Narngulu to Oakajee rail route and services corridor

Westrail

Report and recommendations
of the Environmental Protection Authority

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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 Narngulu 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 Narngulu 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_{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_{Amax} 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_{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_{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 it 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 Narngulu 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 "Narngulu 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.

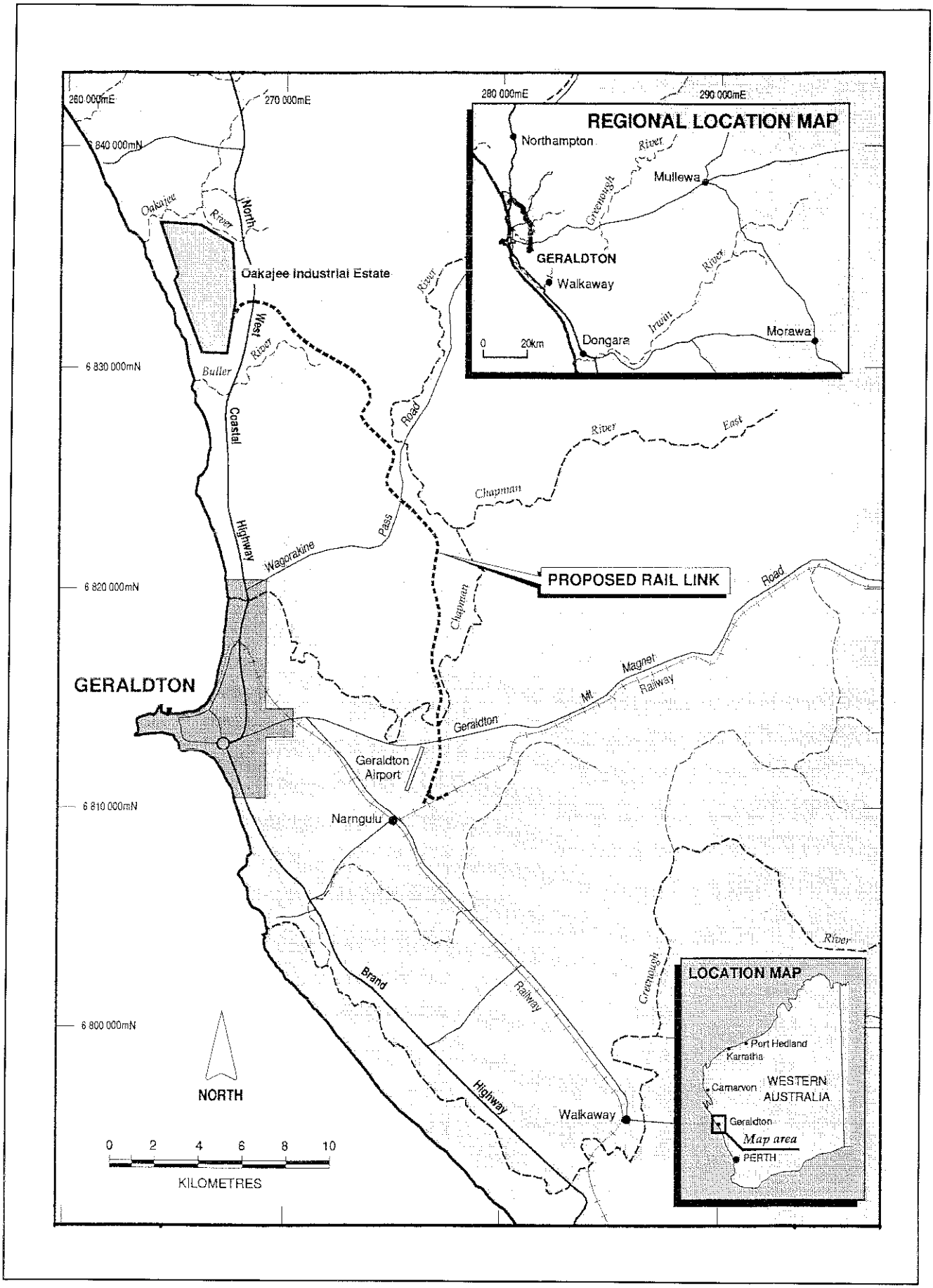


Figure 1. Regional location.

Table 1. Summary of key proposal characteristics

Element	Description
Life of railway project	On-going
Duration of construction	approximately 18 months
Vegetation disturbance	1.2 hectares in Wokatherra Pass area
Major components:	
• railway reserve	40 metres overall width
• length	34 kilometres
• rail formation	6 metres wide
• drains	either side of rail formation.
• access road	3 metres wide in rail reserve
• fire break	3 metres wide on both boundaries of railway reserve.
• rail track	single
• ballast	47,600 tonnes sourced from existing quarries
• gauge	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.
• bridges	Over the Chapman River and over the North-West Coastal Highway.
• underpass	Under the Geraldton-Mount Magnet Road

In the EPA's opinion the following are the environmental factors relevant to the proposal by Westrail to construct a rail line from Narngulu 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

FACTOR	RELEVANT AREA	PROPOSAL CHARACTERISTICS	GOVERNMENT AGENCY AND PUBLIC COMMENTS	IDENTIFICATION OF RELEVANT FACTORS
BIOPHYSICAL				
Vegetation Communities	Area within 250 metres of rail alignment.	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 • Moresby Range area (1.5 ha disturbed).	**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.	**Considered to be a relevant factor.**
Rare and Priority Flora	Area within 250 metres of rail alignment.	Site is cleared farmland, predominantly used for cropping and grazing. No gazetted rare flora found, but four priority species identified in the study area.	**Public**: No comments received from the public.	Addressed in part under factor, Vegetation communities. **Factor does not require further EPA evaluation.**
Specially Protected Fauna	Area within 250 metres of rail alignment.	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.	**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.	Blue-breasted Fairy-wren is not rare or endangered. Impact on habitat discussed in factor, Vegetation Communities. **Factor does not require further EPA evaluation.**
Surface Water Quantity	Rail alignment and surrounding properties.	Construction of railway may change local drainage patterns. Railway may disrupt domestic and stock water supplies.	**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.	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.**

FACTOR	RELEVANT AREA	PROPOSAL CHARACTERISTICS	GOVERNMENT AGENCY AND PUBLIC COMMENTS	IDENTIFICATION OF RELEVANT FACTORS
POLLUTION				
Noise and Vibration	Area within 500 metres of rail alignment including nearby residences.	Land use is predominantly rural with 14 residences in proximity to the rail alignment. • 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. • Potential for significant noise impacts from rail transport of materials and product. The CER proposes the following noise criteria (L_{Amax}); Unacceptable >80 dB(A) Conditional 75-80 dB(A) Acceptable <75 dB(A)	**Government:** The DEP recommends more stringent noise criteria consistant 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. **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.**
Dust	Area within 500 metres of rail alignment including nearby residences.	**Construction:** Construction activities have the potential to create dust emissions. 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 crusting agent used to control dust.	**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.**

FACTOR	RELEVANT AREA	PROPOSAL CHARACTERISTICS	GOVERNMENT AGENCY AND PUBLIC COMMENTS	IDENTIFICATION OF RELEVANT FACTORS
SOCIAL SURROUNDINGS				
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 1902*. 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 Marramongarra Spring is likely to have some heritage value both to Aborigines and Europeans.	The rail alignment will be designed to avoid the Marramongarra 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 Moresby 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.	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(e) 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.**
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.	**Public:** 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.**

Table 3: Summary of assessment of relevant factors

FACTOR	RELEVANT AREA	EPA OBJECTIVES	EPA's ASSESSMENT	EPA's ADVICE
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 Wokatherra 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. Proponent's commitments: • 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; • 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; and • To compensate for the loss of particular conservation values at remnant "G" a remnant with equivalent vegetation and landscape values will be securely protected. This will be done to the satisfaction of CALM and DEP.	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 EIA 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_{Amax} of 65 dB(A) external to nearby residences; • where the noise level from passing trains exceeds an L_{Amax} 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_{Amax} of 55 dB(A); • where the noise level from passing trains exceeds an L_{Amax} 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 crusting 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 crusting 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 is implemented 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.

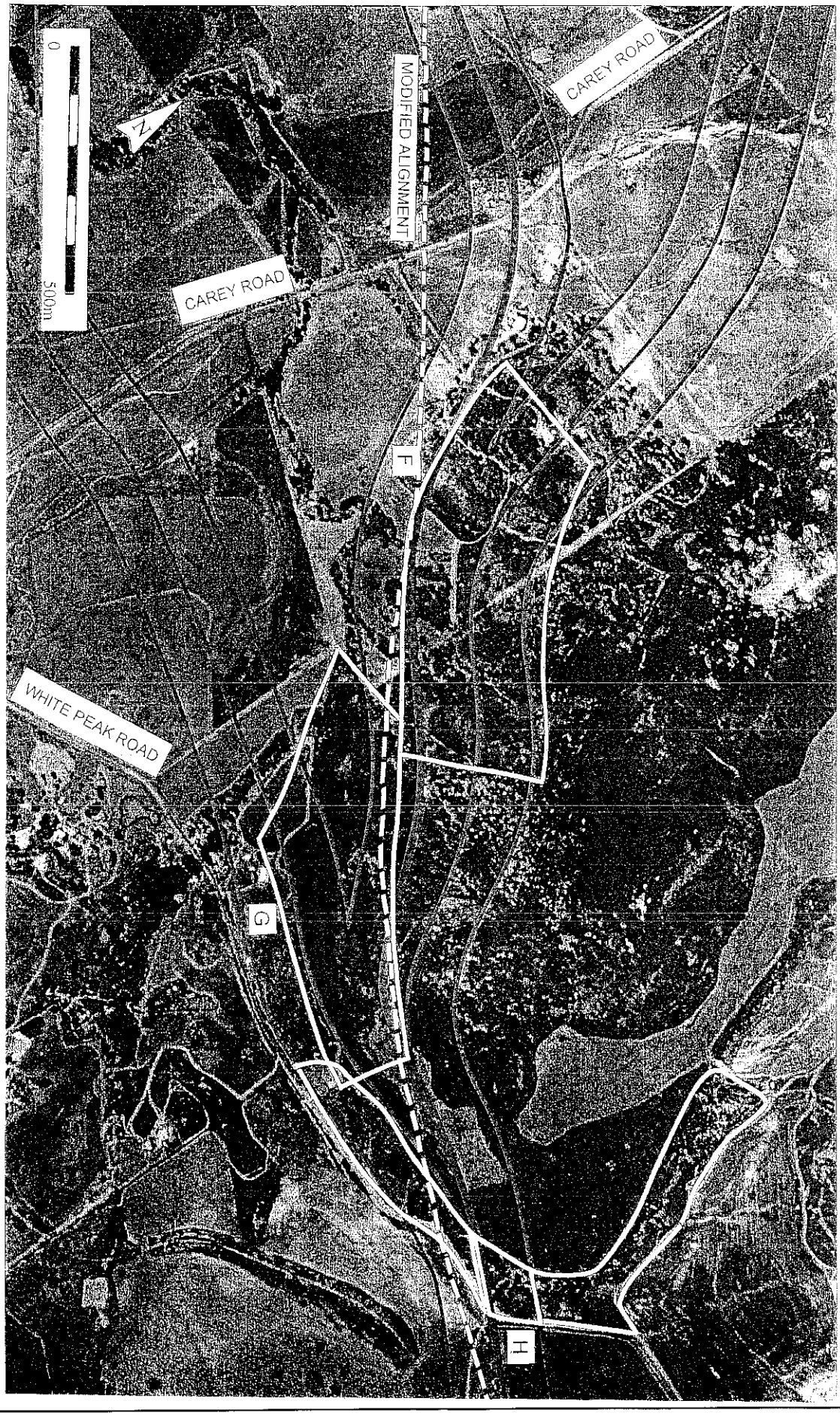


Figure 2. Remnant vegetation locations.

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 Narngulu 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).

	DEP's Criteria		Proponent's Criteria	
	L_{Amax}	*	L_{Amax}	*
Unacceptable	>75 dB(A)	2	>80 dB(A)	1
Conditional	65 - 75 dB(A)	3	75 - 80 dB(A)	1
Acceptable	<65 dB(A)	0	<75 dB(A)	3

* - 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_{Amax} is acceptable, while the DEP recommends 55 dB L_{Amax} .

It should be noted that the World Health Organisation (WHO) recommends a guideline internal noise level of 45 dB L_{Amax} 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_{Amax} 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 Narngulu to Oakajee rail line should not be seen to prejudice or pre-empt 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 Narngulu 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_{Amax} 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_{Amax} 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_{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 should meet Australian Standard 1668.2-1991 when the windows are shut;

(e) Where the noise level from passing trains exceeds an L_{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) 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

DEP, (1996) *Land development sites and impacts on air quality.* Department of Environmental Protection, Government of Western Australia, November 1996.

DEP, (1998) *Draft Guidelines for the Assessment of Environmental Factors No. 14 - Road and Rail Transportation Noise.* Department of Environmental Protection, January 1998.

DRD, (1998) *Proponent's Response to Public Submissions.* Department of Resources Development, April 1998.

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

EPA, (1997a) *Oakajee Industrial Estate, Oakajee, Shire of Chapman Valley, Section 16(E) Report.* Environmental Protection Authority. Bulletin 848, April 1997.

EPA, (1997b) *Oakajee Deep Water Port, Oakajee, Shire of Chapman Valley.* Environmental Protection Authority. Bulletin 866, September 1997.

EPA, (1998) *Interim Guidelines for the Assessment of Environmental factors No. 2 - Risk Assessment and Management: Offsite Individual Risk from Hazardous Industrial Plant.* Environmental Protection Authority, January 1998.

WEC, (1997) *Narngulu to Oakajee Rail Route and Services Corridor* - Consultative Environmental Review. Welker Environmental Consultancy, December 1997.

WHO, (1995) B. Berglund and T Lindvall, *Community Noise.* World Health Organisation, Archives for the Centre for Sensory Research, Vol 2, Issue 1, 1995.

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_{Amax} 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_{Amax} 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_{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.

4-3 Where the noise level from passing trains exceeds an L_{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.

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.

Schedule 1

The Proposal

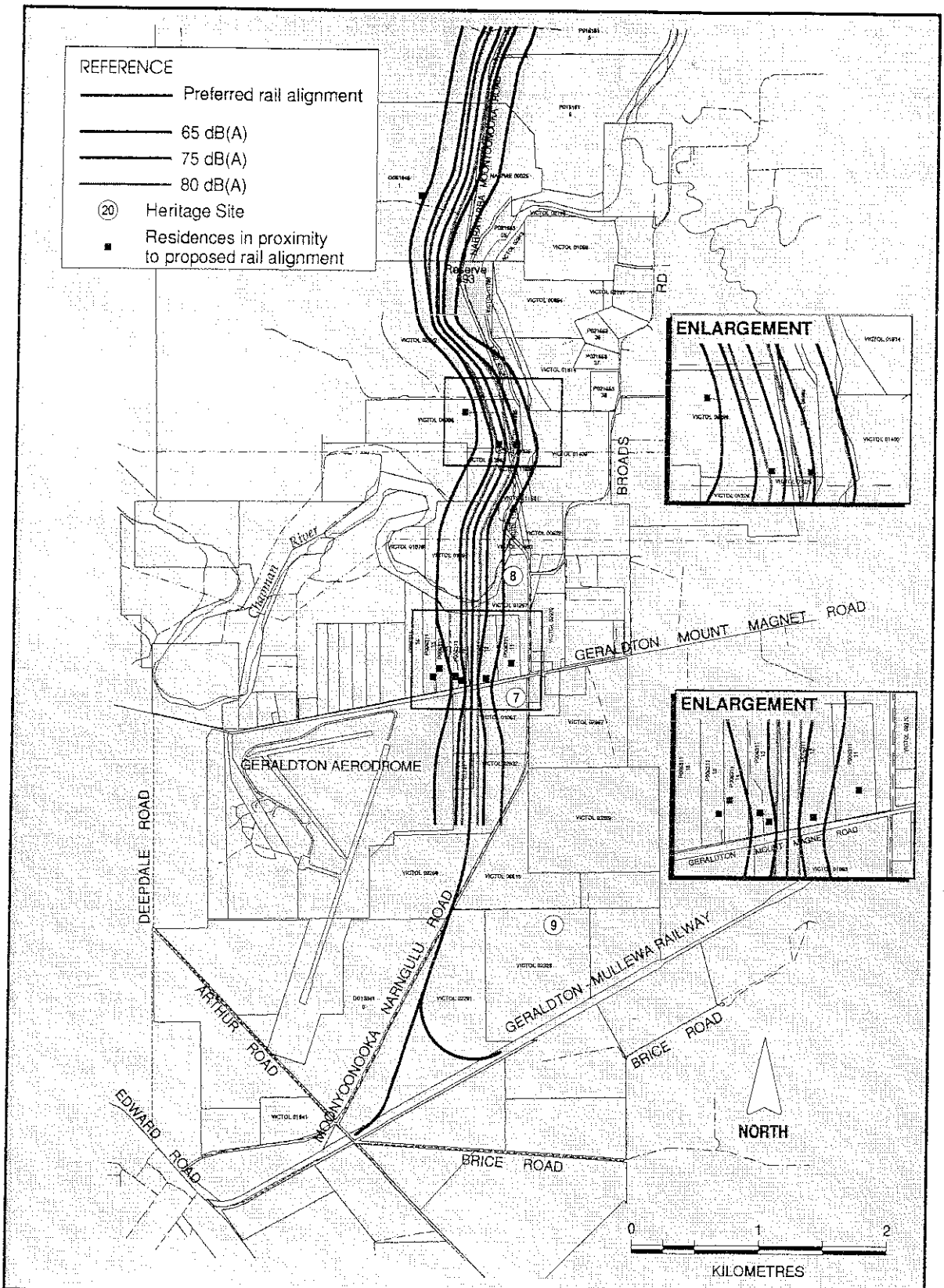
The construction and operation of a 34 kilometre single narrow gauge rail line. The rail line will start at the Mullewa-Geraldton rail line east of the Narngulu Estate, which is about 5 kilometres south-east of Geraldton. The rail line then runs north, initially on the eastern side of the Moresby Range 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. 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.

Key characteristics table

Element	Description
Life of railway project	On-going
Duration of construction	approximately 18 months
Vegetation disturbance	1.2 hectares in Wokatherra Pass area
Major components:	
• railway reserve	40 metres overall width
• length	34 kilometres
• rail formation	6 metres wide
• drains	either side of rail formation.
• access road	3 metres wide in rail reserve
• fire break	3 metres wide on both boundaries of railway reserve.
• rail track	single
• ballast	47,600 tonnes sourced from existing quarries
• gauge	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.
• bridges	Over the Chapman River and over the North-West Coastal Highway.
• underpass	Under the Geraldton-Mount Magnet Road

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".



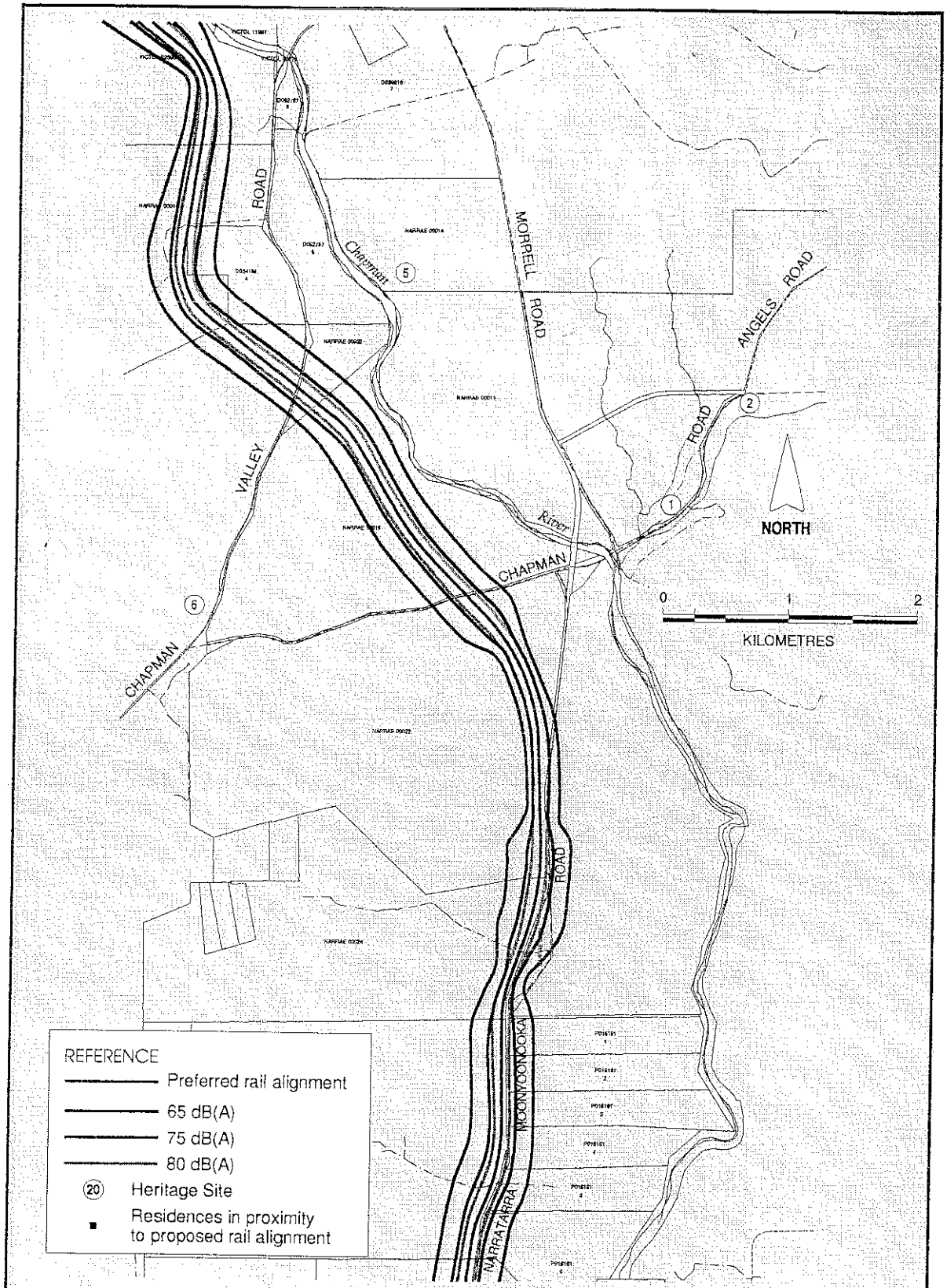
WELKER ENVIRONMENTAL CONSULTANCY

LandCorp

PROPOSED RAIL LINK - OAKAJEE

PROPOSED RAIL ALIGNMENT SOUTHERN PORTION

Figure 1



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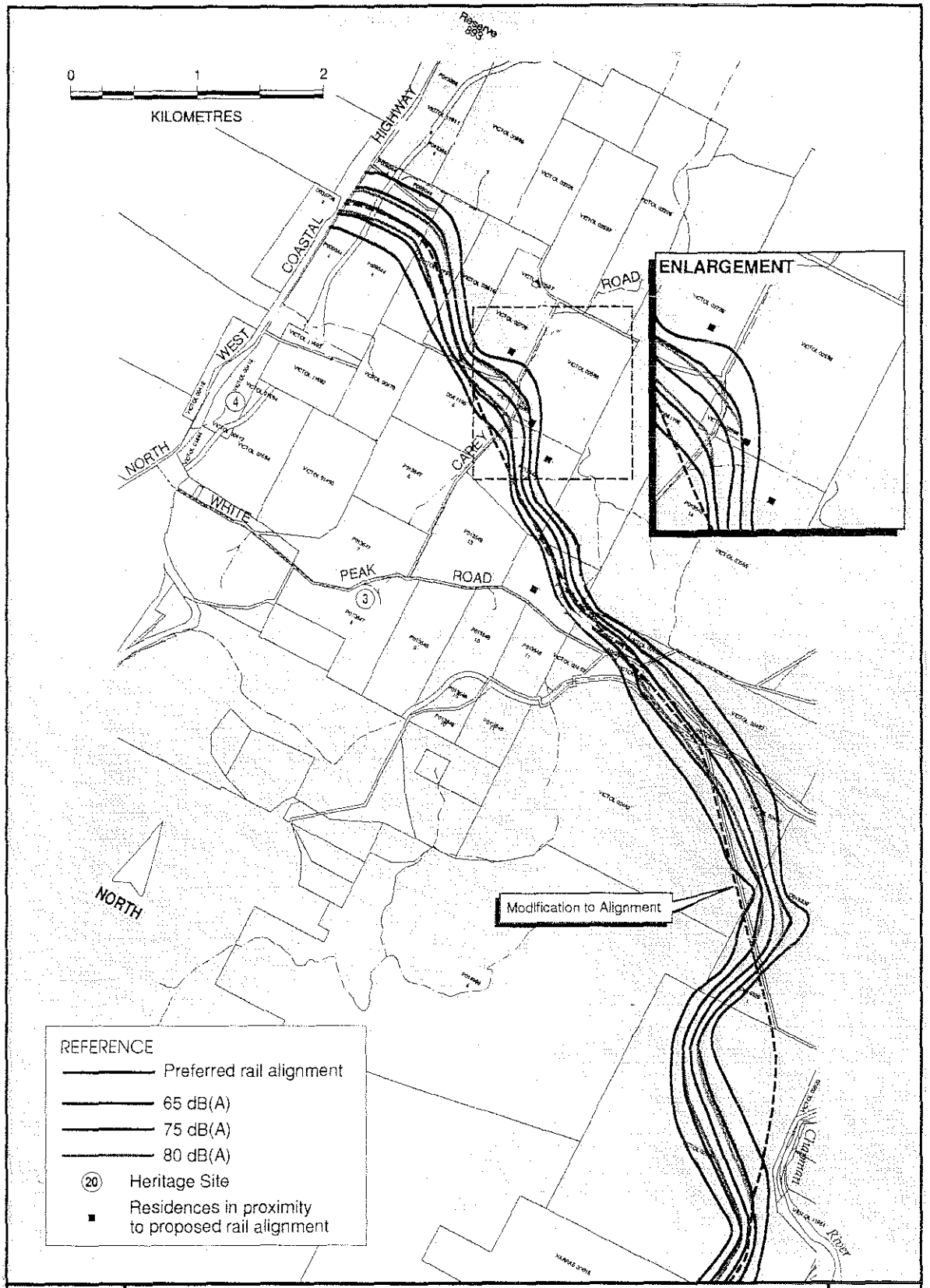
PROPOSED RAIL LINK - OAKAJEE

PROPOSED RAIL ALIGNMENT CENTRAL PORTION

Figure 2



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PROPOSED RAIL LINK - OAKAJEE

PROPOSED RAIL ALIGNMENT NORTHERN PORTION

Figure 3

Schedule 2

Proponent's Consolidated Environmental Management Commitments

November 1998

NARNGULU TO OAKAJEE RAIL ROUTE

WESTRAIL

SUMMARY OF PROPONENT'S COMMITMENTS (1165)

Summary of Commitment	Objective	Action	Timing	Whose Advice	Measurement/ Compliance criteria
1. Prepare and implement an environmental management plan (EMP) incorporating all management plans nominated in commitments (commitments 2, 5, 9 and 14).	To document the measures and procedures that will be used to minimise environmental impact.	By preparing and implementing the EMP.	Prepare before construction. Implement during construction and operation.	Shires of Chapman Valley and Greenough, DEP, WRC, Department of Aboriginal Affairs	Letter from Shires and Department of Aboriginal Affairs indicating the plan meets requirements. Implementation is consistent with EMP.
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. 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. 4. To compensate for the loss of particular conservation values at remnant "G" a remnant with equivalent vegetation and landscape values will be securely protected.	To minimise the impact on vegetation communities	By refinement of rail alignment, rail design, rehabilitation and acquisition of land with comparable vegetation values.	Prepare before construction. Implement during construction.	DEP and CALM.	Letter from CALM indicating VMP meets their requirements. Implementation is consistent with the VMP.
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	To minimise impacts on fauna.	By use of culverts, design of bridges, the railway and preparing and implementing the FMP.	Prepare before construction. Implement during construction.	CALM, WRC	Letter from CALM and WRC indicating the FMP meets its requirements. Implementation is consistent with FMP.

Summary of Commitment	Objective	Action	Timing	Whose Advice	Measurement/ Compliance criteria
6. Apply dust guidelines from the DEP document "Land development sites and impacts on air quality". 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. 8. Document dust suppression procedures for dust blow areas.	To ensure that there is no adverse dust impacts.	By preparing and implementing the EMP consistent with the DEP document and best practice for dust suppression.	Prepare before construction. Implement during construction and operation.	DEP and Shires	Letter from Shires indicating the EMP meets requirements. Implementation is consistent with EMP.
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.	To maintain water supplies, not to unduly affect land uses, vegetation and surface water quality.	By design of drainage systems, replacement of bores and dams, management procedures for spills and preparing and implementing a WSDMP.	Prepare before construction. Implement during construction.	WRC	Letter from WRC indicating that the WSDMP meets its requirements. Implementation is consistent with WSDMP
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. 12. Establish and implement a procedure for compensation. 13. The rail reserve will be managed to avoid conflict with adjoining land uses.	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.
14. Prepare and implement a landscape management plan (LMP). 15. Establish native vegetation buffers in rail reserve	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 Moresby Range Management Committee.	Letter from Shires and Moresby Range Management Committee indicating the LMP meets requirements. Implementation is consistent with the LMP.
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

DEPARTMENT OF ENVIRONMENTAL PROTECTION

POLLUTION PREVENTION DIVISION

REVIEW OF PROPOSED NOISE CRITERIA FOR NARNGULU TO OAKAJEE RAIL LINE (ASSESSMENT 1165)

Report No EN 07/98
June 1998

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_{Amax} of 55 dB(A) for bedrooms in residences adjacent to the rail line while the proponent believes an L_{Amax} 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_{Amax} - this is the maximum noise level of the noise event; and
- L_{Aeq} - 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_{Amax} is approximately 25 dB(A) higher than the L_{Aeq}.

Hence for one train per hour an L_{Amax} of 55 dB(A) corresponds to an L_{Aeq} 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_{Amax} of 45 dB(A) to provide an acceptable level for sleeping.

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

The Environmental Protection (Noise) Regulations 1997 specify an external L_{Amax} 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_{Aeq} 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.

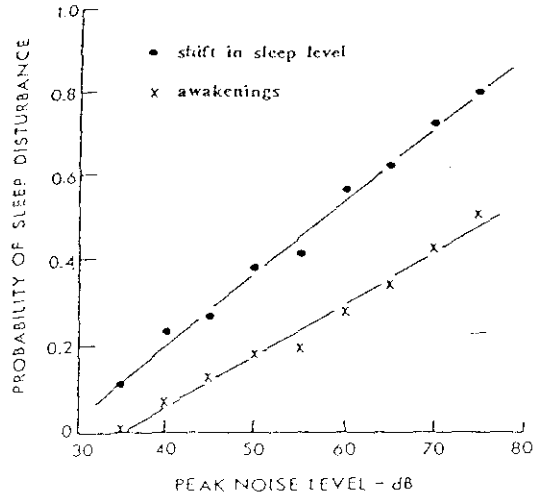

Figure - 1. Sleep disturbance and awakenings. Adapted from Theissen (1978).

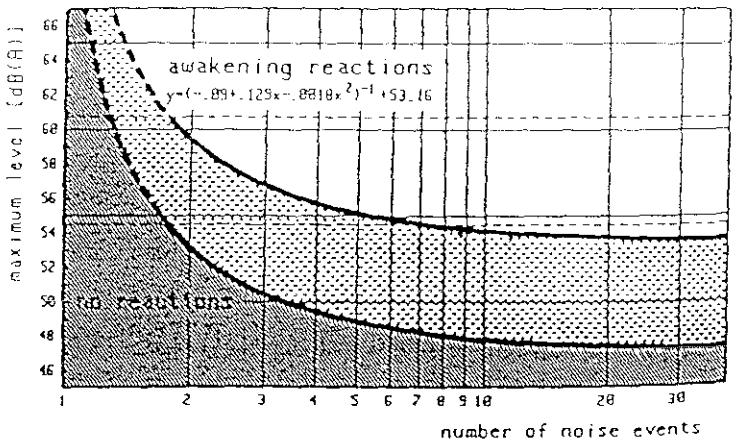

Figure - 2. Noise limits for one wakening per night for 10% of the population. From Griefahn (1993).

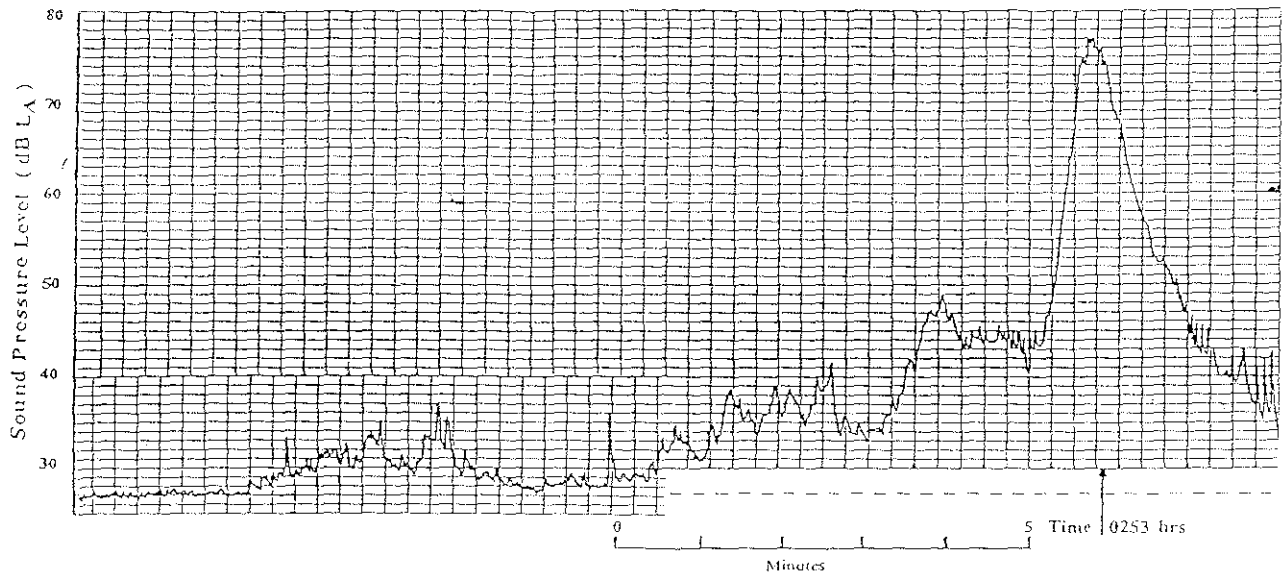

Figure - 3. Emergence of train noise above the background (external noise levels).

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_{Amax} 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 penalise 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.

Ohrstrom 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_{Amax} 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_{Amax} 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_{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_{Amax} could be as high as 55 dB(A) and still meet the maximum L_{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_{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

Bullen R, (1996). Notes on a proposed index for assessing sleep disturbance. AAC Notes 1996.

Environmental Protection Authority, (1995a). Bunbury Harbour City - Marlston Hill development - proposed changes to environmental conditions, Bulletin 774, March 1995.

Environmental Protection Authority, (1995b). Busselton regional aerodrome, Bulletin 785, March 1995.

Griefahn B, Muzet A, (1978). Noise induced sleep disturbance and their effect on health. Journal of Sound and Vibration 1978 59 (1) p 99 -106.

Griefahn B (1990). Critical loads for noise exposure during the night. In Jonasson HG (Ed.) Inter-Noise 90, Science for Silence, Volume II Gothenburg Sweden 1990, p 1163-1166.

Griefahn B (1992). Noise control during the night - proposals for continuous and intermittent noise, Acoustics Australia 20: p 43-47.

Griefahn B (1993). Models to determine critical loads for nocturnal noise. In Vallet M (Ed.) Noise and Man 93, Proceedings of the 6th International Conference. 1993 (vol 3) p 367-372.

Hofmann WF, Heslenfeld DJ, (1992). Effects of airplane noise during sleep. In Coenen AML: Sleep-wake, research in the Netherlands, vol 3, p 73-74.

Hofman W, Kumar A, Eberhardt J, (1993). Comparative evaluation of sleep disturbance due to noises from airplanes, trains and trucks. In Vallet M 1993 (2), p 559-562.

Jansen G (1970). Beeinflussung des naturlichen Nachtschlafes durch Gerausche. Forschungberichte des Landes NRW Nr.2131, Westdeutscher Verlag Koln und Opladen.

Ministry of Environment and Energy - Ontario, Canada (1995). Noise assessment criteria in land use planning. Publication LU-131 1995.

Ohrstrom E, Bjorkman M, (1988). Effects of noise-disturbed sleep - a laboratory study on habituation and noise sensitivity. Journal of Sound and Vibration 1988 122 (2) p 277-290.

Ohrstrom E, Rylander R, (1990). Sleep disturbance by road traffic noise - a laboratory study of number of noise events. Journal of Sound and Vibration 1990 143 (1) p 93-101.

Ohrstrom E, Griefahn B, (1993). Summary of team 5: Effects of noise on sleep. In Vallet M (Ed.) Noise and Man 93, Proceedings of the 6th International Conference. 1993 (vol 3) p 393-398.

Osada Y (1974). Experimental study on the sleep interference by train noise. Bulletin of the Institute of Public Health.

Theissen GJ (1978). Disturbance of sleep by noise. Journal Acoustical Society of America 64(1), p 216-222.

Vallet M, Gagneux J, Blanchet J, Favre B, Labiale G, (1988). Long term sleep disturbance due to traffic noise. Journal of Sound and Vibration 1988 90 p 173-191.

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DRD

DEPARTMENT OF RESOURCES DEVELOPMENT

168-170 St Georges Terrace
Perth, Western Australia

Postal Address
PO Box 7606, Cloisters Square,
Perth, Western Australia 6850

Telephone (08) 9327 5555
Fax (08) 9327 5500

Your Ref: 110/97
Our Ref: 58/9720

Dr Bryan Jenkins
Chief Executive Officer
Department Of Environmental Protection
Westralia Square
141 St George's Terrace
Perth WA 6000

Attention: Mr Richard Sutherland

NARNGULU TO OAKAJEE RAIL AND SERVICES CORRIDOR ASSESSMENT 1165

The Department of Resources Development responds as follows to your letter dealing with public submissions on the Narngulu to Oakajee Rail and Services Corridor.

Noise

Question 1 The Consultative Environmental Review (CER) presents the proponent's suggested criteria for noise, however the Department of Environmental Protection (DEP) notes that for a new proposal in a green field site, the DEP will be recommending more stringent criteria based on Draft Policy for Environmental Impact Assessment No 14 - Transportation Noise. This policy is presently being prepared for stake holder review. How will this affect the proposal?

Answer 1 The Draft Policy for Environmental Impact Assessment No 14 - Transportation Noise was presented to a number of Government agencies which met at the Department of Transport offices in November 1997. It was recommended at that meeting that in order to assist in the better understanding of the proposed criteria the DEP prepare a background paper. The background paper was to cover such issues as the need for the proposed transport noise criteria, practice in other countries, and information on the implications of proposed changes. The proponent is unable to comment on question 1 at this time as the DEP is yet to make available the background paper and as the development of the draft noise policy (transport) is in such an embryonic stage.

Question 2 Landowners state that despite assurances that the noise levels will be within the "criteria", the reason many people chose to live in the area was the quiet serenity. Any noise will destroy this peaceful way of life and people who have chosen to live in quiet surroundings should not have to accept such noise levels. How does the proponent respond to this?

Answer 2 There will inevitably be noise from any introduced services. Environmental responsibility should ensure that any introduced noise is the practicable minimum within recognised acceptable criteria so that any impact is minimal.

There are only 2 existing residences within the affected area i.e. within the 75 dB(A) contour. One of these must be resumed as it falls within the 80 dB(A) contour. The other falls within the 75 to 80dB(A) contour and hence is in a conditional zone. For this residence the alternatives are to resume the actual residence, treat the house to ensure internal levels are below the acceptable criteria or apply noise controls to the rail line i.e. barriers.

It should be remembered that rail traffic noise is not as pervasive as other noise in that it is intermittent and in this case will only mean short duration noise, at the most once per hour. Consequently acceptable noise level criteria tends to be based on internal noise levels where sleep disturbance is the main consideration.

Question 3 The proposed sound proofing of homes to what the "proponent considers acceptable" does not take into consideration outside activities. People cannot live their lives entirely in their homes and their lifestyle will thus be adversely affected. How does the proponent respond to this?

Answer 3 There are essentially two criteria applicable, the first being the indoor acceptable level and the second the outdoor acceptable level. Sound proofing of houses addresses the indoor noise level. The outdoor noise level can be addressed by noise control applications, such as barriers or increased distance from the line.

Question 4 The CER talks about indoor noise levels being 15 dB less than outside levels, this would only be the case if windows were kept closed and is an unacceptable assumption as many residents need to leave windows open for cooling or for the evaporative air conditioning to work correctly. Will the proponent be paying to have refrigerated air conditioning fitted to all residences?

Answer 4 Where a residence requires noise control to satisfy the conditions set out above and this cannot be achieved with the windows and or doors shut, then there may be grounds for compensation to allow mechanical ventilation/air conditioning of bedroom and or living room areas. Invariably the affected rooms will only be those facing the rail line.

Question 5 If An Feng Kingstream reach the final objective of 10 MTPA, this would mean 28 train movements per day of ore alone. This is considerably more than the CER mentions. The transport requirements of other industries establishing at Oakajee should be included and the CER should present the data for the maximum number of trains at full development. How does the proponent respond to this?

Answer 5 The production of 10mtpa slab steel by AFKS would require 16 train movements per day of iron ore (4 train movements/2.4mtpa, 16 train movements/10mtpa), substantially less than the 28 train movements stated in the question. The implications of the increase in train movements, associated with any future increase in the scale of the steel plant, would be evaluated by the EPA at the time when that increase is proposed. At this stage, AFKS considers that a 5mtpa steel plant is a possibility in the foreseeable future. A 10mtpa plant is a possibility only in the long term.

Question 6 Residents on the Geraldton Mount Magnet Road note that they will also have to put up with the squeaking of transport truck brakes as they stop to let the trains through. How does the proponent respond to this?

Answer 6 The rail alignment will pass under the Geraldton Mount Magnet Road so the squeaking of transport truck brakes will not be an issue.

Question 7 A resident suggests the proponent plant four or five rows of trees along the rail line to help cut noise and act as a buffer zone. Would the proponent be prepared to do this?

Answer 7 Trees do not provide an effective noise barrier where high noise contours exist, however, earth mounds and solid barrier walls do. These sorts of situations will be negotiated with the respective property owner.

Planting of four or five rows of trees along the entire route may not be practical because:

- limited space available on the reserve after firebreaks are provided on both sides of the railway;
- the need to provide a maintenance access track on one side;
- the possibility of trees falling across the railway and causing a derailment.

However, planting of shrubs with a potential maximum growth height of about four metres on the boundary between the railway and farms could be considered.

Question 8 Some residents are concerned that noise induced vibration could damage their irrigation network causing leaks and a subsequent loss of crops. They are also concerned about damage to houses, sheds and water tanks. How does the proponent respond to this?

Answer 8 If the question relates to noise borne or induced vibration one only has to consider that many railway stations are built extremely close to tracks and plumbing, sewer and water mains associated with these buildings have not been affected by noise induced vibration.

If the question relates to ground vibration from the passage of trains, damage to the facilities mentioned would not occur unless the facility is within ten (10) metres of the rail and is in very poor condition. Ground vibration from rail operations is relatively low and not a cause for concern beyond 20 metres from the track.

Where pipes are required to pass under the railway they will be at adequate depth and sleeved, more to protect the railway embankment from wash out due to pipe rupture from poor maintenance or old age than to protect the pipe.

If property owners are not convinced of the low risk of damage, particularly to houses and sheds, a property condition inspection and report, with the owner present, can be prepared for houses within, say, 100 metres of the railway. This will provide an accurate state of condition of properties prior to rail operations starting and a base for objective assessment of reputed rail causing damage.

Dust

Question 1 A consultant suggests that the agricultural areas adjacent to the proposed rail line would be adversely affected by the advent of a 400 metre iron ore dust shadow adjacent to either side of the railway line. (Source: Current problems on Yarrie Station, East Pilbara, Goldsworthy BHP rail line, Roy Hill Station, Fortescue Valley, BHP Newman rail line). Currently in the Pilbara the only other location for iron ore rail transportation, there is considerable lift off of iron ore dust from the moving cars. Numerous tests have been carried out by the major mining companies to ameliorate the problem and damage. Different quantities of ore have been loaded into the ore cars for test purposes, but it has become apparent that the vortexes above the cars has caused the dust to lift and spill no matter what the height of the loaded ore. A prime example of the damage sustained to flora can be viewed on the Yarrie station in the Pilbara, where vegetation up to 400 metres either side of the BHP Goldsworthy rail line has been retarded. Dust is also seen to lift from the BHP Mt Newman ore cars as they move into the town of Port Hedland at the statutory yard speed limit of 20 km/hr. How does the proponent intend to handle this issue?

Answer 1 All iron ore from the minesite to the GSP will be transported by rail in either covered wagons or will be treated with a crusting agent to prevent dust lift-off. Both methods will prevent dust emissions from the wagons.

The Ministerial Approval for the GSP was subject to the fulfilment of a number of conditions, including the preparation and approval of an Environmental Management Program relating to the management of dust (Condition 5-4 11-12). This EMP was subject to public review and there will be opportunity for further public input to the dust management programme.

Question 2 Some landowners expressed concern that dust may affect the productivity of their crops and contaminate the crops with heavy metals. How does the proponent respond to this?

Answer 2 Refer to response to question 1 above

Question 3 Residents expressed concern that dust would adversely affect their health and especially the health of their children. They were also concerned the dust could trigger asthma attacks. How does the proponent respond to this?

Answer 3 Refer to response to question 1 above.

Vegetation

Question 1 The Conservation Council of WA (CCWA) notes that the CER says the rail line will avoid Reserve 893, in fact the preferred route is right on the boundary. Will the proposed service corridor and the associated services extend into the reserve and impact upon the reserve? The CCWA believes the proponent should make a commitment to provide a buffer between the conservation reserves and railway to ensure adequate protection.

Answer 1 Current planning indicates that the rail line will be located west of the reserve. Any other services to be located in the services corridor will be the subject of a separate referral to the EPA. Runoff from adjoining farmland is an avenue for ongoing degradation of the vegetation values of the reserve. The rail line in a cutting on the western side of the reserve will intercept runoff from farmland thereby removing a major threatening process and affording protection to the reserve.

Question 2 The CCWA is concerned about the impact of the proposal on remnant vegetation. As the CER points out there is little remnant vegetation left in the area, therefore all remnant vegetation is important. The proponent should commit to no loss of remnant vegetation. How does the proponent respond to this?

Answer 2 The amount of native vegetation disturbed by the railway will be very small (approximately 1.5 ha). The proponent has committed to promoting the restoration of local indigenous native vegetation in the rail reserve consistent with fire management, safety practices and adjoining land uses (page 46 of CER). This commitment has the potential to increase the present area of native vegetation. Details of the vegetation restoration program will be addressed in the environmental management program (Commitment 1) for the railway.

Fauna

Question 1 The CCWA is concerned about the impact of the proposal on Blue Breasted wren habitat. This has not been adequately dealt with in the CER. The CER justifies the destruction of this habitat by saying it is "highly likely that the species occurs elsewhere along the Chapman River....." How does the proponent respond to this?

Answer 1 The Blue-breasted Fairy Wren is not a species listed as Specially Protected or Priority Fauna but is considered of interest by the proponent because it appears to have disappeared from much of the wheatbelt of WA (page 19 and 20 of CER). However, to extrapolate this statement to the species in general fails to take account of the references and other information provided in the environmental studies. Storr (1991) states "common near west coast and locally in south-east, but generally scarce to moderately common and patchily distributed elsewhere, and now extinct in much of the wheatbelt outside of reserves, usually in family parties".

Pizzey (1997) gives its current distribution as "broken distribution in South-west WA and Eyre Peninsula (SA)." and then goes on to say "the northern and eastern limits are around Shark Bay -Mingenew - Bunjil - Wongan Hills - Gibb Rock - Norseman east to the Bight coast south of Mundrabilla, coastally east to Eucla. Approximate south and west limits are Moore River, passing inland of Perth to wheatbelt and south past Katanning to south coast near Albany. It overlaps Variegated Wren on west coast Shark Bay to Moore River" and actually states "common in WA".

It is quite clear from these comments that the Blue-breasted Fairy-wren is not rare or endangered in any way on a state or national basis. However, the statements in Storr (1991) and the CER are correct - it is locally "of interest" because it is scarce and locally extinct in much of the wheatbelt where the project area is located.

The rail bridge over the Chapman River has the potential to impact a very small area of this bird's habitat. Commitments 6 and 7 in the CER address specifically the protection of Fairy-Wren's habitat. These commitments are:

- Minimise the disturbance of the habitat of the Blue-breasted Fairy-Wren through the design of Chapman River crossing and during construction.

- Describe the measures to minimise disturbance of the Blue-breasted Fairy-Wren in the construction management plan.

The construction management plan will be prepared in consultation with DEP, Shires of Greenough and Chapman Valley, Department of Aboriginal Affairs and land owners.

The understorey component of riverine habitat is of prime importance to the Fairy-Wren and minimising disturbance of its habitat will be major criterion in rail bridge design and location (page 32 of CER).

Water

Question 1 The CCWA believes the CER does not adequately identify possible drainage areas, in particular those associated with impacts on remnant vegetation. This could result in further loss of remnant vegetation through hydrological change. How will the proponent address this issue?

Answer 1 The railway is generally located in the lower part of the landscape but as far as possible out of the creek lines in the vicinity of the Wokatherra Pass to minimise direct and indirect impacts on native vegetation.

Creek line vegetation downslope from the rail line is not expected to be significantly impacted upon by the rail line because of:

- the large extent of the creek catchments at higher elevations and well outside the area of impact;
- commitments to minimise disturbance to native vegetation and to prepare a construction management plan which will address in detail the management of drainage; and
- provision of drainage systems so that the rail line will not cause a major obstruction to overland flow.

Question 2 Several landowners stated that their domestic and stock water supplies would be affected and would be very difficult to relocate or replace due to the quality and amount of water available. How does the proponent respond to this?

Answer 2 The proponent will negotiate replacement of dams, use of pipes, culverts and access to dams with affected owners.

Borrow Pits

Question 1 The CCWA states that the CER does not deal with the issue of borrow pits adequately. A balance between cut and fill is not demonstrated in the CER,

neither is a commitment given. Where will any additional fill come from? What impact will this have?

Answer 1 Good engineering practice endeavours to achieve an earthwork design that has balanced cut to fill material, and consequently the lowest cost, from along the rail route. This is not always possible because of external constraints imposed upon the designer. Therefore, if additional fill material is required, the nearest possible source of suitable material is negotiated to maintain costs as low as possible. Negotiation can be with farm owners, Shire Councils or local pit owners. In all instances, existing regulations on this type of operation must be factored in and met.

Because detailed design has not been undertaken for this route, the requirement for an external source of fill material has not been identified but will be addressed in detail in the EMP commitment No 1. This EMP (which will contain a construction management plan) will be prepared in consultation with the DEP, the Shires of Green and the relevant Shires, the Department of Aboriginal Affairs and relevant landowners.

Farm Practices

Question 1 A landowner states that the resumption area and division of their land will mean that primary production is no longer viable. Does the proponent have a solution for this problem?

Answer 1 See also Property Values/Compensation

This issue will be managed under the Land Acquisition and Public Works Act 1902 which is the relevant Act in this instance. The proponent, has committed to establish, implement and inform landowners of a procedure under this Act for securing the required land.

Question 2 A landowner wants to know if the proponent would provide alternative access to their property that would not be subject to delays at rail crossings?

Answer 2 This issue will be managed by implementing current Westrail policy and management procedures rather than involving the Environmental Protection Act 1986. Current Westrail policy and procedures are to resolve these types of issues by making good access that has been affected by the construction of a new rail line. This will be negotiated on a landowner by landowner basis.

Further now that a standard gauge railway is to be constructed by An Feng Kingstream, the number of trains operating on the narrow gauge section of the Narngulu-Oakajee Railway, when constructed, will be considerably less than originally planned and therefore the probability of delays proportionately much lower. Another reason why delays will be minimal is

that assuming a gradient of 1 in 150, it is estimated that it would take less than one minute for a train to pass a standard "farmer" crossing.

Public Safety

Question 1 Residents are concerned about the transport of dangerous goods close to their homes and the effect this could have on their safety. How does the proponent respond to this?

Answer 1 The transport of dangerous goods by rail is carried in accordance with the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code).

The code addresses all the requirements, practices and conditions for the safe transport of dangerous goods and is regulated by the Department of Minerals and Energy under the Dangerous Goods Act (1961) and associated regulations (1992) by means of licensing, assessment, inspection and advisory functions.

The ADG Code is based on recommendations prepared by the United Nations Committee of Experts on the Transport of Dangerous Goods and has been prepared with the intention of ensuring that risks to the public are maintained at an acceptably low risk level.

Westrail is an experienced transporter of dangerous goods and has been carrying large quantities (currently 2 million tonnes per year) of such goods for many years without major incident. Westrail has formal emergency procedures in place to deal with any incident which, for dangerous goods, utilises the resources of the Police and Fire and Rescue Services of WA through the Western Australian Hazardous Materials Emergency Management Scheme.

Question 2 Residents are also concerned about safety at level crossing on their properties. What safety features will be incorporated?

Answer 2 There are a total of five different levels of protection used at railway crossings in this State. In ascending order, they are:

- Give Way Signs
- Stop Signs
- Flashing Lights
- Boom Barriers
- Bridges or Tunnels

The level of protection at level crossings on properties will be assessed in accordance with the Railway Level Crossing Protection Policy and Guidelines issued by Main Roads WA.

The process of determining the appropriate level of protection for any railway crossing entails systematically checking the adequacy of each level of protection, starting from Give Way Sign control and working upwards until an adequate level is determined. Factors such as the number of trains, number of road vehicles, road gradient, sight distances and acceleration rates are considered in assessing an appropriate level of protection.

Visual Amenity

Question 1 Residents state the rail line and the service corridor with its associated power lines, pipelines, roads etc. will have a devastating effect on the visual amenity of the area. Many residents moved into the area to enjoy the scenic beauty. There also needs to be more information on rail gradients and cuttings so the effect on visual amenity can be determined. How does the proponent respond to this?

Answer 1 The CER (page 45) states that the retention of landscape qualities is recognised as a major consideration in the construction and management of the rail reserve and Westrail's environmental policy is to minimise impacts on visual amenity. The proponent is also committed to minimising the clearing of vegetation and consider the establishment of native vegetation buffers in the rail reserve to enhance ecological and landscape values.

Depending on the detailed design of the line there will be places where the rail line will be above or below ground level. The proponent is committed to preparing and implementing a landscape management plan in consultation with landowners, the Shires of Greenough and Chapman Valley, the Ministry for Planning and the Moresby Range Management Committee. This plan will be prepared in parallel with the detailed design of the alignment to ensure landscape matters are considered before the final design is determined.

Proponents wishing to locate services in the corridor will be required to conform with EPA requirements for impact assessment including landscape and visual amenity. The CER is not intended to be a detailed environmental assessment for all potential services that may locate within the services corridor but to highlight any "fatal flaws" and environmental factors that may be considered (page ii of CER).

Property Values/Compensation

Question 1 Many of the submissions from affected landowners were concerned that their properties had been reduced in value and become unsaleable because of the proposed rail line. How does the proponent respond to this?

Question 2 Many of the submissions from affected landowners noted that AFK and other companies, the Government and the people of WA would all benefit from the proposal, but that due to loss of amenity, disruption to lifestyle and social values they would never benefit. They believe they should receive compensation for the amount their land is rendered unsaleable, devalued and not viable for farming if they wish to stay or their properties should be purchased at the full replacement value. How does the proponent respond to this?

Answers 1 & 2

This issue will be managed under the Land Acquisition and Public Works Act 1902 which is the relevant Act in this instance. The proponent, has committed to establish, implement and inform landowners of a procedure under this Act for securing the required land.

Question 3 A landowner states that it would be preferable to have the rail reserve placed on a separate title so that the remaining property could be offered for sale as a complete block of land unencumbered by the prospect of a rail line. Is this possible?

Answer 3 The proponent believes that this is a planning rather than an environmental issue and that it would be more relevant to be dealt with under the Town Planning and Development Act 1928 and the Local Government Act 1995. Nevertheless the proponent advises that it has had initial discussions with the Ministry for Planning regarding the possibility of rationalising block boundaries affected by the Rail and Services Corridor. It is recommended that the correct **procedure** to deal with this issue is for the individual landholders discuss this matter with Ministry for Planning Officers in Geraldton and their Local Authority.

Heritage

Question 1 A submission notes that Marramongarra Spring should have some heritage value both to Aborigines and Europeans. It apparently serviced the original White Peak Homestead as the only source of reasonable water for some distance, this is evidenced by the ancient steel piping still being turned up. The spring would also seem to have some Aboriginal Heritage because of its name. Will the proponent investigate the significance further?

Answer 1 The proponent is advised that the Marramongarra Spring was not raised by Aboriginal groups as a site of significance during the survey work carried out by Quartermaine Consultants and Rory O'Connor & Associates. Notwithstanding this the high archaeological potential of this area is acknowledged.

The European Heritage significance of the Spring was not established in studies by Suba and Callow, 1993.

A commitment (18) has been made in the CER to liaise with the Department of Aboriginal Affairs on measures to avoid disturbance of any Aboriginal sites. The proponent is also committed to liaising with the Shires of Chapman Valley and Greenough to maintain an awareness of any new historic sites in the vicinity of the alignment (page 41 of CER).

In line with these commitments the rail alignment will be designed to avoid the Marramongarra Spring.

Services Corridor

Question 1 The Conservation Council of WA (CCWA) notes although the CER is intended to be for the whole of the rail line, the only section being built is the section from Oakajee to Tallering Peak. When will the remainder be built? Will it be within the 5 year environmental approval period?

Answer 1 Page 11 of the CER indicates that the narrow gauge rail line will not be constructed until Government considers that there is sufficient freight to warrant its construction. This could be some time into the future depending on the future rail haulage requirements of industry that may establish at Oakajee. It is difficult to be more precise at this stage.

Question 2 The CCWA also notes that there is little mention of the Services Corridor in the CER. What types of services are involved and where is the route? The CER says that the services may only co-locate for a part of the length of the rail alignment. Which part? Where will they go if not part of the alignment? What impact will it have? When will it be assessed?

Answer 2 (i) The services corridor may include pipelines, roads and power lines (page 9 of the CER).

(ii)&(iii) Clearly future proponents of services would be encouraged to locate in the services corridor. The Shires of Chapman Valley and Greenough, the Ministry for Planning and the EPA have all indicated their preference for as many services as possible to be located in the one service corridor. The CER was indicating the possibility that a future service proponent may choose to locate outside the corridor for reasons as yet not foreseen.

An example was given of power lines near the airport (page 9). The route chosen will be the responsibility of the future proponent.

(iv)&(v) Future service proposals will be subject to Part IV of the *Environmental Protection Act 1986.* It is at this stage that the

environmental impacts of these proposals will be addressed in detail. Refer also to page 9 of CER.

Question 3 The CCWA state that this is not a CER for a services corridor but purely a rail alignment. This seems a backdoor way of getting approval for a services corridor without provision of details and consequently no commitments on behalf of the proponents. How does the proponent respond to this?

Answer 3 An environmental approval for a services corridor is not being sought and neither can one be granted as the proponent believes it is not a proposal within the meaning of section 38 of the *Environmental Protection Act 1986*. The CER clearly states on page 3 that:

"The current proposal addresses only the rail route in detail. Any specific proposals for services or infrastructure will be referred separately to the EPA for consideration. The Department of Resources Development is seeking strategic advice from the EPA on any potential flaws and environmental requirements associated with the concept of a services corridor that follows the rail route."

The Department of Resources Development is seeking the advice of the EPA at an early stage in the planning process of the services corridor. Consequently the study area, over which environmental information has been collected, is larger than that required for a railway to provide a preliminary indication of any major environmental constraints associated with the establishment of the services corridor (page 1 of CER).

Question 4 What will be the ownership status of the service corridor?

Question 5 Does the government intend purchasing the full 240 metres or just the 40 metre rail reserve?

Answer 4 &5 The proponent understands that other than for land management issues these questions may be outside the charter of the Environmental Protection Act 1986. Notwithstanding the proponent advises that reservation of service corridors such as the Narngulu to Oakajee Rail and Services Corridor are part of the normal strategic transport planning process.

Further subject to environmental advice from the EPA and Government approval it is planned to reserve approximately 240m either side of the narrow gauge rail line for other services such as power lines, pipelines and roads. Reservation of the land required for the service corridor will ensure landowners, Local Authorities and Government agencies are aware of the intended land use of the service corridor. As different services require to use the service corridor commitment 21 (refer to answers 1 & 2 - Property Values and Compensation) is likely to apply.

Question 6 Will the service corridor be fenced off? If so, will it be at the edge of the 40 metre rail reserve or the 240 metre service corridor?

Answer 6 At this stage it is planned that only the rail section of the service corridor will be fenced off.

Question 7 Who will be responsible for maintenance of the service corridor?

Answer 7 The user (e.g. Westrail (if Westrail builds the narrow gauge line) for the rail section). It is likely that for many years the farmer will be able to use the remainder of the service corridor thus as the user and owner of that part of the service corridor the landowner will be responsible for maintenance.

Question 8 A landowner is concerned that the service corridor will alienate them from a third of their land as well as the hills where they enjoy walking. They note that this could also affect any wildflower or bush walking tourism in the area. Does the proponent have any solutions to these concerns?

Answer 8 The proponent wishes to minimise the impact of the services corridor on landowners and to this end is committed (commitments 19 and 20) to negotiating access with all affected landowners.

Question 9 Several submissions questioned why the Government was resuming land and building the railway for what seems like the exclusive use by a private operator?

Answer 9 Though the proponent believes that this issue may be outside the charter of the Environmental Protection Act 1986 it advises that the Rail and Services Corridor is part of a strategic transport plan for the Geraldton region. It is planned, that over time, the service corridor will be occupied by a number of services.

NOEL ASHCROFT
DIRECTOR - SOUTH WEST
10 March 1998
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