Geraldton industrial sites study
Industrial Lands Development Authority

Advice of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 606
December 1991

Geraldton industrial sites study
Industrial Lands Development Authority

Advice of the Environmental Protection Authority

ISBN. 0 7309 4738 6
ISSN. 1030 - 0120

Contents

Figure

1. Introduction

The Industrial Lands Development Authority commissioned a study on two potentially heavy industrial sites near Geraldton. The sites are Bootenal West, 10km south and Oakajee, 20km north, of Geraldton respectively (Figure 1). The study report was released for public review by the Industrial Lands Development Authority on 22 June and closed on 30 September 1991. Subsequently, the closing date was extended to the 31 October 1991. As the study did not constitute a proposal, the Environmental Protection Authority decided not to formally assess it but rather to offer advice during the public comment stage, via this Bulletin.

The Environmental Protection Authority (EPA) has reviewed the study and gives its comments below. The Authority reached its conclusions following site inspections and discussions of the issues with relevant Government agencies and interested members of the public.

Whilst the study has been predominantly treated as a land planning exercise, it should have given more consideration to porting requirements, particularly as the sites are in a primary production region of the State. The port issues have only been mentioned incidentally and have been given little weight in the final evaluation. It is likely that major environmental issues could relate to port development and the establishment of a suitable corridor joining the estates with a port.

2. Environmental criteria

Before discussing the merits or otherwise of each site, the Authority sets out below key environmental criteria used as a basis for providing comments on each site.

2.1 Sulphur dioxide

Some heavy industry produces sulphur dioxide. For the establishment of an industrial estate on a "greenfield" site to be acceptable, the Environmental Protection Authority uses the approach as outlined in the draft Environmental Protection (Kwinana) (Atmospheric Wastes) Policy 1991 and associated regulations. The draft policy states that a 1-hour average sulphur dioxide levels at the nearest residence should be less than 350 micrograms per cubic metre for almost all of the time (commonly taken to be 99.9% of the time) and should never exceed 700 micrograms per cubic metre. To avoid unnecessary constraints on industry, a buffer zone ranging 2-3km downwind, depending on the climatic conditions, could be required.

2.2 Noise

Heavy industry produces noise and usually operates twenty four hours per day. Noise emissions from an industrial estate should not cause or contribute to noise levels in excess of:

1. 50dB(A) between 0700 hours and 1900 hours Monday to Saturday;
2. 45dB(A) between 1900 hours and 2200 hours Monday to Saturday;
3. 45dB(A) between 0700 hours and 2200 hours Sunday and Public Holidays;
4. 40dB(A) between 2200 hours and 0700 hours always;

when measured at the nearest residence or at a location which requires noise control.

These levels should not be viewed as normal operating levels. They are the upper limit above which action will be taken by the Environmental Protection Authority. The Environmental Protection Authority considers that noise below these levels is not unreasonable provided it does not include tonal components, impulses or other intrusive characteristics.

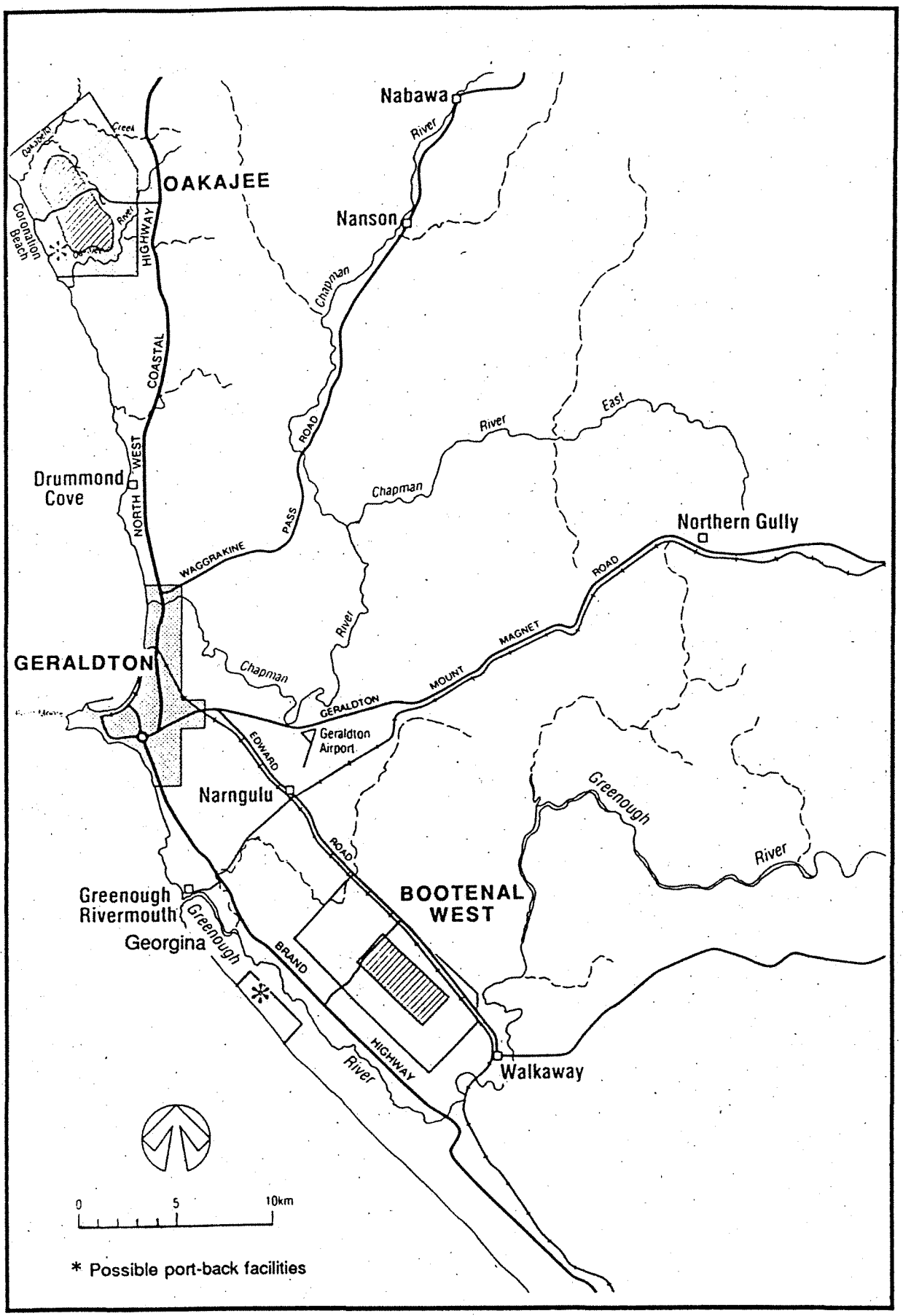

Figure 1. Proposed industrial sites

2.3 Dust

The concentration of airborne dust contributed by any premises licensed under the Environmental Protection Act should not exceed the acute impact level of 1000 micrograms per cubic metre, averaged over 15 minutes, at the boundary of the premises. For the longer term, at residences the NH&MRC guideline of an annual mean of 90 micrograms per cubic metre, measured over 24 hour periods should not be exceeded.

2.4 Risks and hazards

Present criteria for individual fatality risk levels are given in the EPA Bulletin 278, which states: *"An individual risk level in residential zones of less than 1 in a million a year is so small as to be acceptable to the Environmental Protection Authority."*

New guidelines being finalised by the EPA are unlikely to affect the above requirement, but provide further guidance.

The size of the buffer zone between industrial and residential areas is dependent on the type and number of hazardous industries, the hazardous properties of the materials involved, the quantity and physical conditions of the materials stored, and meteorological and topographical conditions.

In the Kwinana industrial area the distance to the one in million individual fatality risk contour extends up to 700 metres from some hazardous industries.

3. General comments on air emissions

The air quality considerations for the prospective industrial sites state that there is not a complete meteorological data set available for modelling. Consequently the report does not present an adequate comparison of the two sites.

Theory and experience indicate that the highest ground level impacts associated with gaseous releases near ground level (including noxious odours) will occur under stable atmospheric conditions (i.e. light wind conditions under cloudless or nearly cloudless skies at night and for an hour or two after sunrise, particularly during autumn). In the Perth region these conditions usually occur under winds from the south-east through north-east. Inspection of the wind roses in Fig 11 of the study similarly shows a predominance of light winds from this sector during autumn at 9 a.m. Hence the sector north-west to south-west will experience the highest impact from near-surface industrial sources. For industrial sources located at the coastline, this is not a problem. Oakajee is relatively well placed in this respect compared to Bootenal West. Odorous industry at Bootenal West would most likely cause problems. Furthermore, winds from the north are infrequent relative to other sectors, so the impact of Oakajee on the Geraldton residential area would be lower than that from Bootenal West.

4. Study sites

4.1 Bootenal West

The Bootenal West site is good agricultural land. It is located near residents (a subdivision), a flood plain (Greenough Flats), the Greenough River, the Greenough Nodes, the historic Greenough Hamlet (historical settlement area) and the town of Walkaway. The principal environmental issues to be considered in assessing the estate are sulphur dioxide and noise emissions, and risks and hazards.

Other issues such as odour, containment of wastewater and contaminated stormwater (run-off), protection of the Greenough river, proper solid waste disposal, and water supply are issues which would need to be clearly addressed in a specific proposal for an industrial estate. Odour can be particularly difficult to address as it depends largely on perception, and there is no numerical standard. The distance odour travels and its persistence depend on weather conditions, process management, and sensitivity of local residents. The best way to manage odorous industry is to locate it as far away as possible from residents, taking account of the meteorological factors discussed above.

For an industrial estate to be established, a corridor connecting the estate to the existing Geraldton Port or a new port at Georgina (Figure 1) may be required. To transport materials from the Bootenal West site to Georgina would require a designated corridor. Where relevant, the preceding criteria should be used also to assess the suitability of a corridor which would service the site and adjoining port facility. When using these criteria it is essential to recognise the existing land uses and locations of dwellings which may be impacted upon.

If Georgina were chosen as a port, impacts on the sand-dune system, and dredging impacts on Africa Reef and the Greenough Estuary would be major issues. Whilst the waters are shallower around Georgina as compared with Oakajee, the associated dredging may have serious environmental impacts on the ecology of the reef and estuary and as a consequence may make the overall potential for the Bootenal West site much less attractive.

The Environmental Protection Authority recognises that some of these issues have a social component and foreshadows these issues so that consideration for proper planning of this agricultural area is undertaken before any proposal is referred to EPA for assessment.

4.2 Oakajee

This site is cleared farmland overlying granitic and limestone bedrock. The industrial core area, whilst flat, is surrounded by hilly cleared poor farmland comprising scrub and outcrop. The land falls quickly to the sea where the coastline is comprised partly of sand-dunes and outcrop. The sand dunes do not appear to be as fragile as those near Georgina. The scrub is generally located on steep slopes.

The population is sparse and there appears to be little potential for major social impact.

As for the Bootenal West site, the development of a port would be a major environmental issue, however, it should be feasible to develop suitable a buffer zone or corridor leading to a port. Whilst the waters off Oakajee are deeper than at Georgina and may lead to the belief that the site is unsuitable as a result of development costs, the EPA emphasises that the environmental costs as a result of dredging at Georgina may be high also and irreversible.

If the Industrial Lands Development Authority proposed the development of Oakajee it would have to address the same issues as those for Bootenal West. The EPA believes that the issues would be more easily addressed at Oakajee.

5. Conclusions

The Environmental Protection Authority concludes that both sites are potentially manageable. However, there would be a greater number of potential problems which would need to be addressed at the Bootenal site such as sulphur dioxide and noise emissions, and risks and hazards. The configuration and size of the buffer zone, as outlined in the study, may be inadequate to manage these issues. Furthermore the corridor requirements to service the site, especially if a new port was required, would pose additional issues to be resolved.

The Oakajee site has no unique environmental significance, limited amenity and there should be few, if any, major potential problems with either a corridor or a buffer zone. Other issues such as waste disposal, noise, odour and gas emissions should be manageable. Whilst the development of a port at Oakajee will have potential environmental impacts, the Environmental Protection Authority believes that they are likely to be manageable.