Mid West Iron and Steel Project, Geraldton Steel Plant, Narngulu Industrial Estate, Geraldton — Increase in production from 1.0 Mt/a to 2.4 Mt/a

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Kingstream Resources NL

Report and recommendations
of the Environmental Protection Authority

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Summary

This report is to provide Environmental Protection Authority (EPA) advice to the Minister for the Environment on the proposal by Kingstream Resources NL to increase the production of its recently assessed Mid West Iron & Steel Project Geraldton Steel Plant (GSP), at the Narngulu Industrial Estate south-east of Geraldton, from 1.0 Mt/a to 2.4 Mt/a.

In the EPA's opinion, the following are the environmental factors relevant to the proposal that have not already been addressed in the Ministerial Conditions:

(a) road transportation;

(b) rail transportation;

(c) noise (steel plant);

(d) gaseous and particulate emissions; and

(e) water resources.

The conditions and procedures, in the EPA's opinion, to which the proposal should be subject, if implemented are in summary:

(a) the existing Ministerial Conditions applied to the original 1.0 Mt/a proposal (Appendix 4: Ministerial Statement 413, 19 April 1996), subject to modification of Conditions 1, 4, and 5 (Proponent Commitments, Impacts on Residents, and Environmental Management Programme respectively) as set out in (b), (c), (d), and (e) below;

(b) the proponent's additional and/or modified commitments made in the CER document (Alan Tingay & Associates, August 1996) and via subsequent correspondence with the DEP (Alan Tingay & Associates, 11 December 1996 and 30 May 1997);

(c) two additional conditions (4-5 & 4-6) requiring the proponent to carry out additional studies on the impacts of road and rail transport for the proposal, and to implement appropriate ameliorative measures if assessment identifies unacceptable noise levels at residences;

(d) the amendment of sections 3 and 4 and the inclusion of additional sections (5 and 6) in existing Condition 5-1 as follows:

3 calculate the greenhouse gas emissions for the project;

4 indicate measures adopted to limit greenhouse gas emissions for the project;

5 estimate the comparative greenhouse gas efficiency of the project with the efficiency of comparable projects producing a similar product; and

6 consider entry into the Commonwealth Government's "Greenhouse Challenge" voluntary co-operative agreement programme which includes:

- an inventory of emissions;
- opportunities for abating greenhouse gas emissions in the organisation;
- a greenhouse gas mitigation action plan;
- regular monitoring and reporting of performance;
- independent performance verification; and

(e) the proponent should be required to implement an environmental management system.

The EPA also notes the need to develop appropriate criteria for road and rail transport noise.

The EPA submits the following recommendations:

Recommendation 1

That the Minister for the Environment note the relevant environmental factors and EPA objective for each factor as set out in Section 3.

Recommendation 2

That subject to the satisfactory implementation of the EPA's recommended conditions and procedures of Section 4, including the proponent's environmental management commitments, the proposal can be managed to meet the EPA's objectives.

Recommendation 3

That the Minister for the Environment imposes the conditions and procedures set out in Section 4 of this report.

Recommendation 4

That the Minister for the Environment requests the Minister for Transport and the Minister for Planning to complete studies of alternative transport routes and options from the Narngulu Industrial Estate to the port. This should specifically include the matter of noise impacts, and liaison should occur with the proponent for the Geraldton Steel Plant regarding their noise studies for the proposed route.

Recommendation 5

That the Minister for the Environment requests the Minister for Planning to implement measures to facilitate the establishment of a suitable buffer zone around the Narngulu Industrial Estate.

Recommendation 6

That the Water and Rivers Commission in discharging its licensing functions ensure that, as far as practical, non-potable groundwater be used in preference to potable water supplies.

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1. Introduction

This report is to provide environmental factors relevant to the Environmental Protection Authority (EPA) advice and recommendations to the Minister for the Environment on the proposal by Kingstream Resources NL to increase the production of its proposed Mid West Iron & Steel Project Geraldton Steel Plant (GSP), at the Narngulu Industrial Estate south-east of Geraldton, from 1.0 Mt/a to 2.4 Mt/a. Changes are also proposed to the product, specifically that slab steel be produced rather than rolled coil, with resulting changes in the requirement for major plant.

The project was initially assessed at the level of Public Environmental Review (EPA, 1996), and Conditions under which the proposal could proceed issued by the Minister for the Environment on April 19, 1996 (Ministerial Statement 413).

The proposal to increase production of the project was referred to the EPA in 2 July 1996. The level of assessment was set at Consultative Environmental Review (CER). The CER report (Alan Tingay & Associates, 1996), hereafter referred to as the CER, was prepared to describe the project, and was made available for a four week public review period which ended on 16 September 1996.

Kingstream Resources NL has also referred to the EPA a proposal to relocate the project to the planned Oakajee Industrial Estate. This is the subject of a separate assessment. Irrespective of this, Kingstream Resources has requested the EPA to complete the assessment of the project at the Narngulu Industrial Estate.

Kingstream Resources NL has indicated that both options are under consideration, and that should either the steel plant or the associated port development not prove feasible at Oakajee, then Kingstream Resources NL will continue with their plans to construct the steel plant within the Narngulu Industrial Estate.

An outline of the proposal is presented in Section 2. Section 3 discusses environmental factors relevant to the proposal.

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 presents the EPA's recommendations to the Minister.

Appendix 1 provides maps relating to the proposal. A list of people and organisations that made submissions is included in Appendix 2. A copy of Ministerial Conditions for the original 1.0 Mt/a proposal (Ministerial Statement 413, 19 April 1996) is included in Appendix 3, and a copy of the recommended Ministerial Conditions for the 2.4 Mt/a proposal is included in Appendix 4. Published information is listed in Appendix 5. The proponent's response to public submissions and their updated list of commitments have been published separately by the proponent.

2. The proposal

The proponent, Kingstream Resources NL, proposes to increase the production of the Mid West Iron & Steel Project Geraldton Steel Plant (GSP) from 1.0 Mt/a to 2.4 Mt/a. The reconfigured plant will be located in the Narngulu Industrial Estate in the Shire of Greenough approximately 5km south-east of Geraldton, and is a larger scale version of a 1.0 Mt/a plant producing hot rolled coil steel proposed at the same location by the proponent in 1995 (Appendix 1: Figures 1 and 2). Details of the major changes between the new 2.4 Mt/a proposal and the original 1.0 Mt/a proposal were provided in the proponent's CER document, and are summarised in Tables 1 and 2.

Table 1. Summary of environmental impacts associated with the proposed increase in production

Environmental Impact	Original Proposal 1.0 Mt/a Plant	Expanded Proposal 2.4 Mt/a Plant	Effect	Percentage increase or decrease (%)
Iron ore & concentrate transported (Mt/a)	1.5	3.3	+1.8	+120
Volumes of solid inputs (t/a)	259,420	557,700	+298,280	+115
GSP steel product output (Mt/a)	1.0	2.4	+1.4	+140
Water consumption (Mm^3/a)	4.55	3.1	-1.45	-32
NO_X emissions (as NO_2) (g/s)	129.1	216.9	+ 87.8	+68
Dust emissions (g/s)	19.63	39.0	+19.37	+99
SO_2 emissions (g/s)	0.45	1.2	+ 0.75	+167
CO_2 emissions (g/s)	70.97	160.23	+ 89.26	+126
Noise Levels under calm conditions (Narngulu townsite) [dB(A)]	40 - 45[1]	35 - 40[1]	- 5	-
Noise Levels during westerly winds (Narngulu Townsite) [dB(A)]	30 - 35[1]	<35[1]	No change	-
No. of truck movements - transport of steel product (per hour) [2]	6	14	+ 8	+133
No. of truck movements - transport of iron ore: Tallering Peak to Mullewa (per day)	120 X 80t trucks	120 X 115t trucks	No change in number	0
No. of train movements - Koolanooka to Mullewa (per day)	NA	6	+ 6	NA
No. of train movements - Mullewa to Narngulu (per day)	4	10	+ 6	+150

1 Noise levels are provided for daytime conditions, which includes the movement of scrap steel. Night time conditions, which do not include this component, will be lower than the levels presented (refer Section 5 of the CER)

2 In the development of transport scenarios for the 2.4 Mt/a proposal, options not previously considered for the 1.0 Mt/a proposal were used. Therefore, it is not possible to make a direct comparison of transport scenarios for the two proposals. A full description of the transport scenarios used in the development of the 2.4 Mt/a option is provided in Section 6 of the CER.

NA: Not applicable to this option.

Table 2. Changes to plant components

COMPONENT	NUMBER OR SCALE REQUIRED	
	1.0 Mt/a	**2.4 Mt/a**
Pellet Plant	1.5 Mt/a	3.4 Mt/a
Direct Reduction Plant	1 X 1.2 Mt/a	2 x 1.2 Mt/a
Electric Arc Furnace	1	3
Ladle Furnace	1	3
Casters	1	3
Equalising Furnace	1	Not required
Descaling Mill	1	Not required
Hot Rolling Mill	1	Not required
Down Coiler	1	Not required
Compact Strip Production Plant	1	Not required
Power Station	3 x 70MW Open Cycle Turbines	4 x 123MW Open Cycle Turbines 1 x 38MW Open Cycle Turbines

The CER indicated that the layout of the proposed plant had changed from the original layout for the 1.0Mt/a proposal. A comparison of the two different layouts was provided in Figure 3 of the CER.

Other plant components will also be increased in size to accommodate the proposed increased plant production. The components affected are as follows:

- the storage facilities for the handling of incoming materials;
- water and wastewater treatment facilities and cooling towers; and
- the cryogenic oxygen plant.

The CER indicated that the size of these components will be determined during the detailed design phase.

It is intended that iron ore will be mined at the Tallering Peak and Koolanooka mine sites, and following crushing, will be transported by rail on a route passing close to Mullewa and then continuing on to the GSP site at Narngulu.

No changes were made to the proposal during the assessment process other than the new commitments cited in this EPA bulletin.

3. Environmental factors

3.1 Relevant environmental factors

It is the EPA's opinion, giving appropriate consideration to the submissions and material referenced in Appendices 1, 2, 3, and 5, that the following are the environmental factors relevant to the proposal:

(a) road transportation;

(b) rail transportation ;

(c) noise from the steel plant;

(d) gaseous and particulate emissions;

(e) water resources;

(f) liquid and solid waste disposal;

(g) protection of groundwater;

(h) visual impacts/light overspill; and

(i) buffer zone.

However, the EPA considers that the relevant factors listed under items (f), (g), (h), and (i) have not changed significantly from the original 1.0 Mt/a proposal (EPA Bulletin 804), and can be adequately managed to meet appropriate EPA objectives through the implementation of the relevant Ministerial Conditions set for the original 1.0 Mt/a proposal.

Accordingly, the relevant factors listed under items (a), (b), (c), (d), and (e) will require assessment, and are discussed in the following Sections 3.2 to 3.6 inclusive.

3.2 Road transportation

Aspects of road transportation

The proponent intends to use the roads previously specified in the PER for transport of steel product to the Port of Geraldton and inputs from the port to the GSP. This route is via Rudds Gully Road, Brand Highway, Portway and Marine Terrace (Appendix 1: Figure 3). Solid inputs to the GSP from the Port would also use this route in reverse.

However, the proponent understands through discussions with various Government agencies that new road systems to the port are currently being examined. Of the scenarios presently being considered, one in particular presents distinct advantages to the Mid West Iron and Steel (MWIS) project, and as such would be utilised by the proponent should Government make a decision to construct this option.

The proponent considers that the use of rail for transport between the GSP and the Port of Geraldton is not practical at this time given the short haul route, the time taken to unload the product at the port, difficulties with rail access to the berth, and management associated with unloading at the port. However, the use of rail will be reconsidered if difficulties associated with access and management in the port area were overcome.

Both the existing road route and the road route that is being examined by Government representatives are discussed below. The two routes are shown in Appendix 1: Figure 3.

It is emphasised in the CER that the proponent must plan to use the existing road system for feasibility purposes as alternative routes are only hypothetical at this stage and may not be constructed. Approval is therefore being sought by the proponent for use of the existing road system.

Existing road system

Rudds Gully Road is a two lane, single carriageway road bounded on both sides by general farming areas. Brand Highway is a single carriageway rural highway between the intersection of Rudds Gully Road and Ackland Road, which is within the City of Geraldton limits. Between Ackland Street and the Rotary, Brand Highway is a four lane divided road.

The Highway is bounded by general farming land to the east and coastal dunes to the west until it enters the City of Geraldton, where it is bounded on both sides by residential and commercial areas.

Portway is a two lane, single carriageway that carries mainly Port-related traffic between Marine Terrace and Fitzgerald Street. Between Fitzgerald Street and the Rotary the traffic also includes a large proportion of cars and light vehicles which access residential and commercial areas mainly to the north but also to the south of Portway.

From Portway vehicles access Berth No.6 via Marine Terrace. Marine Terrace is a two lane, single carriageway which carries predominantly Port-related traffic, but also a limited amount of local traffic to the residential areas, caravan parks and beaches at the west end of Point Moore.

Alternative new transport route

It is understood that this route incorporates the proposed Brand Highway Deviation and an upgrade of Portway. The location of the proposed highway deviation is shown in Appendix 1: Figure 3.

The CER indicated that it is also proposed to construct a new 3km road between the proposed Brand Highway Deviation and Rudds Gully Road to link the existing Industrial Estate to the Brand Highway Deviation. It is also understood that this road would be constructed on a portion of the road reservation that has been established for the proposed 'Spine Road'.

The successful operation of this route relies on the relocation of Portway as proposed by Halpern Glick Maunsell in the 'Rail Access to the Port of Geraldton - Southern Approach Proposal' (Halpern Glick Maunsell, 1995). This report considered the relocation of Portway south of the proposed rail line, and the dedication of the road for port traffic. An additional road is proposed for public access.

Noise and social impacts

The proponent acknowledges that various road improvements will be required along the proposed route (ie. Rudds Gully Road, Brand Highway, Portway and Marine Terrace) to ensure that noise standards are complied with and the existing level of service, safety and public amenity are maintained.

The predicted noise levels from increased traffic movements associated with the GSP have been remodelled by the proponent (Table 6.3 of the CER). Noise levels were calculated at a distance of 10 and 20 metres from the source.

The CER indicates that the level of noise reduces with distance from the road and at nearby residences, which are an average of 30m back from the road along Brand Highway and Portway.

The noise modelling indicates that the highest noise levels occur when the transfer of steel product and solid inputs is undertaken concurrently. During these operations, noise levels ($L_{A\ 10,\ 1\ hour}$) were calculated to be 64dB(A) at a distance of 10m and 59dB(A) at a distance of 20m.

The CER states that "as trucking operations will only occur for a 16 hour period each day (ie. 7am to 11pm) noise levels produced will be within the Main Roads Western Australia (MRWA) design criteria of 63dB(A) $L_{A\ 10,\ 18\ hour}$ for traffic noise in "quiet areas", and also within the DEP requirement that traffic noise levels should not exceed 58dB(A) during any hour between 11pm and 6am".

The CER also states that previous studies have indicated that traffic noise levels along Portway will exceed existing noise criteria in the future due to the predicted growth in traffic, even in the

absence of further development such as the GSP. Mechanisms for limiting traffic noise are indicated, and future predictions for noise attributable to traffic growth provided.

In order to keep noise generated by the vehicles transporting inputs and products to and from the Geraldton Steel Plant to a practical minimum, the proponent has committed to the following specifications for vehicles transporting product and scrap steel to and from the Port of Geraldton, and to specify similar requirements on supply and trucking tenders otherwise:

(a) a minimum rated power output of 388kW (520 horsepower).

(b) no engine braking;

(c) the use of airbag/pneumatic suspension systems in lieu of conventional springs for prime movers and trailers where economically achievable; and

(d) a noise level 5dB(A) less than ADR 28/01(External Noise of Motor Vehicles) where economically achievable.

In summary, the CER indicated that it can be inferred that truck movements associated with the GSP will have minimal impact on existing and future noise levels, particularly in the vicinity of Portway.

There are currently no data on existing traffic levels on Rudds Gully Road (CER). It is assumed that the scenario of 23 truck movements per hour (associated with the movement of both product and solid input trucks) along this road will represent a significant increase. Impacts associated with this level of traffic would be alleviated should Government make a decision to proceed with the construction of an alternative route to the Port of Geraldton that could be utilised by the MWIS Project.

Assessment

The area considered for assessment of this relevant environmental factor is the road route which connects the proposed steel plant with the Port of Geraldton and adjacent properties with residences.

With respect to road transport, the EPA's objective is to ensure that noise levels meet acceptable standards and that an adequate level of service, safety and public amenity is maintained.

The EPA notes that the DEP noise specialists have carried out a technical evaluation of the information presented in the CER relating to noise emissions from road transport. The DEP considers that although trucking operations will be restricted to the period of 7am to 10pm, the impact of noise emissions from road transport could be substantial and may exceed acceptable levels. In particular, the DEP has estimated that the trucking operations could increase the $L_{A\ 10,\ 18\ hour}$ noise level by more than 3dB(A), and the $L_{A\ 10,\ 1\ hour}$ noise level in the 10pm to 11pm period by more than 6dB(A), at residences less than 30m from the road, through the built up area. These increases are considered to be significant. The increase in noise levels would be greater along Rudds Gully Road which passes through a rural area, and along the Brand Highway outside the speed limit area where it will be even greater. The DEP does not consider that the MRWA $L_{A\ 10,\ 18\ hour}$ design level of 63dB(A) should be the sole criterion of acceptability of noise impacts for the proposed trucking operations. Accordingly, the DEP recommended that further studies should be undertaken on noise impacts from use of the proposed route. The DEP also believes that there may be a considerable impact on existing levels of service, safety and public amenity due to the large incremental increase in heavy vehicle traffic volume.

Main Roads Western Australia (MRWA) indicated that it was difficult to comment on the impacts of truck movements in the absence of detailed existing and future traffic movements data, but it could be interpreted, however, that the impact will be significant on some residential areas. If the existing road system was used, major capital costs will be required to upgrade certain sections.

MRWA also advised that the recently completed Narngulu Transportation Access Study (Halpern Glick Maunsell, 1996) recommends the Brand Highway Deviation (that is the new alternative route shown in Appendix 1: Figure 3) as the preferred transportation route between the Narngulu Industrial Estate and Geraldton Port.

The EPA notes that the City of Geraldton stated that the cumulative effects of all road transport movements associated with the proposed route need to be managed, and that the proponent should provide MRWA with a prediction of negative impacts likely to occur in the next 10 to 15 years. Road upgrades would be required prior to proposed plant commencing operations.

The Mid West Development Commission indicated that for that part of the population living close to the Brand Highway and Portway, the prospect of heavy haulage vehicles travelling within 30 metres of their dwellings from 7:00am to 11:00pm every 44 seconds out of Narngulu during the height of the grain delivery season, is of considerable concern, and accordingly the need for a noise barrier along Portway to control road transport related noise has already been identified.

The EPA has also noted the concerns evident in public submissions which dealt predominantly with the deleterious impact that increased road transport along the proposed corridor would have on existing levels of service, safety, and public amenity. Submissions highlighted the potential for increased levels of traffic congestion, noise, vibration and risk levels to be experienced by residents and motorists.

Having particular regard to the concerns of the DEP, MRWA, City of Geraldton, Mid West Development Commission and the public submissions, it is the EPA's opinion that for its objective with respect to this relevant factor to be met, the proponent would need to carry out further studies of noise impacts associated with trucking operations along its proposed route, and be required to take appropriate ameliorative measures where noise levels were considered unacceptable.

Accordingly, the EPA recommends that an additional condition be imposed upon the proponent requiring it to carry out a more detailed assessment of the noise impacts associated with the use of their preferred road transport route, prior to the plant being constructed. Appropriate ameliorative measures should be implemented if the assessment identified unacceptable noise levels at residences. This should be to the satisfaction of the Minister for the Environment on the advice of the EPA.

The EPA notes that the DEP does not consider that the MRWA $L_{A\ 10,\ 18\ hour}$ design level should be utilised as the sole criterion of acceptability of noise impacts for the proposed trucking operations. Accordingly, the EPA intends to develop road transport noise design level criteria in consultation with the DEP, MRWA, and Department of Transport (DOT) against which the results of the noise impact assessment can be compared and to form the basis for comparison for future assessments where transport noise is a significant factor.

Furthermore, the EPA recommends that the Minister for the Environment request both the Minister for Transport and the Minister for Planning to expedite the completion of studies of alternative transport routes and options from the Narngulu Industrial Estate to the port. These studies should make specific reference to noise impacts and that liaison should occur with the proponent of the proposed plant regarding their noise studies for the proposed route.

3.3 Rail transportation

Aspects of rail transportation

Approximately 3.3 million tonnes of high grade iron ore and concentrate will be delivered each year to the GSP for the production of slab steel. The amount of ore to be sourced from each deposit, ie Koolanooka and Tallering Peak, (Appendix 1: Figure 1) is yet to be determined, and it is possible that either of the deposits will be mined in isolation for a number of years prior to developing the other deposit. For example, Tallering Peak may be mined in isolation prior to the development of the Koolanooka deposit. Only the worst case scenarios have been considered for the determination of transport movements.

In relation to potential impacts from rail transportation, the two worst case scenarios for the transport of iron ore to Mullewa are:

- the Tallering Peak deposit is mined in isolation for a period of years, or
- the Koolanooka deposit is mined in isolation for a period of years.

Train movements between Mullewa and the GSP will not be affected by the sourcing of iron ore as this will be a common alignment for both mines.

Transport Routes

The route to be used for the transport of ore between Tallering Peak and the GSP has previously been described in the proponent's PER document, and remains unchanged for the present proposal.

The transport of iron ore from Koolanooka to the GSP will involve the reinstatement of the rail spur to the Koolanooka mine site. This spur has a length of about 20km and connects into the existing rail line approximately 3km north of the town of Morawa. From here, the ore trains will proceed north along the existing line which passes through the towns/sidings of Pintharuka and Evaside Crossing. At Evaside Crossing, the line turns north-west, and passes through the towns/sidings of Gutha, Canna, Tardun, Wilroy and Curava before entering Mullewa.

Land on either side of the rail between Morawa and Mullewa is used for general farming, with some small areas of uncleared native vegetation.

Noise and social impacts

Even assuming the worst case scenarios for transport of ore to the GSP (ie all ore sourced from either Koolanooka or Tallering Peak), the proponent considers that there are not expected to be any noise or social impacts associated with the transport of iron ore other than those previously identified in the proponent's PER document.

The transport of iron ore between Koolanooka and Mullewa will result in an increase of five trains per day above the existing use of the rail line. Current train movements are all associated with grain transport, and the proponent considers that the additional train movements are not expected to impact on the small towns and sidings between Morawa and Mullewa.

There are currently four train movements per day along the line between Mullewa and Narngulu, all of which are associated with grain transport. Transport of the increased tonnage of iron ore to the GSP represents an increase of ten train movements along this line in excess of current operations. This increased rail traffic has been remodelled by the proponent and the noise levels associated with train movements at a distance of 15m are shown in Table 3 below. The proponent has compared these with criteria recommended in the Environmental Noise Control Manual, EPA of New South Wales, 1988.

Table 3. Rail transportation noise levels

Train movements	$L_{Aeq\ 24\ hour}$	L_{Amax}
Existing 4 trains/day	49	88
Predicted 14 trains/day	54	88
Criterion *	55	80

* Environmental Noise Control Manual, EPA of New South Wales, 1988

The CER stated that the noise due to increased rail traffic will still be within the NSW criteria at the closest residences. The L_{Amax} noise level is currently exceeded by existing traffic on the rail line and the predicted increase associated with the production of 2.4 Mt/a slab steel for the current proposal does not alter this existing level.

Assessment

The area considered for assessment of this relevant environmental factor is the rail transport corridor which connects the proposed steel plant with the transfer facility near Mullewa, and the mine sites at Tallering Peak and Koolanooka and adjacent properties with residences.

With respect to rail transport, the EPA's objective is to ensure that noise levels meet acceptable standards.

The EPA notes that DEP noise specialists carried out a technical evaluation of the information presented in the CER relating to noise emissions from rail transport. The DEP found that the predicted $L_{Aeq\ 24\ hour}$ levels may be underestimated and considered that noise impacts may be greater than predicted for premises up to 70m from the railway line being affected. The DEP also advised that it did not consider the criteria recommended in the NSW EPA's Environmental Noise Control Manual were appropriate in this situation. Accordingly, the DEP suggested that further studies should be done on rail transportation noise.

The Shire of Mullewa considers that the increase of ten train movements per day to handle the greater quantity of iron ore required could impact upon the Mullewa community. The Shire pointed out that the noise emanating from trains as they pass through a nearby cutting and as they shunt within the railway yards can impact upon residents at certain times. The Shire expects that rail movements will be managed to ensure that minimal noise intrusion occurs during evening and night times.

Having particular regard to advice received from the DEP and concerns of the Shire of Mullewa, it is the EPA's opinion that for its objective with respect to this relevant factor to be met further studies should be carried out by the proponent. Accordingly, the EPA recommends that a condition be imposed upon the proponent requiring it to carry out further assessment of the noise impacts associated with rail transportation of iron ore between Mullewa and the plant, prior to construction of the plant. Appropriate ameliorative measures should be implemented if the assessment identified unacceptable noise levels at residences. This should be to the requirement of the Minister for the Environment on the advice of the EPA.

In view of the reservations expressed by the DEP in regard to the criteria recommended in the NSW EPA's Environmental Noise Control Manual for rail noise, the EPA intends to develop rail transport noise criteria in consultation with DEP, Westrail and DOT against which the further studies described above can be assessed.

3.4 Noise from the steel plant

Aspects of noise from the steel plant

Noise emissions from the plant were remodelled to determine whether increases in plant infrastructure, and also the movement of plant components, would result in significant changes to noise emissions. The complete assessment was included in Appendix 4 of the proponent's CER document for the proposal to increase production to 2.4 Mt/a (Alan Tingay & Associates, 1996).

Information relating to existing noise levels at Narngulu, assumptions made during modelling and modelling techniques has previously been provided in Section 6.4 of the proponent's PER document for the original 1.0 Mt/a proposal (Alan Tingay & Associates and Signet Engineering Pty Ltd, 1995).

Results of Modelling

Two scenarios of noise emissions from the upgraded GSP plant were remodelled to determine whether increased production would significantly affect noise levels. The two scenarios were firstly calm conditions, and secondly, a gentle wind of 2m/s from the west. Both scenarios were modelled for night time conditions. These are considered ideal conditions for noise propagation at this location.

Temperature inversions were not considered during the modelling, primarily as the effect of an inversion was not considered by the proponent to be as significant for noise propagation as the occurrence of a gentle wind.

The modelling also took into consideration the relocation of the pellet plant to the west of the GSP site, and also the removal of the Compact Strip Production Plant.

The modelling indicated that whilst the overall plant sound power levels have increased, noise levels to the east and south of the plant where houses are located have not increased proportionally. This is primarily due to the relocation of the pellet plant, which has increased the distance between the noise source and potential noise receivers. Other plant buildings also assist in decreasing noise from the pellet plant by providing a noise barrier.

A comparison of the modelling studies for the 1.0 Mt/a and 2.4 Mt/a plant for two scenarios is provided in Tables 5.2 and 5.3 of the CER, and also in Figures 4 and 5 of the CER. This comparison shows that noise levels have generally been reduced by between 5 to 10dB(A) at the Narngulu Townsite and also at residences adjacent to the plant.

On the basis of remodelling, Herring Storer Acoustics concluded that the plant can comply with acceptable levels of noise under the requirements of the *Environmental Protection Act, 1986* Regulations provided further plant attenuation is undertaken. When plant components are attenuated, the plant is able to comply with the existing criteria even under the worst case down wind propagation.

Specifically, the extra attenuation required to achieve 40dB(A) at Narngulu is as follows:

- Turbine exhaust -6dB(A)
- Heater Flue Gas -5dB(A)
- Dedust Fans -5dB(A)

The CER indicated that these additional attenuation measures will be incorporated into the detailed design of the GSP to ensure total compliance with existing regulations. Furthermore, the proponent has made a commitment to ensure that the requirements of the *Environmental Protection Act, 1986* Regulations or any new noise regulations such as the proposed Environmental Protection (Noise) Regulations, are complied with.

Assessment

The area considered for assessment of this relevant environmental factor is the Narngulu Industrial Estate and surrounding neighbouring properties with residences. Road and rail transport related noise impacts are dealt with in Sections 3.2 and 3.3 of this report.

The EPA's objective is to ensure that noise emissions emanating from the proposed plant comply with statutory requirements and acceptable standards.

DEP noise specialists carried out a technical evaluation of the information presented in the CER relating to noise emissions, which confirmed the proponent's acoustic modelling, and supported the proponent's commitment to comply with both the existing regulations and any future regulations when they are promulgated.

The proponent also made a commitment to develop and implement an Environmental Management Programme which will include suitable monitoring programmes and contingency plans should emissions exceed established criteria to reduce emission levels below those criteria.

The existing Ministerial Conditions also require that, prior to construction, the proponent must prepare a management strategy in consultation with the surrounding residents, which details plans for either modifying operations or for relocating residents who would be affected by unacceptable noise, dust and light overspill from the plant to the requirements of the Minister for the Environment on advice from the EPA.

The EPA notes the proponent's recent endeavours to purchase nearby properties in order to reduce any potential noise impacts which could result from the lack of a buffer zone around the proposed plant.

Having particular regard to:

(a) the commitments made by the proponent;

(b) the existing Ministerial Conditions relating to management of noise from the project; and

(c) the proponent's recent endeavours to purchase nearby properties in order to reduce any potential noise impacts which could result from the lack of a buffer zone around the proposed plant;

(d) it is the EPA's opinion that the operation of the proposed steel plant can be managed so that it is unlikely to compromise the EPA's objective with respect to this relevant factor.

The EPA understands that the provision of a suitable buffer zone is ultimately the responsibility of the State government and its relevant departments, and is aware that preliminary steps have been taken by the State Government in this regard.

Accordingly, the EPA recommends that the Minister for the Environment requests the Minister for Planning to facilitate the establishment of a suitable buffer zone around the Narngulu Industrial Estate.

3.5 Gaseous and particulate emissions

Aspects of gaseous and particulate emissions

Atmospheric emissions from the 2.4 Mt/a slab steel plant were modelled by WNI Science & Engineering to determine any changes that may have occurred in ground level concentrations as a result of increased production. The complete assessment undertaken by WNI Science & Engineering (1996) is included in Appendix 3 of the CER.

The principal atmospheric emissions from the GSP will be oxides of nitrogen, carbon dioxide and particulates.

Oxides of nitrogen are primarily produced from the combustion of natural gas, with the highest volumes being emitted from the pellet plant and the power station.

Particulate levels are highest in the pellet plant where iron ore fines are reformed into pellets. Effective dust control systems in this plant ensure that the majority of this dust is fed back into the process.

Carbon dioxide and water are formed during the reduction of the iron ore pellets (refer Appendix 2 of the CER), when the carbon monoxide and hydrogen in the reformed gas combine with the oxygen in the pellets.

Sulphur dioxide emissions will be negligible due to the low sulphur content of iron ore used for steel production and the use of natural gas as a fuel. An analysis of the iron ore from Koolanooka has not yet occurred. However, assays from the Western Mining Corporation operations in the 1960's indicate that the ore has a low sulphur content (range 0.01 to 0.10%, average 0.05%). The sulphur content will be reduced further by beneficiation of the ore at the mine site.

General information relating to these emissions has previously been provided in Section 6.2 of the proponent's PER document (Alan Tingay & Associates and Signet Engineering, 1995).

Data Revisions

During the preparation of the 2.4 Mt/a feasibility study, the proponent determined that a number of errors had been incorporated into the atmospheric modelling study for the original PER document. These were addressed in the CER and generally covered CO_2 and particulate emissions from the pellet plant and the DRI plant.

The remodelling also took into account aspects that were not included in the original study. These were:

i) RGC Mineral Sands Pty Ltd has recently refined its atmospheric emissions monitoring programme at the synthetic rutile plant at Narngulu. This has enabled RGC to provide accurate data on the emission characteristics of existing sources at the Industrial Estate.

ii) The burners on the power plant were modelled with low NO_x burners, to a level of 35ppm, which significantly reduced NO_x emissions from this source.

A combination of the above factors has resulted in data discrepancies in tables provided in the CER, ie. whilst production has increased, emission levels in some cases have decreased.

With respect to the discrepancies and resulting uncertainty surrounding the current atmospheric data, the Department of Environmental Protection (DEP) requested the proponent to commission an independent audit of the atmospheric emissions data to verify its accuracy (Consulting Environmental Engineers, 1997).

Alan Tingay & Associates (1996) suggest that NO_2 concentrations of approximately half of those presented in the atmospheric modelling study may be a more realistic representation of levels emitted from the plant as a consequence of:

- the very conservative assumption that 50% of the NO_x will be converted to NO_2; and
- field assessments undertaken (Bofinger et al, 1986) and photochemical modelling undertaken at the Pinjar gas-fired power station (Bowman Bishaw Gorham, 1990).

Results of Modelling

Atmospheric emissions will occur from the Pellet Plant, Direct Reduction Plant, Meltshop, and the Power Station. The locations of these components are shown in the plant layout Figure 3 of the CER. Details of the sources, nature and volume of the atmospheric emissions from the 2.4 Mt/a plant were provided in Table 4.1 of the CER.

Nitrogen dioxide

Using DISPMOD, the WA DEP coastal fumigation model, a one year data base constructed from air quality meteorological measurements collected in 1994 and 1995 at Narngulu and conservative assumptions, the proponent predicts that the maximum hourly average ground level concentration of NO_2 from the steel complex and existing industries will be 321$\mu g/m^3$ occurring within the industrial estate.

The DEP has indicated that the proposed industrial estate standard of 640$\mu g/m^3$ has no formal status. Nevertheless, the predicted impact complies with the NHMRC goal of "320$\mu g/m^3$ not to be exceeded more than once per month".

A comparison of ground level concentrations of nitrogen dioxide for the 1.0 Mt/a and 2.4 Mt/a plants was provided in Table 4.2 of the CER.

From the morning fumigation modelling, using the model of Deardorff and Willis (1982) the maximum one hourly ground level concentration of NO_2 was predicted to be 120$\mu g/m^3$. This is lower than the maximum concentrations predicted from DISPMOD and indicates that morning fumigation will not be a problem.

Whilst ground level concentrations of NO_2 associated with the plant are within existing emission guidelines, the DEP suggested that it would be desirable for NO_2 emissions from the plant to be reduced further if possible. This would provide greater flexibility for other NO_2 producing industries to locate within the region. This situation arises as cumulative emissions from all industries located within a specific area must comply with current atmospheric emission guidelines.

In response to this request from the DEP, the proponent undertook to remodel ground level gas concentrations with the height of the pellet plant stacks increased to 50m. The results of the revised modelling were provided in Table 4.3 of the CER.

As a consequence of the results, the proponent has decided to install 50m stacks on the pellet plant. The predicted ground level concentrations of NO_2 from the steel plant following the incorporation of this modification are shown in Table 4.3 of the CER.

Sulphur dioxide

It is predicted that the emissions of SO_2 from the steel complex will be negligible, comprising a total of 1.2g/s. However, SO_2 is emitted from the RGC Minerals Pty Ltd synthetic rutile plant although at a lower rate than allowed for in the proponent's PER document. Using DISPMOD, this additional contribution by the GSP to the existing RGC source will increase the ground level concentrations by less than $1\mu g/m^3$. Therefore ground level concentrations essentially will not change as a result of the steel plant.

A comparison of ground level concentrations of sulphur dioxide from the 1.0 Mt/a and the 2.4 Mt/a plant was provided in Table 4.5 of the CER.

Carbon Dioxide Emissions

Using AUSTOX, a Gaussian puff model designed specifically for negatively and positively buoyant gas releases and a range of meteorological conditions, the proponent predicts that the maximum 15 minute concentrations of CO_2 from the heavier than air CO_2 removal stack plume will be 0.5% v/v occurring 160m from the stack. This is well below the exposure of 3.0% v/v for the 15 minute short term exposure limit. Therefore, ground level concentrations of CO_2 are not expected to be a problem. The mass flux of carbon dioxide emissions from the plant was provided in Table 4.6 of the CER.

The CER stated that the proponent recognises that the quantities of carbon dioxide emitted from the plant are quite large, and therefore intends to actively pursue methods for the reduction of CO_2 emissions from the GSP ahead of Government requirements, restrictions, taxes or guidelines with respect to greenhouse gases.

Particulates

Using DISPMOD the proponent predicts that the maximum 15 minute ground level concentration of particulates from the steel complex and existing sources will be $167\mu g/m^3$ occurring within the industrial estate. This is well below the relevant guideline of $1000\mu g/m^3$ (EPA, 1989 &1992). For 24 hour and annual average concentrations, PM_{10} values of 24.8 and $3.9\mu g/m^3$ are predicted which again are well below the relevant guidelines of 120 and $40\mu g/m^3$ respectively (EPA, 1989 &1992).

A comparison of ground level concentration of particulates for the 1.0 Mt/a and the 2.4 Mt/a plant was provided in Table 4.4 of the CER.

Assessment

The area considered for assessment of this relevant environmental factor is the Narngulu Industrial Estate and neighbouring properties with residences within the Townsite of Narngulu and adjacent special rural area. However, for greenhouse gases, the relevant area considered for assessment is in fact global.

The EPA's objective in regard to this environmental factor is to ensure that gaseous and particulate emissions, including greenhouse gases and odours, both individually and cumulatively, meet appropriate criteria and do not cause an environmental or human health problem. Furthermore, the proponent must use all reasonable and practicable measures to minimise the discharge of gaseous and particulate wastes.

The EPA notes the existence of calculation errors in the proponent's PER document. The EPA accepts the findings of the independent audit of the proponent's base data and calculations which found no critical errors or anomalies of substance in the revised calculations (Consulting Environmental Engineers, 1997).

The EPA also notes the concerns raised by the DEP with respect to the impact of the proposal in taking up the majority of the available NO_2 airshed, together with those concerns raised in public and government agency submissions, particularly with respect to potential health impacts from gaseous and particulate emissions. However, the EPA considers that these concerns can be addressed via the proponent's commitments to develop and implement monitoring programmes for gaseous, odorous, and dust and particulate emissions to ensure that they all meet established criteria, and to install 50m exhaust stacks on the pellet plant in an effort to further reduce predicted ground level concentrations of NO_2 from the proposed plant.

In relation to the substantial increase in CO_2 emissions from the proposed plant as predicted in the CER, the EPA recommends that the existing Ministerial Condition pertaining to greenhouse gas emissions (Condition 5-1) should be amended to reflect current EPA policy and require the proponent to:

(i) calculate the greenhouse gas emissions for the project;

(ii) indicate measures adopted to limit greenhouse gas emissions for the project;

(iii) estimate the comparative greenhouse gas efficiency of the project with the efficiency of comparable projects producing a similar product; and

(iv) consider entry into the Commonwealth Government's "Greenhouse Challenge" voluntary co-operative agreement programme which includes:

- an inventory of emissions;
- opportunities for abating greenhouse gas emissions in the organisation;
- a greenhouse gas mitigation action plan;
- regular monitoring and reporting of performance; and
- independent performance verification.

Having particular regard to:

(a) the modelling of gaseous and particulate emissions carried out by the proponent;

(b) the results of the independent audit of the proponent's base data and calculations relating to air emissions which found no critical errors or anomalies of substance;

(c) the commitments made by the proponent to develop and implement monitoring programmes for gaseous, odorous, and dust and particulate emissions to ensure that they all meet established criteria, and to install 50m exhaust stacks on the pellet plant in an effort to further reduce predicted ground level concentrations of NO_2 from the proposed plant; and

(d) the proposed amendments to the existing Ministerial Condition 5-1 in relation to greenhouse gases;

(e) it is the EPA's opinion that the operation of the proposed steel plant is unlikely to compromise the EPA's objective with respect to this relevant factor.

3.6 Water resources

Aspects of water resources

The GSP will require a water supply of approximately 3.1 million cubic metres per year (Mm^3/yr) to produce 2.4 Mt/a of slab steel. This is in comparison to the $4.5Mm^3/yr$ required to produce 1.0 Mt/a hot rolled coil. A comparison of water use at the GSP for the 1.0 Mt/a and 2.4 Mt/a options was provided in Table 3.1 of the CER.

The substantial decrease in water demand, but with an increase in output, is due to the:

- removal of the need to water cool hot rolled steel coil, because slab steel does not require water cooling; and
- incorporation of air-cooled heat exchangers with closed water circuits wherever possible in place of evaporative cooling towers.

The proponent made a commitment during the preparation of the PER to participate in, or implement, an exploration program to define a water resource for the GSP. The CER stated that the GSP will utilise non-potable water for cooling purposes in the plant wherever possible in preference to potable water providing a suitable resource that is cost effective is identified. This commitment has been refined for the current proposal to indicate that it will only participate or implement an exploration program, if it is technically feasible to use significant quantities of non-potable water in the GSP, and such use would not involve additional costs relative to the supply of potable water.

However, the majority of the water used in the plant will need to be of extremely high quality (ie. deionised) and as such it will be necessary to install a water treatment plant at the site. There may, therefore, be limitations on the quality of water that can be treated.

In the absence of the identification of a water resource of suitable quality, the GSP will utilise water from the Allenooka Borefield, which is also the main water supply for Geraldton. During the preparation of the PER, the Water Corporation advised the proponent that the $4.5Mm^3$/annum of water required for the 1.0 Mt/a plant could be supplied from the Borefield in a sustainable manner. Therefore, as the volume of water required by the plant has been reduced, the 2.4 Mt/a plant can also be supplied in a sustainable manner from this resource in the absence of an alternative resource being defined.

Assessment

The area considered for assessment of this relevant environmental factor is the Geraldton / Mid West region. This is due to the fact that the proponent will endeavour to utilise water from either a new source within the region if a suitable one can be found, or from the Allenooka Borefield. The Allenooka Borefield currently supplies the majority of the potable water within this region.

The EPA's objective in regard to this environmental factor is to ensure that the planning and development of additional water resources for the Geraldton/Mid West region is carried out in a co-ordinated and sustainable manner with appropriate assessment of potential environmental impacts.

The development of additional sources of potable water is expected to be the responsibility of the Water Corporation. The Water Corporation would be required to refer any such proposal to the EPA for separate formal environmental assessment, if abstraction is likely to have a significant impact on the environment. The EPA notes that the Water Corporation has confirmed to the proponent that it can supply the required amount of water for the project from the Allenooka Borefield in a sustainable manner, and that the Corporation had taken into account potential future demands on this regional water resource as well.

The Water and Rivers Commission would favour the use of non-potable water at Narngulu wherever technically feasible, and indicated that potable water resources (eg from the Allenooka Water Reserve wellfields) should be conserved for domestic supply and for commercial purposes where low salinity groundwater is essential.

The EPA also notes the commitment made by the proponent that if it is technically feasible to use significant quantities of non-potable water in the proposed plant and provided that no additional costs are incurred over the use of potable water it will participate in, or will implement an exploration programme in an attempt to define a non-potable groundwater resource which can supply the proposed plant.

However, the EPA considers the potential for the use of non-potable water should be evaluated in terms of overall minimisation of environmental impacts in the region, and not just cost. The EPA expects that in discharging its licensing functions the WRC will ensure that as far as practical non-potable groundwater will be used for the GSP and other industry in the region in preference to potable water supplies.

Furthermore, if groundwater abstraction is likely to have a significant effect on the environment it must be referred to the EPA for assessment under the *Environmental Protection Act.*

Having particular regard to:

(a) the requirement for groundwater abstraction to be licensed by the Water and Rivers Commission (WRC), and that WRC take into consideration that as far as practical, non-potable groundwater be used in preference to potable water supplies;

(b) Water Corporation's advice that it can supply the required amount of water for the project from the Allenooka Borefield in a sustainable manner, and that the Corporation had taken into account potential future demands on this regional water resource as well; and

(c) the proponent indicating in its response to public submissions that it will consult with the Mid West Groundwater Steering Committee during the next stage of design and implementation of the project;

(d) it is the EPA's opinion that the operation of the proposed steel plant is unlikely to compromise the EPA's objective with respect to this relevant factor.

4. Conditions and procedures

In the EPA's opinion, the proposal should be subject to the following conditions and procedures if implemented.

4.1 Existing conditions and procedures

The existing Ministerial Conditions applied to the original 1.0 Mt/a proposal (Ministerial Statement 413, 19 April 1996), subject to modification of Conditions 1, 4, and 5 (proponent's commitments, impacts on residents, and Environmental Management Programme) as set out in 4.2, 4.3, 4.4, and 4.5 below should apply.

4.2 Proponent's additional and revised commitments

The proponent's additional and/or modified commitments made in the CER document (Alan Tingay & Associates, August 1996) and via subsequent correspondence with the DEP (Alan Tingay & Associates, 11 December 1996 and 30 May 1997) should be adopted as conditions.

4.3 The addition of two new conditions (4-5 & 4-6) dealing with transportation-related noise studies

Two new conditions (4-5 and 4-6) as detailed below should be added.

4-5 With respect to road transportation noise, the proponent shall, prior to construction and to the requirement of the Minister for the Environment on the advice of the EPA:

- carry out a further assessment of the noise impacts associated with road transportation between the plant and the port and implement appropriate ameliorative measures if assessment identifies unacceptable noise levels at residences.

4-6 With respect to rail transportation noise, the proponent shall, prior to construction and to the requirement of the Minister for the Environment on the advice of the EPA:

- carry out a further assessment of the noise impacts associated with rail transportation of iron ore between Mullewa and the plant and implement appropriate ameliorative measures if assessment identifies unacceptable noise levels at residences.

4.4 Amendment of sections 3 and 4 and the addition of two new sections (5 and 6) under existing Condition 5-1

The amendment of sections 3 and 4 and the inclusion of additional sections (5 and 6) as follows:

3 calculate the greenhouse gas emissions for the project;

4 indicate measures adopted to limit greenhouse gas emissions for the project;

5 estimate the comparative greenhouse gas efficiency of the project with the efficiency of comparable projects producing a similar product; and

6 consider entry into the Commonwealth Government's "Greenhouse Challenge" voluntary co-operative agreement programme which includes:

- an inventory of emissions;
- opportunities for abating greenhouse gas emissions in the organisation;
- a greenhouse gas mitigation action plan;
- regular monitoring and reporting of performance; and
- independent performance verification.

4.5 Environmental Management System

The proponent should be required to prepare and implement an environmental management plan and environmental management procedures in order to implement the proposals and manage the relevant environmental factors to ensure the EPA's objectives (Section 3) are met. The plan should adopt quality assurance principles (such as those adopted in Australian Standards ISO 9000 series) and environmental management principles (such as those adopted in the voluntary Australian Standards ISO 14000 [draft] series), with appropriate monitoring and auditing to ensure compliance with this condition.

5. Recommendations

The EPA submits the following recommendations:

Recommendation 1

That the Minister for the Environment note the relevant environmental factors and EPA objective, for each factor as set out in Section 3.

Recommendation 2

That subject to the satisfactory implementation of the EPA's recommended conditions and procedures of Section 4, including the proponent's environmental management commitments, the proposal can be managed to meet the EPA's objectives.

Recommendation 3

That the Minister for the Environment imposes the conditions and procedures set out in Section 4 of this report.

Recommendation 4

That the Minister for the Environment requests the Minister for Transport and the Minister for Planning to complete studies of alternative transport routes and options from the Narngulu Industrial Estate to the port. This should specifically include the matter of noise impacts, and liaison should occur with the proponent for the Geraldton Steel Plant regarding their noise studies for the proposed route.

Recommendation 5

That the Minister for the Environment requests the Minister for Planning to implement measures to facilitate the establishment of a suitable buffer zone around the Narngulu Industrial Estate.

Recommendation 6

That the Water and Rivers Commission in discharging its licensing functions ensure that, as far as practical, non-potable groundwater be used in preference to potable water supplies.

Table 4. Summary of EPA's assessment of environmental factors relevant to the proposal.

Mid West Iron & Steel Project - Increase in production from 1.0 Mtpa to 2.4 Mtpa			
Factors	**Objectives**	**Proponent's commitments**	**EPA's opinion**
Road transportation related impacts.	With respect to road transportation, the EPA's objective is to ensure that noise levels meet appropriate criteria and that an adequate standard of level of service, safety and public amenity is maintained.	The proponent has committed to the following specifications for vehicles transporting product, scrap steel and other bulk commodities to and from the Port of Geraldton, and to specify similar requirements on supply and trucking tenders otherwise: (a) a minimum rated power output of 388kW (520 horsepower); (b) no engine braking; (c) the use of airbag/pneumatic suspension systems in lieu of conventional springs for prime movers and trailers where economically achievable; and (d) a noise level 5dB(A) less than ADR 28/01(External Noise of Motor Vehicles) where economically achievable.	It is the EPA's opinion that for its objective with respect to this relevant factor to be met an additional condition (4-5) be imposed upon the proponent requiring it to carry out a more detailed assessment of the noise impacts associated with the use of their preferred road transport route, prior to the plant being constructed. The EPA also recommends that the Minister for the Environment request both the Minister for Transport and the Minister for Planning to expedite the completion of studies of alternative transport routes and options from the Narngulu Industrial Estate to the port. Additionally, the EPA recommends that these studies should make specific reference to noise impacts and that liaison should occur with the proponent of the proposed plant regarding their noise studies for the proposed route.
Rail transportation related impacts.	With respect to rail transportation, the EPA's objective is to ensure that noise levels meet appropriate criteria.	The proponent did not make a specific commitment with respect to rail transportation related impacts.	It is the EPA's opinion that for its objective with respect to this relevant factor to be met an additional condition (4-6) be imposed upon the proponent requiring it to carry out further assessment of the noise impacts associated with rail transportation of iron ore between Mullewa and the plant, prior to construction, in order to identify residences where established criteria may be exceeded, as well as appropriate ameliorative measures.
Noise from the steel plant.	The EPA's objective is to ensure that noise emissions emanating from the proposed plant comply with existing statutory requirements and acceptable standards.	• The proponent will incorporate specific noise attenuation measures in the detailed design of the GSP which will ensure that the requirements of the *Environmental Protection Act, 1986* Regulations or any new Regulations with respect to noise are complied with. • The proponent will, prior to construction, develop and subsequently implement an Environmental Management Program which will ensure that all noise emissions are within established criteria. The results of the monitoring programs will be reported to the DEP and will be available to the public.	It is the EPA's opinion that the operation of the proposed steel plant is unlikely to compromise the EPA's objective with respect to this relevant factor, particularly in view of the predicted reduction in noise levels at nearby residences resulting from proposed changes to the plant layout.

Table 4. Summary of EPA's assessment of environmental factors relevant to the proposal (cont'd)

Mid West Iron & Steel Project - Increase in production from 1.0 Mtpa to 2.4 Mtpa			
Factors	**Objectives**	**Proponent's commitments**	**EPA's opinion**
Gaseous and particulate emissions.	The EPA's objective in regard to this environmental factor is to ensure that gaseous and particulate emissions, including greenhouse gases and odours, both individually and cumulatively, meet appropriate criteria and do not cause an environmental or human health problem. The proponent must use all reasonable and practicable measures to minimise the discharge of gaseous and particulate wastes.	• The proponent will, prior to construction, develop and subsequently implement an Environmental Management Program which will ensure that all gaseous and odorous emissions and ground level concentrations are within established criteria. • The proponent will, prior to construction, develop and subsequently implement an Environmental Management Program which will ensure that all dust and particulate emissions and ground level concentrations are within established criteria. The results of the monitoring programs will be reported to the DEP and will be available to the public. • The proponent will include stacks with a minimum height of 50m in the pellet plant in order to achieve the lowest practical ground level concentrations of NO_2 from the sources in accordance with best management practice.	It is the EPA's opinion that the operation of the proposed plant is unlikely to compromise the EPA's objective with respect to this relevant factor, and that existing Condition 5-1 should be amended to reflect current EPA policy with respect to greenhouse gas emissions, and the proponent be required to: (1) calculate the greenhouse gas emissions for the project. (2) indicate measures adopted to limit greenhouse gas emissions for the project. (3) estimate the comparative greenhouse gas efficiency of the project with the efficiency of comparable projects producing a similar product. (4) consider entry into the Commonwealth Government's "Greenhouse Challenge" voluntary co-operative agreement programme which includes: • an inventory of emissions; • opportunities for abating greenhouse gas emissions in the organisation; • a greenhouse gas mitigation action plan; • regular monitoring and reporting of performance; and • independent performance verification.
Water resources.	The EPA's objective in regard to this environmental factor is to ensure that the planning and development of additional water resources for the Geraldton / Mid West region is carried out in a co-ordinated and sustainable manner with appropriate assessment of potential environmental impacts.	• The proponent will participate in, or will implement an exploration program to define a groundwater resource to provide water to the GSP and will use non-potable water for cooling purposes in preference to potable water provided that a suitable resource is identified by the groundwater exploration program and that use of this resource would not incur additional costs relative to supply of potable water. Kingstream Resources NL wishes to replace this Commitment with the following: • If it is technically feasible to use significant quantities of non-potable water in the GSP, and such use would not involve additional costs relative to the supply of potable water, the proponent will participate in, or will implement an exploration program in an attempt to define a non-potable groundwater resource which can supply the GSP.	It is the EPA's opinion that the operation of the proposed plant is unlikely to compromise the EPA's objective with respect to this relevant factor. The EPA recommends that the Water and Rivers Commission in discharging its licensing functions ensure that, as far as practical, non-potable groundwater be used in preference to potable water supplies.

Appendix 1

Figures

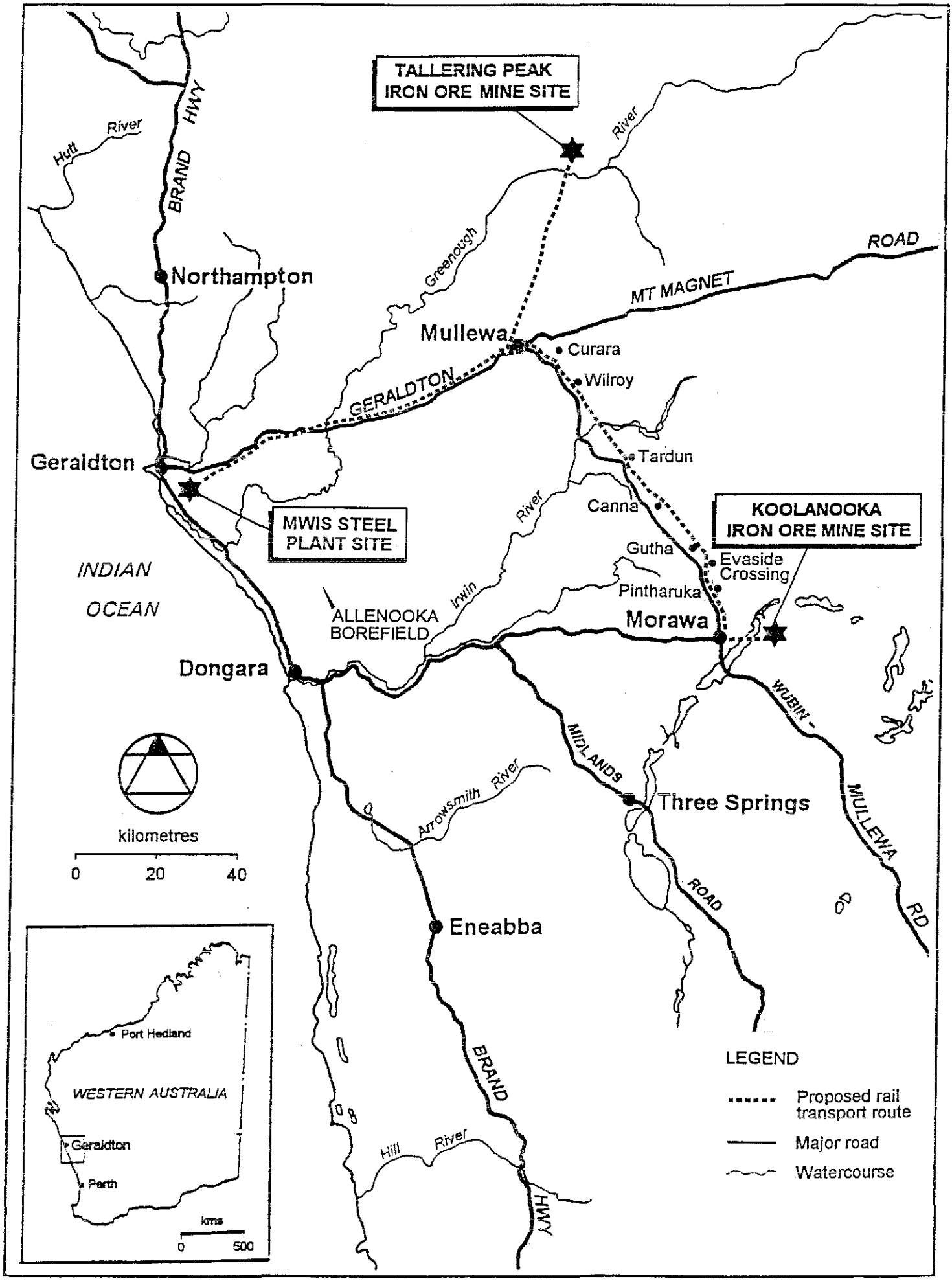

Figure 1. Regional location map — Geraldton Steel Plant, Narngulu Industrial Estate, Tallering Peak and Koolanooka iron ore mine sites. (Source: Figure 1 of the CER).

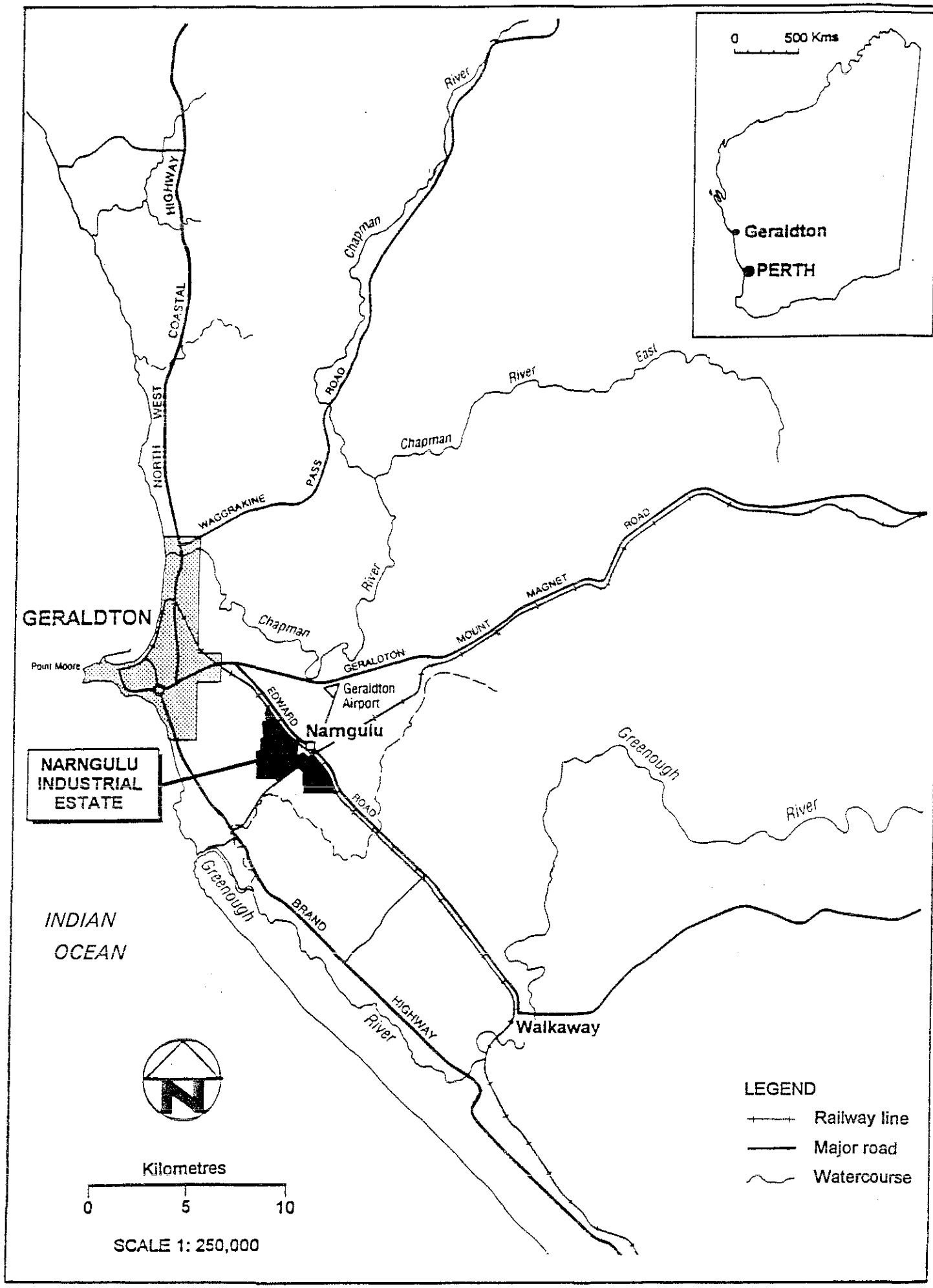

Figure 2. Location map — Geraldton Steel Plant and Narngulu Industrial Estate (Source: Figure 4 of the PER).

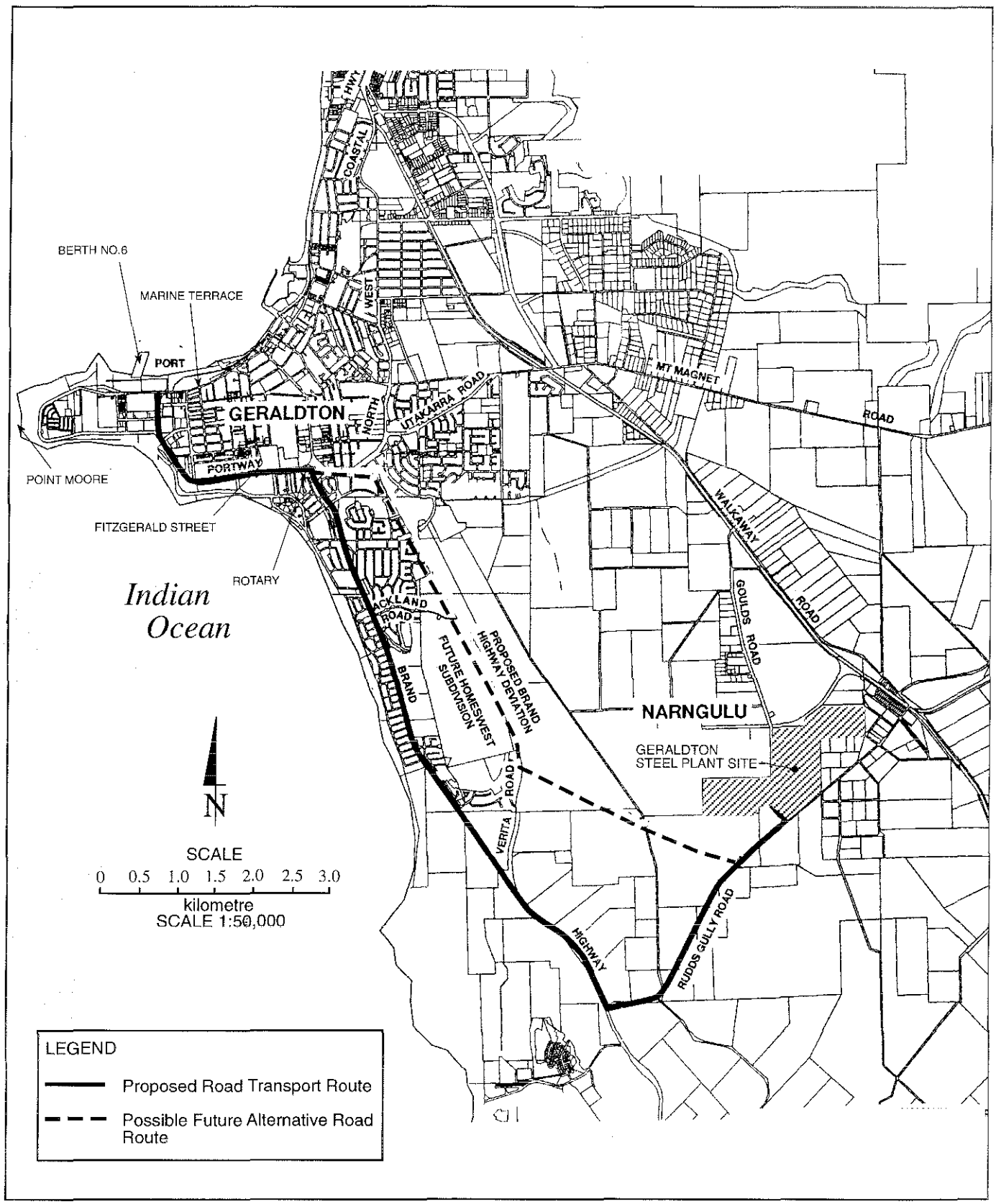

Figure 3. Proposed road transport routes — existing and possible future alternative. (Source: Figure 6 of the CER).

Appendix 2

List of organisations and individuals who made submissions

Organisations:

- City of Geraldton
- Shire of Mullewa
- Commonwealth Environment Protection Agency
- Australian Nature Conservation Agency
- Main Roads Western Australia
- Mid West Development Commission
- Mt Tarcoola Primary School
- Mt Tarcoola Primary School Parents & Citizens Association
- Narngulu Residents Association (Group submission)

Individuals

- AJ & CW Jordan
- M & J.M Lollo
- Mr & Mrs Shelley
- R & T Muir
- Mr D Towers
- Mr A Edwards and family

Appendix 3

Copy of Ministerial Conditions for the original 1.0 Mt/a proposal (Ministerial Statement 413, 19 April 1996)

Ass # 905
Bull # 804
State # 413

MINISTER FOR THE ENVIRONMENT WESTERN

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED (PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL PROTECTION ACT 1986)

MID-WEST IRON AND STEEL PROJECT, GERALDTON STEEL PLANT, NARNGULU INDUSTRIAL ESTATE, GERALDTON (905)

KINGSTREAM RESOURCES NL

This proposal may be implemented subject to the following conditions:

1 Proponent Commitments
The proponent has made a number of environmental management commitments in order to protect the environment.

1-1 In implementing the proposal, the proponent shall fulfil the commitments made in the Public Environmental Review, in response to issues raised following public submissions and those forwarded to the Department of Environmental Protection on 23 January 1996; provided that the commitments are not inconsistent with the conditions or procedures contained in this statement.

The proponent's environmental management commitments, published in Environmental Protection Authority Bulletin 804 (Appendix 5), as revised on 23 January 1996, are attached.

2 Implementation
Changes to the proposal which are not substantial may be carried out with the approval of the Minister for the Environment.

2-1 Subject to these conditions, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the proposal.

2-2 Where, in the course of that detailed implementation referred to in condition 2-1, the proponent seeks to change the designs, specifications, plans or other technical material submitted to the Environmental Protection Authority in any way that the Minister for the Environment determines, on the advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

Published on

19 APR 1996

12th Floor, Dumas House, 2 Havelock Street, West Perth, Western Australia 6005
Telephone (09) 321 2222 Facsimile (09) 322 5149

3 Proponent

These conditions legally apply to the nominated proponent.

3-1 No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister for the Environment has advised the proponent that approval has been given for the nomination of a replacement proponent. Any request for the exercise of that power of the Minister shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.

4 Impacts on Residents

Predicted noise, dust and light overspill impacts on residents living near the Mullewa transfer facility and Narngulu steel plant, particularly at the Narngulu townsite and adjacent rural areas, have the potential to be unacceptable and require a management strategy for resolution before development commences.

4-1 Prior to construction, the proponent shall prepare a management strategy, in consultation with the surrounding residents, which details plans for either modifying operations or for relocating residents who would be affected by unacceptable noise, dust and light overspill from the steel production operation at Narngulu, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

4-2 Prior to construction, the proponent shall prepare a management strategy, in consultation with the surrounding residents, which details plans for either modifying operations, or for relocating residents who would be affected by unacceptable noise, dust and light overspill from the Mullewa transfer facility, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

4-3 Should the strategies prepared in accordance with conditions 4-1 and/or 4-2 lead to modifying operations rather than relocation of residents in either case, the proponent shall implement the strategy(ies) through the Environmental Management Programme required by condition 5-1.

4-4 Should the strategies prepared in accordance with condition 4-1 and/or 4-2 lead to relocation of residents, the proponent shall implement the strategy(ies) to the requirements of the Minister for the Environment.

5 Environmental Management Programme

In order to plan for such a large processing operation with potential large-scale environmental impacts in reasonable proximity to sensitive premises, an Environmental Management Programme is required.

5-1 Prior to commissioning, the proponent shall prepare an Environmental Management Programme, to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection.

This Programme shall address, but not be limited to the following:

<u>Noise</u>

1 monitoring and audit programme for noise emissions as a means of gauging the effectiveness of noise control measures and compliance with the noise regulations.

<u>Gaseous emissions (including greenhouse gases and odours)</u>

2 monitoring and audit programme for all gaseous and odorous emissions (stack and ambient), including greenhouse gases;

3 calculations of the greenhouse gas emissions (using methodology developed for Australia); and

4 employment of best endeavours to assist in the achievement of governments' desired position regarding the generation of greenhouse gas emissions.

Dust and particulate emissions

5 monitoring and audit programme for all dust and particulate emissions (including fugitive dust) and the moisture content of all storage stockpiles as a means of gauging the effectiveness of dust control.

Liquid and solid waste disposal

6 details of waste disposal approvals obtained from relevant government authorities and how the conditions of those approvals will be implemented.

Protection of groundwater

7 efficient use and conservation of fresh water;
8 preferential use of brackish water; and
9 monitoring and audit programme for groundwater quality at the plant perimeter and at other selected sites within the plant, following liaison with the Water and Rivers Commission.

Light overspill

10 details of management measures to ensure that light overspill from the plant and transfer facility near Mullewa meets the requirements of the Department of Environmental Protection.

Results

11 results of monitoring programmes to be submitted annually to the Department of Environmental Protection for audit, and to be made publicly available.

Performance audit

12 annual performance audit of the environmental objectives, and allowance for continuous improvement as new operational procedures and knowledge are developed.

5-2 The proponent shall make the Environmental Management Programme required by condition 5-1 available for public review at appropriate times.

5-3 The proponent shall implement the Environmental Management Programme required by condition 5-1.

6 Incorporation of Low NO_x Technology

6-1 Prior to construction, the proponent shall design the power station gas turbines to incorporate low NO_x technology, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

6-2 The proponent shall construct the power station gas turbines according to the design required by condition 6-1.

7 Decommissioning

7-1 The proponent shall carry out the satisfactory decommissioning of the project, removal of installations and rehabilitation of the site and its environs.

7-2 To achieve the objectives of condition 7-1, at least six months prior to decommissioning, the proponent shall prepare a decommissioning and rehabilitation plan.

7-3 The proponent shall implement the plan required by condition 7-2.

8 Time Limit on Approval

The environmental approval for the proposal is limited.

8-1 If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced.

Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period to the Minister for the Environment.

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

9 Performance Review

9-1 Each year following the commencement of construction, the proponent shall prepare an audit of the performance of the Environmental Management Programme referred to in condition 5-1, and in particular the audit shall show rectification and improvement measures where required.

The annual audit shall be presented to the Department of Environmental Protection acting on behalf of the Environmental Protection Authority.

9-2 Each five years following the commencement of construction, the proponent shall prepare a major review of the following:

(1) environmental protection, including but not limited to consideration of the environmental objectives;
(2) the audit of performance against these objectives; and
(3) the audit of the performance of the Environmental Management Programme referred to in condition 5-1;

to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection.

These environmental objectives shall include but not be limited to those identified by the Environmental Protection Authority in the assessment report (Environmental Protection Authority Bulletin 804) and account for operating experience and new knowledge.

The environmental objectives may be changed by the Environmental Protection Authority following the review.

10 Compliance Auditing

To help determine environmental performance, periodic reports on progress in implementation of the proposal are required.

10-1 The proponent shall submit periodic Performance and Compliance Reports, in accordance with an audit programme prepared by the Department of Environmental Protection in consultation with the proponent.

Procedure

1 Unless otherwise specified, the Department of Environmental Protection is responsible for assessing compliance with the conditions contained in this statement and for issuing formal clearance of conditions.

2 Where compliance with any condition is in dispute, the matter will be determined by the Minister for the Environment.

3 The Environmental Protection Authority will undertake a detailed review of the proposal and the results of the Environmental Management Programme referred to in condition 5-1 after the first five years following commencement of construction.

Note

The proponent is required to apply for a Works Approval and Licence for this project under the provisions of Part V of the Environmental Protection Act.

Kevin Prince

Kevin Prince LL.B MLA
A/MINISTER FOR THE ENVIRONMENT

18 APR 1996

Appendix 4

Copy of recommended Ministerial Conditions for the 2.4 Mt/a proposal

Recommended Ministerial Conditions for the 2.4 Mt/a proposal

MID-WEST IRON AND STEEL PROJECT, GERALDTON STEEL PLANT, NARNGULU INDUSTRIAL ESTATE, GERALDTON - INCREASE IN PRODUCTION FROM 1.0 MTPA TO 2.4 MTPA (1035)

KINGSTREAM RESOURCES NL

This proposal may be implemented subject to the following conditions:

1 Proponent Commitments

The proponent has made a number of environmental management commitments in order to protect the environment.

1-1 In implementing the proposal, the proponent shall fulfil the commitments made in the Public Environmental Review of July 1995 and in the Consultative Environmental Review of August 1996, and those made in response to issues raised following public submissions and subsequently; provided that the commitments are not inconsistent with the conditions or procedures contained in this statement. In the event of any inconsistency, the conditions and procedures shall prevail to the extent of the inconsistency.

The proponent's consolidated environmental management commitments are published under separate cover.

2 Implementation

Changes to the proposal which are not substantial may be carried out with the approval of the Minister for the Environment.

2-1 Subject to these conditions, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the proposal.

2-2 Where, in the course of the detailed implementation referred to in condition 2-1, the proponent seeks to change the designs, specifications, plans or other technical material submitted to the Environmental Protection Authority in any way that the Minister for the Environment determines, on the advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

Published on

3 Proponent

These conditions legally apply to the nominated proponent.

3-1 No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister for the Environment has advised the proponent that approval has been given for the nomination of a replacement proponent. Any request for the exercise of that power of the Minister shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.

4 Environmental Management System

The proponent should exercise care and diligence in accordance with best practice environmental management principles.

4-1 In order to manage the relevant environmental factors, to meet the environmental objectives in Environmental Protection Authority Bulletin 847, and to fulfil the requirements of the conditions and procedures in this statement, prior to construction, the proponent shall prepare environmental management system documentation with components such as those adopted in Australian Standards AS/NZS ISO 14000 series, in consultation with the Environmental Protection Authority.

4-2 The proponent shall implement the environmental management system referred to in condition 4-1.

5 Environmental Management Plan

In order to plan for such a large processing operation with potential large-scale environmental impacts in reasonable proximity to sensitive premises, an Environmental Management Plan is required.

5-1 Prior to commissioning, the proponent shall prepare an Environmental Management Plan, to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection.

This Plan shall address, but not be limited to the following:

Noise

1 monitoring and audit programme for noise emissions as a means of gauging the effectiveness of noise control measures and compliance with the noise regulations.

Gaseous emissions (including greenhouse gases and odours)

2 monitoring and audit programme for all gaseous and odorous emissions (stack and ambient), including greenhouse gases;

3 calculation of the greenhouse gas emissions for the project;

4 indication of the measures adopted to limit greenhouse gas emissions for the project;

5 estimation of the greenhouse gas efficiency of this project and comparison with the efficiencies of other comparable projects producing a similar product; and

6 consideration of entry into the Commonwealth Government's "Greenhouse Challenge" voluntary co-operative agreement programme which includes:

(1) an inventory of emissions;

(2) opportunities for abating greenhouse gas emissions in the organisation;

(3) a greenhouse gas mitigation action plan;

(4) regular monitoring and reporting of performance; and

(5) independent performance verification.

Dust and particulate emissions

5 monitoring and audit programme for all dust and particulate emissions (including fugitive dust) and the moisture content of all storage stockpiles as a means of gauging the effectiveness of dust control.

Liquid and solid waste disposal

6 details of waste disposal approvals obtained from relevant government authorities and how the conditions of those approvals will be implemented.

Protection of groundwater

7 efficient use and conservation of fresh water;

8 preferential use of brackish water; and

9 monitoring and audit programme for groundwater quality at the plant perimeter and at other selected sites within the plant, following liaison with the Water and Rivers Commission.

Light overspill

10 details of management measures to ensure that light overspill from the plant and transfer facility near Mullewa meets the requirements of the Department of Environmental Protection.

Results

11 results of monitoring programmes to be submitted annually to the Department of Environmental Protection for audit, and to be made publicly available.

Performance audit

12 annual performance audit of the environmental objectives, and allowance for continuous improvement as new operational procedures and knowledge are developed.

5-2 The proponent shall make the Environmental Management Plan required by condition 5-1 available for public review at appropriate times.

5-3 The proponent shall implement the Environmental Management Plan required by condition 5-1.

6 Impacts on Residents

Predicted noise, dust and light overspill impacts on residents living near the Mullewa transfer facility and Narngulu steel plant, particularly at the Narngulu townsite and adjacent rural areas, have the potential to be unacceptable and require a management strategy for resolution before development commences.

6-1 Prior to construction, the proponent shall prepare a management strategy, in consultation with the surrounding residents, which details plans for either modifying operations or for relocating residents who would be affected by unacceptable noise, dust and light overspill from the steel production operation at Narngulu, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

6-2 Prior to construction, the proponent shall prepare a management strategy, in consultation with the surrounding residents, which details plans for either modifying operations, or for relocating residents who would be affected by unacceptable noise, dust and light overspill from the Mullewa transfer facility, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

6-3 If either or both of the strategies prepared in accordance with conditions 6-1 and 6-2 lead to modifying operations rather than relocation of residents, the proponent shall implement the strategy(ies) through the Environmental Management Plan required by condition 5-1.

6-4 If either or both of the strategies prepared in accordance with condition 6-1 and 6-2 lead to relocation of residents, the proponent shall implement the strategy(ies) to the requirements of the Minister for the Environment.

6-5 With respect to road transportation noise, prior to construction, the proponent shall carry out further studies of the noise impacts associated with road transportation between the plant and the port in order to identify residences where established criteria may be exceeded, and to determine appropriate ameliorative measures, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

6-6 With respect to rail transportation noise, prior to construction, the proponent shall carry out further studies of the noise impacts associated with rail transportation of iron ore between Mullewa and the plant in order to identify residences where established criteria may be exceeded, and to determine appropriate ameliorative measures, to the requirement of the Minister for the Environment on advice of the Environmental Protection Authority.

6-7 The proponent shall implement the ameliorative measures determined according to the requirements of conditions 6-5 and 6-6.

7 Incorporation of Low NO_x Technology

7-1 Prior to construction, the proponent shall design the power station gas turbines to incorporate low NO_x technology, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

7-2 The proponent shall construct the power station gas turbines according to the design required by condition 7-1.

8 Decommissioning

8-1 The proponent shall carry out the satisfactory decommissioning of the project, removal of installations and rehabilitation of the site and its environs.

8-2 To achieve the objectives of condition 8-1, at least six months prior to decommissioning, the proponent shall prepare a decommissioning and rehabilitation plan.

8-3 The proponent shall implement the plan required by condition 8-2.

9 Time Limit on Approval

The environmental approval for the proposal is limited.

9-1 If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced.

Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period to the Minister for the Environment.

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

10 Performance Review

10-1 Each year following the commencement of construction, the proponent shall prepare an audit of the performance of the Environmental Management Plan referred to in condition 5-1, and in particular, the audit shall show rectification and improvement measures where required.

The annual audit shall be presented to the Department of Environmental Protection acting on behalf of the Environmental Protection Authority.

10-2 Each five years following the commencement of construction, the proponent shall prepare a major review of the following:

(1) environmental protection, including but not limited to consideration of the environmental objectives;

(2) the audit of performance against these objectives; and

(3) the audit of the performance of the Environmental Management Plan referred to in condition 5-1;

to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection.

These environmental objectives shall include but not be limited to those identified by the Environmental Protection Authority in the assessment report (Environmental Protection Authority Bulletin 858) and account for operating experience and new knowledge.

The environmental objectives may be changed by the Environmental Protection Authority following the review.

11 Compliance Auditing

To help determine environmental performance, periodic reports on progress in implementation of the proposal are required.

11-1 The proponent shall submit periodic Performance and Compliance Reports, in accordance with an audit programme prepared by the Department of Environmental Protection in consultation with the proponent.

Procedure

1 Unless otherwise specified, the Department of Environmental Protection is responsible for assessing compliance with the conditions contained in this statement and for issuing formal clearance of conditions.

2 Where compliance with any condition is in dispute, the matter will be determined by the Minister for the Environment.

3 The Environmental Protection Authority will undertake a detailed review of the proposal and the results of the Environmental Management Plan referred to in condition 5-1 after the first five years following commencement of construction.

Note

1 The proponent is required to apply for a Works Approval and Licence for this project under the provisions of Part V of the Environmental Protection Act.

2 The Environmental Protection Authority reported on this proposal in Bulletin 85X (June 1997).

Appendix 5

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