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11 NOISE AND VIBRATION

11.1 Introduction

This Chapter describes the existing noise and vibration environment that may be affected by the Glebe Option including both the weir and pipeline works in construction and operation phases. Potential impacts and measures to mitigate those impacts are identified and discussed.

11.2 Methodology

The methodology had regard to the Environmental Protection (Noise) Policy (EPA, 1997a) (EPP Noise) and the *Environmental Protection Regulation 1998* (amended 2006). Likely sources of noise were identified from the Description of Project (Chapter 5) and nearest sensitive receivers were identified from field inspection and aerial photographs.

11.3 Description of Environmental Values

Management of human-induced noise in the Queensland environment comes under the *Environmental Protection Act 1994* (EP Act). The EPP Noise provides guidance in achieving the object of the EP Act in relation to noise. The EPP Noise aims to enhance or protect those qualities of the acoustic environment that are conducive to:

- the well-being of the community or a part of the community, including its social and economic amenity; and
- the well-being of an individual, including the individual's opportunity to have sleep, relaxation, and conversation without unreasonable interference from intrusive noise.

The EPP Noise also provides a numerical value to determine an acoustic quality objective. The acoustic quality is to achieve an ambient level of L_{Aeq} 55 dB(A) or less, measured over 24 hours, for most of Queensland's population living in residential areas. This is a long-term goal but it is not intended that, in achieving the acoustic quality objective, any part of the existing acoustic environment be allowed to significantly deteriorate.

The ambient level in a residential area is measured over 24 hours as the long-term L_{Aeq} outside a dwelling in the area.

In very rural and rural residential areas, the ambient noise level for residential receptors would be expected to be in the range from 25-40dB(A) (with 25 dBA being a night time noise level for rural areas, and 40 dB(A) being the day time noise level for rural residential areas).

The Queensland EP Act does not provide specific guidelines for the assessment of noise impacts for activities such as construction, even for works over extended periods but the *Environmental Protection Regulation 1998* requires that all noise complaints not considered vexatious are investigated. The regulation specifies that building work on a building site shall not be undertaken in a way that makes or causes audible noise:

- on a Sunday or public holiday, at any time, or
- on a Saturday or business day, before 6:30 a.m. or after 6:30 p.m.

The EPP Noise includes noise limits applicable to blasting but no blasting will be required for the Glebe Option.

Section 319 of the EP Act also places a general duty on persons to ensure that an activity is not carried out that causes, or is likely to cause environmental harm unless that person takes all reasonable and practical measures to minimise that harm.

The Taroom Shire Plan (Taroom Shire Council, 2006a) specifies that noise emissions from premises must not cause environmental harm or nuisance to adjoining properties or sensitive land uses and refers to the EPP Noise.

As with air quality (**Chapter 10**), background noise and vibration sources in the vicinity of Glebe Weir and the pipeline route are generally typical of a rural environment with a mix of cropping and grazing. The only noise sources not associated with rural activities are those from boating activities on Glebe Weir, other recreational activities at the camping area and reserve, and native birds and animals.

Sources of noise in both the Glebe Weir and pipeline areas include:

- domestic animals;
- relatively infrequent light and heavy vehicle traffic (particularly in the vicinity of the pipeline);
- farm cultivation and planting equipment which may operate 24 hours per day for short periods on a seasonal basis;
- grain harvesting equipment which may operate for up to 14 hours per day for short periods on a seasonal basis;
- in the vicinity of Glebe Weir — diesel powered irrigation pumps which may operate 24 hours per day for long periods;
- at the camping area — radios and vehicle noise associated with campers and recreational users of the area; and
- on Glebe Weir — powered boats.

Noise monitoring was not undertaken for this assessment given the Glebe Weir and pipeline work areas, and on the basis that there are no specific criteria in the environmental protection documents listed above for noise emissions from construction activities.

However, logging will be undertaken during detailed design. This will establish criteria to be achieved at the camping area as this will become the nearest sensitive receiver to noise sources during the operational phase.

The data will also be used to establish noise goals for Environmentally Relevant Activities (ERA's) during construction. The nearest receivers sensitive to noise from construction sites are a number of homesteads (the nearest being 3.3km from the weir; **Section 10-1**) while the towns of Taroom and Wandoan and homesteads along transport routes will be impacted by traffic noise associated with heavy vehicles. The camping area is not a sensitive receiver during construction as it will not be open.

The relevant existing meteorological conditions for the Glebe Weir and pipeline areas are described in Chapter 6 of Volume 4.

11.4 Potential Impacts and Mitigation Measures

11.4.1 Construction Phase

ERA's such as concrete batching and resource extraction (quarrying) will require an environmental authority (**Chapter 3**). The EPA Guideline: *Planning for noise control* (EPA, 2004a) provides a framework for the assessment and management of noise emissions from industrial and commercial premises. The assessment framework outlined in the guideline would be applied to develop appropriate operational noise goals for ERA's associated with the Glebe Option.

Detailed noise assessments would be undertaken as part of the subsequent development approval process for each ERA once the particular contractors have been commissioned and as part of the subsequent ERA process.

Equipment use represents the principal source of noise and vibration during construction. Major items of equipment likely to be used during the construction phase of the Project are shown in **Table 5-4 (Chapter 5)**. This table includes equipment required for quarry operations. Management of noise and vibration will be the responsibility of the quarry operator with appropriate operational noise goals established as noted above. Given the remote nature of the sites and their historic use, noise goals are likely to be achievable.

The main generators of noise from weir and weir pump station construction works are likely to be:

- dozers and excavators engaged in clearing, site preparation and levee construction;
- heavy vehicle movements;
- air compressors, jackhammers and concrete saws used to reshape the existing spillway and discharge apron;

- small equipment such as angle grinders, portable generators and pumps;
- sheet pile drivers used for pumping station foundation construction and possibly on the weir; and
- the concrete batch plant and associated activity.

The main generators of noise from pipeline construction are likely to be:

- heavy machinery (dozers, excavators and cranes) used for clearing, excavation, balancing storage construction, pipe laying, backfilling and rehabilitation;
- concrete delivery trucks and concrete pouring for thrust blocks and similar structures;
- portable generators and grinders; and
- rock cutters if required.

Pipeline construction involves initially clearing the easement by dozer, moving at a rate of several kilometres per day. Pipe and other material is delivered to stockpile sites several kilometres ahead of the pipe laying team. Some time later the trench is excavated, pipe laid and the trench re-filled. Final rehabilitation occurs at the conclusion of works and is likely to require just a few days in any location. As such, any sensitive receiver may be affected by noise on three or so separate occasions, each lasting from a day to several days.

The only source of appreciable vibration is likely to be the sheet pile driver at the weir site with other equipment such as jackhammers only likely to be of concern to the project workforce. Rock ripping and if required, the rock cutter are potential sources of vibration at two or three locations along the pipeline route. These sources are not expected to cause excessive vibration impacts due to the distances to sensitive receivers (**Table 10-1**) and the short duration of these specific work items (likely to require several days in each location). The recent Wyaralong Dam EIS (QWI, 2007) predicted the extent of vibration impact from similar activities to reach guideline levels within 25m of the source. No blasting is proposed.

The construction period for both the weir and pipeline is predicted to be 15 months but it will be spread over about 22 months to allow for wet season shut downs. As noted with respect to the pipeline, the activity is mobile with activities in any one area lasting from days to a week or more. Adverse impacts from noise will therefore be temporary. Potential noise and vibration impacts on sensitive receivers in the vicinity of Glebe Weir will be minimised because:

- work will be restricted to the hours of 6:30 am to 6:30 pm on weekdays and Saturdays with no work on Sunday;
- all of the actual construction work on Glebe Weir, except on the control room building, will take place in the bed of the Dawson River so the existing weir structure and / or the stream bed and banks, with their associated vegetation, will provide appreciable shielding;
- the closest homestead is approximately 3.3 km from the weir construction site so distance will attenuate noise to a considerable degree.

However the concrete batching plant will be operating on the natural river levee on the left bank and there will be large mobile plant operations in this area at various stages of construction so noise generated here will not be shielded by the river banks. Similarly some of the construction work for the weir pumping station will take place on the levee of Cockatoo Creek.

The homestead on Lot 15 CP FT2 will have the greatest exposure to noise from the Glebe Weir area. Noise from the weir crest will not be shielded by the Dawson River banks as this homestead is generally up-river and there is little shielding vegetation in the garden on the weir side of the house. The house is 3.8km from the weir. Mitigation is proposed as outlined below.

Twenty-one homesteads have been identified within approximately one kilometre of the pipeline route. Consultation has been undertaken with the residents. The closest homesteads are approximately 200 m away. Construction noise impacts will relate to each phase of works but each is of short duration in the vicinity of each site as work progresses along the line. Stockpile sites will be selected away from the vicinity of any sensitive receivers.

A balancing storage will be required on the highest point on the pipeline (on Nathan Road approximately 15.7 km south of the intersection of Nathan Road and the road to Eidsvold via Deearne) but no homesteads were identified within several kilometres of this location. This is a hilly and well treed area which will buffer construction noise.

Noise impacts associated with the construction of the weir, pumping station and the pipeline to the Wandoan Coal Project will be minimised by compliance with the Glebe Option environmental management plan (Glebe EMP, **Chapter 21**). The noise management plan will incorporate the following noise impact mitigation measures:

- providing and maintaining low-noise equipment and operating it in accordance with manufacturer's instructions;
- repairing or replacing defective mufflers on plant and equipment;
- shutting down construction equipment when not in use;
- setting on-site speed limits;
- arranging for the camping area at Glebe Weir to be closed during construction;
- considering substitution of quieter alternative processes when they are available;
- liaising with the residents of homesteads in the vicinity of works regarding the timing of works and to establish preferred times for undertaking the noisiest of activities (such as pile driving);
- responding to complaints, monitoring noise if required and taking appropriate action to reduce noise to acceptable levels (it is proposed that noise management be complaints based, with mitigation appropriate to negating the cause of the complaint); and
- mitigation may include altering the time of the activity, finding and fixing the offending machinery or placing temporary noise barriers and enclosures around noisy activities or along the noise transmission path.

11.4.1.1 Impact on Fauna

Noise associated with the Glebe Option has the potential to disrupt the routine activities of native fauna. Potentially disruptive sources of noise are expected to be limited to the construction phase.

Generally most wildlife acts to avoid areas of noise or vibration that they sense as annoying or threatening.

The study of Terrestrial Environments (**Chapter 12**) considers impacts on fauna in terms of impacts of the Glebe Option on habitats and the species of conservation significance that these are likely to support. The habitat in the immediate vicinity of the weir and weir pumping station construction sites is Regional Ecosystem 11.3.25 (*Eucalyptus tereticornis* or *E. camaldulensis*), and its status is Not of Concern. Though hollows on habitat trees are noted as potential roosting and breeding sites, the Terrestrial Environments study does not identify any known breeding sites for fauna species of conservation significance. Field observations associated with a number of the investigations undertaken did not reveal any obvious long-term nesting sites in the immediate vicinity of the weir though it is highly probable that hollows in trees will be used by several species.

Migratory avian species that utilise shallow wetland or deeper water habitats may utilise Glebe Weir but are more likely to be found upstream, away from human disturbance at the camping area, in shallower water, and where dead trees in the storage provide perching sites. The actual construction area and its likely area of impact is small in area and surrounded on the left bank by cleared cropping fields and a camping area so the number of animals potentially impacted is very low. Thus, evidence available to date indicates that construction noise around the weir should not impact on wildlife.

Most of the pipeline route, being in a road reserve, and the balancing storage site are currently subjected to noise from periodic traffic movement, including that from heavy vehicles. Noise impacts on fauna at any one site along the pipeline route will be limited to less than several days at a time as construction progresses so impacts on fauna should be minimal.

Fauna spotter/catchers are a component of the Glebe EMP and will be required to be vigilant for species adjacent to work areas being cleared that may be impacted on by noise.

Liaison with landholders along the pipeline route will be continued both before and throughout the construction period to ensure that farm operations such as cattle handling are not disrupted by noise from construction works.

11.4.2 Transport Noise and Vibration

An increase in road traffic noise due to the construction activities has the potential to cause annoyance at sensitive receivers where existing traffic volumes are low.

The Leichhardt Highway currently experiences high traffic volumes with 35.5% commercial vehicles in the vicinity of Taroom and 29% commercial vehicles in the vicinity of Wandoan (**Chapter 9**). If heavy vehicles and buses

associated with the Glebe Option are considered as commercial vehicles, commercial vehicle numbers may increase from 185 per day to 195 per day in the vicinity of Taroom and from 204 per day to 219 in the vicinity of Wandoan. This 4 – 6 % increase in commercial vehicle traffic on the Leichhardt Highway will be temporary, from approximately July 2009 to November 2011 so there will be no long-term impacts and the short-term impacts will be marginal.

The increased traffic along Glebe Weir Road is unlikely to be significant at homesteads in the vicinity due to the attenuation afforded by distance. If complaints are received, monitoring and appropriate noise mitigation measures will be implemented.

Transport of rock, aggregate and sand along the Taroom — Cracow Road, Nathan Road, Glebe Road and the access road to the weir pumping station and transport of pipes along Nathan Road will result in a large increase in heavy vehicle traffic on these roads. Noise mitigation measures to reduce the impacts associated with the increase in traffic on local roads will include the following:

- using appropriate mufflers on heavy vehicles and avoiding exhaust braking near residences;
- observance of speed limits;
- limiting truck movements to the daytime period (i.e. 6:00 am to 6:00 pm);
- maintaining the road surface at a suitable standard; and
- responding to complaints, monitoring noise if required and taking appropriate action to reduce noise to acceptable levels (possibly including finding and fixing the offending machinery or using acoustic shrouding of engine blocks for heavy vehicles).

Vibration impacts as a result of vehicle movements are not expected.

11.5 Operation Phase

The operation of the Glebe Weir Project will include weir overflows, releasing water downstream, inflating and deflating the rubber dams and pumping water along a pipeline from a pumping station near the weir to the Wandoan Coal Project.

Noise generated by weir overflows and releases of water downstream will be very similar to existing levels and on that basis have not been considered further. There is the potential for the air compressors and the pumping station to generate noise that may impact on adjacent sensitive receivers. This equipment will need to operate, or be able to operate 24 hours/day.

Inflating the rubber dams fixed to the weir crest and maintaining inflation requires a number of air compressors which will operate continuously till the rubber dams are inflated. They are then inflated intermittently to maintain the required air pressure. These compressors will be housed in a control room adjacent to the weir on the left bank.

The weir pumping station will be sited on Lot 14 CP FT1 approximately 4.8 km from the homestead on that property and approximately 3.5 km from the nearest homestead. It will however be approximately 0.4 km from the camping area at Glebe Weir when this is reopened to the public on completion of construction.

Noise emissions from air compressors and water pumps will be controlled to acceptable levels by ensuring that equipment of appropriate design is installed and maintained, installing sound enclosures over the equipment and designing buildings to contain sound. The design will be based on a noise target developed from monitoring of ambient noise at the camping area prior to construction commencing. Achieving a suitable target in this location will ensure more distant sensitive receivers are not impacted.

Significant vibration impacts from the compressors and pumping stations are very unlikely as any excessive vibration can be eliminated by adequately isolating the units.

There should be little or no noise from flow along the buried pipeline provided that supporting infrastructure such as non-return air valves and control valves are functioning as designed.

The Glebe EMP (**Chapter 21**) for operations includes a complaints process to respond to issues raised by landholders, residents or the community, monitoring noise according to standard procedures and taking appropriate steps to reduce noise to acceptable levels as soon as possible.