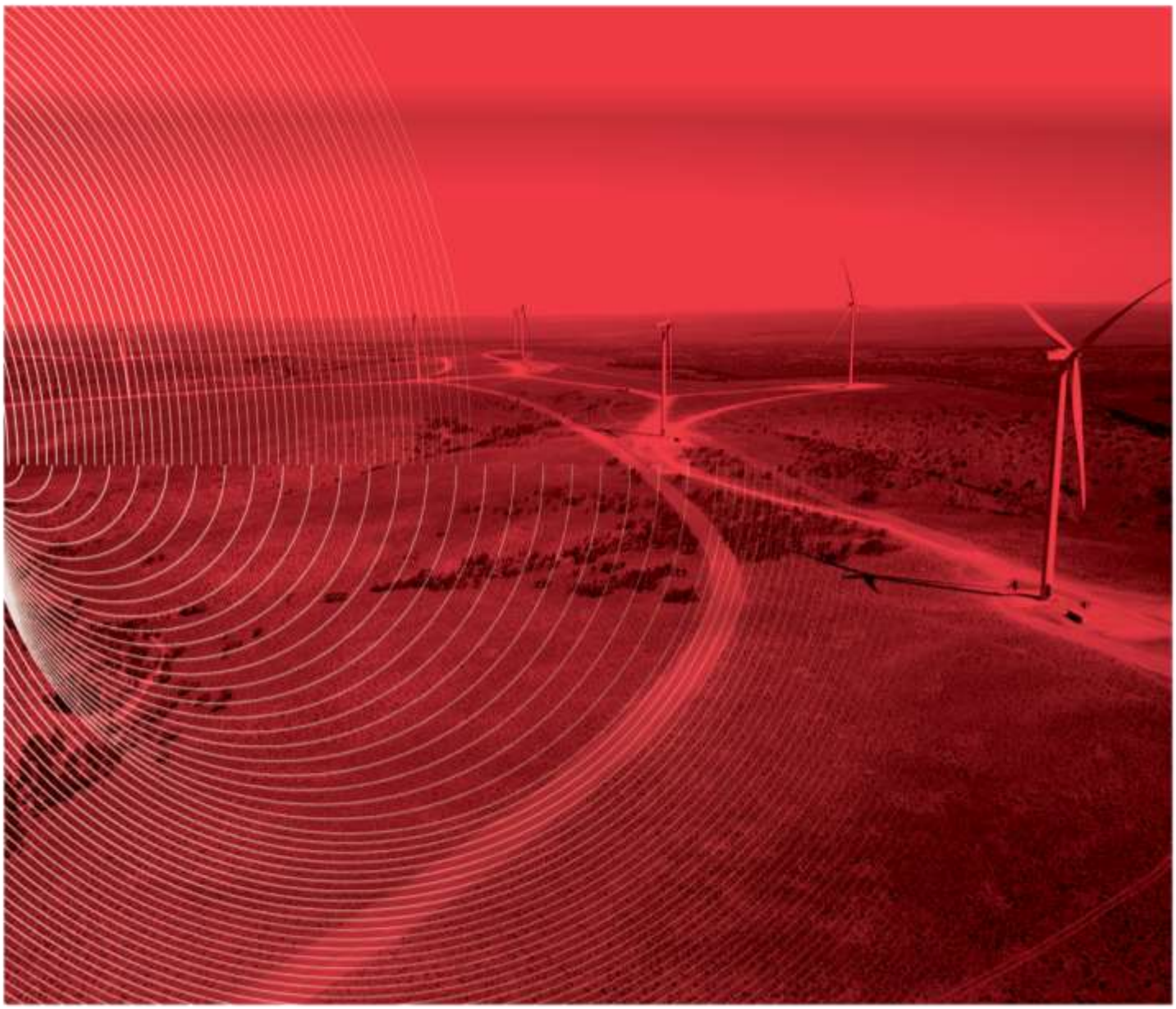
Prepared for Flyers Creek Wind Farm Pty Ltd by Nacap Pty Ltd

Flyers Creek Wind Farm Project

CONSTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN

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REVISION HISTORY

This table describes the primary reason for the production of each new revision after Rev 0

Date	Rev.	Reason for change

SIGNATURE BLOCK

Rev.	Description	*BR*	*BT*	*pp PL*	*PL*	
D	**Issued for Approval**	**Prepared** Brett Rodgers	**Reviewed** Brian Treacy	**QA** Nic Fusca	**Approved** Peter Logan	**Approval Date** 11/05/2020

The first Issued for Use version of this plan will start Revision 0. Revision numbers shall use a sequential numbering system commencing at Rev. 01, 02, etc.

Treacy, Brian

This document is considered uncontrolled when printed.

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ACTIVITY		DESCRIPTION	REFERENCES
1.	**GENERAL INFORMATION**		
1.1	Purpose	This Construction Noise and Vibration Management Plan (CNVMP) has been prepared to satisfy the requirements of Condition F21 (b) of the Project Approval and incorporates related Conditions of Approval (CoA) and relevant commitments from the Flyers Creek Wind Farm Environmental Assessment (EA) 2011 and modifications that have been subsequently approved. The CNVMP has been prepared to ensure construction activities are carried out in accordance with the CoA, relevant regulatory requirements, standards, procedures and current best practice to ensure that all reasonable and practical measures are implemented to ensure that the potential impacts arising from construction noise and vibration are minimised. This CNVMP adopts an integrated approach, considering and identifying management measures overarching the sequencing of construction related activities. All works are to be implemented in accordance with the management measures and strategies contained in this plan.	-
1.2	Conditions of Approval (CoA)	This plan and its associated management measures have been prepared to comply with the following CoA: • F21 (b): Construction Noise & Vibration Management Plan; • F3, F4, F5 Construction Hours; and • F6, F7, F8, F9 Construction Noise and Vibration.	Project Approval (MP 08_0252) Section 4.2.
1.3	CEMP Structure and relationship with sub-plans	This CNVMP forms one of the FCWF Construction Environment Management Plan (CEMP) sub plans. The FCWF CEMP (CoA F20) comprises three Sections: • **PART A**: Provides background information and the overarching systems approach to environmental management and mitigation controls for the project • **PART B**: Comprising Appendices in support of PART A, and • **PART C**: Comprising the required series of environmental management sub-plans outlined in CoA F21 including; (a) Construction Compound and Ancillary Facilities Management Plan (b) **Construction Noise and Vibration Management Plan (this Plan)** (c) Construction Traffic and Access Management Plan (d) Construction Soil and Water Quality Management Plan (e) Construction Heritage Management Plan (f) Construction Flora and Fauna Management Plan (g) Construction Air Quality Management Plan, and (h) Bushfire Management Plan.	Construction Environmental Management Plan
1.4	Scope	This CNVMP applies to all aspects of Noise and Vibration for the construction phase of the Project. This CNVMP will inform Project Managers, Supervisors, Construction Personnel, Subcontractors and relevant stakeholders for the management of noise and vibration during construction activities. This CNVMP forms part of the Construction Environmental Management Plan (CEMP) and describes the mitigation and management measures and protocols derived from the EA. This management plan applies only to the Construction phase of the proposed works.	-
1.5	Objectives and Targets	The objectives and targets for the Flyers Creek Wind Farm Project to be undertaken by GE and CPP-Nacap in relation to construction noise and vibration are listed in Table 1 Objectives and Targets.	-

Table 1 Objectives and Targets

Objective	Target
Minimise noise and vibration impacts on residential receivers generated as a result of construction activities.	Zero complaints from the community as a result of noise and vibration generation.
Ensure all personnel, subcontractors and visitors are inducted, consulted and receive regular updates and information on project noise and vibration aspects and impacts for duration of works.	100% Completion of Project Inductions Daily Pre-Start Noise and Vibration Inputs by Environment Team Monthly Toolbox Noise and Vibration Inputs by Environment Team
Ensure that personnel and subcontractors are aware of hazards and risks associated with construction activities and relevant scope of work under the contract	100% attendance recorded at SWMS workshops Induction of all personnel
To conduct construction activities in compliance with all relevant approvals and environmental legislation.	100% Compliance No regulatory infringements, including provisional improvement notices and prosecutions
Promote a positive reporting culture. To minimise the occurrence and severity of environmental incidents during construction activities.	All incidents to be reported within 2 hours and investigated appropriately.

ACTIVITY		DESCRIPTION		REFERENCES
		Ensure all corrective actions are closed out by the nominated due dates	No corrective actions outstanding past due date >7 days	
1.6	Consultation	Consultation on this Plan is not required under the CoA. It will be reviewed by the NSW Department of Planning, Industry and Environment (DPIE) during their approval process.		-
1.7	Certification and Approval	The CNVMP is required to be submitted for approval by the Secretary of the DPIE at least one month prior to commencement of construction or as otherwise agreed by the Secretary.		-
1.8	Distribution	A controlled hard copy of this CNVMP will be maintained and reside at the Project construction site office. Approved copies of this CNVMP and supporting documentation will be distributed to the Project team, the DPIE, all relevant personnel and interested third parties as required. It will also be available to view on the Project website: www.flyerscreekwindfarm.com		-
1.9	Reference Documents	This CNVMP applies to all aspects of construction for the project and has been informed by the following: • Principal Project Approval Minister for Planning and Infrastructure No MP 08_0252 dated 14 March 2014 and consolidated Conditions of Approval dated June 2019; • Project Environmental Assessment prepared by Aurecon, 2011, specifically: ○ Chapter 12 – Noise; ○ Chapter 19 – Statement of Commitments; ○ Appendix G1 – Noise Impact Assessment; ○ Appendix G2 – Background Noise Monitoring; • Modification 3 Planning Application prepared by Flyers Creek Wind Farm Pty Ltd (FCWFPL), 3 May 2017; and • Modification 4 Planning Application prepared by FCWFPL, 27 July 2018.		-
2. DEFINITIONS AND ABBREVIATIONS				
2.1	Definitions	Associated Residence	Any residence on privately owned land where the owner has reached a commercial or in kind agreement with Flyers Creek Windfarm Pty Ltd.	
		Aspect	An element of an organisation's activities or products or service that can interact with the environment.	-
		Audit	A systematic review of management systems being applied on the Project.	
		Client and or Proponent	Flyers Creek Wind Farm Pty Ltd (FCWFPL)	
		CPP	Consolidated Power Projects Pty Ltd	
		Form 2	CPP-Nacap utilise a system, which acts as a project control gateway (known as a Form 2) for each construction activity to commence. The Form 2 is a document reviewed and signed off by the various Project discipline leads and Project Manager. This form is a pre-commencement gateway for each construction activity within a discrete section of works. The Form 2 is a key means of communicating to the activity supervisor management controls for any given portion of the works.	
		GE	General Electric International Inc.	
		Impact	Any change to the environment whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects.	
		Incident	A set of circumstances that: • causes or threatens to cause material harm to the environment; and/or • breaches or exceeds the limits or performance measures/criteria in this approval	
		Inspection	Review or check on the environment requirements being implemented.	
		Management Measure	An addition to those measures outlined in the Conditions of Approval and are intended to assist in the migration and prevention of non-conformances against the CoA during the Flyers Creek Wind Farm Project lifecycle.	
		Nacap	Nacap Pty Ltd	
		Non- Associated Residence	Any residence on privately owned land where the owner has not entered into a commercial or in kind agreement with Flyers Creek Windfarm Pty Ltd.	
		Obligation	A legal relationship between two entities in which one entities' right is the other entities' duty.	
		Project	Flyers Creek Wind Farm Project	
		Regulatory Requirements	Government acts and regulations that are environment specific which prescribe legal obligations encompassing the client and contractor and amongst other things, registration of projects and plant, certificates to operate machinery and undertake certain trades and notification of injuries.	

ACTIVITY	DESCRIPTION		REFERENCES
	Statement of Commitments	Commitments outlined in Chapter 19 of the Project Environmental Assessment	
2.2 Abbreviations	BNL	Background Noise Level	
	CEMP	Construction Environmental Management Plan	
	CNVMP	Construction Noise and Vibration Management Plan	
	CoA	Conditions of Approval	
	cBOP	Civil Balance of Plant	
	dB	Decibel	
	DECC	Department of Environment and Climate Change (now Environment Energy and Science Group)	
	DPIE	Department of Planning, Industry and Environment	
	EA	Environmental Assessment	
	eBOB	Electrical Balance of Plant	
	EMP	Environmental Management Plan	
	EP&A	Environmental Planning and Assessment	
	EPA	Environment Protection Authority	
	EPL	Environment Protection Licence	
	FCWF	Flyers Creek Wind Farm	
	Hz	Hertz	
	ICNG	Interim Construction Noise Guidelines	
	km	Kilometre	
	LGA	Local Government Area	
	LAeq	Level A Equivalent	
	NPW	National Parks and Wildlife	
	NSW	New South Wales	
	NML	Noise Management Level	
	RBL	Rating Background Level	
	SSD	State Significant Development	
	SWMS	Safe Work Method Statement	
3. PROJECT INFORMATION			
3.1 Project Background and Description	Flyers Creek Wind Farm Pty Ltd (the Proponent) forms part of the Infigen Energy corporate group (Infigen). Infigen Energy is a developer, owner and operator of generation assets delivering energy solutions to Australian businesses and large retailers. The FCWF is an approved 38 wind turbine wind farm located approximately 20km south of Orange NSW. The Project is located predominantly in the Blayney Shire local government area with part of the proposed 132 kilovolt transmission line and switching station being located in Cabonne Shire Council local government area. Project approval MP 08_0252 was granted under Part 3A of the Environmental Planning and Assessment Act 1979 (NSW) (EP&A Act) to the Proponent for the Project by the NSW Planning and Assessment Commission on 14th March 2014. The Project Approval has been modified 4 times since originally being granted and was transitioned to State significant development (SSD) on 6th July 2018. The Project approval authorises the construction and operation of a wind farm and associated infrastructure including access tracks, local road infrastructure upgrades and electrical connections between the turbines (underground cable reticulation, also underground and aboveground powerlines), an on-site substation (inclusive of switch room, control room and auxiliary services building) and a 132-kilovolt transmission line and switching station to connect the Project to the grid. General Electric Pty Ltd (GE), Nacap Pty Ltd (Nacap) and Consolidated Power Projects Pty Ltd (CPP) will function as a consortium to collaboratively deliver the Project scope of works. GE will execute works associated with the wind turbine generator supply, installation and commissioning. Nacap will undertake detailed design and construct the civil Balance of Plant (cBOP) works associated with wind turbines, substation and underground cabling network. CPP will execute the electrical Balance of Plant (eBOP).		-
4. EXISTING PROJECT ENVIRONMENT			
4.1 Legislation and Guidelines	The following legislation and guidelines provide the primary context for construction noise and vibration management in NSW: • Environmental Planning and Assessment Act 1979 (EP&A Act) • Protection of the Environment Operations Act 1997 (POEO Act) • Protection of the Environment Operations (Noise Control) Regulation 2008 (POEO Regulation) • Interim Construction Noise Guidelines (DECC 2009) (ICNG) • Assessing Vibration, A Technical Guideline (DECC 2006) • German Standard *DIN 4150- 3: Structural Vibration - effects of vibration on structures, and* • Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration.		-

ACTIVITY	DESCRIPTION	REFERENCES
4.2 Conditions of Approval	This Plan has been prepared to comply with the MP 08_0252 Project Approval (as modified), dated June 2019 and specifically the requirements of CoA F21 (b) as listed in Table 2 Conditions of Approval. As part of the CEMP for the Project required under condition F20, the Proponent shall prepare and implement a CNVMP.	

Table 2 Conditions of Approval

CoA	Condition	Refer to Section within This Plan
F21 (b)	A Construction Noise & Vibration Management Plan to detail how the construction noise and vibration impacts will be minimised and managed. The Plan shall be consistent with the guidelines contained in the *Interim Construction Noise Guidelines* (DECC, 2009) and shall include, but not limited to:	This Plan
	i) identification of sensitive receivers and relevant construction noise and vibration goals applicable to the Project stipulated in this approval;	Section 4.3 Section 6 Appendix A
	ii) details of construction activities and an indicative schedule for construction works, including the identification of key noise and / or vibration generating construction activities (based on representative construction scenarios, including at ancillary facilities) that have the potential to generate noise and / or vibration impacts on surrounding sensitive receivers;	Section 4.4 Section 4.9
	iii) identification of feasible and reasonable measures proposed to be implemented to minimise and manage construction noise and vibration impacts (including construction traffic noise impacts);	Section 6
	iv) procedures and mitigation measures to ensure relevant vibration and blasting criteria are achieved, including a suitable blast program, applicable buffer distances for vibration intensive works, use of low-vibration generating equipment / vibration dampeners or alternative construction methodology, and pre- and post- construction dilapidation surveys of sensitive structures where blasting and / or vibration is likely to result in damage to buildings and structures (including surveys being undertaken immediately following a monitored exceedance of the criteria);	Section 6
	v) a description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often this monitoring would be conducted, the locations where monitoring would take place, how the results of this monitoring would be recorded and reported, and, if any exceedance is detected, how any non-compliance would be rectified; and	Section 6
	vi) mechanisms for the monitoring, review and amendment of this Plan.	Section 8.3
F3	Unless the Secretary agrees otherwise, construction activities shall be undertaken during the following standard construction hours: a) 7:00am to 6:00pm Mondays to Fridays; b) 8:00am to 1:00pm Saturdays; and c) at no time on Sundays or public holidays.	Section 4.8 Section 6
F4	Construction works outside of the standard construction hours identified in F3 may be undertaken in the following circumstances: a) construction works that generate noise that is: i. no more than 5 dB(A) above rating background level at any residence in accordance with the Interim Construction Noise Guideline (DECC, 2009); and ii. no more than the noise management levels specified in Table 3 of the Interim Construction Noise Guideline (DECC, 2009) at other sensitive receivers; or b) for the delivery of materials required outside these hours by the NSW Police Force or authorities for safety reasons; or c) where it is required in an emergency to avoid the loss of lives, property and / or to prevent environmental harm; or d) works approved through an EPL; or e) works as approved through the out-of-hours work protocol outlined in the Construction Noise and Vibration Management Plan required under condition F21 (b).	Section 4.88 Section 6 Appendix B
F5	Except as expressly permitted by the EPL, activities resulting in impulsive or tonal noise emission (such as rock breaking, rock hammering, pile driving) shall only be undertaken: a) between the hours of 8:00am to 5:00pm Monday to Friday; b) between the hours of 8:00am to 1:00pm Saturday; and	Section 6

<table>
<tr><th>ACTIVITY</th><th>DESCRIPTION</th><th>REFERENCES</th></tr>
<tr><td></td><td>
<table>
<tr><td></td><td>c) in continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block.
For the purposes of this condition ‘continuous’ includes any period during which there is less than a one hour respite between ceasing and recommencing any of the work the subject of this condition.</td><td></td></tr>
<tr><td>F6</td><td>The Project shall be constructed with the aim of achieving the construction noise management levels detailed in the Interim Construction Noise Guideline (DECC, 2009). All feasible and reasonable noise mitigation measures shall be implemented and any activities that could exceed the construction noise management levels shall be identified and managed in accordance with the Construction Noise and Vibration Management Plan required under condition F21(b).

Note: The Interim Construction Noise Guideline identifies ‘particularly annoying’ activities that require the addition of 5dB(A) to the predicted level before comparing to the construction noise management levels.</td><td>Section 4
Section 6</td></tr>
<tr><td>F7</td><td>The Project shall be constructed with the aim of achieving the following construction vibration goals
a) for structural damage, the vibration limits set out in the German Standard DIN 4150- 3: Structural Vibration - effects of vibration on structures; and
(b) for human exposure, the acceptable vibration values set out in the Environmental Noise Management Assessing Vibration: A Technical Guideline (DEC, 2006).</td><td>Section 4
Section 6</td></tr>
<tr><td>F8</td><td>Air blast overpressure generated by blasting associated with the Project shall not exceed the criteria specified in Table 3 when measured at the most affected residence or other sensitive receiver.
Table 3 Air blast overpressure criteria
<table>
<tr><th>Airblast overpressure (dB(Lin Peak))</th><th>Allowable Exceedance</th></tr>
<tr><td>115</td><td>5% of total number of blasts over a 12-month period</td></tr>
<tr><td>120</td><td>0%</td></tr>
</table></td><td>Section 6</td></tr>
<tr><td>F9</td><td>Ground vibration generated by blasting associated with the Project shall not exceed the criteria specified in Table 4 when measured at the most affected residence or other sensitive receiver.
Table 4 Peak particle velocity criteria
<table>
<tr><th>Receiver</th><th>Peak particle velocity (mm/s)</th><th>Allowable Exceedance</th></tr>
<tr><td>Residence on privately owned land</td><td>5</td><td>5% of total number of blasts over a 12-month period</td></tr>
<tr><td></td><td>10</td><td>0%</td></tr>
<tr><td>Historic heritage item</td><td>3</td><td>0%</td></tr>
</table></td><td>Section 6</td></tr>
</table>
</td><td></td></tr>
<tr><td>4.3 Residences and Sensitive Receivers</td><td>The most recent assessment undertaken as part of Planning Modification 4 identified 103 residences within three kilometres of the project (measured between the residence, the closest wind turbine location and 132kV OHL). A total of 34 of these receivers have entered into an agreement with the Project and are considered associated residences. The remaining 69 residences are non-associated residences – refer to Table 5. Refer to Appendix A for resident receiver locations.
Table 5 Distribution of Residences within three kilometres
<table>
<tr><th>Distance of residence from nearest turbine</th><th>Total number of residences</th><th>Wind Farmer Associated Residences</th><th>Non-Associated Residences</th></tr>
<tr><td>0-1 km</td><td>8</td><td>5</td><td>3</td></tr>
<tr><td>1-2 km</td><td>45</td><td>16</td><td>29</td></tr>
<tr><td>2-3 km</td><td>50</td><td>13</td><td>37</td></tr>
<tr><td>Total</td><td>103</td><td>34</td><td>69</td></tr>
</table>
Source: Modification 4 2018, Appendix B Figure 4.
* Distance is measured to nearest turbine</td><td>EA 2018

Appendix A</td></tr>
</table>

<table>
<tr><th>ACTIVITY</th><th>DESCRIPTION</th><th>REFERENCES</th></tr>
<tr><td>4.4 Construction Noise Modelling</td><td>During construction, there will be movements of various types of vehicles, cranes, earthmoving plant and use of portable power equipment (air-compressors, generators and electrical power tools), as well as noise from activity areas such as a site office, workshop, laydown area, concrete batch plant and storage sheds. The noise during construction from these equipment and facilities will be variable, intermittent and temporary.

As most residences in the area are distant from the local roads and because of the rural nature of the area, traffic noise levels are not expected to exceed EPA
policy levels. The traffic movements will be primarily during daylight hours consistent with the approved construction work hours and for any particular vehicle will be a short term temporary impact.

In accordance with the Interim Construction Noise Guidelines 2009, the Project background noise level (BNL), subsequent predicted noise levels and adopted construction noise levels have been derived and presented below.</td><td>-</td></tr>
<tr><td>4.4.1 Background Noise Level</td><td>The Project Environmental Assessment (2011) measured existing background noise levels. Existing background noise levels were measured at five representative residential receiver locations and weather stations were installed at three of the five representative receiver locations. Table 6 identifies the measured background noise levels.

Table 6 Background Noise Levels
<table><tr><th>Receiver</th><th>Distance (km)*</th><th>Average background noise level L_{A90} dB(A)</th><th>Average Daytime Ambient Noise Level LAeq dB(A)</th></tr><tr><td>R012</td><td>2.3</td><td>35</td><td>44</td></tr><tr><td>R025</td><td>1.1</td><td>33</td><td>41</td></tr><tr><td>R027</td><td>1.8</td><td>40</td><td>52</td></tr><tr><td>R078</td><td>1.2</td><td>35**</td><td>46</td></tr><tr><td>R089</td><td>1.2</td><td>40</td><td>51</td></tr></table>
Source: Project EA 2011 Appendix G2 Noise Impact Assessment.
**Modification 2 - R078 Additional Background Noise Measurements</td><td>EA 2011 Chapter 12 Appendix G2</td></tr>
<tr><td>4.4.2 Predicted Construction Noise Sources</td><td>Table 7 provides a list of equipment that could be used on site during construction and their predicted worst case noise levels at various distances derived from the EA 2011.

Table 7 Predicted noise level at various receiver distances for construction equipment
<table><tr><th></th><th colspan="4">Noise level (dB(A) (LAeq))</th></tr><tr><th>Equipment</th><th>500m</th><th>1000m</th><th>1500m</th><th>2000m</th></tr><tr><td>Compactor</td><td>45-52</td><td>38-45</td><td>33-40</td><td>29-36</td></tr><tr><td>Concrete mixer truck</td><td>35-44</td><td>28-37</td><td>23-32</td><td><30</td></tr><tr><td>Concrete pump</td><td><30</td><td><30</td><td><30</td><td><30</td></tr><tr><td>Large crane</td><td>46-50</td><td>39-41</td><td>34-36</td><td>30-32</td></tr><tr><td>Crushing plant</td><td>45-52</td><td>38-45</td><td>33-40</td><td>29-36</td></tr><tr><td>Front end loader / dozer</td><td>46-50</td><td>39-41</td><td>34-36</td><td>30-32</td></tr><tr><td>Excavator</td><td>42-46</td><td>35-39</td><td>30-34</td><td>26-30</td></tr><tr><td>Grader</td><td>42-46</td><td>35-39</td><td>30-34</td><td>26-30</td></tr><tr><td>Piling</td><td>44-49</td><td>37-42</td><td>32-37</td><td>28-33</td></tr><tr><td>Roller</td><td><30</td><td><30</td><td><30</td><td><30</td></tr></table>
Table 8 provides an indication of the likely noise levels for a combination of noise sources for a specific group of activities derived from the EA 2011.

Table 8 Predicted Noise Levels (worst case scenario)
<table><tr><th>Construction Type</th><th>Units Used/Activities</th><th>Maximum Expected Noise Level (dB(A)) at the nearest relevant receiver</th></tr><tr><td>WTG erection</td><td>Crane, concrete truck, front end loader</td><td>43 dB(A)</td></tr><tr><td>Road preparation</td><td>Grader, roller, compactor</td><td>45 dB(A)</td></tr><tr><td>WTG foundation preparation</td><td>Excavator, drilling</td><td>42 dB(A)</td></tr></table></td><td>EA 2011 Chapter 12 Appendix G2</td></tr>
</table>

<table>
<tr><th>ACTIVITY</th><th>DESCRIPTION</th><th>REFERENCES</th></tr>
<tr><td>4.4.3 Adopted Construction Noise Management Levels (NMLs)</td><td>
The construction noise management levels from the ICNG are presented in Table 9.

Table 9 Construction Noise Management Levels
<table>
<tr><th>Time of Day</th><th>Management Level (LAeq (15 min))</th></tr>
<tr><td>Recommended standard hours</td><td>Noise affected
RBL + 10 dB
The noise affected level represents the point above which there may be some community reaction to noise.
• Where predicted or measured LAeq (15 min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet noise affected level.
• The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.</td></tr>
<tr><td></td><td>Highly noise affected
75dB(A)
The highly noise affected level represents the point above which there may be strong community reaction to noise.
• Where noise is above this level, the relevant authority may require respite periods by restricting the hours that the very noisy activities can occur, taking into account:
1. times identified by the community when they are less sensitive to noise
2. if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.</td></tr>
<tr><td>Outside recommended standard hours</td><td>• A strong justification would typically be required for works outside the recommended standard hours.
• The proponent shall apply all feasible and reasonable work practices to meet noise affected level.
• Where all feasible and reasonable practices have been applied and noise is more than 5dB(A) above the noise affected level, the proponent should negotiate with the community.</td></tr>
</table>
The existing background noise levels have indicated the rating background level (RBL) (as derived in accordance with the Industrial Noise Policy (EPA, 2000)). Table 10 identifies the adopted project specific construction NMLs.

Table 10 Adopted Construction Noise Management Levels
<table>
<tr><th>Receiver</th><th>RBL</th><th>NML (day)</th><th>NML (OOHW)</th><th>Highly affected</th></tr>
<tr><td>R012</td><td>35</td><td>45</td><td>40</td><td>75</td></tr>
<tr><td>R025</td><td>33</td><td>43</td><td>38</td><td>75</td></tr>
<tr><td>R027</td><td>40</td><td>50</td><td>45</td><td>75</td></tr>
<tr><td>R078</td><td>35</td><td>45</td><td>40</td><td>75</td></tr>
<tr><td>R089</td><td>40</td><td>50</td><td>45</td><td>75</td></tr>
</table>
</td><td>ICNG 2009</td></tr>
<tr><td>4.5 Blasting Criteria/Limits</td><td>
Blasting noise will be assessed in accordance with the Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration. Air blast overpressure generated by blasting associated with the Project should not exceed the criteria specified in Table 11 when measured at the most affected residence or other sensitive receiver (in accordance with CoA F8).

Table 11 Air blast overpressure criteria
<table>
<tr><th>Air blast overpressure (dB(Lin Peak))</th><th>Allowable Exceedance</th></tr>
<tr><td>115</td><td>5% of total number of blasts over a 12-month period</td></tr>
<tr><td>120</td><td>0%</td></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th>ACTIVITY</th><th>DESCRIPTION</th><th>REFERENCES</th></tr>
<tr><td>4.6 Vibration Criteria/Limits</td><td>
In accordance with CoA F7, limits for structural damage for short term vibration are in accordance with the German Standard DIN 4150 Part 3 Structural vibration – Effects of vibration on structures.

Table 12 DIN 4150-3 Structural damage guideline limits
<table>
<tr><th></th><th></th><th colspan="4">Vibration velocity (mm/s)</th></tr>
<tr><th>Group</th><th>Type of Structure</th><th colspan="3">At foundation, frequency of</th><th>Upper storey</th></tr>
<tr><th></th><th></th><th>1-10 Hz</th><th>10-50 Hz</th><th>50-100 Hz</th><th>All frequencies</th></tr>
<tr><td>1</td><td>Buildings used for commercial purposes, industrial and buildings of similar design</td><td>20</td><td>20 to 40</td><td>40 to 50</td><td>40</td></tr>
<tr><td>2</td><td>Dwellings and buildings of similar design and occupancy</td><td>5</td><td>5 to 15</td><td>15 to 20</td><td>15</td></tr>
<tr><td>3</td><td>Structures that because of their particular sensitivity to vibration are not similar to dwellings or commercial buildings and have intrinsic values (e.g. Under a preservation order)</td><td>3</td><td>3-8</td><td>8-10</td><td>8</td></tr>
</table>
</td><td>-</td></tr>
<tr><td>4.7 Safe Working Distances</td><td>
Construction vibration can lead to cosmetic and structural building damage and loss of amenity due to perceptible vibration, termed human comfort. Cosmetic damage is regarded as minor in nature, it is readily repairable and does not affect a building's structural integrity. It is described as hairline cracks on drywall surfaces, hairline cracks in mortar joints and cement render, enlargement of existing cracks, and separation of partitions or intermediate walls from load bearing walls. If there is no significant risk of cosmetic damage, then structural damage is not considered a significant risk and is not assessed.

Recommended safe working distances for achieving human comfort (Assessing Vibration: a technical guideline, (DECC, February 2006) and cosmetic building damage (BS7385-2:1993) criteria for a range of different plant and equipment is listed in Table 13.

Table 13 Recommended Safe Working Distances for vibration-intensive plant and equipment (RMS NSW 2016)
<table>
<tr><th rowspan="2">Plant</th><th rowspan="2">Rating / Description</th><th colspan="2">Safe working distance (m)</th></tr>
<tr><th>Cosmetic damage 1993) (BS7385-2:1993)</th><th>Human response (DECC,2006)</th></tr>
<tr><td>Vibratory Roller</td><td><50 kN (typically 1-2 tonne)
<100 kN (typically 2-4 tonne)
<200 kN (typically 4-6 tonne)
<300 kN (typically 6-13 tonne)
>300 kN (typically 13-18 tonne)
>300 kN (> 18 tonne)</td><td>5 metres
6 metres
12 metres
15 metres
20 metres
25 metres</td><td>15 to 20 metres
20 metres
40 metres
100 metres
100 metres
100 metres</td></tr>
<tr><td>Small hydraulic hammer</td><td>300 kg – 5 to 12 tonne excavator</td><td>2 metres</td><td>7 metres</td></tr>
<tr><td>Medium hydraulic hammer</td><td>900 kg – 12 to 18 tonne excavator</td><td>7 metres</td><td>23 metres</td></tr>
<tr><td>Large hydraulic hammer</td><td>1600 kg – 18 to 34 tonne excavator</td><td>22 metres</td><td>73 metres</td></tr>
<tr><td>Vibratory pile driver</td><td>Sheet piles</td><td>2 to 20 metres</td><td>20 metres</td></tr>
<tr><td>Pile boring</td><td>≤800 mm</td><td>2 metres (nominal)</td><td>4 metres</td></tr>
<tr><td>Jackhammer</td><td>Hand held</td><td>1 metre (nominal)</td><td>2 metres</td></tr>
</table>
The minimum working distances are indicative and may will vary depending on the particular item of plant and local geotechnical conditions.
</td><td>-</td></tr>
</table>

<table>
<tr><th>ACTIVITY</th><th>DESCRIPTION</th><th>REFERENCES</th></tr>
<tr><td>4.8 Approved Work Hours</td><td>In accordance with CoA F3 the project standard construction hours are:
a) 7:00am to 6:00pm Mondays to Fridays
b) 8:00am to 1:00pm Saturdays

Construction works outside of the standard construction hours identified in above may be undertaken in the following circumstances:
a) construction works that generate noise that is:
i. no more than 5 dB(A) above rating background level at any residence in accordance with the Interim Construction Noise Guideline (DECC, 2009); and
ii. no more than the noise management levels specified in Table 3 of the Interim Construction Noise Guideline (DECC, 2009) at other sensitive receivers; or
b) for the delivery of materials required outside these hours by the NSW Police Force or authorities for safety reasons; or
c) where it is required in an emergency to avoid the loss of lives, property and / or to prevent environmental harm; or
d) works approved through an EPL; or
e) works as approved through the out-of-hours work protocol outlined in the Construction Noise and Vibration Management Plan required under condition F21 (b). Refer to Appendix C.

Except as expressly permitted by the Project EPL, activities resulting in impulsive or tonal noise emission (such as rock breaking, rock hammering, pile driving) will only be undertaken:
• between the hours of 8:00am to 5:00pm Monday to Friday
• between the hours of 8:00am to 1:00pm Saturday, and
• in continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block.

Blasting where required will be undertaken during standard hours. Where compelling safety reasons exist, the EPA may permit a blast to occur outside the abovementioned hours. Prior written notification of any such blast must be made to the EPA.</td><td>Appendix C Out of Hours Work Protocol</td></tr>
<tr><td>4.9 Construction Activities and Program</td><td>Construction Project activities will be split into three phases:
1. Preparatory Works
• Road dilapidation surveys
• Investigative drilling, excavation or salvage
• Minor clearing of native vegetation
• Establishing temporary site offices
• Installation of environmental impact mitigation measures, fencing, enabling works, wind monitoring masts, and
• Minor access roads and minor adjustments to services/utilities etc.

2. Wind Farm Construction
• On-site civil works for internal access roads, crane hardstands, laydown areas, wind turbine foundations, cable trenches and power pole installation
• Site access intersection upgrades
• Transport of WTG components to the project site
• Installation of WTG components
• Construction of electrical substation, switching station and operations and maintenance compound
• Construction of electrical transmission lines and cable reticulation network, and
• Restoration and revegetation of disturbed areas.

3. Decommissioning
• Restoration

Table 14 outlines the general construction activities.

Table 14 Construction Activities
<table><tr><th>Activity</th><th>Summary of Works</th></tr><tr><td>Site Establishment</td><td>Establishment of temporary site offices and laydowns</td></tr><tr><td>Environmental Controls</td><td>Progressive installation of environmental controls including temporary or permanent fencing to establish exclusion and ‘No Go Zones’ in the protection of environmental sensitivities.</td></tr><tr><td>Access roads and hardstands</td><td>Construction of internal access roads to WTG sites
Cut to fill to design and geotechnical and topographical conditions.
Excavated topsoil be stockpiled for site rehabilitation.
Excavation and compaction of crane hardstands and laydown
Drainage line crossings will be upgraded as required including widening of culverts or installing new culverts including scour protection</td></tr></table></td><td>-</td></tr>
</table>

ACTIVITY	DESCRIPTION		REFERENCES
		Upgrade and construction of bed level crossings where required.	
	Turn in Turn Outs	Temporary traffic management arrangements Construction and sealing and widening of the nominated entry/exit points	
	Road Upgrades	Temporary traffic management arrangements Existing local roads will be used by construction vehicles for delivery of wind farm components and materials All roads identified as needing upgrading for construction access will be constructed to relevant engineering standards.	
	Meteorological monitoring masts	Clearing and construction of concrete footings, erection of mast with supporting guy wires, and installation of monitoring equipment.	
	Batch Plant	Clearing and construction of laydown and access for Batch Plant establishment and operation Preparation of temp access and links to internal access for receiving of materials deliveries and movement of concrete outbound to foundation sites	
	Construction of footings	Clearing and removal of topsoil for storage and re-use during restoration of temp disturbance and covering of constructed footing Excavation of subsoil and rock at each turbine location, Excavation and preparation of foundations to geotechnical conditions Steel fixing of reinforcement and concrete pours	
	Construction of Substation, Switching Station and O&M Compound	Site survey, clearing and levelling, foundations and fencing Erection and fit-out of control buildings Installation of transformers, busbars, earthing system etc.	
	Wind Turbine Generators (WTGs)	Each turbine will be manufactured offsite in sections and assembled on-site. Installation of wind turbine generators, materials, and equipment will be delivered to the site by restricted access vehicles where necessary	
	Tower and WTG Erection	Delivery of tower and turbine components (tower sections, turbine blades, generator/nacelle assembly) Tower erection and nacelle installation Rotor assembly and installation Electrical connections and commissioning	
	Electrical infrastructure: underground cables	Underground cabling, comprising power and control cables to be buried in trenches of approximately 1 m in depth and 0.5 - 0.75 m in width. In some locations, wider trenches may be required where two cables are located side by side. Backfill trenches as soon as practicable with the excavated materials Temporary access tracks will be located alongside trenches for access during trenching and cable installation.	
	Electrical infrastructure: overhead lines	Clearing and establishment of laydowns for poles, cable and plant Clearing and construction of foundations for poles Erection of poles and stringing of cables	
	Grid Connection	High voltage connections and commissioning System energisation and turbine connection	
	Restoration and revegetation of disturbed areas	Decommissioning of construction facilities (compound site, batching plant, laydown areas, access tracks, etc.) Rehabilitation of areas disturbed during construction phase.	

Below is an indicative program duration for the construction works, focusing on the main activities which will result in construction noise or vibrations. Construction works will be undertaken (subject to approval of all documentation) concurrently in accordance with the construction schedule which is to be determined during detailed design. It is envisaged that works will be ongoing from commencement for a period of around 18 - 24 months.

Activity	Duration (Weeks)
Collector Group 1 – Construct Access Points	14
Collector Group 1 – Access Road Construction	22
Collector Group 1 – Crane Hardstand Construction	18
Collector Group 1 – Turbine Foundations	20
Collector Group 1 – Backfill Foundation	9
Collector Group 1 – Cable Reticulation	22
Collector Group 2 – Construct Access Points	18
Collector Group 2 – Access Road Construction	16
Collector Group 2 – Crane Hardstand Construction	15
Collector Group 2 – Turbine Foundations	23
Collector Group 2 – Backfill Foundation	11

ACTIVITY	DESCRIPTION	REFERENCES

Collector Group 2 – Cable Reticulation	18
Collector Group 3 – Construct Access Points	8
Collector Group 3 – Access Road Construction	7
Collector Group 3 – Crane Hardstand Construction	8
Collector Group 3 – Turbine Foundations	15
Collector Group 3 – Backfill Foundation	7
Collector Group 3 – Cable Reticulation	14
33KV Overhead Line Foundations	29
33KV Trenching and Underground Cable Installation	25
132KV Overhead Line Foundations	29
132KV Trenching and Underground Cable Installation	19
Substation Bench Works	12
Switching Station Bench Works	10

Intermittent blasting activities will be undertaken during the construction of crane hardstands, foundation construction, construction of access roads and the construction of the substation bench when conventional construction methods such as excavation and rock breaking won't be suitable due to geotechnical conditions.

4.10 Recommendations and Agreed Management Measures

The 2011 EA Statement of Commitments which are relevant to this CNVMP are outlined in Table 15.

Table 15 Statement of Commitments

SoC	Commitment	Refer to Section in this plan
Construction Noise Management Sub Plan	Construction Noise Management sub plan will be implemented as part of the Project CEMP for the construction stage of the project to mitigate potential adverse noise impacts that could affect nearby residents. Key components of the construction noise management sub-plan will include the mitigation measures identified in Chapter 12. FCWFPL Before construction commences. Prior to commencement of construction, neighbours to the wind farm site will be informed of the construction works, the nature and duration of components of the construction phase, the potential impacts and contact details for registering complaints or enquiries.	This Plan
Work hours	Construction activities associated with the Development, including heavy vehicles entering and exiting the Site, will only be carried out between 7:00 am and 6:00 pm, Monday to Friday inclusive, and between 7:00 am and 1:00 pm on Saturdays if inaudible at neighbouring occupied residences and 8:00 am to 1:00 pm if audible. The following activities may be carried out in association with Construction outside of these hours: (a) any works that do not cause noise emissions to be audible at any nearby residences not located on the Premises (b) the delivery of materials as requested by Police or other authorities for safety reasons (c) emergency work to avoid the loss of lives, property and/or to prevent environmental harm (d) completion of a concrete pour that extends beyond normal working hours due to unforeseen delays (e) conduct of some lifting operations to install turbine components during periods of low wind speed for safety reasons Any work undertaken outside the specified construction hours, other than those specified in (a) – (e) above, will not be undertaken without prior approval of the Department of Planning All vehicles to have the required noise control devices suitable for use on public roads	Section 6 Appendix C
Blasting	Blasting operations will be avoided where practicable but if required will only take place between 9:00 am and 5:00 pm Monday to Friday inclusive and between 9:00 am and 1:00 pm Saturday; and at such other times or frequency as may be approved by the DECC (now DPIE) and will comply with the following: (a) The air-blast overpressure level from blasting when assessed at the closest occupied residential sites surrounding the wind farm will not exceed 115 dB(A) (Lin Peak) for more than 5% of the total number of blasts during each reporting period; and 120 dB(A) (Lin Peak) at any time (b) The ground vibration peak particle velocity from blasting operations when assessed at the closest occupied residential sites surrounding the wind will not exceed 5 mm/s for more than 5% of the total number of blasts carried out on the Site during each reporting period; and 10 mm/s at any time.	Section 6
Complaints	Should any instances of elevated noise levels arising from construction works impact surrounding relevant receivers as indicated by receipt of complaints, then the matter will be investigated by the proponent and where practicable measures will be implemented to reduce the impact. A response will be provided to the complainant as to the findings and any modifications to reduce the impact.	Section 6

5. NOISE AND VIBRATION MANAGEMENT ROLES AND RESPONSIBILITIES

Position descriptions describe the responsibilities specific to positions on the Project. -

ACTIVITY	DESCRIPTION	REFERENCES
Project Director (Management Representative)	• The Project Director shall ensure leadership and that adequate, competent and experienced resources are provided and supported in the implementation of this CNVMP.	
Project Manager	• Provide support and guide the implementation of this CNVMP and associated controls • Provide Management, Leadership and implementation of this CNVMP • Ensuring adequate resources are provided for implementing and maintaining controls and mitigation measures, and • Take action including the stopping of work in response to unexpected finds of contamination or environmental incidents or any material harm resulting from contamination arising from construction activities and allocate the required resources to minimise impacts.	
Lands, Environment and Cultural Heritage (LECH) Manager	• Development and preparation of all plans and procedures to support construction • Provide support and guide the implementation of this CNVMP and associated controls • Providing environmental management input and support of construction and associated methodologies • Identifying that all necessary Contractor approvals and permits have been obtained • Support and guide site environmental incident investigation and reporting; and • Review of internal and external project audits and co-ordinating the implementation of audit recommendations.	
Environment Coordinator	• Providing lead and support of construction and associated methodologies to ensure implementation and compliance of commitments contained in this CNVMP • Providing and coordinating inspections and audits of works • Providing and coordinating site based training preparation and delivery • Routine record keeping and reporting in support of commitments in this CNVMP • Reporting of hazards and incidents and implementing any rectification measures; and • Provide site based environmental incident investigation and reporting and corrective action management	
Project Supervisors	• The implementation of commitments contained in this CNVMP, and • Reporting of hazards and incidents and implementing any rectification measures.	
Subcontractors	• Subcontractors engaged to perform works on behalf of GE, CPP and Nacap, shall operate in accordance with all applicable legislation. Subcontractors are required to report all incidents to the Project management team.	
All Project personnel and visitors	• All project personnel and visitors shall uphold a general environmental duty to take all reasonable and practical measures to ensure that the activities on the whole site do not cause environmental harm.	

6. NOISE AND VIBRATION RISKS, IMPACTS, OBJECTIVES AND CONTROLS – CONSTRUCTION ACTIVITY BASED

Construction Noise and Vibration Impacts	• Nuisance noise at sensitive receptors caused by:
	  ○ Construction activities, movement and operation of construction plant, equipment and personnel
	  ○ Traffic noise associated with construction and transport of materials and windfarm components
	  ○ Blasting
	• Vibration at sensitive receptors, and
	• Disturbance to fauna including stock.

Noise and Vibration Performance Objectives and Standards	• To minimise nuisance noise at sensitive receptors • To minimise vibration at sensitive receptors • To minimise impacts to fauna and stock
Measurement Criteria	• Compliance with approval and regulatory requirements • Compliance with noise and vibration management measures • Compliance with project work hours and out of hours' protocols, and • Noise and vibration complaints received from sensitive receptors are resolved

Management Measures		Responsibility	Reference
Pre-Construction			
MM01	All construction personnel and subcontractors are required to undertake a Project induction which will incorporate information on noise and vibration management specific to the project and field of operations and shall include the following: • Legislation and penalties for exceedances of noise and vibration management levels Roles and Responsibilities for noise and vibration management • Identification of resident and sensitive receivers in relation to works • Approved standard working hours Incident reporting and record keeping. • Noise and vibration management measures, and • A register attendance at all inductions will be maintained.	Principal Contractor / Subcontractors	CoA F21 (b) (iii)
MM02	All construction personnel and subcontractors will participate in Safe Work Method Statement (SWMS) development that will include information on specific management measures for specific construction activities.	Principal Contractor/ Subcontractors	CoA F21

ACTIVITY	DESCRIPTION		REFERENCES
MM03	A Construction Noise & Vibration Management Plan will be developed to detail how the construction noise and vibration impacts will be minimised and managed.	Principal Contractor/ Subcontractors	CoA F21
MM04	Prior to commencement of construction update all communication forums so that the community in proximity the wind farm site are informed of the construction works, the nature and duration of components of the construction phase, the potential impacts and contact details for registering complaints or enquiries.	Principal Contractor / Subcontractors	CoA F21 (b) (iii)
MM05	Plan the access, entry and layout of worksites and activities to minimise noise and vibration impacts to resident receivers. Consult with associated residents during the design phase and construction phase and advise of the type and nature of activities to be performed during the works. Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site. Non-tonal reversing beepers (or an equivalent mechanism) will be implemented for use on construction vehicles and mobile plant regularly used on site and for any out of hours' work.	Principal Contractor/ Subcontractors	CoA F21 (b) (iii)
MM06	Design the layout and configuration of the windfarm to avoid the risk of structural damage in accordance with the limits set out in the German Standard DIN 4150- 3: Structural Vibration - effects of vibration on structures.	Principal Contractor/ Subcontractors	CoA F21 (b) (iii)
MM07	A Project complaints management system will be established and maintained for the duration of construction.	FCWF Pty Ltd Principal Contractor and Subcontractors	CoA F21 (b) (iii) (vi)
Ground disturbance works associated with or including but not limited to the following: Clearing and Topsoil Stripping, Earthworks – General and Civil, Establishment of Concrete Batch Plant, access roads and other temporary works areas, Facility construction and WTG Erection, Transmission Line Establishment and Erection and Cable Installation			
MM08	Unless otherwise approved, construction activities will be undertaken during the following standard work hours: a) 7:00am to 6:00pm Mondays to Fridays b) 8:00am to 1:00pm Saturdays, and c) At no time on Sundays or public holidays	Principal Contractor/ Subcontractors	CoA F3

MM09	Any construction works outside of the standard work hours will comply as follows:
	• Generate noise that is:
	  ○ no more than 5 dB(A) above rating background level (refer to Section 4) at any residence
	  ○ no more than the adopted noise management levels determined in Section 4 at other sensitive receivers
	• for the delivery of materials required outside these hours by the NSW Police Force or authorities for safety reasons, or
	• where it is required in an emergency to avoid the loss of lives, property and / or to prevent environmental harm, or works approved through the project EPL, or works as approved through the out-of-hours work protocol, refer to Appendix C
		Principal Contractor/ Subcontractors	CoA F4

MM10	Except as expressly permitted by the Project EPL, activities resulting in impulsive or tonal noise emission (such as rock breaking, rock hammering, pile driving) will only be undertaken: • between the hours of 8:00am to 5:00pm Monday to Friday • between the hours of 8:00am to 1:00pm Saturday, and • in continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block.	Principal Contractor/ Subcontractors	CoA F5
MM11	At daily pre-starts refer to the layout map with reference to Table 10 Adopted Construction Noise Management Levels and gauge the proximity to resident receivers for works activities and plan the conduct of works to achieve the project noise and vibration objectives to minimise impacts.	Principal Contractor/ Subcontractors	CoA F21 (b) (iii)
MM12	Limit high noise impact activities and works to the mid-morning and mid-afternoon periods, where near to resident receivers. Implement respite periods in accordance with MM10.	Principal Contractor/ Subcontractors	CoA F21 (b) (iii)
MM13	Minimise noise disturbance arising from the delivery of plant, equipment and materials to construction sites. Undertake haulage, laydown and the loading and unloading of materials/deliveries as far as practicable from resident receivers.	Principal Contractor/ Subcontractors	CoA F21 (b) (iii)

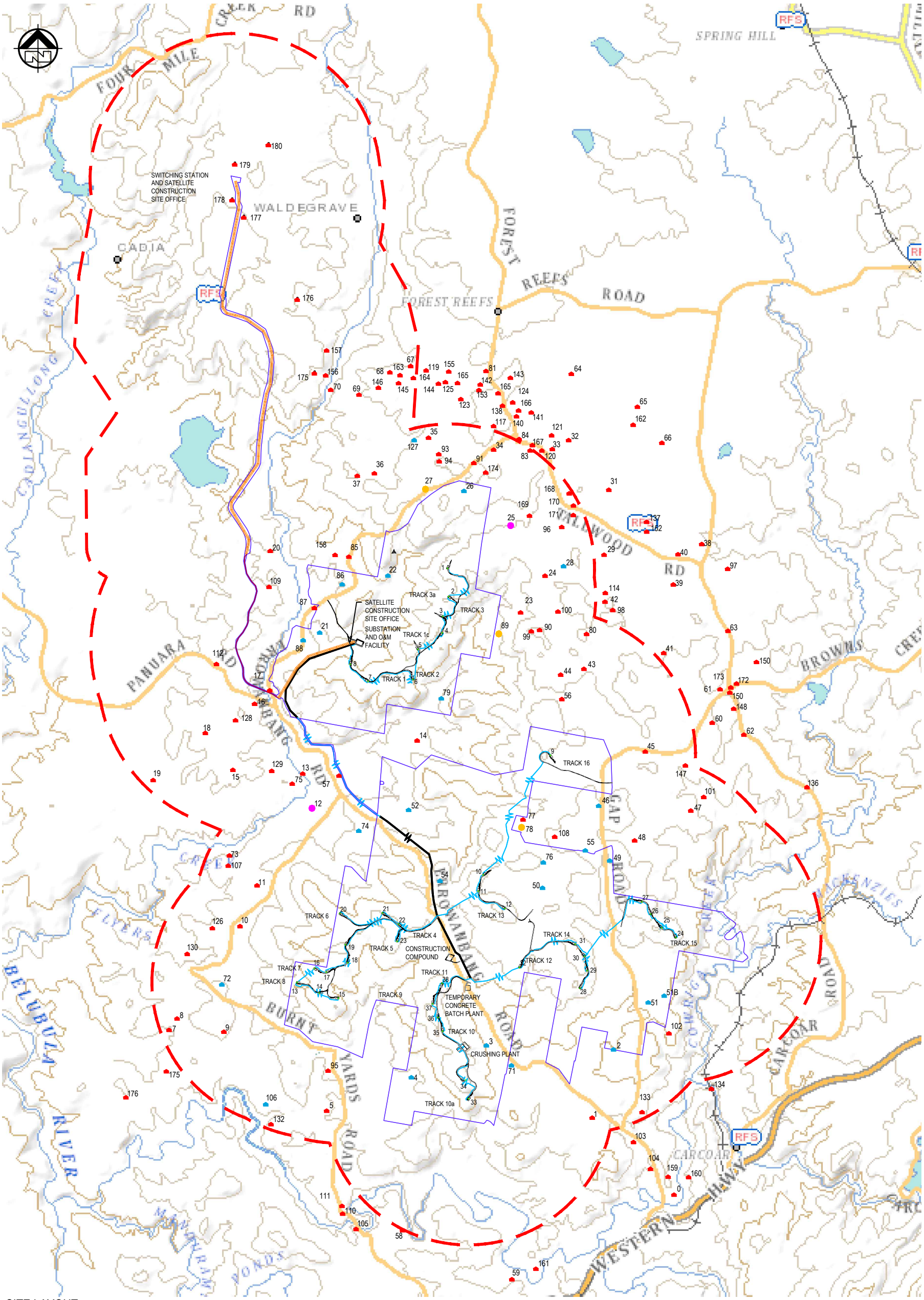
<table>
<tr><th>ACTIVITY</th><th>DESCRIPTION</th><th></th><th>REFERENCES</th></tr>
<tr><td></td><td>Truck movements will be restricted to identified haulage routes and the routes outlined in the Construction Traffic and Access Management Plan and drivers alerted to the limiting of compression braking where safe and practicable.</td><td></td><td></td></tr>
<tr><td>MM14</td><td>All construction plant and equipment will be supplied and maintained in efficient working order and serviced in accordance with the manufacturers recommendations.</td><td>Principal Contractor/ Subcontractors</td><td>CoA F21 (b) (iii)</td></tr>
<tr><td>MM15</td><td>Review and amend construction methodology, where known sensitive receivers will be potentially affected and where this is considered reasonable and feasible. Alternatives for consideration may include grinding, rock splitting or levelling instead of hydraulic rock breaking.</td><td>Principal Contractor/ Subcontractors</td><td>CoA F21 (b) (iii) (vi)</td></tr>
<tr><td>MM16</td><td>The use of temporary noise shielding will be implemented at locations where exceedances of noise criteria is expected at resident receivers in proximity to works.</td><td>Principal Contractor/ Subcontractors</td><td>CoA F21 (b) (iii)</td></tr>
<tr><td>MM17</td><td>The location of static noise sources, such as generators, pumps and lighting towers, will be located as far as practicable and safe from resident receivers. Where practical and safe to do so, static noise sources should be set-up where noise emission is reverse facing from residential receivers.</td><td>Principal Contractor/ Subcontractors</td><td>CoA F21 (b) (iii)</td></tr>
<tr><td>MM18</td><td>All noise complaints received will be dealt with promptly. Construction methods may need to be altered to reduce noise impacts at the affected locations such as the implementation of temporary noise shielding as detailed in MM16. In the event construction methods can't be altered, the quantity of plant and equipment operating in the immediate area should be reduced to minimise noise emissions.</td><td>Principal Contractor/ Subcontractors</td><td>CoA F21 (b) (iii) (vi)</td></tr>
<tr><td>MM19</td><td>Where it has been identified as necessary (e.g. in response to resolving community complaints), noise monitoring will be undertaken at the time to check that the noise mitigation measures are effective.</td><td>Principal Contractor/ Subcontractors</td><td>CoA F6</td></tr>
<tr><td>MM20</td><td>Maintain separation of the operation of construction equipment from personnel in accordance with the limits for human exposure set out in the Environmental Noise Management Assessing Vibration: A Technical Guideline (DEC, 2006).</td><td>Principal Contractor/ Subcontractors</td><td>CoA F7</td></tr>
<tr><td>MM21</td><td>Air blast overpressure generated by blasting associated with the Project shall not exceed the criteria specified in the following table when measured at the most affected residence or other sensitive receiver.
<table>
<tr><th>Airblast overpressure (dB(Lin Peak))</th><th>Allowable Exceedance</th></tr>
<tr><td>115</td><td>5% of total number of blasts over a 12 month period</td></tr>
<tr><td>120</td><td>0%</td></tr>
</table>
Temporary noise monitoring will be undertaken during the course of blasting operations and will occur at the closest sensitive receiver to the activity. Where access does not allow a measurement to be taken at these locations, other locations may be used provided they are representative of the acoustic environment at the original location.</td><td>Principal Contractor/ Subcontractors</td><td>CoA F8</td></tr>
<tr><td>MM22</td><td>Ground vibration generated by blasting associated with the Project shall not exceed the criteria specified in the following table when measured at the most affected residence or other sensitive receiver.
<table>
<tr><th>Receiver</th><th>Peak particle velocity (mm/s)</th><th>Allowable Exceedance</th></tr>
<tr><td>Residence on privately owned land</td><td>5</td><td>5% of total number of blasts over a 12-month period</td></tr>
<tr><td></td><td>10</td><td>0%</td></tr>
<tr><td>Historic heritage item</td><td>3</td><td>0%</td></tr>
</table>
Vibration monitoring will be undertaken during the course of blasting operations and will occur at the closest sensitive receiver to the activity. Where access does not allow a measurement to be taken at these locations, other locations may be used provided they are representative of the environment at the original location.</td><td>Principal Contractor/ Subcontractors</td><td>CoA F9</td></tr>
<tr><td>MM23</td><td>Pre and post construction dilapidation surveys on sensitive structures which fall within the cosmetic zone for vibrations as referenced in Section 4.7 of this plan will be undertaken one week prior to the commencement of the activity and one week post completion of the activity.
In the event a vibration exceedance is measured, a construction dilapidation survey will</td><td>Principal Contractor/ Subcontractors</td><td>CoA F21 (b) (iv)</td></tr>
</table>

ACTIVITY	DESCRIPTION		REFERENCES
	be undertaken immediately in consultation and approval of the property owner.		
MM24	When selecting plant and equipment, quieter and less vibration emitting construction methods will be utilised where feasible and reasonable such as the avoidance of impact pile driving in noise sensitive areas. Drilled piles are a quieter alternative where geological conditions permit. Where geological conditions permit, methods such as grinding, ripping, rock splitting must be considered in lieu of utilising hydraulic rock breaking methods.	Principal Contractor/ Subcontractors	CoA F21 (b) (iv)
7. COMMUNICATION, CONSULTATION AND INCIDENTS			
7.1 Internal Communications	The immediate day-to-day responsibility for communication of noise and vibration management lies with the Project Management Team. The following internal communication forums will occur during the execution of works: • Inductions • SWMS Workshops • Daily Pre-start meetings • Field based awareness talks • Regular toolbox meetings (project workforce), and • Weekly construction management team meetings.		-
7.2 External and Third Party Communications	Regular consultation with stakeholders/landholders is expected to be undertaken during construction activities. All significant stakeholder/landholder issues not readily resolved by construction personnel shall be directed to the Supervisor who will notify the Project Manager for escalation to the FCWFPL representative.		-
7.3 Media Protocol	If any Project personnel have any contact with a media representative, they will: • Respond in a polite and courteous manner, and • Inform the media representative that they are not the authorised spokesperson and provide contact details of the Flyers Creek Wind Farm Project spokesperson or media contact		-
7.4 Incident Management	FCWFPL shall develop and implement a compliance tracking program which will operate for the life of the Project. This program will include mechanisms for recording environmental incidents during construction, and actions taken in response to those incidents. In the event of an incident involving noise and vibration management, a first reporting step will be the provision of a Heads-Up Notification (an Initial Report and Notification via email) detailing brief facts about the incident to be circulated to an agreed list of CPP-Nacap and FCWFPL project personnel. This will be done as soon as practicable but no later than two (2) hours after the incident to enable notification and reporting requirements in accordance with CoA E6 and E7 requiring notification to DPIE in writing to compliance@planning.nsw.gov.au The subsequent Incident Report will include: • Date, time and location details • A description of the incident and root cause • Whether the incident resulted in harm or regulatory Non-Compliance and requires reporting to Regulator) or Third Party • Actions for resolution / close out, and • Corrective actions to assist in preventing recurrence. Upon completion of an investigation, the findings and recommendations shall be distributed to the relevant work crews for discussion at prestart meetings. If the root cause analysis provides justification for amended work practices or processes a review and reissue of relevant documents (such as this CNVMP, CEMP, SWMS and Form 2) will be undertaken. Any updates to the CNVMP will be required to be approved by DPIE in accordance with CoA F20.		-
8. INSPECTIONS, MONITORING, AUDITS AND CNVMP REVIEW			
8.1 Inspections and Monitoring	The LECH Manager or delegate shall coordinate inspections and monitoring of works during construction activities to check and record compliances with works procedures and this CNVMP. Inspections and Monitoring will include: • Weekly review of active works to ensure all management measures are effective and compliant with this CNVMP, and • Monitoring will be undertaken in accord with the Noise Monitoring Protocol Appendix B		-
8.2 Audits	Audits will be undertaken including Noise and Vibration Management in accordance with details and frequency outlined in Section 10.2 of the CEMP.		-
8.3 CNVMP Review	A review of this CNVMP will be undertaken annually and whenever there are significant changes in the scope of work, subsequent changes to construction methodologies, non-conformance and following changes to the layout of the works. Any updates to the CNVMP will be required to approved by DPIE prior to the administration of those updates. A copy of the updated plan and changes will be distributed to all relevant stakeholders and regulatory authorities.		-

ACTIVITY		DESCRIPTION	REFERENCES
8.4	Continuous Improvement	This Sub Plan will be subject to ongoing evaluation and continuous improvement as outlined in Section 10.7 of the CEMP, notwithstanding any updates to the CNVMP will be required to be approved by DPIE in accordance with CoA F20.	-
9.	**REPORTING AND RECORD KEEPING**		
9.1	Record Keeping	CPP-Nacap shall maintain a documentation and record system in support of this CNVMP and monthly Project reporting requirements to enable review and auditing of management systems and procedures. The following records to be maintained: • Site Inspection Records • Incident Reports • Incident Register • Complaints Register, and • Consultation Log.	-
9.2	Reporting	Monthly Reporting includes information on relevant noise and vibration data, summary and includes the reporting of any incidents and non-conformance.	-

APPENDIX A – ASSOCIATED AND NON-ASSOCIATED RESIDENCES

Note – Preliminary layout subject to minor amendments during detailed design and consultations



SITE LAYOUT

1:40,000 1200 0 1200 2400 A1
1:80,000 A3

LEGEND

- ASSOCIATED RECEIVER
- NON-ASSOCIATED RECEIVER
- NOISE LOGGER
- NOISE LOGGER & WEATHER STATION
- 3km BUFFER AREA
- WTG 1 — TURBINE NUMBER
- ACCESS TRACK
- PROJECT BOUNDARY
- 132 kV TRANSMISSION LINE UG
- 132 kV TRANSMISSION LINE OH
- 33 kV CABLING LINE UG
- 33 kV CABLING LINE OH
- HARDSTAND / LAYDOWN AND CRANE PAD OPTIONS

PRELIMINARY LAYOUT SUBJECT TO FINAL DESIGN

DIAL BEFORE YOU DIG www.1100.com.au

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REV	DETAIL	DRN	CHK	APP	DATE
C	FOR APPROVAL	J.C.	F.M.	N.C.	06.04.2020
B	FOR APPROVAL	J.C.	F.M.	N.C.	18.03.2020
A	FOR APPROVAL	J.C.	F.M.	N.C.	06.03.2020

REVISIONS AND APPROVALS

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nacap
A QUANTA SERVICES COMPANY

PROJECT: FLYERS CREEK WIND FARM
TITLE: PROJECT OVERALL ASSOCIATED AND NON-ASSOCIATED RESIDENCIES
DRAWING STATUS: PRELIMINARY
PROJECT No. 18-070
SCALE: AS SHOWN
SIZE: A3
DRAWING No. FCWF-DWG-0291-2
REV. C

APPENDIX B – NOISE MONITORING PROTOCOL

NOISE MONITORING PROTOCOL	
Purpose	This Noise Monitoring Protocol has been prepared in minimising the impacts to the Project area and to ensure compliance and to minimise the risk of penalties to individuals, CPP-Nacap, GE and Flyers Creek Windfarm Pty Ltd.
Scope	Noise monitoring is to be undertaken in accordance with the provisions in the following documents: • Industrial Noise Policy (EPA, 2000), and • Australian Standard AS 1055 Description and measurement of environmental noise. Noise levels from the monitoring should be compared with the noise management levels detailed in Section 4 Noise monitoring will be undertaken at the relevant sensitive receiver in the event of a complaint received by Flyers Creek Wind Farm Pty Ltd or at sensitive receivers as required in the undertaking of a risk assessment in relation to Out of Hours Works.
Location	Noise monitoring will occur at the closest sensitive receiver to the construction activity. Associated and non-associated residencies location is presented in Appendix A. Where access or acoustic considerations do not allow a measurement to take place at these locations, other locations may be used provided that they are representative of the acoustic environment at these locations. Additional monitoring locations may be added on a case by case basis to address specific concerns or complaints from any sensitive receiver.
Frequency	Attended noise surveys will be undertaken during the following periods: • Once per week during the construction period as scheduled in section 4.9 • During scheduled out of hours work • In the event a complaint is raised
Protocol and Methodology	• Noise compliance monitoring should be undertaken only using operator attended noise monitoring. • The monitoring will be carried out in accordance with the provisions of the Industrial Noise Policy and AS 1055. • Monitoring should occur during typical construction activities. The state of activities should be confirmed by a representative of the construction works. • The monitoring equipment's calibration will be checked before and after each monitoring occurrence. • Measurements are only to be considered valid for a difference of less than ±1 dB between calibration checks. • The meteorological conditions at the time of measurements should be recorded by either a portable weather station at the site of the measurements or the nearest Bureau of Meteorology supplemented by onsite weather observations in accordance with AS 1055. • Monitoring will be conducted using a calibrated sound level meter. • The monitoring should be conducted over a sufficient duration which provides results for comparison against the noise management levels. • Attended monitoring should determine the noise level from the construction activities only for comparison with the noise management levels. Where this cannot be directly measured or accurately estimated, alternative methods of determining compliance may be used as detailed in the Industrial Noise Policy. • A representative of the construction contractor be present during the noise measurements to assist in the identification of noise sources, their location and cause. • Any identified exceedances of the noise management levels will be reported as soon as reasonably possible within 24 hours of the event occurring.
Reporting	A report of each monitoring occurrence would include the detail below. • The date, time and duration of measurements. • The equipment used, the serial numbers and date of last NATA calibration. • The results of calibration checks before and after the monitoring occurrence. • The location of the measurements including justification for the selected location. • The prevailing meteorological conditions during the measurement, including the wind speed and direction, rainfall and a determination of the presence of temperature inversions. • A description of the noise sources contributing to the noise environment. • A description of the noise emission from the works including observations on the character of the noise - • intermittent, steady, impulsive, tonal, broadband, low frequency and directivity. • The potential cause of noise from the construction activities. • The noise levels measured including Leq,15min, Lmax, L1,15min, L10,15min, L90,15min in dBA. • Any adjustments made to the measurements eg. for reflecting surfaces (other than the ground). • The measured, estimated or calculated noise level from construction activities. • Where noise levels are not able to be directly measured or reliably estimated, the methodology and assumptions used to determine the noise level from construction shall be stated. • Where noise limits are exceeded, identification of the cause of the exceedance and a list of mitigation and • management measures recommended to reduce noise levels. • Where monitoring is carried out in response to a complaint, the following shall also be included: ○ The nature and description of complaint.

	○ The location from where the complaint was made and the measurement location. ○ An assessment of the contribution of the cause of the complaint to the ambient noise environment and the construction's noise emission. ○ Where required, methods to mitigate and manage the cause of the complaint.
Noise Exceedance	An exceedance of the noise management levels is defined where the measured noise level from the construction activities only is more than 2 dBA above the noise management levels in Section 4 • An exceedance in noise level shall be immediately reported to the Project Manager whom will enact the incident management protocol referenced in section 7.4. • The noise level, use and location of the identified cause of the exceedance shall be reviewed. • Existing noise mitigation and management controls will be reviewed and revised as appropriate. • Corrective action will be implemented as required. • If required, additional monitoring is to be carried out to confirm the effectiveness of any actions taken. • Records of all exceedances and actions taken to address them are to be maintained in the project monitoring register. • Where an exceedance is identified as a result of a complaint, the complainant shall be notified of the corrective action being undertaken to address the complaint.
Legislative Requirements	Refer to Section 4.1 of this Plan.
Relevant Authority	DPIE, and EPA

APPENDIX C – VIBRATION MONITORING PROTOCOL

VIBRATION MONITORING PROTOCOL	
Scope	Vibration monitoring is to be undertaken in accordance with the provisions in the following documents: • Assessing Vibration, A Technical Guideline (DECC, 2006) Vibration levels from the monitoring should be compared with the vibration management levels detailed in Section 4.
Location	Attended vibration monitoring shall be undertaken at the nearest sensitive receiver from the construction activity and on a case by case basis to address specific concerns or any complaint from any sensitive receiver.
Frequency	Attended vibrations surveys will be undertaken in consultation with property owners and service providers. Vibration surveys will also be undertaken during blasting activities at the closest sensitive receiver site and during out of hours works.
Protocol and Methodology	• Vibration compliance monitoring should be undertaken only using operator attended vibration monitoring. • The monitoring will be carried out in accordance with the provisions and guidance within Assessing Vibration, A Technical Guideline (DECC, 2006) • Monitoring will occur during typical construction activities that have a higher risk of generation vibration. The state of activities should be confirmed by a representative of the construction works. • Monitoring should be conducted by an appropriately qualified person using a calibrated vibration transducer. • The monitoring equipment's calibration will be checked before and after each monitoring occurrence. • The ground conditions for the source, receiver and path locations will be noted. • The monitoring should be conducted over a sufficient duration which provides results for comparison against the vibration limits. • A representative of the construction contractor to be present during the vibration measurements to assist in the identification of vibration sources, their location and cause. • Any identified exceedances of the noise management levels will be reported as soon as reasonably possible within 24 hours of the event occurring.

Reporting	A report of each monitoring occurrence would include the detail below.
	• The date, time and duration of measurements.
	• The equipment used, the serial numbers and date of last NATA calibration.
	• The results of calibration check's before and after the monitoring occurrence.
	• The location of the measurements including justification for the selected location.
	• The ground conditions for the source, path and receiver.
	• A description of the vibration levels emission from the including observations on the type of vibration.
	• The measured, estimated or calculated vibration level from construction activities.
	• Where vibration levels are not able to be directly measured or reliably estimated, the methodology and assumptions used to determine the vibration level from construction shall be reported.
	• Where vibration limits are exceeded, identification of the cause of the exceedance and a list of mitigation and management measures recommended to reduce vibration levels.
	• Where monitoring is carried out in response to a complaint, the following shall also be included:
	  ○ The nature and description of complaint.
	  ○ The location from where the complaint was made and the measurement location.
	  ○ An assessment of the contribution of the cause of the complaint to the total vibration levels and the vibration produced by the construction works.
	  ○ Where required, methods to mitigate and manage the cause of the complaint.

Vibration Exceedance	An exceedance of the vibration limits is defined where the measured vibration level from the construction activities are above the vibration management levels in Section 4 and Section 6. • An exceedance in vibration level shall be immediately reported to the Project Manager whom will enact the incident management protocol referenced in section 7.4. • In the event of a non-compliance of the building damage limits being measured, the vibration generating activity should cease and an investigation undertaken into using an alternative less vibration intensive technique. An alternative technique is to be determined based on the activity, location, site conditions or equipment contributing to the exceedance. As part of the investigation, an inspection of any affected property is to be undertaken immediately. • Where an exceedance of the human exposure limits is measured, the person conducting the monitoring shall report the exceedance as soon as reasonably possible within 24 hours of the monitoring. • The monitoring data is to be reviewed to determine the potential cause of the exceedance. • The vibration level, use and location of the identified cause of the exceedance shall be reviewed. • Existing vibration mitigation and management controls will be reviewed and revised as appropriate and corrective action implemented as required. • Where required, additional monitoring is to be carried out to confirm the effectiveness of any actions taken. • Where an exceedance is identified as a result of a complaint, the complainant shall be notified of the corrective action being undertaken to address the complaint.

Legislative Requirements	Refer to Section 4.1 of this Plan.
Relevant Authority	DPIE, and EPA

APPENDIX D – OUT OF HOURS WORKS PROTOCOL

OUT OF HOURS WORKS PROTOCOL	
Purpose	This Out of Hours Work (OOHW) Protocol has been prepared to ensure all out of hours activities are undertaken on a case by case basis and in accordance with CoA F4 in minimising the impacts to the Project area and to ensure compliance and to minimise the risk of penalties to individuals, CPP-Nacap, Infigen and Flyers Creek Windfarm Pty Ltd.
Scope and Justification	This protocol applies to OOHW that may be undertaken by GE and CPP-Nacap and its subcontractors. This protocol applies to construction activities only. Standard and approved working hours are identified in CoA F3 and Management Measure 08. For this protocol and in accordance with CoA F3, OOHW is defined as work that occurs during the following periods: • 6.00pm to 11.59pm and 12.00am to 7.00am Mondays to Friday inclusive • 12.00am to 8.00am and 1.00pm to 11.59pm Saturdays, and • At any time on a Sunday and Public Holiday The ICNG details five categories of works that may be undertaken outside recommended standard hours: • The delivery of oversized plant or structures that police or other authorities determine require special arrangements to transport along public roads. • Emergency work to avoid the loss of life or damage to property, or to prevent environmental harm. • Maintenance and repair of public infrastructure where disruption to essential services and/or considerations of worker safety do not allow work within standard hours. • Public infrastructure works that shorten the length of the project and are supported by the affected community. • Works where a proponent demonstrates and justifies a need to operate outside the recommended standard hours. Noise management levels for OOHW are detailed in the ICNG as being RBL + 5dB. Derived construction noise management levels including OOHW are detailed in Section 4.4.3. as presented in Table 4.6.1. For the purposes of this protocol OOHW adopted noise management levels dB(A) are: **Receiver / RBL / NML (OOHW)** R012 / 35 / 40 R025 / 33 / 38 R027 / 40 / 45 R078 / 35 / 40 R089 / 40 / 45 OOHW will be avoided where reasonable and feasible. Occasions may arise when OOHW are required in providing safe and effective construction activities that reduce the overall cumulative impact on the community and duration of impacts through the timely completion of various construction activities, such as: • Wind turbine generator foundation concrete pours including concrete batching plant operation • Site office works at the Main Compound – Project Management Team • Plant and Equipment maintenance including re-fuelling • Vehicles arriving onsite from 06:00am onwards to prepare for Project pre-starts • Traffic control, • Water cartage, • Survey, • Delivery of materials to the batching plant • Turbine erection and installation, and • Works restricted to the main compound site. This protocol provides guidance for procedures, mitigation and notification that should be followed in circumstances where OOHW are desirable in the delivery of safe and effective construction activities.

Protocol and Mitigation	• Prior to undertaking OOHW, GE and CPP-Nacap will consider nature of the works, expected noise levels at the receiver and duration of the OOHW. A risk assessment for the work will be undertaken in accordance with the Construction Health and Safety Management Plan and the ICNG. • The risk assessment will determine the potential for intrusive noise and vibration impacts at sensitive receivers and categorise the noise and vibration impacts for OOHW. • The derived predicted intrusive noise impacts and the predicted level and duration of exceedance above the adopted NML for OOHW will determine the consultation requirements and/or measures to manage the noise impacts. • Additional mitigation measures will be identified for implementation where reasonable and feasible and will directly relate to the extent of noise impact of the proposed OOHW. The higher the level of impact the greater the level of mitigation and consultation • Impact Categories are proposed as follows: o No exceedance of OOHW Adopted Construction NML – Very Low o 1-5 dB(A) exceedance above NML – Low o 6-15 dB(A) exceedance above NML – Medium o 15-25 dB(A) exceedance above NML – High o >25 dB(A) above NML – Very High • It is proposed that the Project Environmental Representative approve OOHW requests to a level of medium impact and that OOHW requests derived to have a higher than a medium impact i.e. predicted exceedance above 15 dB be referred also to the Secretary. • Upon approval of OOHW application, GE and CPP-Nacap will notify affected resident receivers of the works approved not less than 3 days prior to works commencing • This notification will be by letterbox drop and email where appropriate and by detailing works on the project website. A copy of the notification will be available to the DPIE and EPA on request. • The notification will clearly outline the reason that the work is required to occur outside standard hours; o include a diagram that clearly identifies the location of the proposed works in relation to nearby roads and local landmarks o include details of relevant time restrictions that apply to the proposed works o clearly outline the location, nature, scope and duration of the proposed works o Work methods (including noise mitigation measures), and o include an after-hours contact phone number and the project website address. • Provide DPIE and EPA notification prior to undertaking the works, and • Undertake a Pre-start toolbox for relevant personnel to ensure all onsite personnel involved in disturbance activities are aware of working in accord with the OOHW protocol and SWMSs review.
Monitoring	Monitoring will be conducted in accordance with the Monitoring Protocols identified in Appendices B and C.
Complaints Management	Complaints shall be managed in accordance with Section 9.6 of the CEMP.
Legislative Requirements	Refer to Section 4.1 of this Plan.
Relevant Authority	DPIE, and EPA

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