

Murra Warra Wind Farm

Construction Noise Management Plan

S4453C19

March 2017

PLANNING AND ENVIRONMENT ACT	
HARRISMACK PLANNING SCHEME	
PERMIT NO. PA1600128	
ENDORSED PLAN	
SHEET 1	OF 14
SIGNED [Signature]	FOR
MINISTER FOR PLANNING	
DATE 15/8/17	

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HORSHAM PLANNING SCHEME	
PERMIT NO. PA1600127	
ENDORSED PLAN	
SHEET 1	OF 14
SIGNED [Signature]	FOR
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ENDORSED TO COMPLY WITH CONDITION 42 OF PLANNING PERMIT PA 1600 127 + PA 1600 128

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GLOSSARY

A weighting	Frequency adjustment representing the response of the human ear.
Ambient noise level	Noise level in the absence of the noise from the wind farm.
CNMP	Construction Noise Management Plan
dB(A)	A weighted noise level measured in decibels.
Dwelling	A reference to a dwelling in this document is a reference to a dwelling which exists or has development approval at the time of the Permit approval.
L_{A90}	The A weighted sound pressure level that is exceeded for 90 per cent of the time over which a given sound is measured. The L_{A90} measured over a 10 minute time period is commonly termed “background sound level” and “post-installation sound level” with respect to wind farms.
L_{Aeq}	The A weighted equivalent continuous noise level – the energy-average of noise levels occurring over a measurement period.
The pre-construction assessment	Sonus Report S4453C16 dated June 2016.
The Permit	Planning and Environment Regulations 2015 Form 4 Section 63, 64, 64A and 86 Planning Permit PA1600128 in the Yarriambiack Planning Scheme and Planning Permit PA1600127 for Horsham Planning Scheme under the Minister for Planning for the Murra Warra Wind Farm and planning permit PA1600129 for Yarriambiack Shire for a Utility Installation.
NZS6808:2010	New Zealand Standard NZS 6808:2010 Acoustics – The assessment and measurement of sound from wind turbine generators
Normal working hours	For the purposes of this CNMP: <ul style="list-style-type: none"> • 7am to 6pm weekdays • 7am to 1pm Saturdays
The Construction Manager	The principal entity contracted to construct the Murra Warra Wind Farm

1 BACKGROUND

The construction of a wind farm comprises activities such as road construction, civil works, excavation, foundation construction, electrical infrastructure works, turbine erection and quarry activity. These require processes such as heavy vehicle movements, crushing and screening, concrete batching, loaders, excavators, generators, cranes and rock breaking.

This Construction Noise Management Plan (CNMP) has been prepared in accordance with the Planning Permit. The CNMP provides a framework under which individual action plans will be prepared by the Construction Manager when details such as scheduling, the types of equipment to be used, processes, locations and duration of activities are known.

2 PERMIT CONDITIONS

The Permit provides conditions for the operation and construction of the Murra Warra Wind Farm. The Permit requires a Construction Noise Management Plan to be prepared for the wind farm in accordance with the following (Condition 40):

40. *The environmental management plan must include a construction noise management plan. The construction noise management plan must include:*
- a. *performance requirements for noise at nearby receptors in accordance with EPA Publication 1254;*
 - b. *procedures for measuring compliance with performance requirements; and*
 - c. *procedures for receiving, evaluating and responding to complaints.*

The following table lists the Permit Condition, the specific noise requirement under that Condition and the Section of this CNMP that addresses the Condition:

Permit Condition	Noise Requirement	CNMP Section
40(a)	Performance requirements at dwellings	3.1
40(b)	Measurement procedures at dwellings	4
40(c)	Complaint response procedures at dwellings	6

3 CRITERIA

The Permit condition requires that performance requirements be specified for construction activity in accordance with the "EPA Publication 1254".

EPA Publication 1254, Noise Control Guidelines (the Guidelines), provides specific requirements for construction noise with an emphasis on community consultation and work scheduling to reduce impacts on nearby residences. It also provides specific work requirements and objective criteria for works which are undertaken outside of "normal working hours".

Normal working hours are defined as 7am to 6pm weekdays and 7am to 1pm Saturdays.

Objective noise level criteria to be met outside of "normal working hours" comprise:

Weekend/evening work hours

Noise levels at any residential premises not to exceed background noise by:*

10 dB(A) or more for up to 18 months after project commencement

5 dB(A) or more after 18 months

During the hours of:

6pm – 10pm Monday to Friday

1pm – 10pm Saturdays

7am – 10pm Sundays and public holidays

Night period

Noise inaudible within a habitable room of any residential premises during the hours of:

10pm – 7am Monday to Sunday.

*Note: * The noise level refers to the equivalent noise level, L_{Aeq} , measured over a representative period of time and not less than five minutes.*

Extensive background noise monitoring has been conducted in the vicinity of the wind farm. As with most natural environments, the background noise levels vary significantly depending on each individual location, the wind speed and the time.

The Guidelines do not specify the background noise conditions to establish the objective criteria. In such circumstances, a background noise level of 30 dB(A) is often assumed. This results in an objective noise limit of 40 dB(A) for any weekend or evening works that do not exceed a duration of 18 months at a particular dwelling.

An objective criterion to define “inaudibility” for night time operation (10pm to 7am) will also vary significantly depending on the conditions at the time. For the purposes of the Construction Noise Management Plan, “inaudibility” is defined as 30 dB(A) outside a dwelling, which would result in noise levels inside dwellings of less than 20 dB(A) with the windows open.

Based on the above, the construction noise limit for any regular construction activity conducted outside of the nominated day time periods will be 40 dB(A) for any weekend or evening works and 30 dB(A) for any night works.

It should be noted that the Guidelines are based on activity occurring in the immediate vicinity of a neighbouring dwelling. Most aspects of wind farm construction occur at significant buffer distances in comparison to a typical commercial or residential construction site. Therefore, it is a conservative approach for a wind farm site to secure compliance with the general provisions of the Guidelines.

3.1 Community Consultation

The Guidelines require the following community consultation to occur with nearby residences prior to construction activity being undertaken. For the purposes of this Construction Management Plan, a “noise affected neighbour” would be any dwelling within 1km of the construction activity. This distance should not include access roads which are further from a dwelling than a public road:

- *Inform potentially noise-affected neighbours about the nature of construction stages and noise reduction measures.*
- *Give notice as early as possible for periods of noisier works such as excavation. Describe the activities and how long they are expected to take. Keep affected neighbours informed of progress.*
- *Appoint a principal contact person for community queries.*
- *Provide 24-hour contact details through letters and site signage. Record complaints and follow a complaint response procedure suitable to the scale of works.*

- Within normal working hours, where it is reasonable to do so:
 - schedule noisy activities for less sensitive times, (for example, delay a rock-breaking task to the later morning or afternoon)
 - provide periods of respite from noisier works (for example, periodic breaks from jackhammer noise).
- The weekend/evening work hours in the schedule (including Saturday afternoon or Sunday) are more sensitive times and have noise requirements consistent with quieter work.
- The weekend/evening periods are important for community rest and recreation and provide respite when noisy work has been conducted throughout the week. Accordingly, work should not usually be scheduled during these times.

3.2 Work Requirements

The Guidelines provide the following work requirements in order to reduce noise impacts at nearby residences;

- Where work is conducted in a residential area or other noise-sensitive location, use the lowest-noise work practices and equipment that meet the requirements of the job.
- Site buildings, access roads and plant should be positioned such that the minimum disturbance occurs to the locality. Barriers such as hoardings or temporary enclosures should be used. The site should be planned to minimise the need for reversing of vehicles.
- All mechanical plant is to be silenced by the best practical means using current technology. Mechanical plant, including noise-suppression devices, should be maintained to the manufacturer's specifications. Internal combustion engines are to be fitted with a suitable muffler in good repair.
- Fit all pneumatic tools operated near a residential area with an effective silencer on their air exhaust port.
- Install less noisy movement/reversing warning systems for equipment and vehicles that will operate for extended periods, during sensitive times or in close proximity to sensitive sites. Occupational health and safety requirements for use of warning systems must be followed.
- Turn off plant when not being used.
- All vehicular movements to and from the site to only occur during the scheduled normal working hours, unless approval has been granted by the relevant authority.
- Where possible, no truck associated with the work should be left standing with its engine operating in a street adjacent to a residential area.

- *Special assessment of vibration risks may be needed, such as for pile-driving or works structurally connected to sensitive premises.*
- *Noise from the site needs to comply with the requirements of the schedule, except for:*
 - *unavoidable works*
 - *night period low-noise or managed-impact works approved by the local authority.*

Unavoidable works are works that cannot practicably meet the schedule requirements because the work involves continuous work — such as a concrete pour — or would otherwise pose an unacceptable risk to life or property, or risk a major traffic hazard. Affected premises should be notified of the intended work, its duration and times of occurrence. The relevant authority must be contacted and any necessary approvals sought.

Low-noise or managed-impact works are works approved by the local authority:

- *that are inherently quiet or unobtrusive (for example, manual painting, internal fit-outs, cabling)*
or
- *where the noise impacts are mitigated (for example, no impulsive noise and average noise levels over any half hour do not exceed the background) through actions specified in a noise management plan supported by expert acoustic assessment.*

Low-noise or managed-impact works do not feature intrusive characteristics such as impulsive noise or tonal movement alarms.

4 MEASUREMENT PROCEDURE

The Permit requires a measurement procedure to ensure compliance with the project construction noise criteria.

There are no objective criteria which should be achieved during the “normal working hours”.

In lieu of a measurement procedure, the following site inspections should be conducted on a monthly basis for activities during scheduled hours:

- Equipment has quality OEM mufflers installed;
- Equipment is well maintained and fitted with adequately maintained silencers which meet the OEM design specifications;
- Silencers and enclosures are intact and closed, rotating parts are balanced, loose bolts are tightened, frictional noise is reduced through lubrication and cutting noise reduced by keeping equipment sharp;
- Site personnel are using only necessary power to complete the task;
- Plant and equipment that is noisier than other similar machines is not being used;
- Care is being taken to place material in trucks rather than being dropped;
- Plant emitting noise strongly in one direction is orientated so that the noise is directed away from noise sensitive areas if practicable;
- Machines that are used intermittently are being shut down in the intervening periods between works or throttled down to a minimum.

4.1 Outside of normal working hours

Given that construction noise levels are expected to be in the order of the existing ambient noise environment and therefore difficult to identify and measure at an unattended monitoring site, long term monitoring of construction activity will not be effective for this site.

This measurement procedure therefore requires attended measurements to occur. It also enables measurements to be taken at an intermediate distance and extrapolated in circumstances where the construction noise levels are at or below the noise levels in the ambient environment:

- Noise measurements should be carried out whenever a new construction activity is occurring outside of normal working hours.
- The measurements procedures shall be approved by an acoustic engineer and conducted by a suitably trained person.
- The noise level shall be measured at the closest dwelling (or at a location representative of the closest dwelling) during the night under conditions which are conducive to noise propagation towards the measurement location;
- The noise level can be measured at an intermediate location and extrapolated using a recognised noise model if a result cannot be satisfactorily achieved at the closest dwelling (or at a location representative of the closest dwelling).
- In the event that the measured noise level exceeds the relevant criteria in this Construction Noise Management Plan, then all feasible and reasonable mitigation measures will be implemented and the testing repeated to confirm compliance with the criteria.

5 WORK PROCESS AND MITIGATION MEASURES

Noise control strategies should be implemented in accordance with the requirements of the Guidelines to minimise noise during construction. These may include the engineering measures addressed in the Guidelines such as the use of proprietary enclosures around machines, the use of original equipment manufacturer silencers, the substitution of alternative construction processes and the fitting of broadband reversing signals to site based mobile equipment. It may also include administrative measures such as inspections, scheduling and providing training to establish a noise minimisation culture for the works.

The following site specific noise reduction measures provide a suite developed in accordance with the Guidelines from which the construction contractor can develop action plans for each individual activity.

5.1 Scheduling

Construction works, including heavy vehicle movements into and out of the site, will typically occur during normal working hours:

- 7am to 6pm Monday to Friday;
- 7am to 1pm on Saturdays.

5.2 Out of hours

Works carried out outside of the normal working hours will be required to comply with the objective noise criteria detailed in this Construction Management Plan:

- Where activity outside of the normal working hours is proposed, conduct an objective assessment against the relevant criteria using an acoustic engineer (defined for the purposes of this Construction Noise Management Plan to be an engineer eligible for Membership of the Institution of Engineers Australia and the Australian Acoustical Society). The assessment should indicate compliance prior to any works being conducted out of hours.

5.3 Location of Fixed Noise Sources

Locate fixed noise sources such as generators and compressors at the maximum practicable distance to the nearest dwellings.

5.4 Enclose Generators and Compressors

Provide proprietary acoustic enclosures for site compressors and generators.

5.5 Alternative Processes

Investigate and implement alternative processes where feasible and practicable, such as the use of broadband reversing alarms in lieu of the high pitched devices for site based mobile equipment. The fitting of a broadband alarm should be subject to an appropriate risk assessment, with the construction team being responsible for ensuring the alarms are installed and operated in accordance with all relevant occupational, health and safety legislative requirements.

5.6 Site Management

- Select and locate centralised site activities and material stores as far from noise-sensitive receivers as possible;
- Care should be taken not to drop materials, such as rocks, to cause peak noise events, including materials from a height into a truck. Site personnel should be directed as part of a training regime to place material rather than drop it;
- Plant known to emit noise strongly in one direction, such as the exhaust outlet of an attenuated generator set, shall be orientated so that the noise is directed away from noise sensitive areas if practicable;
- Machines that are used intermittently shall be shut down in the intervening periods between works or throttled down to a minimum;
- Implement worksite induction training, educating workers on the requirements of the Construction Noise Management Plan.

5.7 Equipment and Vehicle Management

- Ensure equipment has Original Equipment Manufacturer (OEM) mufflers installed;
- Ensure equipment is well maintained and fitted with adequately maintained silencers which meet the OEM design specifications. This inspection should be part of the monitoring regime;
- Ensure silencers and enclosures are intact, rotating parts are balanced, loose bolts are tightened, frictional noise is reduced through lubrication and cutting noise reduced by keeping equipment sharp. These items should be part of the monitoring regime;
- Use only necessary power to complete the task;
- Inspect, as part of the monitoring regime, plant and equipment to determine if it is noisier than other similar machines, and replace or rectify as required.

5.8 Temporary Infrastructure

There will be other temporary infrastructure associated with the construction of the wind farm. A main site construction compound will be located adjacent to the Utility Area and will typically comprise offices, laydown area, concrete batch plant, storage, workshops, bunded fuel storage a water storage dam and other ancillary construction equipment. There will be two further construction compounds, one to service the construction of the Terminal Station and another one to service the construction of the connection to the 220kV transmission line. These facilities will be located adjacent to the Terminal Station.

In particular:

- Conduct the batching and quarrying activity in accordance with the Project Mitigation Measures above;
- Where activity outside of normal working hours is proposed, conduct an objective assessment against the relevant criteria. The assessment should indicate compliance prior to any works being conducted out of hours.

6 COMPLAINTS PROCEDURE

The investigation of complaints from construction site noise will generally be in accordance with the approved Murra Warra Wind Farm Complaints Management and Response Plan.

The aim of the complaints resolution process is to identify any feasible and reasonable measures that may further reduce impacts following a complaint, and to provide feedback to the community on the above process within a reasonable timeframe. The complaints resolution process should include the following noise elements;

- Provision of a contact dealing with any complaints who is appropriately trained in the Construction Noise Management Plan requirements and in community consultation, and has the ability to action the complaint;
- Establishment of a complaints handling procedure that:
 - Assesses whether the issue can be resolved easily and take immediate action if possible;
 - If not, ensures that the appropriate consultation has been undertaken for the activity;
 - Ensures the on-site inspections of the CNMP have been carried out regularly for the activity;
 - Assesses the construction site and activities to determine whether there is any reason to believe the noise exposure of dwellings is higher than anticipated;
 - Undertakes monitoring of noise levels where this cannot be confirmed and the complaint relates to out of hours activity, with the aim of establishing if the exposure of receivers is higher than anticipated by the CNMP;
 - Takes remedial action with the assistance of an acoustic engineer if any of the above cannot be confirmed.;