# Mid West Iron and Steel Project — Geraldton Steel Plant, Oakajee, Shire of Chapman Valley

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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 and recommendations to the Minister for the Environment on the proposal by Kingstream Resources NL to establish the Geraldton Steel Plant (GSP), at Oakajee, approximately 23km north of Geraldton.

In the EPA's opinion, the following are the environmental factors relevant to the proposal:

(a) rare and priority flora and vegetation communities;

(b) surface water quality;

(c) groundwater quality;

(d) liquid and solid waste disposal;

(e) gaseous emissions, including greenhouse gases;

(f) dust and particulate emissions;

(g) noise and vibration from the steel plant, and road and rail transportation;

(h) public health and safety (risk); and

(i) heritage.

The EPA has also provided other advice on the following matters related to the proposal:

(a) water resources

(b) road transportation;

(c) services and infrastructure.

(d) planning

(e) unexploded ordnance

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

(a) the preparation of an Environmental Management Plan which will cover elements such as rare and priority flora, noise, gaseous emissions, dust and particulate, the buffer, liquid and solid waste, surface and groundwater, and heritage;

(b) estimation of greenhouse gas emissions for the project;

(c) studies relating to plant, road and rail transport noise;

(d) incorporation of low $NO_x$ control technology for power generation;

(e) a qualitative risk assessment, and hazard and operability studies (HAZOP) and hazardous zone analysis for elements of the plant;

(f) the proponent's commitments should be made enforceable; and

(g) In order to manage the relevant environmental factors and EPA objectives contained in this Bulletin, and subsequent environmental Conditions and Procedures authorised by the Minister for the Environment, the proponent is required to prepare, prior to implementation of the proposal, and environmental management system, including an environmental management programme, in accordance with recognised environmental management principles, such as those in Australian Standards AS/NZS ISO 14000 series.

The EPA submits the following recommendations:

Recommendation 1

That the Minister for the Environment note the relevant environmental factors and other issues assessed by the EPA, as well as the EPA objective for each factor and other issue as set out in Sections 3 and 4.

Recommendation 2

That, subject to the satisfactory implementation of the EPA's recommended conditions and procedures as set out in Section 5, 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 5 of this report.

Recommendation 4

That the Minister for the Environment requests the Minister for Water Resources that in discharging its licensing functions the Water and Rivers Commission 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.

Recommendation 5

That the Minister for the Environment requests the Minister for Transport and the Minister for Planning to complete studies of access into Geraldton Port. This should specifically include the matter of noise impacts, and liaison should occur with the proponent for the Geraldton Steel Plant regarding their transport and noise studies.

Recommendation 6

That the Minister for the Environment and relevant Government agencies note that the EPA will require separate referral of the proposed infrastructure and services to the Oakajee Industrial Estate for assessment, including the Oakajee and Tallering Peak rail lines. Where possible, multiple use service corridors to the Oakajee Industrial Estate should be developed to minimise any potential environmental impacts.

Recommendation 7

That the Minister for Lands and relevant Government agencies note the need to secure an adequate buffer zone around Kingstream Steel NL site and that this area needs to be formally recognised and designated in the planning process.

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## Appendices

# 1. Introduction

This report is to provide Environmental Protection Authority (EPA) advice and recommendations to the Minister for the Environment on the proposal by Kingstream Resources NL to establish the Geraldton Steel Plant (GSP), at Oakajee, approximately 23km north of Geraldton.

This proposal was referred to the EPA on 31 October 1996 and the level of assessment was set at Consultative Environmental Review (CER). The CER (Alan Tingay & Associates 1997a), 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 31 March 1997.

The proponent has prepared two previous documents for a GSP in the Mid West Region- a 1.0 Mtpa (Public Environmental Review (PER), Tingay and Associates 1995) and a 2.4 Mtpa (CER, Tingay and Associates 1996) plant to be located at Narngulu.

Further details of the proposal are presented in Section 2 of this report. Section 3 discusses environmental factors relevant to the proposal and Section 4 presents other advice on matters related 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 5. Section 6 presents the EPA's recommendations to the Minister for the Environment.

Appendix 1 provides figures relating to the proposal. A list of people and organisations that made submissions is included in Appendix 2. References are listed in Appendix 3, and a copy of recommended draft conditions and procedures is presented in Appendix 4.

Kingstream Resources NL has published a summary of comments made during the public submission period and their responses, together with a consolidated list of their commitments for this project.

The EPA has previously provided advice to the Minister for the Environment on the Concept of establishing the Oakajee Industrial Estate (EPA 1997a). The advice was provided under Section 16(e) of the Act.

The proponents for the Oakajee Industrial Estate concept were presented with a number of suggested and related studies and actions to confirm the information provided to the Minister for the Environment (EPA 1997a), and to increase the level of certainty for subsequent proposals undergoing environmental impact assessment in the industrial estate.

A number of these suggested and related studies and actions have been implemented by the Estate Managers, including additional modelling to determine the optimum size and configuration of the industrial estate buffer and a rail option study. The outcome of these studies will be reported separately.

# 2. The proposal

The proponent, Kingstream Resources NL, proposes to establish the GSP at Oakajee, 23km north of Geraldton. The GSP will be located within the planned Oakajee Industrial Estate in the Shire of Chapman Valley, as shown in Figures 1 and 2 (Appendix 1).

The proposal by Kingstream Resources NL to establish the Geraldton Steel Plant (GSP) at Oakajee is described in detail in the CER and will consist of the following main components:

- a pellet plant in which the majority of iron ore is converted to pellets suitable for direct reduction;
- two direct reduction plants for the reduction of pelletised iron ore to direct reduced iron;
- three electric arc furnaces and three ladle furnaces producing liquid steel;
- three metal casters;
- an open cycle gas turbine power station of 370 MW nominal capacity;

- water and wastewater treatment facilities and cooling towers;
- cryogenic oxygen plant;
- handling and storage facilities; and
- administration and maintenance facilities.

A summary of the proposal is presented in Table 1. A plant layout is presented in Appendix 1, Figure 3.

**Table 1. Summary of the Proposal**

| Element | Description |
|---|---|
| Volume of iron ore & concentrate (Mt/a) | 3.3 |
| Volume of solid inputs (t/a) | 778,042 |
| GSP steel product output (Mt/a) | 2.4 |
| Water consumption ($Mm^3/yr$) | 3.5 |
| $NO_X$ emissions (as $NO_2$) (g/s) | 201.2 |
| Particulate emissions (g/s) | 30.9/35.5[3] |
| $SO_2$ emissions (g/s) | 18.0 |
| $CO_2$ emissions (Mt/a) | 4.36[4] |
| Noise Levels under calm conditions [dB(A)][1] | 32 |
| Noise Levels under gentle winds of 2m/s [dB(A)][1] | 35 |
| No. of truck movements/hr[5] - transport of steel product and solid inputs[2] | 17.45 |
| No. of truck movements/hr[5] - transport of solid inputs[2] | 7.98 |
| No. of train movements/day[6] - Tallering Peak to Oakajee | 10 |

(Source: Alan Tingay and Associates 1997a)
Notes:
1. Noise levels are as at the closest residence outside the buffer zone shown in the CER. Levels are provided for an attenuated plant.
2. Number of truck movements at the tenth month following commissioning.
3. Total dust mass flux with all the Melt shop in either charging or tapping phase.
4. Includes $CO_2$ produced from the supply of clean power by Western Power.
5. Truck movements occur 7.00am to 7.00pm, Monday to Friday.
6. Does not include train movements for other projects along the same route between Mullewa and Narngulu.

No changes were made to the proposal from that described in the CER during the assessment process.

Wastewater treatment facilities, issues related to the provision of water and start-up electricity supply, gas, together with transport infrastructure requirements such as road, rail and conveyor transport have not been considered as part of the present report. The provision of basic building and site development materials and social infrastructure are similarly beyond the scope of this advice.

The development of an adjacent port facility at Oakajee is currently subject to separate consideration by the EPA.

# 3. Environmental factors

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

(a) rare and priority flora and vegetation communities;

(b) surface water quality;

(c) groundwater quality;

(d) liquid and solid waste disposal;

(e) gaseous emissions, including greenhouse gases;

(f) dust and particulate emissions;

(g) noise and vibration;

(h) public health and safety (risk); and

(i) heritage.

These relevant factors are discussed in Sections 3.1 to 3.9 of this report.

## 3.1 Rare and priority flora and vegetation communities

### Aspects of rare and priority flora and vegetation communities

The GSP will initially occupy a 200ha site within the Oakajee Industrial Estate. The site of the GSP has been extensively cleared for agricultural purposes including grazing and cereal cropping. Vegetation remaining on the western perimeter of the GSP site is indicated in Appendix 1: Figure 2. Past clearing, combined with high winds experienced in the area, has resulted in significant soil degradation and erosion.

A flora and fauna assessment of the industrial estate was commissioned by LandCorp (Dames & Moore, 1993) and are summarised in the CER.

One of the aims of this assessment was to identify any rare or priority flora on the proposed estate. Although rare and priority species were identified in the greater region, none were identified within the site for the steel plant.

Development of the GSP may result in 25ha in the western margin of the site being cleared. It should be further noted that the balance of the native vegetation will be retained, for the present, in the adjacent buffer area.

An objective of the National Strategy for the Conservation of Australia's Biological Diversity (ANZECC 1996) is to ensure that effective measures are in place to retain and manage native vegetation, including controls on clearing.

In May 1995 the Western Australian State Government adopted the Remnant Vegetation Policy which discourages clearing where total remnant vegetation within a local government authority or sub-catchment is less than 20%. This policy is implemented under the *Soil and Land Conservation Act 1945* by the Commissioner for Soil and Land Conservation.

A submission from the Biodiversity Group of Environment Australia identified listed species in the Region, and recommended that it be confirmed these species not be present. In response to a recommendation of the EPA advice on the Oakajee Industrial Estate Concept (EPA 1997a), LandCorp have indicated their intention to undertake a spring vegetation survey of remaining native vegetation in the Industrial Estate and surrounding buffer.

### Assessment

The area considered for assessment of this relevant environmental factor is the GSP site. The area lies within the Geraldton Sandplain Biogeographic Region (Thackway and Cresswell 1995).

The EPA's objective with regard to this environmental factor is to protect rare and priority flora consistent with the provisions of the Wildlife *Conservation Act* 1950 and to maintain the abundance, diversity, geographic distribution and productivity of vegetation communities.

The EPA notes that the majority of the site has been cleared for agricultural purposes and that a summer floral survey of the remaining vegetation on the site did not identify any rare or priority flora. The EPA considers that for an industrial site area of 200ha it may be possible to avoid the loss of fringing remnant vegetation, particularly as they may play a role in erosion control.

Coastal vegetation communities likely to be impacted by the development of the GSP are well represented within the Region.

LandCorp has indicated of their intention to undertake a follow-up spring survey for the possible presence of gazetted rare and significant flora.

Having particular regard to:

(a) the description of the vegetation cover on the subject land;

(b) the results of the earlier summer flora and fauna survey;

(c) LandCorp's intention to commission a spring flora and fauna survey; and

(d) the opportunity in the project detailed design to avoid the loss of fringing remnant vegetation.

it is the EPA's opinion that the construction of the proposed steel plant is unlikely to compromise the EPA's objective to protect rare and priority flora and vegetation communities on the condition that the proponent undertakes or otherwise reports on a spring survey of the GSP site containing remnant vegetation, and that the report shows that there is no requirement to seek clearance under the Wildlife Conservation Act 1950 to clear the land.

## 3.2 Surface water quality

### Aspects of surface water quality

Surface water run-off is inevitable within plant sites where sandy soils are covered with impervious materials (buildings, bitumen pavement, etc). The proponent has indicated that stormwater will be managed through the isolation of process areas from hardstand drainage, onsite bunding and direction to soakage pits, where appropriate. The location of this pit is indicated in Appendix 1:Figure 3.

The majority of wastewaters from the GSP will be blowdown from cooling and process water circuits. Wastewaters will evaporated in a sealed area using waste heat derived principally from slag, and returned to the minesite with the solid waste. The disposal of slag has been the subject of a separate Notice of Intent to the Department of Minerals and Energy.

The use of solar evaporation ponds is not indicated.

The region around the proposed site is dissected by the Buller and Oakajee Rivers (Appendix 1: Figure 2), although the site itself features internal drainage. The area drained includes broad acre farming, and water samples taken from both these rivers over a period of twenty years indicated that the stream water is consistently saline, with total dissolved solids (TDS) typically in the range 3 000 to 10 000 mg/L. Due to the poor water quality and intermittent nature of flows there is at present no downstream users of the river water, and little opportunity for future beneficial use under current flow and water quality regimes.

Drainage to the west of the GSP site is towards the coast while to the south of the GSP site, drainage is towards the Buller River which subsequently drains into the ocean. The high permeability of the soils covering the proposed site offers little protection against surface water run-off and stormwater soakage entering the drainage system if not managed appropriately.

### Assessment

The area considered for assessment of this relevant environmental factor is the industrial estate and adjacent Buller and Oakajee Rivers. The GSP site covers a total of 200 ha within this area.

The EPA's objective in regard to this environmental factor is to maintain the quality of surface water to ensure existing and potential uses are protected and to meet the requirements of the draft Western Australian Water Quality Guidelines for Fresh and Marine Waters (EPA Bulletin 711).

It is noted that the proponent intends to isolate hardstand drainage from process areas and manage all stormwater run-off on site through soakage to the shallow groundwater.

In considering the information presented by the proponent in the CER document, the EPA understands that surface water run-off will be managed and if necessary treated prior to discharge to the ground in accordance with accepted practice including the separation of wastewater and stormwater streams and wastewater minimisation including recycling.

The proponent has committed to develop and implement a drainage management plan for the site.

Having particular regard to:

(a) the high permeability and hydrology of the subject land;

(b) the management measures proposed by the proponent to separate wastewater and stormwater and to prevent contaminated storm water from leaving the site; and

the commitment made by the proponent to develop and implement a drainage management plan for the site;

it is the EPA's opinion it is likely that the construction and operation of the proposed steel plant is capable of being managed to meet the EPA's objective to maintain the quality of surface water to ensure existing and potential uses are protected through the implementation of the proponent's commitment as reflected in the Environmental Management Plan (EMP). The EMP is to be include appropriate monitoring, reporting and contingency measures, and be developed to the satisfaction of the EPA on advice from the DEP and WRC.

## 3.3 Groundwater quality

### Aspects of groundwater quality

Information presented in Section 3.2 is relevant to this factor.

Uncontrolled discharge of contaminated stormwater and wastewater leakage have the potential to impact on groundwater quality. There are currently no groundwater users located on the proposed site, and no evidence of contamination.

Groundwater flow beneath the proposed Oakajee Industrial Estate has previously been investigated by Jim Davies & Associates (1993a & b). Further hydrogeological work was undertaken by Rockwater (1996a & b) in response to concerns raised in earlier public submissions on the industrial estate about the possibility that the Tamala limestone formation beneath the proposed site may provide preferential groundwater flow through karstic cavities, thus allowing contaminants to reach the coastline and subsequently enter the marine environment.

An outcome of the hydrogeological studies undertaken has been to identify the permeability's of sediment and underlying limestone groups at the site. Paleochannels were not identified in hydrogeological studies undertaken.

The major impact of unacceptable groundwater quality is likely to be the shallow marine environment offshore of the industrial estate. Accordingly the EPA considers that water quality (including stormwater) which has the potential to infiltrate into the groundwater should meet appropriate criteria as identified in ANZECC (1992) and Draft Western Australia Guidelines for Fresh and Marine Waters (EPA, 1993).

The proponent has indicated that there will be no abstraction of groundwater for the GSP, and all liquid waste from the plant will be evaporated using waste heat from the steel making process, and transported to the minesite with waste slag.

The proponent indicated that sewerage will be treated in an approved package treatment plant, with treated wastewaters directed onto landscaped and garden areas.

The EPA, in its earlier consideration of the Oakajee Industrial Estate (EPA 1997a) indicated that baseline water quality monitoring and on-going monitoring for cumulative impacts will be required.

Public concerns related to the interpretation of the hydrogeological information presented, potential for leachate impacts on the adjacent shallow marine environment and the lack of detail of the drainage design proposed.

## Assessment

The area considered for assessment of this relevant environmental factor is the industrial estate and adjacent ocean to about the 25m depth contour.

The EPA's objective in regard to this environmental factor is to maintain the quality of groundwater to ensure existing and potential uses are protected and to meet the requirements of the draft Western Australian Water Quality Guidelines for Fresh and Marine Waters (EPA Bulletin 711).

In reviewing the hydrogeological assessment of the site presented in Rockwater (1996a & b) the Water and Rivers Commission concluded that areas of the site were well suited for industrial development (WRC, unpublished correspondence).

The proponent has made the following commitments (Tingay and Associates 1997a) to:

- prepare and implement a Drainage Management Plan which specifics measures designed to ensure the protection of groundwater resources at the site of the GSP, and will submit the Plan to the DEP for approval;
- install groundwater bores on the plant boundaries to monitor groundwater quality beneath the site. Monitoring results will be reported to the DEP, and will be made available to the public; and
- liaise with the Mid West Development Groundwater Steering Committee with respect to water take-up from the groundwater resources in the region.

Having particular regard to the:

(a) hydrogeology of the subject land;

(b) fact that no groundwater abstraction will occur at the site; and

(c) commitments made by the proponent in relation to groundwater;

it is the EPA's opinion it is likely that the construction and operation of the proposed steel plant are capable of being managed to meet the EPA's objective to maintain the quality of groundwater to ensure existing and potential uses are protected through implementation of the proponent's commitments as reflected in the EMP and subject to the review of measures and monitoring of implementation effects to demonstrate performance criteria have been met.

## 3.4 Liquid and solid waste disposal

### Aspects of liquid and solid waste disposal

The information provided in Sections 3.2 and 3.3 on surface and groundwater are also relevant to this factor.

Disposal of liquid and solid waste on site via any mechanism has the potential to pollute groundwater and to a lesser extent surface waters. A key environmental consideration will be the safe disposal of such materials.

Details and quantities of the wastes that may be generated on the site are described in the CER. Wastes generated during the operational stage are briefly summarised as follows:

- slag (476,748 t/a) - used for road base or in cement manufacture, otherwise transported to minesite at Tallering peak for disposal. The proponent notes that leach testing of slag will be undertaken if the wastes are disposed of at the minesite.
- refractory bricks (22,000 t/a) - disposed of in mine waste dumps;
- casting plant scale (12,000 t/a) - disposed of in mine waste dumps;
- salts from wastewater - disposed of in mine waste dumps following evaporation of wastewater using waste plant heat; and
- sewerage - packaged wastewater treatment plant to be installed to treat sewerage. It is proposed that the packaged treatment plant will be supplied by a Health Department approved contractor, and operated in accordance with the requirements of the *Health Act 1911*. All wastewater generated from the packaged treatment plant will be used on-site to irrigate landscape planting.

Operational wastes such as packaging and construction wastes not so treated and disposed of, will require removal and disposal to an appropriately classified landfill. In this respect, options may include facilities operated by the Shire of Chapman Valley or by the Geraldton/Greenough Regional Council.

Waste disposal at the minesite is covered by a Notice of Intent (Tingay and Associates and Signet Engineering 1995), referred to the Department of Minerals and Energy for assessment.

The proponent has indicated that it has no intention to examine waste disposal options such as ocean discharge for liquid wastes.

Public concerns related to the design, construction and operation of the wastewater treatment plant, and management of salts on site.

### Assessment

The area considered for assessment of this relevant environmental factor is the GSP site and mine site.

The EPA's objective in regard to this environmental factor is to ensure wastes are managed in accordance with the waste management hierarchy, and where this is not possible, are contained and isolated from ground and surface waters, and that discharges meet the requirements of ANZECC (1992) and Draft Western Australia Guidelines for Fresh and Marine Waters (EPA, 1993).

The Authority notes that all solid and liquid wastes should be tested to ensure that they meet waste acceptance criteria at the preferred disposal or re-use site.

A Works Approval to construct, as well as a Licence to operate, the Wastewater Treatment Plant, or solid waste management facilities will be required under Part V of the *Environmental Protection Act* 1986 (the Act).

The proponent has made the following commitments with regard to solid and liquid waste management (Tingay and Associates 1997a):

- the proponent will investigate opportunities for the recycling and reuse of solid wastes generated by the GSP;
- should the recycling or re-use of slag prove not to be viable the proponent will conduct leachability tests on the slag to ensure that disposal of this material in the minesite waste dumps will not have any adverse impacts on the receiving environment. and
- the proponent will conduct leachability tests on refractory bricks and scale to ensure that disposal of this material in the minesite waste dumps will not have any adverse impacts on the receiving environment.

The proponent has also indicated that it will develop a management plan for the collection and disposal of wastes generated during the construction phase, in consultation with local authorities.

Having particular regard to the:

(a) hydrogeology of the subject land;

(b) disposal of all solid wastes off-site; and

(c) commitments made by the proponent;

it is the EPA's opinion that the operation of the proposed steel plant is capable of being managed to meet the EPA's objective for liquid and solid wastes subject to:

(i) the proponent providing details of waste disposal approvals obtained from relevant government authorities and how the conditions of those approvals will be implemented, in the EMP; and

(ii) the preparation of a Waste Management Plan, incorporating relevant aspects of recycling and reuse, as part of the EMP to manage wastes generated during construction and operation.

## 3.5 Gaseous emissions (including greenhouse gases)

### Aspects of gaseous emissions (including greenhouse gases)

Atmospheric emissions from the GSP will occur from the pellet plant, the direct reduction plants, melt shop and the power station. A summary of atmospheric emissions data is presented in Table 7.1 of the CER.

Land adjacent to the GSP can accommodate a substantial buffer, having agricultural lands to the north, south and east, and the ocean to the west. The GSP, if developed, will be the first industry to be located in the Oakajee Industrial Estate.

Nearest residences to the GSP site are in the buffer and are approximately 50m and 750m from the boundary of the GSP site. Air emissions and noise modelling did not consider these properties since it has been indicated that these properties are part of the LandCorp acquisition programme for the industrial estate.

The National Health and Medical Research Council (NHMRC, 1985) remains the primary reference for ambient atmospheric quality standards, pending the finalisation of a National Environmental Pollution Measure (NEPM) that will specify air quality goals for key pollutants. However, in both the NHMRC and proposed NEPM measures, the criteria relate to human health and cannot be related to deleterious impacts on agricultural and horticultural plants.

Australia is a signatory to the 1992 United Nations Framework Convention on Climate Change. That Convention seeks "developed nations" - which Australia is deemed to be - to stabilise its greenhouse gas emissions (based upon the year 1990) by the year 2000, and to reduce emissions progressively thereafter.

Technology to be used for some plant components has not been decided, therefore, the proponent has adopted a conservative approach and has modelled the technology which will result in higher or "worst case" scenario for atmospheric emissions.

Principal emissions from the GSP include carbon dioxide ($CO_2$) oxides of nitrogen ($NO_x$) and particulate. Particulate are addressed in Section 3.6.

*Sulphur dioxide ($SO_2$) emissions*

Sulphur dioxide emissions are low due to the low sulphur content of iron ore and fall well within both the National Health and Medical Research Council and the Kwinana EPP guidelines for both residential and industrial areas.

The DEP has advised that should $SO_2$ emissions be significantly higher than predicted (based on the analysis of sulphur levels in the iron ore feedstock), ambient monitoring may be required.

*Odour*

The GSP will not generate any odorous gases.

*Carbon dioxide ($CO_2$) emissions*

The GSP constitutes a major $CO_2$ producer by virtue of its requirement for power generation. It will produce 4.36 Mt/a of $CO_2$, representing an increase of about 1% of total Australian $CO_2$ emissions.

The proponent notes that each of the components which make up the steel plant represent state of the art technology. Unit $CO_2$ production will be lower than that for older style blast furnaces that they will in part replace due to the:

- use of gas rather than coal for energy production;
- conversion of iron ore to metallic iron by direct reduction;
- use of natural gas to produce heat in the pellet plant.

The proponent notes that the unit $CO_2$ production will be in the lower quartile of equivalent plants.

*Oxides of nitrogen ($NO_x$) emissions*

The CER indicates that the power station gas turbines are proposed to be rated at 42 parts per million volume dry (ppmvd) at 15% oxygen reference level of $NO_x$ using water injection, as the preferred technology. The DEP has confirmed that for water injection, rating of the gas turbines at 42 ppmvd represents best practice. Adoption of this level is appropriate for gas turbines used for this application.

A previous assessment of the 1.0 Mt/a steel mill proposal at Narngulu (EPA, 1996) indicated that dry low $NO_x$ control technology would be adopted, this indicates a level of 34 ppmvd or lower. On the basis of the more recent information provided (Fletcher Challenge Energy, unpublished communication) this is clearly not achievable for this application.

The proponent has prepared two previous documents for a GSP in the Mid West Region- a 1.0 Mt/a (Public Environmental Review (PER) Tingay and Associates, 1995) and 2.4 Mt/a (CER, Tingay and Associates, 1996) plant to be located at Narngulu. Due to a discrepancy in the mass emission rates identified by the proponent's consultants in the latter document, the DEP required the proponent to commission a Victorian-EPA accredited environmental auditor to conduct an independent review of the mass emission rates for discharges to atmosphere which were described in the reports for the Narngulu plant. This was later extended to include the proposal for the GSP to be located at Oakajee (Tingay and Associates, 1997a).

The auditor's report (Consulting Environmental Engineers, 1997) concluded that the emission rates adopted for the DRI plants, melt shops and the power station appeared to be "soundly based and reasonably conservative". However, $NO_x$ concentrations adopted for the pellet plant were found to be "unrealistically low" and an upward revision of 200mg/m$^3$ was a more appropriate basis for estimating $NO_x$ emissions from that source. The auditor's report recommended a recalculation of the total $NO_x$ emission rate from the pellet plant and accordingly the GSP.

This reassessment has been undertaken and is provided, in full in (Tingay & Associates, 1997b). The table and figure references in (Tingay & Associates, 1997b) relate to the equivalent tables and figures presented in Appendix 2 of the CER (Tingay and Associates, 1997a).

A comparison of the $NO_x$ ground level concentrations (GLC) is presented in Table 2, below. The results show that the GLC of $NO_x$ are below the relevant guideline, however, modelled maximum $NO_x$ levels reach 60% of the relevant guideline, in certain areas. This represents a significant utilisation of the $NO_2$ emissions capacity of the Oakajee Industrial Estate.

**Table 2: Maximum Ground Level Concentrations of $NO_X$ ($\mu g/m^3$) from the Steel Plant using DISPMOD**

| AIR QUALITY OBJECTIVE | RELEVANT GUIDELINE | INDUSTRIAL ESTATE | | BUFFER ZONE | | OUTSIDE BUFFER ZONE | | |
|---|---|---|---|---|---|---|---|---|
| | | PREVIOUS VALUES | REVISED VALUES | PREVIOUS VALUES | REVISED VALUES | PREVIOUS VALUES | REVISED VALUES | % OF RELEVANT GUIDELINE |
| Maximum one hourly | 320[1] | 115 | 185 | 109 | 180 | 154 | 194 | 60.6 |
| 3rd highest one hourly | - | 102 | 142 | 95 | 138 | 85 | 125 | - |
| Maximum 24 hour | 150[2] | 22.7 | 28 | 21.3 | 30 | 22 | 31 | 20.7 |
| Annual average | 100[3] | 4.6 | 6.4 | 2.8 | 4.3 | 2.3 | 3.3 | 3.3 |

(Source: Modified from Tingay and Associates 1997b)

Notes:

1 From AEC/NHMRC (1986)
2 From WHO (1987)
3 From USEPA (1977)

Further conclusions by the Auditor related to $SO_2$ and particulate emissions and in relation to the input parameters used, found that the modelling appeared to be very conservative.

Public comments related to the lack of evaluation of the impacts on coastal vegetation, the need for appropriate guidelines for $NO_x$, and potential health impact of gaseous emissions. Further comments related to the lack of commitment on behalf of the proponent to minimise greenhouse gas emissions, and the potential impact of the increase in emissions.

### Assessment

The area considered for assessment of this relevant environmental factor is the Oakajee Industrial Estate and surrounding area, including neighbouring properties with residences.

The EPA's objective in regard to this environmental factor is to ensure that gaseous 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.

*Greenhouse gases*

The GSP constitutes a major $CO_2$ producer by virtue of its requirement for power generation. It will produce 4.36 Mt/a of $CO_2$, representing an increase of about 1% of total Australian $CO_2$ emissions.

In regard to greenhouse gases, the EPA has adopted the following provisional policy:

- proponents should calculate the greenhouse gas emissions associated with their proposal using methodology developed for Australia (Commonwealth of Australia, 1992);
- proponents should indicate specific measures adopted to limit greenhouse gas emissions for their proposal;
- proponents are encouraged to enter into the C21 'Greenhouse Challenge' voluntary agreement programme for the estimation, reporting and auditing of greenhouse gas emissions, whether on a project-specific basis, company-wide arrangement or within an industrial grouping, as appropriate; and
- proponents should estimate the global emission credit (greenhouse gas offsets) achieved through implementation of the proposal.

The Commonwealth has urged a programme of co-operative agreements between industry and the government to reduce greenhouse emissions. The Intergovernmental Committee on Ecologically Sustainable Development (ICESD) has prepared a discussion paper on the National Greenhouse Strategy (ICESD 1997). The paper notes that Australia, although producing less that 2% of the world's anthropogenic greenhouse gas emissions, is one of the biggest emitters on a per capita basis.

The 1997 Strategy recognises the importance of effective monitoring and review and contains measures that ensure progress against specific greenhouse gas objectives and actions, including $CO_2$ emission rates and mass quantities, is clearly stated, regularly reported and accessible. Proposed objectives include that Australia's greenhouse inventories reflect best practice, present opportunities for limiting the contribution to greenhouse gas generation from the transport sector and strategies for reducing non-energy related emissions from industrial sources.

These objectives will progressively be implemented as the strategies are further developed.

Furthermore, the EPA advises that industrial operators should consider entry (whether on a project-specific basis, company-wide arrangement or within an industrial grouping, as appropriate) into the Commonwealth Government's "Greenhouse Challenge" voluntary cooperative agreement programme, or any subsequent programme which is adopted as a consequence of the outcomes of the National Greenhouse Strategy (ICESD 1997).

Accordingly, the EPA considers that the proponent should be required to:

1. calculate the greenhouse gas emissions associated with the proposal (using the generally accepted methods);
2. indicate the measures adopted to limit greenhouse gas emissions for the project; and
3. estimate the greenhouse gas efficiency of this project (per unit of product and/or other agreed performance indicators) and compare it with the efficiencies of other comparable projects producing a similar product;

to the requirements of the EPA on advice of the DEP.

Additionally, the EPA also considers that the proponent should consider entry (whether on a project-specific basis, company-wide arrangement or within an industrial grouping, as appropriate) into the Commonwealth Government's "Greenhouse Challenge" voluntary co-operative agreement programme.

The agreement would include, 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.

Should the above occur, it is likely that implementation of the GSP is capable of being managed so as not to compromise the EPA's objective with regard to greenhouse gas emissions.

*Oxides of Nitrogen*

The EPA considers that for $NO_x$ emissions for gas turbines, the current NHMRC guideline should be used as an upper limit for assessing the performance of new gas turbine installations. The EPA's view is that current technology can readily achieve lower emission levels than the limits in the NHMRC guidelines and considers that the proponent should use best engineering design and best practice management to better these limits. Notwithstanding, there may be operational limits of particular projects which render the industry standard $NO_x$ control methods (dry low $NO_x$ burners) unacceptable. In the case of the GSP the severe load swings on gas turbines associated with switching of the electric arc furnaces would result in instability of dry low $NO_x$ systems. Consequently, the current CER for the project includes $NO_x$ emissions of 42 ppmvd being the minimum achievable via water injection systems to control $NO_x$.

The DEP has undertaken a review of the results of the modelling presented in the CER relating to gaseous and particulate emissions from the steel plant and has advised that the modelling has been carried out competently. Concerns with regard to the validity of input data to the model have been addressed through the auditor's report (Consulting Environmental Engineers, 1997). The DEP also advised that further issues relating to the need to re-assess the height of all stacks and exit points for gaseous emissions should be addressed by the proponent at the works approval stage. Furthermore, as the modelled maximum $NO_x$ levels reach 60% of the relevant guideline level, and represents a significant utilisation of the $NO_x$ emissions capacity of the Oakajee Industrial Estate, it is appropriate for the proponent not only to undertake emissions monitoring during operation, but, also ambient monitoring of oxides of nitrogen for a period before and after the plant commences operation.

In response to the concerns raised by the DEP, the proponent has:

- indicated that the re-examination of stack heights and the impacts that this may have on atmospheric emissions will occur during the Works Approval process as necessary;
- indicated that the reduction in $NO_x$ emissions from the pellet plant compared to that predicted for the plant located at Narngulu was due to a change in technology (ie. different plant was modelled at the two sites), as well as more specific emissions data being made available from the technology suppliers for inclusion in the modelling study;
- provided formal correspondence detailing the reasons why water injection will be used in preference to dry low $NO_x$ technology in the power plant, but also stated that it considers that it is not economically feasible for it to achieve 25 ppmvd of $NO_x$ through the use of dry low $NO_x$ technology; and
- indicated that it is its intention that a monitoring programme will be developed to the satisfaction of the EPA, and that it will consider all potential emissions from the plant, particularly $NO_x$, sulphur dioxide and particulates.

The EPA notes the commitment made by the proponent to develop and subsequently implement an environmental management programme which will ensure that all gaseous, odorous, dust and particulate emissions, and ground level concentrations are within established criteria.

Having particular regard to the:

(a) results of the independent review of emission data;

(b) results of modelling of gaseous and particulate emissions carried out by the proponent, as amended; and

(c) 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;

it is the EPA's opinion that it is likely the operation of the proposed steel plant can be managed to meet the EPA's objective to ensure that gaseous emissions and odours, both individually and cumulatively, meet appropriate criteria and do not cause an environmental or human health problem, subject to the requirement that:

(i) prior to construction, the proponent should design the power station gas turbines to:

- meet the National Health and Medical Research Council guideline for $NO_x$ emissions of 34 parts per million volume dry at 15% oxygen reference level as the upper limit for gas turbines greater than 10MW; or
- if using water injection technology, 42 parts per million volume dry at 15% oxygen reference level of $NO_x$;
- re-examine stack heights and the impacts that this may have on atmospheric emissions and gaseous ground level concentration; and

(ii) the proponent undertakes a monitoring and audit program for all significant gaseous emissions.

## 3.6 Dust and Particulate

### Aspects of dust and particulate

Dust and particulate matter may result from activities undertaken at the proposed industrial estate during construction, and as a consequence of on-going operations.

The GSP site is located on the coast with little adjacent urban development. A number of semi rural dwellings occur to the south and east. The suburb of Drummond Cove occurs 6km to the south and generally the direction of prevailing winds is not to dust-sensitive areas.

The industrial estate consists of sandy soils in a low to medium rainfall area.

The WA Environmental Protection Policy (Atmospheric Wastes) Kwinana (EPA, 1992a) specifies an ambient dust limit (averaged over 24 hours) for land used predominantly for residential and rural purposes (Area C) of 150µg/m$^3$ with a standard (a concentration which is desirable not to exceed) of 90µg/m$^3$. Dust guidelines have been developed for and applied to development sites through Part V of the Act (DEP, 1996).

The results of modelling undertaken for anticipated particulate emissions from the GSP indicates that emissions of dust from the plant during normal operation of stacks and vents will be well below established criteria. A summary of particulate emissions from the GSP is provided in Table 7.4 of the CER.

To address issues related to dust generated during earthworks associated with site preparation and construction, all contractors will be required to manage and suppress dust by using water trucks or other forms of spray. Following construction, the surface will be either paved or landscaped therefore there will be no unstable areas.

Proposed dust management measures are further described in the CER.

Iron ore transport from minesite(s) will be in either covered wagons or a crusting agent will be used to control dust.

Contractors will be required to comply with the requirements of the DEP Guidelines for the Prevention of Dust and Smoke Pollution from Land Development Sites (DEP, 1996).

The DEP has indicated that since the proponent does not intend to house the iron ore stockpiles in sheds, the dust control system will need to be state-of the art, incorporating automatic controls sensitive to meteorological conditions.

Westrail has indicated that the issue of dust from the transport of iron ore needs further consideration since it would be difficult to provide covers to rotary dump wagons.

Public submissions related to concerns about stockpiles of iron ore at the GSP not being covered and the potential impact on properties within the buffer, should these not be acquired by LandCorp.

## Assessment

The area considered for assessment of this relevant environmental factor is the Oakajee Industrial Estate and surrounding area, including neighbouring properties with residences, and the transport route from the minesite to the GSP site.

The EPA's objective in regard to this environmental factor is to protect the surrounding land users such that dust and particulate emissions will not adversely impact upon their welfare and amenity or cause health problems by meeting the Guidelines for the Prevention of Dust and Smoke Pollution from Land Development Sites in WA and the Environmental Protection Policy (Atmospheric Wastes) (Kwinana).

The results of modelling undertaken for anticipated particulate emissions from the GSP indicates that emissions of dust from the plant during normal operation of stacks and vents will be well below established criteria. Notwithstanding, the EPA notes that dust management proposed for this site may not meet best practice.

The proponent will need to re-assess the height of all stacks and exit points for gaseous or particulate emissions when the plant design is close to finality since the turbine stack height is shown as 30m, other buildings are taller than this. Otherwise there is the potential for plumes to be caught in the wakes of larger structures resulting in high ground level concentrations.

Verification of atmospheric emissions should be required as part of the licence to operate under the Environmental Protection Act.

The EPA notes the commitment made by the proponent to develop and subsequently implement an environmental management programme for dust and particulate emissions, aimed at ensuring that ground level concentrations are within established criteria.

Having particular regard to the:

(a) results of modelling of particulate emissions; and

(b) commitments made by the proponent to develop and implement monitoring programmes for dust and particulate emissions to ensure that they meet established criteria;

it is the EPA's opinion that it is likely the operation of the proposed steel plant can be managed to meet the EPA's objective to protect the surrounding land users such that dust and particulate emissions will not adversely impact upon their welfare and amenity or cause health problems, subject to the requirement that the proponent:

(i) reassess the height of all stacks and emission points for particulate emissions;

(ii) implements a monitoring and audit programme for all dust and particulate emissions (including fugitive dust); and

(iii) implements a Dust Management Plan to manage dust and particulate (including fugitive dust) to an acceptable level during construction, operation and transport of materials.

## 3.7 Noise and vibration

### Aspects of noise and vibration

Oakajee is situated in a rural environment with low background noise levels. The most significant noise is presently from traffic along the North West Coastal Highway (Appendix 1: Figure 2). Where this is not a dominant influence, it is likely that night-time background noise levels under calm weather conditions are between 28 and 33dB(A).

Noise levels for premises within Western Australia are subject to the Noise Abatement (Neighbourhood Annoyance) Regulations 1979, which are at present the prescribed standard for noise under the Act . New Environmental Protection (Noise) Regulations are proposed to be gazetted shortly and are expected to apply in the event that implementation of the GSP proceeds.

The noise regulations do not apply to road and rail transport, and there is currently no formal environmental policy on acceptable noise levels from road and rail transport in WA.

*Plant noise*

In considering the proposed Environmental Protection (Noise) Regulations, more stringent noise criteria will be applied to proponents wishing to establish at the site, including the GSP.

The maximum allowable noise levels under the proposed Environmental Protection (Noise) regulations during the most sensitive time for residences around the proposed industrial estate would be in the range 35 to 40dB(A), dependent on additional adjustment for tonal components.

Consultants have carried out a noise impact appraisal of the GSP as described in the CER (Herring Storer Acoustics reported in the CER). Further modelling of plant noise under light westerly wind conditions was undertaken during the assessment process in response to concerns from the DEP. Appendix 1: Figure 3 (modified from Tingay and Associates 1997c) presents the results of this additional modelling.

The noise modelling information provided in the CER indicates that residents to the south of the GSP and near the Buller River will not be unreasonably impacted by plant noise. Information from the modelling under light westerly winds (worst case conditions) indicates that the 35dB(A) contour will extend beyond the North West Coastal Highway. The results of modelling undertaken during this additional study will be used, amongst other information, to determine the extent of the buffer.

The local government and public submissions expressed concerns about the potential noise impacts from the plant on the two properties within the buffer.

*Transport noise*

A proposal for the development of a deepwater port adjacent to and for the purpose of servicing the Oakajee Industrial Estate is the subject of a separate referral.

This proposal considers the environmental factors related to the establishment of the GSP at Oakajee and transport of product and bulk commodities to and from the Port of Geraldton by road and rail for the initial period of operation. Should product transport and scrap steel importation through the Port of Geraldton extend beyond the initial ten months of operation as indicated in the CER, or in the event that production rates exceed those indicated in the CER document, this aspect of the proposal should be referred back to the EPA for further consideration.

The purpose of addressing transportation noise is to identify the extent of areas adjacent to the main road and railway routes which may be affected by road/rail noise and the extent of the likely noise impacts in these areas.

The proponent proposes export of product through the Port of Geraldton for about 10 months, and then through the proposed Oakajee port if this is approved. Transport of product will be either by road or rail as described in the CER. The routes to be used for road and rail transportation activities associated with the operation of the proposed steel plant and the mine site are illustrated in Appendix 1: Figure 4.

*Road transport noise*

The proponent has indicated that the proposed route for the transport of steel product by road to the Port of Geraldton from the GSP site at Oakajee is via the North West Coastal Highway, Portway and Marine Terrace. The proposed route through the City of Geraldton is indicated in Appendix 1: Figure 1. Solid inputs to the GSP will be via the same route.

The CER indicates that there will be, at maximum, one product truck movement every 4.21 minutes to the Geraldton port and one solid input truck movement every 7.52 minutes from the Port of Geraldton to the GSP. Truck traffic (product and inputs) will total 209 movements per day, in the 10th month of operation, that is, one truck movement every 3.44 minutes operating between the hours 7:00 am and 7:00 pm, 5 days a week. Truck movements are proposed to decrease to 96 per day, after the 10th month of operation following which it is anticipated that product and scrap steel importation through the Port of Geraldton will cease and the transport reverting to the movement of other solid inputs only.

The noise impacts associated with the transport of product and inputs between the GSP and the Port of Geraldton are described in the CER. The DEP has identified significant noise impacts in relation to transportation operations, particularly truck movements between the plant site and the Port of Geraldton.

Main Roads Western Australia (MRWA) has noted that there may be a potential for road transportation for a period longer than 10 months, as indicated in the CER. MRWA has indicated that the length of vehicles proposed to be used by the proponent will cause significant traffic congestion and impact on safety and noise associated with frequent breaking and acceleration. MRWA maintains that road transport for the GSP will impact the environment on North West Coastal Highway through Geraldton.

Submissions related to the concerns about the impact noise from the increased road transport may have on the health and amenity of the residents and that further information was required on noise treatment for sections of the transport route, particularly along Portway.

*Rail transport noise*

The proposed route for the rail transport of steel product from the GSP to the existing Port of Geraldton would require a new rail spur line from the Oakajee Industrial Estate, joining the main Narngulu line approximately 2km east of the Narngulu Marshalling Yards, and along the existing line into the Port of Geraldton. The transport routes are described in the CER. A new spur line from the minesites to the existing rail way would be required as described in Appendix 1: Figure 4.

The noise impacts associated with the transport of products and inputs by rail for the various sections of track are described in the CER. The DEP has determined that there may be potentially significant noise impacts associated with rail transport of products and solid inputs.

Westrail indicated that noise along the Oakajee rail spur should be subject to separate assessment, and that the actual distance of noise sensitive premises from the existing rail line from Mullewa to Narngulu and the Tallering Peak rail spur needed to be established.

Public submissions related to the need for separate assessment of noise impacts associated with the Oakajee spur line and the impacts on the health and amenity of residents along the transport routes.

## Assessment

The area considered for assessment of this relevant environmental factor is the GSP steel plant and surrounding noise sensitive premises, and the road and rail routes which link the proposed steel plant with the mine at Tallering Peak and the Port of Geraldton, including adjacent properties with residences.

With respect to this relevant environmental factor, the EPA's objective is to protect the amenity of nearby residents from noise and vibration impacts resulting from operation of the steel plant, and activities associated with the transport of raw materials and product by ensuring that noise and vibration levels meet statutory requirements and acceptable standards for the GSP.

*Plant noise*

The proponent will need to meet the criteria in the Noise Abatement (Neighbourhood Annoyance) Regulations, 1979 and the proposed Environmental Protection (Noise) Regulations criteria (when promulgated).

Analysis of modelling under light westerly winds (2m/s) indicates that there are a number of noise sensitive premises within the industrial estate buffer and which fall within the 35 dB(A) contour and accordingly can be expected to be subject to unreasonable noise (Herring Storer Acoustics in Tingay and Associates 1997c). In addition, a house remains immediately outside of the 35dB(A) contour east of the North West Coastal Highway. Furthermore, and under these wind conditions, there remains the potential for the development of noise sensitive premises within the contour and to the east of the North West Coastal Highway.

In the determination of appropriate criteria for adjacent noise sensitive premises, no adjustment has been made for potential tonal elements.

The EPA notes that the residences within the Oakajee Industrial Estate buffer were excluded from the modelling and that these two properties are to be purchased by LandCorp.

*Road transportation noise*

There are currently no statutory regulations that govern road traffic noise. However, MRWA has a policy that traffic noise at residential locations should be restricted to an $L_{10,\ 18\ hour}$ of 63dB(A). The DEP has advised that it does not consider that this design level should be the sole criterion of acceptability of noise impacts for the proposed trucking operation and further considers that for the planning of new residential areas near roads an $L_{10,\ 18\ hour}$ of 56dB(A) should be used.

The CER provides a limited analysis of the likely traffic noise impacts associated with the proposal to truck input materials and finished product along the North West Coastal Highway and Portway and particularly as they relate to urban built up areas.

The CER predicts $L_{A10,\ 18\ hour}$ levels of 64dB(A) for existing traffic and an increase of up to 3dB (A) to give $L_{A10,\ 18\ hour}$ levels of 67dB(A) during the day at 10 metres from the Highway. This analysis is in good agreement with the DEP assessment.

The CER indicated that, assuming that the houses are set back an average of 30 metres from the Highway and Portway, the predicted levels would be approximately 4dB(A) lower at the houses than those predicted for the 10 metres distance. Thus the existing $L_{A10(18h)}$ level would be approximately 60dB(A), increasing to 63dB(A) with the GSP trucks included. This level is well above the 56dB(A) planning level used by the DEP but consistent with the 63dB(A) level used by MRWA.

The DEP advised that the effect of the GSP traffic would be to increase the area affected by traffic noise $L_{A10,\ 18hour}$ above 56dB(A)) from an estimated 70 metres to 120 metres on both sides of the road. This needs to be recognised by the City of Geraldton in considering any residential development proposals along the Highway.

The EPA notes that the DEP does not consider that the MRWA $L_{A10,\ 18hour}$ 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.

*Rail transportation noise*

There are currently no statutory regulations which govern rail traffic noise.

The criteria used by the proponent are based upon the "Environmental Noise Control Manual" of the EPA of New South Wales for rail noise (NSW EPA, 1988) and are:

- Maximum level, $L_{Amax}$ = 80dB(A)
- "Average" level, $L_{Aeq,\ 24hr}$= 55dB(A)

The maximum acceptable levels are stated as 5dB(A) above these levels. The DEP has advised that it did not consider the criteria recommended in the above Manual were appropriate in this situation. Accordingly, the DEP suggested that further studies should be done on rail transportation noise. In addition, the DEP recommends a target level for planning purposes of 65dB$L_{Amax}$.

The EPA understands that Westrail is considering noise criteria for freight rail to be incorporated into its Environment Management Manual but has not as yet published its noise standards or control policies. The proposed noise regulations do not cover railway noise.

Criteria used for the purposes of the assessment used in the CER quote a different averaging period which makes direct comparisons with DEP criteria difficult. The $L_{Amax}$ levels exceed the criteria by 8dB(A) at the 15 metre distance, for both existing and proposed trains. Assuming the $L_{Amax}$ reduces at a rate of 6dB(A) per doubling of distance, the $L_{Amax}$ criterion would be satisfied at a distance of 38 metres from the track.

Therefore the area affected by rail noise could possibly increase from approximately 38 to 100 metres from the track.

The uncertainty in the potential area of influence highlights the need for a detailed study into the impact of rail noise. This should include definitive measurements of the types and lengths of trains to be used, and incorporate consideration of the transport of solid inputs.

The rail traffic component originating from the GSP will vary according to the section of rail line, ranging from almost exclusive use to service the industries locating in the Oakajee Industrial Estate, to a minimum, in the doubling of existing services. As a major user, therefore, the proponent could be regarded as having at least a part responsibility in this area. Westrail, however, as operator of the line must clearly carry the major responsibility for its noise impact. While Westrail is considering a series of policy measures in relation to freight noise, at this stage there are no specific details in terms of either the noise level at which they would take effect or in terms of the measures themselves.

If there are no existing residences in the affected area, then the affected areas identified above need to be drawn to the attention of local Councils as a planning measure to ensure new residences are not constructed in this area without the incorporation of appropriate architectural solutions.

In relation to plant, road and rail transport noise, the proponent has made the following commitments:

*Plant*

1. Proponent will incorporate specific noise attenuation measures as appropriate 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. These measures will be to the satisfaction of the EPA.
2. Proponent will, prior to construction, develop and subsequently implement the Environmental Management Program (EMP) which will ensure that all noise emissions are within established criteria. The EMP will include but not be restricted to:

- the development of suitable monitoring programmes; and
- contingency plans should emissions exceed established criteria to reduce emission levels bellow those criteria.

The results of the monitoring programs will be reported to the EPA and made available to the public.

*Transport*

1. Proponent will ensure that a study to assess noise sensitive premises along the rail line between the minesites(s) and the GSP prior to plant commissioning, and also along the road transport route to the existing Port of Geraldton is conducted. This study would identify premises that may be affected by road or rail transport, and identify any noise attenuation measures that may be required to reduce impacts on residents.
2. The proponent will apply the following specifications for vehicles transporting product and scrap steel to and from the Port of Geraldton, and will specify similar requirements on supply and trucking tenders:

(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 feasible; and

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

The EPA notes that all trucking of product and inputs between the GSP site and the Geraldton Port will be within the period 7.00 am to 7.00 pm , 5 days a week. The DEP supports this approach which avoids the primary sleep disturbance period.

Having particular regard to the:

(a) results of the noise modelling, including the additional information supplied for light westerly winds;

(b) concerns raised by the community, MRWA, Westrail, and other local and statutory government authorities; and

(c) the proponent's commitments;

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 the following requirements be imposed upon the proponent requiring it to carry out further assessment of the noise impacts associated with plant operation, road and rail transportation of iron ore particularly 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.

*Further assessment of the noise impacts associated with on-going plant operation, and the road and rail transportation of iron ore.*

*Monitoring*

(i) Develop and implement a noise monitoring and audit programme sufficient to characterise noise emissions and determine the area of impact along transport corridors and at noise sensitive premises in close proximity to the plant;

*Plant noise*

(ii) Following detailed design, and prior to commencement of construction, the proponent shall provide sound power levels for the plant including details of the noise attenuation measures proposed to be employed in the plant to meet assigned levels, to the satisfaction of the EPA.

(iii) The proponent shall provide a report to the Environmental Protection Authority, outlining contingency plans and/or management strategies detailing how assigned noise levels will be met in the future at potential noise sensitive premises outside the Oakajee Industrial Estate buffer area.

(iv) The proponent shall develop and implement management strategies for noise emission impacts on residents in the buffer, should LandCorp fail to secure the properties.

*Road transportation noise*

(v) With respect to road transportation noise, the proponent shall, prior to construction and to the requirement of the Minister for the Environment on advice from the Environmental Protection Authority and Main Roads Western Australia, carry out a further assessment of the noise impacts associated with road transportation between the plant and port in order to identify residences where established criteria may be exceeded, and implement appropriate ameliorative measures.

*Rail transportation noise*

(vi) With respect to rail transportation noise, the proponent shall, prior to construction and to the requirement of the Minister for the Environment on advice from the Environmental Protection Authority and Westrail, carry out a further assessment of the noise impacts associated with rail transportation between the plant and minesites in order to identify residences where established criteria may be exceeded, and implement appropriate ameliorative measures.

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 road and rail transport noise criteria in consultation with DEP, Westrail and DOT against which the further studies described above can be assessed.

## 3.8 Public health and safety (risk)

### Aspects of public health and safety (risk)

The EPA has established management principles and acceptable criteria for off-site individual fatality risk (EPA, 1992b and 1992c) for new industrial developments of a potentially hazardous nature.

Although the EPA has not yet established any criteria for societal risk, it recognises the need to develop these criteria in the near future.

A risks and hazards appraisal was undertaken by Dames & Moore (1993b) for the Oakajee Industrial Estate to determine whether the site could accommodate such industries. The results of the risks and hazards assessment were measured against EPA criteria relating to residential precincts (Environmental Protection Authority, 1992b). Based on these criteria, suitable zones were indicated for high, medium and low risk industries within the industrial estate.

The proponent has indicated that no component of the steel plant will present a risk to the general public in terms of the use of hazardous and dangerous goods. Therefore, risk to the public will comply with acceptable standards (CER).

The Department of Minerals and Energy (DOME) has indicated that risks associated with hazardous and dangerous goods requires further assessment, particularly off-site risk related to hydrogen and carbon monoxide reformer gases, the location of diesel tanks and gas storage areas.

Public submissions related to concerns about the safety design of the plant and the provision of fire services to the site.

**Assessment**

The area considered for assessment of this relevant environmental factor is the proposed Oakajee Industrial Estate and neighbouring properties with residences.

The EPA's objective in regard to this environmental factor is to ensure that risk is as low as reasonably achievable and complies with acceptable standards. The EPA's criteria for the assessment of the fatality risk of proposed hazardous and industrial developments is outlined in EPA Bulletins 611 and 627. The proponent would also need to comply with the requirements of the *Mines Safety and Inspection Act , 1994* administered by the Department of Minerals and Energy.

DOME stated that the following will need to be carried out as part of the site's overall risk assessment (required under the *Mine Safety and Inspection Act, 1994)* prior to final plant engineering designs:

(1) qualitative risk assessment of the site shall be completed with sufficient detail to ensure compliance with EPA risk criteria. This should be sensitive to possible differing technologies in the Direct Reduction Plant; and

(2) hazard and operability studies (HAZOP) and hazardous zone analysis for all flammable and toxic gas systems, for the DRI plant and storage area and the cryogenic oxygen unit.

The EPA notes that in response to questions generated from submissions received, the proponent has indicated that it will comply with the requirements of the *Mine Safety and Inspection Act* and that it intends to prepare a fire safety plan for the site as part of an emergency safety plan.

However, the EPA also notes that no specific commitments were made by the proponent in relation to public health and safety.

Having particular regard to the :

(a) concerns raised in the submissions and the proponent's response to questions from submissions;

(b) the establishment of an appropriate buffer area for the industrial estate; and

(c) statutory requirement for hazardous industry to comply with the requirements of the Department of Minerals and Energy.

it is the EPA's opinion that it is likely the operation of the proposed steel plant can be managed to meet the EPA's objective to ensure that risk is as low as reasonably achievable and complies with acceptable standards, providing the proponent carries out the following work as part of the site's overall risk assessment, and prior to final plant engineering designs:

(i) a qualitative risk assessment of the site to ensure compliance with the Department of Environmental Protection's individual risk criteria; and

(ii) a HAZOP and hazardous zone analysis for all flammable and toxic gas systems, for the DRI plant and storage area, and the cryogenic oxygen unit;

to the satisfaction of the Environmental Protection Authority upon advice from the Department of Minerals and Energy and Department of Environmental Protection.

## 3.9 Heritage

### Aspects of heritage

*Aboriginal heritage*

An ethnographic survey of the Oakajee area and an archaeological survey of the Oakajee Industrial Estate, including the proposed steel mill site, has been carried out (Tamora, 1993 and Bavin 1993 cited in the CER). More recently further surveys were undertaken of the of the coastal vegetation adjacent to the Oakajee Industrial Estate (Tamora 1996; Quartermaine 1996 in the CER). These surveys did not locate any ethnographic sites within the industrial estate. Archaeological sites were located along the Oakajee River, one site on the eastern edge of the proposed industrial estate buffer and another site was located near the coast to the west.

In addition, an archaeological scatter was located over approximately a one kilometre to the south of the proposed GSP site boundary through a search of the Aboriginal Sites Register held by the Aboriginal Affairs Department. The proponent has indicated that this site will not be disturbed during the construction of the GSP.

The Department of Aboriginal Affairs has indicated that although surveys have been conducted on the proposed site in order to determine the presence or otherwise of Aboriginal heritage sites, there is the possibility of sub-surface skeletal material (Aboriginal burial sites) and archaeological material being found in the Quindalup and Tamala dune systems. The Department also indicated that it had received calls from Aboriginal people who were concerned about the possibility of Aboriginal burial sites being uncovered during any excavations in the Oakajee area.

The Australian Heritage Commission expressed concerns regarding the need for a comprehensive assessment of the heritage values of the GSP site and the infrastructure service corridors to ensure the protection of heritage sites.

*European heritage*

A European Heritage study was undertaken by the Mid-West Branch of the National Trust for the Oakajee Industrial Estate PER. This study identified two significant sites in the proposed Industrial Estate. Both of these sites are located in the north of the Estate and will not be impacted by the development of the GSP.

### Assessment

The area considered for assessment of this relevant environmental factor is the GSP site.

With respect to this environmental factor, the EPA's objectives are:

- to ensure that development complies with statutory requirements in relation to places and sites of heritage significance; and
- to ensure that the development does not result in changes to the physical and biological environment which adversely affect cultural associations with the area.

The AAD has recommended that a Heritage Management Strategy be developed and implemented for the GSP site, prior to construction activities being undertaken on site.

The EPA understands that the provision of infrastructure to service the proposed steel plant will be co-ordinated by relevant government agencies and that these will be subject to separate referral to the EPA for assessment, including assessment of heritage issues.

Having particular regard to:

(a) the recommendations provided by the Department of Aboriginal Affairs and the Australian Heritage Commission;

(b) the requirement for proponents to comply with the *Aboriginal Heritage Act* and the *WA Heritage Act* for Aboriginal and European heritage sites; and

(c) that associated infrastructure developments and service corridors will be subject to separate formal assessment;

it is the EPA's opinion that it is likely the construction and operation of the proposed steel plant is capable of being managed to meet the EPA's objective to comply with statutory requirements in relation to areas of cultural or historical significance, provided that the proponent develops and implements a Heritage Management Strategy to include but not be limited to:

(i) detailed ethnographic and archaeological surveys;

(ii) an evaluation of any sites proposed to be impacted, including consultation with Aboriginal custodians;

(iii) detailed assessment of the likely effects of the development on such sites, including ground disturbance, chemical and water emissions, altered surface hydrology; and

(iv) proposals for avoiding or minimising impact to Aboriginal sites within and adjacent to the area be developed;

for Aboriginal sites prior to the commencement of construction activities on site, to the satisfaction of the EPA on the advice of the Department of Aboriginal Affairs.

# 4. Other advice

## 4.1 Water Resources

The GSP will require a water supply of approximately 3.5 million cubic metres per year ($Mm^3/yr$) to produce 2.4 Mt/a of slab steel.

The proponent made a commitment during the preparation of documentation for the initial assessment of the 1.0 Mt/a plant (Tingay and Associates, 1995) to participate in, or implement, an exploration program to define a water resource for the GSP.

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.

The proponent, in the absence of the identification of a water resource of suitable quality, the GSP will utilise water from the Allanooka Borefield, which is also the main water supply for Geraldton. During the preparation of the earlier PER (Tingay and Associates, 1995), the Water Corporation advised the proponent that the $4.5Mm^3$/annum of water could be supplied from the Borefield in a sustainable manner. As the volume of water required by the plant has been reduced, the 2.4 Mt/a plant can be supplied from this resource in the absence of an alternative resource being defined.

The EPA notes that the Allanooka Borefield identified as a possible source of water for the GSP project currently supplies the majority of the potable water within this region.

The EPA's brings to the attention of Government the importance of planning and development of additional water resources for the Geraldton/Mid West region be 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 Allanooka Borefield in a sustainable manner, and that the Corporation had taken into account potential future demands on this regional water resource as well.

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.

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.*

The EPA further recommends that the:

Minister for the Environment requests the Minister for Water Resources that in discharging its licensing functions the Water and Rivers Commission 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.

## 4.2 Road Transportation

Transport of products and inputs along the North West Coastal Highway and City of Geraldton has emerged as a key issue of concern to the Geraldton community.

The proposed route for the transport of steel product by road to the Port of Geraldton from the GSP site is via the North West Coastal Highway, Portway and Marine Terrace. Solid inputs to the GSP from the port will be transported on the same route. The Highway is bounded by general farming land to the east and west until it enters the City of Geraldton, where it is bounded on both sides by residential and commercial areas.

Ore will be transported by rail from the minesites to the GSP.

A proposal for the development of a deepwater port adjacent to and for the purpose of servicing the Oakajee Industrial Estate is the subject of a separate referral.

Truck movements are summarised in the Section 3.7 relating to noise and vibration from the steel plant, road and rail transportation.

In the event that product transport and scrap steel importation through the Port of Geraldton extend beyond the ten month anticipated period, or in the event that production rates exceed those indicated in the CER document, this aspect of the proposal should be referred back to the EPA for further consideration.

Apart from noise impacts which were addressed in Section 3.7, the main impacts associated with the proposal are traffic safety, level of service and amenity. The proponent has indicated that the North-West Coastal Highway would require various road upgrades to ensure that the existing level of service, safety and public amenity are maintained.

Movement along the North West Coastal Highway is currently limited to vehicles of up to 36.5m in length. The EPA notes that the vehicles currently proposed for transport of steel product will have a combined length of 53.5m.

MRWA has indicated that movement of product and materials will seriously impact the environment of Geraldton, and have significant implications for traffic congestion and safety. Road upgrading will be required along the transport route to cater for the increased transport task, including access into the Oakajee Industrial Estate. MRWA has further indicated that the road upgrading required for the GSP need to be resolved and that any additional works required need to be in place prior to any trucking operations commencing.

Submissions from local government authorities and the community relate to the need for road upgrading, grade separation crossings for several road/rail crossings, the need for a traffic modelling exercise for the transport route, conflicts with school curfew hours and the concerns about the frequency of trucking proposed.

The EPA is aware that there is significant concern within the community about the potential impacts of heavy vehicle movements along the North West Coastal Highway, Portway and Marine Terrace from noise and on safety and amenity. Noise impacts have been considered in Section 3.7.

The proponent has made the following commitments in relation to road transport:

To liaise with the:

1. City of Geraldton regarding the movement of truck traffic through the City during school curfew hours.
2. Main Roads Western Australia, as necessary, to determine potential road upgrades and improvement measures that may be required to ensure that public safety and the level of service of roads are not affected by increased traffic associated with the transport of steel product to the Port of Geraldton.

The EPA notes that:

- a decision is yet to be made on the mode of transport; and
- the anticipated truck operating hours are 7.00 am to 7.00 pm, 5 days a week.

Having particular regard to the:

(a) concerns raised by government agencies, local government authorities and the community; and

(b) proponent's commitments;

the EPA's advice in relation to road transportation is that the proponent should undertake a road transport study to identify appropriate road upgrades and safety measures, in consultation with MRWA and other relevant agencies, prior to commencement of trucking operations, should road transportation be selected as the preferred mode of transport.

The EPA further recommends that the:

Minister for the Environment requests the Minister for Transport and the Minister for Planning to complete studies of access into Geraldton Port. This should specifically include the matter of noise impacts, and liaison should occur with the proponent for the Geraldton Steel Plant regarding their transport and noise studies.

## 4.3 Services and infrastructure

No infrastructure has been established for the supply of services to the Oakajee Industrial Estate. Services such as natural gas, water and electricity will need to be supplied during the construction of the GSP. It will also be necessary to construct a railway spur to the Industrial Estate from the existing railway line that connects with Narngulu from Mullewa (Appendix 1: Figure 3).

While the services are likely to be designed and constructed by the relevant government authorities, the proponent has sought in the CER "in principle environmental approval". The proponent has also indicated that it anticipates that separate referrals would be made to the EPA by the relevant government agencies for the establishment of the required infrastructure when specific alignments are determined.

The services and preliminary routes are described in the CER (Tingay and Associates, 1997a).

The EPA notes that the environmental impacts of construction of the proposed services and corridors has not been described in the CER. The EPA further notes that the proposed rail spur from the Tallering Peak mine to the existing rail into Geraldton is likely to cross the Urawa "A" Class Nature Reserve which has been established for the conservation of flora and fauna and is indicated in Appendix 1:Figure 5.

The EPA, in the Oakajee Industrial Estate Section 16(e) Report (EPA, 1997a), highlighted the need for separate referral of infrastructure development proposals and indicated its preference for multiple use service corridors.

The Shire of Chapman Valley has indicated a preference for services to be located in a single corridor, or minimisation of the number of corridors, in order to reduce potential impacts on landowners and the environment.

A public submission outlined concerns relating to the request for "in principle" approval for the development of services and infrastructure.

The EPA notes that the proponent has committed to liaising with CALM and the National Parks and Nature Conservation Authority regarding the routing of the rail spur from the Tallering Peak mine.

The EPA notes the:

(a) absence of information about the environmental impacts of the proposed services;

(b) the proponent's commitment;

(c) EPA's preference for service and infrastructure developments to be located in multiple-use corridors; and

(d) fact that the proposed services will be the subject of separate referral to the EPA.

The EPA recommends that the :

Minister for the Environment and relevant Government agencies note that the EPA will require separate referral of the proposed infrastructure and services to the Oakajee Industrial Estate for assessment, including the Oakajee and Tallering Peak rail lines. Where possible, multiple use service corridors to the Oakajee Industrial Estate should be developed to minimise any potential environmental impacts.

## 4.4 Planning

The Western Australian Planning Commission is currently undertaking a review of the Geraldton Region Plan. As input into this process, a Taskforce was established in 1995 to undertake a review of industry and port sites for the Mid West Region. The Report of the Geraldton Region Pan Review Taskforce (1996) identified that there was a need to develop additional industrial land in the region, in the short to medium term. The Study also made a number of specific recommendations relevant to industry land and port sites in the Oakajee locality, particularly that:

- investigations on the Oakajee Industrial Estate should be urgently completed so that a decision can be made on whether the area is suitable for an industrial estate;
- investigations on the potential for a port to be developed at Oakajee should be completed as soon as possible.

The *Geraldton Region Plan Review: Industry and Port Sites Study* (1996) noted that Oakajee provides the only option for the provision of a combined deepwater port and heavy industrial estate within the region.

As a result of the recommendations of the Geraldton Region Plan Review Taskforce, Government agencies are undertaking a range of investigations to provide information for the regional planning process.

In relation to the environmental considerations of the Oakajee Industrial Estate, the investigations for this site have been completed and reported in EPA, 1997a. This report concludes that implementation of the Oakajee Industrial Estate Concept Plan is capable of being managed to meet the EPA's objectives for environmental protection.

A proposal for a deepwater port has been referred to the EPA and is currently the subject of a separate assessment.

A number of these studies underway relate to the identification of an adequate buffer to mitigate environmental impacts. The EPA brings to the attention of Government the importance in appropriate zoning of the Oakajee Industrial Estate buffer and surrounding land to minimise the potential for land use conflict. This would be further facilitated by the proponent or Government securing a buffer to provide adequate separation between the industrial site and adjacent sensitive premises.

The EPA recommends that the :

Minister for Lands and relevant Government agencies note the need to secure an adequate buffer zone around Kingstream Resources NL site and that this area needs to be formally recognised and designated in the planning process.

### 4.5 Unexploded ordnance

The Western Australian Police advises that the Australian Defence Forces conducted extensive training with live high explosive ammunition in the Geraldton region during World War II. A result of this training, numerous areas within the region are known to be contaminated with unexploded ordnance. They further advise that some forms of unexploded ordnance known to exist in the region, and possibly within the GSP site, are capable of causing damage, injury and death, have a life expectancy of some six hundred years.

The EPA notes the Western Australian Police advice concerning unexploded ordnance and brigs to the attention of Government the possibility of unexploded ordnance being on the steel plant site

Should implementation of the steel plant and any regional infrastructure development designed to support the project (eg. roads, rail, water supply, quarry sites, energy and power utilities, and deepwater port development) proceed, additional investigations in conjunction with the Western Australian Police and the Australian Defence Forces should be carried out in order to determine the nature, extent, and risk associated with the presence of unexploded ordnance in the areas of potential impact.

## 5. Conditions and procedures

### Conditions

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

### 5.1 Proponent commitments

The proponent's commitments set out in the CER (Alan Tingay & Associates, 1997a) and subsequently modified (16 April, 1997), as summarised in Table 3, should be made enforceable conditions.

## 5.2 Environmental Management Programme

Prior to commencement of construction, the proponent shall prepare and subsequently implement an Environmental Management Programme, to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection.

This Programme shall contain within it plans, which address, but not be limited to the following:

### Rare and priority flora and vegetation communities

1. prior to clearing any remnant vegetation, carry out or otherwise report on a spring flora survey for rare and priority flora;
2. identify contingency measures including that in the event that rare and priority flora during the spring survey and that clearing be required, the proponent will seek clearance under the *Wildlife Conservation Act 1950*;
3. assess the quality and coverage of remnant vegetation on the site in accordance with the *Remnant Vegetation Policy* as implemented under the *Soil and Land Conservation Act 1945*;

### Noise

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

### Gaseous emissions and odours

5. review stack heights and their corresponding impact on the ground level concentrations of gaseous emissions;
6. prepare a monitoring and audit programme for all gaseous and odorous emissions as a means of gauging the effectiveness of air pollution abatement measures and compliance with designated criteria;

### Dust and particulate emissions

7. prepare a monitoring and audit programme for all dust and particulate emissions (including fugitive dust), as a means of gauging the effectiveness of dust control measures and compliance with designated criteria;
8. prepare a Dust Management Plan to manage dust and particulate (including fugitive dust) to an acceptable level during construction, operation and transport of materials;

### Buffer

9. develop and implement management strategies for atmospheric and noise emission impacts on residents in the buffer, should LandCorp fail to secure properties within the designated area;

### Liquid and solid waste disposal

10. produce details of waste disposal approvals for all solid and liquid wastes obtained from relevant government authorities;
11. Waste Management Plan to manage wastes generated during construction and operation addressing waste characteristics (including a detailed description of waste characteristics including TCLP tests for solid wastes), consideration of opportunities for recycling and how the conditions of those approvals indicated in 10 above will be implemented;

**Protection of surface and groundwater**

12. monitoring and audit programme for groundwater quality at the plant perimeter as a means of gauging the effectiveness of stormwater and wastewater management measures and compliance with designated criteria;
13. Drainage Management Plan, including contingency measures for treatment as required, to protect surface and groundwater;
14. liaise with the Mid West Development Groundwater Steering Committee with respect to water take-up from the groundwater resources in the region;

**Heritage**

15. prior to construction, the proponent shall develop a Heritage Management Strategy for the GSP site to the satisfaction of the EPA on advice of the Aboriginal Affairs Department including but not limited to:

(i) a detailed ethnographic and archaeological surveys;

(ii) an evaluation of any sites proposed to be impacted, including consultation with Aboriginal custodians;

(iii) a detailed assessment of the likely effects of the development on such sites, including ground disturbance, chemical and water emissions, altered surface hydrology;

(iv) the presentation of proposals for avoiding or minimising impact to Aboriginal sites within and adjacent to the area.

**Monitoring Results**

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

**Performance audit**

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

### 5.3 Greenhouse gas emissions

Greenhouse gas emissions should be addressed in the Environmental Management Programme.

At appropriate times, the proponent shall address, in the Environmental Management Programme, the following matters relating to greenhouse gas emissions:

1. calculation of the greenhouse gas emissions associated with the proposal (using the generally accepted methods);
2. indication of the measures adopted to limit greenhouse gas emissions for the project; and
3. estimation of the greenhouse gas efficiency of this project (per unit of product and/or other agreed performance indicators) and comparison with the efficiencies of other comparable projects producing a similar product;

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

The proponent shall consider entry (whether on a project-specific basis, company-wide arrangement or within an industrial grouping, as appropriate) into the Commonwealth Government's "Greenhouse Challenge" voluntary co-operative agreement programme.

The agreement would include, 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.

## 5.4 Noise limits

- The proponent shall conduct operations so that noise emissions do not unreasonably impact on noise sensitive premises.
- The proponent shall ensure that noise emissions meet the requirements of noise control regulations applying from time to time under the Environmental Protection Act.
- The proponent shall conduct noise surveys (including baseline measurements) and assessments (including the impact of tonal noise) in consultation with the Department of Environmental Protection.

### Plant noise

(i) Following detailed design, and prior to commencement of construction, the proponent shall provide sound power levels for the plant including details of the noise attenuation measures proposed to be employed in the plant to meet assigned levels, to the satisfaction of the Environmental Protection Authority.

(ii) The proponent shall provide a report to the Environmental Protection Authority, outlining contingency plans and/or management strategies detailing how assigned noise levels will be met in the future at potential noise sensitive premises outside the Oakajee Industrial Estate buffer area.

### Road transportation noise

With respect to road transportation noise, the proponent shall, prior to construction and to the requirement of the Minister for the Environment on advice from the Environmental Protection Authority and Main Roads Western Australia, carry out a further assessment of the noise impacts associated with road transportation between the plant and port in order to identify residences where established criteria may be exceeded, and implement appropriate ameliorative measures.

### Rail transportation noise

With respect to rail transportation noise, the proponent shall, prior to construction and to the requirement of the Minister for the Environment on advice from the Environmental Protection Authority and Westrail, carry out a further assessment of the noise impacts associated with rail transportation between the plant and minesites in order to identify residences where established criteria may be exceeded, and implement appropriate ameliorative measures.

## 5.5 Incorporation of low $NO_x$ technology for power generation

(i) Prior to construction, the proponent shall design the power station gas turbines to:

- meet the National Health and Medical Research Council guideline for $NO_x$ emissions of 34 parts per million volume dry at 15% oxygen reference level as the upper limit for gas turbines greater than 10MW; or
- if using water injection technology, 42 parts per million volume dry at 15% oxygen reference level of $NO_x$.

(ii)The proponent shall construct the power station gas turbines according to the design required by condition 8-1 and to the requirements of the Minister for the Environment on advice from the Environmental Protection Authority.

### 5.6 Public Health and Safety - Risk

As part of the site's overall risk assessment, and prior to final plant engineering designs, the proponent shall undertake the following:

(i) a qualitative risk assessment of the site to ensure compliance with the Department of Environmental Protection's individual risk criteria; and

(ii) a HAZOP and hazardous zone analysis for all flammable and toxic gas systems, for the DRI plant and storage area and the cryogenic oxygen unit;

to the satisfaction of the Environmental Protection Authority upon advice from the Department of Minerals and Energy and Department of Environmental Protection.

### 5.7 Environmental Management

In order to manage the relevant environmental factors and EPA objectives contained in this Bulletin, and subsequent environmental Conditions and Procedures authorised by the Minister for the Environment, the proponent is required to prepare, prior to implementation of the proposal, and environmental management system, including an environmental management programme, in accordance with recognised environmental management principles, such as those in Australian Standards AS/NZS ISO 14000 series.

## 6. Recommendations

The EPA submits the following recommendations:

Recommendation 1

That the Minister for the Environment note the relevant environmental factors and other issues assessed by the EPA, as well as the EPA objective for each factor and other issue as set out in Sections 3 and 4.

Recommendation 2

That, subject to the satisfactory implementation of the EPA's recommended conditions and procedures as set out in Section 5, 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 5 of this report.

Recommendation 4

That the Minister for the Environment requests the Minister for Water Resources that in discharging its licensing functions the Water and Rivers Commission 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.

Recommendation 5

That the Minister for the Environment requests the Minister for Transport and the Minister for Planning to complete studies of access into Geraldton Port. This should specifically include the matter of noise impacts, and liaison should occur with the proponent for the Geraldton Steel Plant regarding their transport and noise studies.

Recommendation 6

That the Minister for the Environment and relevant Government agencies note that the EPA will require separate referral of the proposed infrastructure and services to the Oakajee Industrial Estate for assessment, including the Oakajee and Tallering Peak rail lines. Where possible, multiple use service corridors to the Oakajee Industrial Estate should be developed to minimise any potential environmental impacts.

Recommendation 7

Minister for Lands and relevant Government agencies note the need to secure an adequate buffer zone around Kingstream Resources NL Steel site and that this area needs to be formally recognised and designated in the planning process.

**Table 3. Summary of assessment of relevant factors**

| PROPONENT'S COMMITMENTS | EPA's OPINION |
|---|---|
| | The EPA's objective is unlikely to be compromised subject to the proponent undertaking or otherwise reports on a spring survey of the GSP site containing remnant vegetation, and that the report shows that there is no requirement to seek clearance under the Wildlife Conservation Act 1950 to clear the land |
| ınd implement a Drainage Management Plan which specifies ; designed to ensure the protection of groundwater resources at f the GSP, and will submit the Plan to the DEP for approval. | The EPA's objective is unlikely to be compromised , and can be met through proponent's commitment and recommended Conditions. |
| ınd implement a Drainage Management Plan which specifies ; designed to ensure the protection of groundwater resources at f the GSP, and will submit the Plan to the DEP for approval.<br><br>oundwater bores on the plant boundaries to monitor groundwater eneath the site. Monitoring results will be reported to the DEP, be made available to the public.<br><br>onent will liaise with the Mid West Development Groundwater Committee with respect to water take-up from the groundwater ; in the region. | The EPA's objective is unlikely to be compromised , and can be met through proponent's commitment and recommended Conditions. |
| onent will investigate opportunities for the use of solid wastes l by the GSP.<br><br>ıe recycling or re-use of slag prove not to be viable the ıt will conduct leachability tests on the slag to ensure that disposal aterial in the minesite waste dumps will not have any adverse ɔn the receiving environment. | The EPA's objective is unlikely to be compromised, and can be managed through proponent's commitments, Ministerial Conditions and Part V of the *Environmental Protection Act.* |
| ıt will, prior to construction, develop and subsequently implement onmental Management Program (EMP) which will ensure that ıs emissions and ground level concentrations are within ɔd criteria. The EMP will include but not be restricted to:<br><br>development of suitable monitoring programmes;<br>ingency plans should emissions exceed established criteria to ıce emission levels bellow those criteria.<br><br>ts of the monitoring programs will be reported to the DEP and ilable to the public. | The EPA's objective is unlikely to be compromised and can managed through proponent's commitments, recommended Conditions and Part V of the *Environmental Protection Act.* |

# Appendix 1

**Figures**

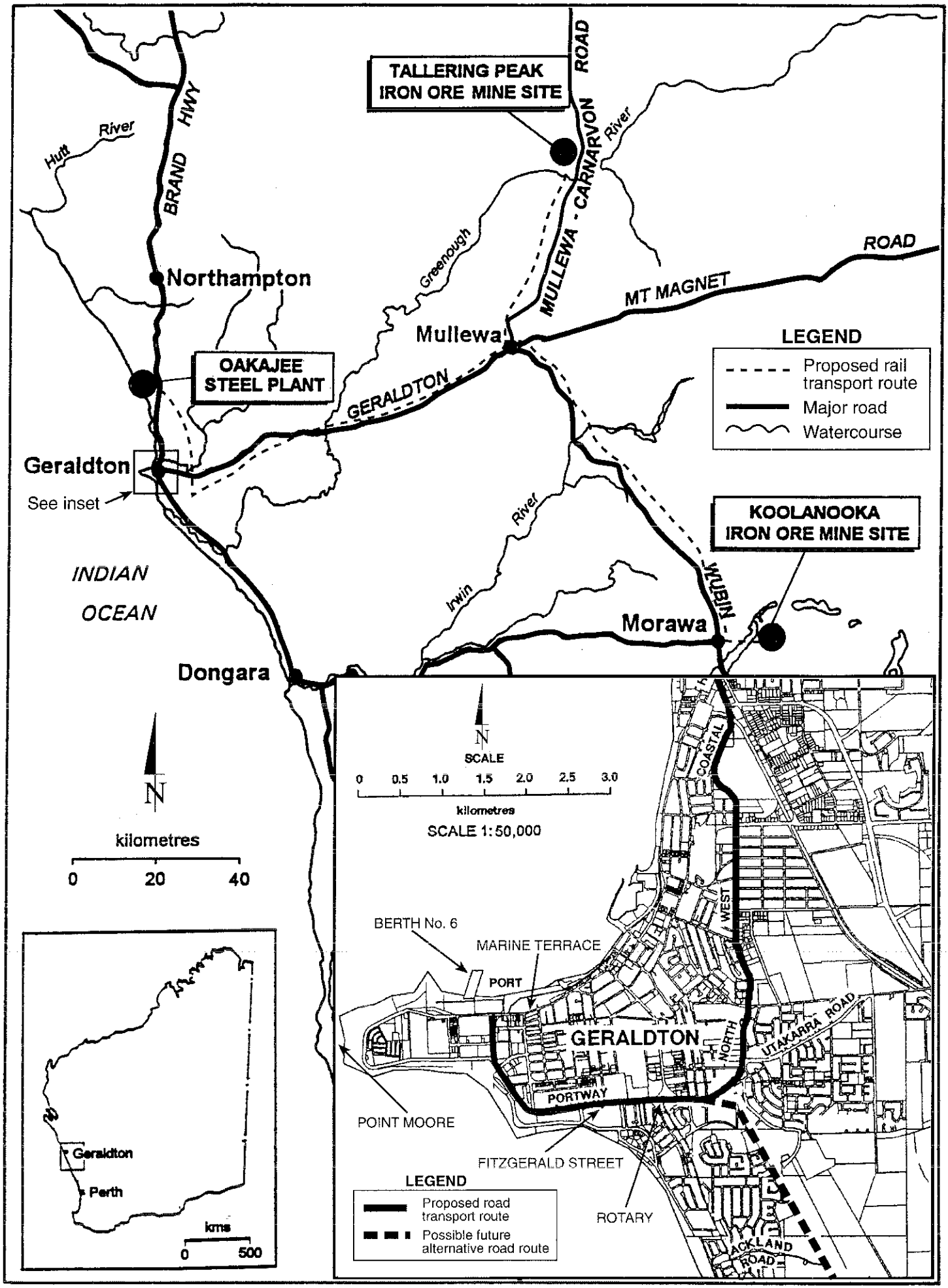


*Figure 1. Regional Location Map - Geraldton Steel Plant, Oakajee Industrial Estate, and the Tallering Peak and Koolanooka Iron Mine Sites. (Source: Tingay and Associates 1997a)*

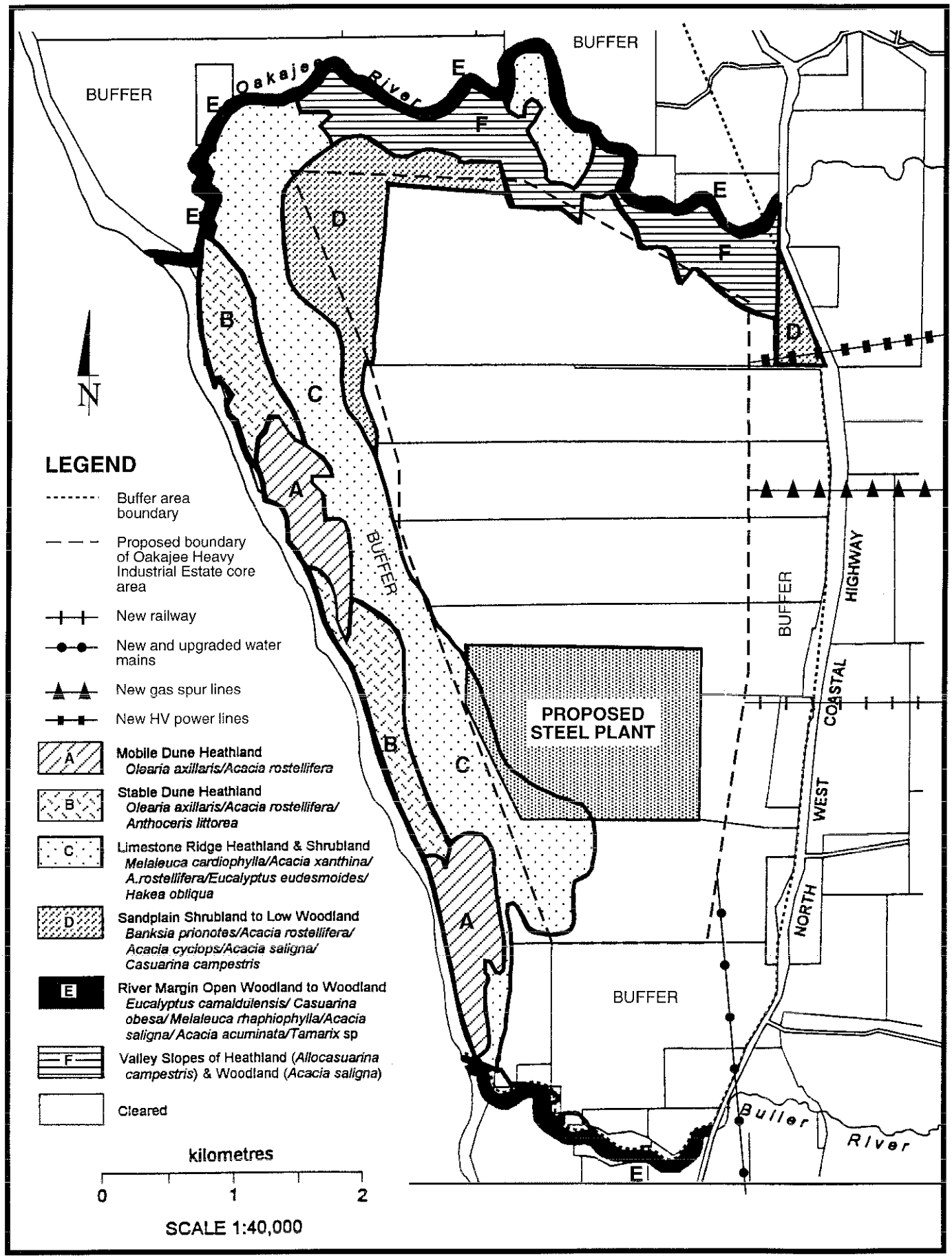


*Figure 2. Vegetation complexes in the vicinity of the proposed location of the Geraldton Steel Plant within the Oakajee Industrial Estate. (Source: Tingay and Associates 1997a)*

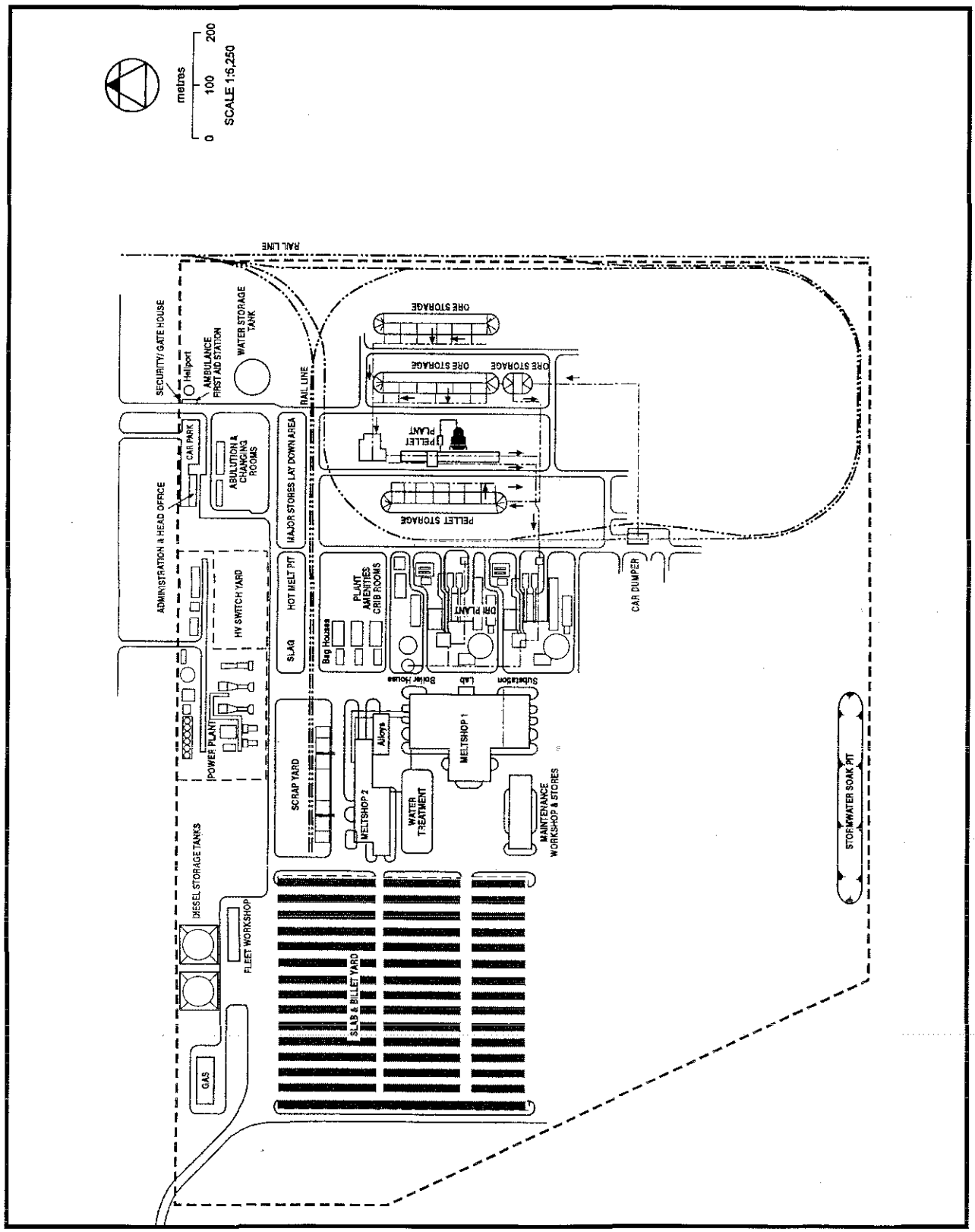


*Figure 3. Geraldton Steel Plant, Oakajee, Plant Site Layout (Source: Tingay and Associates, 1997a)*

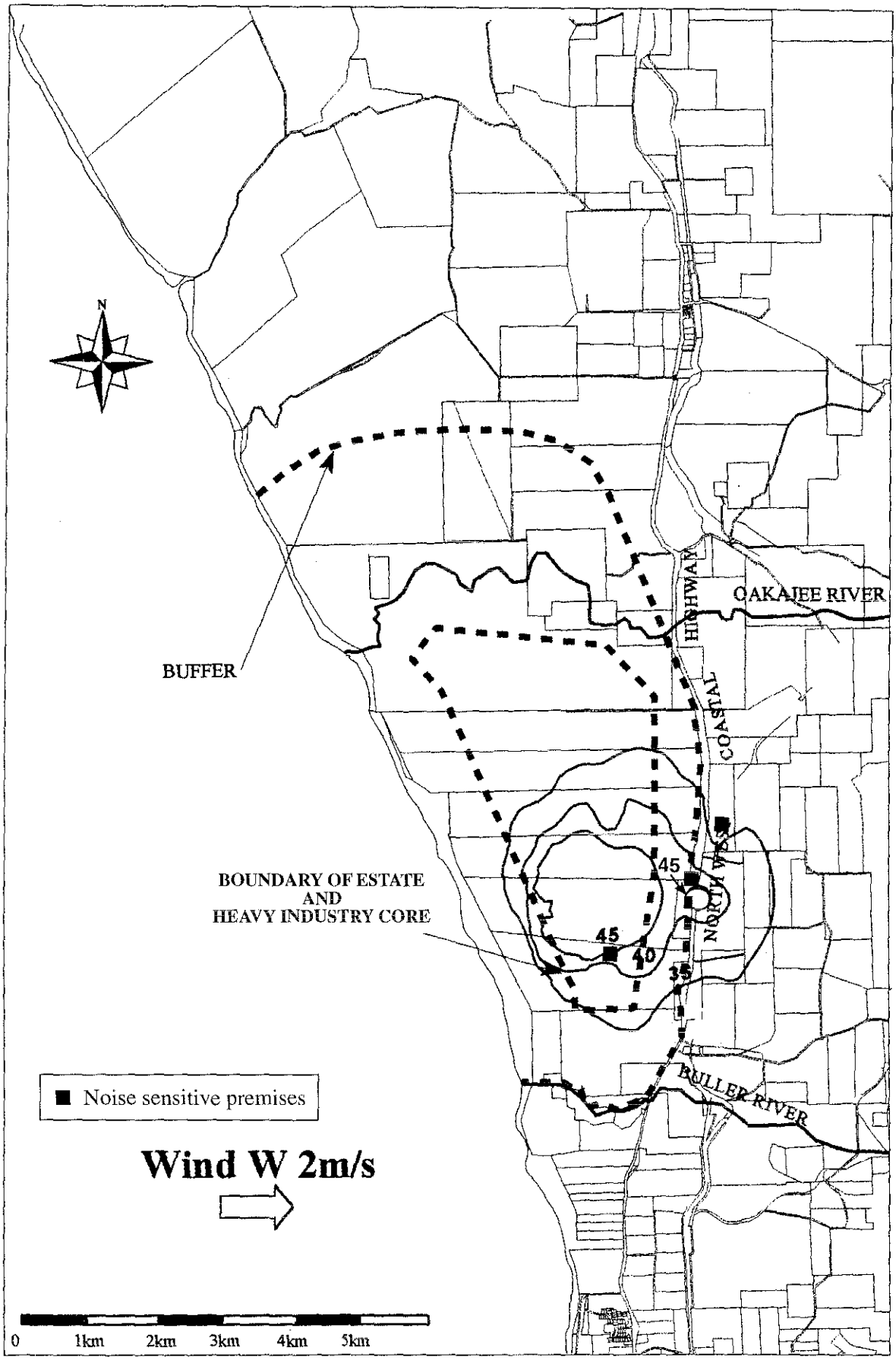


*Figure 4. GSP Noise Level Contours under Light Westerly Winds (Tingay and Associates 1997c)*

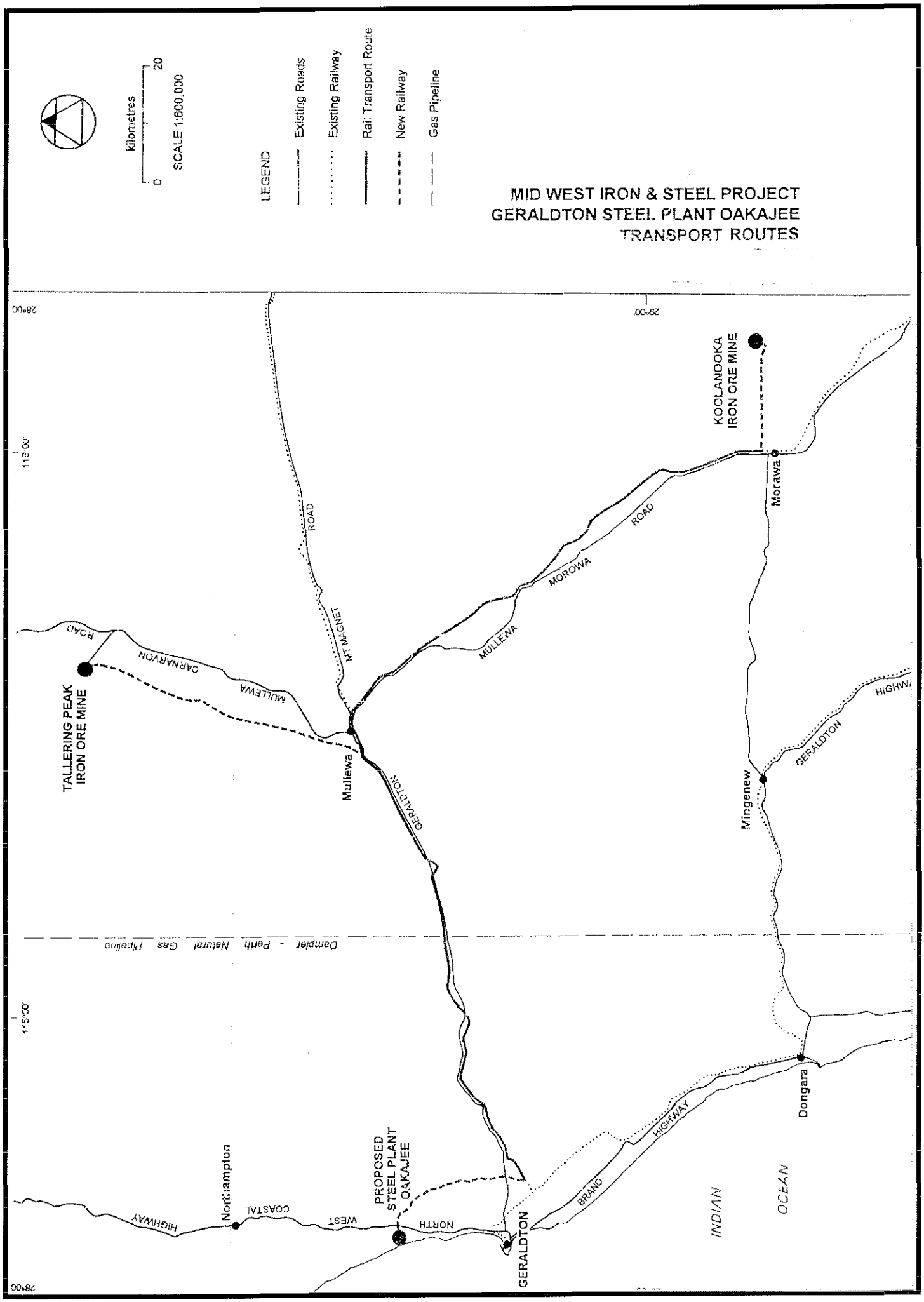


*Figure 5. Proposed road and rail transportation routes. (Source: Tingay and Associates 1997a)*

# Appendix 2

**List of organisations and individuals who made submissions**

**Organisations:**

- City of Geraldton
- Shire of Chapman Valley
- Shire of Greenough
- Shire of Mullewa
- Main Roads Western Australia
- Department of Minerals and Energy
- Water and Rivers Commission
- Mid West Development Commission
- Westrail
- Department of Aboriginal Affairs
- Environment Australia
- Australian Heritage Commission
- Conservation Council of Western Australia Inc
- Geraldton Professional Fishermen's Association Inc

**Individuals**

- M & V Denton
- M Cheah
- KM & TJ Strawbridge
- P Gallaher
- AE & NM Petersen
- R Naism
- A Lang
- J B Gommes
- (No name supplied)
- G Walsh
- J Bayly
- T Morrison
- V Talbot-Varion
- Donna Moustaka
- David Moustaka
- J Y Clarke
- P V Burford
- D Weller
- B Galvin
- S Larby
- B Younger
- A & R & C & M Field
- M Hatch
- M Winter
- Dr K Taylor
- K Jackson
- M MacFarlane
- A Blake
- B E Cooper
- C Collins
- Dr P S Blackwell
- C Tamm
- RG & V Casey
- P Robb
- S Smith & G Zineth
- P Stone
- N E Macintyre
- B E Teale
- E Casey
- J Laverack
- K Vinton
- A Gartner
- T Cutmore
- P E Gallaher
- Hon. M Criddle, MLC
- R Speed
- D K Tavakoli
- G R J Ingham
- J Wann
- G S Johnstone
- K Belki
- E LeFroy
- F Angelatos
- M Hatch
- L Hatch
- B Hatch
- J Hatch
- M W Hatch
- I Vinton
- G Burgess
- M Burgess
- C Burgess
- M Winter
- T Campbell
- C Cooper
- A Dunston
- M Bumbak
- J C Tucker
- R C Hawkins
- T Sheriff
- S Fraser
- J Davidson
- S Messina
- L Mullane
- C Fairley
- K Feeney
- T Vince
- P Scolyer
- J Long
- N Bennet
- I Lin
- S Morris

**Individuals (continued)**

- S Morris
- MG & M Hatch
- D Parera
- M E Lynch
- Mr & Mrs P Oneill
- (No name supplied)
- M Marshall
- J Mullane
- D Mullane
- R & J Aston
- S Laverack
- G R Howard
- V Hillwood
- J Parkinson
- L Kliesch
- F Porter
- G Smarliassi
- S Kelly N Bartlett
- C Weeks
- M Newman
- M Russell
- T Moffat
- S Von Bergheim
- C Prowse
- A Howitt
- R I Marshall
- J Ritchie
- D Anderson
- V Macey
- D Browne
- M Browne
- K & V Bovis
- S Harmer
- B Primrose
- E Gildon
- L Currell
- D R Brown
- S Barnden
- T & G Tunks
- J Graham
- N Ryan
- K Coulthard
- G & R Eszes
- J & S Howe
- R B Townsend
- P Townsend
- C L Sheriff
- P Sheriff
- H Hess
- N Harmer
- S Leonardis
- S Anderson
- G Anderson
- S J Hall
- M Hatch
- C Brockhoff
- G Burrows
- J Best
- R McLeod
- T Carr
- E Quick
- A Harrison
- K Thomas
- M Carson
- J Hancock
- L Bailey
- S Young
- T Cutmore
- D Taylor
- P Margetic
- N Howitt
- A & L Criddle
- J & D Hill
- P Wise
- (No name supplied
- J Styeo
- K M Criddle
- P Barnden S Macintyre
- B Guthrie
- R Meredith
- R Mickle
- S Higgins
- D Hancock
- D Follington

**Individuals (continued)**

- M Clarice
- A Bunter
- R Speed
- K Mitsuda
- B Mitsuda
- E K Mitsuda
- R Kliesch
- D Nickolls
- J Burton
- R Richards
- P T Anderson
- T & S Jeeves
- A Lane
- L Scrivener
- J McGeachie
- M & L Howe
- R & J Aston
- R C Yarran
- M Gohl
- M A Brooks
- K B Thomas
- K Jones
- E J & S G Green
- J Millet
- C Councillor
- K Councillor
- A Blake
- C J Coulthard
- S Morcom
- J P Beaver
- S Jeeves
- K May
- R & J Aston

# Appendix 3

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# Appendix 4

**Recommended Ministerial Conditions for**

**MID-WEST IRON AND STEEL PROJECT - GERALDTON STEEL PLANT, OAKAJEE, SHIRE OF CHAPMAN VALLEY (1063)**

MID-WEST IRON AND STEEL PROJECT - GERALDTON STEEL PLANT, OAKAJEE, SHIRE OF CHAPMAN VALLEY (1063)

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 Consultative Environmental Review and subsequently during the environmental assessment process conducted by the Environmental Protection Authority, 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 attached environmental management commitments form the basis for consideration by the Chief Executive Officer of the Department of Environmental Protection for auditing of this proposal in conjunction with the conditions and procedures contained in this statement.

**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.

**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 860, and to fulfil the requirements of the conditions and procedures in this statement, prior to commencement of construction, the proponent shall prepare environmental management system documentation with components such as those adopted in Australian Standards AS/NZS ISO 14000 series, to the requirements of the Environmental Protection Authority.

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

## 5 Environmental Management Programme

5-1 Prior to commencement of construction, 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:

Rare and priority flora and vegetation communities

1 prior to clearing any remnant vegetation, a plan for carrying out and reporting on a spring flora survey for rare and priority flora;

2 contingency measures, including those in the event that rare and priority flora are identified during the spring survey and that clearing is required, the proponent will seek approval for clearance under the *Wildlife Conservation Act 1950*;

3 the quality and coverage of remnant vegetation on the site in accordance with the Remnant Vegetation Policy as implemented under the *Soil and Land Conservation Act 1945*;

Noise

4 a monitoring and audit plan for noise emissions as a means of gauging the effectiveness of noise control measures and compliance with noise regulations;

Gaseous emissions (including greenhouse gases and odours)

5 a review of stack heights and their corresponding impact on the ground level concentrations of gaseous emissions;

6 a monitoring and audit plan for all gaseous and odorous emissions as a means of gauging the effectiveness of air pollution abatement measures and compliance with designated criteria;

7 calculation of the greenhouse gas emissions associated with the proposal (using the generally accepted methods);

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

9 estimation of the greenhouse gas efficiency of this project (per unit of product and/or other agreed performance indicators) and comparison with the efficiencies of other comparable projects producing a similar product;

10 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

11 a monitoring and audit plan for all dust and particulate emissions (including fugitive dust) and the moisture content of all storage stock piles as a means of gauging the effectiveness of dust control measures and compliance with designated criteria;

12 a dust management plan to manage dust and particulate emissions (including fugitive dust) to an acceptable level during construction, operation and transport of materials;

Buffer

13 management strategies for atmospheric and noise emission impacts on residents in the Oakajee Industrial Estate buffer area, should LandCorp fail to secure properties within the designated buffer area.

Liquid and solid waste disposal

14 details of waste disposal approvals obtained from relevant government authorities for all solid and liquid wastes produced;

15 a waste management plan to manage wastes generated during construction and operation, including waste characteristics (together with a detailed description of waste characteristics including Toxicity Characteristic Leaching Procedure tests for solid wastes), consideration of opportunities for recycling, and details of how the conditions of the approvals referred to in 14 above will be implemented;

Protection of surface and groundwater

16 a monitoring and audit plan for groundwater quality at the plant perimeter as a means of gauging the effectiveness of stormwater and wastewater management measures and compliance with designated criteria;

17 a drainage management plan, including contingency measures for treatment as required to protect surface water and groundwater;

Heritage

18 a heritage management strategy for the Geraldton Steel Plant site to the requirements of the Environmental Protection Authority on advice of the Aboriginal Affairs Department including but not limited to:

(1) detailed ethnographic and archaeological surveys;

(2) an evaluation of any sites proposed to be impacted, including consultation with Aboriginal custodians;

(3) a detailed assessment of the likely effects of the development on such sites, including ground disturbance, chemical and water emissions, and altered surface hydrology; and

(4) the presentation of proposals for avoiding or minimising impact to Aboriginal sites within and adjacent to the area;

Monitoring results

19 results of monitoring to be submitted annually to the Department of Environmental Protection for audit, and to be made publicly available; and

Performance audit

20 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 implement the Environmental Management Programme required by condition 5-1.

## 6 Noise Limits

6-1 The proponent shall conduct operations so that noise emissions do not unreasonably impact on noise-sensitive premises.

6-2 The proponent shall ensure that noise emissions meet the requirements of noise control regulations applying from time to time under the Environmental Protection Act.

6-3 The proponent shall conduct noise surveys (including baseline measurements) and assessments (including the impact of tonal noise) in consultation with the Department of Environmental Protection.

## 7 Plant Noise

7-1 Following detailed design and prior to commencement of construction, the proponent shall provide sound power levels for the plant and details of the noise attenuation measures proposed to be employed in the plant to meet assigned levels, to the requirements of the Environmental Protection Authority.

7-2 The proponent shall provide a report to the Environmental Protection Authority outlining contingency plans and/or management strategies detailing how assigned noise levels will be met in the future at potential noise-sensitive premises outside the Oakajee Industrial Estate buffer area.

7-3 The proponent shall implement the contingency plans and/or management strategies referred to in condition 7-2.

## 8 Road and Rail Transportation Noise

8-1 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 Geraldton 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 and Main Roads Western Australia.

8-2 With respect to rail transportation noise, prior to construction, the proponent shall carry out further studies of the noise impacts associated with rail transportation between the plant and minesites 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 and Westrail.

8-3 The proponent shall implement the ameliorative measures determined according to the requirements of conditions 8-1 and 8-2.

## 9 Incorporation of Low $NO_x$ Technology for Power Generation

9-1 Prior to construction, the proponent shall design the power station gas turbines :

1 to meet the National Health and Medical Research Council guideline for $NO_x$ emissions of 34 parts per million volume dry at 15% oxygen reference level as the upper limit for gas turbines greater than 10 MW, if incorporating dry low $NO_x$ technology; or

2 if using water injection technology, to meet the criteria of 42 parts per million volume dry at 15% oxygen reference level of $NO_x$.

9-2 The proponent shall construct the power station gas turbines according to the design required by condition 9-1 and to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

## 10 Public Health and Safety - Risk

10-1 Prior to the preparation of final plant engineering designs, as part of the site's overall risk assessment, the proponent shall undertake:

1 a qualitative risk assessment of the site to ensure compliance with the Department of Environmental Protection's individual risk criteria; and

2 a Hazard Operability Study and hazardous zone analysis for all flammable and toxic gas systems for the Direct Reduced Iron plant and storage area and the cryogenic oxygen unit;

to the requirements of the Environmental Protection Authority on advice of the Department of Minerals and Energy and the Department of Environmental Protection.

## 11 Road Transport

11-1 If road transportation is selected as the preferred mode of transport between the plant and Geraldton port, prior to commencement of trucking operations, the proponent shall undertake a road transport study to identify appropriate road upgrades and safety measures in consultation with Main Roads Western Australia and other relevant agencies.

## 12 Decommissioning

12-1 The proponent shall carry out the decommissioning of the project, removal of the plant and installations and rehabilitation of the site and its environs.

12-2 At least six months prior to decommissioning, the proponent shall prepare a decommissioning and rehabilitation plan to achieve the objectives of condition 12-1.

12-3 The proponent shall implement the plan required by condition 12-2.

## 13 Time Limit on Approval

The environmental approval for the substantial commencement of the proposal is limited.

13-1 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 Environmental Protection Authority that the environmental parameters of the proposal have not changed significantly, then the Minister may grant an extension not exceeding five years.

**14 Performance Review**

The proponent should review their environmental performance to ensure that environmental management meets the environmental objectives and allows for continuous improvement.

14-1 Each six years following commencement of construction, the proponent shall carry out a performance review to evaluate environmental performance with respect to the environmental objectives, the performance indicators, and the environmental management system targets, to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection.

Note:

1 In the event that the timing requirements of this condition are not compatible with the timing requirements of the triennial reporting required under the State Agreement Act, then the timing requirements of the latter will prevail.

2 The Environmental Protection Authority may recommend actions to the Minister for the Environment following consideration of the performance review.

**15 Compliance Auditing**

To help determine environmental performance and compliance with the conditions, periodic reports on the implementation of the proposal are required.

15-1 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.

**Note**

1 The Environmental Protection Authority reported on the proposal in Bulletin 860 (June 1997).

2 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.