Narngulu to Oakajee rail route and services corridor

Westrail

Report and recommendations of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 915
November 1998
Summary and recommendations

This report is to provide the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment about the proposal by Westrail to construct a rail line from the Mullewa-Geraldton rail line at Narngulu to the Oakajee Industrial Estate. The report is based on the environmental factors relevant to the proposal.

The proponent Westrail proposes to build and operate a 34 kilometre single narrow gauge rail line from the Oakajee Industrial Estate to the Mullewa-Geraldton rail line. The rail line will meet a proposed standard gauge rail line from Tallering Peak and the northern third of the rail line will consist of a dual (three rails) standard/narrow gauge rail line.

Section 44 of the Environmental Protection Act 1986 requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the rail line proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

Additionally, this report provides the advice of the EPA to the Minister for the Environment on the Department of Resources Development's (DRD's) concept for a Services Corridor that follows the rail route. The Services Corridor would be used for the co-location of services such as roads, powerlines, pipelines etc. An area wider (250m wide) than that required for the rail line (40m wide) has therefore been studied.

Relevant environmental factors

Although a number of environmental factors were considered by the EPA in the assessment, it is the EPA's opinion that the following are the environmental factors relevant to the proposal by Westrail to construct a rail line from Narngulu to Oakajee which require detailed evaluation in this report:

(a) vegetation communities;
(b) noise; and
(c) dust.

Conclusion

The EPA has considered the proposal by Westrail to construct a rail line from Narngulu to Oakajee. The EPA has concluded that the proposal can be managed to meet the EPA's objectives, and thus not impose an unacceptable impact on the environment, provided the conditions recommended in Section 4 and set out in Appendix 3 are imposed.

In relation to noise, the EPA has defined noise criteria that should be met for this new development to ensure the social impacts would be acceptable.

Other Advice

The EPA has considered the DRD's concept of a Services Corridor that follows the rail line from Narngulu to Oakajee and has not identified any environmental issues that would prohibit the use of the land as a Services Corridor. However, the EPA has not considered any specific development other than the rail line and notes that all proposals for services to co-locate in the Services Corridor would be required to be referred to the EPA under Part IV of the Environmental Protection Act 1986.

The EPA supports the co-location of services in one corridor as a means of minimising the environmental impacts of services to the Oakajee Industrial Estate.
Recommendations

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister consider the report on the relevant environmental factors of vegetation communities, noise and dust;

2. That the Minister notes that the EPA has concluded that the proposal can be managed to meet the EPA's objectives, and thus not impose an unacceptable impact on the environment, provided there is a satisfactory implementation by the proponent of the recommended conditions;

3. That the Minister imposes the conditions and procedures consistent with Section 4 and set out in formal detail in Appendix 3 of this report;

4. That the Minister notes the EPA’s advice on the concept of a Services Corridor; and

5. That the Minister requests the Shire of Chapman Valley and the Shire of Greenough to develop and implement appropriate statutory policies to prevent incompatible development adjacent to the Narrgulu to Oakajee rail line.

Conditions

Having considered the proponent’s commitments and the information provided in this report, the EPA has developed the following set of conditions which the EPA recommends be imposed if the proposal by Westrail to construct a rail line from Narrgulu to Oakajee is approved for implementation:

(a) the proponent shall fulfil the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 3;

(b) in order to manage the environmental impacts of the proposal, and to fulfil the requirements of the conditions and procedures authorised by the Minister for the Environment, prior to ground-disturbing activities, the proponent shall demonstrate to the requirements of the Environmental Protection Authority on advice from the Department of Environmental Protection that there is in place an environmental management system;

(c) The proponent shall, subject to the following conditions, design and operate the railway so as to limit the noise from passing trains to an \( L_{\text{Amax}} \) of 65 dB(A) at any point within 15 metres from existing residences located within 500 metres of the rail line;

(d) Where the noise level from passing trains exceeds an \( L_{\text{Aeq}} \) of 65 dB(A) at any point within 15 metres from a residence, the proponent shall offer to acoustically treat that residence to ensure that passing trains do not cause noise levels within the bedrooms to exceed an \( L_{\text{Amax}} \) of 55 dB(A);

Note: The type of acoustic treatment applied shall be agreed with the property owner and the air quality in the bedrooms shall meet Australian Standard 1668.2-1991 when the windows are shut;

(e) Where the noise level from passing trains exceeds an \( L_{\text{Amax}} \) of 75 dB(A) at any point within 15 metres from a residence, the proponent shall offer to purchase that residence or if practical relocate that residence; and

(f) Where agreement for the acoustic treatment, purchase, or relocation of a residence cannot be reached with the owner, the proponent shall prepare a Noise Management Plan for that residence, to the requirements, including timelines, of the Minister for the Environment on advice of the Environmental Protection Authority. This Noise Management Plan shall detail the measures taken to reduce noise as far as practical, the actions taken to avoid complaints and provide for the opportunity to reopen negotiations for the acoustic treatment or purchase or relocation of the residence, with the owner in the future.

Note: Noise levels shall be measured in accordance with the Environmental Protection (Noise) Regulations 1997.
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1. Introduction and background

This report is to provide the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment on the environmental factors relevant to the proposal by Westrail to build a rail line from the Mullewa-Geraldton rail line at Narrgulu to the Oakajee Industrial Estate (Figure 1).

This report also provides strategic advice on the Services Corridor concept.

The proposed rail line was referred to the EPA in September 1997, and the level of assessment was set at Consultative Environmental Review (CER).

The CER report “Narrgulu to Oakajee Rail Route and Services Corridor”, hereafter referred to as the CER (WEC, 1997), was made available for public review for five weeks from 15 December 1997 to 19 January 1998.

Twelve submissions were received by the DEP, eight of which were from affected property owners. The major issues raised were:

- noise;
- dust;
- vegetation communities;
- lowered property values;
- disruption to farm practices;
- public safety;
- heritage;
- loss of lifestyle; and
- visual amenity.

In compiling this report, the EPA has considered: information provided in the CER; issues raised by the public and government agencies in their submissions on the CER; the proponent’s response to issues raised in submissions; and information provided by the DEP as well as other expert agencies.

Further details of the proposal are presented in Section 2 of this Report. Section 3 discusses environmental factors relevant to the proposal, while conditions and procedures to which the proposal should be subject if the Minister determines that it may be implemented are set out in Section 4. Section 5 provides other advice to the Minister for the Environment on the Services Corridor Concept. Section 6 presents the EPA’s conclusion and Section 7 the EPA’s recommendations.

A list of people and organisations that made submissions is included in Appendix 1, published information is listed in Appendix 2. Recommended Environmental Conditions and Proponent Commitments are included as Appendix 3 and a review of the noise criteria is included in Appendix 4.

The DEP’s summary of submissions and the proponent’s response to those submissions has been published separately and are available in conjunction with this report.
2. The Proposal

The proposed rail line would service the Oakajee Industrial Estate which is located 23 kilometres north of Geraldton (Figure 1).

The rail proposal would involve the construction of a 34 kilometre single narrow gauge rail line. The rail line would start at the Mullewa-Geraldton rail line east of the Narngulu Estate, which is about 5 kilometres south-east of Geraldton. The rail line then runs north, initially on the eastern side of the Moresby range and to the west of Narra Tarra Moonyoonooka Road. The alignment passes through the Wokatherra Pass and then heads westerly to the Oakajee Industrial Estate, which is approximately 23 kilometres north of Geraldton.

An Feng Kingstream Steel propose to construct a standard gauge rail line from Tallering Peak to the Oakajee Industrial Estate. The standard gauge line would meet the narrow gauge line at a point approximately 13 kilometres east of the North West Coastal Highway. West of this point, the rail line would consist of a dual (three rails) standard/narrow gauge rail line.

The rail reserve is proposed to be 40 metres wide to accommodate the rail line, service road, drains and firebreaks. On average, approximately half of the reserve may remain undisturbed.

In the short to medium term the use of the dual standard/narrow gauge section is likely to be dominated by the transport of iron ore. When the demand is high enough the remainder of the rail line would be constructed and used to transport general freight to the Oakajee Industrial Estate. Initially about 3.6 million tonnes of iron ore would be hauled over the northern 13 kilometres of the rail line to the Oakajee Industrial Estate. The transport of iron ore may involve a maximum of ten train movements per day. The CER document assumes a maximum of twenty train movements per day along the northern 13 kilometres of rail line (dual standard/narrow gauge section) and notes that train movements on the remainder of the rail line (narrow gauge section) are likely to be about half this number.

The main characteristics of the proposal are summarised in Table 1.

Additionally, the DRD is seeking strategic advice from the EPA on the suitability of the land adjacent to the rail route for a service corridor. An area wider than that required for the rail line has been studied to highlight any environmental factors that may need to be considered for a services corridor. Such a corridor may include pipelines, roads and powerlines.

Services with the potential to impact on the environment and wishing to establish in the Services Corridor would be subject to referral to the EPA under Part IV of the Environmental Protection Act 1986. Advice on the Services Corridor is given in Section 5 of this report.

3. Environmental factors

3.1 Relevant environmental factors

Section 44 of the Environmental Protection Act 1986 requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal by Westrail to construct a rail line from Narngulu to Oakajee and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.
Figure 1. Regional location.
Table 1. Summary of key proposal characteristics

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life of railway project</td>
<td>On-going</td>
</tr>
<tr>
<td>Duration of construction</td>
<td>approximately 18 months</td>
</tr>
<tr>
<td>Vegetation disturbance</td>
<td>1.2 hectares in Wokatherra Pass area</td>
</tr>
<tr>
<td>Major components:</td>
<td></td>
</tr>
<tr>
<td>• railway reserve</td>
<td>40 metres overall width</td>
</tr>
<tr>
<td>• length</td>
<td>34 kilometres</td>
</tr>
<tr>
<td>• rail formation</td>
<td>6 metres wide</td>
</tr>
<tr>
<td>• drains</td>
<td>either side of rail formation.</td>
</tr>
<tr>
<td>• access road</td>
<td>3 metres wide in rail reserve</td>
</tr>
<tr>
<td>• fire break</td>
<td>3 metres wide on both boundaries of railway reserve.</td>
</tr>
<tr>
<td>• rail track</td>
<td>single</td>
</tr>
<tr>
<td>• ballast</td>
<td>47,600 tonnes sourced from existing quarries</td>
</tr>
<tr>
<td>• gauge</td>
<td>Narrow gauge from Geraldton-Mullewa railway to 13 kilometres east of North-West Coastal Highway. Dual narrow/standard gauge (three rails) west of this point.</td>
</tr>
<tr>
<td>• bridges</td>
<td>Over the Chapman River and over the North-West Coastal Highway.</td>
</tr>
<tr>
<td>• underpass</td>
<td>Under the Geraldton-Mount Magnet Road</td>
</tr>
</tbody>
</table>

In the EPA’s opinion the following are the environmental factors relevant to the proposal by Westrail to construct a rail line from Namgulu to Oakajee:

(a) Vegetation communities;
(b) Noise; and
(c) Dust.

The above relevant factors were identified from the EPA’s consideration and review of all environmental factors (preliminary factors) generated from the proponent’s CER document, the submissions received, the proposal characteristics (including significance of the potential impacts), the adequacy of the proponent’s response and commitments, and the effectiveness of the proposed management. The identification of relevant environmental factors is summarised in Table 2.

The proponent’s commitments in relation to surface water quality, farm practices, and visual amenity are such that further evaluation by the EPA is not required. Heritage issues have been avoided by alignment selection. Public health and safety issues are adequately covered by other agency requirements. The matters of amenity relevant to property value issues are addressed by the factors of Noise and Dust.

The relevant environmental factors are discussed in Sections 3.2 to 3.4 of this report, and the EPA’s assessment is summarised in Table 3.
Table 2: Identification of relevant environmental factors

<table>
<thead>
<tr>
<th>FACTOR</th>
<th>RELEVANT AREA</th>
<th>PROPOSAL CHARACTERISTICS</th>
<th>GOVERNMENT AGENCY AND PUBLIC COMMENTS</th>
<th>IDENTIFICATION OF RELEVANT FACTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BIOPHYSICAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetation Communities</td>
<td>Area within 250 metres of rail alignment.</td>
<td>Site is predominantly cleared farmland, used for cropping and grazing. There are three areas where remnant vegetation could be affected by the proposal:  - the Chapman River crossing,  - Reserve 893, and  - Moosby Range area (1.5 ha disturbed).</td>
<td>Government: The DEP notes the scarcity of remnant vegetation in the region and the impact on remnant vegetation in the Wokatherra Pass area is likely to be significant. The Water and Rivers Commission (WRC) note that fringing vegetation along the Chapman River which is destroyed during construction should be replanted with native vegetation. Public: The Conservation Council of WA (CCWA) notes that the CER states that the rail line will avoid Reserve 893, but is concerned that the service corridor will extend into the reserve. The CCWA believes the proponent should commit to no loss of remnant vegetation.</td>
<td>Considered to be a relevant factor.</td>
</tr>
<tr>
<td>Rare and Priority Flora</td>
<td>Area within 250 metres of rail alignment.</td>
<td>Site is cleared farmland, predominantly used for cropping and grazing. No gazetted rare flora found, but four priority species identified in the study area.</td>
<td>Public: No comments received from the public.</td>
<td>Addressed in part under factor, Vegetation communities. Factor does not require further EPA evaluation.</td>
</tr>
<tr>
<td>Specially Protected Fauna</td>
<td>Area within 250 metres of rail alignment.</td>
<td>Site is predominantly cleared farmland, used for cropping and grazing which does not support faunal habitats. No rare or endangered fauna identified on site. Culverts will be used in the Wokatherra Pass area to allow movement of small fauna.</td>
<td>Government: The WRC note that the Chapman River crossing should provide for the passage of aquatic fauna. Public: The CCWA is concerned about the impact the proposal may have on the Blue-breasted Fairy-wren habitat in the vicinity of the Chapman River crossing.</td>
<td>Blue-breasted Fairy-wren is not rare or endangered. Impact on habitat discussed in factor, Vegetation Communities. Factor does not require further EPA evaluation.</td>
</tr>
<tr>
<td>Surface Water Quantity</td>
<td>Rail alignment and surrounding properties.</td>
<td>Construction of railway may change local drainage patterns. Railway may disrupt domestic and stock water supplies.</td>
<td>Government: The WRC note that natural drainage patterns would need to be maintained. Public: The CCWA believes the CER does not adequately address the effect that drainage changes could have on remnant vegetation. Landowners stated that their domestic and stock water supplies would be difficult to relocate or replace.</td>
<td>Proponent committed to prepare and implement a Water Supply and Drainage Management Plan, and will submit the Plan to the DEP for approval. Factor does not require further EPA evaluation.</td>
</tr>
<tr>
<td>FACTOR</td>
<td>RELEVANT AREA</td>
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<td>GOVERNMENT AGENCY AND PUBLIC COMMENTS</td>
<td>IDENTIFICATION OF RELEVANT FACTORS</td>
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<tr>
<td>POLLUTION</td>
<td></td>
<td></td>
<td></td>
<td>Considered to be a relevant Factor.</td>
</tr>
<tr>
<td>Noise and Vibration</td>
<td>Area within 500 metres of rail alignment including nearby residences.</td>
<td>Land use is predominantly rural with 14 residences in proximity to the rail alignment.</td>
<td>Government: The DEP recommends more stringent noise criteria consistent with the “Draft Policy for EIA No. 14 - Road and Rail Transportation Noise” for the assessment of this proposal. The DEP notes that vibration levels would be acceptable 15 m from the track.</td>
<td></td>
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</tbody>
</table>
|                        |                                                                                | - The CER indicates that there will be about 10 train movements per day along the narrow gauge section of track and an additional 10 train movements of ore per day to the GSP site on the dual narrow/std gauge section of track. | Public: Local residents expressed concern that:  
  - despite the noise being within the ‘criteria’ the noise would still destroy the peaceful way of life.  
  - soundproofing of houses would not protect outside amenity.  
  - the CER assumes inside levels that would require doors and windows to be kept closed.  
  - if AFK reach their final objective of 10 MTPA, there would be many more train movements than described in the CER.  
  - trucks on the Mt Magnet Road would be an additional source of noise as they braked and accelerated at the rail crossing.  
  - noise and vibration could damage buildings and farm infrastructure such as reticulation systems. | Considered to be a relevant Factor. |
|                        |                                                                                | - Potential for significant noise impacts from rail transport of materials and product.                                                                                                                                   |                                                                                                                                                                                                                                                                                                   |                                     |
|                        |                                                                                | The CER proposes the following noise criteria ($L_{Aeq}$):                                                                                                           |                                                                                                                                                                                                                                                                                                   |                                     |
|                        |                                                                                | Unacceptable: $>80$ dB(A)                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                   |                                     |
|                        |                                                                                | Condition: $75-80$ dB(A)                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                   |                                     |
|                        |                                                                                | Acceptable: $<75$ dB(A)                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                   |                                     |
| Dust                   | Area within 500 metres of rail alignment including nearby residences.          | Construction: Construction activities have the potential to create dust emissions.                                                                                                                                           | Public: A consultant suggested that agricultural areas adjacent to the rail line could be affected by a 400m wide iron ore dust shadow.  
  - Members of the public expressed concern that dust may affect the productivity of their crops.  
  - Members of the public expressed concern that dust would affect their health and especially the health of their children. They were also concerned that dust could trigger asthma attacks. | Considered to be a relevant Factor. |
<p>|                        |                                                                                | Following construction, the surface will be either paved or landscaped therefore there will be no unstable areas.                                                                                                         |                                                                                                                                                                                                                                                                                                   |                                     |
|                        |                                                                                | Transport: Transport of iron ore can give rise to dust emissions. The CER states transport from minesite(s) either in covered wagons or with a託ing agent used to control dust. |                                                                                                                                                                                                                                                                                                   |                                     |</p>
<table>
<thead>
<tr>
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<th>PROPOSAL CHARACTERISTICS</th>
<th>GOVERNMENT AGENCY AND PUBLIC COMMENTS</th>
<th>IDENTIFICATION OF RELEVANT FACTORS</th>
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<tbody>
<tr>
<td>SOCIAL SURROUNDINGS</td>
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</tbody>
</table>
| Farm Practices | Rail alignment and surrounding properties. | Land fragmentation will result in:  
- reduced access to properties,  
- interference with farm management practices,  
- interference with stock movement,  
- disruption of domestic and stock water supplies, and  
- reduced viability for primary production. | Government:  
The WRC notes that water supplies are limited in the area and where these supplies are disrupted, sampling should be undertaken to ensure a replacement supply of equivalent quality is provided.  
Public:  
Landowners were concerned that fragmentation may make primary production unviable.  
Landowners stated that their domestic and stock water supplies would be difficult to relocate or replace. | Proponent committed to prepare and implement a Water Supply and Drainage Management Plan, and will submit the Plan to the DEP for approval.  
The issue of compensation will be managed under the Land Acquisition and Public Works Act 1992.  
Proponent committed to:  
- restore road and property access,  
- advise landowners on submission of compensation claims, and  
- manage rail reserve to not conflict with adjoining land uses.  
Factor does not require further EPA evaluation. |
| Heritage | Rail alignment and surrounding area. | An archaeological survey was undertaken within the proposed service corridor.  
No ethnographic sites within the preferred service corridor route.  
No European heritage sites located within the service corridor route. | Public:  
A resident notes that Marrangarangers Spring is likely to have some heritage value both to Aboriginals and Europeans. | The rail alignment will be designed to avoid the Marrangarangers Spring.  
Factor does not require further EPA evaluation. |
| Public Health and Safety | Rail alignment and surrounding area including nearby residences. | Dangerous Goods Transport (risk)  
Accidents involving the transport of Dangerous Goods could pose a threat to public safety and the local environment.  
Rail Crossings  
There will be a requirement for railway crossings both on public roads and private property. | Public:  
Local residents are concerned about the effect that transport of dangerous goods could have on their safety.  
Local residents are concerned about safety at level crossings on their properties. | The transport of dangerous goods will be in accordance with the "Australian Code for the Transport of Dangerous Goods by Road and Rail".  
The level of protection at level crossings will be determined in accordance with the "Railway Level Crossing Protection Policy and Guidelines" issued by the Main Roads WA.  
Factor does not require further EPA evaluation. |
### SOCIAL SURROUNDINGS

| Visual Amenity | Rail alignment and surrounding area. | A portion of the rail alignment passes through the Moreeby Range Landscape Protection Area nominated in town planning schemes and will be visible from some roads and residences. | **Public:** Local residents state that the rail line and service corridor with its associated powerlines, pipelines and roads will have a devastating impact on the visual amenity of the area. | **Proposer:** The Proponent has made a commitment to prepare a Landscape Management Plan in consultation with landowners and relevant authorities. Factor does not require further EPA evaluation. |

### OTHER ISSUES

| Services Corridor | Service Corridor and surrounding area. | The Oakajee Industrial Estate will likely require the following services:  
- water supply;  
- gas;  
- electricity;  
- rail access, and  
- road access.  

The proponent has stated that there would be separate referrals for each service. | **Government:** The EPA, in the Oakajee Industrial Estate Section 16(c) Report, highlighted the need for separate referral of infrastructure items and the preference for multiple-use service corridors.  
**Public:** The Shire of Chapman Valley has indicated a preference for services to be located in a single corridor (or to minimise number of corridors) to reduce impacts on landowners and the environment (EPA, 1997b).  
The CCWA question what services would be placed in the corridor, what sections of the corridor would they co-locate for and when would they be assessed? The CCWA suggest the CER is a backdoor way of getting approval for services without proper details and assessment. | Further advice needed to be given on this issue. This advice is provided in Section 5 of this report. |

<p>| Property values/Compensation | Rail alignment and surrounding area. | Land for the rail reserve and possibly the services corridor will need to be acquired. Division of properties by the rail reserve may affect the viability of primary production. | <strong>Public:</strong> Many residents were concerned that their properties were reduced in value or had become unsaleable because of the proposed rail line. | The issue of resuming property and compensation will be managed under the Land Acquisition and Public Works Act 1902. The matters of amenity that cause the perception of reduced property values are addressed by the factors of Noise and Dust. Factor does not require further EPA evaluation. |</p>
<table>
<thead>
<tr>
<th>FACTOR</th>
<th>RELEVANT AREA</th>
<th>EPA OBJECTIVES</th>
<th>EPA’S ASSESSMENT</th>
<th>EPA’S ADVICE</th>
</tr>
</thead>
</table>
| Vegetation Communities | Area within 250 metres of rail alignment. | To maintain the abundance, species diversity, geographic distribution and productivity of vegetation communities. | Reserve 893 will be avoided by the rail route but other services locating in the Service Corridor may require special attention in the area of the reserve. The rail line in the Wokatha Pass area would have a significant impact on the large remnant of native vegetation in this area. This may be particularly significant as the part of remnant to be affected is an example of the lower slope vegetation of the Moresby Range, which is now apparently very uncommon (more so than the mid-upper slopes and crests). Initially, 1.5 hectares was to be affected, but changes to the alignment have reduced this to 1.2 hectares. | Having particular regard to:  
  - the reduction in the area of remnant vegetation impacted;  
  - the requirements under the Soil and Land Conservation Act 1945; and  
  - the proponent’s commitments, it is the EPA’s opinion that the proposal can be managed to meet the EPA’s objective subject to the Commissioner for Soil and Land Conservation’s approval to clear and provided that the proponent’s commitments are made legally enforceable. |
| Noise         | Area within 500 metres of rail alignment including nearby residences. | To protect the amenity of nearby residences from noise and vibration impacts by ensuring noise and vibration meet reasonable criteria. | The EPA has accepted the DEP’s recommendation that noise criteria consistent with the “Draft Guidelines for ELA No. 14 - Road and Rail Transportation Noise” be used for the assessment of this proposal. This would require the purchase of two residences and the acoustic treatment of a further three residences. Summary of Recommended Conditions:  
  - the proponent shall design and operate the rail line so as to limit the noise from passing trains to an $L_{max}$ of 65 dB(A) external to nearby residences;  
  - where the noise level from passing trains exceeds an $L_{max}$ of 65 dB(A) external to a residence, the proponent shall acoustically treat the residence to ensure that passing trains do not cause noise levels within the bedrooms which exceed an $L_{max}$ of 55 dB(A);  
  - where the noise level from passing trains exceeds an $L_{max}$ of 75 dB(A) external to a residence, the proponent shall offer to purchase that residence or if practical relocate that residence; and  
  - where agreement for the acoustic treatment or purchase or relocation of a residence cannot be reached with the owner, the proponent shall prepare an NMP for that residence. | Having particular regard to:  
  - the low background levels in the area;  
  - the advice from the DEP; and  
  - the recommended conditions, it is the EPA’s opinion that the proposal can be managed to meet the EPA’s objective provided that the recommended conditions are applied. |
| Dust          | Area within 500 metres of rail alignment including nearby residences. | To ensure that dust levels generated by the proposal do not adversely impact upon welfare and amenity or cause health problems by meeting statutory requirements and acceptable standards. | Dust generated from the transport of iron ore would be expected to consist of particles greater than 10 um in diameter. The dust would not therefore be respirable and consequently would not represent a substantial health hazard. The proponent has stated that iron ore being transported to the Geraldton Steel Plant would be in covered wagons or treated with a dusting agent to prevent dust.  
Proponent’s commitments:  
  - Apply the DEP’s “Guidelines for the prevention of dust and smoke pollution from land development sites in WA” during construction; and  
  - Establish and implement dust control procedures for rail transport, including the use of covered wagons or a dusting agent for the transport of iron ore. | Having particular regard to:  
  - the proponent’s commitment to the application of the DEP’s “Guidelines for the prevention of dust and smoke pollution from land development sites in WA” during construction; and  
  - the proponent’s commitments to develop and implement dust control procedures, it is the EPA’s opinion that the proposal can be managed to meet the EPA’s objective provided that the proponent’s commitments are made legally enforceable. |
3.2 Vegetation communities

Description

The proposed route is predominantly through cleared rural land. Owing to grazing and the small area of remnants, plant associations along the route generally have low vegetation complexity and species richness with the exception of remnant heath at locations F, G, and H, near the Wokatherra Pass. (Figure 2).

The Moresby Range has particular values and is poorly represented in conservation reserves and is subject to System 5 recommendations, in which the EPA commented:

"The EPA recognises the scarcity of conservation reserves in the Geraldton area and the scenic attraction of the Moresby Range. The EPA recommends that the National Parks Authority maintain a watching brief on land suitable for acquisition for National Parks, when financial resources permit and the land becomes available for purchase." (EPA, 1976).

Initially the rail line was to disturb about 1.5 hectares of remnant vegetation, but changes to the alignment have reduced this to about 1.2 hectares of remnant vegetation, mainly in the Wokatherra pass area of the Moresby Range. In May 1995 the Western Australian State Government adopted the Remnant Vegetation Policy which discourages clearing where total remnant vegetation within a local government authority or sub-catchment is less than 20%. This policy isimplemented under the Soil and Land Conservation Act 1945 by the Commissioner for Soil and Land Conservation.

Regionally there is very little remnant vegetation. The Shire of Chapman Valley has less than 11.1% of its area as remnant vegetation and the Shire of Greenough has less than 8.2%. All remaining remnant vegetation is therefore significant, albeit that it may have varying quality.

An A Class Reserve 893 for the Conservation of Flora and Fauna is adjacent to the proposed route and has the potential to be threatened through construction activities and changes to drainage.

Public submissions expressed concern about the loss of remnant vegetation.

Assessment

The area considered for assessment of this relevant environmental factor is the proposed route and the area 250m on either side of the rail line. This is the area where loss of remnant vegetation could occur.

The EPA’s objective in regard to this environmental factor is to maintain the abundance, species diversity, geographic distribution and productivity of vegetation communities.

The rail line route in the Wokatherra Pass area would have a significant impact on the large remnant of native vegetation (areas F, G and H) in this area. This may be particularly significant as the part of the remnant to be affected is an example of the lower slope vegetation of the Moresby Range, which is now very uncommon (more so than the mid-upper slopes and crests).

The DEP undertook discussions with the proponent about the possibility of relocating the rail alignment to the south of remnant G, however the proponent advised that this was not practical as the gradient of the line would be 1:80 which is greater that the maximum acceptable gradient of 1:100 for freight trains. There would also be a greater impact on a residence as the rail line would be located closer to it.

Following these discussions the proponent made a new commitment to prepare and implement a Vegetation Management Plan and to compensate for the loss of particular conservation values at remnant “G” by securely protecting a remnant with equivalent vegetation and landscape values into the conservation estate.

The proponent has also made a commitment to prepare a Water Supply and Drainage Management Plan which will address the issue of drainage in sensitive areas such as Conservation Reserve 893 and the Chapman River.
The EPA notes that the clearing of greater than one hectare of remnant vegetation requires approval by the Commissioner for Soil and Land Conservation.

Having particular regard to:
(a) the reduction in the area of remnant vegetation impacted;
(b) the requirements under the *Soil and Land Conservation Act 1945*; and
(c) the proponent’s commitments for a Vegetation Management Plan and Water Supply and Drainage Management Plan and compensation for the loss of conservation values.

It is the EPA’s opinion that the proposal can be managed to meet the EPA’s objective subject to the Commissioner for Soil and Land Conservation’s approval to clear and provided that the proponent’s commitments are made legally enforceable.

### 3.3 Noise

#### Description

The proposed route is through a rural area. The CER states that a maximum of twenty train movements per day are envisaged for the rail line in the medium to long term. The night time background noise levels in this rural area would be expected to be generally low and limited monitoring has confirmed the night time background level under calm weather conditions can be less than 27 dB(A).

Noise levels for projects within Western Australia are subject to the *Environmental Protection (Noise) Regulations 1997*, however these regulations specifically exclude noise from trains, aircraft and vehicles on roads. Therefore the EPA needs to assess proposals involving transport noise on their individual merits. For this proposal, the DEP examined the proposal and advised the proponent of the noise criteria that it would be recommending the EPA to adopt for the assessment of the Narginulu to Oakajee rail line proposal. The criteria was based on the protection of outside amenity and the need to provide an acceptable sleeping environment.

To provide greater certainty to proponents and the public on the outcome of the environmental impact assessment process, the EPA has in conjunction with the DEP been preparing guidance on the assessment of a variety of environmental factors. As part of this process the DEP has recently prepared “Draft Guidelines for the Assessment of Environmental Factors No. 14 - Road and Rail Transportation Noise” (DEP, 1998). This Draft is currently with the Department of Transport, Westrail and the Main Roads Department for 12 months peer review. The noise criteria in the Draft Guidelines are consistent with the DEP criteria advised to the proponent.

The CER document presents train noise contours (as an L_{Amax}) of 65, 75 and 80 dB(A) and describes the proponent’s proposed criteria to differentiate between noise level zones which are unacceptable, conditional and acceptable. These noise level zones are then used to decide what action, including whether residences should be purchased or receive acoustic treatment in line with the proponent’s commitments, should be undertaken.

The proponent’s proposed criteria are however, less stringent than the criteria initially recommended by the DEP for this particular proposal and subsequently included in the “Draft Guidelines for the Assessment of Environmental Factors No. 14 - Road and Rail Transportation Noise”. A comparison of the two criteria is presented in Table 4 below.
Table 4. Comparison of Noise Criteria (presented as external or outside levels).

<table>
<thead>
<tr>
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<th>DEP’s Criteria</th>
<th>Proponent’s Criteria</th>
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<td>$L_{A_{max}}$</td>
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<td>&gt;80 dB(A)</td>
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<tr>
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<td>&lt;65 dB(A)</td>
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</table>

* - Number of residences affected. Only includes residences that are within the modelled 65 dB(A) contour and assumes the modified rail alignment.

The internal noise levels would be approximately 10 dB(A) less than the external levels in the above Table.

Discussion between the proponent and the DEP over the noise level criteria did not result in mutually agreed noise criteria. In summary the proponent maintains that an internal level of 65 dB $L_{A_{max}}$ is acceptable, while the DEP recommends 55 dB $L_{A_{max}}$.

It should be noted that the World Health Organisation (WHO) recommends a guideline internal noise level of 45 dB $L_{A_{max}}$ and that it is especially important to limit the maximum level when the background noise levels are low (WHO, 1995).

Public submissions related to the impact that train noise would have on residents amenity and quality of life irrespective of the noise meeting “acceptable” standards.

Assessment

The area considered for assessment of this relevant environmental factor is the proposed route and the area 500 metres either side of the rail line. This is the area within which noise levels should be managed to meet reasonable criteria.

The EPA’s objective in regard to this environmental factor is to protect the amenity of nearby residences from noise impacts by ensuring noise levels meet reasonable criteria.

At the request of the EPA, the DEP reviewed the noise criteria that should apply to the proposal and this review is provided in Appendix 4.

The EPA notes that the effect noise has on sleep disturbance is dependent on a number of factors including the noise level, emergence above background, number of noise events and duration of noise events and that much of the published research indicates that an internal noise level of 55 dB $L_{A_{max}}$ is a critical level in sleep disturbance.

The EPA recognises the importance of minimising sleep disturbance and has accepted the DEP’s recommended criteria for the assessment of this proposal.

The EPA notes that the “Draft Guidelines for Assessment of Environmental Factors No. 14 - Road and Rail Transportation Noise” is presently out for peer review for 12 months. Until the review process for the Draft Guidelines has been completed, the EPA will continue to consider all proposals on their individual merits in regard to acceptable noise impacts.

The EPA emphasises that the decision to adopt criteria consistent with the Draft Guidelines No: 14 for assessment of the Narrgulu to Oakajee rail line should not be seen to prejudice or preempt the review of the Draft Guidelines No. 14.

The EPA is aware that the noise level criteria adopted for assessment of this proposal could still result in a degree of noise impact on the adjacent residences and may thus lead to complaints.
from the occupiers. The criteria does however represent a significant improvement on the noise levels that many residences are subject to, from existing rail lines in Western Australia.

Having particular regard to:

(a) the low background noise levels in the area;
(b) the advice from the DEP (Appendix 4); and
(c) the recommended conditions relating to acoustical treatment or purchase of affected residence where noise criteria are exceeded,

it is the EPA’s opinion that the proposal can be managed to meet the EPA’s objective.

3.4 Dust

Description
Particulate matter may result from activities undertaken during land clearing and construction of the rail line, and as a consequence of on-going operations. In particular the transport of materials such as iron ore has the potential to generate dust emissions.

The CER states that dust generated during construction will be minimised by the application of procedures from the DEP’s “Guideline for the prevention of dust and smoke pollution from land development sites in Western Australia” (DEP, 1996) and that Westrail would require the control of dust from the rail transportation of any material to be in accordance with best practice.

Public concern related to the impact dust may have on health, particularly the health of children and asthmatics, and on the affect that iron ore dust lift off could have on adjacent vegetation.

Assessment
The area considered for assessment of this relevant environmental factor is the proposed route and the area within 500 metres, including nearby residences.

The EPA’s objective in regard to this environmental factor is to ensure that dust levels generated by the proposal do not adversely impact upon welfare and amenity or cause health problems by meeting statutory requirements and acceptable standards.

The CER states that the dust generated from the transport of iron ore would be expected to consist of particles much greater than 10 micrometres in diameter. The dust would not therefore be respirable and consequently would not present a substantial health hazard. However, excessive dust levels may potentially give rise to a nuisance or impact on vegetation. There are examples in Western Australia where the rail transport of iron ore has resulted in the retardation of vegetation in the “dust shadow”.

The proponent has made a commitment to apply the procedures from the DEP’s “Guideline for the prevention of dust and smoke pollution from land development sites in Western Australia” during construction and to establish and implement procedures for the suppression of dust from rail transportation. These procedures would include the transport of iron ore in covered wagons or the treating of the fines in the ore with a crusting agent.

Having particular regard to:

(a) the proponent’s commitment to the application of the DEP’s “Guideline for the prevention of dust and smoke pollution from land development sites in Western Australia” during construction; and
(b) the proponent’s commitment to establish and implement dust control procedures for rail transport, including the use of covered wagons or a crusting agent for the transport of iron ore,

it is the EPA’s opinion that the proposal can be managed to meet the EPA’s objective.
4. Conditions

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

In developing recommended conditions for each project, the EPA's preferred course of action is to have the proponent provide an array of commitments to ameliorate the impacts of the proposal on the environment. The commitments are considered by the EPA as part of its assessment of the proposal, and following discussion with the proponent the EPA may seek additional commitments.

The EPA recognises that not all of the commitments are written in a form which makes them readily enforceable, but they do provide a clear statement of the action to be taken as part of the proponent's responsibility for and commitment to continuous improvement in environmental performance. The commitments then form part of the conditions to which the proposal should be subject if it is to be implemented.

The EPA may, of course, also recommend conditions additional to that relating to the proponent's commitments.

Having considered the proponent's commitments and the information provided in this report, the EPA has developed the following set of conditions which the EPA recommends be imposed if the proposal by Westrail to construct a rail line from Nanggala to Oakajee is approved for implementation:

(a) the proponent shall fulfil the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 3;

(b) in order to manage the environmental impacts of the proposal, and to fulfil the requirements of the conditions and procedures authorised by the Minister for the Environment, prior to ground-disturbing activities, the proponent shall demonstrate to the requirements of the Environmental Protection Authority on advice from the Department of Environmental Protection that there is in place an environmental management system;

(c) The proponent shall, subject to the following conditions, design and operate the railway so as to limit the noise from passing trains to an $L_{A_{max}}$ of 65 dB(A) at any point within 15 metres from existing residences located within 500 metres from the rail line;

(d) Where the noise level from passing trains exceeds an $L_{A_{avg}}$ of 65 dB(A) at any point within 15 metres from a residence, the proponent shall offer to acoustically treat that residence to ensure that passing trains do not cause noise levels within the bedrooms to exceed an $L_{A_{max}}$ of 55 dB(A);

Note: The type of acoustic treatment applied shall be agreed with the property owner and the air quality in the bedrooms should meet Australian Standard 1668.2-1991 when the windows are shut;

(e) Where the noise level from passing trains exceeds an $L_{A_{max}}$ of 75 dB(A) at any point within 15 metres from a residence, the proponent shall offer to purchase that residence or if practical relocate that residence; and

(f) Where agreement for the acoustic treatment, purchase, or relocation of a residence cannot be reached with the owner, the proponent shall prepare a Noise Management Plan for that residence, to the requirements, including timelines of the Minister for the Environment on advice of the Environmental Protection Authority. This Noise Management Plan shall detail the measures taken to reduce noise as far as practical, the actions taken to avoid complaints and provide for the opportunity to reopen negotiations for the acoustic treatment or purchase or relocation of the residence, with the owner in the future.

Note: Noise levels shall be measured in accordance with the Environmental Protection (Noise) Regulation 1997.
5. Other advice

The DRD is seeking strategic advice from the EPA on the suitability of the land adjacent to the rail route for a services corridor. An area wider than that required for the rail line has been studied to highlight any environmental factors that may need to be considered for a services corridor. Such a corridor may include pipelines, roads and powerlines.

In its assessment of the Oakajee Industrial Estate - Concept (EPA, 1997a) the EPA stated:

“The EPA is further of the view that a goal of Government in relation to the development of the Oakajee Industrial Estate Concept is to limit the impact of infrastructure corridors to the industrial site. This can best be achieved by multi-use corridors, including the provision for separation from sensitive land uses, which can in themselves be afforded recognition through planning amendment.”

In the EPA’s opinion and having regard to the public and government agency comments (Appendix 1) and other relevant information, the following are the environmental issues likely to be applicable to development within a Services Corridor that follows the rail route.

(a) vegetation communities;
(b) noise;
(c) dust;
(d) visual impact; and
(e) public health and safety.

These are discussed below. It should be noted that this consideration is not of individual proposals but of the Services Corridor Concept as a whole. The focus is not, therefore, on the direct impacts associated with individual services. These would need to be considered separately under Section 38 of the Environmental Protection Act 1986 when a proposed user of the Services Corridor is referred to the EPA.

Vegetation communities

As with the rail line, the proposed corridor is predominantly through cleared rural land. Owing to grazing and the small area of remnants, plant associations along the route generally have low vegetation complexity and species richness with the exception of remnant heath at locations F, G, and H. (Figure 2). Services locating in the corridor would likely result in the further loss of remnant vegetation at these locations.

The rail route passes just east of Conservation Reserve 893 (area about 15 hectares) and the nominal service corridor width extends over approximately 5 hectares of the reserve.

It would be necessary to manage the services in the vicinity of Conservation Reserve 893 to prevent an impact on the reserve. The reserve could be avoided by locating the services to the west of the rail line in this area.

The EPA notes that the commitment made by Westrail for the rail line would enable an area of remnant vegetation with equivalent vegetation and landscape conservation values to the whole Services Corridor width in the Wokatherra Pass area to be placed in a secure reserve initially, instead of a piece by piece approach.

In considering aspects of vegetation communities, any future referral for a service to co-locate in the Services Corridor should include, but not be limited to the following:

- a vegetation management plan which details the measures to protect, retain, enhance or replace the vegetation and landscape conservation values of remnant vegetation impacted by the proposed service; and
- measures to avoid impact on Conservation Reserve 893.
Noise

The proposed route is through a rural area, with night time background levels expected to be very low at times.

The DEP has advised that since trucks are typically about 10 dB(A) quieter than the proposed trains, the buffer width necessary for the train noise should be sufficient to accommodate a road without exceeding reasonable criteria.

Noise from fixed plant such as pumping stations or conveyors would be required to comply with the assigned levels in the Environmental Protection (Noise) Regulations 1997.

In considering aspects of noise, any future referral for a service to co-locate in the Services Corridor should include, but not be limited to the following:

- noise modelling which predicts the noise levels at nearby noise sensitive premises;
- details of any noise control measures required to comply with the appropriate criteria; and
- measures to manage construction noise.

Dust

Particulate matter may result from activities undertaken during land clearing and construction of the particular service, and as a consequence of on-going operations.

The EPA cannot forecast what particular types of service may wish to co-locate in the Services Corridor, however it is likely that most services would have the potential to generate dust during the construction phase. The EPA notes that application of the DEP’s “Guideline for the prevention of dust and smoke pollution from land development sites in Western Australia” is likely to ensure that the EPA’s objective is met during construction.

In considering aspects of dust, any future referral for a service to co-locate in the Services Corridor should include, but not be limited to the following:

- measures to minimise dust emissions during construction; and
- measures to minimise dust during operation, if applicable.

Visual impact

The Shire of Chapman Valley has designated an area of heritage (landscape) value in its town planning scheme centred on the Moresby Range, associated valleys and the Lower Chapman River.

The 1989 Draft Region Plan outlined the need to protect the landscape of the Moresby Range. The Moresby Range Management Committee was established in 1996 to examine land management requirements for the Range. This Committee is currently preparing a land management strategy for the Range.

Public concern related to the impact that powerlines, pipelines and roads could have on scenic beauty of the area, particularly in the Wokatherra Pass area.

The EPA recognises that the greatest visual impact is likely to occur where the route crosses the Moresby Range and notes that it may be prudent to address the management of visual amenity in this area for a suite of possible services.

Whilst development in the Services Corridor may detract from the existing rural amenity of the area, the EPA believes that the impact should be able to be managed to an acceptable level. It would therefore be prudent for DRD to prepare a Landscape Management Plan for a suite of possible services in consultation with the local Shires and the Moresby Range Management Committee and with opportunities for public comment.

In considering aspects of visual impact, any future referral for a service to co-locate in the Services Corridor should include, but not be limited to the following:
• a landscape management plan with details of screening and view-shed analysis. This should be in consultation with the local Shires and the Moresby Range Management Committee.

Public health and safety

The EPA has established management principles and acceptable off-site individual fatality risk for new industrial developments with a potentially hazardous nature (EPA, 1998).

Risk assessment would be required for specific services wishing to establish in the services corridor.

Public submissions did not specifically relate to risk from other services.

The EPA would expect that public risk associated with services locating in the Services Corridor were as low as reasonably achievable and in compliance with the EPA’s Interim Guidelines for the Assessment of Environmental Factors No. 2 - Risk Assessment and Management: Offsite Individual Risk from Hazardous Industrial Plant.

The EPA can not forecast what particular type of services may wish to co-locate in the Services Corridor and can not therefore predict the levels of risk which may be associated with those services. The EPA has however, set down criteria to protect surrounding residents and notes that the buffer necessary for the train noise, also provides reasonable scope for accommodating risk generating services.

In considering aspects of public health and safety, any future referral for a service to co-locate in the Services Corridor which has the potential to generate risk, should include, but not be limited to the following:

• a risk assessment to determine the hazardous nature of the source and the potential risk to surrounding public and environment (gas pipelines would need to be assessed in accordance with SAA HB105-1998 “Guide to pipeline risk assessment in accordance with AS2885.1”); and

• a risk management plan that provides details of measures necessary to minimise risk.

EPA advice

The EPA has considered the concept of a Services Corridor that follows the rail line from Narngulu to Oakajee and has not identified any fatal flaws that would prohibit the consideration of the land as a Services Corridor. The EPA supports the co-location of services in one corridor as a means of minimising the environmental impacts of services to the Oakajee Industrial Estate.

The EPA notes that all proposals for services to co-locate in the Services Corridor would be required to be referred to the EPA under Part IV of the Environmental Protection Act 1986.

6. Conclusions

The EPA has considered the proposal by Westrail to establish a rail line from Narngulu to Oakajee. The EPA has concluded that the proposal can be managed to meet the EPA’s objectives, and thus not impose an unacceptable impact on the environment, provided there is a satisfactory implementation by the proponent of the recommended conditions set out in Section 4 and Appendix 3.

In relation to noise, the EPA has defined noise criteria that should be met for this new development to ensure the social impacts would be acceptable.
7. Recommendations

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister consider the report on the relevant environmental factors of vegetation communities, noise and dust;

2. That the Minister notes that the EPA has concluded that the proposal by Westrail to build a rail line from Narngulu to Oakajee can be managed to meet the EPA's objectives, and thus not impose an unacceptable impact on the environment, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 3;

3. That the Minister imposes the conditions and procedures consistent with Section 4 and set out in formal detail in Appendix 3 of this report;

4. That the Minister notes the EPA's advice on the concept of a Services Corridor; and

5. That the Minister requests the Shire of Chapman Valley and the Shire of Greenough to develop and implement appropriate statutory policies to prevent incompatible development adjacent to the Narngulu to Oakajee rail line.
Appendix 1

List of submitters
State and local government agencies:
- Department of Environmental Protection
- Waters and Rivers Commission

Organisations:
- Conservation Council of Western Australia Inc

Members of the Public:
- J. and K. Beissel
- E.J. and S.G. Green
- K.J. and S. Macintyre
- P.J. and S. Monaghan
- Van Tru Nguyen and Van Lan Tran
- M. and G. Price
- J. and M. Purchase
- G.M. and E.L. Royce
- Chapple Research
Appendix 2

References


EPA, (1976) *Conservation Reserves For Western Australia - System 1,2,3,5*. Environmental Protection Authority, July 1976.


Appendix 3

Recommended Environmental Conditions and proponent commitments
Recommended Conditions

NARNGULU TO OAKAJEE RAIL ROUTE

Proposal: The construction and operation of a 34 kilometre single narrow gauge rail line from the Oakajee Industrial Estate (approximately 23 kilometres North of Geraldton) to the Mullewa-Geraldton rail line. The rail line will meet the proposed standard gauge rail line from Tallering Peak and the northern third of the rail line will consist of a dual (three rails) standard/narrow gauge rail line, as documented in schedule 1 of this statement.

Proponent: Westrail

Proponent Address: Westrail Centre, West Parade, PERTH WA 6000

Assessment Number: 1165

Report of the Environmental Protection Authority: Bulletin 915

The proposal to which the above report of the Environmental Protection Authority relates may be implemented subject to the following conditions and procedures:

1 Implementation

1-1 Subject to these conditions and procedures, the proponent shall implement the proposal as documented in schedule 1 of this statement.

1-2 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment determines, on advice of the Environmental Protection Authority, is substantial, the proponent shall refer the matter to the Environmental Protection Authority.

1-3 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment determines, on advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

2 Proponent Commitments
2-1 The proponent shall implement the consolidated environmental management commitments documented in schedule 2 of this statement.

2-2 The proponent shall implement subsequent environmental management commitments which the proponent makes as part of the fulfilment of conditions and procedures in this statement.

3 Environmental Management System

3-1 In order to manage the environmental impacts of the project, and to fulfil the requirements of the conditions and procedures in this statement, prior to ground-disturbing activities, the proponent shall demonstrate to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection that there is in place an environmental management system which includes the following elements:

1 environmental policy and commitment;

2 planning of environmental requirements;

3 implementation and operation of environmental requirements;

4 measurement and evaluation of environmental performance; and

5 review and improvement of environmental outcomes.

3-2 The proponent shall implement the environmental management system referred to in condition 3-1.

4 Noise Management

4-1 The proponent shall, subject to conditions 4-2, 4-3 and 4-4, design and operate the railway so as to limit the noise from passing trains to an $L_{A_{max}}$ of 65 dB(A) at any point within 15 metres from existing residences located within 500 metres of the rail line.

4-2 Where the noise level from passing trains exceeds an $L_{A_{max}}$ of 65 dB(A) at any point within 15 metres from a residence, the proponent shall offer to acoustically treat that residence to ensure that passing trains do not cause noise levels within the bedrooms to exceed an $L_{A_{max}}$ of 55 dB(A).

Note: The type of acoustic treatment applied shall be agreed with the property owner, and the air quality in the bedrooms shall meet Australian Standard 1668.2-1991 when the windows are shut.

4-3 Where the noise level from passing trains exceeds an $L_{A_{max}}$ of 75 dB(A) at any point within 15 metres from a residence, the proponent shall offer to purchase that residence or if practical relocate that residence.

4-4 Where agreement for the acoustic treatment, purchase, or relocation of a residence cannot be reached with the owner, the proponent shall prepare a Noise Management Plan for that residence, to the requirements, including timelines of the Minister for the Environment on advice of the Environmental Protection Authority.

This Noise Management Plan shall detail the measures taken to reduce noise as far as practical, the actions taken to avoid complaints and provide for the opportunity to reopen
negotiations for the acoustic treatment or purchase or relocation of the residence, with the owner in the future.

Note: Noise levels shall be measured in accordance with the Environmental Protection (Noise) Regulations 1997.

5 Decommissioning Management Plan

5-1 At least six months prior to decommissioning, the proponent shall prepare a Decommissioning Management Plan to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection.

This Plan shall address:

1. removal or, if appropriate, retention of plant and infrastructure;

2. rehabilitation of all disturbed areas to a standard suitable for agreed new land use(s); and

3. identification of contaminated areas, including provision of evidence of notification to relevant statutory authorities.

5-2 The proponent shall implement the Decommissioning Management Plan required by condition 5-1.

5-3 The proponent shall make the Decommissioning Management Plan required by condition 5-1 publicly available, to the requirements of the Environmental Protection Authority.

6 Proponent

6-1 The proponent for the time being nominated by the Minister for the Environment under section 38(6) or (7) of the Environmental Protection Act 1986 is responsible for the implementation of the proposal until such time as the Minister for the Environment has exercised the Minister’s power under section 38(7) of the Act to revoke the nomination of that proponent and nominate another person in respect of the proposal.

6-2 Any request for the exercise of that power of the Minister referred to in condition 6-1 shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the proposal in accordance with the conditions and procedures set out in the statement.

6-3 The proponent shall notify the Department of Environmental Protection of any change of proponent contact name and address within 30 days of such change.

7 Commencement

7-1 The proponent shall provide evidence to the Minister for the Environment within five years of the date of this statement that the proposal has been substantially commenced.

7-2 Where the proposal has not been substantially commenced within five years of the date of this statement, the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment will determine any question as to whether the proposal has been substantially commenced.
7-3 The proponent shall make application to the Minister for the Environment for any extension of approval for the substantial commencement of the proposal beyond five years from the date of this statement at least twelve months prior to the expiration of the five year period referred to in conditions 7-1 and 7-2.

7-4 Where the proponent demonstrates to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority that the environmental parameters of the proposal have not changed significantly, then the Minister may grant an extension not exceeding five years for the substantial commencement of the proposal.

8 Compliance Auditing

8-1 The proponent shall submit periodic Performance and Compliance Reports, in accordance with an audit program prepared in consultation between the proponent and the Department of Environmental Protection.

8-2 Unless otherwise specified, the Chief Executive Officer of the Department of Environmental Protection is responsible for assessing compliance with the conditions, procedures and commitments contained in this statement and for issuing formal clearance.

8-3 Where compliance with any condition, procedure or commitment is in dispute, the matter will be determined by the Minister for the Environment.
The Proposal

The construction and operation of a 34 kilometre single narrow gauge rail line. The rail line will start at the Mullewa-Geraldton rail line east of the Nargulu Estate, which is about 5 kilometres south-east of Geraldton. The rail line then runs north, initially on the eastern side of the Moreby Range and to the west of Narra Tarra Moonyoomooka Road. The alignment passes through the Wokatherra Pass and then heads westerly to the Oakajee Industrial Estate, which is approximately 23 kilometres north of Geraldton. The rail line will meet the proposed standard gauge rail line from Talicing Peak and the northern third of the rail line will consist of a dual (three rails) standard/narrow gauge rail line.

Key characteristics table

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<tr>
<td>fire break</td>
<td>3 metres wide on both boundaries of railway reserve.</td>
</tr>
<tr>
<td>rail track</td>
<td>single</td>
</tr>
<tr>
<td>ballast</td>
<td>47,600 tonnes sourced from existing quarries</td>
</tr>
<tr>
<td>gauge</td>
<td>Narrow gauge from Geraldton-Mullewa railway to 13 kilometres east of North-West Coastal Highway. Dual narrow/standard gauge (three rails) west of this point.</td>
</tr>
<tr>
<td>bridges</td>
<td>Over the Chapman River and over the North-West Coastal Highway.</td>
</tr>
<tr>
<td>underpass</td>
<td>Under the Geraldton-Mount Magnet Road</td>
</tr>
</tbody>
</table>

Route

The rail route is shown on Figures 1, 2 and 3, being the southern, central and northern portions of the rail route respectively. In Figure 3 the rail route is labelled as “Modification to Alignment”.
REFERENCE
- Preferred rail alignment
- 65 dB(A)
- 75 dB(A)
- 80 dB(A)
- Heritage Site
- Residences in proximity to proposed rail alignment

LandCorp
PROPOSED RAIL LINK - OAKAJEE
PROPOSED RAIL ALIGNMENT
SOUTHERN PORTION

Figure 1
Proponent's Consolidated Environmental Management Commitments

November 1998

NARNGULU TO OAKAJEE RAIL ROUTE

WESTRAIL
<table>
<thead>
<tr>
<th>Summary of Commitment</th>
<th>Objective</th>
<th>Action</th>
<th>Timing</th>
<th>Whose Advice</th>
<th>Measurement/ Compliance criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Prepare and implement an environmental management plan (EMP) incorporating all management plans nominated in commitments (commitments 2, 5, 9 and 14).</td>
<td>To document the measures and procedures that will be used to minimise environmental impact.</td>
<td>By preparing and implementing the EMP.</td>
<td>Prepare before construction. Implement during construction and operation.</td>
<td>Shires of Chapman Valley and Greenough, DEP, WRC, Department of Aboriginal Affairs</td>
<td>Letter from Shires and Department of Aboriginal Affairs indicating the plan meets requirements. Implementation is consistent with EMP.</td>
</tr>
<tr>
<td>2. Prepare and implement a vegetation management plan (VMP) to protect, retain or rehabilitate to acceptable levels identified environmental values of remnant vegetation affected by the development.</td>
<td>To minimise the impact on vegetation communities</td>
<td>By refinement of rail alignment, rail design, rehabilitation and acquisition of land with comparable vegetation values.</td>
<td>Prepare before construction. Implement during construction.</td>
<td>DEP and CALM.</td>
<td>Letter from CALM indicating VMP meets their requirements. Implementation is consistent with the VMP.</td>
</tr>
<tr>
<td>3. The VMP to include but not be limited to: weed control and where appropriate eradication; dieback management measures; procedures to keep vegetation clearing to a minimum; and rehabilitation of areas to best practice standards where applicable.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>4. To compensate for the loss of particular conservation values at remnant &quot;Q&quot; a remnant with equivalent vegetation and landscape values will be securely protected.</td>
<td>To minimise impacts on fauna.</td>
<td>By use of culverts, design of bridges, the railway and preparing and implementing the FMP.</td>
<td>Prepare before construction. Implement during construction.</td>
<td>CALM, WRC</td>
<td>Letter from CALM and WRC indicating the FMP meets its requirements. Implementation is consistent with FMP.</td>
</tr>
<tr>
<td>5. A fauna management plan (FMP) which includes procedures and measures to keep impacts on the Blue-Breasted Fairy-Wren (Malurus pulcherrimus) habitat and terrestrial and aquatic fauna to practical minimum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summary of Commitment</td>
<td>Objective</td>
<td>Action</td>
<td>Timing</td>
<td>Whose Advice</td>
<td>Measurement/Compliance criteria</td>
</tr>
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<td>--------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>---------------------------------------------</td>
<td>--------------------------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>6. Apply dust guidelines from the DEP document “Land development sites and impacts on air quality”.</td>
<td>To ensure that there is no adverse dust impacts.</td>
<td>By preparing and implementing the EMP consistent with the DEP document and best practice for dust suppression.</td>
<td>Prepare before construction. Implement during construction and operation.</td>
<td>DEP and Shires</td>
<td>Letter from Shires indicating the EMP meets requirements. Implementation is consistent with EMP.</td>
</tr>
<tr>
<td>7. Establish a procedure for dust suppression from rail transportation, including the use of covered wagons or a crusting agent for the transport of iron ore.</td>
<td></td>
<td></td>
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<tr>
<td>8. Document dust suppression procedures for dust blow areas.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>9. Prepare and implement a water supply and drainage management plan (WSDMP) which includes measures to make good water supplies that are disrupted and manage spills and stormwater.</td>
<td>To maintain water supplies, not to unduly affect land uses, vegetation and surface water quality.</td>
<td>By design of drainage systems, replacement of bores and dams, management procedures for spills and preparing and implementing a WSDMP.</td>
<td>Prepare before construction. Implement during construction.</td>
<td>WRC</td>
<td>Letter from WRC indicating that the WSDMP meets its requirements. Implementation is consistent with WSDMP.</td>
</tr>
</tbody>
</table>
| 10. Ethnographic and archaeological  
Aboriginal sites detected by survey will be avoided unless otherwise authorised. | To ensure compliance with the requirements of the heritage legislation. | By design and realignment of rail route and preparing and implementing an EMP. | Prepare before construction. Implement during construction. | Aboriginal Affairs Department. | Letter from Aboriginal Affairs Department indicating that the EMP meets requirements. Implementation is consistent with EMP. |
| 11. Restore disrupted public and private access.                                   | To ensure that impacts on social surrounds are managed. To ensure the rail reserve is managed to avoid conflict with adjacent land uses | By preparing and implementing procedures for compensation and providing road and internal access. | Prepare before construction. Implement during construction. | DEP | Letter from proponent advising of actions taken. |
| 12. Establish and implement a procedure for compensation.                          |                                                                                           |                                                                                       |                                             |                                      |                                                      |
| 13. The rail reserve will be managed to avoid conflict with adjoining land uses.   |                                                                                           |                                                                                       |                                             |                                      |                                                      |
| 14. Prepare and implement a landscape management plan (LMP).                      | To ensure that visual amenity is not unduly impacted.                             | By preparing and implementing a LMP.                                               | Prepare before construction. Implement during construction. | Shires of Chapman Valley and Greenough and Moreby Range Management Committee. | Letter from Shires and Moreby Range Management Committee indicating the LMP meets requirements. Implementation is consistent with the LMP. |
| 15. Establish native vegetation buffers in rail reserve                            |                                                                                           |                                                                                       |                                             |                                      |                                                      |
| 16. Hydraulically assess river crossings.                                         | To ensure that the afflux for each bridge/culvert associated with 100 year flow is acceptable. | By preparing hydraulic assessment.                                                  | Prepare before construction. Implement during construction. | WRC. | Letter from WRC indicating the hydraulic assessment is acceptable. |
Appendix 4

Review of noise criteria
1.0 INTRODUCTION

This report provides further information on the Department of Environmental Protection’s (DEP’s) recommended noise level criteria for the Narngulu to Oakajee rail line proposal and the likely impact on people. It focuses on the internal noise levels which are the main point of disagreement between the DEP and the proponent.

1.1 Background

The noise impacts identified from the referral document were examined in detail by DEP noise specialists. Advice was provided to the proponent’s representatives on the noise level criteria that the DEP would be recommending for the assessment of this proposal in May 97.

Subsequently in December 97, “Draft Policy for EIA No 14 - Road and Rail Transportation Noise” was prepared by the DEP. The noise level criteria in the draft policy are consistent with the criteria advised to the proponent in May 97.

There is disagreement between the DEP and the proponent on the noise criteria that should be applied to the proposal. The DEP recommends an internal $L_{A_{max}}$ of 55 dB(A) for bedrooms in residences adjacent to the rail line while the proponent believes an $L_{A_{max}}$ of 65 dB(A) is acceptable.

1.2 Proposal

The proposal is for a 34 km rail line from Narngulu to Oakajee. A maximum of 20 train movements per day or 0.8 train movements per hour is proposed. This equates to approximately 7 train movements over the 2200 to 0700 night time period.

1.3 Noise descriptors

There are two noise descriptors used in this report:

- $L_{A_{max}}$ - this is the maximum noise level of the noise event; and
- $L_{A_{eq}}$ - this is the average energy level of the noise over the measurement period.
From analysis of train noise the DEP has determined that for one train movement per hour the $L_{A_{max}}$ is approximately 25 dB(A) higher than the $L_{A_{eq}}$.

Hence for one train per hour an $L_{A_{max}}$ of 55 dB(A) corresponds to an $L_{A_{eq}}$ of 30 dB(A).

The effects of noise on sleep have been studied many times in regard to awakenings and change of sleep state. The effect of noise on sleep quality, performance, immunosuppression, psycho social well being etc have been observed but require further research.

2.0 CRITERIA FOR PROTECTION OF SLEEP AMENITY

The World Health Organisation (WHO) recommends an $L_{A_{max}}$ of 45 dB(A) to provide an acceptable level for sleeping.

Australian Standard (AS) 2107 -1987 recommends a level of 25 dB(A) $L_{A_{eq}}$ and a maximum level of 30 dB(A) $L_{A_{eq}}$ for sleeping areas in rural locations.

The Environmental Protection (Noise) Regulations 1997 specify an external $L_{A_{max}}$ of 55 dB(A) during the night time period and this level would correspond to an internal noise level of 45 dB(A) which is in line with the WHO recommendation.

The proponent has also suggested that the Sleep Disturbance Index (SDI) developed by Bullen (1996) could be used and suggests an SDI = 1.5 would be the appropriate criteria for this proposal. However, in personal communication, Bullen stated that an SDI of around 0.2 was more appropriate to protect sleep amenity. The DEP believes the SDI requires further work to define its limitations and quantify its output and is thus not considered further in this report.

3.0 LITERATURE REVIEW

A literature search reveals that as expected, sleep disturbance is dependant on a number of factors such as:

- noise level of the noise event;
- number of noise events;
- emergence above background;
- duration of noise;
- variability of the population; and
- habituation.

3.1 Noise level and Number of events

In a study of sleep disturbance, Jansen (1970) suggested the maximum level should not exceed 55 dB(A) based on the threshold for vegetative reactions.

Osada (1974) found that it takes a person two to three times longer to get to sleep with train noise at maximum levels of 60 dB(A) than it does in the case of background levels of 40 dB(A).

Vallet et al (1988) established that a noise environment where the indoor $L_{A_{eq}}$ is 35-37 dB(A), and the maximum levels do not exceed 45 dB(A) will ensure that at least two thirds of the noise induced sleep pattern changes that would otherwise occur are avoided.
Ohrstrom and Rylander (1990) found that at levels of 50 dB(A) there was no relation between number of events and sleep quality and that at 60 dB(A) sleep quality decreased with the number of noise events.

Research published by Theissen (1978) fits the particular situation for the Oakajee rail line proposal very well. Theissen conducted experiments in sleep disturbance using recorded sound played back to subjects with a frequency of seven noise events per night. The noise levels were varied and graphs of sleep disturbance and awakenings were produced (Figure 1).

These graphs should not be used to determine precise impacts due to other factors which influence the results such as duration of noise, emergence above background level and the large variability of individual people. The graphs do however, allow the relative effects at different levels to be estimated and compared.

From Figure 1, there is a likelihood of awakening per noise event of 20% at 55 dB(A) increasing to about 35% at 65 dB(A). This is also supported by Hofman et al (1993) who found that train noise at a level of 65 dB(A) had a 34% chance of causing an awakening.

A model has been suggested by Griefahn (1990) to protect from awakenings and minor sleep alterations. For intermittent noise the maximum levels should not exceed 53 dB(A) and 47 dB(A) respectively.

Hofmann and Heslenfeld (1992) analysed the literature on sleep and noise since 1964. They summarised the results of 58 publications where the methods, measurements and statistical procedures were adequately defined and the results presented quantitatively. They concluded that noise induced awakenings become successively likely if a maximum level of 55 dB(A) is reached or exceeded.

Griefahn (1992) performed a quantitative analysis, where she used 10 publications comparable in method and evaluation to produce curves of comparable risk of awakening. She later refined her research to include the effect of the number of noise events and habituation (Griefahn, 1993) and provided a graph which gives the risk of awakening versus noise level and number of events (Figure 2). The upper curve represents the risk of a single awakening for 10% of the population. Reading from the graph, seven noise events corresponds to a level of 54.5 dB(A).

3.2 Emergence above background

Large differences between background and maximum noise levels increase the probability of a reaction to noise. (Ohrstrom & Griefahn, 1993). This is consistent with AS 2107 which specifies levels for sleeping areas which are 5 dB(A) quieter for rural areas.

In the vicinity of the Oakajee rail line, low background levels would make the impact more severe than that predicted in the above studies which were conducted with higher background levels. For example the internal background levels in the Theissen (1978) study were between 32-35 dB(A) whereas the external background level at Oakajee could often be less than 30 dB(A).

Figure 3 shows the sort of emergence above background that could be expected from trains at Oakajee if the proponent’s criteria were adopted (the chart represents external noise levels). Clearly the train would be audible approaching and departing for periods of up to twenty five minutes.
Figure 1. Sleep disturbance and awakenings. Adapted from Theissen (1978).

Figure 2. Noise limits for one wakening per night for 10% of the population. From Grieve (1993).

Figure 3. Emergence of train noise above the background (external noise levels).
3.3 Duration of noise events

The longer the duration of a noise event the greater the impact it has, hence noise from a train is likely to have more impact than noise from a truck. Hofman et al (1993) found that train noise at an $L_{A_{max}}$ of 65 dB(A) caused significantly more wake reactions than did truck or aircraft noise at the same levels. Some government authorities have introduced regulations which penalize train noise by 5 dB(A) when compared to traffic noise (M.E.E., 1995).

The Draft Policy for EIA No-14, however addresses road and rail pass by noise equally.

3.4 Variability of the population

Clearly there are large differences in the reactions of individuals and a statistical approach must be used to determine the impact on the population. The approach used by Griefahn (1993) on the risk of a "single awakening for 10% of the population" is around the level of protection which decisions could be based on and receive the DEP's support.

3.5 Habituation

The research by Theissen (1978) showed that there is no habituation for changes in sleep state, but that there is some habituation for awakenings. Griefahn and Muzet (1978) however, notes that habituation is not observed in test series without the active cooperation of the subject and only occurs when the subject must push a button to signal an awakening.

Ohstrom and Bjorkman (1988) also found there was no habituation for the negative influence of noise on sleep quality, mood and performance.

4.0 PREVIOUS EPA ASSESSMENTS RE: TRANSPORT NOISE

The EPA has previously recognised the WHO criteria in the assessment of transport noise in the Bunbury Harbour City - Marlston Hill development (E.P.A., 1995a). For the Marlston Hill assessment an internal $L_{A_{max}}$ of 45 dB(A) and an $L_{Aeq}$ of 35 dB(A) was adopted due to the large number of traffic movements.

In the assessment of the Busselton Regional Aerodrome (E.P.A., 1995b), an external $L_{A_{max}}$ of 65 dB(A) was adopted which would equate to an internal level of 55 dB(A).

5.0 PRACTICABILITY

One of the proponent's concerns is the practicability of achieving the criteria. For this rail line proposal, the proponent's criteria would require the purchase of one residence and the acoustic treatment of another. The DEP's criteria would require the purchase of two residences and the acoustic treatment of a further three.

Considering the size of this rail line proposal and the small number of affected residences, the DEP believes its recommended criteria is practicable this case. The practicability considerations would of course be different for other proposals.
6.0 CONCLUSION

On the basis of the above information, the maximum noise level considered to provide a fully acceptable situation is the WHO recommended internal $L_{\text{Amax}}$ of 45 dB(A).

Much of the research points to a maximum level of 53-55 dB(A) as being a critical point in sleep disturbance.

The DEP accepts that once the WHO recommended level of 45 dB(A) is exceeded, there will be some sleep disturbance to persons adjacent to the rail line. However due to the low number of train movements, the internal $L_{\text{Amax}}$ could be as high as 55 dB(A) and still meet the maximum $L_{\text{Aeq}}$ recommendation in AS 2107.

The scientific papers reviewed have not supported the proponent's criteria and the DEP believes the proponents suggested internal $L_{\text{Amax}}$ of 65 dB(A) would result in an unacceptable level of impact on people in this situation.

Richard Sutherland  
Environmental Officer  
Industrial Development Branch

John Macpherson  
Senior Environmental Officer  
Pollution Management Branch

25 June 1998
REFERENCES


