can also affect sensitive structures, which could include heritage listed buildings. Due to the distance between the works and recorded historic heritage items, no direct or indirect impacts to historic heritage items are expected as result of the Stage 2 works at Lockhart, Dinawan, Cobb Highway and Balranald. The Ivydale homestead and woolshed (Wagga Wagga LEP 2010, #I72 and #I73) are located in close proximity to the construction compound at Wagga Wagga. The EIS identified that neither heritage item would be impacted by the works.

The nearest sensitive receiver to the Stage 2 works is approximately 44m from the transmission line corridor boundary, and inside the minimum human response working distance during the work stages of access and clearing, earthworks and civil construction works and final completion stages. Each of these stages is schedule to be carried out for a period of approximately one week. This receiver is located outside of the safe working distance for cosmetic damage and presented graphically in Technical Paper 10 (Appendix B-5) of the EIS.

The minimum working distances identified in Table 4.8 indicate that where sensitive receivers are in excess of 100m from vibration generating equipment, there is negligible risk of structural damage or impacts on human comfort due to the use of vibration intensive equipment. There are therefore no receivers identified within the safe working distances of either of the substation locations, or the construction compounds or accommodation camps.

One potential archaeological deposit (PAD) was identified within close proximity to the Cobb Highway camp and compound, however, modifications to the location and scale of the facility were made as part of the Amendment Report to reduce potential impacts to this site.

6.4 Construction road traffic noise

Section 5.5 of Technical Paper 10 of the EIS assessed the road traffic noise impacts for primary access and key haulage routes from modelled traffic numbers. Indicative vehicle movements for construction of the project were identified in Appendix B-6 of Technical Paper 10 of the EIS and assessed traffic noise levels for residential receivers within 350 metres of each route. Table 3-2 of the Amendment Report detailed changes in haulage route use and haulage road classifications from that described in Section 6.11.3.1 of the EIS, or to ensure consistency with the figures presented of the construction haulage network. However the expected volumes did not change.

The use of the haulage routes would vary according with the construction activity undertaken - in terms of both volume of construction vehicles and the duration of use and only a quarter of the identified haulage routes would be used for the full duration of construction. Construction vehicle traffic would generally be higher during the main earthworks and civil construction activities.

As assessed in the EIS, road traffic noise levels would increase by more than 2dB at numerous properties across the whole project, due to the relatively large increases in vehicle volumes when compared to the low existing vehicle volumes. However, almost all of these increases are predicted to remain below 10dB. Increases up to 2dB are considered to be barely perceptible to the average person.

For the Stage 2 works, the number of affected properties would be expected to be lower than those identified for the whole project. A total of 10 receivers (over the whole project) detailed in Table 6.9 have been assessed to have predicted noise increases of greater than 2dB and exceed the RNP criteria identified in Table 4.10.

Table 6.9 - Road traffic noise impacts that exceeds both triggers (>2dB and RNP criteria)

Road	LGA	Type of haulage route/expected traffic impact	RNP criteria L_{AEQ} Road type	Number of properties increasing by more than 2dB and exceeding RNP criteria
Elizabeth Avenue	Wagga Wagga	**Secondary Haulage Route** Would be used throughout the construction program. The proposal would typically generate around 86 construction vehicles per day when in use (50 light vehicles and 36 heavy vehicles) but would peak up to 200 daily movements for short durations (100 light vehicles and 100 heavy vehicles).	55 local roads	10

While the construction traffic noise assessment determined a number of properties would experience noise increases, the base road noise emission levels would remain low, as would the number of properties predicted to exceed the RNP criteria. These exceedances would also be intermittent through the proposal construction program as not all roads are required to be used daily for the full program duration. The construction traffic noise assessment provided is conservative and typical noise levels are likely to be lower than those predicted.

In accordance with RMM NV4, where noise from construction–related traffic is likely to result in road traffic noise increases of more than 2 dB at affected receivers, mitigation and management measures would be implemented where practicable and appropriate. Consideration will also be given to the noise levels associated with construction traffic and whether or not these levels comply with the road traffic noise criteria in the RNP as identified in Table 4.10 of this NVMP.

By implementing the mitigation measures outlined within Table 7.1, further noise impacts associated with construction road traffic will be minimised.

7 Environmental management

7.1 Designing for corona discharge

Detailed design undertaken during Stage 2 will consider all reasonable and feasible steps to minimise the impacts of corona discharge noise that could occur during operation. Detailed design processes will:

- identify residences expected to exceed 35 dB(A) LAeq,15min at the reasonably most affected point of the residence, determined in accordance with the NPfI, and will determine how often these conditions would likely occur annually; and
- identify reasonable and feasible noise mitigation measures for those residences.

Where possible, the measures will be implemented prior to the commencement of operation. This will be subject factors such as the provision of access to private properties and acceptance of measures from landholders, where applicable.

The NPfI states that:

> *Where the project noise trigger level is exceeded, assess the feasible and reasonable mitigation measures that could be implemented to reduce noise down towards the relevant project noise trigger level. If it is reasonable to achieve these levels, the proponents should do so. If not, then achievable noise levels should be identified. It is not mandatory to achieve the trigger levels but the assessment should provide justification if they cannot be met. An assessment of the acceptability of residual impacts should also be provided.*

Guidance is provided in NPfI in regard to definition of 'feasible' and 'reasonable' mitigation as well as a generic list of mitigation measures.

The current alignment has been selected based on the consideration of a range of constraints and opportunities, including environmental considerations, and is not expected to be altered in any significant manner. As outlined in Section 4 of the Response to DPE Request for Information (30 August 2022), options for at-source mitigation of potential operational noise from corona discharge to achieve the project trigger level of 35 dB(A) LAeq,15min are limited. The available options are not reasonable and feasible for this infrastructure.

Due to of the height of the transmission lines (noise sources), the large angles of exposure and the potential for adverse impact to visual amenity impacts, path controls, such as noise barriers are not reasonable and feasible in this context.

Subsequent to consideration of all source and pathway feasible and reasonable noise mitigation measures (as discussed in the preceding subsections), the NPfI allows for receiver property treatment to be considered for any residual noise impacts. Only at-receiver treatments are likely to reasonable and feasible in this context to mitigate potential amenity impacts in internal areas due to corona discharge.

To provide an appropriate indoor acoustic amenity for residential dwellings, appropriate internal ambient noise level targets are typically established per *AS/NZS 2107:2016 Acoustics—Recommended design sound levels and reverberation times for building interiors.* Relevant internal noise and reverberation criteria for the sleeping areas of rural residential buildings is recommended as 25-30 Leq, dBA.

From the perspective of the NPfI, receivers with a 'negligible' level of significance as discussed in Table 6.8 are not likely to warrant receiver-based controls. Technical Paper 10 of the EIS identified that for the other receivers with a higher category of noise level significance, based on an outdoor noise levels of 46 dBA Leq / 44 dBA Leq during the worst-case condition, an overall noise reduction of between 16 and 21 dB / 14 and 19 dB would be required to be achieved through the building envelope to meet the appropriate internal noise target. This assumes that the affected rooms are sleeping areas. Where the noise affected rooms are less noise sensitive, lower noise reductions may be appropriate.

In addition to the mitigation measures identified during detailed design in Stage 2, Transgrid will prepare and implement a Research Program, prepared in consultation with the Environment Protection Authority (EPA). Transgrid will allocate $150,000 to this program and will submit the program to the Planning Secretary for approval prior to the commencement of operation.

7.2 Exceedances of construction noise management levels

As described in Section 6.2, the noise assessment carried out in the EIS and the Amendment Report indicated the potential for noise impacts during Stage 2 works at sensitive receivers located within a worst case separation distance of approximately two kilometres.

If construction activities are identified that could generate noise levels that are likely to exceed the relevant noise management levels at any sensitive receivers, additional reasonable and feasible measures would be implemented in accordance with this plan and RMM NV2. As detailed in RMM NV5, works likely to generate noise levels that exceed applicable noise management levels at sensitive receivers would be scheduled during standard construction hours, wherever practicable, or would be undertaken in accordance with an out of hours works protocol (RMM NV6).

A construction noise and vibration management tool will be implemented on the project, that incorporates specific work areas and equipment for each activity to calculate the potential noise and vibration impacts. The tool can also estimate whether and which sensitive receivers are within minimum working distances from the proposed construction activities. The noise tool will:

- consider the location of the proposed activities;
- consider the noise and vibration generating activities that will take place and determine if they are low or high risk activities;
- assess the predicted noise and vibration levels against the relevant management levels; and
- identify feasible and reasonable mitigation and management measures in accordance with the ICNG.

Any noise assessments undertaken for the project, as and when required by RMM NV6, will be document controlled separately from this NVMP.

Where exceedances of noise management or vibration levels are predicted, residents/sensitive receivers will be notified of construction activities that are likely to affect their noise and vibration amenity in accordance with Section 9 of the *Community Communication Strategy* (45860-HSE-DOC-D-0024). This proactive communication will include:

- the types of activities to be undertaken;
- the timing of activities including expected start and finish;
- the location of activities; and
- details of the community information line and how to make an enquiry and/or a complaint.

Notification of OOHW will occur in accordance with the notification requirements of the *Out of Hours Work Protocol* (45860-HSE-PR-D-0011).

SecureEnergy will use a range of tools to communicate with the community and stakeholders such as community and stakeholder notifications, email, community drop-in sessions and door knocks.

Works that potentially exceed the noise management levels will be undertaken in accordance with the relevant measures identified in Table 7.1, and any additional measures that are identified through the additional noise assessments described above. Monitoring will be undertaken as described in Section 8.3.

7.3 Management measures

A range of environmental requirements and mitigation measures are identified in the EIS, Submissions Report and the Infrastructure Approval. Safeguards and management measures will be implemented to minimise or manage impacts to noise and vibration as required by RMM NV2 and

condition C4. Specific safeguards and management measures that will be implemented to address noise and vibration impacts associated with Stage 2 of the project are identified in Table 7.1.

Table 7.1 - Noise and vibration management measures

ID	Measurement/Requirement	When to implement	Responsibility	Source document
General				
N1	Training and awareness programs will be delivered to project personnel, including relevant sub-contractors on noise and vibration requirements (including operating hours) through inductions, toolboxes and targeted training.	Pre-construction and construction	Environmental Advisor Environmental Manager Health, Safety, Security and Environment (HSSE) Team	Good practice RMM NV2
N2	Landowners using disturbance areas for livestock grazing will be consulted prior to the commencement of works regarding alternatives for the management of their stock during these activities.	Pre-construction and construction	Engagement Manager Construction Manager	LP6
Construction noise				
N3	Plant and equipment used on site will maintained in a proper and efficient condition and operated in a proper and efficient manner to avoid the generation of excessive noise.	Pre-construction and construction	HSSE Team	POEO Act RMM NV2
N4	Where noise levels from construction-related traffic are expected to result in road traffic noise increases of more than 2dB at an affected receiver, mitigation and management measures would be implemented where practicable and appropriate. Measures may include: • a driver's code of conduct will be developed and implemented (refer to *Traffic and Transport Management Plan* (45860-HSE-PL-D-0109)); • heavy vehicle parking, idling and queuing on public roads will be discouraged (except where permitted, e.g. water supply points); • heavy vehicles will avoid compression braking and the use of air brakes in the vicinity of affected receivers; • limit traffic movements to daytime periods as far as possible and minimise traffic movements outside standard construction hours; and • all heavy and light vehicles associated with the project will travel to and from site via the routes nominated in the *Traffic and Transport Management Plan* (45860-HSE-PL-D-0109), where practical. These mitigation measures will be implemented with the aim of achieving the road traffic noise assessment criteria for residential land uses from the *Road Noise Policy* (DECCW, 2011).	Pre-construction and construction	Supervisors Construction Manager Environmental Manager Engagement Manager All project-related vehicle drivers	RMM NV4 Condition C4

ID	Measurement/Requirement	When to implement	Responsibility	Source document
N5	Where the noise level without the development is either within 2dB or exceeds the relevant road traffic noise criteria (Table 4.10), and noise levels associated with project construction road traffic results in increases greater than 2dB at any affected receiver, feasible and reasonable noise measures will be examined to reduce potential noise impacts. Measures may include: • minimising peak traffic movements or regulating time of use; or • reducing traffic speed (where safe to do).	Construction	Supervisors Construction Manager Environmental Manager	RMM NV4 Condition C4
N6	Where noise from construction is predicted to exceed the noise management levels, mitigation and management measures would be implemented where practicable and appropriate. This would include the following measures: • select quieter plant and equipment and use alternative construction methods to minimise noise levels; • install screens or use barriers to mitigate noise from stationary noise sources; • maximise the offset distance between noisy plant and orient equipment away from sensitive receivers; • use noise source controls, such as residential class mufflers, to reduce noise from all regularly – used plant including cranes, excavators and trucks; • use alternative reversing alarms in place of traditional beeper reversing alarms during works outside standard construction hours where noise impacts have been predicted; • turn off machinery when not in use; and • operate machinery in a manner which reduces maximum noise level events, such as shaking excavator buckets, loading trucks from a height, steel on steel contact and dragging materials across hard surfaces.	Construction	Supervisors Construction Manager Environmental Manager	RMM NV2
N7	Where noise from construction is predicted to exceed the applicable noise management levels, work would be planned and scheduled where practicable and appropriate: • during standard construction hours; and; • to minimise the number of items of noisy plant operating at one time and cumulative noise levels.	Construction	Supervisors Construction Manager Environmental Manager	RMM NV2 RMM NV5

ID	Measurement/Requirement	When to implement	Responsibility	Source document
Construction vibration				
N8	Where construction is likely to result in vibration levels that exceed relevant criteria at sensitive receivers, mitigation and management measures would be implemented where practicable and appropriate. This would include (but is not limited to) the following measures: • avoid the use of vibration–intensive plant at distances where human discomfort would result; • substitute lower vibration–intensive plant and methods (for example use a smaller machine, lower power settings or alternative equipment); • sequence operations to avoid or minimise concurrent vibration–intensive activities; and • schedule the use of vibration–sensitive equipment during the least sensitive times of the day.	Construction	Supervisors Construction Manager Environmental Manager	RMM NV3
N9	In the event that vibration-sensitive heritage structures could be impacted by the Stage 2 works: • develop site-specific measures to avoid vibration impacts; and • implement the measures during vibration-intensive activities in the vicinity of the vibration-sensitive heritage structures.	Construction	Supervisors Construction Manager Environmental Manager	RMM NV3
Blasting				
N10	A Blast Management Strategy will be prepared prior to the commencement of blasting and will: • describe the process that would be used to design each blast (depths and Maximum Instantaneous Charge for each location, etc.) to comply with relevant noise and vibration criteria at any nearby sensitive receivers; and • detail noise and vibration monitoring and landholder notification requirements for blasting. The strategy will be implemented for all blasting.	Prior to blasting During blasting	Engineers Environmental Manager	
N11	Where required, impacts from blasting would require assessment with regard to the Australian and New Zealand Environment Conservation Council's (ANZECC) *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration* (ANZECC, 1990) and the *AS 2187.2 Explosives – Storage, Transport and use Part 2: Use of Explosives*.	During blasting	Engineers Environmental Manager	
Working hours				
N12	Road upgrades, construction, upgrading and decommissioning may only be undertaken between: • 7am to 6 pm Monday to Friday; • 8am to 1 pm Saturdays; and • at no time on Sundays and NSW public holidays; unless the Planning Secretary agrees otherwise.	Pre-construction and Construction	Supervisors Construction Manager Environmental Manager	Condition C1

ID	Measurement/Requirement	When to implement	Responsibility	Source document
N13	The following construction, upgrading and decommissioning activities may be undertaken outside of the hours specified in measure N13 above: • the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons; • emergency work to avoid the loss of life, property or to prevent material harm to the environment; • activities that are inaudible at non-associated residences; • road upgrades required by the relevant roads authority to be undertaken outside the standard construction hours; or • works carried out in accordance with an Out of Hours Work Protocol.	Construction	Supervisors Construction Manager Environmental Manager	Condition C2
N14	Any works outside of the hours defined in condition C1, C2 and C6 will be undertaken in accordance with the Out of Hours Work Protocol in Appendix A.	Construction	Supervisors Construction Manager Environmental Manager	RMM NV6 Condition C2 f) Condition C10 f)
N15	Works may be undertaken in accordance with the hours and noise limits specified in negotiated agreements with affected sensitive receivers. Where multiple receivers are affected by works, a substantial majority of the receivers must agree to the specified hours and noise limits proposed by the project. Negotiated agreements must be in writing and finalised prior to the relevant works.	Pre-construction and Construction	Supervisors Environmental Manager Engagement Manager	Condition C2 c)
Consultation and complaints management				
N16	Where exceedances of noise and vibration management levels are predicted, residents/sensitive receivers will be notified of construction activities that are likely to affect their noise and vibration amenity in accordance with the *Community Communication Strategy* (45860-HSE-DOC-D-0024). This proactive communication will include: • the types of activities to be undertaken; • the timing of activities including expected start and finish; • the location of activities; • details of the community information line and how to make an enquiry and/or complaint.	Construction	Engagement Manager	RMM NV2 RMM NV3
N17	Investigate any complaints regarding construction noise and vibration to determine if actual noise and vibration levels are as predicted and that appropriate mitigation measures have been implemented. Where required, identify and implement appropriate additional mitigation measures.	Construction	Environmental Manager Engagement Manager	RMM NV9
N18	All complaints received will be managed in accordance with the *Community Communication Strategy* (45860-HSE-DOC-D-0024).	Construction	Engagement Manager	RMM NV9

ID	Measurement/Requirement	When to implement	Responsibility	Source document
Designing for corona discharge				
N19	Detailed design processes during Stage 2 will take all reasonable and feasible steps to minimise corona discharge noise during operation. These processes will: • identify residences expected to exceed 35 dB(A) LAeq,15min at the reasonably most affected point of the residence, determined in accordance with the NPfI, and will determine how often these conditions would likely occur annually; and • identify reasonable and feasible noise mitigation measures for those residences. The measures will be implemented prior to the commencement of operation, subject to the provision of access to private properties and acceptance of measures from landholders, where applicable.	Construction	Design Manager	Condition C9
Monitoring and reporting				
N20	Noise and vibration monitoring will be undertaken in accordance with Section 8.1.	Construction	Environmental Manager Environmental Advisor	RMM NV1

8 Compliance management

8.1 Training and awareness

All site personnel will undergo the SecureEnergy site induction prior to the personnel participating in on-site construction activities. The induction training addresses elements related to noise and vibration management including, but not limited to:

- complying with the conditions of the Infrastructure Approval;
- the environmental management system, including the CEMP;
- sensitive receivers in close proximity to project locations;
- management measures that are necessary to comply with to minimise and manage potential impacts to those sensitive receivers; and
- the *Out of Hours Work Protocol* (45860-HSE-PR-D-0011).

Targeted training in the form of toolbox talks or specific training will also be delivered to personnel with a key role in noise and vibration management. Examples of training topics include:

- vibration awareness in the vicinity of Aboriginal heritage features; and
- noise monitoring.

Records of training, including attendance, will be retained by SecureEnergy.

8.2 Roles and responsibilities

SecureEnergy's organisational structure and overall roles and responsibilities are outlined in Section 4 of the CEMP.

The project environmental management structure incorporates the following site personnel:

- Environmental Manager responsible for overall management of the CEMP and CEMP sub-plans; and
- Environmental Advisors to assist in implementing and monitoring measures in the CEMP and CEMP sub-plans.

SecureEnergy's Project Director, in consultation with functional managers, will ensure that appropriate resources are available to effectively manage the implementation of the CEMP and CEMP sub-plans during delivery of the project. All SecureEnergy staff, subcontractors and visitors are required to operate in accordance with this NVMP and related environmental management plans during construction.

Specialist consultants and subcontractors will be engaged for environmental support roles, as required, such as noise and vibration specialists for noise modelling (as required) and ongoing advice throughout construction.

Specific responsibilities for the implementation of mitigation measures are detailed in Section 7 of this NVMP.

8.3 Monitoring

The impacts and environmental performance of the project relevant to noise and vibration, and the effectiveness of the management measures identified in Section 7 will be monitored through the proposed monitoring program in Table 8.1.

Table 8.1 - Monitoring program

Item	Scope	Frequency	Equipment	Responsibility	Records/ reporting
Commencement of OOHW activities	At the commencement of a new OOHW activities or location where exceedances of the noise management levels are predicted to occur at the most affected receiver. This will be at select locations/occasions which are determined based on risk.	Commencement of OOHW activities predicted to exceed noise management levels. This will be on select occasions which are determined based on risk.	Hand held calibrated noise monitor	Environmental Advisor	Noise monitoring records
Commencement of new activity near structures/ receivers within minimum vibration working distances	Attended vibration measurements would be undertaken at the start of the works to determine actual vibration levels at the structure.	Commencement of works for receivers/ structures within minimum working distances	Vibration monitor	Environmental Advisor	Noise monitoring records
Complaint-based monitoring	Where complaints are received, noise monitoring may be undertaken at sensitive receivers to determine if the actual construction noise generated exceeds the predicted 'worst case' construction noise levels identified in this plan.	As required	Hand held calibrated noise monitor	Environmental Manager, Environmental Advisor	Noise monitoring records
Weekly inspections	Inspection of the environmental controls and implementation of the noise and vibration mitigation measures outlined in Table 7.1.	Weekly	Not applicable	Environmental Advisor Supervisors	Weekly Environmental Inspection Checklist

8.4 Inspections

Weekly inspections will be performed by the Environmental Manager (or delegate) and documented in a weekly environmental checklist. The inspections will check the implementation and effectiveness of the management measures identified in Section 7 and the environmental performance of the project relevant to noise and vibration. Visual inspection of any noise controls, e.g. hoarding or noise barriers will be undertaken.

8.5 Auditing

Audits will be undertaken to assess the effectiveness of the management measures and overall compliance with this plan, and other relevant approvals, licences and guidelines. Audit requirements are detailed in Section 9.3 of the CEMP.

Independent audits will be undertaken in accordance with the *Independent Audit Post Approval Requirements (2020).*

8.6 Reporting

Reporting which will be undertaken in accordance with the NVMP is summarised within Table 8.2.

Table 8.2 - Reporting program

Item	Scope	Frequency	Responsibility	Recipient
Monitoring reporting	Monitoring reports will include the results of monitoring undertaken during the reporting period and an assessment of the effectiveness of the noise and vibration management system. Monitoring reports will be prepared as required based on monitoring which has occurred (i.e. six monthly). Reporting of noise and vibration matters on the project website in accordance with condition D12.	As required based on monitoring which has occurred (i.e. six-monthly)	Environmental Manager	ER Transgrid Public (via project website)
Audit reports	Independent audits undertaken in accordance with the Infrastructure Approval will include audits of noise and vibration management measures (based on the Independent Auditor's program). Audit reports will be prepared. Further detail in relation to auditing is provided within Section 9.3 of the CEMP.	Independent audit will be undertaken within 12 weeks from the commencement of construction and then at intervals, no greater than 26 weeks from the date of the initial Independent Audit or as otherwise agreed by the Secretary.	Environmental Manager / Independent Auditor	ER Transgrid DPE

8.7 Emergencies, incidents and non-compliances

8.7.1 Emergencies

Emergency management and planning including any emergencies related to noise and vibration will be undertaken in accordance with the Clough management system and relevant procedures. Emergencies will be managed through Clough three-tiered management system approach. Depending on the severity of the emergency, emergencies will be managed in accordance with the following:

- **Level 1** – on-site emergencies will be in accordance with the *Project Specific Emergency Preparedness and Response Plan* (45860-HSE-PL-G-1015);
- **Level 2** – emergency situations where response exceeds the capacity of site resources incidents will be coordinated by the Incident Coordination Team; and
- **Level 3** – an emergency situation where the incident has the potential to, or has impacted, the business in terms of, reputation, and commercial liability. Incidents will be supported by the Major Incident Management Team.

Emergencies will be responded to in accordance with the level of the emergency (listed above). For each level of emergency, the situation will be assessed, the site support requirements will be established, and notification will occur. A Level 1 emergency will result in activation of the *Project Specific Emergency Preparedness and Response Plan* (45860-HSE-PL-G-1015). A Level 2 emergency will result in activation of the Incident Coordination Team, and a Level 3 emergency will result in activation of the Incident Management Team.

Refer to Section 8.1 of the CEMP.

8.7.2 Environmental incidents

Environmental incidents, including incidents related to noise and vibration will be managed as described in Section 8.2 and Appendix A4 of the CEMP. All site personnel are authorised to suspend a work activity that is likely to cause or actually causing or contributing to an incident. A supervisor/manager may request additional staff be deployed to the site to provide additional capacity or capability to manage the incident.

Incident reporting is described in Section 8.3 of the CEMP.

All environmental incidents that occur on the project, regardless of how minor, must be reported to a supervisor by personnel involved or witnesses to the incident immediately after the incident occurs. The Environmental Manager will be notified immediately of any environmental incident. Transgrid will be notified of incidents and near misses immediately. Formal, documented reporting of incidents will be completed, and will be submitted to Transgrid in accordance with requirements under the Contract. The Environmental Representative will also be included on all incident notifications.

For incidents which are reportable to DPE, notification will occur to DPE via the Major Projects website immediately after becoming aware that an incident has occurred. A written notification will then be provided to DPE via the Major Projects website within seven days after becoming aware of the incident. Refer to Section 8.3.1 of the CEMP in accordance with the Infrastructure Approval for further details requirements of the notification.

8.7.3 Non-compliances

Where a non-compliance with the Infrastructure Approval has been identified, including those relevant to noise and vibration, corrective actions will be developed as required and implemented to address the non-compliance that occurred.

Reporting of non-compliances will be undertaken as described in Section 10.1 of the CEMP – Reporting non-compliances. The Planning Secretary will be notified in writing via the Major Projects website within seven days after Transgrid becomes aware of any non-compliance. The written non-compliance notifications, in line with condition D7, will contain the requirements set out in Appendix 4 of the Infrastructure Approval and will include details such as:

- the non-compliance;
- the reasons for the non-compliance (if known); and
- what actions have been taken, or will be taken, to address the non-compliance.

Refer to Section 10.1.1 of the CEMP in accordance with the Infrastructure Approval for further details requirements of the notification.

A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.

Failure to comply with other statutory requirements such as the EPBC Act Approval will be reported in accordance with Section 10.1.2 of the CEMP. Any other reporting will occur in accordance with Section 10.1.3 of the CEMP.

Where a non-compliance has been identified, the non-compliance will be reviewed by the Environmental Manager to determine the reason for the non-compliance, and what corrective actions have, or will be taken, to address the non-compliance. Preventative actions will be developed as required and implemented to minimise the potential for recurrence.

Section 11 of the CEMP describes the process for non-compliance management.

8.8 Contingency plan

Although the project has been assessed through the environmental impact assessment process and potential impacts identified, unpredicted impacts may occur as the project progresses. In the event that unexpected impacts are identified, the action or cause will be categorised and as required will be managed as:

- an emergency or environmental incident in accordance with Section 8 of the CEMP – Incidents and emergencies; and/or
- a non-compliance or non-conformance in accordance with Section 11 of the CEMP – Non-compliance, non-conformance, corrective and preventative action.

Reporting of the unpredicted impacts would be in line with the above processes and as described in Section 10 of the CEMP – Reporting.

Corrective and preventative actions may be generated from a number of sources, including but not limited to incidents, audits and management reviews. The actions will be managed in accordance with the Clough management system to ensure that the required actions are tracked and closed out in a timely manner. The completion of the required actions will be recorded and will include details on the source of the action (e.g. audit, inspection or other), the action required, target close out date, actual close out date and the person responsible.

Through the identification of corrective and/or preventative actions through the above processes, the following steps will occur as relevant:

a) determine the relevant impact assessment criterion/criteria, below which the impact should be reduced, consistent with the requirements of this NVMP;

b) identify options to reduce the unexpected impacts to below the relevant criterion/criteria and appropriate timeframe for implementation;

c) implement the selected measure(s) to reduce the unexpected impacts; and

d) identify and implement an appropriate monitoring program to determine the effectiveness of the selected measure(s) to reduce the unexpected impact.

If the above monitoring program identifies that the unexpected impacts have not been reduced to below the nominated criterion/criteria, items b) to d) of the contingency process will be repeated.

Appendix A - Out of Hours Work Protocol

PUBLIC

Noise and Vibration Management Plan
EnergyConnect (NSW - Eastern Section)
Stage 2

45860-HSE-PL-D-0116

REV	DATE	GENERAL DESCRIPTION	PREPARED	REVIEWED	VERIFIED	VERIFIED	APPROVED
A	26/10/2022	Issued for internal review	K.Baxter	A.Kriegel	A.Boyd	B.Calligeros	S.Basanta
B	10/11/2022	Issued for Transgrid review	K.Baxter	R.Walker-Edwards	A.Boyd	B.Calligeros	S.Basanta
C	18/11/2022	Issued for ER review	K.Baxter	R.Walker-Edwards	G.Crighton	B.Calligeros	S.Basanta
0	9/12/2022	Issued for DPE review	R.Walker-Edwards	M.Lee	A.Boyd	B.Calligeros	S.Basanta
1	17/03/2023	Issued for DPE review	R.Walker-Edwards	C.Curlewis	G.Crighton	-	S.Basanta

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Revision History	
Rev.	**Detailed Description**
A	Issued for internal review
B	Issued for Transgrid review
C	Issued for Environmental Representative review
0	Issued for DPE review
1	Revised to address DPE comments

Key Document Stakeholders
To be communicated with during reviews and revisions of this document

Contents

Tables

Figures

Abbreviations

Acronym	Definition
AAAC	Association of Australian Acoustical Consultants
Amendment Report	*Amendment Report EnergyConnect (NSW – Eastern Section)*
AS/NZ	Australian Standard/New Zealand Standard
Base construction hours or extended (day) working hours	Construction work hours defined in the *Environmental Impact Statement EnergyConnect (NSW – Eastern Section)* as seven days per week (Monday to Sunday) between 7am and 7pm
CCS	Community Communication Strategy
CEMP	Construction Environmental Management Plan
Council	Relevant Council
CSSI	Critical State significant infrastructure
DAWE	Department of Agriculture, Water and the Environment, now known as Department of Climate Change, Energy, the Environment and Water
dB	Decibel
dBA	Decibel (A-weighted)
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DEC	(former) Department of Environment and Conservation
DECC	(former) Department of Environment and Climate Change
DECCW	(former) Department of Environment, Climate Change and Water
DPE or Department	NSW Department of Planning and Environment (formerly Department of Planning, Industry and Environment)
EIS	*Environmental Impact Statement EnergyConnect (NSW – Eastern Section)*
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPA	NSW Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPC	Engineering, procurement and construction
EPL	Environment Protection Licence
ER	Environmental Representative
HSSE	Health, safety, sustainability and environment
ICNG, the	*Interim Construction Noise Guideline* (Department of Environment and Climate Change 2009)
NML	Noise management level
NPfI	*Noise Policy for Industry* (EPA 2017)
NSW	New South Wales
NVMP	Noise and Vibration Management Plan
OOHW	Out of hours work
PAD	Potential archaeological deposit
Planning Secretary	Planning Secretary under the EP&A Act, or nominee
POEO Act	*Protection of the Environment Operations Act 1997*
project, the	EnergyConnect (NSW – Eastern Section)
Response to DPE Request for Information	EnergyConnect (NSW – Eastern Section) Response to Department of Planning and Environment Request for Information (30 August 2022)

Acronym	Definition
RBL	Rating background level
RMMs	Revised mitigation measures
RNP	Road Noise Policy
SA	South Australia
SAP	Sensitive area plan
SecureEnergy	Elecnor and Clough Projects Australia Pty Ltd have formed the SecureEnergy Joint Venture (SecureEnergy). SecureEnergy is the contractor who will be carrying out the project on behalf of Transgrid
SSI	State significant infrastructure
Stage 1	Stage 1 of construction of the project. This includes establishment of three accommodation camps, establishment and operation of five construction compounds, site establishment and construction works for the upgrade of Wagga Wagga substation and Dinawan substation and water supply points.
Stage 2	All construction activities associated with EnergyConnect (NSW – Eastern Section). Once approved the Stage 2 CEMP and the relevant Stage 2 CEMP sub-plans will supersede the existing Stage 1 CEMP and Stage 1 CEMP sub-plans. The Stage 2 CEMP and Stage 2 CEMP sub-plans do not address the operational phase of the project.
Submissions Report	*Submissions Report EnergyConnect (NSW – Eastern Section)*
Technical Paper 10 of the EIS	Technical Paper 10 of the *Environmental Impact Statement EnergyConnect (NSW – Eastern Section)* (Noise and vibration impact assessment)
WMS	Work method statement

1 Introduction

1.1 Context

This Noise and Vibration Management Plan (NVMP or this plan) forms part of the Construction Environmental Management Plan (CEMP) for Stage 2 of EnergyConnect (NSW – Eastern Section).

This plan has been prepared for construction activities undertaken during Stage 2 of the project. Once approved this plan will supersede the existing Stage 1 Noise and Vibration Management Plan. It does not address the operational phase of the project.

This plan has been prepared to address the relevant requirements of the Infrastructure Approval (SSI 9172452), the *Environmental Impact Statement EnergyConnect (NSW – Eastern Section)* (EIS), the *Submissions Report EnergyConnect (NSW – Eastern Section)* (Submissions Report) and the *Amendment Report EnergyConnect (NSW – Eastern Section)* (Amendment Report).

1.2 Background

On 29 August 2019 the New South Wales (NSW) Minister for Planning and Public Spaces declared the NSW component of EnergyConnect to be critical State significant infrastructure (CSSI) under the *Environmental Planning and Assessment Act 1979* (EP&A Act) on the basis that it is critical to the State for environmental, economic or social reasons. Within NSW, EnergyConnect is therefore subject to assessment under Part 5, Division 5.2 of the EP&A Act.

Transgrid have two environmental planning approval applications for the sections within NSW:

- EnergyConnect (NSW – Western Section) – South Australia (SA)/NSW border to Buronga and Buronga to the NSW/Victorian border; and
- EnergyConnect (NSW – Eastern Section) – Buronga to Wagga Wagga (the project).

A referral under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) was submitted on 25 August 2020. The Australian Department of Agriculture, Water and the Environment (DAWE) determined the project to be a controlled action on 30 September 2020 and thus, it would be assessed using the bilateral assessment process. As such, the project also requires approval from the Australian Minister for the Environment under the EPBC Act.

The EIS was prepared for the project in January 2022 and was placed on public exhibition from 19 January 2022 to 15 February 2022. A total of 75 submissions were received, with five from special interest groups, nine from local councils and 44 from the public. In addition, 17 government agencies also provided advice during this time.

The Submissions Report was prepared for the project in response to the submissions received during the public exhibition of the EIS and includes the final set of revised mitigation measures (RMMs) that are to be applied. The Submissions Report was finalised in May 2022.

Transgrid also prepared a separate Amendment Report to document design changes and additional environmental assessment undertaken since exhibition of the EIS. The Amendment Report was also finalised in May 2022.

On 2 June 2022, the Department requested additional information (Project EnergyConnect (NSW - Eastern Section) (SSI-9172452) Request for Additional Information (June 2022)) to assist with the assessment of the project. In response TransGrid prepared and provided the *EnergyConnect (NSW – Eastern Section) Response to Department of Planning and Environment Request for Information* (Response to DPE Request for Information) to address the various requests for information raised by the Department. The Response to DPE Request for Information was dated 30 August 2022.

Approval for the project under the EP&A Act was granted by the NSW Minister for Planning (Infrastructure Approval SSI 9172452). Approval for the project under the EPBC Act was granted by the Australian Minister for the Environment.

Transgrid have engaged SecureEnergy, a joint venture between Elecnor and Clough Projects Australia Pty Ltd to design and construct their portion of the EnergyConnect project.

1.3 Staging

Condition A8 allows preparation of plans on a staged basis, with the approval of the Planning Secretary. Where a plan is staged, the scope of works can be carried out without addressing requirements of the Infrastructure Approval that are not applicable to that stage. This NVMP is staged in accordance with condition A8. The two stages are as follows:

- Stage 1 – establishment of three accommodation camps, establishment and operation of five construction compounds, site establishment and construction works for the upgrade of Wagga Wagga substation and Dinawan substation, water supply points; and
- Stage 2 – Stage 1 and all other construction activities (i.e. all construction activities associated with EnergyConnect (NSW – Eastern Section).

The plans for Stage 2 incorporate and supersede the Stage 1 plans and cover the entire construction phase of the project.

This NVMP has been prepared specifically for EnergyConnect (NSW – Eastern Section) Stage 2 and will be implemented for the duration of Stage 2 of construction. The key project components of Stage 2 of construction include, but are not limited to, the activities provided in Table 1.1.

An overview of the project is provided as Figure 1.1.

Table 1.1 - Key project components of construction (Stage 2)

Key activity	Description of key activity
Pre-construction minor works permitted in accordance with the Infrastructure Approval	The definition of 'construction' within the Infrastructure Approval excludes these activities. They will therefore not be subject to the Stage 2 CEMP and CEMP sub-plans. Irrespective of this, these activities will occur in accordance with the relevant conditions of the Infrastructure Approval. Key activities include: • environmental investigations, including biodiversity and heritage protection, salvage and recordings; • Aboriginal heritage assessment, mitigation (e.g. exclusion zones) and salvage activities including subsurface testing/test excavation, additional survey, and consultation with RAPs; • other survey work, such as road dilapidation surveys, and surveys of the general alignment and existing utilities; • installing of environmental management measures (including erosion and sediment controls), fencing, signage and security measures, enabling works; and • connections and pre-commissioning of utilities (wastewater treatment plant, electrical power, lighting etc.).
Continuation of any outstanding Stage 1 construction activities	Construction activities undertaken during Stage 1 of the project will continue where required. This includes, but is not limited to continuation of the following activities: • any outstanding construction activities at Dinawan and Wagga Wagga substations; • operation of earthworks material site, including the crushing and screening plant, where required; • operation of the construction compound including offices and laydown areas; and • use of traffic access routes and access and egress points.
Establishment of ancillary facilities along the transmission line corridor	A number of minor staging, storage and laydown ancillary areas would be required within the project corridor for temporary storage of materials, plant and equipment required to construct the various elements of the proposal (in particular transmission line structures). Some temporary mobile batching plant locations may also need to be established to enable easy access to concrete.

Key activity	Description of key activity
	Upon completion of works, these ancillary sites would be cleared of any temporary infrastructure and equipment. These sites would be in place for shorter periods at locations suitable to support the construction works as they move along the alignment.
Property adjustment work, including adjustments to property fencing	Installation or adjustment of gates and fences would be required at some locations along the alignment to enable access from the nearest roadway to construction areas. These would be constructed in consultation with the relevant council and/or affected landholder.
Water supply points – establishment and/or use	A number of water supply points have been identified along the length of the project to support construction water needs for the project. The proposed water supply points which are to be established and / or used include: • Euston Coop*, Balranald Shire Council; • Lake Benanee*, Balranald Shire Council; • Sturt Highway/Meilman Road*, Balranald Shire Council; • Mylatchie Track*, Balranald Shire Council; • 159 Church Street, Balranald Shire Council; • Ravensworth, Hay Shire Council [Ravensworth in Amendment Report]; • Moulamein Rd 1*, Edward River Council; • Moulamein Rd 2, Edward River Council [Moulamein Road, Moulamein in Amendment Report]; • Burraburoon*, Edward River Council; • X5 Mabins Well*, Edward River Council; • Gala Vale*, Murrumbidgee Council; • Kidman Way*, Murrumbidgee Council; • Crosby Road*, Murrumbidgee Council; • Newell Highway, Morundah*, Federation Council; • Urana-Lockhart Road, Brookong*, Lockhart Shire Council; • Brookdale*, Lockhart Shire Council; • Federation Way/Coonong Road*, Federation Council; • Newell Highway/Arrawidgee Road*, Federation Council; • Federation Way*, Federation Council; • Coonong Road*, Federation Council; • Red Hill Road, Wagga Wagga, Wagga Wagga City Council [Glenfield in Amendment Report]; • 1254 Four Corners Road, Coleambally, Murrumbidgee Council [1254 Four Corners Road in Amendment Report]; • Cooinbil Water Bore, Coleambally, Murrumbidgee Council [Cooinbil, Four Corners Road, Coleambally in Amendment Report]; • Carrathool Road, Four Corners, Edward River Council [shown in Figure 6-9 of the Amendment Report, however, unclear of name in Table 6-5]; • Wonga Station, Four Corners Road, Edward River Council [Wonga in Amendment Report]; • Four Corners Road Mabins Well; Edward River Council [Four Corners Road, Mabins Well in Amendment Report]; • North Bundy Station, North Bundy Road, Booroorban, Edward River Council [North Bundy, Booroorban-Tchelery Road, Booroorban in Amendment Report]; • Booroorban-Tchelery Road*, Booroorban, Edward River Council; • Strongs Lane*, Lockhart, Lockhart Shire Council; • Strongs Lane/Ben Hoffmanns Lane*, Lockhart Shire Council; • Urana-Lockhart Road 2*, Brookong, Lockhart Shire Council; • Slys Lane*, Lockhart Shire Council; • The Rock - Collinguillie Road*, The Rock, Lockhart Shire Council;

Key activity	Description of key activity
	• Bullenbung-the-Rock Road*, Lockhart Shire Council; • Tuttys Lane*, Tootool, Lockhart Shire Council; • French Park-Bullenbung Road*, Lockhart Shire Council; • Napier Road*, Lockhart Shire Council; • Albury Road*, Lockhart, Lockhart Shire Council; • 3 Bencubbin Avenue, Coleambally, Murrumbidgee Council [3 Bencubbin Avenue in Amendment Report]; • Kerr Kerri Rd, Moulamein, Murray River Council [Keri Keri in Amendment Report]; • Urana (between Osborne Street and Stephen Street), Federation Council [Urana in Amendment Report]; • Federation Way* (near corner Federation Way and Stephen Street), Federation Council; • Cadell Road, Coleambally, Murrumbidgee Council [Cadell Road Coleambally in Amendment Report]; • Mclennons Bore Road, Coleambally, Murrumbidgee Council [Mclennons Bore Road in Amendment Report]; • 8955 Newell Highway Bundure, Murrumbidgee Council [Newell Highway, Bundure in Amendment Report]; • Commera Wilson Lane Urana*, Lockhart Shire Council; • Commera Wilson Lane/Urana-Lockhart Road*, Lockhart Shire Council; • Paraway at Four Corners Road*, Murrumbidgee Council; • Paraway at Cobb Highway*, Hay Shire Council; • North Boundary Road*; Murrumbidgee Council; • Tooleybuc*, Murray River Council; • Off Sturt Highway* Wentworth Shire Council; • 16 Mile Gums*, Hay Shire Council; • Cadell Street, Hay, Hay Shire Council; • Jerilderie Road*, Hay Shire Council; • Court Street/Sturt Highway*, Balranald Shire Council; • Boiling Down Road*, Wagga Wagga City Council; and • continued use of the Stage 1 water supply points. The water supply points may require works to the existing infrastructure to enable connection and use by the water supply vehicles. The definition of ‘construction’ within the Infrastructure Approval excludes these activities. They will therefore not be subject to the Stage 1 CEMP and CEMP sub-plans. Irrespective of this, these activities will occur in accordance with the relevant conditions of the Infrastructure Approval. * The water supply points denoted above with an asterisk are additional to the water supply points identified in the EIS. Section 6.9.2 of Appendix B of the Amendment Report identifies potential sources of water for the project and notes that the final water sources, including any additions, would be confirmed in consultation with the water suppliers. Consultation with potential water suppliers has progressed and the list of proposed water supply points above has been amended accordingly. Prior to the use of each additional water supply point, the project would: • confirm that the water supply point could be accessed using the approved access routes identified in Appendix 3 to the Infrastructure Approval, or otherwise obtain the Planning Secretary’s agreement in accordance with condition C32; • reach agreement with the water supplier regarding the use of the water supply point for the project; and • carry out any additional assessments which may be required (ie heritage or biodiversity).

Key activity		Description of key activity
Traffic access routes and access points		Construction vehicle movements will be required for a variety of activities (i.e. earthworks, clearing and grubbing activities). All construction vehicles associated with the development will travel via the access routes as identified in Appendix 3 of the Infrastructure Approval or as otherwise approved. The establishment of access points would include establishing vehicle access and egress points to ensure safe vehicle movements. Existing access points may also be used. The definition of construction within the Infrastructure Approval does not include road upgrades (which includes access points). Road upgrade works are, however, incorporated within the Traffic and Transport Management Plan as required by condition C35.
Construct access tracks		Access to each tower would be required during construction. Access tracks would be required to be traversable by a range of vehicles. Access tracks would fall into two broad groups: • un-improved access tracks - using existing roads or tracks, or driving on existing soil or ground surface with minimal or no prior preparation; • improved access track – using existing roads or tracks where minor modification (such as grading or widening of the existing track) is required; and • constructed access tracks – around six metres wide and would generally follow the natural contour of the land as far as practicable to minimise the amount of cut and fill and soil disturbance. Access tracks would also include drainage control features such as table drains or cross banks to minimise erosion. Constructed access tracks would be required in areas, outside identified heritage risk zones, where there are no existing roads or tracks, or where terrain conditions prevent continuous access along the line easement between road crossings. Local waterway spans and causeways may be required, where alternative access routes are impractical, along the length of the proposal.
Temporary works		The project will require a significant quantity of temporary works during construction. The temporary works will include, but not be limited to, the following: • earthworks, including trenches, excavations, temporary slopes, stockpiles, and embankments; • laydown and parking areas for the towers; • structures, such as formwork, shoring, edge protection, temporary bridges, solid fencing/guardrails/barriers and signage, temporary scaffold; and • equipment/plant foundations, such as work platforms, crane, and piling platforms.
Transmission line construction	Earthworks and transmission tower footing construction	Excavation works and establishment of construction pads at each tower site would be required for the installation of foundations, levelling around the individual tower foundations, drainage and grading or preparation for construction at the tower site. Excavations would typically be up to five metres in depth. Construction of footings and foundation works for the new transmission line towers includes: • piling. Typical transmission line tower piling depth would be generally up to 6-15 metres below ground level and would depend on ground conditions (e.g. greater piling depths would be required where soft soil types are present).The foundation type would also vary (subject to detailed design) but would consist of either: - bored pile (reinforced concrete); - driven or screw pile (concrete or steel); and - helical screw anchor or cast in-situ reinforced concrete; • excavation to create bench sites (stepped ground excavation) where required to provide a level platform for equipment setup, the erection of the tower and other construction activities. Benching would be constructed by use of earthing equipment such as graders and excavators; • steel fabrication works; and

Key activity		Description of key activity
		• concrete pours.
	Assembly and erection of transmission line towers	The transmission line towers would typically be erected by assembling in sections on the ground and hoisting or lifting successive sections into place using cranes. Alternatively, towers may be erected in place on the footings by installing individual members. These towers would include infrastructure such as step bolts, climbing attachment plates, ladders, platforms, climbing barriers, identification plates, warning plates, other fixtures and fittings for the attachment of earthwires and insulators.
	Stringing of transmission lines including conductors and overhead earth wires and optical ground wires	Following erection and securing of the tower, the transmission line would be strung by either a ground pulled draw wire (with brake/winch sites) or a line stringing drone. The area required for the construction of each tower would require access for tower assembly and stringing works. Where a transmission tower is proposed to allow for a direction change of the transmission line, a larger area would be required (to allow for brake and winching sites). At a typical site, this would include a temporary area of up around 60 metres by 80 metres at each transmission line tower location (for the 330kV tower). The transmission line would require spanning a series of major watercourses. The general construction methodology is to assemble and erect a transmission line structure on either side of each major river. A drone would then be used to take a lead wire over the river to allow cables to then be pulled and strung tower to tower. Similar methodology will be undertaken when stringing transmission line across major road networks and railway lines.
	Installation of earthing conductors and connection to substations	The following key activities will be undertaken: • installation of earthing conductors at each of the transmission tower arms; • installation of earthing or isolation sections of fences and gates where the transmission line crosses or closely runs parallels to a metallic fence; and • connection of incoming transmission lines at the Dinawan and Wagga Wagga substations.
Optical repeater sites		Three optical repeater site communication huts would need to be constructed at Balranald, Boorooban and Lockhart. The optical repeater sites are communication huts to ensure the stability of the communications system over great distances during the operation phase. The key activities for the construction of the optical repeater sites would consist of the following: • site establishment, including vegetation removal and establishment of temporary construction site office, if required; • earthworks and preparation of the site for concrete foundations; • construction of a new communication hut building at each site; • installation of new pole-mounted transformers; • installation of electrical cables and terminations (either through the installed conduits or stringing of the aboveground poles); • installation of site wiring and electrical control equipment within each building; • trenching for underground conduit between the Balranald optical repeater hut and transmission line; • installation of new above ground poles between the transmission line and the respective Booroorban and Lockhart optical repeater sites; • provision of power connections between the transmission line and associated optical repeater site; and • removal of waste and remediation of site areas.
Pre-commissioning phases		Pre-commissioning activities would form part of the final construction and installation works and would incorporate all tests and checks to confirm that construction quality assurance documentation, inspection and test plans, checklists and associated activities have been completed for each individual component of plant. This would be to ensure that it has been supplied and

Key activity	Description of key activity
	installed in accordance with the design and statutory standards and is safe to proceed to commissioning. The key pre-commissioning activities which would be undertaken would include: • testing and commissioning of the new substation equipment; • point to point testing of the new transmission lines and substation connections; • earthing testing; • high voltage testing; • high voltage equipment operational checks; • testing of the installed protection, metering, control, and communication systems; and • cut over (energisation) of electricity between the existing and new transmission lines (where required).
Utility adjustments and protection	General utility protection and adjustment works, where required, to allow for the Wagga Wagga substation expansion and upgrades works to occur, the optical repeater sites, the establishment and operation of the construction compounds and accommodation camps, and where else required.
Progressive site rehabilitation and landscaping	Site rehabilitation would be carried out progressively along completed sections of the transmission line as well as the substation sites. This phase would occur following the completion of construction and involve the removal of materials not required during the operation of the substation and/or transmission lines. This phase would include the removal/remediation of the construction compounds and camp sites, removal of temporary facilities and site buildings and temporary environmental controls. Works may also be undertaken to restore: • water infrastructure facilities to pre-existing conditions before arrival on site in consultation with landowners; • natural drainage in areas where temporary facilities were provided; and • fences, gates, etc., which may have been damaged during construction. Installation of the permanent Transgrid property boundary fence surrounding the substation sites would also likely occur during this phase.
Demobilisation	SecureEnergy will start to downsize the construction team with gradual demobilisation as particular key construction activities are completed.

Some activities nominated in this stage will have already commenced as part of Stage 1 and/or the pre-construction minor works permitted in accordance with the Infrastructure Approval.

The pre-construction minor works will remain excluded from the definition of ‘construction’ and will therefore not be subject to this NVMP.

Once approved, this NVMP will supersede the existing Stage 1 NVMP. Therefore the activities that were approved to be carried out under the Stage 1 NVMP will continue under this NVMP.

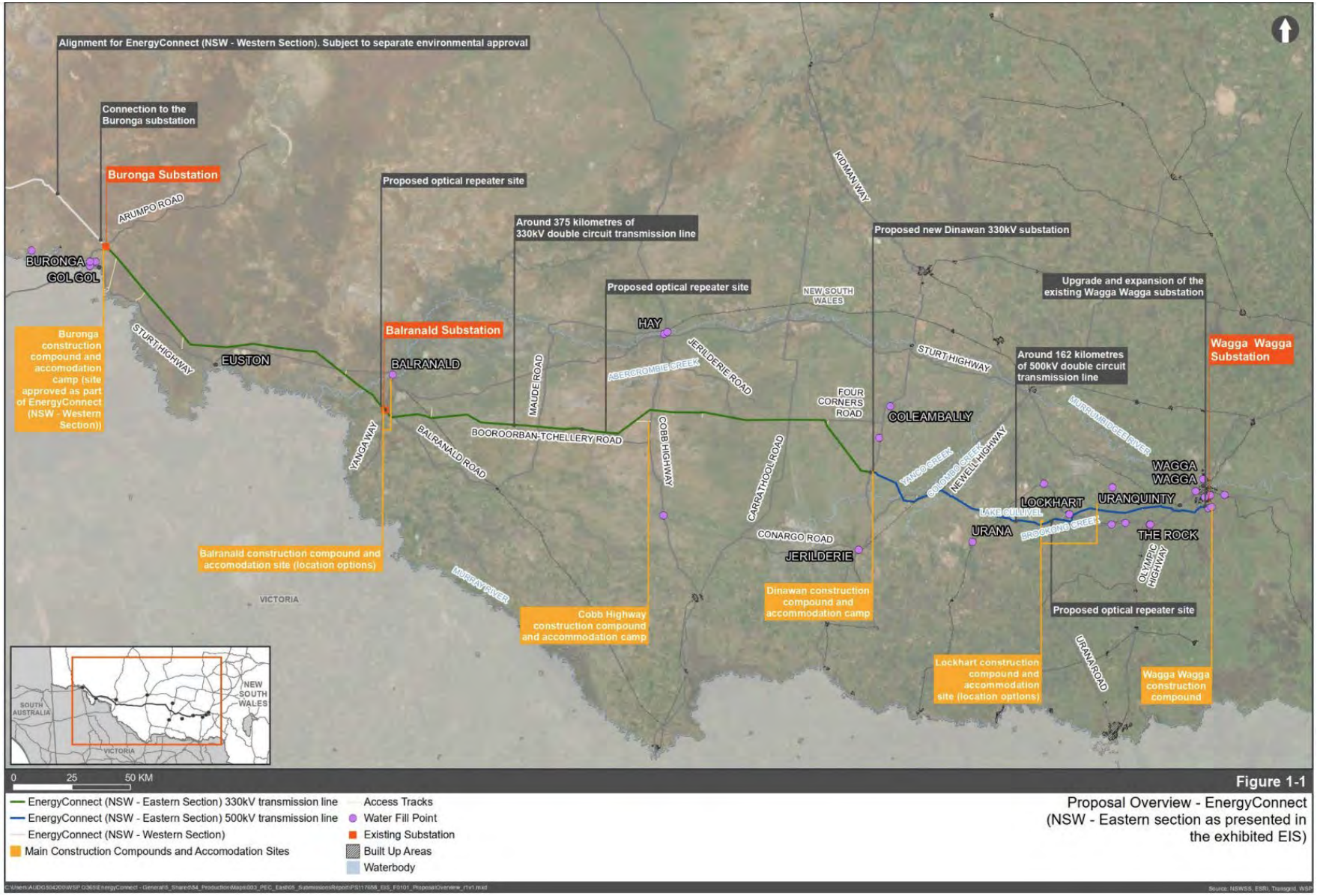

Figure 1.1 - Key features of EnergyConnect (NSW – Eastern Section) as shown in Figure 1-1 of the Amendment Report

1.4 Environmental management system

The overall environmental management system for the project is described in Section 4 of the CEMP.

This NVMP is a sub-plan that forms part of the CEMP and is also part of the environmental management framework for the project, as described in the CEMP. Figure 1.2 shows the CEMP framework for the project.

Management measures identified in this plan will be incorporated into relevant site-based documents including, but not limited to, site or activity specific work packs or work method statements (WMSs), the geographic information system (GIS)/sensitive area plans (SAPs) or training and awareness material.

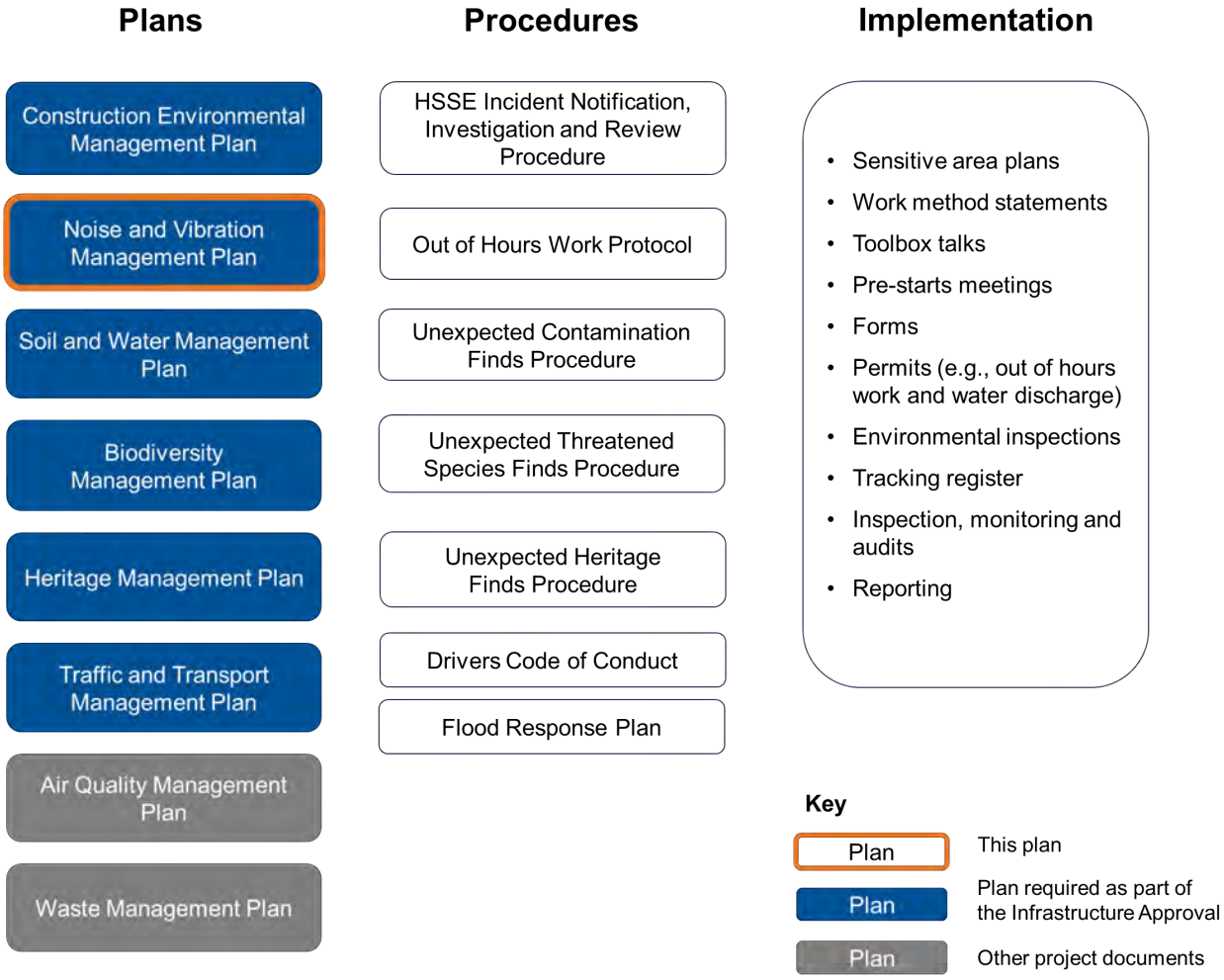

Figure 1.2 - CEMP framework

1.5 Purpose and objective

The purpose of this NVMP is to describe the approach to manage noise and vibration impacts that will be adopted during construction of the project.

The key objective of this plan is to detail management measures and inform site procedures for implementation so that noise and vibration impacts are minimised. To achieve this, the following will be undertaken:

- implement appropriate measures to address the requirements outlined in the Infrastructure Approval, EIS, Submissions Report and Amendment Report;
- implement appropriate measures during construction to minimise potential noise and vibration impacts to sensitive receivers; and

- implement appropriate measures to comply with relevant legislative requirements as described in Section 2.1 of this plan.

As a means of assessing environmental performance, environmental objectives (performance measures), targets (criteria) and performance indicators have been established for the project and are provided within Table 4.2 of the CEMP. All performance measures and indicators are applicable to the project, however, those most relevant to noise and vibration are detailed in Table 1.2.

Table 1.2 - Environmental objectives, targets and performance indicators relevant to noise and vibration

Aspect	Objectives (performance measures)	Targets (criteria)	Performance indicators
Compliance	Compliance with legislation, statutory approvals and the Infrastructure Approval	• Full compliance with statutory approvals. • No regulatory infringements (PINs or prosecutions). • No formal regulatory warning.	Number of regulatory infringements (PINs or prosecutions), formal regulatory warning, audits
	Implement and comply with the CEMP and associated management plans	• Zero non-compliances identified during each compliance audit of CEMP and sub-plans.	Number of non-compliances arising from each audit.
Engage with stakeholders and the broader community, minimise complaints and respond to any complaints within a suitable timeframe	Disseminate regular project updates and other information to keep the community informed of the project, particularly out of hours works. Record and respond to complaints, including noise and vibration complaints, within a timely manner.	• All project updates provided within the timeframes specified within the *Community Communication Strategy.* • All complaints are reviewed within the timeframes specified within the *Community Communication Strategy.*	Timeliness of project updates per project website; and timeliness of complaints response as recorded in the complaints register.
Training and improvement	Provide adequate training to ensure construction activities are undertaken safely and with minimal risk to the environment. Continuously improve environmental performance	• Regular environmental training that focuses on the specific project activities and associated environmental risks; • Regular pre-start meetings and toolbox talks in accordance with Section 6 of the CEMP.	Records of inductions, toolbox talks with environmental focus, daily pre-start meetings.

1.6 Preparation of this plan

In accordance with condition B1 of the Infrastructure Approval, this plan has been prepared and reviewed by a suitably qualified and experienced person. This plan was prepared by Katie Baxter and was reviewed by Rebecca Walker-Edwards.

1.7 Consultation

1.7.1 Development of the Out of Hours Work Protocol

In accordance with condition C10 f) of the Infrastructure Approval, the Out of Hours Work Protocol, which is required to form part of this NVMP, has been prepared in consultation with relevant councils (refer to Appendix A).

The Out of Hours Work Protocol applies to the entire construction phase (Stage 1 and Stage 2) and all associated activities required outside of standard construction hours. The Out of Hours Work Protocol was issued to the relevant councils for review and comment during consultation for the Noise and Vibration Management Plan associated with Stage 1 of construction (45860-HSE-PL-D-0110). Details of all consultation with the relevant councils will be submitted to the Department along with the submission of this plan. No changes were required in relation to Stage 2 of construction.

1.7.2 Ongoing communication and consultation

SecureEnergy will use a range of tools in accordance with the *Community Communication Strategy* (CCS) (45860-HSE-DOC-D-0024) to facilitate ongoing consultation and communication with the community and stakeholders (including government agencies where necessary) regarding the project. Communication tools include, but are not limited to, stakeholder briefings, project website, community drop-in sessions, door knocks and project factsheets. Notifications will be issued for, but not limited to the following commencement of construction, significant milestones and changes to the scope of work. Refer to the CCS for further information.

In accordance with condition D12 a) of the Infrastructure Approval, project documents including the EIS, approved strategies, plans or programs required under the conditions of approval and independent reports will be publicly available on the project website. The project website is https://www.transgrid.com.au/projects-innovation/energyconnect. A 24-hour toll-free telephone number (1800 490 666) is also available for any project enquiries. In accordance with condition D12 b) the information will be kept up to date.

1.7.3 Negotiated agreements

In accordance with condition C2 c) of the Infrastructure Approval, an agreement with sensitive receivers (owners and occupiers) may be negotiated to carry out works in accordance with the hours and noise limits specified in the agreement.

Where multiple receivers are affected by works, a substantial majority of the receivers must agree to the specified hours and noise limits proposed by the project.

All negotiated agreements will be in writing and will be finalised before the commencement of relevant works.

1.7.4 Complaints

Complaints will be managed by the Engagement Team with the use of Consultation Manager. Complaints will be received via phone calls, emails and letters. Any complaint received is regarded as a high priority and will be recorded, tracked and responded to in accordance with the CCS. Complaints will be investigated and dealt with impartially. The key principles of the complaint management process include:

- acknowledge - SecureEnergy staff should respect the communities' right to voice their concerns. All complaints received should be acknowledged to the complainant either by telephone or in writing;
- resolve - SecureEnergy staff should aim at first contact, resolution for all community concerns. SecureEnergy staff should investigate community concerns in detail before negotiating a resolution. All SecureEnergy staff should use their relevant discretions to achieve a mutually acceptable resolution to complaints;
- escalate - all SecureEnergy staff should aim to escalate the complaint if the community member remains dissatisfied with the investigation and/or resolution offered by their first point of contact at SecureEnergy. All complaints where a community member requests to speak to a higher-level representative, should also be escalated;
- record - SecureEnergy staff should aim, through the Engagement Team, to record all relevant information, on the community account in Consultation Manager, regarding customer concerns along with details of all discussions had with the community member in the process of investigating and/resolving the complaint. Detailed information on the resolutions offered to address community concerns should also be clearly recorded;
- communicate - SecureEnergy staff should remain in constant touch with the community member while their concerns are being investigated. The community member should be informed of all steps of the investigation and the resulting outcome at appropriate times;
- report - SecureEnergy should report on all complaints received to the SecureEnergy Management Team and Transgrid. The reporting should include information on the number as well as type of

complaints being received, the status of these complaints from time to time and the resulting outcomes or resolutions offered to close them;

- feedback - the SecureEnergy Engagement Team should aim at regular and intensive reviews to identify possible trends in the complaints being received. These reviews should be aimed at highlighting improvements required to avoid complaints being repeated;
- action - SecureEnergy should aim to effectively implement improvements suggested directly by the community or highlighted by complaint trends.

Wherever possible, complaints will be resolved directly between SecureEnergy and the stakeholder. If a complaints management process has been followed and the issue cannot be resolved, dispute resolution will be undertaken in accordance with the CCS. As part of this, a Community Complaints Mediator will be engaged to address any complaint where a member of the public is not satisfied by SecureEnergy's response. The escalated review process will include an assessment of the details of the complaint received, any findings of the investigation undertaken in response to the complaint, and any further matters raised by the complainant.

If a complaint requires referral to senior management and Transgrid, the complainant will be informed of this and the outcome of the review process. DPE may also request that the Environmental Representative (ER) assist in dispute resolution of community complaints.

All complaints will be provided to the ER in accordance with condition A13 on the day they are received, and a summary of complaints received, such as a complaints register, will be updated monthly on the project website in accordance with condition D12 vi).

1.8 Submission and approval

Prior to submission to DPE, the NVMP will be reviewed by the ER to ensure that the plan is consistent with the requirements of the Infrastructure Approval. A written statement to this effect will be prepared and submitted to DPE. This review will be undertaken in accordance with condition A12 of the Infrastructure Approval.

This NVMP will be submitted to DPE for review and approval by the Planning Secretary prior to commencing Stage 2 of construction.

Stage 2 of construction will not commence until the CEMP and all sub-plans required under condition B1, or where staging is proposed the plans required for that stage, have been approved by the Planning Secretary. The approved NVMP will then be implemented for the duration of the Stage 2 construction activities. The Department will be notified in writing via the Major Projects portal of the proposed date of commencement of Stage 2 of construction.

1.9 Periodic review

This NVMP will be reviewed at least annually and updated, if required, in accordance with Section 1.10 of the CEMP – Updating the CEMP. This includes the review and, if necessary, revision of this NVMP in accordance with condition D2 within three months of the following:

- submission of an incident report under condition D6 of the Infrastructure Approval;
- submission of an audit report under condition D11 of the Infrastructure Approval; or
- any modifications to the Infrastructure Approval.

Any updates to the NVMP will be approved as described in Section 1.10 of the CEMP.

2 Environmental requirements

2.1 Legislation

Legislation relevant to the management of noise and vibration includes:

- *Environmental Planning and Assessment Act 1979* (EP&A Act); and
- *Protection of the Environment Operation Act 1997* (POEO Act).

Relevant provisions of the above legislation are detailed within the register of legal and other requirements included in Appendix A1 of the CEMP.

2.2 Conditions of Approval

The conditions of the Infrastructure Approval relevant to noise and vibration are presented in Table 2.1. A cross reference is also included to indicate where the condition is addressed within this plan or other project management documents.

Table 2.1 - Conditions of Approval relevant to noise and vibration

<table>
<tr><th>Condition no.</th><th>Requirement</th><th>Where addressed</th><th>How addressed</th></tr>
<tr><td>B1</td><td>Prior to commencing construction, an Environmental Management Plan (EMP) comprising the Sub-plans listed in Table 1 must be prepared by a suitably qualified and experienced persons, to the satisfaction of the Planning Secretary.
Following the Planning Secretary's approval, the Proponent must implement the Environmental Management Plan.
Table 1: EMP Sub-plans
<table>
<tr><th></th><th>Required EMP Sub-plan</th><th>Relevant government agencies and stakeholders to be consulted for each EMP Sub-plan</th></tr>
<tr><td>(a)</td><td>Noise and Vibration</td><td>N/A</td></tr>
</table></td><td>Section 1.6
Section 1.8
The CEMP</td><td>The Construction Environmental Management Plan has been prepared to address the requirements of an EMP.
Construction of Stage 2 will not commence until this CEMP and the CEMP Sub-plans are approved, as detailed in Section 1.8.
Consultation for the CEMP subplans is addressed in Section 1.7.
There are no specific consultation requirements for this NVMP, however the Out of Hours Work Protocol required by condition C10 must be prepared in consulted with relevant councils (refer to condition C10 f) (i). As noted in Section 1.7.1, the Out of Hours Work Protocol covers all of construction (Stages 1 and 2) and the required consultation was completed during preparation of the Stage 1 documents CEMP and sub-plans. The protocol in Appendix A is unchanged and no additional consultation is required to satisfy condition C10 f) (i).</td></tr>
<tr><td rowspan="4">B2</td><td colspan="2">The EMP Sub-plans must be prepared in accordance with relevant guidelines and in consultation with the relevant government agencies identified for each Sub-plan in Table 1, and include:</td><td>Section 1.6
Section 1.7
Section 2.5</td><td>This NVMP has been jointly prepared in accordance with relevant guidelines.</td></tr>
<tr><td>a)</td><td>a summary of relevant background or baseline data;</td><td>Section 3</td><td>The existing known noise and vibration environment adjacent to the project is outlined in Section 3.</td></tr>
<tr><td>b)</td><td>details of:</td><td>-</td><td>-</td></tr>
<tr><td></td><td>(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);</td><td>Section 2
Section A1 of the CEMP</td><td>The relevant legislation, conditions, RMMs and guidelines applicable to noise and vibration are outlined in Section 2. Appendix A1 of the CEMP provides further detail on the relevant</td></tr>
</table>

Condition no.	Requirement	Where addressed	How addressed
			legislation applicable to noise and vibration.
	(ii) any relevant limits or performance measures and criteria;	Section 4 Section 1.5 Section 4.2 of the CEMP – Objectives and targets	Section 4 identifies specific noise and vibration criteria for the project. Further to this, the objectives (performance measures) and targets (criteria) relevant to noise and vibration management are outlined in Section 1.5 of this NVMP. The CEMP also provides project-wide environmental objectives (performance measures) and targets (criteria).
	(iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures; and	Section 1.5 Section 4.2 of the CEMP – Objectives and targets	The performance indicators relevant to noise and vibration management are outlined in Section 1.5 of this NVMP. The CEMP also provides project-wide performance indicators.
	(iv) any relevant commitments or recommendations identified in the EIS;	Section 2.3	Relevant noise and vibration commitments and recommendations identified in the EIS, have been outlined in Section 2.3.
	c) a description of the management measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Section 7	Specific noise and vibration related safeguards and management measures to address potential impacts associated with construction and comply with the relevant statutory requirements, limits and performance measures are outlined in Section 7.
	d) a program to monitor and report on the:	-	-
	(i) impacts and environmental performance of the development (including a table summarising all the monitoring and reporting obligations under the conditions of this approval); and	Section 8, including: Section 8.3 Section 8.4 Section 8.5 Section 8.6	Monitoring, inspections, auditing and reporting is outlined in Section 8 of this NVMP.
	(ii) effectiveness of the management measures set out pursuant to paragraph (c);	Section 8	Monitoring of the effectiveness of the management measures is outlined in Section 8 through compliance management process.
	e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Section 8.8 Section 8 of the CEMP- Incidents and emergencies Section 10 of the CEMP - Reporting Section 11 of the CEMP - Non-compliance, non-conformance, corrective and	Section 8.8 outlines a contingency plan in the event that unpredicted impacts are identified. The CEMP also provides additional detail regarding incidents and emergencies, reporting, non-compliance, non-conformance, corrective and preventative actions.

Condition no.	Requirement	Where addressed	How addressed
		preventative action	
	f) a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 1.9 Section 8 Section 1.9 of the CEMP - Continuous improvement	Section 8 of this NVMP outlines procedures for compliance management, including details for monitoring, inspections, auditing and reporting. Actions to undertake in the event that monitored noise levels exceed the modelling predictions are identified in Section 8.8 of this NVMP. This NVMP will reviewed at least annually as described in Section 1.9 of this NVMP. The Plan-Do-Check-Act model will be applied to the continuous improvement process, also outlined in Section 1.9 of the CEMP.
	g) a protocol for managing and reporting any: (i) incident, non-compliance or exceedance of any impact assessment criterion or performance criterion;	Section 8.7 Section 8.8 Section 8 of the CEMP - Incidents and emergencies Section 10 of the CEMP - Reporting Section 11 of the CEMP - Non-compliance, non-conformance, corrective and preventative action	Sections 8.7 and 8.8 describe the procedures for emergencies, incidents and non-compliances, including those related to noise and vibration. Actions to undertake in the event that monitored noise levels exceed the modelling predictions are identified in Section 8.8 of this NVMP. Additional detail for managing incidents and emergencies, non-compliances and non-conformances is included in the CEMP. The protocol for reporting any incidents, non-compliances or non-conformances is included in Section 10 of the CEMP.
	(ii) complaint; or	Section 1.7.4 Community Communication Strategy (CCS)	A summary of the complaints management procedure and reporting of complaints is included in Section 1.7.4 of this NVMP. The procedure for managing and reporting any complaints is described in the *Enquiries, Complaint and Dispute Resolution Management Procedure* provided in the CCS. The procedure includes a complaints management process which outlines how SecureEnergy will respond to complaints related to the project. In the event of a noise and vibration related complaint, the complaints management process will be implemented.
	(iii) failure to comply with other statutory requirements;	Section 8.7 Section 8 of the CEMP -	In the event of failure to comply with statutory requirements, the procedures summarised in Section 8.7 of this NVMP, and described in more detail in the CEMP, would be followed.

Condition no.	Requirement	Where addressed	How addressed
		Incidents and emergencies Section 10 of the CEMP - Reporting Section 11 of the CEMP - Non-compliance, non-conformance, corrective and preventative action	
	h) public sources of information and data to assist stakeholders in understanding environmental impacts of the development; and	Section 1.7 CCS	All public sources of information are available on the project's website (https://www.transgrid.com.au/projects-innovation/energyconnect) and detailed in Section 1.7.
	i) a protocol for periodic review of the EMP and EMP Sub-plans.	Section 1.9 Section 1.10 of the CEMP - Updating the CEMP	This NVMP will be reviewed at least annually in accordance with the CEMP.
	The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.	-	Noted
C1	Road upgrades, construction, upgrading and decommissioning activities may only be undertaken between: a) 7 am to 6 pm Monday to Friday; b) 8 am to 1 pm Saturdays; and c) at no time on Sundays and NSW public holidays; unless the Planning Secretary agrees otherwise.	Section 4.1	The standard construction hours for the project are identified in Section 4.1.
C2	The following activities may be carried out outside the hours specified in condition C1 above: a) the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons; b) emergency work to avoid the loss of life, property or to prevent material harm to the environment; or c) works carried out in accordance with the hours and noise limits specified in any negotiated agreements with sensitive receivers (owners and occupiers), provided the negotiated agreements are in writing and finalised before the commencement of works; d) activities that are inaudible at non-associated residences; e) road upgrades required by the relevant roads authority to be undertaken	Section 4.1 Section 1.7.3 Table 7.1 - N15 Appendix A – Out of Hours Work Protocol	The permitted variations to the standard construction hours are identified in Section 4.1. Agreements may be sought with sensitive receivers to undertake works in accordance with negotiated hours and noise limits as identified in Section 1.7.3 and/or in accordance with Appendix A – *Out of Hours Work Protocol*.

Condition no.	Requirement	Where addressed	How addressed
	outside the standard construction hours; or f) works carried out in accordance with an Out-of-Hours Work Protocol approved in accordance with condition C10.		
C3	The Proponent must take all reasonable and feasible steps to minimise the construction, upgrading or decommissioning noise of the development in the locations where the noise is audible to sensitive receivers, including any associated traffic noise.	This NVMP, particularly Section 7	Section 7 provides the management measures to minimise noise impacts on sensitive receivers.
C4	The Proponent must implement mitigation measures:	-	-
	a) to ensure that the noise generated by any construction, upgrading or decommissioning activities is managed in accordance with the requirements for construction 'noise affected' management levels established in accordance with *Interim Construction Noise Guideline* (DECC, 2009); and	Section 4.5 Section 6.2 Section 7	Construction 'noise affected' management levels are described as project 'noise management levels' throughout this NVMP and have been established in accordance with the Interim Construction Noise Guideline (ICNG) as identified in Section 4.5. In line with the ICNG, where predicted or measured noise levels exceed the noise management level (refer to construction noise impacts in Section 6.2), feasible and reasonable work practices will be identified and implemented, such as those included in Section 7.
	b) with the aim of achieving the road traffic noise assessment criteria for residential land uses from *NSW Road Noise Policy* (DECCW, 2011).	Section 4.7 Section 6.4 Table 7.1 – N6	The road traffic noise assessment criteria is described in Section 4.7. A consideration of construction road traffic noise is presented in Section 6.4. Measures to minimise the impacts of construction road traffic are identified in Table 7.1.
C5	The Proponent must comply with the following vibration limits: a) vibration criteria established using the Assessing vibration: a technical guideline (DEC, 2006) (for human exposure); b) BS 7385 Part 2-1993 "Evaluation and measurement for vibration in buildings Part 2" as they are "applicable to Australian conditions"; and c) vibration limits set out in the German Standard DIN 4150-3: Structural Vibration- effects of vibration on structures (for structural damage).	Section 4.6 Section 6.3	The nominated vibration criteria is described in Section 4.6. No exceedances of the nominated vibration criteria are expected as a result of the works as described in Section 6.3.
C6	Blasting may only be carried out on the site between 9 am and 5 pm Monday to Friday and between 9 am to 1 pm on Saturday. No blasting is allowed on Sundays or public holidays, unless approved in accordance with condition C1.	Section 4.1	Should blasting need to occur, the work would be carried out between 9 am and 5 pm Monday to Friday and between 9 am and 1 pm on Saturday. No blasting would be undertaken on Sundays or on public holidays unless the Planning Secretary agrees otherwise.

<table>
<tr><th>Condition no.</th><th>Requirement</th><th>Where addressed</th><th>How addressed</th></tr>
<tr><td>C7</td><td>The Proponent must ensure that any blasting carried out on the site does not exceed the criteria in Table 2.
Table 2: Blasting criteria
<table>
<tr><th>Location</th><th>Airblast overpressure (dB(Lin Peak))</th><th>Ground vibration (mm/s)</th><th>Allowable exceedance</th></tr>
<tr><td rowspan="2">Any non-associated residence</td><td>120</td><td>10</td><td>0%</td></tr>
<tr><td>115</td><td>5</td><td>5% of the total number of blasts or events over a rolling period of 12 months</td></tr>
</table></td><td>Section 4.7</td><td>Should blasting need to occur, the blasting will not exceed the criteria stipulated in Table 2.</td></tr>
<tr><td>C8</td><td>Except for corona discharge noise, the Proponent must ensure that the noise generated by the operation of the development does not exceed 35 dB(A) LAeq,15min, at the reasonably most affected point of the residence, in accordance with the NPfI, at any non-associated residence.</td><td>Section 5.4</td><td>Detailed design undertaken during Stage 2 will ensure that the project does not exceed 35 dB(A) LAeq,15min, at the reasonably most affected point of residence in accordance with the NPfI, at any non-associated residence.</td></tr>
<tr><td>C9</td><td>The Proponent must:
a) take all reasonable and feasible steps to minimise corona discharge noise during operation of the project;
b) identify residences predicted to experience corona discharge noise levels above 35 dB(A) LAeq, 15 min at the reasonable most affected point of the residence, determined in accordance with the NPfI, and how often corona noise is expected to be above this level per year;
c) implement all reasonable and feasible noise mitigation measures, determined in accordance with the NPfI, at receivers predicted to experience corona discharge noise levels that exceed the noise level identified in condition C8; and
d) prepare and implement a Research Program and allocate $150,000 to this program, prepared in consultation with EPA and be submitted to the Planning Secretary for approval prior to commencement of operation, which must provide further scientific and engineering understanding of corona discharge noise and best practice noise mitigation measures.</td><td>Section 7.1</td><td>Detailed design undertaken during Stage 2 will consider all reasonable and feasible steps to minimise the impacts of corona discharge noise that could occur during operation.
Detailed design will identify residences expected to exceed 35 dB(A) LAeq,15min and will determine how often these conditions would likely occur annually.
Detailed design will identify reasonable and feasible noise mitigation measures and these measures will be implemented.
Transgrid will prepare and implement a Research Program, prepared in consultation with the Environment Protection Authority (EPA). Transgrid will allocate $150,000 to this program and will submit the program to the Planning Secretary for approval prior to the commencement of operation.</td></tr>
<tr><td rowspan="3">C10</td><td>The Noise and Vibration EMP Sub-Plan required under condition B2 must:</td><td>-</td><td>-</td></tr>
<tr><td>a) ensure the requirements in conditions C1 to C9 are complied with;</td><td>Refer above for conditions C1 to C9.</td><td>Refer above for conditions C1 to C9.</td></tr>
<tr><td>b) include a description of the reasonable and feasible measures that would be implemented to minimise noise and vibration impacts of the development;</td><td>Table 7.1</td><td>Management and mitigation measures implemented to minimise noise and vibration impacts of the project are included in Section 7, particularly Table 7.1.</td></tr>
</table>

Condition no.	Requirement	Where addressed	How addressed
	c) include a detailed description of the noise and vibration management system for the development;	This NVMP, particularly Section 7 and Section 8	The noise and vibration management system is described throughout this NVMP, particularly the management and mitigation measures included in Section 7, and the compliance management process included in Section 8.
	d) include a protocol for the identification, notification and management of works that exceed the noise management levels; and	Section 7.1 Table 7.1 Section 8.3 CCS Appendix A	A protocol for the management of activities that could result in noise levels that exceed the noise management levels at sensitive receivers is identified in Section 7.1. Notification, as required, will be undertaken in accordance with the CCS. Works would be managed in accordance with the management measures identified in Table 7.1 and monitored as described in Section 8.3. Any works undertaken outside the hours identified in conditions C1 and C2, including those that could exceed the noise management levels, would be undertaken in accordance with the Out-of-Hours-Work Protocol in Appendix A.
	e) include a monitoring program that evaluates and reports on the effectiveness of the noise and vibration management system; and	Section 8.3 Section 8.4	The effectiveness of the management measures identified in Section 7 of this NVMP will be monitored and reported through the program provided in Sections 8.3 and 8.4.
	f) include an Out-of-Hours Work Protocol to identify a process for the consideration, management and approval of works that are outside the hours defined in conditions C1 and C6, which must: (i) be prepared in consultation with the relevant Council; (ii) identify low risk activities that can be undertaken without the approval of the Planning Secretary and with the approval of the ER; and (iii) identify high risk activities that must be approved by the Planning Secretary; and g) identify Department, Council and community notification arrangements for approved out of hours work.	Appendix A – Out of Hours Work Protocol	An Out of Hours Work Protocol has been prepared and is included in Appendix A. The protocol covers all construction activities (Stage 1 and Stage 2). Consultation with the relevant Councils was completed as part of consultation for the Stage 1 CEMP and sub-plans. The Protocol in Appendix A remains unchanged from the version in the Stage 1 NVMP.

2.3 Revised mitigation measures

The revised mitigation measures (RMMs) for the project are provided in Appendix B of the Submissions Report. The RMMs relevant to noise and vibration management are presented in Table 2.2.

A cross reference is also included to indicate where the measure is addressed within this plan or other project management documents. The management measures that will be implemented for the project are provided in Section 7 of this plan.

Table 2.2 - Revised mitigation measures relevant to noise and vibration

Ref	Revised mitigation measures	Application location(s)	Where addressed	How addressed
NV1	A Construction Noise and Vibration Management Plan (CNVMP) would be prepared by the construction contractor prior to construction works commencing and would (as a minimum) identify:	All locations	This plan	This plan has been prepared prior to Stage 2 construction works commencing.
	• all noise and vibration sensitive receivers;		Appendix B - Sensitive receivers Table 3.1	Sensitive receivers associated with Stage 2 works identified in Table 3.1 and visually represented in Appendix B.
	• feasible and reasonable noise mitigation where management levels are likely to be exceeded;		Section 7 Table 7.1	Feasible and reasonable mitigation measures are identified in Table 7.1.
	• feasible and reasonable noise measures to manage traffic noise impacts on public roads where impacts are identified at any sensitive receiver due to proposal–related traffic;		Section 7 Table 7.1	Mitigation measures to minimise noise levels associated with project construction road traffic are included in Table 7.1, as measure N4.
	• feasible and reasonable vibration mitigation where vibration criteria are likely to be exceeded;		Section 7 Table 7.1	Vibration management measures are included in Table 7.1, specifically measures N8 and N9.
	• describe associated noise and vibration monitoring programs;		Section 8.3	The monitoring program is presented in Section 8.3.
	• refer to complaint handling protocols for complaints related to construction noise and vibration; and		Section 1.7.4	Proactive strategies to prevent complaints include notification and consultation with sensitive receivers. Complaints management will be undertaken in accordance with the CCS.
	• outline community consultation measures including notification requirements.		Section 1.7	
	This CNVMP would be implemented for the duration of construction.		Section 1.3	This plan has been developed for Stage 2 and will be implemented for the duration of Stage 2 of construction.
NV2	Where noise from construction is likely to result in noise affected receivers, mitigation and management measures would be implemented where practicable and appropriate. This would include (but is not limited to) the following measures:	All locations	Section 7 Table 7.1	The mitigation measures listed in RMM NV2 have been included in Table 7.1 of this plan.
	• select quieter plant and equipment and use alternative construction methods to minimise noise levels;		Table 7.1	This requirement is included as management measure N6.

Ref	Revised mitigation measures	Application location(s)	Where addressed	How addressed
	• plan and schedule concurrent noisy activities to minimise the number of items of noisy plant operating at one time and cumulative noise levels;		Table 7.1	This requirement is included as management measure N7.
	• install screens or use barriers to mitigate noise from stationary noise sources;		Table 7.1	This requirement is included as management measure N6.
	• maximise the offset distance between noisy plant and orient equipment away from sensitive receivers;		Table 7.1	This requirement is included as management measure N6.
	• use noise source controls, such as residential class mufflers, to reduce noise from all regularly – used plant including cranes, excavators and trucks;		Table 7.1	This requirement is included as management measure N6.
	• use alternative reversing alarms in place of traditional beeper reversing alarms during works outside standard construction hours where noise impacts have been predicted;		Table 7.1	This requirement is included as management measure N6.
	• turn off machinery when not in use;		Table 7.1	This requirement is included as management measure N6.
	• ensure equipment is well maintained and not generating excessive noise;		Table 7.1	This requirement is included as management measure N3.
	• operate machinery in a manner which reduces maximum noise level events, such as shaking excavator buckets, loading trucks from a height, steel on steel contact and dragging materials across hard surfaces;		Table 7.1	This requirement is included as management measure N6.
	• provide awareness training regarding noise mitigation measures to be implemented;		Table 7.1	This requirement is included as management measure N1.
	• notify and consult with potentially affected receivers about upcoming noisy activities; and		Table 7.1 Section 1.7.2	This requirement is included as management measure N14 and N16.
	• ensure that noise affected receivers outside standard construction hours and highly noise affected sensitive receivers are provided with appropriate respite.		Appendix A	All works undertaken outside the hours defined in condition C1 and C2 will be undertaken in accordance with the Out of Hours Work Protocol.
NV3	Where construction is likely to result in vibration levels that exceed relevant criteria at sensitive receivers, mitigation and management measures would be implemented where practicable and appropriate. This would include (but is not limited to) the following measures:	All locations	Section 4.6 Section 7 Table 7.1	The mitigation measures listed in RMM NV3 have been included in Table 7.1 of this plan.
	• avoid the use of vibration–intensive plant at distances where human discomfort would result;		Table 7.1	This requirement is included as management measure N8.
	• substitute lower vibration–intensive plant and methods (for example use a smaller machine, lower power settings or alternative equipment);		Table 7.1	This requirement is included as management measure N8.

Ref	Revised mitigation measures	Application location(s)	Where addressed	How addressed
	• sequence operations to avoid or minimise concurrent vibration–intensive activities;		Table 7.1	This requirement is included as management measure N8.
	• schedule the use of vibration–sensitive equipment during the least sensitive times of the day;		Table 7.1	This requirement is included as management measure N8.
	• confirm any vibration–sensitive heritage structures that could be impacted by the proposal works. Develop site–specific measures to avoid vibration impacts and implement the measures during vibration–intensive activities in the vicinity; and		Table 7.1	No vibration-sensitive heritage structures have been identified in the vicinity of the Stage 2 disturbance area. In the event that vibration-sensitive heritage structures could be impacted, this requirement would be implemented as identified in management measure N9.
	• inform and consult with potentially affected receivers about upcoming vibration–intensive activities.		Table 7.1 Section 1.7.2	This requirement is included as management measure N16 and N14.
NV4	Where noise from construction–related traffic is likely to result in road traffic noise increases of more than 2 dB at affected receivers, mitigation and management measures would be implemented where practicable and appropriate. This would include (but is not limited to) the following measures: • minimise proposal–related traffic movements along the route; • minimise speeds for proposal–related traffic in the vicinity of affected receivers; • avoid compression braking and the use of air brakes in the vicinity of affected receivers; • implement driver training and measures to ensure driver awareness, speed limits, driver behaviour and designated routes are effectively communicated; and • limit traffic movements to daytime periods as far as possible and minimise traffic movements outside standard construction hours.	All locations	Section 4.7 Section 7 Table 7.1	The mitigation measures listed in RMM NV4 have been included in Table 7.1 of this plan, including N4 and N5.
NV5	Activities likely to generate noise levels that exceed applicable noise management levels at sensitive receivers would be scheduled during standard construction hours wherever practicable. Other activities required outside standard construction hours that are likely to generate noise levels that exceed applicable noise management levels at any nearby sensitive receivers would be carried out in accordance with an out of hours works protocol (Mitigation measure NV6).	All locations excluding the operation of the accommodation camps	Section 7 Table 7.1 Appendix A - *Out of Hours Work Protocol*	An Out of Hours Work Protocol has been prepared in line with condition C10 f) of the Infrastructure Approval and is included in Appendix A of this NVMP.
NV6	Develop and implement an out of hours works (OOHW) protocol that details how the proposal would identify, assess and approve	All locations excluding the operation	Section 1.7.2 Table 7.1	An Out of Hours Work Protocol has been prepared in line with

Ref	Revised mitigation measures	Application location(s)	Where addressed	How addressed
	out of hours works outside standard construction hours that are likely to generate noise levels that exceed the relevant noise management levels at sensitive receivers. The protocol would include provisions to: • carry out additional assessments for works proposed outside standard construction hours to confirm predicted noise levels • minimise noise levels outside standard construction hours • carry out the noisiest activities as early as possible in the work shift where practicable • identify appropriate respite for noise affected receivers (where required) • notify and engage with potentially affected receivers about upcoming works outside standard construction hours and address any associated complaints. The Out of Hours Work protocol would not apply to the operation of the accommodation camps. Prior to works outside standard construction hours, engagement and consultation would occur with potentially affected receivers regarding various mitigation and management measures. Based on this consultation, appropriate mitigation and management options would be considered and implemented where feasible and reasonable to minimise the impacts.	of the accommodation camps	Appendix A - Out of Hours Work Protocol	condition C10 f) of the Infrastructure Approval and is included in Appendix A of this NVMP.
NV7	Where residences or other sensitive receivers/structures are within the minimum working distances for vibration, different construction methods with lower source vibration levels would be investigated and implemented, where feasible. Attended vibration measurements would be undertaken at the start of the works to determine actual vibration levels at the structure. Works would cease if the monitoring indicates vibration levels are likely to, or do, exceed the relevant criteria.	All locations	Section 6.2.8	No sensitive receivers/ structures are within the minimum working distances for vibration as a result of the Stage 2 works.
NV8	Prior to the commencement of blasting, a Blast Management Strategy would be developed. The strategy would describe the process that would be used to design each blast (depths and Maximum Instantaneous Charge for each location etc) to comply with relevant noise and vibration criteria at any nearby sensitive receivers. The strategy would also detail noise and vibration monitoring and landholder notification requirements for blasting. The strategy would be implemented for all blasting.	Blasting locations	Section 6.2.8 Table 7.1	If blasting is proposed, a Blast Management Strategy would be developed in accordance with NV8 prior to the commencement of blasting.

Ref	Revised mitigation measures	Application location(s)	Where addressed	How addressed
NV9	Investigate any complaints regarding construction noise and vibration to determine if actual noise and vibration levels are as predicted and that appropriate mitigation measures have been implemented. Where required, identify and implement appropriate additional mitigation measures.	Blasting locations	Section 1.7.4 Section 7 Table 7.1	All complaints will be investigated in accordance with the CCS.
LP6	Procedures will be implemented so that potential impacts or conflicts between livestock and construction activities are appropriately managed. Procedures will be developed in consultation with affected landholders will include management of: • noise intensive activities during sensitive periods within the livestock production cycle (such as lambing and calving) • vehicle movements and other activities within the vicinity of livestock • movement of stock away from potential stressors created by construction activities.	Transmission line	Table 7.1	Landowners using disturbance areas for livestock grazing will be consulted prior to the commencement of works regarding alternatives for the management of their stock during these activities.

2.4 Licences and permits

Subject to the outcomes of geotechnical investigations, crushing and screening may be required. If necessary, an environment protection licence (EPL) will be obtained for the project for the scheduled activity of crushing and screening. The EPL will detail conditions which must be complied with when undertaking the crushing and screening activities.

2.5 Guidelines

The main guidelines, specifications and policy documents relevant to this plan include:

- NSW *Interim Construction Noise Guideline* (the ICNG), Department of Environment and Climate Change (DECC) 2009;
- *Noise Policy for Industry*, Environment Protection Authority 2017;
- *NSW Road Noise Policy* (RNP) (DECCW, 2011);
- *NSW Assessing Vibration – a technical guideline*, Department of Environment and Conservation 2006;
- British Standard BS 6472-2008, '*Evaluation of human exposure to vibration in buildings (1-80Hz)*;
- British Standard 7385: Part 2-1993 *'Evaluation and measurement of vibration in buildings'*;
- German Standard DIN4150-2016 *Structural vibration Part 3: Effects of vibration on Structures*;
- AS/NZS 2107:2016 *Acoustics – Recommended design sound levels and reverberation times for building interiors*; and
- Association of Australian Acoustical Consultants (AAAC): *Guideline for Child Care Centre Acoustic Assessment* (2013).

The documents identified above are considered by the project as described and referenced throughout this NVMP.

3 Existing environment

The following section summarises the existing noise and vibration environment within and adjacent to Stage 2 of the project. The key reference documents include:

- Chapter 18 of the EIS;
- Technical Paper 10 of the EIS (Noise and vibration impact assessment) (Technical Paper 10 of the EIS); and
- Section 6.6 of the Amendment Report.

Existing noise levels within and surrounding the project are influenced by the surrounding agricultural, industrial and rural residential land uses as well as local traffic and the operation of the existing Wagga Wagga substation.

Wagga Wagga is a rural township at the eastern extent of the project, in which noise levels are influenced by industrial, commercial and urban residential land uses and higher levels of local traffic.

3.1 Sensitive receivers

Sensitive residential receivers located within 1km of the project are listed in Table 3.1. All sensitive receivers located within 5km of the project are shown in Appendix B. All sensitive receivers specific to the water supply points are listed in Table 3.2.

At a broad scale, the project would only impact on a relatively small number of sensitive residential receivers for a majority of the alignment between Buronga and the proposed Dinawan substation. East of the proposed Dinawan substation, there would be smaller areas of more densely located sensitive receivers, typically around the following:

- the townships of Lockhart, Uranquinty and Wagga Wagga;
- a small cluster of receivers within the vicinity of Lake Benanee; and
- a cluster of receivers to the west of Lake Cullivel.

Table 3.1 - Sensitive residential receivers within 1km of the project

Receiver ID	Address	Nearest project element
188	The Rock	Transmission line
191	Valleyfield, 301 Boiling Down Rd, Rowan	
192	Belhaven, 233 Boiling Down Rd, Rowan	
202	Benlock, 83 Ashfords Rd, Gregadoo	Wagga Wagga construction compound
211	2 Mcgeachies Lane, The Rock	Transmission line
231	Caringa, 253 Rowan Rd, Rowan	
249	1066 Bullenbong Rd, Tootool	
259	517 Plumpton Rd, Rowan	
260	286 Boiling Down Rd, Rowan	
279	Uranquinty	
384	4353 Boree Creek Rd, Cullivel	
385	Cullivel	
414	Woodown, 5086 Albury Rd, Lockhart	
415	254 Lockhart The Rock Rd, Lockhart	
419	60 Dunleveys Lane, Lockhart	
432	128 Slys Lane, Milbrulong	

Receiver ID	Address	Nearest project element
450	128 Slys Lane, Milbrulong	
451	Holm Lea, 564 French Park-Bullenbung Rd, Milbrulong	
461	731 Hendersons Rd,Tootool	
468	The Rock	
500	Rowanfeyld, 6701 Holbrook Rd, Rowan	
501	Ubatuba, 6645 Holbrook Rd, Gelston Park	
502	6720 Holbrook Rd, Rowan	
503	6640 Holbrook Rd, Gelston Park	
504	6823 Holbrook Rd, Rowan	
546	2696 Lockhart Rd, Lockhart	Lockhart construction compound and accommodation camp
737	Arundel, 1504 Gregadoo East Rd, Gregadoo	Wagga Wagga construction compound
737	Arundel, 1504 Gregadoo East Rd, Gregadoo	Transmission line
738	Kismet, 1526 Gregadoo East Rd, Gregadoo	Wagga Wagga construction compound
738	Kismet, 1526 Gregadoo East Rd, Gregadoo	Transmission line
739	Kismet, 1526 Gregadoo East Rd, Gregadoo	Wagga Wagga construction compound
739	Kismet, 1526 Gregadoo East Rd, Gregadoo	Transmission line
740	551 Mitchell Rd, Gregado	Wagga Wagga construction compound
740	551 Mitchell Rd, Gregadoo	Transmission line
742	10 Butterbush Rd, Gregadoo	Wagga Wagga construction compound
743	36 Butterbush Rd, Gregadoo	
844	456 Plumpton Rd, Rowan	Transmission line
845	517 Plumpton Rd, Rowan	
846	Spring Creek, 21 Rowan Rd, Rowan	
847	511 Plumpton Rd, Rowan	
848	517 Plumpton Rd, Rowan	
851	688 Plumpton Rd, Rowan	
852	Valleyfield, 301 Boiling Down Rd, Rowan	
853	Mayfield, 202 Ashfords Rd,Gregadoo	Wagga Wagga construction compound
862	9 Ivydale Rd, Gregadoo	
1126	Milbrulong	Transmission line
1685	50985 Sturt Hwy, Euston	
1702	Lockhart	
1712	The Rock	
9996	St Johns, 672 French Park-Bullenbung Rd, Milbrulong	
10001	Milbrulong	
10006	Lockhart	
10007	Lockhart	

Receiver ID	Address	Nearest project element
10239	8955 Newell Hwy, Bundure	
11318	374 Barragunda Rd, Urana	
12296	747 Urana-Lockhart Rd, Lockhart	
14908	Woodlands, 4536 Boree Creek Rd, Urana	
15158	Euston	
20425	Connorton, 6879 Holbrook Rd, Rowan	
20426	Connorton, 6879 Holbrook Rd, Rowan	
20519	Thurrowa Road, Bundure	
20522	877 Coonong Rd, Morundah	
20523	877 Coonong Rd, Morundah	
20564	Il Bosco, 6643 Holbrook Rd, Gelston Park	
20571	6752 Holbrook Rd, Rowan	
20572	6823 Holbrook Rd, Rowan	
26749	6701-6739 Holbrook Rd, Gelston Park, Rowan	
26750	6701-6739 Holbrook Rd, Gelston Park, Rowan	
26865	2750 Lockhart Rd, Lockhart	Lockhart construction compound and accommodation camp
26868	2569-2569 Lockhart Collingullie Rd, Milbrulong	
26869	Collingullie Jerinderie Rd, Milbrulong	
26870	County Boundary Rd, Milbrulong	
26871	County Boundary Rd, Milbrulong	
26907	709-709 The Rock Collingullie Rd, The Rock	Transmission line
26908	709-709 The Rock-Collingullie Rd, The Rock	
26952	718-1040 Old Station Rd, Uranquinty	
27027	688 Plumpton Rd, Rowan	
27028	21-275 Rowan Rd, Rowan	
27032	456-456 Plumpton Rd, Lake Albert, Rowan	

Table 3.2 - Sensitive receivers for water supply points

Location	Owner	Local government area	Name in Amendment Report (if applicable)	Description of location	Distance to project site boundary	Distance to nearest EIS sensitive receiver (approximate)	Nearest sensitive receiver (approximate)
Euston Coop	Private	Balranald Shire Council	-	Morris Road, Euston	>1.5km	>1.5km	300m E
Lake Benanee	Private	Balranald Shire Council	-	-	>1.5km	>1.5km	200m NE
Sturt Highway/Meilman Road	Private	Balranald Shire Council	-	-	>1.5km	>1.5km	5km SE
Mylatchie Track	Private	Balranald Shire Council	-	-	>1.5km	>1.5km	13km SE
Court Street/Sturt Highway	TBD	Balranald Shire Council	-	-	>1.5km	>1.5km	50m NW
159 Church Street, Balranald	Balranald Shire Council	Balranald Shire Council	Church Street, Balranald	Note that the Amendment Report listed one Church Street water supply point within Table 6-5, however the mapping is unclear if two Church Street locations are included. It must be noted that the GIS mapping provided from the EIS process indicates two water supply points on Church Street.	>1.5km	>1.5km	70m NW
Church Street, Balranald	Balranald Shire Council	Balranald Shire Council	Church Street, Balranald	This water supply point uses existing infrastructure located in the south of Balranald township at the intersection between Church Street and Bank Street. It is indicated as a water supply point, however is connected direct to the camp via underground utilities.	>1.5km	>1.5km	50m SW
Ravensworth	Private	Hay Shire Council	Ravensworth	-	>1.5km	>1.5km	7.5km SW
Paraway at Cobb Highway	Private	Hay Shire Council	-	-	<1.5km	>1.5km	10km SE

Location	Owner	Local government area	Name in Amendment Report (if applicable)	Description of location	Distance to project site boundary	Distance to nearest EIS sensitive receiver (approximate)	Nearest sensitive receiver (approximate)
16 Mile Gums	LLS	Hay Shire Council	-	-	>1.5km	>1.5km	>20km
Cadell Street	Hay Shire Council	Hay Shire Council	Cadell Street		<1.5km	>1.5km	8.5km NE
Jerilderie Road	Private	Hay Shire Council	-	-	>1.5km	>1.5km	>20km
Tooleybuc	Murray River Council	Murray River Council	-	-	>1.5km	>1.5km	50m W
Kerri Kerri Road	Private	Murray River Council	Keri Road, Keri Keri		>1.5km	>1.5km	There are no receivers within 20km
137 Cadell Road, Jerilderie	TBC	Murrumbidgee Council	-	This water supply point is located on 137 Cadell Road.	>1.5km	>1.5km	5km S
Gala Vale	Private	Murrumbidgee Council	-	-	>1.5km	>1.5km	2km SE
Kidman Way	TBC	Murrumbidgee Council	-	-	>1.5km	>1.5km	2.3km SW
Crosby Road	TBC	Murrumbidgee Council	-	-	>1.5km	>1.5km	2km SE
Paraway at Four Corners Road	Private	Murrumbidgee Council	-	-	<1.5km	>1.5km	10km SE
North Boundary Road	Private	Murrumbidgee Council	-	-	<1.5km	>1.5km	14.5km
1254 Four Corners Road, Coleambally	Private	Murrumbidgee Council	1254 Four Corners Road	-	>1.5km	>1.5km	60m NE
Cooinbil Water Bore, Coleambally	Private	Murrumbidgee Council	Cooinbil Four Corners	-	>1.5km	>1.5km	9km SE
3 Bencubbin Avenue, Coleambally	Murrumbidgee Council	Murrumbidgee Council	3 Bencubbin Avenue, Coleambally	-	>1.5km	>1.5km	50m SW
Mclennons Bore Road, Coleambally	Private	Murrumbidgee Council	Mclennons Bore Road	-	<1.5km	>1.5km	2.5km SE

Location	Owner	Local government area	Name in Amendment Report (if applicable)	Description of location	Distance to project site boundary	Distance to nearest EIS sensitive receiver (approximate)	Nearest sensitive receiver (approximate)
8955 Newell Highway Bundure	Private	Murrumbidgee Council	Newell Highway, Bundure	-	<1.5km	>1.5km	2.5km SE
Boiling Down Road	Private	Wagga Wagga City Council	-	-	<1.5km	<1.5km	50m W
Red Hill Road, Wagga Wagga	Riverina Water	Wagga Wagga City Council	Glenfield	-	>1.5km	>1.5km	60m NE
Burraburoon	Private	Edward River Council	-	-	>1.5km	>1.5km	1.5km NE
X5 Mabins Well	Private	Edward River Council	-	-	<1.5km	>1.5km	400m N
Moulamein Road 1	Private	Edward River Council	-	-	<1.5km	>1.5km	2.5km SE
Moulamein Road 2	Private	Edward River Council	Moulamein	-	>1.5km	>1.5km	500m SE
Carrathool Road, Four Corners	Private	Edward River Council	Show in Figure 6-9 of the Amendment Report, but unclear of name in Table 6-5 of Amendment Report.		>1.5km	>1.5km	20km
North Bundy Station, North Bundy Road, Booroorban	Private	Edward River Council	North Bundy, Booroorban-Tchelery Road, Booroorban		>1.5km	>1.5km	20km
Booroorban-Tchelery Road	Private	Edward River Council	-	-	>1.5km	>1.5km	2.5km SW
Wonga Station, Four Corners Road	Private	Edward River Council	Wonga	-	>1.5km	>1.5km	400m NE
Four Corners Road Mabins Well	Private	Edward River Council	Four Corners Road Mabins Well	-	<1.5km	>1.5km	500m SE
Urana-Lockhart Road, Brookong	Private	Lockhart Shire Council	-	-	>1.5km	>1.5km	9km NW

Location	Owner	Local government area	Name in Amendment Report (if applicable)	Description of location	Distance to project site boundary	Distance to nearest EIS sensitive receiver (approximate)	Nearest sensitive receiver (approximate)
Brookdale	Private	Lockhart Shire Council	-	-	<1.5km	>1.5km	400m S
Strongs Lane, Lockhart	Private	Lockhart Shire Council	-	-	<1.5km	>1.5km	500m SE
Strongs Lane/Ben Hoffmanns Lane	Private	Lockhart Shire Council	-	-	<1.5km	>1.5km	2km SE
Urana-Lockhart Road 2, Brookong	Private	Lockhart Shire Council	-	-	<1.5km	>1.5km	800m SE
Slys Lane	Private	Lockhart Shire Council	-	-	<1.5km	>1.5km	350m SE
Commera Wilson Lane Urana	Private	Lockhart Shire Council	-	-	<1.5km	>1.5km	1.6km N
Commera Wilson Lane/Urana-Lockhart Road	Private	Lockhart Shire Council	-	-	<1.5km	>1.5km	2km N
The Rock - Collinguillie Road, The Rock	Private	Lockhart Shire Council	-	-	<1.5km	>1.5km	1km N
Bullenbung-the-Rock Road	Private	Lockhart Shire Council	-	-	>1.5km	>1.5km	1.7km NW
Tuttys Lane, Tootool	Private	Lockhart Shire Council	-	-	>1.5km	>1.5km	1.7km SE
Napier Road	Private	Lockhart Shire Council	-	-	>1.5km	>1.5km	1.6km NW
Albury Road, Lockhart	Private	Lockhart Shire Council	-	-	>1.5km	>1.5km	900m NW
Federation Way/Coonong Road	Private	Federation Council	-	-	>1.5km	>1.5km	>20km
Newell Highway/Arrawidgee Road	Private	Federation Council	-	-	>1.5km	>1.5km	>20km

Location	Owner	Local government area	Name in Amendment Report (if applicable)	Description of location	Distance to project site boundary	Distance to nearest EIS sensitive receiver (approximate)	Nearest sensitive receiver (approximate)
Coonong Road	Private	Federation Council	-	-	<1.5km	<1.5km	4.5km SE
Newell Highway, Morundah	Private	Federation Council	-	-	>1.5km	>1.5km	2km SE
Urana (between Osborne Street and Stephen Street)	Riverina Water	Federation Council	Urana		>1.5km	>1.5km	25m W
Federation Way* (near corner Federation Way and Stephen Street)	TBC	Federation Council	-	Near the corner of Federation Way and Stephen Street	>1.5km	<1.5km	1km SW
Off Sturt Highway	Private	Wentworth Shire Council	-	-	>1.5km	>1.5km	10km SE
812 Windomal Road, Balranald	Private	Balranald Shire Council	Lucerne at Balranald	This water supply point is located on 812 Windomal Road, Balranald.	>1.5km	>1.5km	25m S
6204 Yanga Way, Yanga	TBC	Murray River Council	-	This water supply point is located on 6204 Yanga Way and the access track off Balranald Road.	>1.5km	>1.5km	25m W
111 Jerilderie Street, Murrumbidgee	Murrumbidgee Council	Murrumbidgee Council	111 Jerilderie Street, Jerilderie	This water supply point uses existing infrastructure located in the centre of Jerilderie township on Jerilderie Street.	>1.5km	>1.5km	30m E
Dinawan Stock & Domestic	Private	Murrumbidgee Council	Red Swamp / Dinawan Station	This water supply point is located approximately 16km west of Bundure at the intersection between Bundure Road and Kidman Way.	>1.5km	2km	2km W
Dinawan Camp and Laydown	Private	Murrumbidgee Council	Red Swamp / Dinawan Station	This water supply point is located east of Dinawan construction compound and accommodation camp.	>1.5km	>1.5km	2.3km SW
50 Elizabeth Avenue, Forest Hill	TBC	Wagga Wagga City Council	-	This water supply point is located on 50 Elizabeth Avenue, Forest Hill.	>1.5km	>1.5km	30m E

Location	Owner	Local government area	Name in Amendment Report (if applicable)	Description of location	Distance to project site boundary	Distance to nearest EIS sensitive receiver (approximate)	Nearest sensitive receiver (approximate)
Ashfords Road, Wagga Wagga	Riverina Water	Wagga Wagga City Council	Ashfords Road	This water supply point is located southeast of Wagga Wagga township on Ashfords Road.	<1.5km	<1.5km	500m NE
Lake Albert (Plumpton Road), Wagga Wagga	Riverina Water	Wagga Wagga City Council	Lake Albert	This water supply point is located in the south of Wagga Wagga township adjacent to Plumpton Road.	>1.5km	>1.5km	50m E
394 Hay Rd, Deniliquin	Edward River Council	Edward River Council	394 Hay Road, Deniliquin	This water supply point is located on 394 Hay Rd, Deniliquin.	>1.5km	>1.5km	20m E
9 Lang Street, Wanganella	Edward River Council	Edward River Council	Wanganella	This water supply point is located on 9 Lang Street, Wanganella.	>1.5km	>1.5km	40m SW
39 Urana Street, The Rock	TBC	Lockhart Shire Council	The Rock	This water supply point is located on 39 Urana Street, The Rock.	>1.5km	>1.5km	25 W
2850 Lockhart the Rock Road, Tootool	Riverina Water	Lockhart Shire Council	Tootool	This water supply point is located on 2850 Lockhart the Rock Road, Tootool.	>1.5km	>1.5km	100m S
Bulgary (Rohan Road), Lockhart	Riverina Water	Lockhart Shire Council	Bulgary	This water supply point is located approximately 11km south of Bulgary on Rohans Road.	>1.5km	>1.5km	>1.5km
Lockhart - the Rock Road, Lockhart	Riverina Water	Lockhart Shire Council	Lockhart	This water supply point is located in the east of Lockhart township adjacent to Lockhart the Rock Road.	>1.5km	>1.5km	100m S
French Park-Bullenbung Road	Private	Lockhart Shire Council	-	-	>1.5km	>1.5km	300m NW
Richmond Street, Boree Creek	Riverina Water	Federation Council	Boree Creek	This water supply point is located on intersection of Richmond Road and Lachlan Street, Boree Creek.	>1.5km	>1.5km	100m NE

3.2 Aboriginal and historic heritage

Supplementary technical assessment 2 of the Submissions Report included the *Revised Non-Aboriginal and Aboriginal Cultural Heritage Assessment Report* which identifies the location of Aboriginal heritage features in the vicinity of the project. Aboriginal features include culturally modified trees, middens, scattered artefact finds and potential archaeological deposits (PADs).

The supplementary technical assessment identified the following Aboriginal features that have the potential to be impacted by the project:

- two PADs, PAD15 and PAD45, and two sites, PEC-E-18 and PEC-E-20 would be located less than 200m away from the Cobb Highway accommodation camp and compound and the nearby transmission line corridor;
- PAD38, which was refined into a larger PAD area, encompasses part of the alignment, a transmission line tower and an access track near the Lockhart alignment; and
- one PAD32 and one artefact scatter (PEC-E-60) which encompasses a transmission line tower Colombo Creek.

Technical Paper 10 of the EIS considered Aboriginal heritage items that are identified within the minimum safe working distances (refer Table 4.8). The technical paper stated that it does not implicitly follow that these items are sensitive to vibration on the basis of being classified as a heritage item alone, and that the items (trees, middens or scattered artefact finds) consist of typically non-vibration sensitive objects. The report concluded that none of these items were classified as structures and as such, no vibration heritage items are assumed to be within the safe working distances during construction. It is noted that Technical Paper 10 made no reference to PADs.

Additional information regarding the management of heritage sites near the Stage 2 works are included in the *Heritage Management Plan* (45860-HSE-PL-D-0119).

Further to above, no historic heritage structures were identified within the safe working distances for the Stage 2 works.

3.3 Measured noise levels

Unattended noise monitoring was undertaken at two locations during the assessment process of the EIS. Table 3.3 details the noise levels that were measured during the noise monitoring which occurred between 18 October and 4 November 2021 at 211 Liddles Lane, Jerilderie (referred to as noise monitoring location 1 (NM1)) and 83 Ashfords Road, Wagga Wagga (referred to as noise monitoring location 2 (NM2)).

The EIS advises that these noise monitoring locations were selected as they were considered representative of the existing background noise levels across the project and are located in the vicinity of the proposed Dinawan 330kV substation (NM1) and the existing Wagga Wagga substation (NM2).

Table 3.3 - Unattended noise measurement results

Noise monitoring location	Measured noise level (dBA)					
	Rating background level (RBL) dBA			Ambient noise level $L_{Aeq(15min)}$		
	Day(1)	Evening(1)	Night(1)	Day(1)	Evening(1)	Night(1)
NM1	35 (32)(2)	30	30 (27)(2)	52	51	48
NM2	35 (31)(2)	30 (29)(2)	30 (26)(2)	46	43	38

Notes (as per the EIS):

(1) Time periods defined as – Day: 7am to 6pm Monday to Saturday, 8am to 6pm Sunday; Evening: 6pm to 10pm; Night: 10pm to 7am Monday to Saturday, 10pm to 8am Sunday

(2) Where background levels are below the minimum assumed RBLs outlined in the NPfI, they have been adjusted to 35dBA during the day period, and 30dBA during the evening and night periods in accordance with the NPfI

To characterise the existing noise environment, short term (attended) noise measurements were also undertaken at each of the unattended noise monitoring locations during the daytime period as summarised in Table 3.4. Background noise levels were observed to be low during the daytime period and dominated by rural and natural sounds. The main noise sources observed during monitoring included birds, insects, motor vehicles, agricultural equipment, which is typical of rural and natural sounds and is expected to be generally consistent across the project area. Background noise levels were found to be consistent with the findings of the unattended noise monitoring program.

Table 3.4 - Attended noise measurement results

ID	Date and Time	Measured noise level			Comments
		$L_{A90(15min)}$	$L_{Aeq(15min\_}$	L_{Amax}	
NM1	20/10/2020 2:40 pm	33	42	62	Noise from a nearby tractor, insects, birds, local traffic
NM2	19/10/2020 2:55 pm	33	43	62	Local traffic, birds, electricity substation, insects

4 Noise and vibration criteria

The EPA recommends management levels and goals when assessing construction noise and vibration. These are outlined in:

- the ICNG (DECC, 2009); and
- *Assessing Vibration: a technical guideline* (DEC, 2006).

Relevant elements of these documents are summarised in the sections below.

4.1 Construction hours

4.1.1 Standard construction hours

In accordance with condition C1, and in line with the ICNG standard construction hours, road upgrades, construction, upgrading or decommissioning may only be undertaken between:

- 7am to 6pm – Monday to Friday;
- 8am to 1pm – Saturdays; and
- at no time on Sundays and NSW public holidays;

unless the Planning Secretary agrees otherwise.

In accordance with condition C6, blasting may only be carried out on the site between 9 am and 5 pm Monday to Friday and between 9 am to 1 pm on Saturday. No blasting is allowed on Sundays or public holidays, unless approved in accordance with condition C1.

4.1.2 Variation to standard construction hours

The following construction, upgrading and decommissioning activities may be carried out outside the hours specified above, as permitted in condition C2:

- the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons;
- emergency work to avoid the loss of life, property or to prevent material harm to the environment;
- works carried out in accordance with the hours and noise limits specified in any negotiated agreements with sensitive receivers (owners and occupiers), provided the negotiated agreements are in writing and finalised before the commencement of works;
- activities that are inaudible at non-associated residences;
- road upgrades required by the relevant roads authority to be undertaken outside the standard construction hours; or

works carried out in accordance with an Out-of-Hours Work Protocol approved in accordance with condition C10.Construction work is proposed seven days per week (Monday to Sunday) between 7am and 7pm (referenced in the EIS as the base construction hours). These work hours were assessed in the EIS, to enable an overall reduction in the duration of construction and were considered due to the limited number of nearby sensitive receivers and the proposed shift arrangements of the workforce given the remote nature of the project. Any works undertaken outside of the standard construction hours detailed within Section 4.1.1, except those allowable as detailed within this section, will be undertaken subject to the requirements of the Out of Hours Work Protocol (Appendix A).

4.2 Out of hours work protocol

An Out of Hours Work Protocol (required in accordance with condition C10 f)) is provided in Appendix A to identify the process for the consideration, management and approval of works to be undertaken outside the hours defined in conditions C1, C2 and C6 (which details blasting hours) of the Infrastructure Approval.

Works that comply with the conditions C1, C2 and C6 are not required to be undertaken in accordance with the processes outlined in the Out of Hours Work Protocol. Operation of the accommodation camps will not be subject to the Out of Hours Work Protocol as the definition of 'construction' within the Infrastructure Approval excludes the operation of the accommodation camps. The operation of the accommodation camps is addressed in their respective Accommodation Camp Management Plan required under condition C50.

4.3 Construction noise and assessment objectives

The ICNG provides guidelines for the assessment and management of construction noise. The ICNG focuses on applying a range of work practices to minimise construction noise impacts rather than focusing on achieving numeric noise levels.

The main objectives of the ICNG are to:

- identify and minimise noise from construction works;
- focus on applying all 'feasible' and 'reasonable' work practices to minimise construction noise impacts;
- encourage construction during the recommended standard hours only, unless approval is given for works that cannot be undertaken during these hours;
- reduce time spent dealing with complaints at the project implementation stage; and
- provide flexibility in selecting site-specific feasible and reasonable work practices to minimise noise impacts.

4.4 Quantitative noise assessment criteria

Construction noise assessment goals presented in the ICNG are referred to as noise management levels for residential, sensitive land uses and commercial/industrial premises.

4.4.1 Residential premises

Table 4.1 (reproduced from Table 2 of the ICNG) sets out the external noise management levels for construction noise at residences.

In Table 4.1 the rating background level (RBL) is used when determining the management level. The RBL is the overall single-figure background noise level measured in each relevant assessment period (during or outside the recommended standard hours). The term RBL is described in detail in the *Noise Policy for Industry* (NPfI) (EPA, 2017).

As a guide, the difference between the internal noise level and the external noise level is typically 10dB with windows open for adequate ventilation.

Table 4.1 - Noise at residents using quantitative assessment

Time of day	Noise Management Level $L_{Aeq(15min)}$ *	How to apply
Recommended standard hours: • Monday to Friday 7am to 6pm • Saturday 8am to 1pm • No work on Sundays or public holidays	Noise affected RBL + 10dB	The noise affected level represents the point above which there may be some community reaction to noise. • where the predicted or measured $L_{Aeq(15min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level; and • the proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise.

Time of day	Noise Management Level $L_{Aeq(15min)}$ *	How to apply
		• where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: – times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences; – if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected RBL + 5dB	• a strong justification would typically be required for works outside the recommended standard hours; • the proponent should apply all feasible and reasonable work practices to meet the noise affected level; and • where all feasible and reasonable practices have been applied and noise is more than 5dBA above the noise affected level, the proponent should negotiate with the community.

* Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5m above ground level. If the property boundary is more than 30m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30m of the residence. Noise levels may be higher at upper floors of the noise affected residence.

4.4.2 Other land uses (non-residential)

The ICNG provides noise management levels for commercial and industrial premises and 'other sensitive' land uses (ICNG, Table 3). The management levels for other noise sensitive receivers not listed in the ICNG, such as hotels, are derived from *AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors* and the Association of Australian Acoustical Consultants (AAAC) *Guideline for Child Care Centre Acoustic Assessment* (2013). The noise management levels from AS2107 are the upper range levels to account for the variable and short-term nature of construction noise.

Table 4.2 presents noise management levels for other non-residential land uses based on the principle that the characteristic activities for each of these land uses should not be unduly disturbed. The noise management levels apply when the premises are in use during any assessment period.

Internal noise levels are assessed at the centre of the occupied room. External noise levels are assessed at the most affected point within 50m of the area boundary. Where internal noise levels cannot be measured, external noise levels may be used. A conservative estimate of the difference between internal and external noise levels is 10dB for buildings other than residences. Some buildings may achieve greater performance, such as where windows are fixed (that is, cannot be opened).

Table 4.2 - Noise at sensitive land uses (non-residents) using quantitative assessment

Land use	Noise management level ($L_{Aeq(15min)}$)	Where noise management level applies	Assumed façade loss (conservative) (dBA)	External equivalent noise management level ($L_{Aeq(15min)}$)	Reference
Cinema space, theatre, auditorium	35	Internal noise level	20	55	AS2107 'maximum'
Hotel (sleeping areas: hotels near minor roads)	35	Internal noise level	20	55	AS2107 'maximum'

Land use	Noise management level ($L_{Aeq(15min)}$)	Where noise management level applies	Assumed façade loss (conservative) (dBA)	External equivalent noise management level ($L_{Aeq(15min)}$)	Reference
Classrooms at schools and other educational institutions	45	Internal noise level	10	55	AS2107 'maximum'
Childcare centre (sleeping areas)	40	Internal noise level	10	50	AAAC Guideline for Child Care Centre Acoustic Assessment
Hospital wards and operating theatres	45	Internal noise level	20	65	ICNG
Places of worship	45	Internal noise level	20	65	ICNG
Library (reading areas)	45	Internal noise level	20	65	AS2107 'maximum'
Community centres – municipal buildings	50	Internal noise level	10	60	AS2107 'maximum'
Restaurant, bar (bars and lounges/ restaurant)	50	Internal noise level	20	70	AS2107 'maximum'
Passive recreation (e.g. area used for reading, meditation)	60	External noise level	--	60	ICNG
Active recreation (e.g. sports fields)	65	External noise level	--	65	ICNG
Commercial premises (including offices and retail outlets)	70	External noise level	--	70	ICNG
Industrial premises	75	External noise level	--	75	ICNG

4.4.3 Sleep disturbance criteria

Where construction works are planned to extend over more than two consecutive nights, the potential for works to disturb sleep should be considered. Factors that may be important in assessing the extent of impact on sleep include how often high noise events occur at night, the predicted maximum noise levels, whether there are times when there is a clear change in the noise environment (such as during early morning shoulder periods), and the degree of maximum noise levels above the background noise level.

A night-time sleep disturbance 'screening criterion' noise goal of RBL + 15dB is used to identify the receivers where there is potential for sleep disturbance.

Where the sleep disturbance screening criterion is exceeded, further assessment is conducted to determine whether the 'awakening reaction' level of L_{Amax} 55dBA internal (i.e. 65dBA external assuming an open window or 75dBA external assuming a closed window) would be exceeded and the likely number of these events. The awakening reaction level is the level above which sleep disturbance is considered likely.

4.5 Project noise management levels for residential receivers

The project noise management levels presented in Table 4.3 are based on the existing background noise levels and are determined in accordance with the ICNG.

Table 4.3 - Noise management levels for residential receivers

Location	Rating background level (RBL) L_{A90}			Noise management level (NML) $L_{Aeq(15min)}$				Sleep disturbance $L_{A1(1min)}$
	Day (7am – 6pm)	Evening (6pm – 10pm)	Night (10pm – 7am)	Standard Hours[1] (RBL + 10dB)	Out of hours work (OOHW)[2] (RBL + 5dB)			
				Day (7am – 6pm)	Day	Evening	Night	RBL + 15dB
Dinawan	35 (32)[3]	30 [3]	30 (27)[3]	**45**	**40**	**35**	**35**	45
Wagga Wagga	35 (31)[3]	30 (29)[3]	30 (26)[3]					
All other receivers	35	30	30					

Notes:

(1) ICNG standard construction hours are defined as Monday – Friday: 7am – 6pm, Saturday: 8am – 1pm with no work on Sundays or public holidays.

(2) Out of hours work time periods are defined as:

Day: 7am to 8am Saturday, 1pm to 6pm Saturday and 8am to 6pm on Sunday and public holidays

Evening: 6pm to 10pm Monday to Sunday

Night: 10pm to 7am Monday to Saturday, 10pm to 8am Sunday

(3) Where background levels are below the minimum assumed RBLs outlined in the NPfI, they have been adjusted to 35dBA during the day period, and 30dBA during the evening and night periods in accordance with the NPfI.

4.6 Vibration criteria

Effects of ground vibration on buildings resulting from construction may be segregated into the following three categories:

- human exposure – disturbance to building occupants: vibration in which the occupants or users of the building are inconvenienced or possibly disturbed;
- effects on building contents – vibration where the building contents may be affected; and
- effects on building structures – vibration in which the integrity of the building or structure itself may be prejudiced.

4.6.1 Human comfort

Vibration criteria relating to human comfort that are applicable to this project are taken from the DEC (2006) document *Assessing Vibration – A Technical Guideline* and include the following:

- continuous vibration – from uninterrupted sources (Table 4.4);
- impulsive vibration – up to three instances of sudden impact e.g. dropping heavy items, per monitoring period (Table 4.5); and
- intermittent vibration – such as from drilling, compacting or activities that would result in continuous vibration if operated continuously (Table 4.6). All proposed vibration intensive activities are considered intermittent.

Table 4.4 - Human comfort - continuous vibration acceleration criteria (m/s^2) 1-80Hz

Location	Assessment period	Preferred Values		Maximum Values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Residences	Daytime	0.010	0.0071	0.020	0.014
	Night-time	0.007	0.005	0.014	0.010
Offices, schools, educational institutions and places of worship	Day or night-time	0.020	0.014	0.040	0.028
		0.04	0.029	0.080	0.058
Workshops	Day or night-time	0.04	0.029	0.080	0.058

Table 4.5 - Human comfort - impulsive vibration acceleration criteria (m/s^2) 1-80Hz

Location	Assessment period	Preferred values		Maximum values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Residences	Daytime	0.30	0.21	0.60	0.42
	Night-time	0.10	0.071	0.20	0.14
Offices, schools, educational institutions and places of worship	Day or night-time	0.64	0.46	1.28	0.92
Workshops	Day or night-time	0.64	0.46	1.28	0.92

Table 4.6 - Intermittent vibration impacts criteria (m/s1.75) 1-80Hz

Location	Daytime		Night-time	
	Preferred values	Maximum values	Preferred values	Maximum values
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

4.6.2 Structural damage

Two standards by which building damage from construction-induced vibration are commonly assessed include:

- British Standard 7385: Part 2-1993 *Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration* (BSI 1993); and
- German DIN 4150: Part 3 – 1999 *Effects of Vibration on Structure* (DIN 1999).

The German standard provides the most stringent criteria and will be used in this NVMP. The DIN guideline values for peak particle velocity (mm/s) measured at the foundation of the building are summarised in Table 4.7. The criteria are frequency dependent and specific to particular categories of structure.

Table 4.7 - Structural damage criteria

Type of structure	Peak Component Particle Velocity, mm/s			
	Vibration at the foundation at a frequency of			Vibration of horizontal plane of highest floor at all frequencies
	1Hz to 10Hz	10Hz to 50Hz	50Hz to 100Hz*	
Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
Structures that, because of their sensitivity to vibration, do not correspond to those listed in lines 1 and 2 and are of great intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

* For frequencies above 100Hz, at least the values specified in this column shall be applied.

4.6.3 Minimum working distances

The EIS (Table 5-10 of Technical Paper 10 of the EIS) identified minimum working distances for typical items of vibration intensive equipment to minimise potential for vibration related impacts. These are reproduced in Table 4.8.

Where vibration intensive equipment such as vibratory rollers, hydraulic hammers or bored piling rigs are used at a greater distance from sensitive receivers than the specified minimum working distance, there is negligible risk of structural damage or impacts on human comfort. Where recommended minimum working distances are not met, more detailed consideration of potential vibration impacts and the construction approach would occur during detailed design.

Table 4.8 - Minimum working distances for vibration intensive plant

Equipment	Rating/Description	Minimum working distance (m)		
		Human response (DEC, 2006)	Cosmetic damage to non-heritage structures (BSI, 1993)	Damage to heritage structures (DIN 4150-3:1999-02)
Vibratory roller	<100kN (typically 2-4t)	20	6	16
	>300kN (typically 13-18t)	100	20	54
Small hydraulic hammer	300kg – 5 to 12t excavator	7	2	5
Medium hydraulic hammer	900kg – 12 to 18t excavator	23	7	15
Large hydraulic hammer	1600kg – 18 to 34t excavator	73	22	44
Pile boring	≤800mm	N/A	2	5
Piling rig - hammer	12t down force	50	15	115

4.7 Blasting criteria

Table 4.9 reflects the blasting criteria stipulated for the project in accordance with condition C7. Any blasting undertaken on the project will meet the blasting criteria.

Table 4.9 - Blasting criteria

Location	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance
Any non-associated residence	120	10	0%
	115	5	5% of the total number of blasts or events over a rolling period of 12 months

4.8 Construction road traffic noise

Technical Paper 10 of the EIS notes that traffic impacts associated with construction vehicles are assessed using guidance from the *Road Noise Policy* (RNP). The RNP provides guidance on the assessment of noise impacts on sensitive receivers from additional road traffic generated by the proposal operating on a public road network.

The RNP makes a distinction between the assessment of freeway/arterial/sub-arterial roads and local roads. Freeway/arterial/sub-arterial roads are assessed over day (7am to 10pm) and night (10pm to 7am) periods.

Table 4.10 presents a summary of applicable road traffic criteria for residential receivers identified in Table 3 of the RNP.

Table 4.10 - Road traffic noise criteria for receivers on existing roads affected by the additional traffic from the project

Road type	External road traffic noise criteria[1]	
	Day 7am – 10pm	Night 10pm – 7am
Freeway/arterial/sub-arterial roads	60 dBA $L_{Aeq(15hour)}$	55 dBA $L_{Aeq(9hour)}$
Local roads	55 dBA $L_{Aeq(1hour)}$	50 dBA $L_{Aeq(1hour)}$

(1) Façade corrected noise levels

The application notes from the RNP detail the requirements for construction-generated traffic noise as follows:

> *For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level as a result of the development should be limited to 2dB above that of the noise level without the development. This limit applies where the noise level without the development is within 2dB of, or exceeds, the relevant day or night noise assessment criterion.*

Therefore, if the road traffic noise levels increase by more than 2dB as a result of the proposed construction traffic, and the criteria outlined in Table 4.9 are exceeded, mitigation options should be investigated.

4.9 Noise intensive equipment

SecureEnergy considers noise intensive equipment as having a sound power level above 115dBA (refer to Table B.1.1 of Technical Paper 10 of the EIS). Noise intensive equipment that may be used includes but is not limited to:

- piling rig;
- D8 dozer;
- excavator with hammer;
- pneumatic jackhammer;
- stump grinder; and/or
- mulcher/chipper.

5 Environmental aspects and impacts

5.1 Construction activities

An environmental aspect is an element of an organisation's activities, products, or services that has or may have an impact on the environment (ISO 14001 Environmental management systems). The relationship of aspects and impacts is one of cause and effect.

The key aspects that could result in adverse impacts to noise and vibration include the use of noise and/or vibration producing equipment for the following activities:

- vegetation clearing and grubbing activities;
- topsoil stripping;
- topsoil/material handling including stockpiling, material and spoil loading and material and spoil haulage;
- earthworks;
- surface grading and compaction;
- operating plant and equipment, including crushing and screening (as required);
- tower assembly and stringing;
- establishment of access points and water supply points;
- movement of vehicles including light and heavy vehicles;
- establishment and operation of the construction compounds at Wagga Wagga, Lockhart, Dinawan, Cobb Highway and Balranald;
- establishment of the accommodation camps at Lockhart, Dinawan and the Cobb Highway; and
- operation of the construction compounds.

Subject to a Blast Management Strategy in accordance with NV8, blasting may also be undertaken during construction.

5.2 Construction impacts

Potential impacts attributable to the works might include:

- loss of amenity for residential and non-residential sensitive receivers;
- reputational impacts due to complaints from the public; and
- disturbance of livestock.

Noise and vibration impacts will be intermittent and transient in nature, with some activities only occurring for a week at a time (e.g. access and clearing at tower sites).

Due to the location of the transmission line works and the distances to nearby receivers at the various sites, the works may exceed the noise management levels at a number of receivers along the alignment:

- up to and around 166 receivers are predicted to exceed the standard hours noise management levels during the access and clearing stage; and
- up to and around 139 receivers are predicted to exceed the standard hours noise management levels during the earthworks phase.

Construction activities associated with the Dinawan substation and Buronga sites are generally predicted to comply with noise management levels. At the Cobb Highway site a number of impacts are anticipated to occur at receivers:

- up to and around 26 residential receivers are predicted to exceed the standard hours noise management level (NML) during the predicted worst case (noisiest) works stage which is the earthworks stage. For the other work stages, up to six residential receivers are predicted to exceed the standard hours noise management levels; and
- up to and around 95 and 350 residential receivers are predicted to exceed the day and evening/night out of hours noise management levels respectively if out of hours earthworks are required at the Wagga Wagga substation.

There is also negligible risk of structural damage or impacts on human comfort due to the use of vibration intensive equipment (refer Section 6.2.7).

Further detail of the potential noise and vibration impacts resulting from specific proposed activities is provided within Section 6. The environmental management described in Section 7 (particularly the measures in Table 7.1) have been developed to address the potential noise and vibration impacts described here and in Section 5.3.

5.3 Blasting

Blasting may be required, depending on geotechnical conditions along the project alignment. The need for blasting will be confirmed during detailed development of the construction methodology, however it is expected that it will be limited to small areas as required at tower locations where shallow bedrock or hard geological conditions are identified.

Controlled blasting is a process used in road construction to break up hard rock that cannot be easily removed by typical excavation techniques or where typical excavation techniques (for example using excavators with hydraulic hammers) would result in poor amenity outcomes for adjacent sensitive receivers.

Controlled blasting may be required to be used in some locations along the alignment to loosen and break up existing rock to allow for creation of transmission tower pads and/or to facilitate excavation associated with the proposed Dinawan 330kV and/or Wagga 330kV substation works.

Controlled blasting will be used to loosen or sever the existing shallow rock in areas required so it can be removed by more traditional excavation methods. This would typically be undertaken by drilling a line of closely spaced holes within the area required (such as a transmission tower pad). Each hole would then be loaded with a small amount of explosives and a delayed detonation of the explosive would be carried out to limit the amount of energy being released at any particular moment. The energy generated as a result of detonating the explosive would break the harder rock formation(s) into smaller pieces to allow subsequent removal.

Following the controlled blasting activities, two options would be available for the removal of the rock material. These would include traditional excavation with excavation equipment or additional blasting. The technique to be used would be determined based on the success of the initial blasting activities.

Specific blasting and seismic details would be assessed on a site and blast specific basis. It is important that the actual buffer zone distances, associated specifically with this project, be identified and appropriate measures taken to limit overpressure and vibration to acceptable levels at critical locations.

5.4 Designing for corona discharge

Audible noise associated with the operation of high voltage transmission lines is primarily due to corona discharge from transmission lines. Such phenomenon is driven by conductor's Surface Voltage Gradient (SVG) and accumulation of pollution and water droplets on the transmission lines conductor surface. Corona discharge noise is therefore intermittent, typically occurring in certain atmospheric conditions such as during rain, mist or fog.

Such audible noise is understood to be typically characterised a broadband crackling noise with a possible more prominent tonal component at 100Hz. Such noise occurrence would apply to the new

transmission lines as well as existing transmission lines which run parallel to the new transmission lines, where cumulative noise impact requires consideration.

As outlined in Section 4 of the Response to DPE Request for Information (30 August 2022), options for at-source mitigation of potential operational noise from corona discharge to achieve the project trigger level of 35 dB(A) LAeq,15min are limited and not reasonable and feasible for this infrastructure. Only at-receiver treatments are likely to be reasonable and feasible to mitigate potential amenity impacts due to corona discharge in this context.

The operation of the project is not addressed in this Plan.

6 Construction noise and vibration assessment

6.1 Construction activities

Appendix B of Technical Paper 10 of the EIS includes a summary of the construction scenarios and noise levels for plant and equipment that were assessed to predict noise impacts associated with the project.

The scenarios relevant to construction that were assessed include:

- substation construction at Dinawan and expansion of Wagga Wagga substation:
  - enabling works;
  - earthworks and civil construction works;
  - electrical construction works;
  - pre-commissioning; and
  - demobilisation and rehabilitation;
- construction compounds and accommodation camps:
  - enabling works;
  - enabling works – site establishment;
  - operation of the compound – standard hours;
  - operation of the compound – outside standard hours; and
  - demobilisation / rehabilitation;
- transmission line construction:
  - enabling works;
  - site establishment and access tracks;
  - earthworks and civil construction works;
  - tower assembly;
  - tower erection;
  - tower stringing;
  - commissioning/energisation; and
  - demobilisation and rehabilitation.

Additional information regarding the types of activities included in each scenario and assessed equipment is included in Appendix C.

6.2 Construction noise impacts

Condition C4 of the Infrastructure Approval states that noise generated by any construction activities must be managed in accordance with the requirements for construction 'noise affected' management levels established in accordance with the ICNG.

Construction 'noise affected' management levels are described as project 'noise management levels' throughout this NVMP and have been established in accordance with the ICNG as identified in Section 4.5. In line with the ICNG, where predicted or measured noise levels exceed the noise management level, feasible and reasonable work practices will be identified and implemented, such as those included in Section 7.

The information in the following sections describes the potential noise impacts for Stage 2 activities compared to the noise management levels. The information is generally obtained from noise assessments presented in Chapter 18 and Technical Paper 10 of the EIS and Section 6.6 of the Amendment Report. The location of the nearest sensitive receivers referenced in this section are depicted on the maps included in Appendix B.

6.2.1 Wagga Wagga

Overview

The EIS assessed the upgrade and expansion of the Wagga Wagga substation site and the establishment and operation of a construction compound adjacent to the Wagga Wagga substation.

Potential impacts

Section 5.2.1.9 of Technical Paper 10 of the EIS found that construction works at the Wagga Wagga substation upgrade and expansion site and compound site would result in a number of predicted exceedances of the noise management level at the nearest sensitive receivers in close proximity to both sites. The predicted noise levels at the Wagga Wagga substation and construction compound sites during standard hours and out of hours work periods are listed within Table 6.1.

Table 6.1- Predicted noise levels – Wagga Wagga substation and construction compound

Construction work phase	Period[1]	Project NML $L_{eq(15min)}$ dBA	Predicted noise level range $L_{eq(15min)}$ dBA	Exceedance of project NMLs $L_{eq(15min)}$ dBA	Highly noise affected NML 75dBA or greater $L_{eq(15min)}$
Substation early and set out works	SH day	45	Up to 55	Up to 10	-
	OOHW day	40	Up to 60	Up to 20	-
	OOHW E/N	35	Up to 55	Up to 20	-
Earthworks and civil construction works	SH day	45	Up to 60	Up to 20	-
	OOHW day	40	Up to 70	Up to 30	-
	OOHW E/N	35	Up to 65	Up to 30	-
Electrical construction works	SH day	45	Up to 65	Up to 20	-
	OOHW day	40	Up to 60	Up to 20	-
	OOHW E/N	35	Up to 65	Up to 30	-
Construction of the compound	SH day	45	Up to 70	Up to 30	-
	OOHW day	40	Up to 60	Up to 20	-
	OOHW E/N	35	Up to 70	Up to 35	-
Operation of the compound	SH day	45	Up to 65	Up to 20	-
	OOHW day	40	Up to 60	Up to 20	-
	OOHW E/N	35	Up to 65	Up to 30	-
Pre-commissioning	SH day	45	Up to 55	Up to 10	-
	OOHW day	40	Up to 60	Up to 20	-
	OOHW E/N	35	Up to 65	Up to 20	-
Final completion	SH day	45	Up to 55	Up to 10	-
	OOHW day	40	Up to 60	Up to 20	-
	OOHW E/N	35	Up to 65	Up to 20	-

(1) SH day = ICNG standard construction hours, OOHW day = 7am to 8am and 1pm to 6pm Saturday, 8am to 6pm Sunday, OOHW E/N = 6pm to 7am Monday to Saturday and 6pm to 8am Sunday.

Note: Exceedance classes – Less than or meets noise management level (NML); NML+1–10 dB; NML+11 – 20 dB; NML+21 dB or more

The closest receivers are residential and are located approximately 330m south east of the Wagga Wagga substation, however the majority of receivers predicted to experience exceedances of the noise management levels are located in suburban districts to the north of the substation. No non-residential sensitive receivers were predicted to be impacted by the upgrade and expansion works at Wagga Wagga substation.

As noted in Section 7, reasonable and feasible measures would be implemented for works that are predicted to exceed the relevant NMLs or result in audible noise at sensitive receivers, in accordance with D4 and RMM NV2.

In accordance with condition C10 f), any works proposed to be undertaken outside the hours defined in conditions C1, C2 and C6 of the Infrastructure Approval, will be undertaken in accordance with the Out of Hours Work Protocol included in Appendix A.

As detailed in RMM NV5, activities likely to generate noise levels that exceed applicable noise management levels at sensitive receivers would be scheduled during standard construction hours, wherever practicable.

Stage 2 construction works at the Wagga Wagga sites would generally be conducted between 7 am and 7 pm. Where works are anticipated to result in impacts below the noise management levels, these works may be undertaken outside of these hours, in accordance with the Out of Hours Work Protocol (Appendix A).

6.2.2 Dinawan

Overview

The EIS assessed the Dinawan site for the establishment of a new substation and temporary construction compound and accommodation camp. The closest receiver was determined to be located at least four kilometres from the Stage 2 works.

Potential impacts

The EIS predicted the noise levels due to the Dinawan construction compound and accommodation camp during standard hours of work and out of hours work periods. These are listed within Table 6.2.

Table 6.2 - Predicted noise levels – Dinawan substation, construction compound and accommodation camp

Construction work phase	Period[1]	Project NML $L_{eq(15min)}$ dBA[2]	Predicted noise level range $L_{eq(15min)}$ dBA	Exceedance of project NMLs $L_{eq(15min)}$ dBA	Highly noise affected NML 75dBA or greater $L_{eq(15min)}$
All activities	SH Day	45	Less than 45	-	-
	OOHW D	40	Less than 40	-	-
	OOHW E/N	35	Less than 35	-	-

(1) SH day = ICNG standard construction hours, OOHW day = 7am to 8am and 1pm to 6pm Saturday, 8am to 6pm Sunday, OOHW E/N = 6pm to 7am Monday to Saturday and 6pm to 8am Sunday.

Note: Exceedance classes – Less than or meets noise management level (NML); NML+1–10 dB; NML+11 – 20 dB; NML+21 dB or more

No exceedances of construction noise management levels were predicted to occur near this site during any construction works at all hours.

In accordance with condition C10 f), any works proposed to be undertaken outside the hours defined in conditions C1, C2 and C6 of the Infrastructure Approval, will be undertaken in accordance with the Out of Hours Work Protocol included in Appendix A.

As detailed in RMM NV5, activities likely to generate noise levels that exceed applicable noise management levels at sensitive receivers would be scheduled during standard construction hours, wherever practicable.

Stage 2 construction works at the Dinawan substation sites would generally be conducted between 7 am and 7 pm. Where works are anticipated to result in impacts below the noise management levels, these works may be undertaken outside of these hours, in accordance with the Out of Hours Work Protocol (Appendix A).

6.2.3 Cobb Highway

Overview

The EIS assessed the Cobb Highway site as a construction compound and accommodation camp. The location of the combined construction facility was revised in the Amendment Report, to avoid impacts to a known PAD site. The Amendment Report considered that the change in location did not alter the noise assessment results from the EIS in the vicinity of the site.

Potential impacts

Section 5.2.1.5 of Technical Paper 10 of the EIS found that construction works at the Cobb Highway compound site would result in a number of predicted noise management level exceedances at the nearest sensitive receivers in close proximity to the site. The predicted noise levels at the Cobb Highway construction compound and accommodation camp site during standard hours and out of hours work periods are listed within Table 6.3.

Table 6.3 - Predicted noise levels – Cobb Highway construction compound and accommodation camp

Construction work phase	Period[1]	Project NML $L_{eq(15min)}$ dBA[2]	Predicted noise level range $L_{eq(15min)}$ dBA	Exceedance of project NMLs $L_{eq(15min)}$ dBA	Highly noise affected NML 75dBA or greater $L_{eq(15min)}$
Construction of the compound and camp	SH Day	45	Up to 50	Up to 5	-
	OOHW D	40	Up to 45	Up to 5	-
	OOHW E/N	35	Up to 45	Up to 10	-
Operation of the compound	SH Day	45	Less than 45	-	-
	OOHW D	40	Less than 40	-	-
	OOHW E/N	35	Less than 35	-	-
Decommissioning	SH Day	45	Less than 45	-	-
	OOHW D	40	Less than 40	-	-
	OOHW E/N	35	Up to 40	Up to 5	-

(1) SH day = ICNG standard construction hours, OOHW day = 7am to 8am and 1pm to 6pm Saturday, 8am to 6pm Sunday, OOHW E/N = 6pm to 7am Monday to Saturday and 6pm to 8am Sunday.

Note: Exceedance classes – Less than or meets noise management level); NML+1–10 dB; NML+11 – 20 dB; NML+21 dB or more

One residential property located approximately 1.5km north from the construction compound (Receiver ID 1777) was predicted to experience exceedances of the noise management levels during the Stage 2 works. These exceedances are anticipated to be limited to less than 5dB during both the standard and out of hours day works (OOHW D) and less than 10dB during works undertaken during evening and night periods (OOHW E/N).

As noted in Section 7, reasonable and feasible measures would be implemented for works that are predicted to exceed the relevant NMLs or result in audible noise at sensitive receivers, in accordance with D4 and RMM NV2.

In accordance with condition C10 f), any works proposed to be undertaken outside the hours defined in conditions C1, C2 and C6 of the Infrastructure Approval, will be undertaken in accordance with the Out of Hours Work Protocol included in Appendix A.

As detailed in RMM NV5, activities likely to generate noise levels that exceed applicable noise management levels at sensitive receivers would be scheduled during standard construction hours, wherever practicable.

Stage 2 construction works at the Cobb Highway sites would generally be conducted between 7 am and 7 pm. Where works are anticipated to result in impacts below the noise management levels, these works may be undertaken outside of these hours, in accordance with the Out of Hours Work Protocol (Appendix A).

6.2.4 Lockhart (County-Boundary Road)

Overview

The EIS assessed the Lockhart site as a construction compound and accommodation camp.

Potential impacts

Section 5.2.1.8 of Technical Paper 10 of the EIS found that construction works at the Lockhart construction compound and accommodation camp would result in a number of predicted exceedances of the noise management levels at the nearest sensitive receivers in close proximity to the site. The predicted noise levels at the Cobb Highway site during standard hours and out of hours work periods are listed within Table 6.4.

Table 6.4 - Predicted noise levels – Lockhart construction compound and accommodation camp

Construction work phase	Period[1]	Project NML $L_{eq(15min)}$ dBA	Predicted noise level range $L_{eq(15min)}$ dBA	Exceedance of project NMLs $L_{eq(15min)}$ dBA	Highly noise affected NML 75dBA or greater $L_{eq(15min)}$
Construction of the compound and camp	SH day	45	Up to 45	Up to 10	-
	OOHW day	40	Up to 60	Up to 20	-
	OOHW E/N	35	Up to 55	Up to 20	-
Operation of the compound	SH day	45	Up to 45	-	-
	OOHW day	40	Up to 40	-	-
	OOHW E/N	35	Up to 45	Up to 10	-

(1) SH day = ICNG standard construction hours, OOHW day = 7am to 8am and 1pm to 6pm Saturday, 8am to 6pm Sunday, OOHW E/N = 6pm to 7am Monday to Saturday and 6pm to 8am Sunday.

Note: Exceedance classes – Less than or meets noise management level (NML); NML+1–10 dB; NML+11 – 20 dB; NML+21 dB or more

Nine residential receivers are predicted to experience exceedances of the noise management levels, with one receiver (Receiver ID 546) located approximately 630 metres northeast of the Lockhart site, predicted to a maximum exceedance of 19 dBA during the out of hours evening/night time period during the Stage 2 works to establish the construction compound. The EIS noted this receiver would also experience an exceedance of the noise management level of up to 10dB during the evening and night period, however this is likely associated with the operation of the camp (as the EIS grouped the operational noise assessment for these facilities), which is not included in the Stage 2 scope of works.

As noted in Section 7, reasonable and feasible measures would be implemented for works that are predicted to exceed the relevant NMLs or result in audible noise at sensitive receivers, in accordance with D4 and RMM NV2.

In accordance with condition C10 f), any works proposed to be undertaken outside the hours defined in conditions C1, C2 and C6 of the Infrastructure Approval, will be undertaken in accordance with the Out of Hours Work Protocol included in Appendix A.

As detailed in RMM NV5, Activities likely to generate noise levels that exceed applicable noise management levels at sensitive receivers would be scheduled during standard construction hours, wherever practicable.

Stage 2 construction works at the Lockhart sites would generally be conducted between 7 am and 7 pm. Where works are anticipated to result in impacts below the noise management levels, these works may be undertaken outside of these hours, in accordance with the Out of Hours Work Protocol (Appendix A).

6.2.5 Balranald

Overview

The EIS assessed the Balranald site as a construction compound and accommodation camp.

Potential impacts

No receivers are predicted to experience exceedances of the noise management levels during any work stages at the construction compound at Balranald (1.1 kilometres northwest of existing Balranald substation).

In accordance with condition C10 f), any works proposed to be undertaken outside the hours defined in conditions C1, C2 and C6 of the Infrastructure Approval, will be undertaken in accordance with the Out of Hours Work Protocol included in Appendix A.

Stage 2 construction works at the Balranald sites would generally be conducted between 7 am and 7 pm. Where works are anticipated to result in impacts below the noise management levels, these works may be undertaken outside of these hours, in accordance with the Out of Hours Work Protocol (Appendix A).

6.2.6 Buronga - operation of construction compound

Section 3 of the Technical Paper 10 of the EIS noted that the project would use the proposed construction compound and accommodation camp at Buronga which was approved under the EnergyConnect NSW – Western Section project approval. No new activities are required at this facility and as a result no new noise impacts were predicted. Based on noise assessments undertaken for the NSW – Western Section, no receivers are predicted to experience exceedances of the nose management levels during operation of the construction compound at Buronga. Therefore no exceedances of construction noise management levels were identified for this facility for the Stage 2 works.

6.2.7 Transmission line

Overview

Technical Paper 10 of the EIS identified that based on the indicative duration of works along the transmission line corridor, it is expected that for each key activity stage, the duration would generally be limited to less than one week with periods of no work between each stage of the transmission line construction (varying between one and 15 weeks).

Potential impacts

The construction of the transmission line has the potential to result in the exceedance of noise management levels for all assessed construction scenarios. The predicted noise levels for the transmission line construction works presented in Table 6.5 are conservative, as the assessment did not include screening impacts from terrain and assumed all plant identified in Appendix C of this NVMP was operational at any one time. As described in Section 5.2.1.1 of Technical Paper 10 of the EIS, actual noise levels experienced during construction are expected to be generally well below the predicted noise levels in at any identified receiver.

Due to the progressive nature of works at different locations along the transmission line corridor, all receivers would not be impacted for the entire duration of works.

Table 6.5 - Predicted noise levels – transmission line construction (source WSP)

Construction work phase	Period[1]	Project NML $L_{eq\ 15\ min}$ dBA	Predicted noise level range $L_{eq\ 15\ min}$ dBA	Exceedance of project NMLs $L_{eq\ 15\ min}$ dBA	Highly noise affected NML 75dBA or greater $L_{eq\ 15\ min}$
Enabling works	SH day	45	Up to 75	Up to 30	-
	OOHW day	40	Up to 70	Up to 30	-
	OOHW E/N	35	Up to and >65	>30	-
Site establishment and access tracks	SH day	45	Up to and >75	>30	2 receivers
	OOHW day	40	Up to and >70	>30	-
	OOHW E/N	35	Up to and >65	>30	-
Earthworks and civil construction works	SH day	45	Up to and >75	>30	2 receivers
	OOHW day	40	Up to and >70	>30	-
	OOHW E/N	35	Up to and >65	>30	-
Tower assembly	SH day	45	Up to 75	Up to 30	-
	OOHW day	40	>70	>30	-
	OOHW E/N	35	Up to and >65	>30	-
Tower erection	SH day	45	Up to 75	Up to 30	-
	OOHW day	40	Up to and >70	>30	-
	OOHW E/N	35	Up to and >65	>30	-
Tower stringing	SH day	45	Up to 75	Up to 30	-
	OOHW day	40	Up to and >70	>30	-
	OOHW E/N	35	Up to and >65	>30	-
Commissioning / energisation	SH day	45	Up to 65	Up to 20	-
	OOHW day	40	Up to and >70	>30	-
	OOHW E/N	35	Up to 65	Up to 30	-
Demobilisation and rehabilitation	SH day	45	Up to 75	Up to 30	-
	OOHW day	40	Up to and >70	>30	-
	OOHW E/N	35	Up to and >65	>30	-

Note: Exceedance classes – Less than or meets noise management level (NML); NML+1–10 dB; NML+11 – 20 dB; NML+21 dB or more

(1) SH day = ICNG standard construction hours, OOHW day = 7am to 8am and 1pm to 6pm Saturday, 8am to 6pm Sunday, OOHW E/N = 6pm to 7am Monday to Saturday and 6pm to 8am Sunday.

6.2.8 Blasting

Estimated maximum instantaneous charges to comply with the objectives outlined below have been provided in Figure 6.1 to provide some indication of acceptable blast sizes, however further assessment would be undertaken and incorporated into site specific blast management plans to ensure that the vibration and overpressure objectives can be met. It should be noted that the assessment conducted are preliminary in nature and should be confirmed once tower locations and blasting methodology are finalised as part of detailed design.

Vibration formula:

and

$$V = 1140\left(\frac{R}{Q^{1/2}}\right)^{-1.6}$$

Overpressure formula: OP = 165 − 24 *(LogR − 0.33LogQ)

Where:

V = ground vibration as peak particle velocity in mm/s

R = distance between charge and point of measurement in metres

Q = effective charge mass per delay or maximum instantaneous charge in kilograms.

The distance limits per nominated Maximum Instantaneous Charge (MIC) may vary significantly depending on the geological conditions, local shielding and meteorological factors at the site.

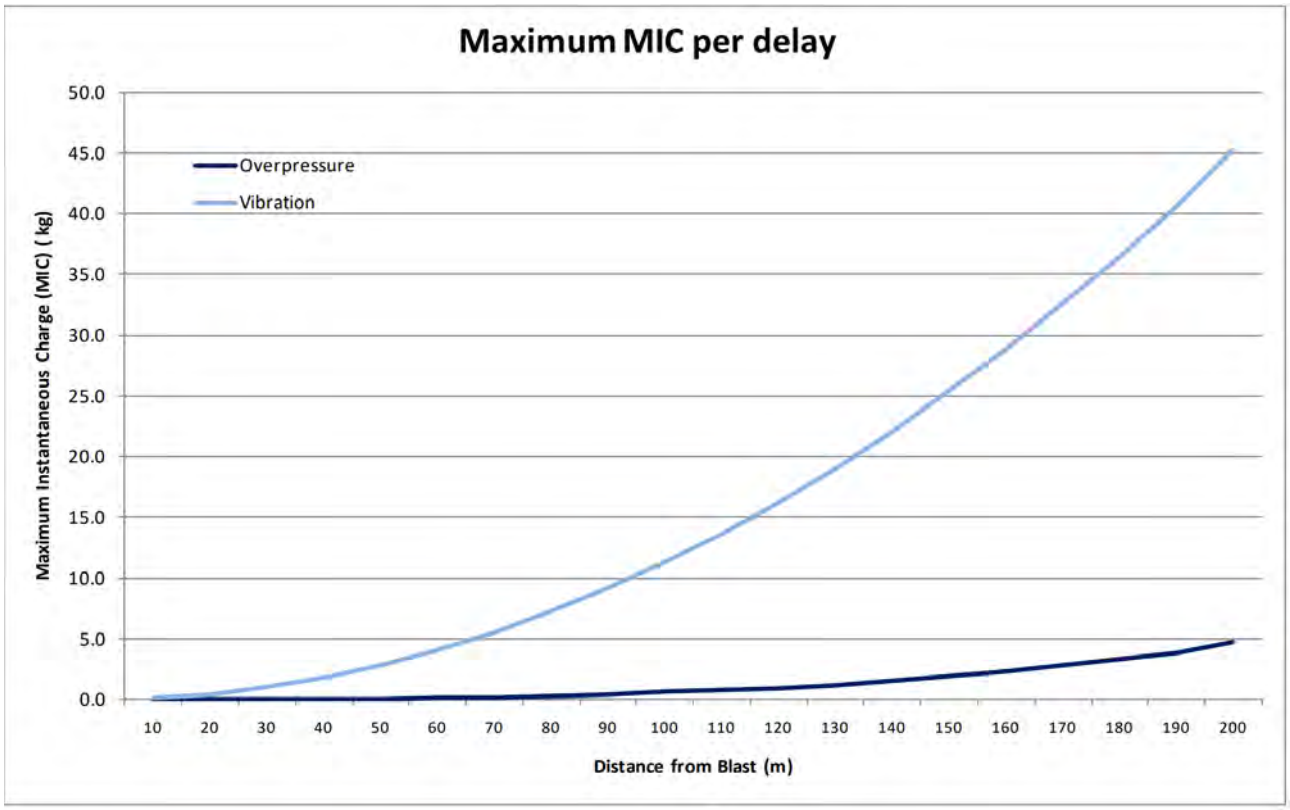

Figure 6.1 - Estimated effective mass charges to minimise annoyance (source: WSP)

Based on the outcomes of this assessment, the need for management and mitigation is dependent upon the maximum MIC proposed for use and the separation distance to the nearest affected sensitive receivers. These would be developed on a site specific basis in a Blast Management Strategy in accordance with RMM NV8.

Areas where blasting may be required are provided in Figure 6.2.

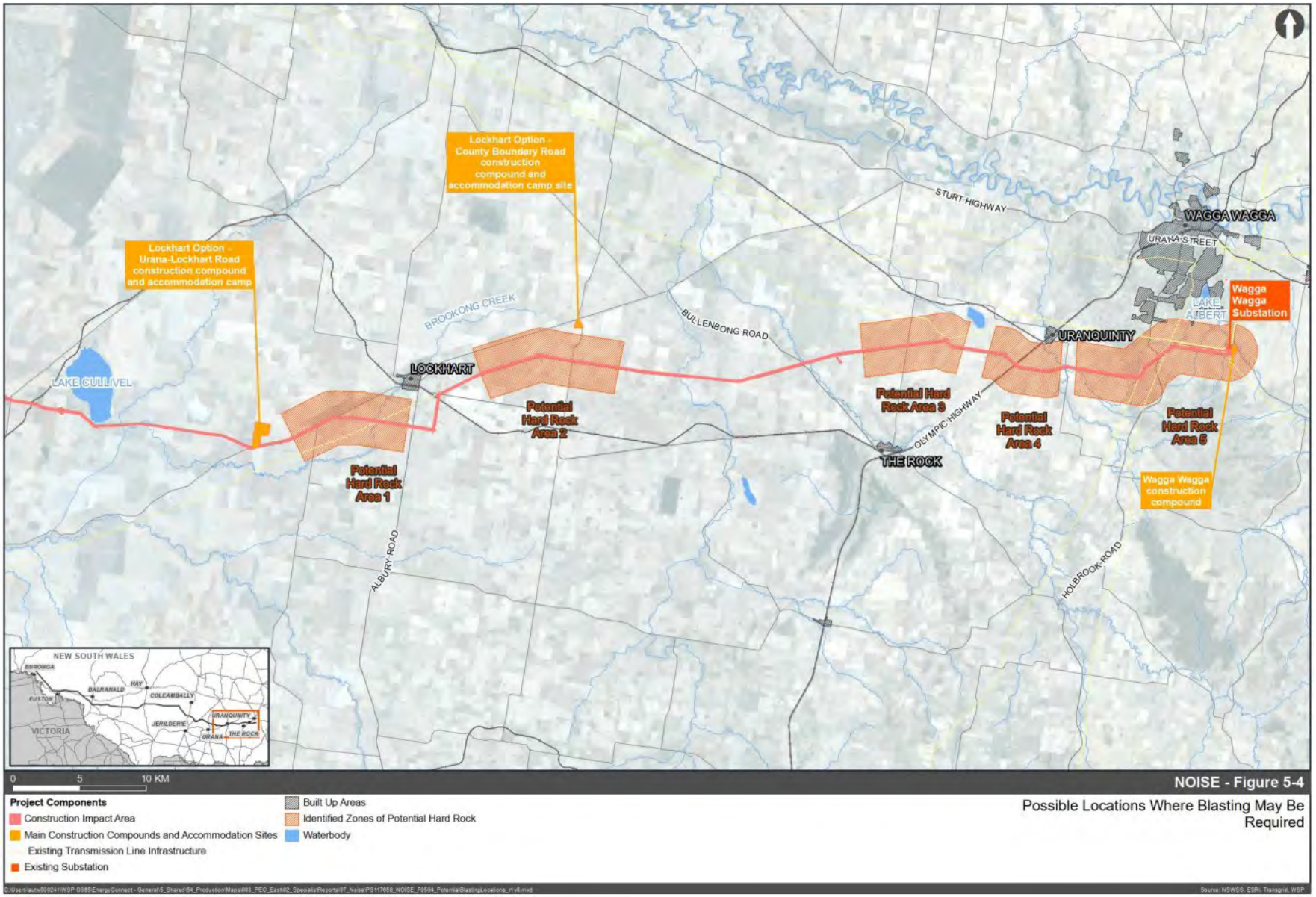

Figure 6.2 - Areas identified in the Final BDAR where potential blasting may be required (source: WSP)

6.2.9 Corona discharge

As outlined in Technical Paper 10 of the EIS, the transmission line audible noise risk zone is based on the setback distances from the transmission line centreline where the operational noise trigger level of Leq, 15min 35 dBA is met for both the project's contribution and cumulative impact (where relevant). These distances are summarised in Table 6.6. Based on these distances, the number of potential residential receivers within each of these audible noise risk zones has been calculated. The results are provided in Table 6.7.

The 'significance' of the predicted noise impact has been determined based on guidance provided in NPfI, as discussed in Technical Paper 10 of the EIS, is summarised in Table 6.8.

Table 6.6 - Transmission line audible noise risk zones (distance from new transmission line centreline) (source: WSP)

	Transmission line scenarios	Project only (metres)	Cumulative impact scenario	Cumulative impact risk zone (metres) (north/south)
1	330kV (Base) Buronga substation to Dinawan 330kV substation; and	442	Dinawan substation to Wagga Wagga substation: • Section 3.A; and • Section 3.B.	505/433
	500kV (Base) Dinawan 330kV substation to Wagga Wagga substation	358		432/401
2	330kV (Base + 1% SVG) Buronga substation to Dinawan 330kV substation; and	548	Dinawan substation to Wagga Wagga substation: • Section 3.A; and • Section 3.B.	569/512
	500kV (Base + 1% SVG) Dinawan 330kV substation to Wagga Wagga substation	451		510/535

Table 6.7 - Number of residential receivers within transmission line audible noise risk zones (source: WSP)

	Transmission line scenarios	No. of sensitive receivers within audible risk zone	No. of additional sensitive receivers within audible risk zone (cumulative impacts)	Cumulative impact risk zone (metres) (north/south)
1	330kV (Base) Buronga substation to Dinawan 330kV substation; and	8	6	14 (up to 8 dB exceedance)
	500kV (Base) Dinawan 330kV substation to Wagga Wagga substation			
2	330kV (Base + 1% SVG) Buronga substation to Dinawan 330kV substation; and	12	11	23 (up to 9 dB exceedance)
	500kV (Base + 1% SVG) Dinawan 330kV substation to Wagga Wagga substation			

Table 6.8 - Significance of audible noise impact per NPfI (source: WSP)

Significance of noise impact	No. of receivers	List of receivers (ID)
330kV (Base) Buronga substation to Dinawan substation and 500kV (Base) Dinawan substation to Wagga Wagga substation		
Negligible (≤ 2 dB(A) above trigger level)	6	20522, 12942, 450, 313, 500, 259
Moderate (≥ 3 but ≤ 5 dB(A) above trigger level)	6	422, 208, 26750, 504, 27028, 202
Significant (≥ 5 dB(A) above trigger level)	2	385, 26749

Significance of noise impact	No. of receivers	List of receivers (ID)
Total	**14**	-
330kV (Base + 1% SVG) Buronga substation to Dinawan substation and 500kV (Base + 1% SVG) Dinawan substation to Wagga Wagga substation		
Negligible (≤ 2 dB above trigger level)	12	20519, 461, 468, 26908, 26907, 211, 279, 313, 186, 20533, 500, 259
Moderate (≥ 3 but ≤ 5 dB above trigger level)	9	422, 20522, 12942, 450, 208, 26750, 504, 27028, 202
Significant (≥ 5 dB above trigger level)	2	385, 26749
Total	**23**	-

In fair weather conditions all sensitive receivers are expected to be compliant with the project Noise Trigger Level (PNTL). This assumes that all sensitive receivers would be located outside of the easement which is an operational requirement (that is, all sensitive receivers would be greater than 40 metres from the transmission line).

Based on analysis conducted by Beca on historical meteorological data (Appendix D of Technical Paper 10 of the EIS), audible noise corona discharge noise is not expected to be a constant occurrence but is only present during wet and misty conditions. Based on the meteorological conditions identified for the area, the expected annual frequency of these conditions is between 20–40 per cent of the time. During heavier rain events, general ambient noise levels in the environment would likely be higher and therefore potentially have a masking effect over any possible corona discharge noise. Noise disturbance under such circumstances is therefore likely to be low risk.

Appropriate operational mitigation measures will be identified during detailed design and implemented accordingly.

6.3 Construction vibration

At sufficient levels, vibration can lead to cosmetic (and possibly structural) building damage and can cause disturbance to occupants. Vibration can also affect sensitive structures, which could include heritage listed buildings. Due to the distance between the works and recorded historic heritage items, no direct or indirect impacts to historic heritage items are expected as result of the Stage 2 works at Lockhart, Dinawan, Cobb Highway and Balranald. The Ivydale homestead and woolshed (Wagga Wagga LEP 2010, #I72 and #I73) are located in close proximity to the construction compound at Wagga Wagga. The EIS identified that neither heritage item would be impacted by the works.

The nearest sensitive receiver to the Stage 2 works is approximately 44m from the transmission line corridor boundary, and inside the minimum human response working distance during the work stages of access and clearing, earthworks and civil construction works and final completion stages. Each of these stages is schedule to be carried out for a period of approximately one week. This receiver is located outside of the safe working distance for cosmetic damage and presented graphically in Technical Paper 10 (Appendix B-5) of the EIS.

The minimum working distances identified in Table 4.8 indicate that where sensitive receivers are in excess of 100m from vibration generating equipment, there is negligible risk of structural damage or impacts on human comfort due to the use of vibration intensive equipment. There are therefore no receivers identified within the safe working distances of either of the substation locations, or the construction compounds or accommodation camps.

One potential archaeological deposit (PAD) was identified within close proximity to the Cobb Highway camp and compound, however, modifications to the location and scale of the facility were made as part of the Amendment Report to reduce potential impacts to this site.

6.4 Construction road traffic noise

Section 5.5 of Technical Paper 10 of the EIS assessed the road traffic noise impacts for primary access and key haulage routes from modelled traffic numbers. Indicative vehicle movements for construction of the project were identified in Appendix B-6 of Technical Paper 10 of the EIS and assessed traffic noise levels for residential receivers within 350 metres of each route. Table 3-2 of the Amendment Report detailed changes in haulage route use and haulage road classifications from that described in Section 6.11.3.1 of the EIS, or to ensure consistency with the figures presented of the construction haulage network. However the expected volumes did not change.

The use of the haulage routes would vary according with the construction activity undertaken - in terms of both volume of construction vehicles and the duration of use and only a quarter of the identified haulage routes would be used for the full duration of construction. Construction vehicle traffic would generally be higher during the main earthworks and civil construction activities.

As assessed in the EIS, road traffic noise levels would increase by more than 2dB at numerous properties across the whole project, due to the relatively large increases in vehicle volumes when compared to the low existing vehicle volumes. However, almost all of these increases are predicted to remain below 10dB. Increases up to 2dB are considered to be barely perceptible to the average person.

For the Stage 2 works, the number of affected properties would be expected to be lower than those identified for the whole project. A total of 10 receivers (over the whole project) detailed in Table 6.9 have been assessed to have predicted noise increases of greater than 2dB and exceed the RNP criteria identified in Table 4.10.

Table 6.9 - Road traffic noise impacts that exceeds both triggers (>2dB and RNP criteria)

Road	LGA	Type of haulage route/expected traffic impact	RNP criteria L_{AEQ} Road type	Number of properties increasing by more than 2dB and exceeding RNP criteria
Elizabeth Avenue	Wagga Wagga	**Secondary Haulage Route** Would be used throughout the construction program. The proposal would typically generate around 86 construction vehicles per day when in use (50 light vehicles and 36 heavy vehicles) but would peak up to 200 daily movements for short durations (100 light vehicles and 100 heavy vehicles).	55 local roads	10

While the construction traffic noise assessment determined a number of properties would experience noise increases, the base road noise emission levels would remain low, as would the number of properties predicted to exceed the RNP criteria. These exceedances would also be intermittent through the proposal construction program as not all roads are required to be used daily for the full program duration. The construction traffic noise assessment provided is conservative and typical noise levels are likely to be lower than those predicted.

In accordance with RMM NV4, where noise from construction–related traffic is likely to result in road traffic noise increases of more than 2 dB at affected receivers, mitigation and management measures would be implemented where practicable and appropriate. Consideration will also be given to the noise levels associated with construction traffic and whether or not these levels comply with the road traffic noise criteria in the RNP as identified in Table 4.10 of this NVMP.

By implementing the mitigation measures outlined within Table 7.1, further noise impacts associated with construction road traffic will be minimised.

7 Environmental management

7.1 Designing for corona discharge

Detailed design undertaken during Stage 2 will consider all reasonable and feasible steps to minimise the impacts of corona discharge noise that could occur during operation. Detailed design processes will:

- identify residences expected to exceed 35 dB(A) LAeq,15min at the reasonably most affected point of the residence, determined in accordance with the NPfI, and will determine how often these conditions would likely occur annually; and
- identify reasonable and feasible noise mitigation measures for those residences.

Where possible, the measures will be implemented prior to the commencement of operation. This will be subject factors such as the provision of access to private properties and acceptance of measures from landholders, where applicable.

The NPfI states that:

> *Where the project noise trigger level is exceeded, assess the feasible and reasonable mitigation measures that could be implemented to reduce noise down towards the relevant project noise trigger level. If it is reasonable to achieve these levels, the proponents should do so. If not, then achievable noise levels should be identified. It is not mandatory to achieve the trigger levels but the assessment should provide justification if they cannot be met. An assessment of the acceptability of residual impacts should also be provided.*

Guidance is provided in NPfI in regard to definition of 'feasible' and 'reasonable' mitigation as well as a generic list of mitigation measures.

The current alignment has been selected based on the consideration of a range of constraints and opportunities, including environmental considerations, and is not expected to be altered in any significant manner. As outlined in Section 4 of the Response to DPE Request for Information (30 August 2022), options for at-source mitigation of potential operational noise from corona discharge to achieve the project trigger level of 35 dB(A) LAeq,15min are limited. The available options are not reasonable and feasible for this infrastructure.

Due to of the height of the transmission lines (noise sources), the large angles of exposure and the potential for adverse impact to visual amenity impacts, path controls, such as noise barriers are not reasonable and feasible in this context.

Subsequent to consideration of all source and pathway feasible and reasonable noise mitigation measures (as discussed in the preceding subsections), the NPfI allows for receiver property treatment to be considered for any residual noise impacts. Only at-receiver treatments are likely to reasonable and feasible in this context to mitigate potential amenity impacts in internal areas due to corona discharge.

To provide an appropriate indoor acoustic amenity for residential dwellings, appropriate internal ambient noise level targets are typically established per *AS/NZS 2107:2016 Acoustics—Recommended design sound levels and reverberation times for building interiors.* Relevant internal noise and reverberation criteria for the sleeping areas of rural residential buildings is recommended as 25-30 Leq, dBA.

From the perspective of the NPfI, receivers with a 'negligible' level of significance as discussed in Table 6.8 are not likely to warrant receiver-based controls. Technical Paper 10 of the EIS identified that for the other receivers with a higher category of noise level significance, based on an outdoor noise levels of 46 dBA Leq / 44 dBA Leq during the worst-case condition, an overall noise reduction of between 16 and 21 dB / 14 and 19 dB would be required to be achieved through the building envelope to meet the appropriate internal noise target. This assumes that the affected rooms are sleeping areas. Where the noise affected rooms are less noise sensitive, lower noise reductions may be appropriate.

In addition to the mitigation measures identified during detailed design in Stage 2, Transgrid will prepare and implement a Research Program, prepared in consultation with the Environment Protection Authority (EPA). Transgrid will allocate $150,000 to this program and will submit the program to the Planning Secretary for approval prior to the commencement of operation.

7.2 Exceedances of construction noise management levels

As described in Section 6.2, the noise assessment carried out in the EIS and the Amendment Report indicated the potential for noise impacts during Stage 2 works at sensitive receivers located within a worst case separation distance of approximately two kilometres.

If construction activities are identified that could generate noise levels that are likely to exceed the relevant noise management levels at any sensitive receivers, additional reasonable and feasible measures would be implemented in accordance with this plan and RMM NV2. As detailed in RMM NV5, works likely to generate noise levels that exceed applicable noise management levels at sensitive receivers would be scheduled during standard construction hours, wherever practicable, or would be undertaken in accordance with an out of hours works protocol (RMM NV6).

A construction noise and vibration management tool will be implemented on the project, that incorporates specific work areas and equipment for each activity to calculate the potential noise and vibration impacts. The tool can also estimate whether and which sensitive receivers are within minimum working distances from the proposed construction activities. The noise tool will:

- consider the location of the proposed activities;
- consider the noise and vibration generating activities that will take place and determine if they are low or high risk activities;
- assess the predicted noise and vibration levels against the relevant management levels; and
- identify feasible and reasonable mitigation and management measures in accordance with the ICNG.

Any noise assessments undertaken for the project, as and when required by RMM NV6, will be document controlled separately from this NVMP.

Where exceedances of noise management or vibration levels are predicted, residents/sensitive receivers will be notified of construction activities that are likely to affect their noise and vibration amenity in accordance with Section 9 of the *Community Communication Strategy* (45860-HSE-DOC-D-0024). This proactive communication will include:

- the types of activities to be undertaken;
- the timing of activities including expected start and finish;
- the location of activities; and
- details of the community information line and how to make an enquiry and/or a complaint.

Notification of OOHW will occur in accordance with the notification requirements of the *Out of Hours Work Protocol* (45860-HSE-PR-D-0011).

SecureEnergy will use a range of tools to communicate with the community and stakeholders such as community and stakeholder notifications, email, community drop-in sessions and door knocks.

Works that potentially exceed the noise management levels will be undertaken in accordance with the relevant measures identified in Table 7.1, and any additional measures that are identified through the additional noise assessments described above. Monitoring will be undertaken as described in Section 8.3.

7.3 Management measures

A range of environmental requirements and mitigation measures are identified in the EIS, Submissions Report and the Infrastructure Approval. Safeguards and management measures will be implemented to minimise or manage impacts to noise and vibration as required by RMM NV2 and

condition C4. Specific safeguards and management measures that will be implemented to address noise and vibration impacts associated with Stage 2 of the project are identified in Table 7.1.

Table 7.1 - Noise and vibration management measures

ID	Measurement/Requirement	When to implement	Responsibility	Source document
General				
N1	Training and awareness programs will be delivered to project personnel, including relevant sub-contractors on noise and vibration requirements (including operating hours) through inductions, toolboxes and targeted training.	Pre-construction and construction	Environmental Advisor Environmental Manager Health, Safety, Security and Environment (HSSE) Team	Good practice RMM NV2
N2	Landowners using disturbance areas for livestock grazing will be consulted prior to the commencement of works regarding alternatives for the management of their stock during these activities.	Pre-construction and construction	Engagement Manager Construction Manager	LP6
Construction noise				
N3	Plant and equipment used on site will maintained in a proper and efficient condition and operated in a proper and efficient manner to avoid the generation of excessive noise.	Pre-construction and construction	HSSE Team	POEO Act RMM NV2
N4	Where noise levels from construction-related traffic are expected to result in road traffic noise increases of more than 2dB at an affected receiver, mitigation and management measures would be implemented where practicable and appropriate. Measures may include: • a driver's code of conduct will be developed and implemented (refer to *Traffic and Transport Management Plan* (45860-HSE-PL-D-0109)); • heavy vehicle parking, idling and queuing on public roads will be discouraged (except where permitted, e.g. water supply points); • heavy vehicles will avoid compression braking and the use of air brakes in the vicinity of affected receivers; • limit traffic movements to daytime periods as far as possible and minimise traffic movements outside standard construction hours; and • all heavy and light vehicles associated with the project will travel to and from site via the routes nominated in the *Traffic and Transport Management Plan* (45860-HSE-PL-D-0109), where practical. These mitigation measures will be implemented with the aim of achieving the road traffic noise assessment criteria for residential land uses from the *Road Noise Policy* (DECCW, 2011).	Pre-construction and construction	Supervisors Construction Manager Environmental Manager Engagement Manager All project-related vehicle drivers	RMM NV4 Condition C4

ID	Measurement/Requirement	When to implement	Responsibility	Source document
N5	Where the noise level without the development is either within 2dB or exceeds the relevant road traffic noise criteria (Table 4.10), and noise levels associated with project construction road traffic results in increases greater than 2dB at any affected receiver, feasible and reasonable noise measures will be examined to reduce potential noise impacts. Measures may include: • minimising peak traffic movements or regulating time of use; or • reducing traffic speed (where safe to do).	Construction	Supervisors Construction Manager Environmental Manager	RMM NV4 Condition C4
N6	Where noise from construction is predicted to exceed the noise management levels, mitigation and management measures would be implemented where practicable and appropriate. This would include the following measures: • select quieter plant and equipment and use alternative construction methods to minimise noise levels; • install screens or use barriers to mitigate noise from stationary noise sources; • maximise the offset distance between noisy plant and orient equipment away from sensitive receivers; • use noise source controls, such as residential class mufflers, to reduce noise from all regularly – used plant including cranes, excavators and trucks; • use alternative reversing alarms in place of traditional beeper reversing alarms during works outside standard construction hours where noise impacts have been predicted; • turn off machinery when not in use; and • operate machinery in a manner which reduces maximum noise level events, such as shaking excavator buckets, loading trucks from a height, steel on steel contact and dragging materials across hard surfaces.	Construction	Supervisors Construction Manager Environmental Manager	RMM NV2
N7	Where noise from construction is predicted to exceed the applicable noise management levels, work would be planned and scheduled where practicable and appropriate: • during standard construction hours; and; • to minimise the number of items of noisy plant operating at one time and cumulative noise levels.	Construction	Supervisors Construction Manager Environmental Manager	RMM NV2 RMM NV5

ID	Measurement/Requirement	When to implement	Responsibility	Source document
Construction vibration				
N8	Where construction is likely to result in vibration levels that exceed relevant criteria at sensitive receivers, mitigation and management measures would be implemented where practicable and appropriate. This would include (but is not limited to) the following measures: • avoid the use of vibration–intensive plant at distances where human discomfort would result; • substitute lower vibration–intensive plant and methods (for example use a smaller machine, lower power settings or alternative equipment); • sequence operations to avoid or minimise concurrent vibration–intensive activities; and • schedule the use of vibration–sensitive equipment during the least sensitive times of the day.	Construction	Supervisors Construction Manager Environmental Manager	RMM NV3
N9	In the event that vibration-sensitive heritage structures could be impacted by the Stage 2 works: • develop site-specific measures to avoid vibration impacts; and • implement the measures during vibration-intensive activities in the vicinity of the vibration-sensitive heritage structures.	Construction	Supervisors Construction Manager Environmental Manager	RMM NV3
Blasting				
N10	A Blast Management Strategy will be prepared prior to the commencement of blasting and will: • describe the process that would be used to design each blast (depths and Maximum Instantaneous Charge for each location, etc.) to comply with relevant noise and vibration criteria at any nearby sensitive receivers; and • detail noise and vibration monitoring and landholder notification requirements for blasting. The strategy will be implemented for all blasting.	Prior to blasting During blasting	Engineers Environmental Manager	
N11	Where required, impacts from blasting would require assessment with regard to the Australian and New Zealand Environment Conservation Council's (ANZECC) *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration* (ANZECC, 1990) and the *AS 2187.2 Explosives – Storage, Transport and use Part 2: Use of Explosives*.	During blasting	Engineers Environmental Manager	
Working hours				
N12	Road upgrades, construction, upgrading and decommissioning may only be undertaken between: • 7am to 6 pm Monday to Friday; • 8am to 1 pm Saturdays; and • at no time on Sundays and NSW public holidays; unless the Planning Secretary agrees otherwise.	Pre-construction and Construction	Supervisors Construction Manager Environmental Manager	Condition C1

ID	Measurement/Requirement	When to implement	Responsibility	Source document
N13	The following construction, upgrading and decommissioning activities may be undertaken outside of the hours specified in measure N13 above: • the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons; • emergency work to avoid the loss of life, property or to prevent material harm to the environment; • activities that are inaudible at non-associated residences; • road upgrades required by the relevant roads authority to be undertaken outside the standard construction hours; or • works carried out in accordance with an Out of Hours Work Protocol.	Construction	Supervisors Construction Manager Environmental Manager	Condition C2
N14	Any works outside of the hours defined in condition C1, C2 and C6 will be undertaken in accordance with the Out of Hours Work Protocol in Appendix A.	Construction	Supervisors Construction Manager Environmental Manager	RMM NV6 Condition C2 f) Condition C10 f)
N15	Works may be undertaken in accordance with the hours and noise limits specified in negotiated agreements with affected sensitive receivers. Where multiple receivers are affected by works, a substantial majority of the receivers must agree to the specified hours and noise limits proposed by the project. Negotiated agreements must be in writing and finalised prior to the relevant works.	Pre-construction and Construction	Supervisors Environmental Manager Engagement Manager	Condition C2 c)
Consultation and complaints management				
N16	Where exceedances of noise and vibration management levels are predicted, residents/sensitive receivers will be notified of construction activities that are likely to affect their noise and vibration amenity in accordance with the *Community Communication Strategy* (45860-HSE-DOC-D-0024). This proactive communication will include: • the types of activities to be undertaken; • the timing of activities including expected start and finish; • the location of activities; • details of the community information line and how to make an enquiry and/or complaint.	Construction	Engagement Manager	RMM NV2 RMM NV3
N17	Investigate any complaints regarding construction noise and vibration to determine if actual noise and vibration levels are as predicted and that appropriate mitigation measures have been implemented. Where required, identify and implement appropriate additional mitigation measures.	Construction	Environmental Manager Engagement Manager	RMM NV9
N18	All complaints received will be managed in accordance with the *Community Communication Strategy* (45860-HSE-DOC-D-0024).	Construction	Engagement Manager	RMM NV9

ID	Measurement/Requirement	When to implement	Responsibility	Source document
Designing for corona discharge				
N19	Detailed design processes during Stage 2 will take all reasonable and feasible steps to minimise corona discharge noise during operation. These processes will: • identify residences expected to exceed 35 dB(A) LAeq,15min at the reasonably most affected point of the residence, determined in accordance with the NPfI, and will determine how often these conditions would likely occur annually; and • identify reasonable and feasible noise mitigation measures for those residences. The measures will be implemented prior to the commencement of operation, subject to the provision of access to private properties and acceptance of measures from landholders, where applicable.	Construction	Design Manager	Condition C9
Monitoring and reporting				
N20	Noise and vibration monitoring will be undertaken in accordance with Section 8.1.	Construction	Environmental Manager Environmental Advisor	RMM NV1

8 Compliance management

8.1 Training and awareness

All site personnel will undergo the SecureEnergy site induction prior to the personnel participating in on-site construction activities. The induction training addresses elements related to noise and vibration management including, but not limited to:

- complying with the conditions of the Infrastructure Approval;
- the environmental management system, including the CEMP;
- sensitive receivers in close proximity to project locations;
- management measures that are necessary to comply with to minimise and manage potential impacts to those sensitive receivers; and
- the *Out of Hours Work Protocol* (45860-HSE-PR-D-0011).

Targeted training in the form of toolbox talks or specific training will also be delivered to personnel with a key role in noise and vibration management. Examples of training topics include:

- vibration awareness in the vicinity of Aboriginal heritage features; and
- noise monitoring.

Records of training, including attendance, will be retained by SecureEnergy.

8.2 Roles and responsibilities

SecureEnergy's organisational structure and overall roles and responsibilities are outlined in Section 4 of the CEMP.

The project environmental management structure incorporates the following site personnel:

- Environmental Manager responsible for overall management of the CEMP and CEMP sub-plans; and
- Environmental Advisors to assist in implementing and monitoring measures in the CEMP and CEMP sub-plans.

SecureEnergy's Project Director, in consultation with functional managers, will ensure that appropriate resources are available to effectively manage the implementation of the CEMP and CEMP sub-plans during delivery of the project. All SecureEnergy staff, subcontractors and visitors are required to operate in accordance with this NVMP and related environmental management plans during construction.

Specialist consultants and subcontractors will be engaged for environmental support roles, as required, such as noise and vibration specialists for noise modelling (as required) and ongoing advice throughout construction.

Specific responsibilities for the implementation of mitigation measures are detailed in Section 7 of this NVMP.

8.3 Monitoring

The impacts and environmental performance of the project relevant to noise and vibration, and the effectiveness of the management measures identified in Section 7 will be monitored through the proposed monitoring program in Table 8.1.

Table 8.1 - Monitoring program

Item	Scope	Frequency	Equipment	Responsibility	Records/ reporting
Commencement of OOHW activities	At the commencement of a new OOHW activities or location where exceedances of the noise management levels are predicted to occur at the most affected receiver. This will be at select locations/occasions which are determined based on risk.	Commencement of OOHW activities predicted to exceed noise management levels. This will be on select occasions which are determined based on risk.	Hand held calibrated noise monitor	Environmental Advisor	Noise monitoring records
Commencement of new activity near structures/ receivers within minimum vibration working distances	Attended vibration measurements would be undertaken at the start of the works to determine actual vibration levels at the structure.	Commencement of works for receivers/ structures within minimum working distances	Vibration monitor	Environmental Advisor	Noise monitoring records
Complaint-based monitoring	Where complaints are received, noise monitoring may be undertaken at sensitive receivers to determine if the actual construction noise generated exceeds the predicted 'worst case' construction noise levels identified in this plan.	As required	Hand held calibrated noise monitor	Environmental Manager, Environmental Advisor	Noise monitoring records
Weekly inspections	Inspection of the environmental controls and implementation of the noise and vibration mitigation measures outlined in Table 7.1.	Weekly	Not applicable	Environmental Advisor Supervisors	Weekly Environmental Inspection Checklist

8.4 Inspections

Weekly inspections will be performed by the Environmental Manager (or delegate) and documented in a weekly environmental checklist. The inspections will check the implementation and effectiveness of the management measures identified in Section 7 and the environmental performance of the project relevant to noise and vibration. Visual inspection of any noise controls, e.g. hoarding or noise barriers will be undertaken.

8.5 Auditing

Audits will be undertaken to assess the effectiveness of the management measures and overall compliance with this plan, and other relevant approvals, licences and guidelines. Audit requirements are detailed in Section 9.3 of the CEMP.

Independent audits will be undertaken in accordance with the *Independent Audit Post Approval Requirements (2020).*

8.6 Reporting

Reporting which will be undertaken in accordance with the NVMP is summarised within Table 8.2.

Table 8.2 - Reporting program

Item	Scope	Frequency	Responsibility	Recipient
Monitoring reporting	Monitoring reports will include the results of monitoring undertaken during the reporting period and an assessment of the effectiveness of the noise and vibration management system. Monitoring reports will be prepared as required based on monitoring which has occurred (i.e. six monthly). Reporting of noise and vibration matters on the project website in accordance with condition D12.	As required based on monitoring which has occurred (i.e. six-monthly)	Environmental Manager	ER Transgrid Public (via project website)
Audit reports	Independent audits undertaken in accordance with the Infrastructure Approval will include audits of noise and vibration management measures (based on the Independent Auditor's program). Audit reports will be prepared. Further detail in relation to auditing is provided within Section 9.3 of the CEMP.	Independent audit will be undertaken within 12 weeks from the commencement of construction and then at intervals, no greater than 26 weeks from the date of the initial Independent Audit or as otherwise agreed by the Secretary.	Environmental Manager / Independent Auditor	ER Transgrid DPE

8.7 Emergencies, incidents and non-compliances

8.7.1 Emergencies

Emergency management and planning including any emergencies related to noise and vibration will be undertaken in accordance with the Clough management system and relevant procedures. Emergencies will be managed through Clough three-tiered management system approach. Depending on the severity of the emergency, emergencies will be managed in accordance with the following:

- **Level 1** – on-site emergencies will be in accordance with the *Project Specific Emergency Preparedness and Response Plan* (45860-HSE-PL-G-1015);
- **Level 2** – emergency situations where response exceeds the capacity of site resources incidents will be coordinated by the Incident Coordination Team; and
- **Level 3** – an emergency situation where the incident has the potential to, or has impacted, the business in terms of, reputation, and commercial liability. Incidents will be supported by the Major Incident Management Team.

Emergencies will be responded to in accordance with the level of the emergency (listed above). For each level of emergency, the situation will be assessed, the site support requirements will be established, and notification will occur. A Level 1 emergency will result in activation of the *Project Specific Emergency Preparedness and Response Plan* (45860-HSE-PL-G-1015). A Level 2 emergency will result in activation of the Incident Coordination Team, and a Level 3 emergency will result in activation of the Incident Management Team.

Refer to Section 8.1 of the CEMP.

8.7.2 Environmental incidents

Environmental incidents, including incidents related to noise and vibration will be managed as described in Section 8.2 and Appendix A4 of the CEMP. All site personnel are authorised to suspend a work activity that is likely to cause or actually causing or contributing to an incident. A supervisor/manager may request additional staff be deployed to the site to provide additional capacity or capability to manage the incident.

Incident reporting is described in Section 8.3 of the CEMP.

All environmental incidents that occur on the project, regardless of how minor, must be reported to a supervisor by personnel involved or witnesses to the incident immediately after the incident occurs. The Environmental Manager will be notified immediately of any environmental incident. Transgrid will be notified of incidents and near misses immediately. Formal, documented reporting of incidents will be completed, and will be submitted to Transgrid in accordance with requirements under the Contract. The Environmental Representative will also be included on all incident notifications.

For incidents which are reportable to DPE, notification will occur to DPE via the Major Projects website immediately after becoming aware that an incident has occurred. A written notification will then be provided to DPE via the Major Projects website within seven days after becoming aware of the incident. Refer to Section 8.3.1 of the CEMP in accordance with the Infrastructure Approval for further details requirements of the notification.

8.7.3 Non-compliances

Where a non-compliance with the Infrastructure Approval has been identified, including those relevant to noise and vibration, corrective actions will be developed as required and implemented to address the non-compliance that occurred.

Reporting of non-compliances will be undertaken as described in Section 10.1 of the CEMP – Reporting non-compliances. The Planning Secretary will be notified in writing via the Major Projects website within seven days after Transgrid becomes aware of any non-compliance. The written non-compliance notifications, in line with condition D7, will contain the requirements set out in Appendix 4 of the Infrastructure Approval and will include details such as:

- the non-compliance;
- the reasons for the non-compliance (if known); and
- what actions have been taken, or will be taken, to address the non-compliance.

Refer to Section 10.1.1 of the CEMP in accordance with the Infrastructure Approval for further details requirements of the notification.

A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.

Failure to comply with other statutory requirements such as the EPBC Act Approval will be reported in accordance with Section 10.1.2 of the CEMP. Any other reporting will occur in accordance with Section 10.1.3 of the CEMP.

Where a non-compliance has been identified, the non-compliance will be reviewed by the Environmental Manager to determine the reason for the non-compliance, and what corrective actions have, or will be taken, to address the non-compliance. Preventative actions will be developed as required and implemented to minimise the potential for recurrence.

Section 11 of the CEMP describes the process for non-compliance management.

8.8 Contingency plan

Although the project has been assessed through the environmental impact assessment process and potential impacts identified, unpredicted impacts may occur as the project progresses. In the event that unexpected impacts are identified, the action or cause will be categorised and as required will be managed as:

- an emergency or environmental incident in accordance with Section 8 of the CEMP – Incidents and emergencies; and/or
- a non-compliance or non-conformance in accordance with Section 11 of the CEMP – Non-compliance, non-conformance, corrective and preventative action.

Reporting of the unpredicted impacts would be in line with the above processes and as described in Section 10 of the CEMP – Reporting.

Corrective and preventative actions may be generated from a number of sources, including but not limited to incidents, audits and management reviews. The actions will be managed in accordance with the Clough management system to ensure that the required actions are tracked and closed out in a timely manner. The completion of the required actions will be recorded and will include details on the source of the action (e.g. audit, inspection or other), the action required, target close out date, actual close out date and the person responsible.

Through the identification of corrective and/or preventative actions through the above processes, the following steps will occur as relevant:

a) determine the relevant impact assessment criterion/criteria, below which the impact should be reduced, consistent with the requirements of this NVMP;

b) identify options to reduce the unexpected impacts to below the relevant criterion/criteria and appropriate timeframe for implementation;

c) implement the selected measure(s) to reduce the unexpected impacts; and

d) identify and implement an appropriate monitoring program to determine the effectiveness of the selected measure(s) to reduce the unexpected impact.

If the above monitoring program identifies that the unexpected impacts have not been reduced to below the nominated criterion/criteria, items b) to d) of the contingency process will be repeated.

Appendix A - Out of Hours Work Protocol

PUBLIC

Out of Hours Work Protocol
EnergyConnect (NSW - Eastern Section)
45860-HSE-PR-D-0011

REV	DATE	GENERAL DESCRIPTION	PREPARED	REVIEWED	VERIFIED	VERIFIED	APPROVED
0	27/10/2022	Issued for ER review	R. Walker-Edwards	A.Kriegel	A.Boyd	B.Calligeros	S.Basanta
1	21/11/2022	Revised to address DPE comments	R. Walker-Edwards	A.Kriegel	A.Boyd	B.Calligeros	S.Basanta
2	7/12/2022	Revised to address DPE comments	R. Walker-Edwards	A.Kriegel	A.Boyd	B.Calligeros	S.Basanta
3	22/12/2022	Revised to address DPE comments	R. Walker-Edwards	A.Kriegel	G.Crighton	B.Calligeros	S.Basanta
4	9/02/2023	Revised to provide a separate section for Wagga Wagga	R. Walker-Edwards	C.Curlewis	G.Crighton	B.Calligeros	S.Basanta
5	17/04/2023	Revised to address DPE comments	R.Walker-Edwards	C.Curlewis	G.Crighton	-	S.Basanta

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Revision History	
Rev.	**Detailed Description**
A	Issued for internal review
B	Issued for Transgrid review
C	Issued for Transgrid review and ER review
0	Issued for ER review
1	Revised to address DPE comments
2	Revised to address DPE email and meeting comments regarding Wagga Wagga
3	Revised to address DPE comments
4	Revised to provide a separate section for Wagga Wagga
5	Revised to address DPE comments

Key Document Stakeholders
To be communicated with during reviews and revisions of this document

Contents

Tables

1 Introduction

This Out of Hours Work Protocol (OOHW Protocol or protocol) supports the Noise and Vibration Management Plan (NVMP), which forms part of the Construction Environment Management Plan (CEMP) for EnergyConnect (NSW – Eastern Section).

This OOHW Protocol has been prepared to address condition C10 of the Infrastructure Approval (SSI-9172452) and revised mitigation measure (RMM) NV6 identified in the *Submissions Report EnergyConnect (NSW – Eastern Section)* (Submissions Report).

In accordance with condition C10 f) of the Infrastructure Approval, this OOHW Protocol has been prepared in consultation with the relevant councils and will be approved by the Planning Secretary prior to works being undertaken outside the hours defined in condition C1 and C2.

Blasting is not proposed for Stage 1 of the project however it may be required as part of the Stage 2 works and would be carried out in accordance with conditions C6 and C7.

This OOHW Protocol is applicable to works that are proposed outside the hours defined in condition C1, C2 and C6. Works that comply with the hours or circumstances defined in these conditions are not required to be undertaken in accordance with the processes outlined in this OOHW Protocol.

Subject to the outcomes of geotechnical investigations, crushing and screening may be required for the project. An Environment Protection Licence (EPL) may be issued for the scheduled activity of crushing and screening, and the licence would likely contain conditions that relate to noise generating activities outside standard construction hours for that relevant activity.

In accordance with RMM NV6, the operation of the accommodation camp facilities would not be subject to this OOHW Protocol, as these camps will be operational 24 hours a day, 7 days a week, as assessed in the *Environmental Impact Statement EnergyConnect (NSW – Eastern Section)* (EIS).

2 Construction hours

2.1 Standard construction hours

In accordance with condition C1, and in line with the *Interim Construction Noise Guideline* (ICNG), standard construction hours, road upgrades, construction, upgrading and decommissioning activities may only be undertaken between:

- 7 am to 6 pm – Monday to Friday;
- 8 am to 1 pm – Saturdays; and
- at no time on Sundays and NSW public holidays;
- unless the Planning Secretary agrees otherwise.

In accordance with condition C6, blasting is further limited to specific times within standard construction hours, and may only be undertaken between:

- 9 am and 5 pm Monday to Friday**;**
- 9 am to 1 pm on Saturday**;** and
- no blasting is allowed on Sundays or public holidays**.**

2.2 Variation to standard construction hours

The following construction, upgrading and decommissioning activities may be carried out outside the hours specified in condition C1:

- the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons;
- emergency work to avoid the loss of life, property or to prevent material harm to the environment;
- works carried out in accordance with the hours and noise limits specified in any negotiated agreements with sensitive receivers (owners and occupiers), provided the negotiated agreements are in writing and finalised before the commencement of works;
- activities that are inaudible at non-associated residences;
- road upgrades required by the relevant roads authority to be undertaken outside the standard construction hours; or
- works carried out in accordance with an Out-of-Hours Work Protocol approved in accordance with condition C3.

Inaudible is not defined within the Infrastructure Approval. To provide clarity, out of hours works are considered to be audible when receivers are noise affected in accordance with the *Interim Construction Noise Guideline* (ICNG). The noise affected levels are described in Table 2 of the ICNG. Further detail relating to noise management levels is provided in Section 5 and Section 6.

Any other planned works which are proposed to occur outside of the hours detailed within conditions C1, C2 and C6 must be undertaken in accordance with this OOHW Protocol.

3 OOHW process

3.1 Justification

Generally, works are considered justified as OOHW:

- to sustain the operational integrity of the electricity network or other services/utilities (e.g. water, gas, sewerage, drainage) and to minimise potential services/utilities disruptions;
- to promote the safety of construction personnel and/or the general public;
- to sustain the operational integrity of the road network or to promote the safety of road users where proposed works are in the vicinity of a main road;
- where works will shorten the length of the works that would affect a receiver and are supported by the affected community;
- where a need to work outside the recommended standard hours is demonstrated and justified;
- where works are required to be completed continuously (over a longer period than the ICNG standard construction day); and
- where works do not result in impacts to noise affected and vibration affected sensitive receivers (i.e. compliant with the noise management levels and vibration criteria as outlined in Section 4 of the Noise and Vibration Management Plan (NVMP)).

The potential for amenity impacts due to works outside standard construction hours changes based on the time of the day and night. The justification for works outside standard construction hours must consider the potential for amenity impacts based on sensitivity of the proposed working hours. For example, noisy activities carried out during the early evening period (for example during daylight hours after 6pm) have less potential to result in amenity impacts than works later in the evening (up to 10pm) or at night (10pm to 7am).

Some works (such as works within road and rail corridors and works associated with utility infrastructure) can only occur with the permission of the relevant asset owner/authority. The asset owner/authority may require these works to occur outside standard construction hours to maintain the operational integrity of the associated infrastructure network. When this occurs, works are considered justified. Note that this does not apply to road upgrades as these may occur outside of the standard construction hours without the application of the OOHW Protocol (refer condition C2). Where construction activities can occur outside of the standard construction hours in accordance with condition C2, or where construction activities are justified outside standard construction hours, associated activities at the relevant construction compounds to support the activities are also justified.

Construction activities that are likely to be required to occur outside of standard construction hours are indicatively provided within Table 3.1.

Table 3.1 - Indicative list of construction activities likely to be required outside of standard construction hours

Stage	Stage 1	Stage 2
Construction activities	Construction activities which are likely to be required to occur outside of standard construction hours during Stage 1 include: • vegetation clearing and grubbing activities; • topsoil stripping; • topsoil/material handling including stockpiling, material and spoil loading and material and spoil haulage; • earthworks;	Construction activities which are likely to be required to occur outside of standard construction hours during Stage 2 include: • vegetation clearing and grubbing activities; • topsoil stripping; • topsoil/material handling including stockpiling, material and spoil loading and material and spoil haulage; • earthworks;

Stage	Stage 1	Stage 2
	• surface grading and compaction; • crushing and screening (as required); • movement of light and heavy vehicles; • establishment of the construction compounds and accommodation camps; and • operation of the construction compounds.	• surface grading and compaction; • operating plant and equipment, including crushing and screening (as required); • tower assembly, erection and stringing; • movement of light and heavy vehicles; • establishment of the construction compounds and accommodation camps; • operation of the construction compounds; • commissioning / energisation; and • rehabilitation and decommissioning.

The justification of the proposed OOHW activities will be identified in the OOHW permit as identified in Section 3.2. The OOHW is considered to be justified if it meets or is below the noise management levels.

3.1.1 OOHW required to address delivery of critical State significant infrastructure

EnergyConnect is declared critical State significant infrastructure under schedule 5 of the *State Environmental Planning Policy (State and Regional Development) 2011*. Critical state significant infrastructure projects are high priority infrastructure projects that are essential to the State for economic, social or environmental reasons.

EnergyConnect is expected to:

- help NSW's energy future demand, particularly as existing coal-fired generators retire;
- reduce annual residential bills and small business bills in New South Wales;
- integrate renewable energy sources into the National Electricity Market;
- provide low-cost renewable generation sources;
- improve the reliability of the power network in both New South Wales and South Australia;

Australia is currently undergoing an energy crisis, particularly in relation to affordability concerns. The timely delivery of EnergyConnect is important in assisting to meet these demands.

The EIS proposed that the working hours for EnergyConnect be from 7am to 7pm, seven days per week. These working hours were proposed to assist with the timely delivery of the project. Of particular importance, as part of these working hours, is the ability to work Saturday afternoons and Sundays, particularly at the substations, which have the longest construction durations. Completing the substations sooner will reduce the overall duration of any associated amenity impacts for sensitive receivers in the vicinity. The use of the construction compounds on Saturday afternoons and Sundays is also critical to support substation and transmission line works during those times.

Construction of the substations and operation of the construction compounds is therefore proposed to occur outside of the standard construction hours on Saturday (from 7am to 8am and 1pm to 7pm) and on Sundays (from 7am to 7pm) (extended (day) working hours).

There is, therefore, a need for extended working hours (compared to the standard construction hours established by condition C1) to deliver the infrastructure as quickly as possible and minimise the overall duration of disturbance to the affected community. However, works outside standard construction hours for extended durations have the potential to disrupt the amenity of any nearby affected sensitive receivers. While extended (day) working hours are justified in this context, appropriate mitigation measures must be selected and implemented to minimise amenity impacts.

Where the noise management levels are exceeded, activities during extended (day) working hours would be subject to the following requirements of this OOHW Protocol:

- a construction noise assessment would be undertaken. Assessments are most likely to be undertaken through a construction noise tool;

- appropriate mitigation measures will be considered and implemented to reduce the noise levels as detailed within Table 7.1 of the NVMP including:
  - where possible, avoiding activities outside standard construction hours where exceedances of noise management levels indicate that the residents will be highly noise affected (ie experience noise of 75 dB(A) or more);
  - limiting high noise impact activities (refer Section 4.3) outside standard construction hours where a sensitive receiver may be noise affected (by more than 10dBA above the noise management level (NML));
  - minimising the use of noise intensive equipment (refer Section 4.4) outside standard construction hours;
  - selecting quieter plant and equipment and use alternative construction methods to minimise noise levels;
  - install screens or use barriers to mitigate noise from stationary noise sources;
  - using noise source controls, such as residential class mufflers, to reduce noise levels;
  - using alternative reverse alarms in place of traditional beeper reversing alarms during works outside standard construction hours where noise impacts have been predicted;
  - turning off machinery when not in use; and
  - operating machinery in a manner which reduces maximum noise level events, such as shaking excavator buckets, loading trucks from a height, steel on steel contact and dragging materials across hard surfaces;
- where exceedances of noise management levels are predicted, the Engagement Team (or delegates) will undertake engagement and consultation with potentially affected receivers on noise mitigation and management measures, including respite (RMM NV6). Feedback from the affected receivers would be considered when planning and carrying out noise generating activities at the substations outside standard construction hours;
- where exceedances of noise management levels indicate that the residents will be highly noise affected (ie a noise management level of 75 dB(A) or more), then approval will be sought from the Environmental Representative for the works; and
- community engagement (including notification with potentially affected receivers) will be undertaken as required, in accordance with the *Community Communication Strategy* (45860-HSE-DOC-D-0024).

These requirements do not apply to construction activities permitted to occur in accordance with condition C2.

3.2 OOHW permit

For the proposed OOHW, the following process will be implemented:

1. OOHW permit prepared by the team requesting the works that summarises the activities, equipment required, location and duration and proposed mitigation measures, and justifies why the activities are needed outside standard construction hours;
2. The OOHW permit will be submitted to the Environment Team, who will undertake a noise assessment for the OOHW (or review the assessment, if this has been completed as part of Step 1). This may include use of the construction noise and vibration management tool developed for the project;
3. Where exceedances of noise management levels are predicted, the Engagement Team (or delegates) will undertake engagement and consultation with potentially affected receivers on noise mitigation and management measures, including respite (RMM NV6). Previous

feedback on preferences for mitigation and management measures may be applied to subsequent, similar scenarios;

4. The Environment Team will determine the appropriate mitigation measures based on the predicted noise levels and duration of works, and determine the appropriate risk level (refer to Section 6.1);
5. The OOHW permit will be submitted to the appropriate party for review and approval (refer to Section 6.2);
6. The OOHW permit will be assessed and approved or not approved; and
7. If approved, community engagement (including notification with potentially affected receivers) will be undertaken as required, in accordance with the *Community Communication Strategy* (45860-HSE-DOC-D-0024) and the OOHW will proceed.

OOHW permits may be issued for extended periods of time where the risk of amenity impacts due to noise and vibration are negligible and/or where similar activities will be undertaken for an extended period of time.

OOHW permits may also be issued on an area basis (rather than an activity basis) so that project areas can be identified where project activities can occur at any time without the any risk of exceeding noise management levels at the nearest sensitive receivers (for example remote sections of the transmission line). The approval process for OOHW is identified in Section 6.

3.3 Coordination of third party OOHW

To identify and coordinate any OOHW undertaken by third parties in the vicinity of the project site, where sensitive receivers would be noise affected by the SecureEnergy works, the following will occur:

- SecureEnergy will use best endeavours to identify other potential OOHW in the vicinity of the proposed project's OOHW. This may include OOHW undertaken by third parties (e.g. utility providers, road authorities, etc.), other State significant infrastructure or State significant development projects;
- SecureEnergy will communicate with any other parties, giving as much advanced notice as possible regarding proposed OOHW. If there are multiple OOHW proposed in the same vicinity and sensitive receivers would be noise affected (an exceedance of the noise management level), the project's proposed OOHW will be reviewed to determine respite periods;
- in the event that the OOHW proposed by all parties cannot be coordinated to provide appropriate respite for noise affected receivers, the following will occur:
  - further communication with third party regarding their proposed works;
  - modification or rescheduling of the proposed OOHW;
  - consultation with affected receivers regarding mitigation measures (RMM NV6); and/or
  - consideration of additional respite or mitigation in addition to that considered in consultation with affected receivers.

It is noted that other parties may have their own procedures in place regarding out of hours works.

4 OOHW assessment

4.1 Noise assessment

A construction noise assessment will be undertaken to consider proposed works outside of the hours defined in conditions C1, C2 and C6. Assessments are most likely to be undertaken through a construction noise tool.

The construction noise tool will enable the prediction and assessment of potential noise impacts resulting from proposed OOHW in specific work areas. The construction noise tool provides assistance in identifying noise and vibration impacts on sensitive receivers, based on the specific work areas and types of plant and equipment operating in the work area. The tool will identify potentially noise affected sensitive receivers, as well as the magnitude of any predicted exceedance of relevant noise management levels.

The results of the assessment(s) will be used to determine the requirements for actions in accordance with this OOHW Protocol.

4.2 Noise intensive equipment

SecureEnergy considers noise intensive equipment as having a sound power level above 115dBA (refer to Table B-1.1 of Technical Paper 10 (Noise and Vibration Impact Assessment) of the EIS). Noise intensive equipment therefore includes:

- piling rig;
- D8 dozer with and without tree pusher;
- excavator with hammer;
- stump grinder;
- mulchers/chipper.

4.3 High noise impact activities

The ICNG identifies the following activities as particularly annoying to nearby residents:

- use of power saws;
- grinding metal or grinding concrete / masonry;
- rock drilling;
- jackhammering, rock hammering or rock breaking; and
- impact piling.

For the purposes of this protocol, these activities are referred to as high noise impact activities.

4.4 Vibration

Where vibration intensive activities are proposed during the OOHW, these will be assessed for compliance with minimum working distances for human comfort and structural damage identified in Section 4.6.3 of the NVMP.

5 OOHW management and mitigation measures

The results of the noise and vibration assessment process described in Section 4.1 will be used to determine the most appropriate reasonable and feasible mitigation measures from the NVMP and any additional measures that might be required.

ICNG standard construction hours and the nominated OOHW periods are represented in Table 5.1.

Table 5.1 - ICNG standard construction hours and OOHW periods

Day	12am	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm
Monday																			Extended (day) working hours		OOHW period 1 (evening)			
Tuesday																								
Wednesday		OOHW period 2 (night)						ICNG standard construction hours																
Thursday																								
Friday																								
Saturday																								
Sunday/PH																								

Notes:

PH = public holiday; ICNG standard construction hours = white; Extended (day) working hours = orange; OOHW period 1 (evening) = grey; OOHW period 2 (night) = blue

Feasible and reasonable are defined as the following under the ICNG:

- Feasible – a work practice or abatement measure is feasible if it is capable of being put into practice or of being engineered and is practical to build given project constraints such as safety and maintenance requirements;
- Reasonable – selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall noise benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure.

Where exceedances of the noise management levels are expected, mitigation measures identified will be implemented. The noise mitigation measures below are in line with the noise mitigation measures described in Section 8 of Technical Paper 10 of the EIS. The nominated mitigation measures are:

- **Notification**: The notification may consist of a letterbox drop (or equivalent) detailing work activities, time periods over which these will occur, impacts and mitigation measures. Notification will be provided to potentially affected receivers seven business days prior to the start of works. Given that the affected sensitive receivers are also likely to be affected landholders for the project, phone call and email will be favoured for these notifications;
- **Respite**: Where out-of-hours construction noise is proposed to occur during OOHW period 1 (evening) or OOHW period 2 (night) the following will apply:
  - for OOHW period 1 (evening) where work occurs for four or more consecutive evenings, respite should occur; or
  - for OOHW period 2 (night) where work occurs for three or more consecutive nights, respite should occur;
- **Duration respite**: Respite periods may be counterproductive in reducing the impact on the community for longer duration projects. In these instances, where it can be agreed upon by affected residents, it may be beneficial to increase the work duration, number of evenings or nights worked through duration respite so that the project can be completed more quickly. The

project will engage with affected receivers to determine support for duration respite. Where possible, negotiated agreements permitted in accordance with condition C2(c) are the preferred project approach in lieu of duration respite.

In accordance with RMM NV6, prior to the notification of potentially noise and vibration impacted receivers, community engagement and consultation would occur with potentially affected receivers regarding potential mitigation and management of impacts, and to address any complaints. Based on this engagement and consultation, appropriate mitigation and management measures would be considered and implemented where feasible and reasonable to minimise the impacts.

6 Approval process

6.1 Risk level

The following section outlines the assessment criteria to determine the risk level of the proposed OOHW. The risk category considers both the predicted noise impact relative to the appropriate noise management level and the duration of works.

Where reference is made to predicted noise levels, these levels are those which are predicted to occur either before the implementation of mitigation measures, or after the implementation of management measures where the mitigation measures reduce the predicted noise level.

Due to risk, the approval process differs for out of hours works proposed at Wagga Wagga substation and Wagga Wagga construction compound. Section 6.2 therefore provides for the approvals process for all other project areas and Section 6.3 provides the approval process for Wagga Wagga substation and Wagga Wagga construction compound.

6.2 All project areas (other than Wagga Wagga substation and construction compound)

6.2.1 Negligible risk activities

Negligible risk relates to activities which are:

- for extended (day) working hours – predicted noise levels are higher than NML (audible) but no more than 5 dBA above NML.

Any works proposed during evening or night must be assessed as low or high risk in accordance with the categories below.

6.2.2 Low risk activities

Low risk activities are:

- essential activities:
  - works required to occur on or adjacent to a road (i.e. stringing activities) and the relevant road authority requires the works to be undertaken outside the standard construction hours (i.e. Road Occupancy Licence restrictions). This does not include road upgrade works as condition C2 permits road upgrades to occur outside of the hours detailed within condition C1;
  - utility works required by relevant service providers to occur outside of the standard construction hours;
  - works on or adjacent to rail corridors. The asset owner/authority may require these works to occur outside standard construction hours to maintain the operational integrity of the associated infrastructure network;
  - activities (i.e. concrete pours) which must occur continuously for quality reasons;
  - where transmission line connections to the substations are required to occur during an outage; or
- for any other activity (other than the above-listed essential activities):
  - any activity during extended (day) working hours where predicted noise levels are 5 dBA to 20 dBA above the NML; or
  - any activity during evening or night where predicted noise levels are higher than the NML (audible) to 10 dBA above the NML.

6.2.3 High risk activities

A high risk activity is any activity which is not considered to be negligible risk and is not considered to be low risk.

High risk activities include:

- any activity during extended (day) working hours where predicted noise levels are >20 dBA above the NML;
- any activity during evening or night where predicted noise levels are >10 dBA above the NML; or
- activities where the Environmental Representative is of the opinion that the proposed works do not meet the criteria of low risk. These proposals should be revised by the project (to achieve the criteria of low risk) or referred to the Planning Secretary.

Refer to Table 6.1 which provides a summary of the approval process.

Table 6.1 - Summary of the process for OOHW for all project areas (other than Wagga Wagga substation and Wagga Wagga construction compound)

All project areas (other than Wagga Wagga substation and Wagga Wagga construction compound)				
Risk level	**Approval authority**	**Item no.**	**OOHW period**	**Activities or circumstances**
The below activities are not subject to the OOHW Protocol process due to the application of condition C2:				
Permitted	Not applicable	1	Any	The below activities are not subject to this OOHW Protocol in accordance with condition C2 of the Infrastructure Approval: • the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons; • emergency work to avoid the loss of life, property or to prevent material harm to the environment; • works carried out in accordance with the hours and noise limits specified in any negotiated agreements with sensitive receivers (owners and occupiers), provided the negotiated agreements are in writing and finalised before the commencement of works; • activities that are inaudible at non-associated residences; or • road upgrades required by the relevant roads authority to be undertaken outside the standard construction hours. These works may proceed without any further approvals detailed within the OOHW Protocol.
Activities not listed within condition C2 will be subject to the OOHW Protocol process as follows:				
Negligible	SecureEnergy Environmental Manager	2a	Extended (day) working hours	Negligible risk relates to: • activities where predicted noise levels are higher than NML (audible) but no more than 5dBA above NML.
		2b	Evening and night periods	Any works proposed during evening or night cannot be deemed negligible and must be assessed as low or high risk in accordance with the categories below.
Low	Environmental Representative	3a	Any OOHW period	Any activity which is not negligible in risk, and is one of the following essential activities: • works required to occur on or adjacent to a road (ie stringing activities) and the relevant road authority requires the works to be undertaken outside the standard construction hours (i.e. Road Occupancy Licence restrictions). This does not include road upgrade works as condition C2 permits road upgrades to occur outside of the hours detailed within condition C1; • utility works required by relevant service providers to occur outside of the standard construction hours; • works on or adjacent to rail corridors. The asset owner/authority may require these works to occur outside standard construction hours to maintain the operational integrity of the associated infrastructure network; • activities (ie concrete pours) that must occur continuously for quality reasons; • where transmission line connections to the substations are required to occur during a power outage.
		3b	Extended (day) working hours	Any activity which is not negligible in risk and is not an essential activity within row 3a. The following noise levels must be met for the activity to be determined as low risk: • any activity during extended (day) working hours where predicted noise levels are 5 dBA to 20 dBA above the NML.
		3c	Evening and night periods	Any activity which is not an essential activity within row 3a. The following noise levels must be met for the activity to be determined as low risk: • any activity during evening or night where predicted noise levels are higher than the NML (audible) to 10 dBA above the NML.
High	Planning Secretary	4	Any OOHW period	A high risk activity is any activity which is not considered to be negligible risk and is not considered to be low risk. High risk activities include: • any activity during extended (day) working hours that results in predicted noise levels which are more than 20 dBA above the NML; • any activity during evening or night where predicted noise levels are >10 dBA above the NML; • activities where the Environmental Representative is of the opinion that the proposed works do not meet the criteria of low risk. These proposals should be revised by the project (to achieve the criteria of low risk) or referred to the Planning Secretary.

6.3 Wagga Wagga substation and Wagga Wagga construction compound

6.3.1 Negligible risk activities

Due to the proximity of sensitive receivers and duration of works, the negligible risk category does not apply to works at the Wagga Wagga substation or Wagga Wagga construction compound.

6.3.2 Low risk activities

Low risk activities are:

- essential activities:
  - works required to occur on or adjacent to a road (i.e. stringing activities) and the relevant road authority requires the works to be undertaken outside the standard construction hours (i.e. Road Occupancy Licence restrictions). This does not include road upgrade works as condition C2 permits road upgrades to occur outside of the hours detailed within condition C1;
  - utility works required by relevant service providers to occur outside of the standard construction hours;
  - works on or adjacent to rail corridors. The asset owner/authority may require these works to occur outside standard construction hours to maintain the operational integrity of the associated infrastructure network;
  - activities (i.e. concrete pours) which must occur continuously for quality reasons;
  - where transmission line connections to the substations are required to occur during an outage; or
  - high risk activities (i.e. clearing and grubbing) within Section 6.3.3, but only if they are required to occur as part of the items listed above (i.e. works required as part of an ROL, or works during a power outage etc). At all other times, these activities are high risk activities;
- any other activity (other than the above listed essential activities):
  - for Saturday between 1pm and 5pm where the predicted noise level is higher than NML (audible) to 10 dBA above the NML;
  - for the extended (day) working hours where the predicted noise levels are higher than NML (audible) to 10 dBA above the NML. Such works between Saturday 5pm and Monday 7am are not included as activities during this period, as they are considered to be high risk; or
  - during evening or night (7pm to 7am) (other than between Saturday 5pm and Monday 7am, as these are high risk) where predicted noise levels are higher than the NML (audible) to 5 dBA above the NML. In these situations, consent agreements would be required from 100% of noise affected residences.

6.3.3 High risk activities

A high risk activity is any activity which is not considered to be negligible risk and is not considered to be low risk.

High risk activities include the following activities if proposed to occur during extended (day) working hours, evening or night (except for any activity required as part of an essential low risk activity as detailed in Section 6.3.2):

- clearing and grubbing;
- bulk earthworks;
- foundation preparation at the Wagga Wagga construction compound;
- rock drilling;

- boring;
- jackhammering, rock hammering or rock breaking;
- impact piling;
- any activity from Saturday 5pm to Monday 7am is considered to be high risk;
- any activity during extended (day) working hours where predicted noise levels are >10 dBA above the NML;
- any activity during evening or night (7pm to 7am) where predicted noise levels are >5 dBA above the NML. In these situations, consent agreements would be required from 100% of noise affected residences; or
- activities where the Environmental Representative is of the opinion that the proposed works do not meet the criteria of low risk. These proposals should be revised by the project (to achieve the criteria of low risk) or referred to the Planning Secretary.

Table 6.2 - Summary of the process for OOHW for Wagga Wagga substation and Wagga Wagga construction compound

Wagga Wagga substation and Wagga Wagga construction compound				
Risk level	**Approval authority**	**Item no.**	**OOHW period**	**Activities or circumstances**
The below activities are not subject to the OOHW Protocol process due to the application of condition C2:				
Permitted	Not applicable	1	Any	The below activities are not subject to this OOHW Protocol in accordance with condition C2 of the Infrastructure Approval: • the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons; • emergency work to avoid the loss of life, property or to prevent material harm to the environment; • works carried out in accordance with the hours and noise limits specified in any negotiated agreements with sensitive receivers (owners and occupiers), provided the negotiated agreements are in writing and finalised before the commencement of works; • activities that are inaudible at non-associated residences; or • road upgrades required by the relevant roads authority to be undertaken outside the standard construction hours. These works may proceed without any further approvals detailed within the OOHW Protocol.
Activities not listed within condition C2 will be subject to the OOHW Protocol process as follows:				
Negligible	SecureEnergy Environmental Manager	2a	Extended (day) working hours	OOHW at the Wagga Wagga substation or Wagga Wagga construction compound site cannot be deemed negligible and must be assessed as low or high risk in accordance with the criteria below.
		2b	Evening and night periods	Any works proposed during evening or night cannot be deemed negligible and must be assessed as low or high risk in accordance with the categories below.
Low	Environmental Representative	3a	Any OOHW period	Any activity which is not negligible in risk, and is one of the following essential activities: • works required to occur on or adjacent to a road (ie stringing activities) and the relevant road authority requires the works to be undertaken outside the standard construction hours (i.e. Road Occupancy Licence restrictions). This does not include road upgrade works as condition C2 permits road upgrades to occur outside of the hours detailed within condition C1; • utility works required by relevant service providers to occur outside of the standard construction hours; • works on or adjacent to rail corridors. The asset owner/authority may require these works to occur outside standard construction hours to maintain the operational integrity of the associated infrastructure network; • activities (ie concrete pours) that must occur continuously for quality reasons; • where transmission line connections to the substations are required to occur during a power outage; • refer to the list of high risk activities (i.e clearing and grubbing) within row 4. These activities can only be assessed as low risk if they are required to occur as part of the items listed above (i.e. works required as part of an ROL, or works during a power outage etc). At all other times, these activities are high risk activities.
		3b	Extended (day) working hours	Any activity which is not negligible in risk and is not an activity within row 3a. The following noise levels must be met for the activity to be determined as low risk: • for Saturday between 1pm and 5pm where the predicted noise level is higher than NML (audible) to 10 dBA above the NML; • for the extended (day) working hours of 6pm – 7pm Monday to Friday and 7am to 8am Saturday where the predicted noise levels are higher than NML (audible) to 10 dBA above the NML. Saturday 5pm to Monday 7am are not included as activities during this period are considered to be high risk.
		3c	Evening and night periods	Any activity which is not an activity within row 3a. The following noise levels must be met for the activity to be determined as low risk: • any other activity during evening or night (7pm to 7am) (other than Saturday 5pm to Monday 7am as these are high risk) where predicted noise levels are higher than the NML (audible) to 5 dBA above the NML. In these situations, consent agreements would be required from 100% of noise affected residences.
High	Planning Secretary	4	Any OOHW period	A high risk activity is any activity which is not considered to be negligible risk and is not considered to be low risk. High risk activities include: • at Wagga Wagga substation and Wagga Wagga construction compound, the following activities if proposed to occur during extended (day) working hours, evening or night (except where required as part of an essential low risk activity as detailed in row 3a): – clearing and grubbing; – bulk earthworks; – foundation preparation at the Wagga Wagga construction compound; – rock drilling; – boring; – jackhammering, rock hammering or rock breaking; – impact piling; – any activity from Saturday 5pm to Monday 7am is considered to be high risk; – any activity during extended (day) working hours where predicted noise levels are >10 dBA above the NML; or – any activity during evening or night (7pm to 7am) where predicted noise levels are >5 dBA above the NML. In these situations, consent agreements would be required from 100% of noise affected residences; – activities where the Environmental Representative is of the opinion that the proposed works do not meet the criteria of low risk. These proposals should be revised by the project (to achieve the criteria of low risk) or referred to the Planning Secretary.

6.4 Approval pathway

An approval process that considers the risk of the proposed out of hours work activities has been identified in Table 6.1, in accordance with condition C10 f).

Table 6.3 - OOHW approval pathway

Risk level	Approval pathway
Negligible	SecureEnergy Environmental Manager
Low	Environmental Representative
High	Planning Secretary

Once the risk level has been determined, considering the noise assessment and duration of proposed works, the OOHW permit and supporting assessment will be provided to the relevant approval authority identified in Table 6.3.

Activities with negligible risk can be approved by the SecureEnergy Environmental Manager. The Environmental Representative has the authority to approve OOHW assessed to be low risk as described in Section 6.1, while the Planning Secretary will be required to approve any OOHW assessed to be high risk.

The Environmental Representative may approve the application with conditions that must be met during the activity.

If a negligible risk activity receives a complaint from an affected sensitive receiver in relation to construction noise, the Environmental Representative will be advised of the complaint. Where the Environmental Representative deems it appropriate, the activity will be reassessed as a low risk activity.

If, during the assessment process, the Environmental Representative is of the opinion that the proposed works do not meet the low risk criteria described in Section 6.1, the Environmental Representative will inform SecureEnergy of this opinion. The proposed works may be revised, or the permit will be provided to the Planning Secretary for assessment.

If during the assessment process for high risk activities, the Planning Secretary (or their delegate) determines that the proposed works can be assessed as low risk, the application will be referred to the Environmental Representative.

Once reviewed, the OOHW permit may be approved or not approved through the approval pathway. If not approved, the proposed works may be modified and resubmitted in line with the flow chart presented in Appendix A.

If approved, the OOHW will be undertaken in accordance with the OOHW permit and any identified mitigation measures.

This OOHW Protocol or the high risk approvals will be subject to a two monthly review by the Department of Planning and Environment (the Department). The approvals may be terminated by the Department following such review.

7 OOHW stakeholder consultation and communication

The Engagement Team will use a range of communication tools to provide clear, effective and timely information to the predicted affected sensitive receivers and stakeholders. The method of communication will be selected based on the type of works, potential impacts and individual receiver.

7.1 Notification

Affected receivers will be notified of upcoming OOHW activities that would be undertaken under this OOHW Protocol at least five days prior to the start of works. Notification details are described in Section 3.2 and Section 5.

Notification will also be provided to relevant councils and Department of Planning and Environment (the Department) prior to the commencement of OOHW undertaken under this OOHW Protocol. Notification to councils may occur through email, phone call or project updates (including updates of the proposed OOHW). Notification to the Department may occur through email or a submission made to the Planning Portal.

In the event of unexpected OOHW (emergency or other) the Environmental Manager and Engagement Manager (or delegates) will be contacted. SecureEnergy will use best endeavours to notify all noise and/or vibration affected sensitive receivers within two (2) hours after commencing any works.

7.2 Consultation

All consultation will be undertaken in accordance with the *Community Communication Strategy* (45860-HSE-DOC-D-0024), which includes a description of communication tools such as letterbox drops, phone calls and emails.

Where exceedances of noise management levels are predicted prior to OOHW, consultation will be undertaken with affected receivers to understand their preferences for mitigation and management measures (in accordance with RMM NV6). The results of this consultation may be applied in similar subsequent OOHW activities.

Where agreements are reached with the potentially noise affected sensitive receivers regarding OOHW the proposed work can proceed without an OOHW permit (in accordance condition C2(c)).

7.3 Complaints management

Section 1.7.5 of the NVMP outlines the complaints management process. The key principles of the complaints management process will be implemented for any OOHW carried out under this protocol, as outlined in the NVMP.

In addition to the complaints management process outlined in the NVMP, should a complaint be received that relates to noise associated with out of hours work, the complaint will be reviewed by the Environment Manager (or delegate) to ensure that appropriate mitigation measures were implemented as per the approved out of hours work permit.

The complaints register will need to be submitted to the Department's Compliance team on a weekly basis when complaints are received.

7.3.1 Recurrent complaints

Should recurrent complaints be received from the same receiver about the same type of out of hours work, the Environment Manager (or delegate) will review the applied mitigation measures and determine if any additional reasonable and feasible measures can be implemented and/or if the construction methodology can be reasonably or feasibly altered in such a way that would meaningfully reduce impacts on the complainant.

The project's responses to recurrent complainants and the decision whether to apply further mitigation measures or not, will be reviewed by the ER.

7.3.2 Noise monitoring

Noise monitoring (attended or unattended) at the complainant's property boundary may be offered in instances of recurrent complaints, with the aim of comparing the actual noise levels to those predicted in the out of hours work permit and understanding the suitability of the implemented noise mitigation measures. Should the monitored noise levels exceed the maximum levels considered in the out of hours work permit (i.e. in cases of negligible or low risk work), work that applies to that out of hours work permit will be halted at the end of the shift, and an investigation will be carried out to understand why that is the case. The work creating the noise exceedance cannot recommence under that particular permit until the Environment Manager (or delegate) has given approval.

Should the permit be deemed insufficient by the investigation, a new permit may be required to be produced and approved, and additional mitigation measures may need to be applied.

Noise monitoring results would be explained to the complainant, if requested, and the outcome of the investigation would be shared with the ER.

8 OOHW compliance management

8.1 Department review

This OOHW Protocol or the high risk approvals will be subject to a two monthly review by the Department. The approvals may be terminated by the Department following such review.

8.2 Monitoring

Noise monitoring will be undertaken in accordance with Section 8.3 of the NVMP to confirm actual noise levels do not exceed predicted noise levels. Noise monitoring will be undertaken in the following scenarios:

- at the commencement of new OOHW activities that are predicted to exceed the noise management level at sensitive receivers; and
- in response to complaints received as a result of OOHW construction activities.

8.3 Continual improvement

Where monitored construction noise and/or vibration levels are found to be above modelling predictions or in response to complaints, the process described in Section 8.9 of the NVMP will be implemented, which includes:

- confirming the monitored levels are due to project works;
- determining if the exceedance is due to an uncharacteristically loud piece of plant or equipment;
- confirm that the actual activity being undertaken is the same as the modelled scenario on which the predictions are based;
- review feasible and reasonable mitigation measures that were applied and revise, if necessary, which may include reducing plant size, modifying time of works and/or utilising alternative construction methodology; and
- communicate lessons learnt, as required, to relevant personnel.

Section 1.7.5 of the NVMP outlines the complaints management process. The key principles of the complaint management process will be implemented for OOHW, as outlined in the NVMP.

Appendix A – Out of Hours Work Protocol flowchart

Noise Management Procedure
OUT OF HOURS WORK PROCEDURE

secureenergy

WORKS REQUIRED TO OCCUR OUTSIDE CONDITION C1 CONSTRUCTION HOURS
MON-FRI: 7am – 6pm; SAT: 8am – 1pm

ARE THE PROPOSED WORKS:

a) the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities; or
b) emergency work to avoid the loss of life, property or to prevent material harm to the environment; or
c) works carried out in accordance with the hours and noise limits specified in any negotiated agreements with sensitive receivers (owners and occupiers), provided the negotiated agreements are in writing and finalised before the commencement of works; or
d) activities that are inaudible at non-associated residences; or
e) road upgrades required by the relevant roads authority to be undertaken outside the standard construction hours?

YES → **Works are permitted to proceed** without OOHW permit

NO

OOHW does not occur OR proposed OOHW are modified

1. ENGINEER TO PROVIDE DETAIL OF PROPOSED OOH WORKS
Engineer to provide detail of proposed work, including type of work, location, machinery, duration and justification (prepare OOHW permit)
← Construction Team

2. DETERMINE NOISE LEVELS
Predicted noise levels to be determined through existing EIS data or a noise tool
← Construction Team / Environment Team

3. UNDERTAKE ENGAGEMENT AND CONSULTATION AS REQUIRED
Engage and consult with affected sensitive receivers and discuss mitigation measures (RMM NV6)
← Community and Stakeholder Engagement Team

4. DETERMINE MITIGATION MEASURES
Determine required mitigation measures based on predicted noise level, recommended mitigation measures and engagement and consultation
← Environment Team

NEGLIGIBLE RISK | **LOW RISK** | **HIGH RISK**

5A. ENVIRONMENTAL MANAGER RECEIVES OOHW PERMIT

5B. ENVIRONMENTAL REPRESENTATIVE RECEIVES OOHW PERMIT

5C. DPE RECEIVES OOHW PERMIT

6. OOHW PERMIT IS ASSESSED

7A. OOHW PERMIT IS APPROVED

7B. OOHW PERMIT IS NOT APPROVED

8. NOTIFY AFFECTED RECEIVERS, COUNCIL and DPE
In the event that any further notification is required following Step 3, notify affected receivers in accordance with the Community Communication Strategy
Notification to occur to the relevant council and DPE in accordance with Section 7.1 of the OOHW Protocol
← Community and Stakeholder Engagement Team; Environment Team and Transgrid for DPE notification

9. UNDERTAKE OOHW IN ACCORDANCE WITH PERMIT
Undertake OOHW in accordance with OOHW permit, OOHW Protocol and NVMP
← Construction Team

NOTES

Previous results of consultation regarding mitigation measures (RMM NV6) may be applied to subsequent similar OOHW.

In the event of emergency OOHW contact the Environmental Manager and Engagement Manager (or delegate(s)). SecureEnergy will use best endeavours to notify all noise and/or vibration affected sensitive receivers.

Appendix B - Sensitive receivers

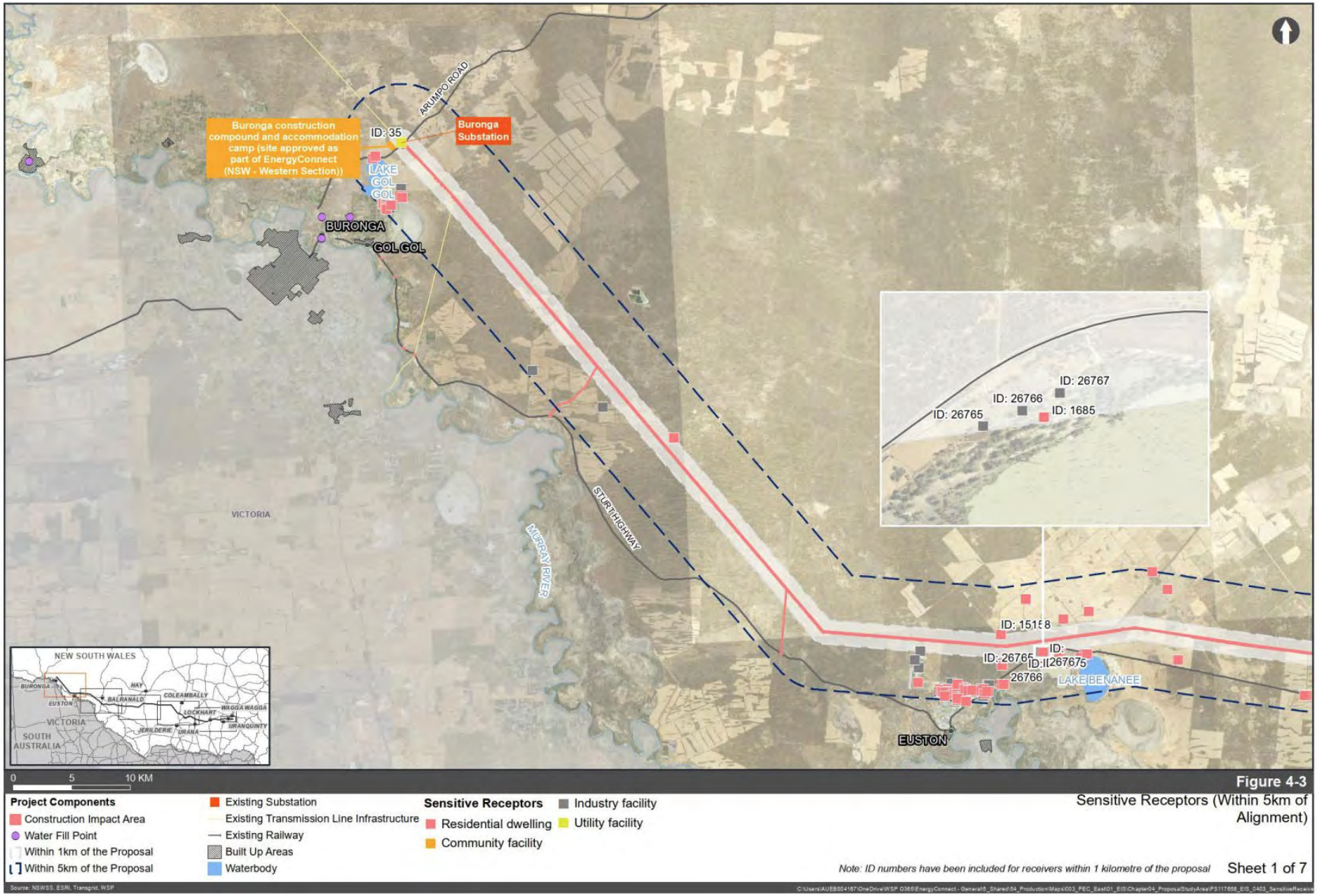
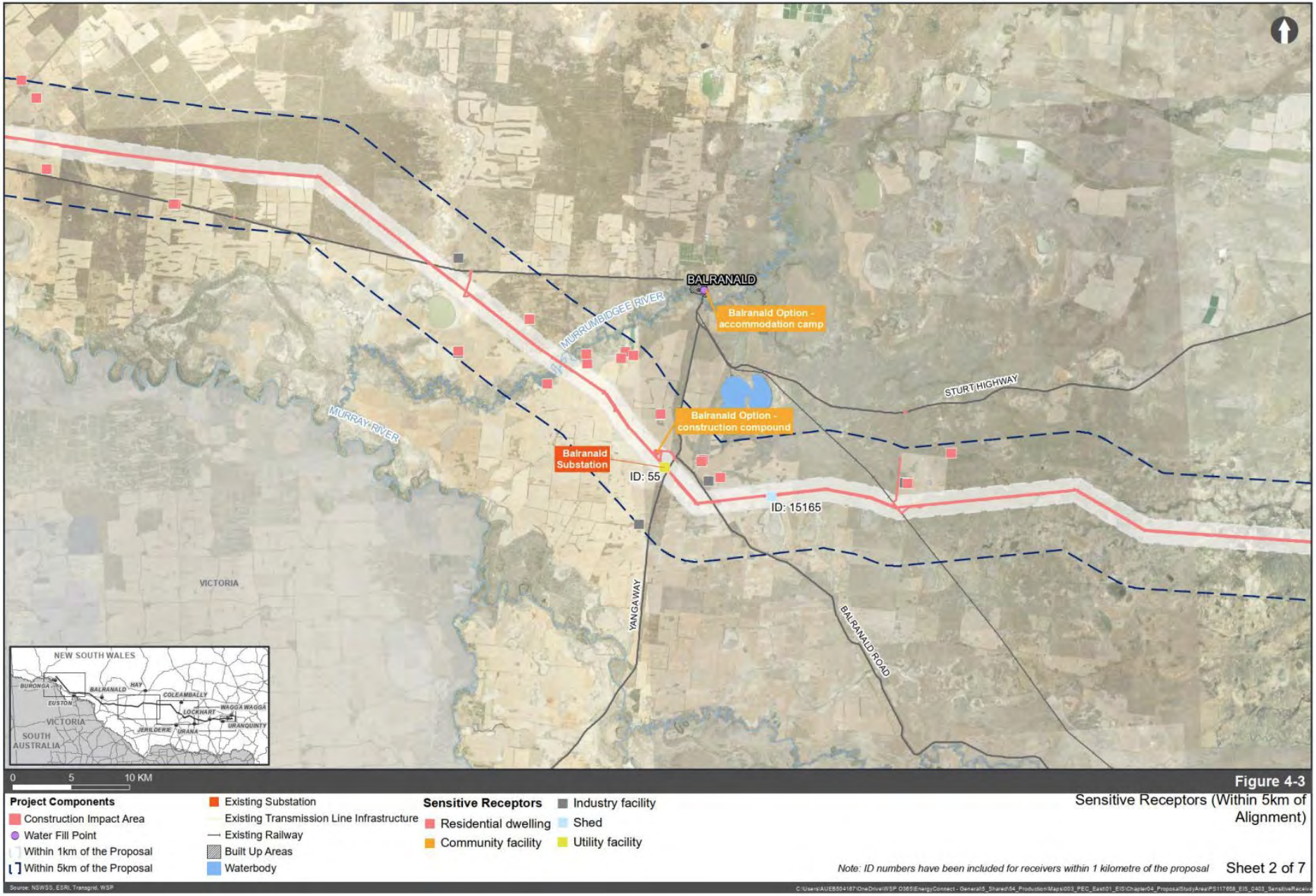


Figure 4-3
Sensitive Receptors (Within 5km of Alignment)
Sheet 1 of 7


BALRANALD
Balranald Option - accommodation camp
MURRUMBIDGEE RIVER
MURRAY RIVER
STURT HIGHWAY
Balranald Option - construction compound
Balranald Substation
ID: 55
ID: 15165
VICTORIA
YANGA WAY
BALRANALD ROAD
NEW SOUTH WALES
BURONGA
HAY
BALRANALD
COLEAMBALLY
EUSTON
LOCKHART
WAGGA WAGGA
VICTORIA
JERILDERIE
URANA
URANQUINTY
SOUTH AUSTRALIA
0 5 10 KM
Project Components
Construction Impact Area
Water Fill Point
Within 1km of the Proposal
Within 5km of the Proposal
Existing Substation
Existing Transmission Line Infrastructure
Existing Railway
Built Up Areas
Waterbody
Sensitive Receptors
Residential dwelling
Community facility
Industry facility
Shed
Utility facility
Figure 4-3
Sensitive Receptors (Within 5km of Alignment)
Note: ID numbers have been included for receivers within 1 kilometre of the proposal
Sheet 2 of 7

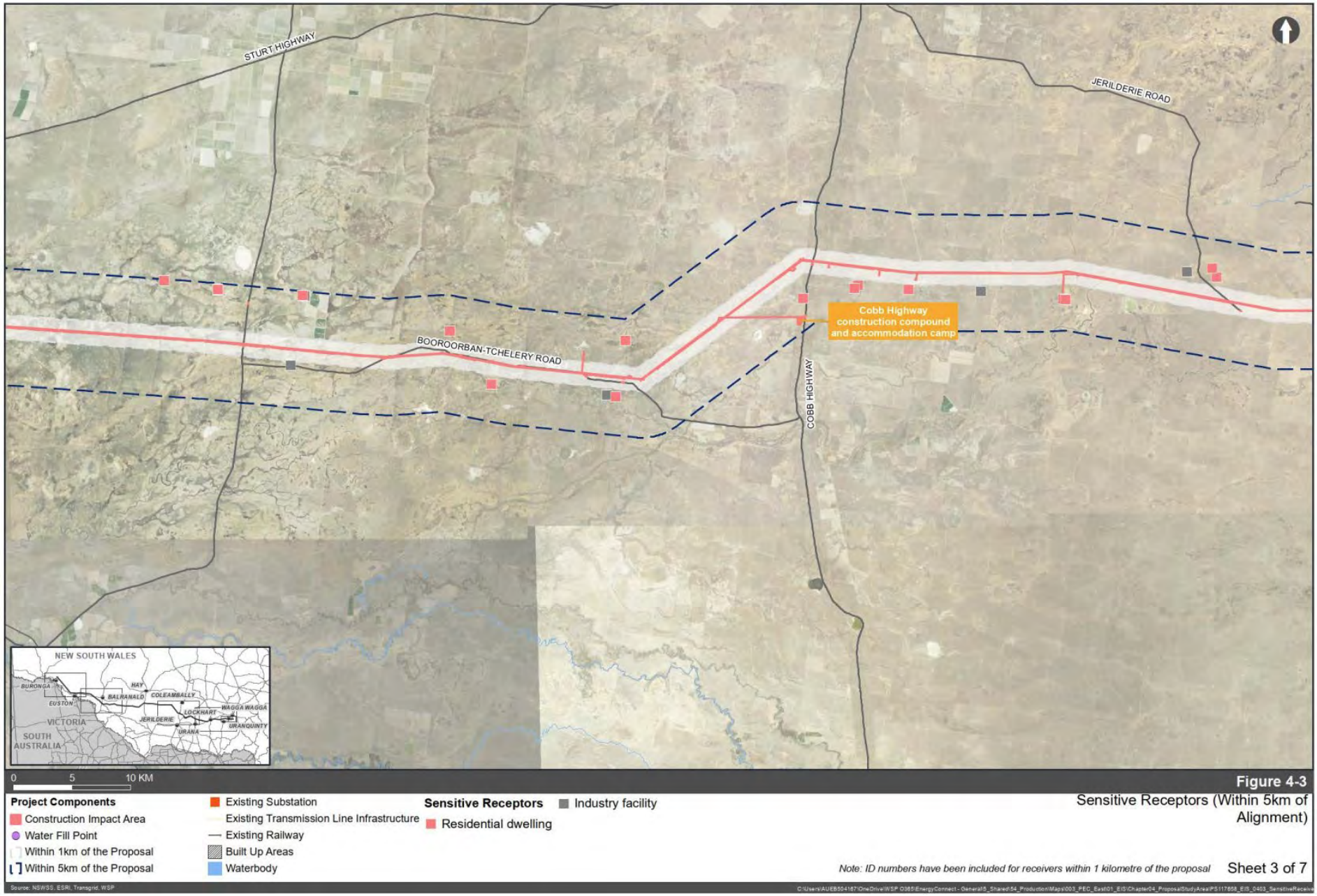
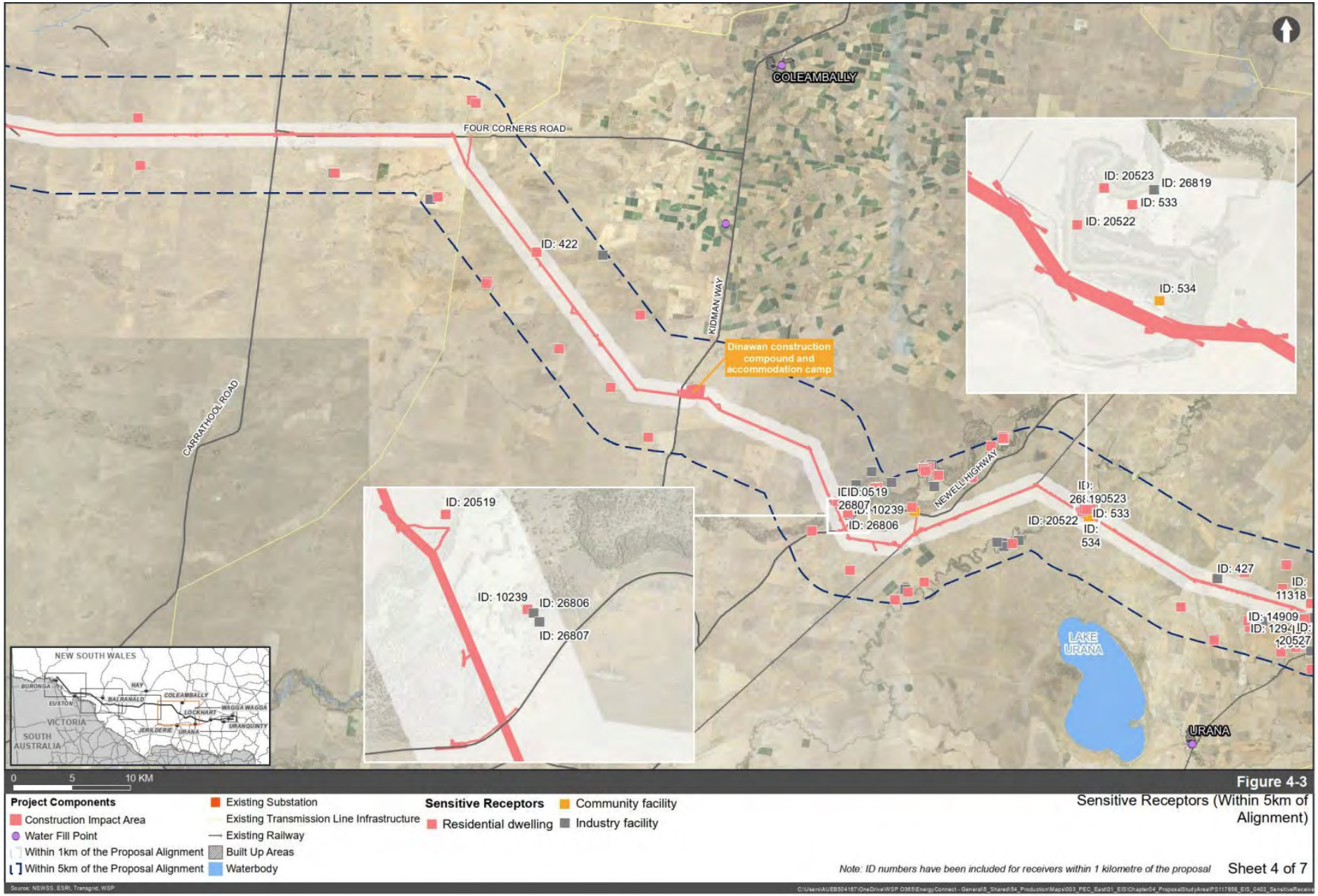


Figure 4-3
Sensitive Receptors (Within 5km of Alignment)
Sheet 3 of 7


COLEAMBALLY
FOUR CORNERS ROAD
ID: 422
KIDMAN WAY
Dinawan construction compound and accommodation camp
CARRATHOOL ROAD
NEWELL HIGHWAY
ID: 20523
ID: 26819
ID: 533
ID: 20522
ID: 534
ID: 20519
ID: 10239
ID: 26806
ID: 26807
ID: 427
ID: 11318
ID: 14909
ID: 20527
LAKE URANA
URANA
NEW SOUTH WALES
VICTORIA
SOUTH AUSTRALIA
BURONGA
HAY
EUSTON
BALRANALD
COLEAMBALLY
LOCKHART
WAGGA WAGGA
URANQUINTY
JERILDERIE
0 5 10 KM
Project Components
Construction Impact Area
Water Fill Point
Within 1km of the Proposal Alignment
Within 5km of the Proposal Alignment
Existing Substation
Existing Transmission Line Infrastructure
Existing Railway
Built Up Areas
Waterbody
Sensitive Receptors
Residential dwelling
Community facility
Industry facility
Note: ID numbers have been included for receivers within 1 kilometre of the proposal
Figure 4-3
Sensitive Receptors (Within 5km of Alignment)
Sheet 4 of 7

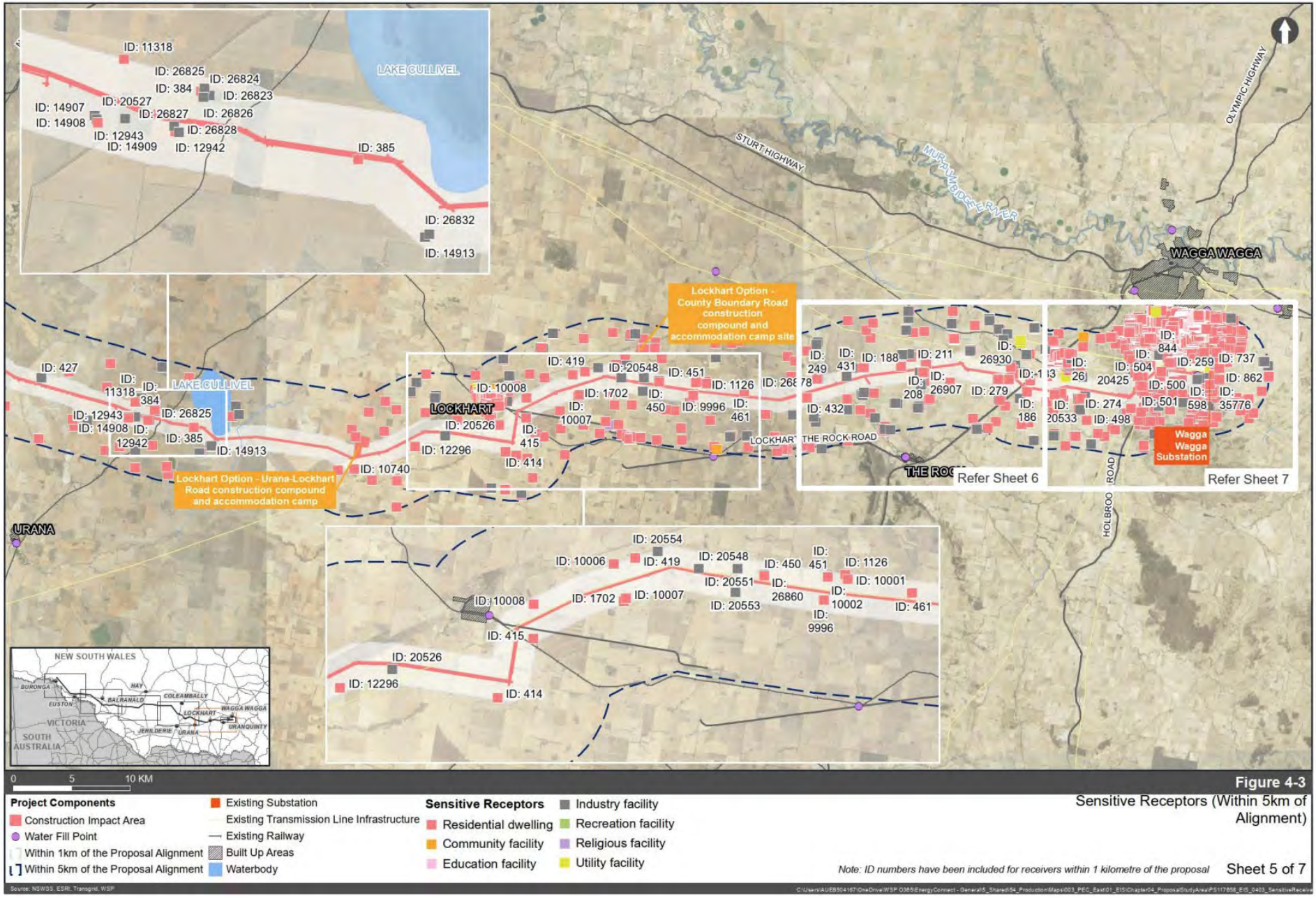
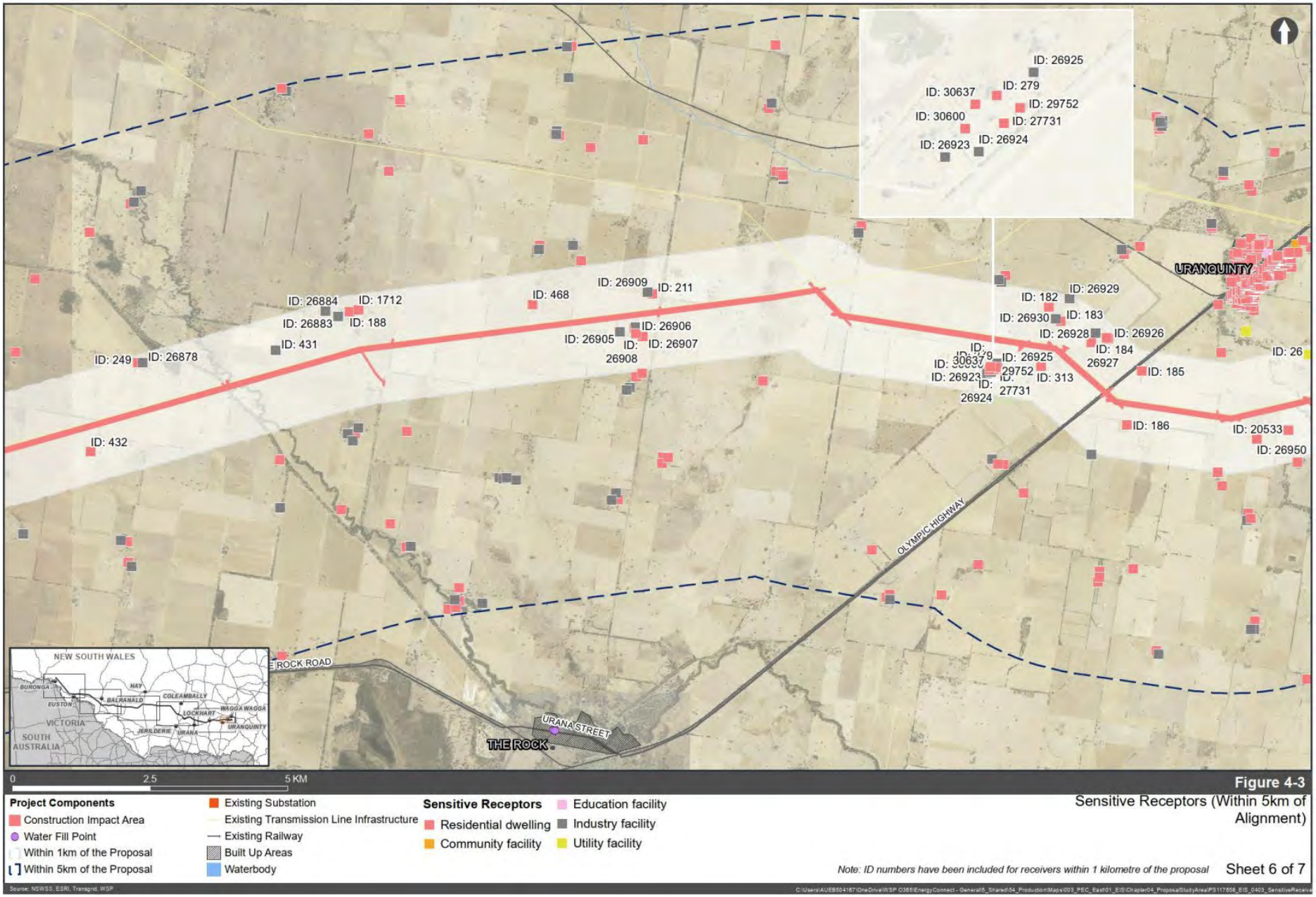


Figure 4-3
Sensitive Receptors (Within 5km of Alignment)
Sheet 5 of 7


ID: 26925
ID: 279
ID: 30637
ID: 29752
ID: 30600
ID: 27731
ID: 26923
ID: 26924
URANQUINTY
ID: 26884
ID: 1712
ID: 26883
ID: 188
ID: 431
ID: 249
ID: 26878
ID: 468
ID: 26909
ID: 211
ID: 26906
ID: 26905
ID: 26907
ID: 26908
ID: 182
ID: 26929
ID: 26930
ID: 183
ID: 26928
ID: 26926
ID: 184
26927
ID: 26
ID: 313
ID: 185
ID: 432
ID: 186
ID: 20533
ID: 26950
OLYMPIC HIGHWAY
ROCK ROAD
URANA STREET
THE ROCK
NEW SOUTH WALES
VICTORIA
SOUTH AUSTRALIA
BURONGA
HAY
EUSTON
BALRANALD
COLEAMBALLY
LOCKHART
WAGGA WAGGA
JERILDERIE
URANA
URANQUINTY
0
2.5
5 KM
Project Components
Construction Impact Area
Water Fill Point
Within 1km of the Proposal
Within 5km of the Proposal
Existing Substation
Existing Transmission Line Infrastructure
Existing Railway
Built Up Areas
Waterbody
Sensitive Receptors
Residential dwelling
Community facility
Education facility
Industry facility
Utility facility
Figure 4-3
Sensitive Receptors (Within 5km of Alignment)
Note: ID numbers have been included for receivers within 1 kilometre of the proposal
Sheet 6 of 7

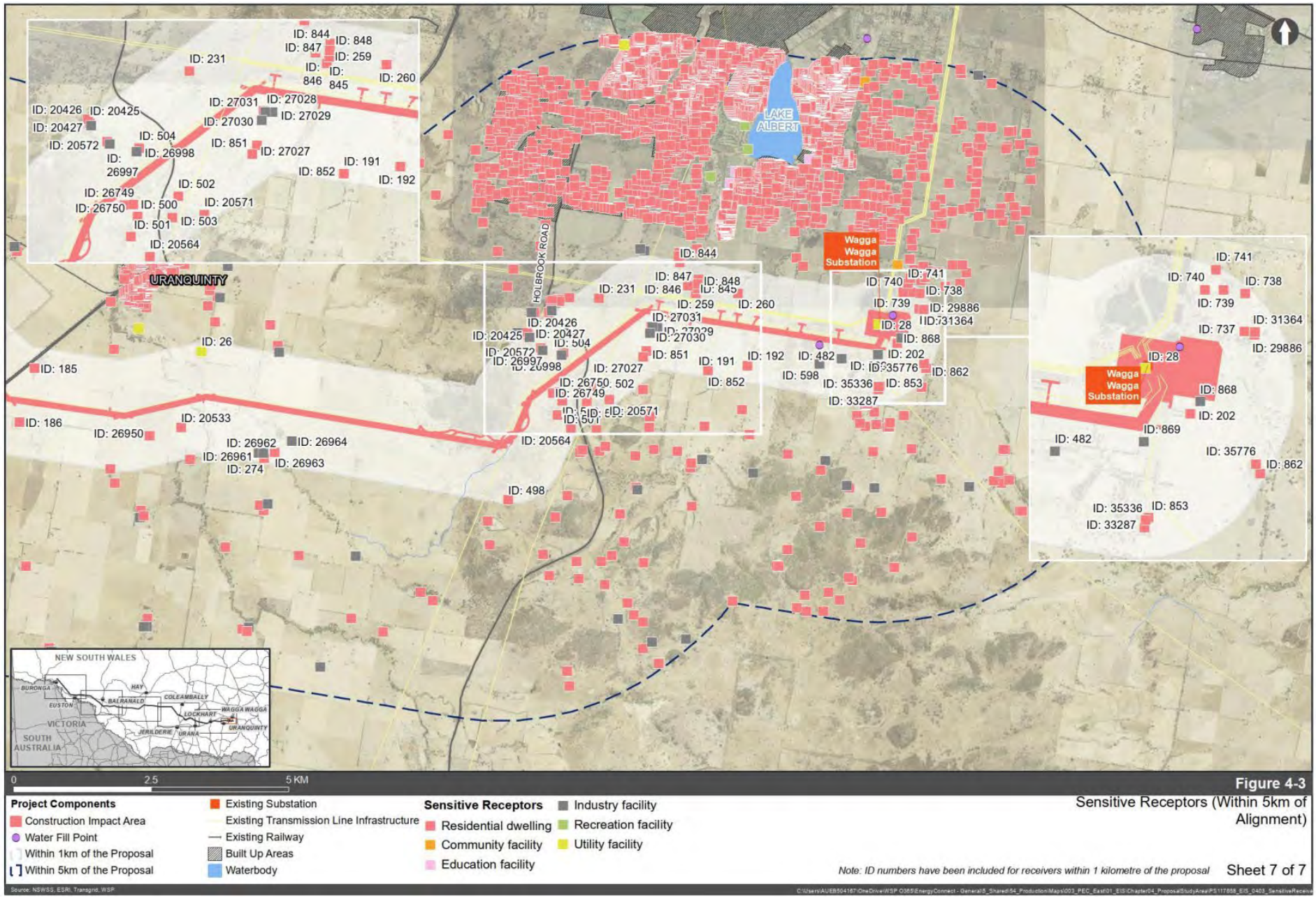


Figure 4-3
Sensitive Receptors (Within 5km of Alignment)
Sheet 7 of 7

Appendix C - Construction scenarios and noise levels for plant and equipment

Table C.1 Construction scenarios and associated plant and equipment – main construction compounds and accommodation camps (source: Appendix B-1 in Technical Paper 10 of the EIS)

WORK STAGE	EQUIPMENT	NUMBER OF ITEMS	USAGE FACTOR	BASE SWL
Enabling works – site establishment	Flatbed hi – ab truck	1	1	107
	Concrete agitator	1	0.5	109
	Concrete pump	1	0.5	102
	Bob cat	1	1	104
	10–15 tonne roller	1	1	109
	Watercart	1	1	107
	CAT 140M grader	1	0.5	113
	D8 Dozer	1	0.5	116
	30–45 tonne excavator	1	1	110
	20 tonne excavator	1	1	110
	12–15 tonne excavator	1	1	104
	7–10 tonne excavator	1	1	104
	5 tonne excavator	1	1	100
	Excavator with hammer	1	0.5	119
	12–15 tonne franna crane	1	0.5	98
	15–20 tonne franna crane	1	0.5	98
	70 tonne crane	1	0.2	113
	Backhoe	1	1	111
	Pneumatic jackhammer	1	0.5	115
	Dumper truck	1	2	110
	Elevated working platforms	1	0.5	98
	Chainsaw	1	0.1	114
	Mulcher/Chipper	1	0.1	116
	TOTAL			**125**
Compound operation	Front end loader	1	1	91
	Excavator (tracked) 35t	1	1	108
	Road truck	1	1	110
	Light vehicles	1	1	108
	Power generator	1	1	88
	Concrete batching plant	1	1	103
	TOTAL			**112**

Table C.2 Construction scenarios and associated plant and equipment – substation construction (source: Appendix B-1 in Technical Paper 10 of the EIS)

WORK STAGE	EQUIPMENT	NUMBER OF ITEMS	USAGE FACTOR	BASE SWL
Earthworks and Civil Construction Works (Substations)	Rigid tippers with trailers	3.00	1.00	110
	Compactor	2.00	1.00	106
	Flatbed Hi – Ab truck	1	1.00	107
	Tilt tray truck	1	1.00	103
	Concrete agitator	1	0.30	109
	Concrete pump	1	0.25	109
	Bob cat	2.00	1.00	104
	10–15 tonne roller	2.00	1.00	109
	Watercart	2.00	1.00	107
	Piling rig	1	0.10	116
	CAT 14M grader	1	1.00	113
	CAT 140M grader	1	0.50	113
	Scraper	7.00	1	110
	30–45 tonne excavator	1	1	110
	20 tonne excavator	1	0.50	110
	12–15 tonne excavator	1	1	104
	7–10 tonne excavator	1	1	104
	5 tonne excavator	1	1	100
	Excavator with hammer	1	0.20	122
	15–20 tonne franna crane	1	0.30	113
	Backhoe	1	1	111
	Pneumatic jackhammer	1	0.20	115
	<10t dump truck	3.00	1	110
	Articulated Dumper truck	2.00	1	110
	Rigid Dumper truck	2.00	1	110
	Elevated working platforms	1	0.10	98
	Asphalt plant	1	0.10	106
	Geotech boring rig	1	0.50	112
	Generator	1	3.00	103
	Trencher	1	1	105
	Chainsaw	3.00	1	114
	Mulcher/Chipper	2.00	1	116
	TOTAL			**127**

Table C.3 Construction scenarios and associated plant and equipment – early works at substations (source: Appendix B-1 in Technical Paper 10 of the EIS)

WORK STAGE	EQUIPMENT	NUMBER OF ITEMS	USAGE FACTOR	BASE SWL
Early works, and setout works (Substations)	Flatbed Hi – Ab truck	1	1	110
	Watercart	1	1	107
	Bob cat	1	1	104
	12-15 tonne excavator	1	1	104
	Geotech boring rig	1	1	112
	TOTAL			**115**
Access & Clearing	Rigid tippers with trailers	2.00	1	110
	Flatbed Hi – Ab truck	2.00	1	107
	Concrete agitator	1	0.10	109
	Concrete pump	1	0.05	109
	Bob cat	2.00	1	104
	10–15 tonne roller	2.00	1	109
	Watercart	2.00	1	107
	CAT 14M grader	1	2.00	113
	CAT 140M grader	1	1	113
	D8 Dozer with tree pusher	1	0.70	116
	30–45 tonne excavator	1	0.80	110
	20 tonne excavator	1	0.80	110
	Excavator with harvester	1	1	110
	Excavator with shears and grab	1	1	110
	Articulated Dumper truck	1	0.50	110
	Chainsaw	4.00	1	114
	Stump Grinder	2.00	1	116
	Mulcher/Chipper	2.00	1	116
	TOTAL			127

Table C.4 Construction scenarios and associated plant and equipment – transmission lines (source: Appendix B-1 in Technical Paper 10 of the EIS)

WORK STAGE	EQUIPMENT	NUMBER OF ITEMS	USAGE FACTOR	BASE SWL
Early works, and setout works (Transmission lines)	Flatbed Hi – Ab truck	1	1	110
	Watercart	1	1	107
	Geotech boring rig	1	1	112
	TOTAL			**114**
Early works, and setout works (Substations)	Flatbed Hi – Ab truck	1	1	110
	Watercart	1	1	107
	Bob cat	1	1	104
	12-15 tonne excavator	1	1	104
	Geotech boring rig	1	1	112
	TOTAL			**115**
Access & Clearing	Rigid tippers with trailers	2.00	1	110
	Flatbed Hi – Ab truck	2.00	1	107
	Concrete agitator	1	0.10	109
	Concrete pump	1	0.05	109
	Bob cat	2.00	1	104
	10–15 tonne roller	2.00	1	109
	Watercart	2.00	1	107
	CAT 14M grader	1	2.00	113
	CAT 140M grader	1	1	113
	D8 Dozer with tree pusher	1	0.70	116
	30–45 tonne excavator	1	0.80	110
	20 tonne excavator	1	0.80	110
	Excavator with harvester	1	1	110
	Excavator with shears and grab	1	1	110
	Articulated Dumper truck	1	0.50	110
	Chainsaw	4.00	1	114
	Stump Grinder	2.00	1	116
	Mulcher/Chipper	2.00	1	116
	TOTAL			127

WORK STAGE	EQUIPMENT	NUMBER OF ITEMS	USAGE FACTOR	BASE SWL
Earthworks and Civil Construction Works (Transmission Lines)	Prime mover and semi trailer	1	1	108
	Flatbed Hi – Ab truck	1	1	107
	Tilt tray truck	1	1	103
	Concrete agitator	1	0.50	109
	Concrete pump	1	0.40	109
	Bob cat	4.00	1	104
	10–15 tonne roller	1	1	109
	Watercart	3.00	1	107
	Piling rig	1	1	116
	CAT 140M grader	1	0.50	113
	D8 Dozer with tree pusher	1	1	116
	30–45 tonne excavator	1	1	110
	20 tonne excavator	1	0.50	110
	12–15 tonne excavator	1	1	104
	7–10 tonne excavator	1	1	104
	5 tonne excavator	1	1	100
	Excavator with hammer	1	0.50	122
	15–20 tonne franna crane	1	1.00	113
	Backhoe	1	1.00	111
	Pneumatic jackhammer	1	1.00	115
	<10t dump truck	1	1.00	110
	Articulated Dumper truck	1	0.50	110
	Elevated working platforms	1	1.00	98
	Asphalt plant	1	0.20	106
	Geotech boring rig	1	0.50	112
	Generator	1	1.00	103
	TOTAL			**125**

WORK STAGE	EQUIPMENT	NUMBER OF ITEMS	USAGE FACTOR	BASE SWL
Tower Assembly	Prime mover and semi-trailer	1 to 3	1	108
	Flatbed Hi – Ab truck	1 to 3	1	107
	Watercart	1	1	107
	15–20 tonne franna crane	2 to 3	1	98
	50 tonne crane	1	1	113
	70 tonne crane	1	0.50	113
	130 tonne crane [1]	2.00	1	113
	300 tonne crane	1	0.20	113
	Elevated working platforms	4.00	1	98
	Generator	2 to 5	1	103
	TOTAL			**120-121**
Tower Erection	Prime mover and semi-trailer	3.00	1	108
	Flatbed Hi – Ab truck [1,2]	1 to 2	1	107
	Bob cat	1	1	104
	Watercart	1	1	107
	70 tonne crane	1	1	113
	130 tonne crane	1	0.50	113
	200 tonne crane	1	0.50	113
	300 tonne crane	2.00	1	113
	Backhoe	1	1	111
	Elevated working platforms	4.00	1	98
	Generator [1]	2.00	1	103
	TOTAL			**121**