Geraldton Port Enhancement Project and Preparatory Works for the Town Beach Foreshore Redevelopment

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Geraldton Port Authority

Report and recommendations
of the Environmental Protection Authority

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Summary and recommendations

The Geraldton Port Authority (GPA) proposes to upgrade the Port of Geraldton (otherwise known as the Port Enhancement Project (PEP)) and undertake preparatory works for the Town Beach Foreshore Redevelopment Project. The objective of the PEP is to enable vessels to sail from the port fully laden. Due to current depth restrictions in the harbour basin and shipping channel, this is currently not possible. This report provides the Environmental Protection Authority's (EPA's) advice and recommendations to the Minister for the Environment and Heritage on the environmental factors relevant to the proposal.

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

Relevant environmental factors

It is the EPA's opinion that the following environmental factors grouped under the issues of Dredging Impacts, Eastern Breakwater Impacts and Coastal Stability Impacts are relevant to the proposal and require detailed evaluation in this report:

Issue of Dredging Impacts

The following factors have been grouped under the issue of Dredging Impacts, as they have been identified as a consequence of dredging:

- Benthic Primary Producer Habitat – loss of seagrass habitat;
- Water Quality – impacts of turbidity on ecosystem health;
- Water Quality – impacts of turbidity on commercial activities;
- Water Quality – impacts of turbidity on recreational activities; and
- Marine Mammals – impacts on migratory whales.

Issue of the Eastern Breakwater

The following factors have been grouped under the issue of Eastern Breakwater Impacts, as they have been identified as a consequence of constructing the Eastern Breakwater:

- Marine Mammals – disturbance to Australian Sealions;
- Water Quality – impacts of decreased flushing on water quality (Harbour Basin);
- Water Quality – impacts of decreased flushing on water quality (Town Beach);
- Noise Impacts – impacts of rail noise; and
- Visual Impacts.

Issue of Coastal Processes

- Coastal stability - impacts of widened channel and port structures on long shore sediment movement; and
- Coastal stability - management responsibility for Town Beach.

There were a number of other factors which were relevant to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation.

Conclusion

The EPA has considered the proposal by the GPA to upgrade the Port of Geraldton and undertake preparatory works for the Town Beach Foreshore Redevelopment Project.

Dredging impacts

Large scale dredging and reclamation will result in the irreversible loss of approximately 30 hectares of seagrass habitat in Champion Bay. Taking into account the previous losses of seagrass habitat through historical activities and existing marine structures, the PEP will contribute to a cumulative loss of approximately 145 hectares of seagrass habitat. Given that the EPA is unaware of any other proposals that involve seagrass loss in the Champion Bay, the EPA considers that the additional loss of seagrass habitat in Champion Bay as a result of the PEP is acceptable. However, if there were other proposals in Champion Bay, any further loss of seagrasses would be an issue requiring detailed consideration.

The extent of seagrass habitat to be irreversibly lost as a result of the PEP is primarily determined by the extent of the PEP's 'footprint' through dredging and reclamation. The EPA is mindful of the risk of dredging indirectly impacting on the further areas of seagrass habitat through dredge-induced turbidity. Accordingly, the loss of seagrass habitat needs to be considered in association with the risk of losing additional areas of seagrass habitat.

Seagrass health and productivity may be affected by the dredging operations in light of the considerable and continuous 10-month dredging campaign.

In response to concerns regarding the impacts of turbidity on seagrass health, the GPA has developed a water quality monitoring and management plan (WQMMP) which includes defined 'alert' and 'action' light intensity trigger levels and management actions applicable to the 'alert' and 'action' levels. The GPA has proposed to apply the levels during the course of the dredging programme.

The GPA's intention to implement management actions such as adjusting dredging operations or temporarily halting the dredge in the event 'action' levels are exceeded demonstrates an adaptive management strategy to the issue of dredge-induced turbidity. This strategy will ensure seagrass receives sufficient light for survival and thus demonstrates the manageability of the issue.

In addition to the development of satisfactory 'alert' and 'action' levels, the EPA would expect the GPA and dredging operator to implement best practice operational management in minimising the generation of turbidity during dredging and for this to be documented in a satisfactory dredge management plan (commitment 15). The dredge management plan will require the advice of the EPA, prior to its approval.

To address the impacts of dredging on the live lobster holding industry, the GPA has reached agreement with their representatives on acceptable site-specific 'alert' and 'action' levels at the seawater intakes. Similarly, management actions in the event alert and action levels are exceeded have been proposed. The GPA has also undertaken modelling of dredge plume generation and dispersal to predict the likelihood and frequency of exceedences against the proposed 'alert' and 'action' levels under certain dredge locations and wind conditions. Assessing the impacts of turbidity in this manner improves the GPA's ability to anticipate worst operational case conditions and provides an opportunity for the GPA to plan the dredging programme accordingly.

Eastern Breakwater
In responding to concerns in relation to potential impacts on the local Sealion colony from construction and use of the eastern breakwater, the GPA has developed management strategies to minimise the PEP's impacts on Sealions. The EPA considers that the GPA are proposing to undertake reasonable and practicable measures to reduce the impacts of the PEP on the local Sealions and notes that if the Sealions did leave the port area as a result of ongoing disturbance it would not have a significant effect on the conservation status of the Australian Sealions.

The GPA in consultation with the Department of Environmental Protection (DEP) has initiated a programme to reduce the environmental impacts of port activities through the GPA's 'Bulk Handling Action Plan'. This plan has been proposed in accordance with DEP licence conditions. The plan aims to improve port management practices, reduce stormwater inputs, spillages and inputs into the waters during routine loading and unloading activities and will be regularly reviewed with the DEP.

Provided there is improved and satisfactory management of nutrient and contaminant inputs into the inner harbour waters as part of the Bulk Handling Action Plan (including water and sediment quality monitoring), the risk of water quality deterioration occurring will be minimised.

The eastern breakwater is expected to provide a barrier to existing turbid plumes and associated contaminants that occasionally enters Town Beach from the harbour as a result of shipping movements. Given that the PEP does not introduce new sources of contaminants and nutrients, and the predicted increase in flushing times following completion of the eastern breakwater is minor, the likelihood of water quality deterioration occurring in Town Beach is considered to be low.

The GPA will be required to monitor water and sediment quality in the inner harbour and Town Beach to confirm that the relevant Environmental Quality Objectives documented in recommended condition 7 are being maintained and confirm the GPA's impact predictions with respect to water quality, following completion of the PEP.

Coastal stability
Through the GPA's investigations, the PER has highlighted the long-term risks to coastal stability that will require regular management action. To address the issue of coastal stability, the GPA has committed to a programme of monitoring shoreline movement of the beaches between the Batavia Coast Marina and the Chapman River and providing sand nourishment on a regular basis as part of the City of Geraldton's Northern Foreshore Stabilisation and Enhancements Strategy. The EPA has recommended that this programme for the northern beaches be extended to include the monitoring and nourishment of Town Beach until the newly reclaimed beach can be demonstrated to be stable.

Overall the EPA considers that the loss of seagrass habitat due to the PEP and the adaptive management strategy proposed by the GPA to minimise the risk of further losses is considered to be acceptable. The risk of water quality deterioration occurring in Town Beach and the inner harbour is low given the existing plans in place to minimise nutrient and contaminant inputs. The commitment to monitor and nourish should ensure that the stability of beaches could be managed. The EPA has therefore concluded that it is unlikely that the EPA's objectives would be compromised provided there is satisfactory implementation by the GPA of the GPA's commitments and the recommended conditions set out in Appendix 4 and summarised in Section 4.

Recommendations

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

1. That the Minister notes that the proposal being assessed is for GPA to upgrade the Port of Geraldton and undertake preparatory works for the Town Beach Foreshore Redevelopment Project.
2. That the Minister considers the report on the relevant environmental factors as set out in Section 3.
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 4, and summarised in Section 4, including the proponent's commitments.
4. That the Minister imposes the conditions and procedures recommended in Appendix 4 of this report.

Conditions

Having considered the proponent's commitments and information provided in this report, the EPA has developed a set of conditions that the EPA recommends is imposed if the proposal by the GPA to upgrade the Port of Geraldton is approved for implementation. These conditions are presented in Appendix 4. Matters addressed in the conditions include the following:

(a) that the proponent shall fulfil the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 4;

(b) the various management plans and programmes proposed through the proponent's commitments be made publicly available to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority;

(c) the designation of Environmental Quality Objectives (EQOs) (defined in the Environmental Protection Authority document "Perth's Coastal Waters, Environmental Values and Objectives") to the inner harbour basin and Town Beach and development of guidelines and indicators by which the EQOs can be measured to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority; and

(d) the management of the newly reclaimed Town Beach to achieve long-term stability which includes replenishment/nourishment until it can be demonstrated to be stable to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

Contents

Page

Summary and recommendations ..... **i**

1. Introduction and background **1**

2. The proposal **2**

3. Relevant environmental factors **10**

3.1 Issue of Dredging Impacts 11

3.1.1 Benthic Primary Producer Habitat – loss of seagrass habitat 11

3.1.2 Water Quality - impacts of turbidity on ecosystem health 16

3.1.3 Water Quality – impacts of turbidity on commercial activities 19

3.1.4 Water Quality – impacts of turbidity on recreational activities 20

3.1.5 Marine Mammals – migratory Whales 21

3.2 Issue of Eastern Breakwater Impacts 25

3.2.1 Marine Mammals - impacts on Sealions 25

3.2.2 Water Quality - impacts of decreased flushing (inner harbour) 29

3.2.3 Water Quality – impacts of decreased flushing (Town Beach) 35

3.2.4 Noise Impacts – impacts of rail noise 37

3.2.5 Visual Impacts 40

3.3 Issue of Coastal Stability 41

3.3.1 Coastal stability 41

3.3.2 Management of Town Beach 44

4. Conditions and Commitments **46**

4.1 Proponent's commitments 46

4.2 Recommended conditions 47

5. Conclusions **48**

6. Recommendations **50**

Table

Table 1: Summary of key proposal characteristics 3

Figures

1. Locality of the Port of Geraldton
2. Proposed modifications to the channel alignment, the Geraldton Port and Town Beach
3. Location of proposed dredged material disposal area
4. City of Geraldton Foreshore Redevelopment Concept Plan
5. GPA's Benthic Primary Producer Management Units
6. Migration Routes of Humpback Whales
7. Long-Term Environmental Quality Objectives for Maintenance of Ecosystem Integrity – Levels of Protection

Appendices

1. List of submitters
2. References
3. Identification of relevant environmental factors
4. Recommended Environmental Conditions and Proponent's Consolidated Commitments
5. Summary of submissions and Proponent's response to submissions
6. Ministerial statements 087 and 367.

1. Introduction and background

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment and Heritage on the environmental factors relevant to the proposal by the Geraldton Port Authority (GPA) to upgrade the Port of Geraldton (otherwise known as the Port Enhancement Project (PEP)) and undertake preparatory works for the Town Beach Foreshore Redevelopment Project. The objective of the PEP is to enable vessels to sail from the port fully laden. Due to current depth restrictions in the harbour basin and channel, this is currently not possible.

The original Geraldton Port Expansion proposal was assessed by the EPA in November 1989 (EPA Bulletin 411, 1989) and subsequently approved (Ministerial Statement 087) and amended in 1994 pursuant to the provisions of section 46 of the *Environmental Protection Act 1986* (Ministerial Statement 367). This proposal essentially involved dredging sands from within the port and fishing boat harbour to reclaim land which now separates the two harbours, and also the construction of a new entrance for the Fishing Boat Harbour. Ministerial conditions 087 and 367 are included in Appendix 6.

The conditions of Ministerial statement 367 remain current, as the outer reclamation area, which was part of the proposal, has not been completed. The main requirements of these conditions require the GPA to monitor shoreline stability, seagrass impacts from the reclamation and water quality in the inner and outer harbour waters.

The port upgrade proposal is being assessed as a Public Environmental Review (PER). The PER (URS, 2001) was released for an eleven-week public review period between 12 November 2001 and 28 January 2002.

In addition to a referral to the EPA the GPA referred the proposal to Environment Australia (EA) under the *Environment Protection Biodiversity Conservation Act 1999 (EPBC Act 1999)*. The Commonwealth Minister for the Environment and Heritage subsequently decided that the proposed project is an action, which was likely to have a significant impact on a matter of national environmental significance, and therefore requires approval of the Commonwealth Minister. For this proposal these provisions relate specifically to the potential effects on the Humpback Whale (*Megaptera novaeangliae*).

An assessment of the environmental implications of sea dumping and a Sea Dumping Permit will also be required for offshore disposal of dredge spoil, in accordance with the Commonwealth *Environment Protection (Sea Dumping) Act 1981*.

Further details of the proposal are presented in Section 2 of this report. Section 3 discusses the environmental factors relevant to the proposal. The Conditions and Commitments to which the proposal should be subject, if the Minister determines that it may be implemented, are set out in Section 4. Section 5 presents the EPA's conclusions and Section 6, the EPA's Recommendations.

Appendix 5 contains a summary of submissions and the proponent's response to submissions and is included as a matter of information only and does not form part of the EPA's report and recommendations. Issues arising from this process and which have been taken into account by the EPA appear in the report itself.

2. The proposal

The proposal is described in detail in Section 1.3 of the GPA's PER (URS, 2001). The proposal involves the upgrade to the Port of Geraldton (otherwise known as the Port Enhancement Project (PEP)) and preparatory works for the Town Beach Foreshore Redevelopment Project. The objective of the PEP is to enable vessels to sail from the port fully laden. Due to current depth restrictions in the harbour basin and channel, this is currently not possible.

The main elements of the proposal are described in Figures 2 and 3 and are as follows:

- deepening by dredging of the harbour basin from 9.3 metres depth to 12.1 metres depth;
- widening of the existing channel and extension out to sea from 90 metres to 200 metres at the entrance to the harbour basin, from 150 metres to 250 metres wide around the corner, and from 150 metres to 200 metres along the outer straight;
- disposal of dredge spoil (3.5 million cubic metres of limestone material) from channel dredging offshore to create artificial lobster catching reefs (see Figure 3);
- reconfiguration and construction of breakwaters;
- relocation of the existing northern breakwater;
- reclamation of land adjacent to the existing northern breakwater requiring 0.3-0.4 million cubic metres of fill and within and adjacent to the new eastern breakwater;
- sand nourishment of Town Beach from 0.6 million cubic metres of spoil from the Southern Transport Corridor project; and
- construction and operation of a railway line on the eastern breakwater.

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

Table 1: Summary of key proposal characteristics

Element	Description
Deepen harbour basin and access channel	• Deepen harbour basin from 9.3 metres depth to 12.1 metres depth. • Deepen access channel to between 12.5 metres at the inshore end, and 14.2 to 14.7 metres at the offshore end.
Widen the access channel.	• Widen the access channel from 90 metres to 200 metres at the straight entrance to the harbour basin, from 150 metres to 230 metres wide around the bend, and from 150 metres to 200 metres along the outer straight.
Disposal of dredged material	Dispose of some 3.5 million cubic metres of dredged limestone material offshore to the southwest of Point Moore in sand veneered pavement habitat, between 25 metres and 30 metres deep to create artificial lobster catching reefs.
Reconfigure outer breakwater	Remove 50 metres from the western end of the outer breakwater and relocate the rocks adjacent to the channel entrance to form an 'L'-shape.
Relocate existing northern breakwater.	Remove existing northern breakwater on the western side of the port entrance, and relocate it some 50 metres to the west and extend it a further 200 metres north.
Construct eastern breakwater	• Fill deep hole north of GPA recreational boat harbour with marine sands from harbour entrance using small cutter suction dredge. • Construction of new eastern breakwater between the GPA Recreational Boat Harbour and almost to the outer breakwater but leaving 10 metres wide water buffer.
Wharf modifications	• Modify wharves to access the deeper harbour basin. Install navigational aids. • Install new navigational aids to mark the external boundaries of the widened channel.

Reclaim land adjacent to existing northern breakwater	• 0.3 - 0.4 million cubic metres of dredged material will be pumped directly in to the new northern reclamation area to provide future hard standing and cargo storage capacity for two future berths adjacent to the northern breakwater.
Construction of railway line on eastern breakwater	Up to 1 kilometre of double railway track from existing grain unloading facility to end of the eastern breakwater.
Reclaim land within eastern breakwater and Sand nourishment of Town Beach	Up to 600 000 cubic metres of clean fill material from the Southern Transport Corridor project will be used to provide the fill required.
Construction of beach stabilization groynes in Town Beach.	• The existing breakwaters at Town Beach will be lengthened by approximately 50 metres. • A new groyne will be constructed on the north west corner of the Batavia Coast Marina.

The construction of approximately 1 kilometre of double railway track from the existing grain unloading facility to the end of the proposed eastern breakwater was described in the PER document as being part of the PEP. This element has subsequently been introduced into the Key Proposal Characteristics Table as a complete description of the proposal.

As part of the proposal, the GPA proposes to contribute to the City of Geraldton's (CoG's) Town Beach Foreshore Redevelopment Project by coordinating the engineering design studies, construction works and environmental management for the Town Beach foreshore reclamation works. Such works will include the seaward extension of existing groynes on Town Beach, nourishment of Town Beach using excess fill from the Southern Transport Corridor Project and the addition of a small groyne to the northwest corner of the Batavia Coast Marina (BCM). The GPA has assessed the environmental impacts of the contributions and accordingly has included the proposed contributions as part of the PEP proposal.

A concept plan of the Town Beach Foreshore Redevelopment project is shown in Figure 4. The CoG, following community consultation, workshops and negotiations with key stakeholders, adopted the concept plan for the redevelopment in December 2001. The concept plan serves as a blue print for the redevelopment of the Central Business District and the foreshore and was made available for public comment and feedback.

The CoG will assume responsibility for stabilising and developing the reclaimed beaches and the broader Town Beach Redevelopment project once the GPA has constructed it (URS, 2001). The EPA notes that the CoG is coordinating and has set in place a comprehensive consultative process for implementing the broader and overall Town Beach Foreshore Redevelopment Project.

Since release of the PER, one modification has been made to the proposal.

The proposal as originally presented in the PER proposed to create and nourish Town Beach from sands dredged from the channel. It was subsequently found that insufficient sand of suitable quality in terms of grain size and silt content was available for that purpose. Therefore, no sands from dredging works will be supplied to Town Beach.

It is now proposed to use clean sand from the Geraldton Southern Transport Corridor Project (STC). Geo-technical investigations of this material have recently been completed and results indicate that adequate volumes of good quality clean sands exist within the STC (DPI, 2002). The GPA has indicated that use of the STC sands to nourish Town Beach will result in less environmental impact through turbidity generation and potential odour generation. The environmental impacts associated with the construction of the STC project has been assessed by the EPA and is documented in EPA Bulletin 1013 (EPA, 2001).

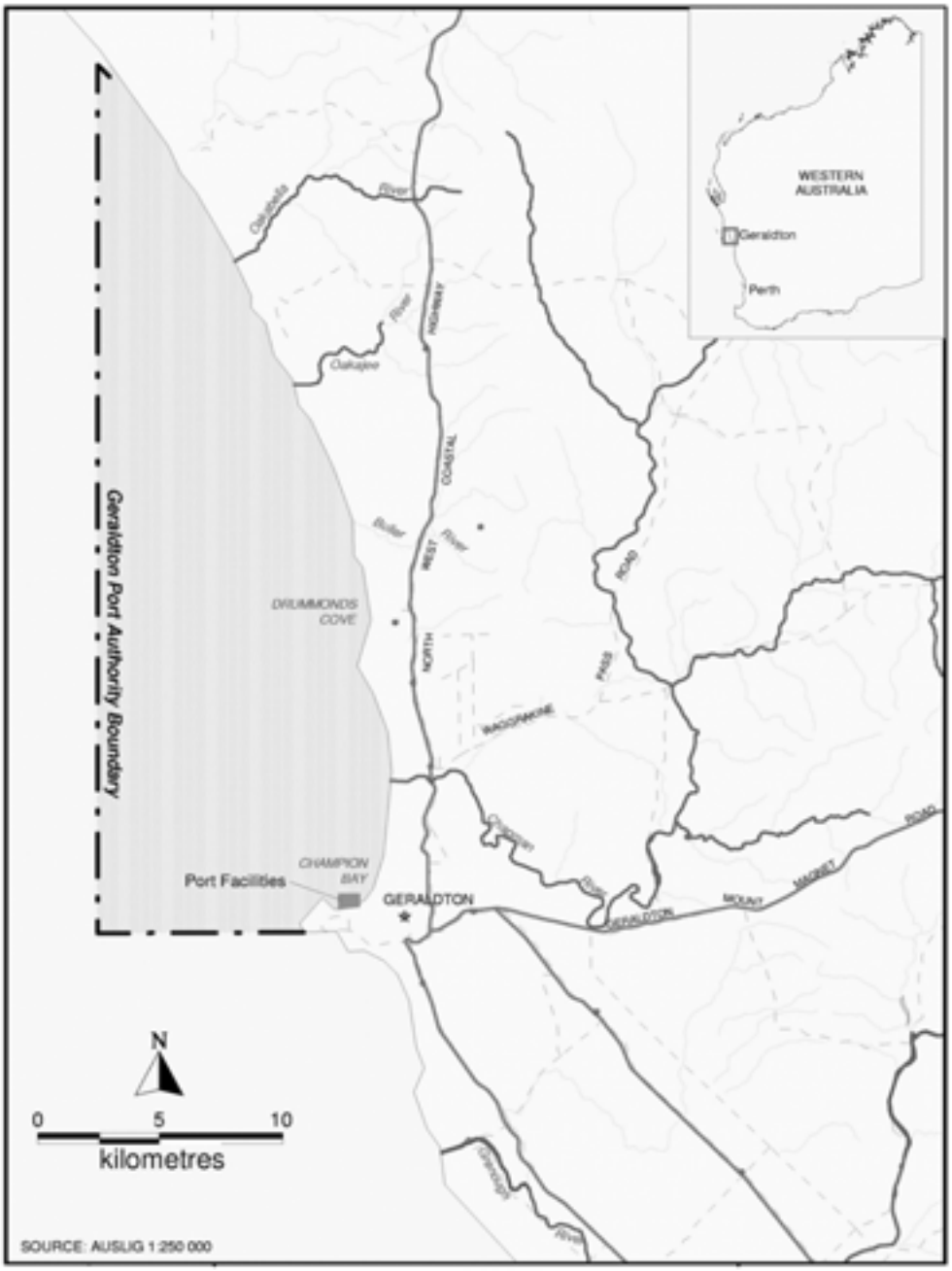

Figure 1: Locality of the Port of Geraldton (Source: Port Enhancement Project, PER, URS, 2001)

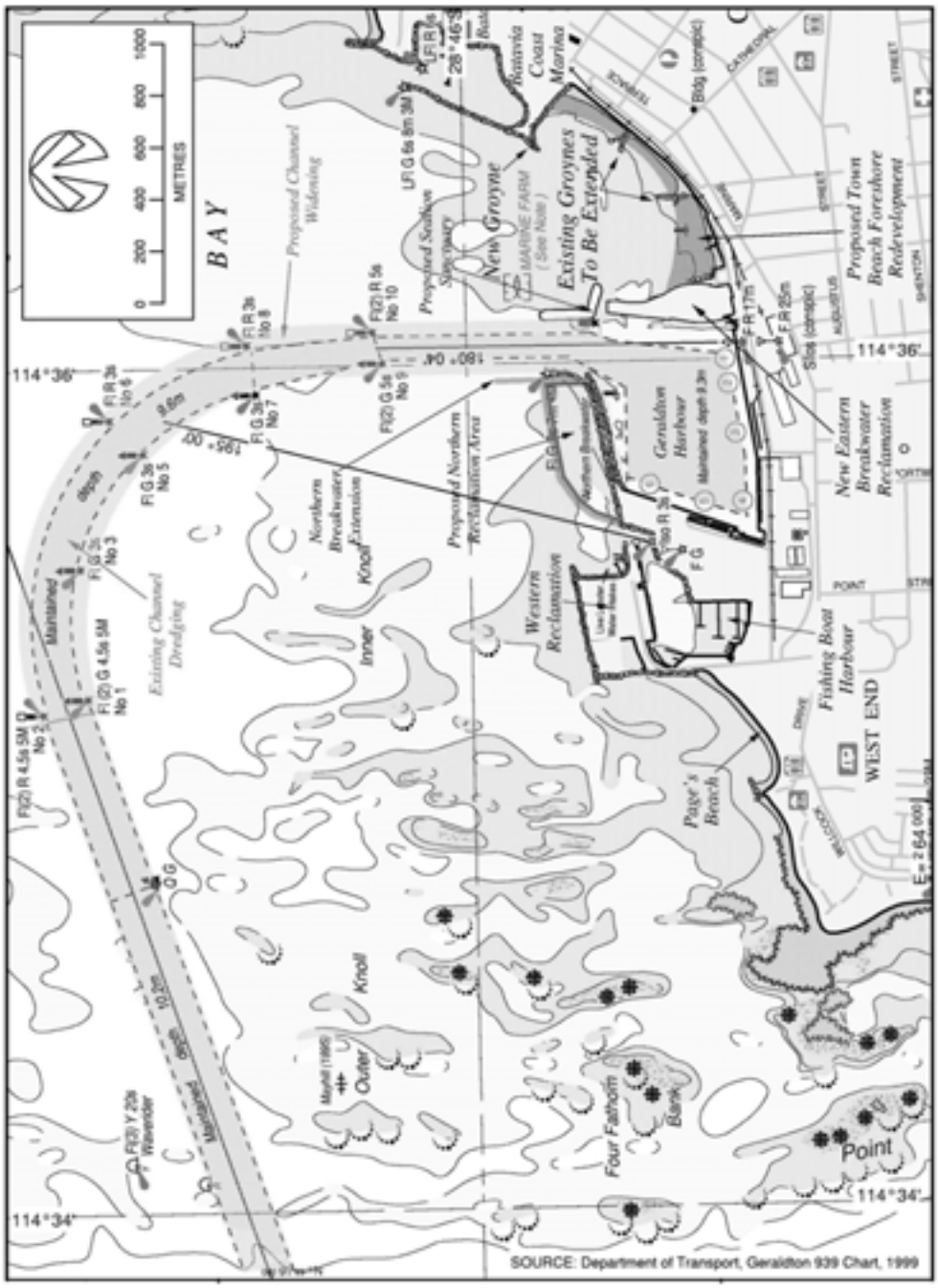

Figure 2: Proposed modifications to the channel alignment, the Geraldton Port and Town Beach (Source: Port Enhancement Project PER, URS, 2001)

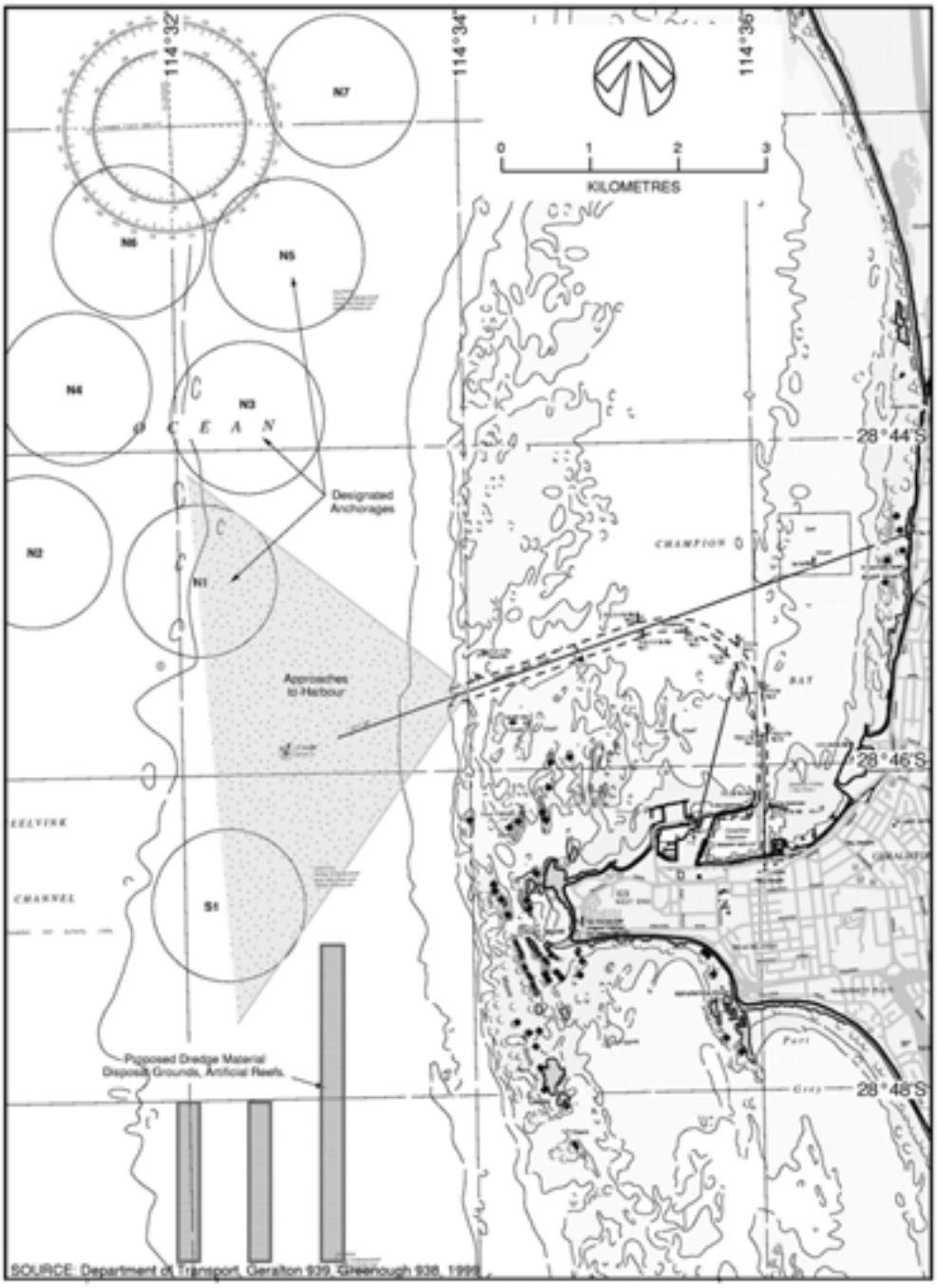

Figure 3: Location of proposed dredged material disposal area (Source: Port Enhancement Project PER, URS, 2001).

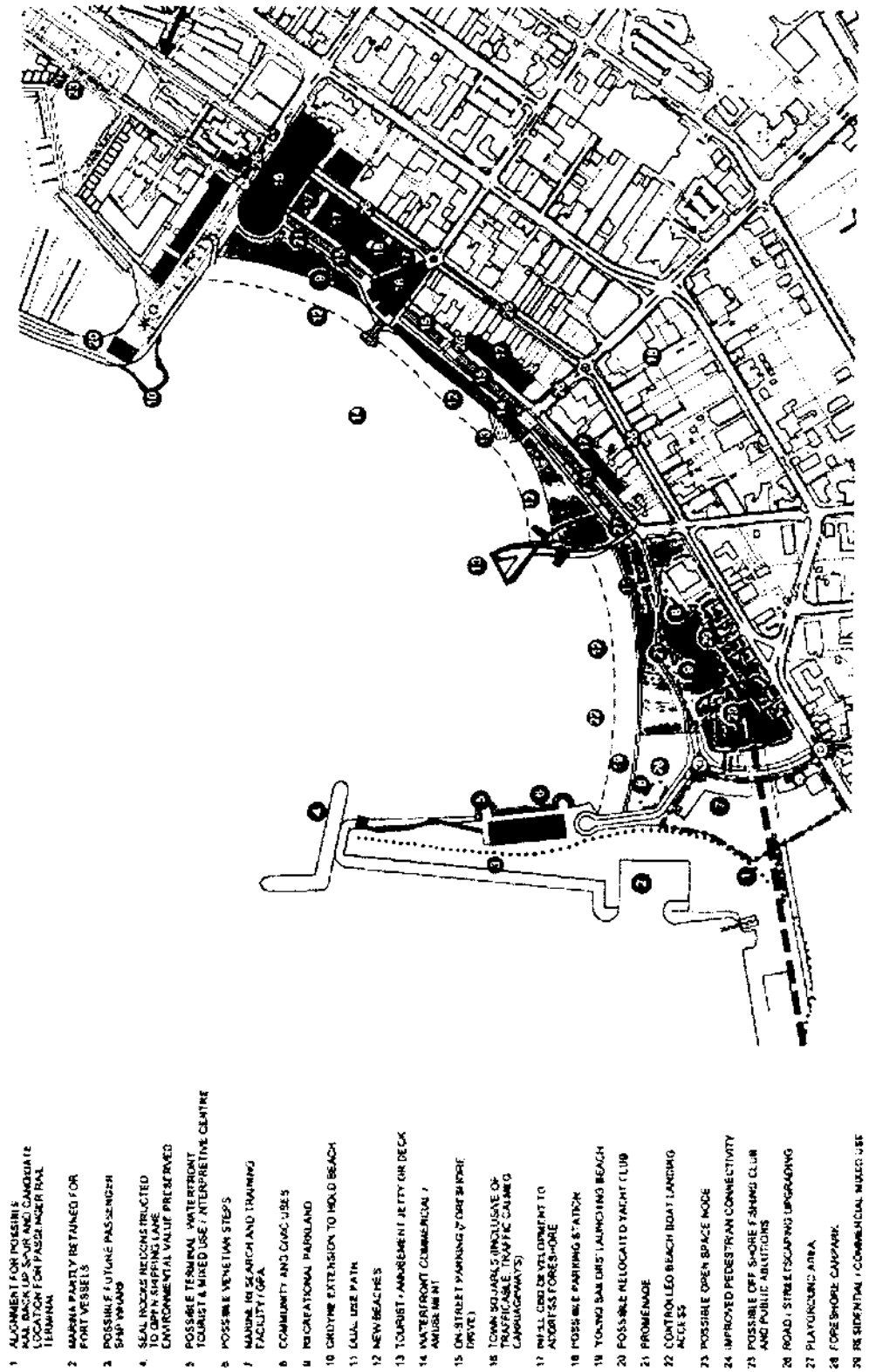

Figure 4: City of Geraldton Foreshore Redevelopment Concept Plan (Source: Geraldton Foreshore/CBD Redevelopment and Revitalisation Project Workshop, Outcomes Report, March 2002).

3. Relevant environmental factors

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

The identification process for the relevant factors selected for detailed evaluation in this report is summarised in Appendix 3. The reader is referred to Appendix 3 for the evaluation of factors not discussed below. A number of these factors, such as dust and oil spill, are relevant to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation.

It is the EPA's opinion that the following environmental factors grouped under the issues of Dredging Impacts, Eastern Breakwater Impacts and Coastal Stability Impacts are relevant to the proposal and require detailed evaluation in this report. The issues were primarily identified from a review of the public submissions.

Issue of Dredging Impacts

The following factors have been grouped under the issue of Dredging Impacts, as they have been identified as a consequence of dredging:

- Benthic Primary Producer Habitat – loss of seagrass habitat;
- Water Quality – impacts of turbidity from dredging on ecosystem health;
- Water Quality – impacts of turbidity from dredging on commercial activities;
- Water Quality – impacts of turbidity from dredging on recreational activities; and
- Marine Mammals – impacts of dredging on migratory whales.

Issue of the Eastern Breakwater

The following factors have been grouped under the issue of Eastern Breakwater Impacts, as they have been identified as a consequence of constructing the Eastern Breakwater:

- Marine Mammals – disturbance to Australian Sealions;
- Water Quality – impacts of decreased flushing on water quality (Harbour Basin);
- Water Quality – impacts of decreased flushing on water quality (Town Beach);
- Noise Impacts – impacts of rail noise; and
- Visual Impacts.

Issue of Coastal Processes

- Coastal Stability - impacts of widened channel and port structures on long shore sediment movement; and
- Coastal Stability - management of Town Beach.

The above relevant factors were identified from the EPA's consideration and review of all environmental factors generated from the PER document and the submissions received in conjunction with the proposal characteristics.

Details on the relevant environmental factors and their assessment are contained in Section 3. The description of each factor shows why it is relevant to the proposal and how it will be affected by the proposal. The assessment of each factor provides the basis for the EPA decision on whether or not a proposal meets the environmental objective set for that factor.

3.1 Issue of Dredging Impacts

The following environmental factors/issues have been identified as a consequence of dredging.

3.1.1 Benthic Primary Producer Habitat – loss of seagrass habitat

Description

This issue primarily relates to the 'footprint' of the proposal as a result of dredging the port and channel, reclamation (including Town Beach), and the disposal of dredge spoils.

At a regional level, the marine habitats to be affected by this proposal are generally described in the Marine Parks and Reserves Selection Working Group (MPRSWG) Report (1994) as being well distributed along the mid west coast between Port Gregory and Port Denison.

The marine benthic habitat types to be directly impacted by the project and those that occur in adjacent areas have been described in the PER (Section 2.2.6). The GPA's benthic habitat survey described a mosaic of bare sand, seagrass and macro algal cover in Champion Bay and the Town Beach area. The most numerous seagrasses to occur in the project area belong to the genera *Posidonia* and *Amphibolis.*

The GPA's environmental consultant has identified 13 marine habitat types based on the information gathered from previous marine surveys in Champion Bay, Point Moore and Town Beach, the GPA's own marine surveys and the interpretation of aerial photographs and bathymetry charts. The marine benthic habitats identified are shown in figure 2.6 of the PER and are as follows:

- Intertidal habitats:
    - Sand beaches
    - Limestone platforms and exposed beach rock
- Shallow (< 8m) sub tidal habitats:
    - Sand
    - Seagrass meadow on sand
    - Algae and seagrass on sand veneered limestone pavement
    - Raised reef
- Deep (>8m) sub tidal habitats:
    - Sand
    - Algae and seagrass on sand veneered limestone pavement
    - Raised reef

- Human modified habitats:
    - Breakwaters (including jetties, piles etc.)
    - Mooring basins
    - Navigation channel
    - Dredged material disposal areas

Marine fauna that utilise this habitat include a wide range of reef fish and a large number of invertebrates, including western rock lobsters.

The PER's benthic habitat survey concluded that no locally or regionally significant seagrass species or benthic primary producer habitat has been identified within or near the project area.

Submissions
The community has raised concerns over the considerable loss of seagrass meadows. The community has also raised concerns in relation to the methodology used for determining the distribution and extent of marine habitats, particularly seagrass habitats, to be affected by this proposal.

The Department of Fisheries in its submission on the PER has indicated that all significant environmental impacts on the marine environment and commercial and recreational fishing, likely to arise from the proposal have been identified and have been adequately addressed.

Assessment
The EPA's objective for this issue is to maintain the ecological integrity of the marine environment.

The area considered for assessment is considered to be the marine 'footprint' of the PEP.

The PEP will directly impact on approximately 367 hectares of benthic marine habitat. Of the 367 hectares to be impacted, approximately 127 hectares of the PEP's 'footprint' have been previously modified through historic construction activities and port related structures. The PEP will again modify this habitat.

The types of activities that will impact on benthic primary producer habitat were identified as:

- reclamation of marine habitat and its conversion to terrestrial habitat for future port facilities and construction of new breakwaters as replacements for existing breakwaters (21 hectares - includes peripheral 'halo' impacts of the structures);
- reclamation of marine habitat and its conversion to terrestrial habitat for recreational uses (Town Beach) (15 hectares - includes peripheral 'halo' impacts of the structures);
- dredging of harbour (37 hectares (all previously modified));
- dredging to widen and deepen the existing navigation channel (113.5 hectares - 80 hectares of which is previously modified); and
- disposal of material dredged from the navigation channel, in water at depths greater than 25 metres to the southwest of Point Moore (180 hectares).

Dredging and reclamation in Champion Bay

Consistent with the Draft EPA Guidance Statement for Benthic Primary Producer Habitat Protection, the GPA defined a management unit of approximately 6000 hectares (Figure 5) to provide the basis for calculating and assessing cumulative seagrass loss following the implementation of the PEP.

The GPA's consultants estimated from marine surveys and interpretation of bathymetric charts that 2500 hectares of seagrass habitat occurred in the management unit. Seagrass habitat includes seagrass meadows and areas of seagrass mixed with macro algal communities. A majority of high-density seagrass habitat was observed in the southeastern corner of Champion Bay.

The GPA's consultants have examined historical aerial photographs and estimated the potential historical loss of seagrass habitat from existing marine structures in Champion Bay. It was determined that the cumulative and irreversible loss of seagrass habitat with the PEP within the management unit described in figure 5, is 145 hectares (5.8 percent of the management unit). The PEP itself will result in the irreversible loss of 30 hectares of seagrass habitat (1.2 percent of the management unit).

Submissions also raised concerns in relation to the marine benthic survey methodology used to determine the extent and distribution of seagrasses in Champion Bay and Town Beach to be affected. In response to the submissions, the GPA's consultants undertook additional intensive marine surveys in the areas likely to be affected by the PEP. The results of the subsequent marine benthic survey have enabled the GPA to refine the initial predictions particularly with regard to the area and types of seagrass habitat to be affected by the proposal.

The EPA notes that no species will be lost as the seagrass habitats and other benthic primary producer habitats encountered in Champion Bay occur elsewhere.

Given that the EPA is not aware of any other major proposals in the area, the EPA considers that this additional loss of seagrass habitat is acceptable. However, if there were other proposals in Champion Bay, any further loss of seagrass would be an issue requiring detailed consideration.

In terms of other benthic primary producer habitat types to be affected, the dredging of the shipping channel will result in the cumulative loss of approximately 57 hectares of macro algal communities on limestone reef and sand veneered pavement. The loss of macro algae communities on reef and limestone pavements is considered to be acceptable given that the GPA's benthic surveys shows that macro algal communities are well distributed throughout Champion Bay.

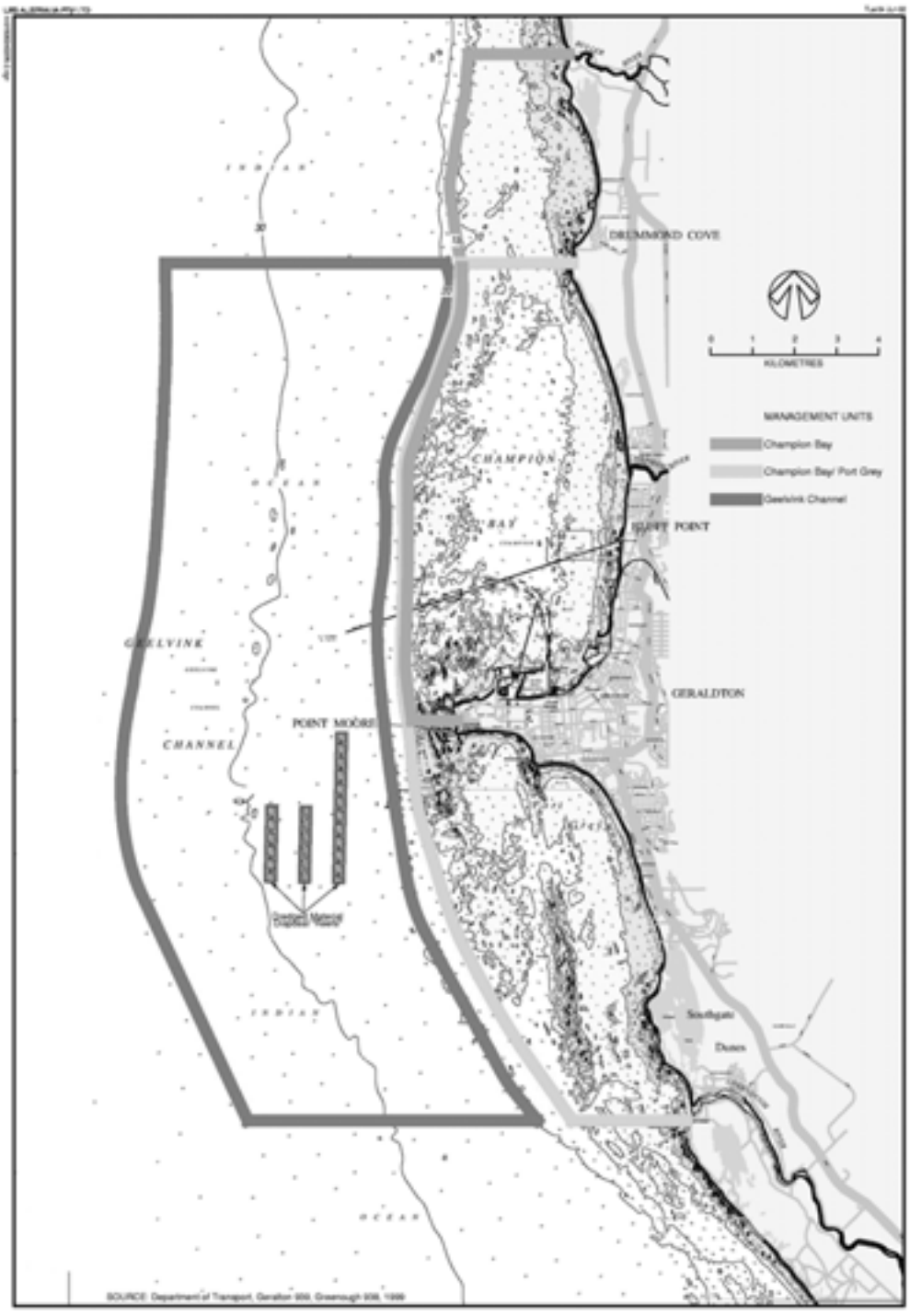

Figure 5: GPA's Benthic Primary Producer Management Units (Source: Port Enhancement Project PER, URS, 2001

Dredge spoil disposal in the Geelvink Channel

A separate management unit was defined to assess the 'footprint' implications of the proposed offshore disposal site in the Geelvink Channel. The GPA's proposed management unit is shown in Figure 5 of the PER and has been described as extending from Drummond Rocks to the mouth of the Greenough River. The disposal site will directly impact on approximately 180 hectares of bare sand and offshore limestone pavement habitat supporting a low density of red and brown algae and occasional shoots of seagrass (*Thalassondendrum sp*.).

In the context of the defined management unit, the GPA concluded that 2.3 % of the offshore limestone pavement habitat would be impacted by the disposal of dredge spoil.

The GPA predicted that over time, most of the dredge spoil will be recolonised by algae and sessile invertebrates and eventually be returned to a state equal or greater in productivity. Observations made by the GPA's consultants at existing dredge spoil disposal grounds in Champion Bay and further offshore support this prediction.

In maximising the opportunity for recolonisation to occur, the GPA proposed to create three stable ridges of spoil material with a view to achieving an artificial reef. It is likely that the proposed artificial reef habitat will increase lobster catch rates, as existing dredge disposal areas have proven to be productive lobster catching grounds. This is supported by anecdotal information from professional fisherman (URS, 2001).

The Department of Fisheries advised the EPA in its submission that it is expected that the spoil from the deepening of the shipping channel will contain significant amounts of rock and a rocky reef habitat would replace the less productive sand habitat. To verify the GPA's predictions with regard to the proposed artificial reef habitat, the GPA has committed to developing and implementing an artificial reef monitoring plan (commitment 11) on advice of the Department of Fisheries which aims to address post-construction monitoring of reef habitat development.

Given the low density of benthic primary producer habitat in the Geelvink Channel, and the proposal to return the area to a state of productivity equal or greater to the previous state, the EPA considers that the 'footprint' of the dredge spoil disposal area in the Geelvink Channel, is acceptable.

Summary

The GPA has assessed the PEP's impacts on benthic primary producer habitat and particularly seagrass habitat taking into account the direct losses from dredging, dredge spoil disposal and from existing and proposed port structures.

The EPA notes that the extent of seagrass habitat to be irreversibly lost as a result of the PEP is primarily determined by the extent of the PEP's footprint through dredging and reclamation. The EPA is mindful of the risk that the PEP may indirectly impact on additional areas of seagrass habitat through an increase in turbidity from dredging and consequent decrease in light levels reaching the seagrass. Accordingly, the EPA is of the view that the loss of seagrass habitat needs to be considered in association with the risk of losing additional areas of seagrass habitat. The risk of the PEP indirectly impacting on additional areas of seagrass through dredging is discussed in section 3.1.2.

Having particular regard to:

- the limited area of marine habitat that will be affected by the proposal, particularly seagrass habitat, and the fact that these are widely distributed along the mid west coast;
- the beneficial uses of dredge spoil by the proposed creation of an artificial reef habitat to achieve levels of productivity equal to or greater than the previous habitat in the Geelvink channel;
- GPA's commitment to develop and implement an artificial reef management and monitoring plan (commitment 11); and
- advice of the Department of Fisheries that all significant environmental impacts on the marine environment and on recreational fishing have been identified and have been adequately addressed,

the EPA considers that the cumulative loss of seagrass habitat as a result of the PEP is unlikely to compromise the EPA's objective of maintaining the ecological integrity of the marine environment.

The EPA notes that the cumulative and irreversible loss of seagrass in Champion Bay following implementation of this proposal would be in the order of 5.8%. The EPA recognises the important role that seagrass plays as a primary producer and a habitat and if there were other proposals in Champion Bay any further loss of seagrass would be an issue requiring detailed consideration.

3.1.2 Water Quality - impacts of turbidity on ecosystem health

Description

Dredging, construction of the breakwaters, reclamation and dredge spoil disposal will generate plumes of suspended sediments in the water column. The generation of sediment plumes over the 10-month continuous dredging campaign is considered to be a key impact of this project.

Seagrass is dependent upon sufficient light being available for its survival. Studies undertaken in Cockburn Sound for the meadow-forming *Posidonia sinuosa* species have demonstrated that to maintain seagrass health, the levels of light that needs to be maintained at the canopy of the seagrass is about 10% of the available photosynthetic radiation just below the water surface (DEP, 1996).

The period at which seagrasses are most susceptible to the impacts of shading is during spring/summer when the majority of seagrass growth occurs. This coincides with a period when photosynthesis rates and hence seagrass growth, is at its highest and energy stores are being laid down to ensure survival through the winter months.

Some species of seagrass are able to store energy reserves in the rhizomes to enable them to withstand the low light conditions experienced during winter. However, if these reserves are utilised during summer as a result of excessive shading (eg. turbidity), the seagrass may have insufficient energy reserves to ensure their survival through winter. The recovery of some seagrass species such as *Posidonia sinuosa* following an impact can be extremely slow.

Dredging for the PEP is expected to coincide with one entire seagrass growing period (spring to autumn).

As described in the PER, substantial seagrass coverage occurs adjacent to the project area, particularly in the southeastern quarter of Champion Bay. The seagrasses in the impact area are dominated by *Posidonia sinuosa* and *Amphibolis griffithii,* with lesser amounts of *Amphibolis antarctica* and *Posidonia australis.*

Submissions

A submitter suggested that the GPA should provide further details of how it will manage and monitor turbidity from dredging.

Assessment

The EPA's objective for this issue is to maintain or improve marine water quality to protect the environmental values, Environmental Quality Objectives (EQOs) as defined in Perth Coastal Waters Environmental values and Objectives (EPA, 2000) and applying the water quality guidelines described in Australian and New Zealand Water Quality Guidelines (ANZECC 2000).

Sustained and prolonged reductions in light levels reaching seagrass as a result of high turbidity levels can potentially impact on seagrass health, productivity, density and distribution in Champion Bay. There is also likely to be an increase in sedimentation in the immediate vicinity of the dredging operations that could potentially lead to smothering of seagrasses that occur immediately adjacent to the navigation channel.

The GPA has undertaken the following investigations in predicting the implications of dredging and dredge spoil disposal on turbidity:

- conducting water quality baseline measurements in Champion Bay;
- conducting water quality surveys during the Esperance Harbour deepening project to estimate the likely percentage of material to be liberated into the water column while dredging;
- incorporating results of the surveys undertaken in Esperance and local marine geo-technical investigations to predict types of materials and levels of fines that would be liberated by dredging in Geraldton; and
- numerical modelling to assess the likely turbidity levels to be experienced in the vicinity of the dredge and Champion Bay.

The following conclusions have been made as a result of the above investigations:

- the result of the numerical model was able to identify areas in Champion Bay that will be most susceptible to high turbidity levels. These areas include the inshore reefs to the north of the Batavia Coast Marina and the south eastern corner of Champion Bay particularly during dredging of the inner portion of the shipping channel and reclamation of Town Beach;
- the likely median Total Suspended Solids concentrations throughout Champion Bay will rise from 2.3 mg/L to 3.5 mg/L;
- the extent of dredge plumes are likely to be localised and temporary because of the frequent shifts in dredging location along the shipping channel, periodic changes to wind strength and direction and the sub surface location (>5m depth) of where the spoil will be released from the dredging plant; and
- dredging operations will not cause persistent and significant declines to light levels reaching the seafloor and minor and inconsequential reductions to plant growth rates can be predicted.

The GPA has proposed to manage the impacts of dredging by monitoring the amount of Photosynthetic Active Radiation (PAR) reaching seagrass during dredging as part of GPA's proposed Water Quality Monitoring Programme (WQMMP) (commitment 3). Based on PAR levels, the GPA has defined 'alert and 'action' trigger levels, and management actions to be immediately implemented if they are exceeded. The PAR levels are based on the studies undertaken by Masini and Manning (1994) on the light requirements of seagrass in southwestern Australia.

The GPA has committed to undertaking the following management actions in the event of exceedences to 'alert' trigger levels:

- advising the Dredge Plume Monitoring Group representatives by phone/e-mail immediately;
- intensifying monitoring to confirm the continuing exceedence of the alert levels and identify the source of turbidity;
- developing in conjunction with the dredge plume-monitoring group, a strategy that describes the appropriate response should the action level be exceeded. The strategy will consider in addition to other factors, the location at which the criteria is exceeded, seasonal factors and events such as storm activity and run-off events; and
- alerting the contractor to the potential need for adjusting dredging or reclamation operations or temporarily halting them in the event that the 'action' level is exceeded.

If the PAR 'action' level is exceeded, the GPA undertakes to:

- implement agreed management actions which includes undertaking additional monitoring, instructing the dredge contractor to reposition the dredge or temporarily cease dredging, breakwater construction or spoil dumping until weather/sea conditions change, or light levels return to acceptable levels at the affected location.

Monitoring of dredging impacts in this manner is designed to confirm that no single area of seagrass habitat will be continuously affected by highly turbid water (over a period of three weeks) and that light levels are maintained at acceptable levels over seagrass habitats. In essence, should light levels be reduced below the agreed 'action' levels for PAR, the GPA has committed to modifying the dredging or construction operations to ensure acceptable light levels are maintained.

The GPA has also committed to preparing a Seagrass Monitoring Programme (SMP), which includes qualitative and quantitative measurements of seagrass health to confirm whether or not the PEP has had any long-term impacts on the seagrass habitat.

In terms of turbidity generation, the GPA has committed to preparing a dredge management plan (DMP), which addresses amongst other issues, the management of works to minimise the duration of turbid plumes over any one location. This plan will require the approval of the EPA, prior to dredging commencing. The EPA would expect the DMP to have strong linkages with the WQMMP in demonstrating an adaptive management strategy to the issue of dredge-induced turbidity.

In general terms, dredging will not meet the EPA's objectives for water quality in some parts of Champion Bay at certain times, particularly in the vicinity of the dredge plant, as dredging and spoil disposal is unlikely to maintain or improve marine water quality in terms of turbidity.

Light level at the seafloor is considered to be the key indicator/stressor associated with the issue of excessive shading and its impact on seagrass habitat. For this proposal, it is proposed to assess the impacts of dredging on seagrass habitat by ensuring critical light levels, measured as PAR, in areas containing seagrass are maintained at acceptable levels.

The EPA considers that with the adaptive management strategy proposed by GPA, whereby adjustments to the dredging operations will be made based on results of PAR monitoring, that the impacts of turbidity on seagrass habitat should be manageable to acceptable levels.

Summary

Having particular regard for the:

- GPA's investigations into the implications of turbidity from dredging and associated impacts on seagrass health;
- The finite time over which dredging will take place;
- GPA's proposal to monitor and manage dredging operations within the adaptive framework of defined 'alert' and 'action' trigger levels and associated management actions; and
- GPA's commitment to prepare and implement a WQMMP, SMP and DMP to ensure areas of seagrass are not significantly impacted by dredge-induced turbidity,

the EPA considers that, while the dredging is likely to result in short-term deterioration of water quality, it is unlikely to result in permanent long-term impact on ecosystem health.

3.1.3 Water Quality – impacts of turbidity on commercial activities

Description

Up to 20% of the Rock lobsters commercially caught in Geraldton are exported live. The processing plant holds the lobsters for 2-5 weeks in tanks that are supplied with fresh seawater pumped from intakes located close to the entrance of the Fishing Boat Harbour. The live lobster holding facility operates during and for approximately one month after, the rock lobster season (15 November to 31 July).

Dredging of the channel will increase the risk of turbid waters entering the rock lobster processing plants via the seawater intakes at times when the dredging coincides with live rock lobster holding periods. An increase in turbidity may impact on the husbandry of rock lobsters, leading to an increase in mortality while held at Geraldton.

Assessment

The EPA's objective for this issue is to ensure that dredging and reclamation do not compromise the live Rock Lobster holding industry.

The area considered for assessment is the area surrounding the seawater intakes.

The GPA have developed a draft Water Quality Management and Monitoring Program (commitment 11). The WQMMP proposes to monitor turbidity on a continuous basis at the seawater intakes during the live lobster-holding period, to ascertain compliance with 'alert' and 'action' turbidity criteria agreed with the GPA and the Rock Lobster Processing Industry (RLP). The agreed levels will be based on the critical level of suspended material which prevents adequate

visual husbandry of the rock lobsters held in tanks. The 'alert' and 'action' values proposed by the RLP and agreed by the GPA are 8 and 12 Nephelometric Turbidity Units (NTUs), respectively.

The GPA's draft monitoring programme provides for a warning system to the live holding industry and for the dredging supervisor to take appropriate action in that event the agreed alert and action levels are exceeded.

An exceedence of the alert level is proposed to invoke the following GPA management actions:

- GPA to notify all exporters that the alert level has been exceeded;
- GPA to notify the dredge contractor that the alert level has been exceeded;
- Dredge contractor to check wave and wind forecast and predict the likely duration of the event, and recommended relocation options available in the event that the action criteria is exceeded;
- GPA to notify all exporters of dredge contractors predictions and management options; and
- GPA and exporters to agree on preferred management option and exporters to agree action and notify dredge contractor.

If the 'action' level of 12 NTU at the seawater intake is exceeded, the GPA undertakes to:

- Contractor to implement agreed management option when agreed action level exceeded.

The GPA has undertaken modelling of dredge plume generation and dispersal to predict the likelihood and frequency of exceedences against the proposed 'alert' and 'action' levels under certain dredge locations and wind conditions. The probability of exceedences is predicted to be higher during April –July 2003 due mainly to winter wind patterns. Assessing the impacts of turbidity in this manner improves the GPA's ability to anticipate operational worst case conditions and provides an opportunity for the GPA to plan the dredging programme accordingly.

Summary

Having regard to the:

- GPA's commitment to finalise the draft WQMMP, which includes 'alert' and 'action' levels and management actions in the event levels are exceeded; and
- ongoing discussions with the live lobster holding industry on the matter,

it is considered that the EPA's objective for this issue can be managed.

3.1.4 Water Quality – impacts of turbidity on recreational activities

Description

Recreational activities currently occurring in Champion Bay and the Town Beach include: Swimming, windsurfing, sailing, scuba diving, sailing, recreational fishing, and water skiing.

Assessment

The EPA's objective for this issue is to ensure that the environmental values for recreational activities are maintained.

Modelling undertaken by the GPA indicates that the dredging activity will cause high levels of visible turbid plumes in the high use areas of Town Beach, the Northern Foreshores and the greater Champion Bay for periods of time. High levels of marine turbidity are likely to impact on the visual amenity of these areas during the construction phase.

The GPA has indicated that prevention or confinement of turbidity by the use of silt screens is not considered practicable due to the wave climate of Champion Bay. GPA therefore anticipates that turbidity guidelines for the maintenance of recreational and aesthetic values will be exceeded during the course of dredging.

Activities such as swimming and scuba diving in waters off Town Beach and Champion Bay are likely to be affected and temporarily displaced for short periods during the 10 month dredging period.

The GPA has committed to establishing a dialogue with the City of Geraldton and the community regarding the impacts of dredging on recreational activities. This will be achieved by way of communicating the impacts of dredging through the newspaper, radio, signs on beaches etc in consultation with the CoG.

Summary

Impacts from dredging on recreational and aesthetic values will affect activities such as scuba diving, fishing, and swimming in high usage areas such as Town Beach and certain sections of Champion Bay at certain times. Given that the impacts on recreational and aesthetic values are expected to be temporary (at certain times during the 10 month dredging campaign) it is the EPA's opinion the PEP will not unacceptably compromise the EPA's objective for this issue.

3.1.5 Marine Mammals – migratory Whales

Description

The dumping of 3.5 million cubic metres of dredge spoil offshore approximately 2.5 kilometres west of Point Moore has the potential to cause disturbance in an area through which Humpback Whales (*Megaptera novaeangliae*) pass during their annual northern and southern migrations along the coast of WA.

The Humpback Whale (*Megaptera novaeangliae*) is a listed threatened species (vulnerable category), and a listed migratory species under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999 (*EPBC Act 1999*).* It is also listed pursuant to Section 14(2) (ba) of the *Wildlife Conservation Act* as being in need of special protection.

The Humpback Whale's conservation status based in the IUCN (1994) category is "Vulnerable".

Humpback Whales migrate through the Geraldton area between mid June to July for the northbound migration and October to November for the South Bound migration (Jenner 2001, cited by URS 2001) (Figure 6). Southbound migration is typically closer to the coastline (Jenner 2001, cited by URS 2001).

Based on the limited information available, the PER has concluded that Champion Bay is not a recognised critical habitat area used by a large proportion of the Humpback Whale population (URS, 2001).

A Sea Dumping permit has been granted for offshore disposal of dredge spoil, in accordance with the Commonwealth *Environment Protection (Sea Dumping) Act 1981*. The GPA has also applied to Environment Australia (EA) for a Cetacean Permit in accordance with section 165 of the EPBC Act 1999, given the potential impacts on whales that is incidental to the purpose of the PEP. The permit will impose conditions on the GPA with regard to minimising the impacts of the PEP on whales that enter the project area.

The potential impacts of the PEP on whales are considered to be:

- the risk of dredge plants colliding with the whales; and
- the risk of underwater noise interfering with the whale's ability to communicate.

Assessment
The objective for this issue is that an ecologically significant proportion of the WA Humpback Whale population should not have their lifecycle adversely affected by the proposed dredged material disposal operations offshore Geraldton.

The area considered for assessment is considered to be Champion Bay and the proposed site of dredge spoil disposal.

In assessing the impacts of the PEP on Humpback Whales, the GPA has identified the whale's migration routes and seasons. Due to limited information available on the migration of the Humpback whales between Jurien Bay and the Shark Bay, the GPA has inferred the migratory path of Humpback Whales from anecdotal information provided by professional lobster fisherman, tourist operators (including whale watch charters), the Department of Conservation and Land Management (CALM) and the information described in Jenner (2001).

By comparing the proposed dredge disposal site to the inferred migratory path of the Humpback Whale, the GPA has concluded the disposal of spoil is likely to affect a small proportion of the migratory path and therefore would enable the whales to avoid disturbance by deviating around the disposal operations.

Should some whales enter the project area during the course of construction and dredging, the PER predicts that migrating Humpback Whales will encounter:

- a steady increase in underwater noise;
- localised dissipating plumes of turbid water; and
- a moving dredge plant between the project area disposal grounds.

The risk of collisions with whales occurring is low because the dredge plant is expected to be operating at slower speeds than regular shipping traffic and whales have the ability to move away from the dredge plant.

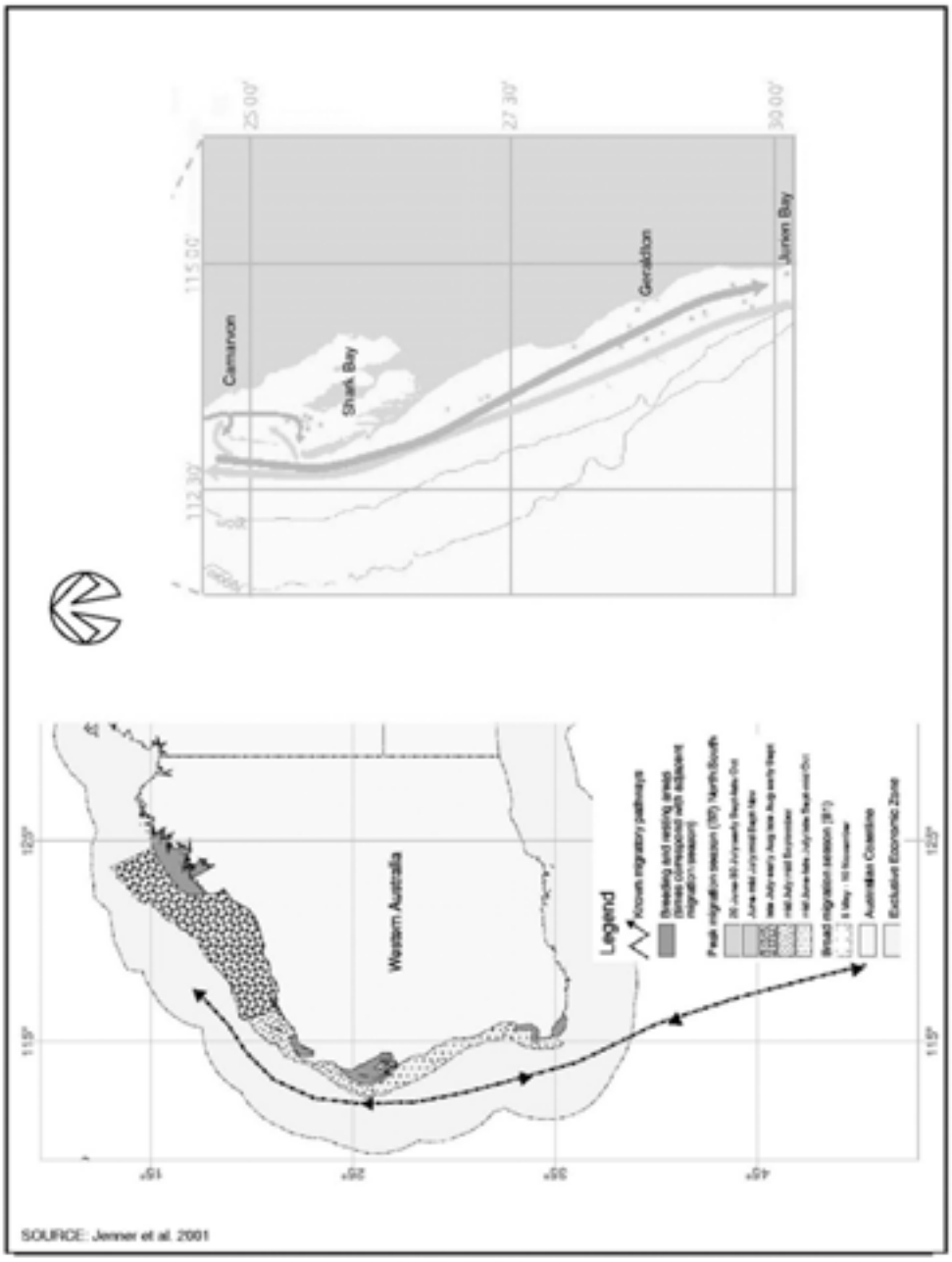

Figure 6: Migration routes of Humpback Whales (Source: Port Enhancement Project PER, URS, 2001)

With respect to the potential for underwater noise to impact on whales, the GPA has predicted that whales are likely deviate around the disposal operations. The PER has cited the research done by McCauley (1998) to support its predictions. McCauley *et al* (1998) monitored the response of whales to seismic operations and showed that whales initiated avoidance manoeuvres at distances greater than 4km but continued migrating southward once the seismic vessel has passed.

EA has assessed the sea dumping aspects of this proposal under the *Commonwealth Environment Protection (Sea Dumping) Act 1981.* The environmental conditions of the sea dumping component of the PEP, as required by EA, include Mitigation Measures for Protection of Cetaceans. These conditions require specific procedures for whale observations to be undertaken by the GPA at any time during the course of the dredging operations.

Based on their environmental investigations, the GPA has considered it is most unlikely that the life cycle of a significant proportion of Humpback Whales will be adversely affected by the PEP.

Should whales enter the project area during the course of the PEP, the impacts on these whales will be minimised by the controls available under the conditions of the Commonwealth Sea Dumping Permit.

The CALM has advised the EPA in its submission on the PER that the project is unlikely to have a significant environmental effect on the Humpback Whale population or individuals.

The GPA has committed to monitoring the occurrence of whales during the PEP construction period to confirm the GPA's predictions.

Summary

Having particular regard to:

- the ability of whales to move away from the disturbance;
- the GPA's investigations to support its conclusion that the PEP is unlikely to disturb a significant proportion of the Humpback Whale population;
- the Mitigation Measures for Protection of Cetaceans related conditions of the Commonwealth Sea Dumping Permit;
- CALM's advice that the project is unlikely to have a significant environmental effect on the Humpback Whale population or individuals; and
- the proponent's commitment to develop a Marine Mammal Monitoring Plan on advice of CALM and EA,

it is considered highly unlikely that the life cycle of a significant proportion of Humpback Whales will be adversely affected by this proposal.

3.2 Issue of Eastern Breakwater Impacts

The following environmental factors/issues have been identified as being consequent on the construction of the breakwater;

3.2.1 Marine Mammals - impacts on Sealions

Description

The construction of the proposed eastern breakwater, the shunting of trains and carriages and proposed modifications to the outer breakwater ('Seal Rocks') has the potential to disturb the local resident Australian Sealions (*Neophoca cinerea*).

The proposed eastern breakwater will be approximately 10 metres from the haul out area and will contain a railway spur line. There will be 30 metres between the tip of the railway spur and the outer breakwater. The locomotives are expected to decouple from the wagons at a point located 150 metres from the end of the spur line then move forward to within 10 metres of the end of the spur.

Sealions currently haul out in the harbour area. The outer breakwater is used as a haul out site by mainly sub-adult non-breeding Sealions (URS, 2001). The PER points out (based on CALM's advice) that in addition to the outer breakwater, Sealions also haul out on some of the nearby beaches, the northern breakwater and the ledges beneath the berths in the harbour.

The Australian Sealion (*Neophoca cinerea*) is listed pursuant to Section 14(2)(ba) of the *Wildlife and Conservation Act* as 'Other specially protected fauna'. This is due in part to a requirement to manage potential conflict with commercial fishing and recreational boating. The management objective is to mitigate activities that may significantly impact on the conservation of the species.

The Sealion's conservation status based in the IUCN (1994) category is "Lower Risk, near threatened" (Shaugnessy, 1999).

The breeding range of the Sealion extends from the Houtman Abrolhos Islands west of Geraldton, to the Pages (east of Kangaroo Island) in South Australia (Shaugnessy, 1999, cited by URS, 2001). Some of the breeding colonies in Western Australia occur at the Abrolhos Islands, Beagle Islands, Buller Island and North Fisherman Islands (near Leeman) (Shaugnessy, 1999, cited by URS, 2001). The breeding colonies are considered to be critical habitats of the Australian Sealions (Shaugnessy, 1999).

The impacts of the PEP on the local Sealion colony are two fold:

- the impacts from disturbance during the construction/dredging phase of the PEP; and
- the impacts associated with the ongoing disturbance to Sealions who haul out on Seal Rocks from proposed port activities on the proposed eastern breakwater.

Submissions

Concerns were raised through submissions on the issue of disturbance to Sealions. The main concern was that the PER has not addressed the issue of ongoing disturbance associated with the proposed eastern breakwater and port activities, which are proposed to occur on it. There were considerable concerns that the Sealions may permanently depart from the area as a result of continual ongoing disturbance from proposed port activities on the eastern breakwater.

The community of Geraldton considers that every effort should be made by the GPA to ensure the Sealions continue to reside in the port area.

The CoG has requested the GPA to seek further expert advice and take any remedial action required to promote the continuation of the Sealions residing in this location.

Assessment

The EPA's objective for this issue is to protect marine mammals consistent with the provisions of the *Wildlife Conservation Act 1950*.

The area considered for assessment is considered to be the outer breakwater or 'Seal Rocks' where Sealions haul out.

Sealions are likely to experience disturbance during the construction phase of the PEP through;

- construction of the eastern breakwater,
- a decrease in clarity of the water column as a result of dredging, and
- modifications to the outer breakwater.

The GPA's expectation is that the Sealions will temporarily vacate the area during the construction phase but on completion of the PEP, will return to the area provided that suitable haul out areas are incorporated in the design of the proposed breakwaters.

However, submissions have asked whether the impacts of continued and ongoing disturbance to the Sealions as a result of the close proximity of the proposed eastern breakwater have been considered in the assessment.

CALM has advised the EPA of its opinion that continual and ongoing disturbance from the eastern breakwater and related port activities have a high potential to cause individuals of the Sealion to depart permanently. The specific activities of concern are disturbance in the form of both noise and light interference during the periods where the trains are on the eastern breakwater. CALM has also indicated that the potential for disturbance from members of the public as a result of the close proximity to the eastern breakwater to Seal Rocks requires management.

In responding to submissions regarding the issue of ongoing disturbance from port activities, the GPA indicated that the disturbance from train movements will be short term (5-10 minutes) and infrequent (once every 5-6 hours two or three times a night). The GPA also indicated that the Sealions are known to habituate to non-threatening disturbance as is evidenced in Geraldton by their tolerance of large vessels entering and leaving the port at all times of the day and night, divers, crayboats, jetskis, and ski boats in their vicinity (URS, 2002). Therefore, it is expected the Sealions will also tolerate the short-term and occasional non-threatening disturbance associated with train movements on the rail spur.

To address the issue of disturbance from public access, the GPA has committed to funding the construction of a viewing shelter and fence across the end of the breakwater. The proposed viewing shelter and fence will be constructed only if it is considered necessary and supported by CALM and the CoG.

Additionally, the GPA has proposed to monitor the location and abundance of Sealions, to verify its predictions and to determine present and future abundance of Sealions, as part of the Marine Mammal Monitoring Plan (commitment 9). The collected data will be provided to CALM to assist in future management activities.

In summary, the GPA's strategies for maximising the potential for the Sealions to remain in the area, includes the following:

- modifying the original design of the breakwater to incorporate a 10 metre wide buffer between the end of the eastern breakwater and Seal Rocks;
- modifying the shape of the outer breakwater to provide Sealions with additional wave protection;
- improving the quality of the haul out areas by incorporating flat rocks in the design of the breakwaters; and
- commitment to funding a viewing shelter and wall across the end of the eastern breakwater, which incorporates viewing ports and in consultation with CALM and the CoG (if the viewing shelter is supported by CALM); and
- although not directly related to the issue of Sealion disturbance, the GPA has committed to providing an interpretive facility in the proposed CoG Marine Centre of Excellence Interpretive Centre building to raise the conservation profile of Sealions.

The GPA has sought the expert advice of Dr Nick Gales on the consequences of the Sealions not returning (quoted in the PER as an expert on Sealions). Dr Gales advised the GPA that if the Sealions did not return to the port area following construction, their overall population size in the mid–west coast would not be adversely affected (URS, 2001).

Dr Nick Gales has clarified that the advice was provided in the context of critical breeding components of the Sealion population. The advice quoted in the PER is correct insofar as the advice is based on the current understanding that the majority of sub-adult and adult male Sealions that haul out in the project area, are not a significant breeding component of the Mid-West Sealion population and further, the haul out area to be affected is not considered to be an important breeding habitat.

CALM has also advised in its submission on the PER that the project is unlikely to have a significant overall effect on the Australian Sealion population. The Australian Sealion population is reasonably stable and population numbers are unlikely to be affected. It is recognised however that there may be detrimental effects on individual Sealions living within the project area. If the Sealions were to remain at the site then disturbance and impact from port activities and the public should be appropriately managed.

The EPA acknowledges the Geraldton community's concern regarding the risk of Sealions permanently departing from the port area as a result of continual disturbance from port activities. Notwithstanding the nature conservation issues, the EPA is mindful of the social values associated with the local Sealions.

Dr Gales has advised that the regular occurrence of the Sealions in the port area is considered to be unique and is likely to have a high public appeal. The accessibility of the Sealions currently provides opportunities for education and enjoyment by the community of Geraldton. Furthermore, the unique opportunity to observe the Sealions within close proximity of port area and the foreshore is likely to contribute to the advocacy and the conservation of the species. Within this context the permanent departure of the Sealions from the area is likely to have some social implications.

It is acknowledged that there are difficulties in reliably predicting the effects of continued disturbance on the permanent residence of the local Sealions due to current gaps in knowledge and a lack of similar proposals to allow comparison. Hence the information to be gained from the GPA's proposed monitoring programme for Sealions will be valuable in assisting the GPA to confirm the overall effect of the PEP on the local Sealions, and to support the GPA's predictions.

Summary

Having particular regard to the:

- CALM's advice that the PEP is unlikely to have a significant overall effect on the Australian Sealion Population;
- GPA's management strategies and commitments in maximising the potential for the Sealions to return and permanently reside in the port area; and
- GPA's commitment to develop a Marine Mammal Monitoring Plan (commitment 9) which will include monitoring the presence of Sealions to determine the effectiveness of the Sealion management strategies,

it is concluded that the GPA, through its commitments, has demonstrated that it is undertaking all reasonable and practicable measures in maximising the potential for the Sealions to return and continue to reside in the port area. However, should the permanent departure of the Sealions from the area occur, it will not affect the conservation status of the Australian Sealions.

The EPA has therefore concluded that the PEP is unlikely to compromise the EPA's objective for this issue.

3.2.2 Water Quality - impacts of decreased flushing (inner harbour)

Description
Deepening of the harbour basin from 9.3 to 12.1 metres and construction of the eastern breakwater will lead to the semi-enclosure of the marine waters in the harbour basin and Town Beach, and lead to a decrease in water exchange with surrounding waters. Water exchange between the ocean and the harbour waters is an important factor for maintaining water and sediment quality within the port.

The breakwater will also lead to a semi separation of inner harbour waters from Town Beach waters.

The activities and 'sources' that currently affect water quality in the harbour are considered to be:
Sediments
The regular propeller stirring of contaminated silty sediments in the harbour basin and associated release of metals such as copper, lead and zinc into the water column;
Shipping
The flaking of ship anti-fouling paints;
Maintenance activities associated with small vessels in the GPA recreational boat harbour;
Terrestrial inputs
Stormwater from the port's catchment;
Loading and unloading activities, particularly those that relate to fertiliser and livestock loading;
Metal accumulation from ore dust and spillages; and
Historical inputs
The in-water removal of ship anti-fouling paints.

Sediment samples taken from the harbour basin indicated levels for tributyl tin (TBT), copper, lead and zinc were above 'screening' levels recommended in ANZECC *Interim Ocean Disposal Guidelines*. Some contaminant levels were too high to enable environmentally acceptable disposal in unconfined open waters. The high sediment contaminant levels are due to historic spillage of copper, lead and zinc ore during loading which have gradually accumulated in harbour sediments and from dockside washdown operations (URS, 2001a). The contaminated sediments pose an environmental risk and as such need to be removed from the harbour.

As the silty sediments from the harbour are unlikely to be suitable for disposal at sea they will be secured and buried within the lined northern reclamation area as part of the GPA's Ore Spillage Sediment Remediation Programme. The programme of relocating contaminated silts from the harbour basin is not part of the PEP proposal and will proceed irrespective of the PEP gaining approval. The programme was initiated to address a number of Department of Environmental Protection (DEP) licence requirements that were identified through licence inspections and water and sediment quality monitoring results.

The contaminated silts will be relocated to the northern reclamation area prior to the harbour deepening works proposed in the PER. The DEP has advised of its general agreement with the GPA's remediation programme.

In terms of existing water quality, the GPA's consultants have undertaken a review of water quality data for Town Beach and the inner harbour basin and concluded that apart from episodic periods of high turbidity from shipping movements and associated high concentrations of TBT, the water quality of both areas is relatively good.

Values for physical and biological water quality parameters in the port and Town Beach are very similar to background values recorded in the open waters of Champion Bay (PER Addendum Report, December 2001), suggesting that terrestrial inputs to both areas are generally small and/or that exchange between both areas and the open waters of the bay are efficient (URS, 2001).

Long-Term maintenance of water quality objectives
The EPA has been developing a management framework based on defining Environmental Values and Objectives to protect coastal waters and marine environment systems. The EPA is also developing quantitative Environmental Quality Criteria (EQCs) for assessing whether the Environmental Quality Objectives (EQO) have been met. The ANZECC guidelines (2000) provide an authoritative and comprehensive basis for developing and applying guidelines to support the management framework.

The GPA has designated the following Environmental Values (EVs) to the project area:

- Ecosystem health.
- Fishing and Aquaculture.
- Recreation and Aesthetics.

The EPA document Perth's Coastal Waters, Environmental Values and Objectives, (EPA, 2000) proposes six EQOs to protect the EVs. These EQOs are for the maintenance of:

- ecosystem integrity (naturally diverse and healthy ecosystems);
- aquatic life for human consumption (seafood safe to eat);
- primary contact recreation values (waters safe for swimming);
- secondary contact recreation values (waters safe for boating); and
- aesthetic values (pleasant, attractive environment).

The draft Cockburn Sound Environmental Protection Policy now defines another EQO for the marine environment for the maintenance of aquaculture.

Submissions
Submissions are concerned over the potential water quality deterioration that may occur in the harbour following the construction of the eastern breakwater.

Assessment
The EPA's objective for this issue is to maintain or improve marine water quality to protect environmental values, in accordance with Environmental Quality Objectives (EQOs) defined above and water quality guidelines provided in Australian and New Zealand Water Quality Guidelines (ANZECC 2000).

The area to be assessed is the marine waters within the harbour.

The GPA has undertaken a review of existing water quality data and conducted numerical modelling (flushing studies) to assess the impacts of the proposed eastern breakwater on the water quality in Town Beach and the inner harbour.

The numerical model used to assess the flushing implications of the eastern breakwater has been satisfactorily validated against local current meter data in Champion Bay.

In summary, the flushing study predicts that the eastern breakwater will increase the flushing time of the harbour from 3-5 to 4-6 days in summer and from 4-7 to 7-10 days in autumn. The PER concludes that the change in flushing will result in negligible water quality changes.

The EPA notes that a quantitative assessment and prediction of water quality and its ecological implications as a result of the reduced flushing and increased depth have not been made during the course of GPA's environmental investigations.

The GPA's consultants have indicated that due to the lack of quantitative data on contaminant, nutrient and bacterial inputs to the main harbour or Town Beach it would be difficult to reliably predict water quality following completion of the PEP. It was also indicated through a review of existing water quality data that water quality problems have not been recorded in the harbour or Town Beach and hence the risk of water quality deterioration resulting from the small change in flushing rates following completion of the PEP would be low.

In reducing the risk of water quality deterioration occurring, GPA in consultation with the DEP, has initiated a programme to reduce the environmental impacts of port activities in the GPA's 'Bulk Handling Action Plan' in accordance with DEP licence conditions and previous environmental licence inspections for the port. This plan aims to improve port management practices to reduce contaminant and nutrient inputs will be regularly reviewed with the DEP.

Contaminant Input
Following the completion of the PEP, inputs of tributyl tin (TBT) will continue to be a toxicant of concern. TBT is leached into the water from antifouling paints on the hulls of vessels. TBT in waters and sediments are likely to have significant impacts on sensitive marine biota, particularly shellfish.

In the PER and response to submissions the GPA indicated that its existing measures on TBT management include:

- banning in-water hull cleaning of any ship, fishing boat or other vessels in port waters;
- not using TBT paints on its line boats, barges and pilot launch;
- requesting the harbour tug contractor not to use TBT anti-fouling paints;
- removing historically TBT-contaminated silts from the harbour by instigating the Ore Spillage Remediation Programme;
- monitoring TBT levels on slipways and boat maintenance areas in the Fishing Boat Harbour to confirm that there is no illegal use of TBT anti fouling paints; and
- monitoring TBT levels in port waters in its monitoring programme.

With respect to other contaminant inputs, the 'Bulk Handling Action Plan' aims to minimise spillage of ore during loading and unloading events which is considered to be a key contributor of contaminants.

Nutrient Input
Deeper and calmer waters within the harbour will magnify the impacts of local nutrient inputs, resulting in accumulation of total nutrients, greater nutrient assimilation and more algal biomass. Impacts on water quality can result in high nutrient concentrations, lower dissolved oxygen concentrations, high chlorophyll concentrations, and increased turbidity.

The GPA, in its response to submissions, has indicated that there will be no new sources of nutrients to the harbour as a result of the proposal.

Existing known nutrient inputs to the harbour include spillage during the unloading of fertilisers, animal wastes from the loading of livestock and stormwater inputs.

The GPA is addressing and improving management practices at the port with a view to minimising nutrient inputs through the implementation of the Bulk Handling Action Plan.

The Bulk Handling Action Plan also includes the diversion of stormwater drainage from direct entry to the harbour basin.

The GPA has also indicated there are plans to sewer the port to reduce bacterial and nutrient input into the harbour waters.

The GPA is required to continue to undertake water and sediment quality monitoring in accordance with the water and sediment quality criteria documented in the DEP licence to determine concentrations of nutrients, accumulation of contaminants and the effectiveness of the Bulk Handling Action Plan and the port's management practices.

Long-Term maintenance of water quality objectives
The EPA guidelines for the proposal require the GPA to identify interim environmental values within port-controlled waters and establish Environmental Quality Objectives (EQOs) for those values (including appropriate levels of protection for EQO 1, maintenance of ecosystem integrity). The GPA should pay particular attention to waters within the inner harbour basin, waters outside and adjacent to the port and the waters within the enclosed Town Beach. With respect to EQOs other than ecosystem integrity, the EPA' objective, as a starting point, is to protect all social values.

In the long term, these EVs and EQOs should be revised and formally established through a consultative process that involves all key stakeholders, including the general community.

The GPA has defined, the levels of protection it intends to achieve for the EQO 'Maintenance of Ecosystem Integrity' in the long term by designating zones for the inner harbour basin and Town Beach. The GPA has proposed designating a high (some small changes from natural variation) level of protection for Town Beach and a moderate (moderate changes from natural variation) level of protection for the inner harbour basin. No areas have been designated as low-level protection. The proposed zones have been modified from those in the PER during the assessment to reflect the proposed long-term objectives following the completion of the PEP and in response to the concerns raised in public submissions.

The GPA has indicated that the other EQOs that should apply to Champion Bay and Town Beach include:

- Maintenance of Aquatic Life for human consumption;
- Maintenance of Aquaculture;
- Maintenance of Primary Contact for Recreational Values;
- Maintenance of Secondary contact recreation values; and
- Maintenance of Aesthetic Values.

In addition to the above EQOs, the EPA considers that the following social values should be maintained in the inner harbour area due to the present and ongoing use of the harbour for recreational activities and also aesthetic considerations;

- Maintenance of Aquatic Life for human consumption;
- Maintenance of Primary Contact for Recreational Values;
- Maintenance of Secondary contact recreation values; and
- Maintenance of Aesthetic Values.

The EPA is recommending a condition (condition 7), which complements the GPA's commitment to prepare and implement a Water Quality Monitoring and Management Programme. This condition provides for the establishment of interim EQOs for environmental and social values and levels of protection in the harbour and Town Beach and monitoring against the EQOs.

The EPA notes that for this recommended condition, the approach documented in the ANZECC (2000) Water Quality Guidelines should be applied within the context of the marine environmental quality management framework being developed by the EPA (EPA, 2000). Through this approach the GPA will be required to identify ecosystem health indicators and develop and implement site-specific environmental quality criteria for measuring ecosystem health. The site-specific criteria will also be reflected in the monitoring requirements set under the operating licence required by the DEP. The proposed environmental quality criteria will need to be reviewed by the EPA.

Management strategies are required to be implemented in the event the EQOs are not being achieved.

Summary
Having particular regard to the:

- GPA's conclusion from flushing studies that the eastern breakwater will increase the flushing time of the harbour from 3-5 to 4-6 days in summer and from 4-7 to 7-10 days in autumn;
- GPA's implementation of the Bulk Handling Facility Action Plan to reduce the environmental impacts of port activities and reduce inputs to the inner harbour basin so that the risk of adverse water quality occurring in the harbour is minimised;
- GPA's implementation of its GPA's Ore Spillage Sediment Remediation Programme, to remove contaminated silts and reduce the contaminant load within the harbour;
- ability of the DEP to manage product handling practices at the port under licence conditions issued under Part V of the *Environmental Protection Act 1986*;
- GPA's identification of EQOs and levels of protection to be maintained in the port area and Town Beach; and
- GPA's commitment to prepare and implement a Water Quality Monitoring and Management Programme,

it is the EPA's opinion that water quality within the port can be maintained to meet the EPA's environmental objective for this issue provided that recommended condition 7 is implemented and there is improved and satisfactory management of nutrient and contaminant inputs into port waters as part of the implementation of the GPA's Bulk Handling Action Plan and compliance with DEP licence conditions (including water and sediment quality monitoring).

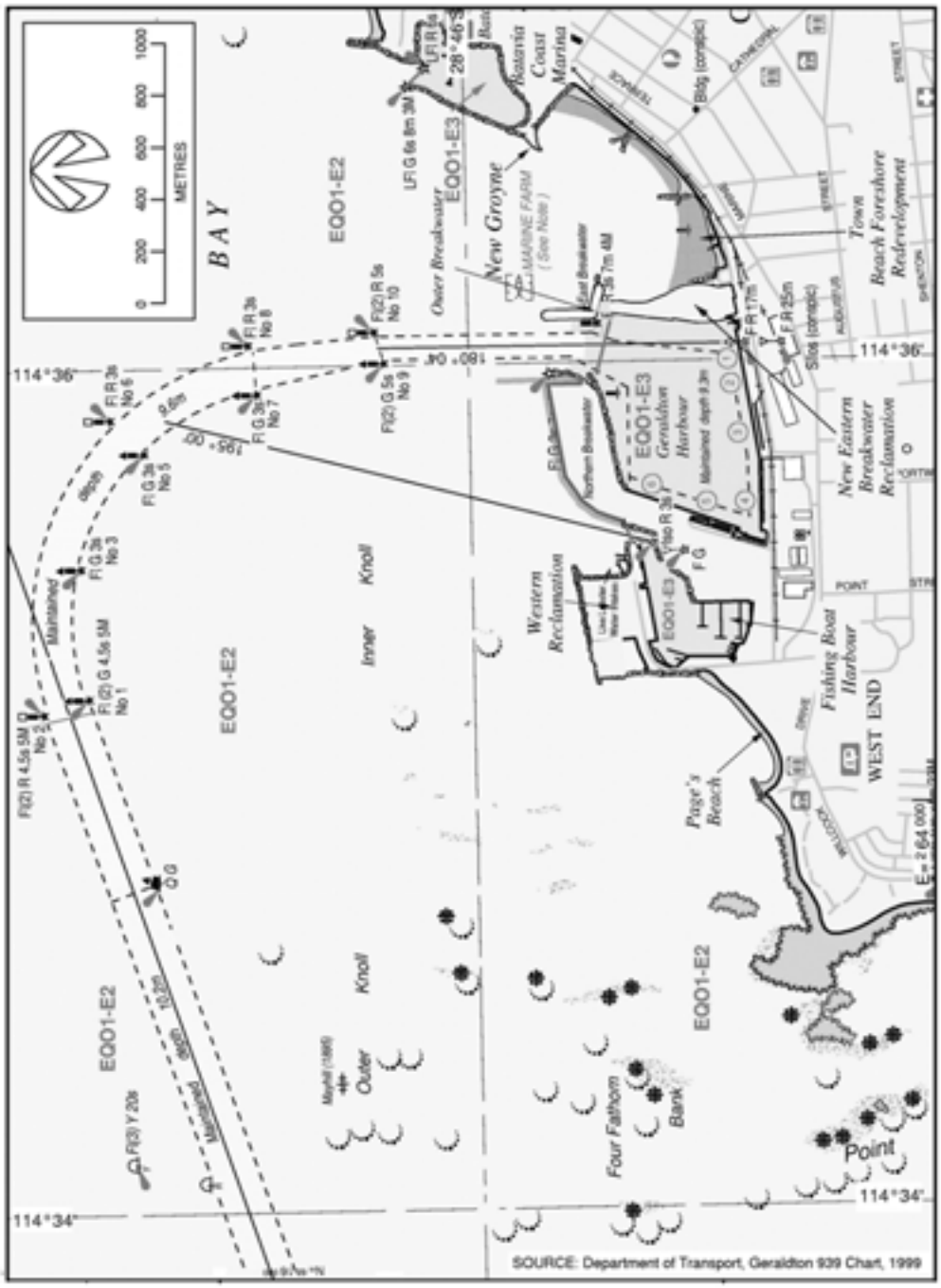

Figure 7: **Environmental Quality Objective for Maintenance of Ecosystem Integrity – Levels of Protection. Note: E2 – High Level of Protection is proposed for Town Beach; E3 – Medium level of protection is proposed for the inner harbour basin.**

3.2.3 Water Quality – impacts of decreased flushing (Town Beach)

Description
The eastern breakwater will lead to a semi separation of port waters from Town Beach waters and lead to a decrease in water exchange with surrounding waters.

The PER has indicated that through the review of available water quality data (particularly for pH, DO, nutrients and chlorophyll 'a'), the existing water quality in Town Beach is similar to that in Champion Bay and has suggested that there may be adequate flushing between Town Beach and Champion Bay. The episodic drift of turbid plumes into Town Beach from the re-suspension of silts generated by the regular movements of shipping currently affects water quality in Town Beach. Construction of the eastern breakwater will prevent this occurrence in the future.

Submissions
Concerns were raised through public submissions in regard to:

- the potential for nutrients and bacteria from septic tanks in Geraldton to leach into the groundwater and eventually impact on the Town Beach area;
- the reduced flushing of the Town Beach area will result in water quality deterioration and related public health issues;
- water quality in Town Beach being maintained at the highest level possible;
- the influence of water quality in the harbour on water quality in Town Beach;
- the potential for a reduction in flushing is likely to enhance the conditions for stingers to be more prolific; and
- the potential for reduction in flushing is likely to enhance conditions for seagrass/wrack to build up on Town Beach.

Assessment
The EPA's objective for this issue is to maintain or improve marine water quality to protect environmental values, in accordance with the EQOs defined in section 3.2.2 above and water quality guidelines provided in Australian and New Zealand Water Quality Guidelines (ANZECC 2000).

The area to be assessed is the waters of Town Beach.

The GPA's flushing study indicates that the increase in flushing times at Town Beach will be minor. The eastern breakwater will increase the flushing time of the Town Beach area from 15-30 hours to 20-40 hours in summer and from 20-45 hours to 30-60 hours in autumn.

From the modelling results, the GPA has concluded that the risk of water quality deterioration occurring in Town Beach is low (URS, 2001a).

The key pollutant load to Town Beach is considered to be turbidity and TBT from the silt plumes generated by frequent shipping movements in the harbour. Bacteria and nutrients from illegal discharge from the recreational boat harbour and livestock loading operations at the port may also be a contributor. The GPA has predicted the construction of the eastern breakwater will serve as a barrier to the silt plumes from the harbour that result from shipping movements. As a result, the GPA anticipates the water clarity in Town Beach will improve and dissolved metal concentration will decrease. In addition, the GPA's removal of contaminated silty material from the harbour basin, and its relocation to the northern reclamation site (as part of GPA's ore spillage remediation project), will reduce the source of contaminant loads from the harbour.

Upon completion of the eastern breakwater, the results of modelling show that waters exiting the main harbour in summer are likely to flow through the northern edge of Town Beach as it disperses northward. In winter, the modelling indicates that most flow will exit the port and head west. Therefore, should water quality deterioration occur in the harbour, it is unlikely to significantly influence water quality in Town Beach.

Other sources of contaminants to Town Beach include occasional inputs of nutrients and bacteria from stormwater, the existing small boat harbour and from existing septic tanks.

The GPA has not investigated the potential for nutrients and bacteria to leach from septic tanks in Geraldton and make its way to Town Beach. Routine water quality monitoring undertaken by GPA since 1994 does not indicate a bacterial or significant nutrient problem in Town Beach. The GPA in the response to submissions has indicated that the Water Corporation is presently installing a reticulated sewerage system near Town Beach to reduce the number septic tanks presently in the area, thereby reducing the potential for contamination from this source in the future.

In response to concerns about the potential for accumulation of stingers and seagrass wrack in the Town Beach area, the GPA has indicated that this situation already exists. The PER points out that there is insufficient information on the factors that control the abundance and distribution of jellyfish stingers and algal/seagrass wrack to competently assess the implications of the PEP. In the response to submissions, the GPA envisages that a slight increase in residence time of jellyfish in the area could occur as a result of the PEP, however it is impossible to predict the effect on abundance of jellyfish.

In terms of algal/seagrass wrack, the PER has indicated that the PEP is unlikely to affect the amount of wrack expected to enter the Town Beach area from the north and therefore wrack accumulation at Town Beach should be no worse than presently occurs.

Given the minor reduction in water exchange as a result of the eastern breakwater, it is unlikely that the PEP will significantly affect the amount of seagrass/algal wrack and jellyfish in Town Beach.

Recommended condition 7 will require the GPA to monitor and confirm the adequacy of waters in Town Beach for its designated EQOs. The EQOs that are considered to be relevant to Town Beach include:

- Maintenance of Ecosystem Integrity – High Level of Protection;
- Maintenance of Aquatic Life for Human Consumption;
- Maintenance of Aquaculture;
- Maintenance of Primary Contact Recreational Values;
- Maintenance of Secondary Contact Recreational Values; and
- Maintenance of Aesthetic Values.

Summary

Having particular regard to the:

- GPA's conclusion that the flushing implications of the eastern breakwater will be minor;
- GPA's conclusion that the eastern breakwater will act as a barrier to the turbid waters generated by the movement of ships in the harbour;
- the identification of EQOs and levels of protection to be maintained in Town Beach; and
- GPA's commitment to prepare and implement a Water Quality Monitoring and Management Programme which will include water quality monitoring at Town Beach,

it is the EPA's opinion that long-term water quality within Town Beach can be maintained to meet the EPA's environmental objective for this issue provided that recommended condition 7 is implemented.

3.2.4 Noise Impacts – impacts of rail noise

Description

Currently, trains enter the Port of Geraldton for loading and unloading activities from the east. This involves the movement of trains through Geraldton along the foreshore of Town Beach.

Following the implementation of the Geraldton Southern Transport Corridor (STC) project, trains will enter the Port of Geraldton from the west. The implementation of this proposal would allow the removal of the current rail line along the city foreshore allowing the redevelopment of this area, and remove the existing social and environmental effects associated with this rail line alignment through Geraldton (EPA, 2001).

The GPA and relevant government departments have examined the various rail unloading alternatives as a consequence of the STC and the opportunities that it offers from a transport efficiency perspective. A Transport Working Group has examined the various rail unloading alternatives following the commissioning of STC project with a view to identify a practical rail unloading operations solution for the Port of Geraldton. Following the review, the GPA expressed its preference for the option of extending the railway line out onto a breakwater into Champion Bay. The option of constructing the railway line on the eastern breakwater is preferred by the GPA because it:

- completely removes the railway line from the town beach foreshore;
- locates the railway line away from the nearest residential areas thus resulting in a reduction in noise received by those areas in comparison with existing operations and other options;
- enables the port to handle long trains efficiently; and
- provides an identifiable eastern boundary to the port.

Accordingly, the GPA has included the placement of the railway line on the eastern breakwater as part of the PEP proposal.

The construction and relocation of the existing rail line onto the proposed eastern breakwater has the potential to impact on the amenity of noise sensitive premises in the vicinity of the proposed eastern breakwater and the port.

Essentially, shunting trains onto the proposed eastern breakwater has the potential to redistribute existing noise emissions to other noise sensitive areas.

The STC proposal was recently assessed by the EPA to examine the environmental impacts associated with the proposed road/rail transport corridor on an area that is currently experiences relatively low levels of noise (EPA, 2001). Consideration was given during the assessment to the development of a noise criterion to apply to road and rail traffic based on measurements of background noise levels. The project specific noise criterion agreed for this project for the overnight period (calculated over the period 10pm to 6pm) was 55 $dBL_{Aeq,\ 8h}$ (or as low as can be reasonably and practicably be achieved below this level) applying to both road and rail traffic.

Submissions

Some public submissions expressed concern over the proponent's assessment of noise impacts from the relocation of the train line on the proposed eastern breakwater. The specific concern was that the PER has not assessed the impacts of noise from the movement and shunting of trains and carriages on the eastern breakwater on noise sensitive premises located at the Batavia Coast Marina (BCM) and the upper Town Beach foreshore areas. The submissions believe that sound would be attenuated to a lesser degree across the open water between the proposed eastern breakwater and the BCM and, therefore, the amenity of residents in the new marina area may be impacted.

The CoG, in its submission indicated that noise emissions from the movement and shunting of trains and carriages on the eastern breakwater should comply with current EPA standards.

Assessment

The area considered for assessment is the proposed relocation of the rail line on the eastern breakwater and the existing and future noise sensitive premises in its vicinity.

The EPA's objective for this factor is to protect residents from potential noise impacts resulting from the movement and shunting of trains on the eastern breakwater by ensuring that predicted noise levels meet statutory requirements and acceptable standards.

If the broader PEP proposal were to be implemented, it would be subject to the *Environmental Protection (Noise) Regulations 1997*. However, the noise regulations do not apply to trains and there are no statutory regulations or criteria relating to train operations in Western Australia. Elements of the PEP proposal, such as those involving the shunting of trains on the eastern breakwater, would therefore not be subject to the regulations.

The potential noise impact of relocating the rail line on the eastern breakwater were not identified as an issue by the GPA during the referral stage, and was not addressed in the PER. However, concerns in regard to this issue were expressed by the community following the release of the PER document and consequently the GPA addressed the noise implications of the various rail unloading alternatives. The issue of noise impacts from the eastern breakwater was addressed in a separate document and the results were made public through an addendum to the PER during the public review period.

Initially, the acoustic consultants for GPA conducted acoustic noise propagation calculations to determine the noise levels that would be received from 62 wagon trains at the closest residence being 40 metres from existing tracks, near the corner of Francis Street and Marine Terrace.

The initial noise assessment concluded that the noise generated from the locomotive and take-up (shunting) received around the Francis, Gregory and Fitzgerald Streets area would be less than the noise which would be received under existing operations. This is mainly due to the increased separation distance to noise sensitive premises as a result of moving the rail line onto the eastern breakwater.

Public submissions expressed concern regarding the potential noise impacts on noise sensitive premises further north of the Francis, Gregory and Fitzgerald Streets area. Further consideration was subsequently given by the GPA to examining the noise implications of train movements on the eastern breakwater at the corner of Cathedral Avenue and Foreshore Drive and the residential areas at BCM. The additional noise assessment gave consideration to maximum noise levels and L_{Aeq} (average) noise levels of trains unloading during the night period based on two trains per night with each train having 62 wagons.

The noise assessment concluded that maximum noise levels are likely to increase for noise sensitive premises to the north of the Francis and Gregory Streets area. The results show that the noise to be received at residences at BCM and along the foreshore drive near the Ocean Centre Hotel will be marginally higher for the eastern breakwater option (up to 3dB(A) higher in some areas).

As a consequence of the STC project, the railway line that currently runs along the foreshore will be removed. It is therefore expected that whilst maximum noise levels may be expected to increase slightly, the average noise levels will decrease for noise sensitive residences located to the northeast of the eastern breakwater.

Recent noise calculations undertaken by the GPA's acoustic consultants have shown that the calculated L_{Aeq} noise levels based on two trains operating per night will result in an L_{Aeq} noise levels of 47 dB(A) at the corner of Cathedral Street and Foreshore Drive and 40 dB(A) at the residences at BCM. The L_{Aeq} noise results are summarised in the table below:

CALCULATED L_{Aeq} NOISE LEVEL (from Herring Storer Acoustics, 2002)

Location	Night Period L_{Aeq} Noise Level (dB(A))		
	Existing*	With Eastern Breakwater	Change
Corner Gregory St and Marine Tce	69	49	-20
Corner of Cathedral St and Foreshore Drv	51	47	-4
Northern Marina	41	40	-1

* Including train movements to and from unloading facility

The GPA's calculations show that for locations further north from the port, the reduction in the night noise levels, would be between 1 and 4 dB(A). This is because trains will no longer pass these areas on the way to and from the port following the commissioning of the STC project.

Summary

The EPA notes that the degree of increase in noise levels as a result of locating the rail line on the eastern breakwater is expected to be of low. Accordingly, the EPA considers that based on the noise assessment undertaken by the GPA, the proposal to construct and operate a railway line on the proposed eastern breakwater should not significantly impact upon the amenity of noise sensitive areas in Geraldton.

The EPA would expect that, where undeveloped land in the vicinity of the port and eastern breakwater is zoned urban in the Geraldton Town Planning Scheme, land developers will be responsible through urban design, acoustical treatment and building construction for ensuring future residents are not exposed to unreasonable noise emissions.

3.2.5 Visual Impacts

Description

The proposed eastern breakwater and associated rail line will disrupt existing ocean views from the Town Beach area.

Submissions

The impact from the eastern breakwater on ocean panoramas as viewed from Town Beach is an issue of concern to the Geraldton community.

Assessment

The EPA's objective for this factor is to ensure that the visual amenity of the area is not unduly affected by the proposal.

The area considered for assessment is the eastern breakwater, port areas and Town Beach.

The GPA holds the view that the general level of visual amenity arising from existing built infrastructure along the Geraldton foreshore is low.

Following the acceptance of the Town Beach Foreshore Redevelopment Plan by the City Council, the GPA produced an artist's impression of the eastern breakwater and rail line, which was reproduced on the front page of the local newspaper on 21 December 2001. The artist's impression of the eastern breakwater provided an opportunity for the members of the public to make an informed decision on the visual impacts of the proposal.

The CoG in its submission on the PER indicated that the GPA should provide facilities or visual treatments on the proposed eastern breakwater to screen the proposed rail and port related facilities from the recreational areas of the foreshore.

In its response to submissions, and to minimise visual impacts the GPA has indicated that the proposed eastern breakwater will soften the view across the port by incorporating visual treatments such as trees or recreational facilities, to be determined in conjunction with the CoG.

Summary

Having regard for the existing port setting of the project, it is considered that the eastern breakwater will not unduly compromise the EPA's objective for this factor. However, it is recognised that

visual amenity from Town Beach will be partially impaired by the proposed eastern breakwater and rail line.

The issue of visual discoloration of the sea from an increase in turbidity is addressed under the issue of dredging impacts.

3.3 Issue of Coastal Stability

The following environmental factors/issues have been identified as being consequent on the environmental impacts of the PEP on the issue coastal stability:

3.3.1 Coastal stability

Description

The PEP includes the construction and extension of breakwaters, the reclamation of land using dredge spoil and the deepening and widening of the shipping channel. These activities and components of the PEP have the potential to disrupt coastal processes.

The various natural and artificial structures along the shoreline of Geraldton, including breakwaters and groynes, have affected sediment movement from the beaches south of Geraldton. It has been estimated that port structures reduces the annual rate of sand feeding to this stretch of the coastline by about 10000 cubic metres per annum (MP Rogers and Associates, 2001).

Based on the coastal studies undertaken by M P Rogers and Associates (1996, 2001) and Coastal Engineering Solutions (2001), the PER has described the stability of Geraldton's coastline as follows:

Coastline South of Geraldton - The coast to the south of Geraldton Port has been accreting sand at significant rates. The near shore reefs and port structures at Point Moore trap sand and prevent sand being moved to Town Beach.

Town Beach - Town Beach is a contained system with sediment movement restricted by the GPA recreational boat harbour to the west and the Batavia Coast Marina (BCM) to the east.

BCM to Chapman River - The net longshore sediment transport along the section of the coast between the BCM and the Chapman River is to the north. Some minor localised erosion has occurred in places, but overall the shoreline is generally stable, in part because of regular sand nourishment at an average rate of about 5000 cubic metres per year.

North of Chapman River – Sunset Beach to the north of Chapman River is feeding sand to the south and has eroded some 40 metres in total since 1942.

Submissions

The key issues that were raised through the public submissions include:

- potential for the PEP to increase the existing problems of beach erosion at certain beaches;
- uncertainty associated with the responsibility for the long term management of beach erosion; and
- mitigation measures required to be undertaken.

Assessment

The EPA's objective for this factor is to maintain the stability of beaches and dunes and to maintain the integrity, function and environmental values of any foreshore/dune areas.

Altering the bathymetry of the sea bed by the deepening and widening of the shipping channel is likely to influence the wave energy reaching the shoreline which in turn can affect the stability of the beach (URS, 2001).

Studies undertaken by Coastal Engineering Solutions (2001) for the GPA indicate that dredging and widening the shipping channel will modify the existing wave climate at the shoreline to the extent that there will be increased erosion pressure on some beaches north of BCM. The PER indicates that although the channel is likely to have some impact on all of the northern beaches shoreline in term of affecting the sediment transport capacities, the most significant potential impact on the beaches occurs at about 100 to 200 metres north of the BCM where, in a localised area, the sediment transport capacity is predicted to approximately double from 7000 to 15000 cubic metres per year. In addition, a 20% increase in net sediment transport northwards, from the eroding beach south of Chapman River, is predicted to occur (URS, 2001).

In summary, the PER has concluded that the PEP will increase the potential erosion rate for the BCM to Mable Street coastal precinct and for the beach immediately south of the Chapman River mouth.

Coastal stability management

The CoG, together with the GPA and the Department of Planning and Infrastructure (DPI), is developing a Foreshore Stabilisation and Enhancement Strategy for the foreshore between the BCM and Sunset Beach, north of the Chapman River. As part of the commitments for the PEP, the GPA has proposed to contribute to this overall strategy by providing ongoing sand bypassing and nourishment to the northern beaches.

The CoG, with assistance from the GPA and DPI, commissioned a study (M P Rogers and Associates, 2001), to evaluate the erosion problem at the northern beaches. The study's objectives were to recommend a strategy for stabilising the coast north of the BCM and to determine public use preferences for the affected shoreline.

The first stage of the study has been completed and has recommended that additional contributions from GPA be made to mitigate the impacts of the proposed PEP by way of:

- beach nourishment with dredged sand from the PEP or the STC; and
- ongoing sand bypassing, eg 7000 to 15000 cubic metres per year of sand from Pages, Explosives and Point Moore beaches being trucked to the northern beaches on an ongoing and regular basis.

At this stage, the GPA expects that the annual input of sand required to undertake beach nourishment at a rate which is consistent with long-term shoreline stability, will be between 5000 to 10000 cubic metres (URS, 2001).

Stage 2 of the study (The Geraldton Northern Foreshore Stage 2) will be investigating, in detail, the options available to stabilise the northern beaches. Some the options will include, ongoing sand bypassing, a combination of sand by passing and structural schemes, and schemes with no bypassing. The second stage of the study is nearing completion and the findings and recommendations will be presented to the community of Geraldton for comment.

The annual volume of sand required to maintain the stability of the northern beaches (as part of GPA's contribution to the overall strategy) would be influenced by the recommendations of the Stage 2 Geraldton Northern Foreshore Study, the CoG's final adopted strategy and the public use preferences for the affected shoreline.

In responding to the concerns raised through the public submissions with regard to the long-term management responsibility of managing beach erosion, the GPA has indicated that the CoG is responsible for the maintenance of beaches within its municipal boundaries. However, the GPA has committed to (commitment 13) contributing to the management of the northern beaches by regular monitoring of the shoreline position of the beaches and the provision of sand nourishment on a regular basis within the context of the overall CoG strategy. At this stage, the GPA anticipates that it will need to bypass sand to the northern beaches in perpetuity.

Accordingly, the GPA has committed to developing and implementing a Northern Beaches Stabilisation Programme (Commitment 13) as part of the broader City of Geraldton Foreshore Stabilisation and Enhancement Strategy, which includes:

- regular beach monitoring;
- volumes of sand nourishment and timing of placement;
- location and scale of stabilisation works; and
- management of dust, noise and traffic impacts during nourishment.

The above programme will be developed on advice of the CoG and the DPI (Coastal Facilities Branch).

The CoG, in its submissions to the EPA has indicated that although the GPA has committed to monitoring and renourishing the northern beaches, the PER did not make a commitment to provide any structural features (eg, groynes, breakwater extension, shore features). It is noted that the option to include structures as part of the broader coastal strategy for the northern beaches has not been determined. Should structures form part of the overall selected long-term strategy then it will require endorsement by Council.

The overall CoG coastal management strategy, including any structures proposed, is separate to the PEP proposal and is currently out for public comment.

The CoG has advised the EPA that it intends to write to the GPA to initiate the joint preparation of a Memorandum of Understanding (MOU) regarding the management arrangements and the ongoing maintenance of the programme. It is the expectation of the EPA that the GPA's final Northern Beaches Stabilisation Programme will be consistent with any agreements reached between the GPA and CoG, which may take the form of an MOU.

It is noted that on-going discussions are being held between the GPA, the CoG and the DPI to progress the MOU and the final strategy to be adopted.

Summary

The GPA has reviewed the available data and studies, and has reached the following conclusions in the PER:

- the beaches to the north of the BCM require sand nourishment now to remain stable, and may require additional nourishment once the PEP has been completed;
- it is important for the rate of nourishment to match the demand. Too little sand input will result in shoreline erosion. Too much nourishment will result in shoreline accretion and has the potential to change the nature of some beaches; and
- there may be some value in the use of coastal structures to help stabilise the local erosion immediately to the north of the BCM.

Having regard for the:

- GPA's investigations into the impacts of the new channel on wave climate reaching the shoreline and the possible changes in coastal stability to the beaches north of BCM;
- studies currently being undertaken to determine the most suitable strategy for stabilising the northern beaches and possibility of coastal structures being chosen to help stabilise local erosion; and
- GPA's commitment to develop a Northern Beaches Stabilisation Programme (commitment 13),

it is considered that the EPA's objective for maintaining stability of beaches can be met, provided that there is satisfactory implementation of the GPA's commitment 13 on the advice of the DPI and in accord with any agreements reached between the CoG and the GPA with regard to the management of the northern beaches.

3.3.2 Management of Town Beach

Description

As part of the PEP, the GPA has proposed to participate and contribute to the CoG's Town Beach Foreshore Redevelopment Project. Subject to approval of the PEP, the GPA will provide:

- a groyne extension from the Recreational Boat Harbour to within 10 metres to the outer breakwater;
- adjustments to groynes and breakwaters on the BCM to provide energy absorbing and reflection options which counter reflection of waves and energy towards the port, and to act as a toe anchor for the proposed beach;
- adjustments to groynes/breakwaters to provide two groynes centrally in the Town Beach area to assist with holding the beach in position, using existing rock and modest quantities of additional rock if deemed necessary; and
- undertaking to provide the engineering of the preparatory beach and coastal works to be constructed for the CoG's foreshore redevelopment.

Town Beach is a contained system with sediment movement restricted by the GPA recreational boat harbour to the west and the BCM to the east (URS, 2001).

Submissions

Concerns were raised through public submissions in regard to the:

- lack of assurances from the GPA that the new Town Beach will be secure and stable;
- uncertainty associated with the responsibility for the long term management of Town Beach; and
- mitigation measures required being undertaken in the event of erosion occurring.

Assessment

The EPA's objective for this factor is to maintain the stability of beaches and dunes and to maintain the integrity, function and environmental values of any foreshore/dune areas replaced through beach enhancement.

The area considered for assessment is the proposed New Town Beach foreshore.

In addressing the concerns raised through the public submissions regarding the stability of the new Town Beach, the GPA provided the following response:

- The breakwater and groyne extensions proposed for Town Beach have been designed to stabilise the proposed new shoreline. Town Beach itself is an enclosed system and there is little if any lateral movement of sediment along the coastline in this area. Offshore movement of sediment is possible in the event of a storm from the north. This situation occurs at present. The proposed breakwaters will not alter this situation. It is possible that, as occurs at present, the beaches may require nourishment at some time in the future in response to the erosion caused by a strong northerly storm. However, there is unlikely to be a requirement for regular sand nourishment, such as is proposed for the Northern Foreshore.

- The beach shape and slope has been designed to incorporate sufficient beach volume and width to accommodate a one in 20 year storm.

- The overall wave penetration into Town Beach is expected to be slightly less following the PEP than is the case at present. This will be achieved by the presence of the northern extension to the existing port breakwater, which will provide additional protection from waves generated to the west of Town Beach.

While the GPA has satisfactorily responded to the key concerns regarding the proposed Town Beach, it has not indicated its acceptance for the responsibility for the long-term management of Town Beach.

The concerns expressed by submissions regarding the stability of the new Town Beach are likely to stem from the uncertainties associated with the management of the new Town Beach. The lack of clearly defined responsibilities or agreement between the CoG and the GPA is likely contribute to the community's perception that coastal stability issues for the new Town Beach are unresolved or are unlikely to be manageable.

The CoG has advised the EPA that it intends to write to the GPA formally requesting that a MOU be jointly prepared which would address amongst other issues, the monitoring and renourishment of the Town Beach precinct.

An MOU between the CoG and the GPA is likely to provide a satisfactory basis for the long-term management of the new Town Beach and therefore should be finalised as soon as possible.

In the absence of clearly defined responsibilities and resolution of the long-term management arrangements of the Town Beach, the EPA is recommending a condition (condition 8), which provides for the monitoring and maintenance of Town Beach until Town Beach can be demonstrated to be stable. The recommended condition is intended to complement any agreement reached between the GPA and CoG.

Summary
The GPA has indicated that the proposed port structures and design of the new Town Beach shoreline are unlikely to affect the long-term stability of Town Beach. However, the EPA notes that the important aspect of the management of Town Beach from a coastal stability perspective remains unresolved.

Accordingly, the EPA is of the view that the MOU currently in preparation between the CoG and the GPA and the GPA's proposed Northern Beaches Stabilisation Programme should be accompanied by a recommended condition to ensure the new Town Beach foreshore is maintained stable for a period of up to seven years. This timeframe would provide an opportunity for the GPA to demonstrate the stability of the new Town Beach.

4. Conditions and Commitments

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

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

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

4.1 Proponent's commitments

The proponent's commitments as set in the PER and subsequently modified, as shown in Appendix 4, should be made enforceable.

4.2 Recommended conditions

Having considered the proponent's commitments and information provided in this report, the EPA has developed a set of conditions that the EPA recommends is imposed if the proposal by the GPA to upgrade the Port of Geraldton and contribute to the Town Beach Foreshore Redevelopment is approved for implementation. These conditions are presented in Appendix 4. Matters addressed in the conditions include the following:

- that the proponent shall fulfil the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 4;
- the various management plans and programmes proposed through the proponent's commitments be made publicly available to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority;
- the designation of Environmental Quality Objectives (EQOs) (defined in the Environmental Protection Authority document "Perth's Coastal Waters, Environmental Values and Objectives") to the inner harbour basin and Town Beach and development of guidelines and indicators by which the EQOs can be measured to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority; and
- the management of the newly reclaimed Town Beach to achieve long-term stability which includes replenishment/nourishment until it can be demonstrated to be stable to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

It should be noted that a regulatory mechanism relevant to the proposal is:

- The provisions of Part V of the *Environmental Protection Act 1986* administered by the Department of Environmental Protection and the requirement of the proponent to comply with the Act and a licence to operate the Port of Geraldton. The Port is licensed under the Act for the purpose of loading and unloading and abrasive blasting works. The licence reporting process will require the proponent to monitor and report on it environmental performance, and, on the basis of monitoring, amend its port activities and environmental management program as appropriate. The GPA's current licence conditions include requirements for:
  - implementation of the Bulk Handling Action Plan and reporting on progress and monitoring data;
  - dust emissions control;
  - water pollution control ore spillage control and clean up;
  - regular water and sediment quality monitoring and reporting; and
  - ballast water discharge control.

5. Conclusions

The EPA has considered the proposal by the GPA to upgrade the Port of Geraldton and undertake preparatory works for the Town Beach Foreshore Redevelopment Project.

Dredging impacts

Large scale dredging and reclamation will result in the irreversible loss of approximately 30 hectares of seagrass habitat in Champion Bay. Taking into account the previous losses of seagrass habitat through historical activities and existing marine structures, the PEP will contribute to a cumulative loss of approximately 145 hectares of seagrass habitat. Given that the EPA is unaware of any other proposals that involve seagrass loss in the Champion Bay, the EPA considers that the additional loss of seagrass habitat in Champion Bay as a result of the PEP is acceptable. However, if there were other proposals in Champion Bay, any further loss of seagrass would be an issue requiring detailed consideration.

The extent of seagrass habitat to be irreversibly lost as a result of the PEP is primarily determined by the extent of the PEP's 'footprint' through dredging and reclamation. The EPA is mindful of the risk of dredging indirectly impacting on the further areas of seagrass habitat through dredge-induced turbidity. Accordingly, the loss of seagrass habitat needs to be considered in association with the risk of losing additional areas of seagrass habitat.

Seagrass health and productivity may be affected by the dredging operations in light of the considerable and continuous 10-month dredging campaign.

In response to concerns regarding the impacts of turbidity on seagrass health, the GPA has developed a water quality monitoring and management plan (WQMMP) which includes defined 'alert' and 'action' light intensity trigger levels and management actions applicable to the 'alert' and 'action' levels. The GPA has proposed to apply the levels during the course of the dredging programme.

The GPA's intention to implement management actions such as adjusting dredging operations or temporarily halting the dredge in the event 'action' levels are exceeded demonstrates an adaptive management strategy to the issue of dredge-induced turbidity. This strategy will ensure seagrass receives sufficient light for survival and thus demonstrates the manageability of the issue.

In addition to the development of satisfactory 'alert' and 'action' levels, the EPA would expect the GPA and dredging operator to implement best practice operational management in minimising the generation of turbidity during dredging and for this to be documented in a satisfactory dredge management plan (commitment 15). The dredge management plan will require the advice of the EPA, prior to its approval.

To address the impacts of dredging on the live lobster holding industry, the GPA has reached agreement with their representatives on acceptable site-specific 'alert' and 'action' levels at the seawater intakes. Similarly, management actions in the event alert and action levels are exceeded have been proposed. The GPA has also undertaken modelling of dredge plume generation and dispersal to predict the likelihood and frequency of exceedences against the proposed 'alert' and 'action' levels under certain dredge locations and wind conditions. Assessing the impacts of turbidity in this manner improves the GPA's ability to anticipate worst operational case conditions and provides an opportunity for the GPA to plan the dredging programme accordingly.

Eastern Breakwater
In responding to concerns in relation to potential impacts on the local Sealion colony from construction and use of the eastern breakwater, the GPA has developed management strategies to minimise the PEP's impacts on Sealions. The EPA considers that the GPA are proposing to undertake reasonable and practicable measures to reduce the impacts of the PEP on the local Sealions and notes that if the Sealions did leave the port area as a result of ongoing disturbance it would not have a significant effect on the conservation status of the Australian Sealions.

The GPA in consultation with the Department of Environmental Protection (DEP) has initiated a programme to reduce the environmental impacts of port activities through the GPA's 'Bulk Handling Action Plan'. This plan has been proposed in accordance with DEP licence conditions. The plan aims to improve port management practices, reduce stormwater inputs, spillages and inputs into the waters during routine loading and unloading activities and will be regularly reviewed with the DEP.

Provided there is improved and satisfactory management of nutrient and contaminant inputs into the inner harbour waters as part of the Bulk Handling Action Plan (including water and sediment quality monitoring), the risk of water quality deterioration occurring will be minimised.

The eastern breakwater is expected to provide a barrier to existing turbid plumes and associated contaminants that occasionally enters Town Beach from the harbour as a result of shipping movements. Given that the PEP does not introduce new sources of contaminants and nutrients, and the predicted increase in flushing times following completion of the eastern breakwater is minor, the likelihood of water quality deterioration occurring in Town Beach is considered to be low.

The GPA will be required to monitor water and sediment quality in the inner harbour and Town Beach to confirm that the relevant Environmental Quality Objectives documented in recommended condition 7 are being maintained and confirm the GPA's impact predictions with respect to water quality, following completion of the PEP.

Coastal stability
Through the GPA's investigations, the PER has highlighted the long-term risks to coastal stability that will require regular management action. To address the issue of coastal stability, the GPA has committed to a programme of monitoring shoreline movement of the beaches between the Batavia Coast Marina and the Chapman River and providing sand nourishment on a regular basis as part of the City of Geraldton's Northern Foreshore Stabilisation and Enhancements Strategy. The EPA has recommended that this programme for the northern beaches be extended to include the monitoring and nourishment of Town Beach until the newly reclaimed beach can be demonstrated to be stable.

Overall the EPA considers that the loss of seagrass habitat due to the PEP and the adaptive management strategy proposed by the GPA to minimise the risk of further losses is considered to be acceptable. The risk of water quality deterioration occurring in Town Beach and the inner harbour is low given the existing plans in place to minimise nutrient and contaminant inputs. The commitment to monitor and nourish should ensure that the stability of beaches could be managed. The EPA has therefore concluded that it is unlikely that the EPA's objectives would be compromised provided there is satisfactory implementation by the GPA of the GPA's commitments and the recommended conditions set out in Appendix 4 and summarised in Section 4.

6. Recommendations

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

1. That the Minister notes that the proposal being assessed is for GPA to upgrade the Port of Geraldton and undertake preparatory works for the Town Beach Foreshore Redevelopment Project;
2. That the Minister considers the report on the relevant environmental factors as set out in Section 3;
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 4, and summarised in Section 4, including the proponent's commitments.
4. That the Minister imposes the conditions and procedures recommended in Appendix 4 of this report.

Appendix 1

List of submitters

Organisations:
Department of Conservation & Land Management
Main Roads Western Australia
Department of Indigenous Affairs
Conservation Council of WA Inc
Department of Fisheries
City of Geraldton
Mid-West Heritage Inc.

Individuals:
Bob Stawarz
Dee Margetts MLC
Don West
E B Thompson
Graham Leevers
Gwyneth R J Ingham
I H Grosvenor
Jackie Healy
Jodie McCarthy
John Link
Josslyn Else
Judy Simpson
Kim Leevers
L E Smith
Lorraine Allen
Lyn Huges
Mary Hall
Micheal Piesse
Nicole Edwards
Nova Piesse
Patricia Gallaher
Paul Connolly
Paul Robb
Paul Rooney
Paul Thompson
Ray Gibson
Richard Hamilton
Robert S Dutch
Roger Leevers
Roxanne Grant
Russell Speed
S Brierley
Steve Hug
Sue Thompson
Suzanne Speed

Appendix 2

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Appendix 3

Summary of identification of relevant environmental factors

Preliminary Environmental Factors	Preliminary Environmental Issues	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factor/Issue
BIOPHYSICAL				
Marine biota and associated habitat	Loss of benthic primary producer habitat (seagrass, algae, reef and sand habitat) as a result of dredging and spoil disposal, which includes sea dumping and land reclamation	• Deepening by dredging of the harbour basin from 9.3m depth to 12.1m depth; • Widening of the existing channel and extension out to sea from 90m to 200m at the entrance to the harbour basin, from 150m to 250m wide around the corner, and from 150m to 200m along the outer straight; • Disposal of dredge spoil (3.5 million cubic metres of limestone material) from channel dredging, offshore to create artificial lobster catching reefs; • Reclamation of land adjacent to the existing northern breakwater requiring 0.3-0.4 million cubic metres of fill and within and adjacent to the new eastern breakwater; and • Reclamation of land for Town Beach. The area of benthic marine habitat (includes reef, sand, algae and seagrass habitat) to be impacted by the proposal is approximately 346.5 hectares. Of this total, approximately 127 hectares have previously been modified through construction of the harbour basin and navigation channel, including peripheral impact adjacent to the existing breakwaters and Town Beach.	**Government Departments:** The Department of Fisheries has expressed support for the construction of the artificial reefs and is presently seeking funds to study the biological development and commercial productivity of the reefs. The GPA should provide further information defining the area of seagrass in the project area to allow an accurate estimate of seagrass loss against the seagrass management unit area as specified in the Draft EPA Guidance Statement No. 22. **Public**: The loss of seagrass as a result of the proposal is considered to be unacceptable. The methodology for identifying areas of seagrass should have included an appropriate system of ground truth by diving transects of the seabed, particularly in those areas to be impacted by the proposal. GPA should put in place a management plan to rehabilitate areas of seagrass that are impacted by the proposal. There is uncertainty in relation to the effectiveness of the proposed artificial reefs to create an environment conducive to attracting rock lobsters.	**Considered to be a relevant environmental factor/issue and addressed under the issue of *Dredging Impacts* in section 3.1.1 of the report.**

Preliminary Environmental Factors	Preliminary Environmental Issues	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factor/Issue
	Disturbance to Sealions inhabiting the port area	The Sealion colony residing on the island breakwater in the port area will be disrupted during the re-configuration of the island breakwater 'Seal Rocks' and other construction related activities. The Sealions are also likely to experience disturbance from the ongoing operation of the port as a result of the close proximity of the rail spur on the eastern breakwater to the 'Seal Rocks'.	**Government Departments:** The project is unlikely to have a significant overall effect on the Australian Sealion population. The Australian Sealion population is reasonably stable and population numbers are unlikely to be affected as the port area and 'Seal Rocks' is used for a haul out and feeding area, not for breeding. It is recognised however that there may be detrimental effects on individual Sealions living within the project area. The possible effect on the Sealion colony inhabiting the port area from ongoing disturbance by members of the public and GPA activities has not been adequately addressed. It is the opinion of CALM and Dr Nick Gales (quoted in the PER an expert on Sealions) that continual ongoing disturbance has high potential to cause individuals of Sealion colony to depart permanently. The data collected on the numbers of Sealions using the port area during the 2001/2002 seasons should be provided to the CALM to assist in future management. **City of Geraldton:** The CoG has expressed concern about the possibility of the Sealion population not continuing to reside in the area. The CoG requested the EPA to request the GPA to seek further expert advice and take any remedial action required to promote the continuation of the Sealions residing in their location. **Public:** Assurances were requested that the Sealions would continue to reside in the port area and 'Seal Rocks'. It was suggested that a shorter eastern breakwater be designed with a view to increasing the buffer between 'Seal Rocks' and the eastern breakwater.	**Considered to be a relevant environmental factor/issue to be addressed under the issue of *Eastern Breakwater Impacts* in section 3.2.1 of the report.**

Preliminary Environmental Factors	Preliminary Environmental Issues	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factor/Issue
Marine migratory species	Off-shore spoil disposal	Offshore disposal of dredge spoil (3.5 million cubic metres of limestone material) from the dredging of the channel has the potential to disturb populations of whales, particularly Humpback whales (*Megaptera novaeangliae*), should it pass through the project area during south and northbound migration.	**Government Departments:** The project is unlikely to have a significant effect on the Humpback Whale population. There is also unlikely to be any significant effect on Humpback Whale individuals. The data collected on migratory routes used during the 2001/2002 seasons should be provided to CALM to assist in future management activities.	**Considered to be a relevant environmental factor/issue to be addressed under the issue of *Dredging Impacts* in section 3.1.5 of the report.**
Coastal process and littoral drift (including impacts on the seabed)	Impact of construction activities, northern breakwater reclamation and Town Beach enhancement	The current configuration of GPA port structures including breakwaters, groynes and channel have interrupted the longshore transport of sediments to the northern beaches. The extension of the breakwater and reclamation areas is likely to contribute to the interruption of sand transport to the northern beaches. The widening and deepening of the shipping channel will modify the existing wave climate at the shoreline to the extent that there will be increased erosion pressure on some beaches to the north of the Batavia Coast Marina.	**City of Geraldton:** The claim that erosion problems occurring to the north of Chapman River has not been a result of GPA's structures requires substantiation. Questions were raised as to whether the quantity of sand trapped by the port structure has been accurately assessed and whether this will be further increased by wider entry channels and the new northern breakwater. If there is determined to be a need for groynes, breakwater extension or offshore features for the northern beaches then responsibility for provision and/or funding of such features must be determined. The CoG requests the GPA enter into a detailed written agreement (MOU) specifying the short and medium term commitments to foreshore stabilisation. With regard to the proposed reclamation of the Town Beach area, the CoG seeks a commitment from the GPA (in perpetuity) to; regular monitoring of the beach; sand nourishment as required; ongoing maintenance of groyne structures; and repair and extension of groynes or placement of additional breakwaters in the event of major erosion or storm events. **Public:** Concern was expressed that the GPA will not restore/nourish the Northern Beaches to the original shoreline configuration. Concern was also expressed regarding the potential impacts of the extensions and widening of the channel in exacerbating the existing erosion problems.	**Considered to be a relevant environmental factor/issue to be addressed under the issue of *Coastal Stability* in sections 3.3.1 and 3.3.2 of the report.**

Preliminary Environmental Factors	Preliminary Environmental Issues	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factor/Issue
			The PER only commits to providing beach nourishment up to Chapman River. Given that beaches to the north of Chapman River have a severe and ongoing erosion problem, submissions believe that the GPA's commitment should extend to beaches north of Chapman River. Was the environmental impact of the proposed breakwater structures off the northern breakwater taken into account when predicting the amount of sand required to nourish the northern beaches? There is no evidence to assure the Geraldton Community that the new Town Beach will be stable, secure and remain in any form similar to what is represented in the figures shown in the PER. The GPA and the CoG should clarify to the community of Geraldton the areas of legal responsibility and contingencies in the long-term management and maintenance of Town Beach.	
Introduction of exotic organisms	Ballast water management associated with increased shipping operation	An increase in ship movements resulting from the upgrade of port facilities will increase the risk of introduction of exotic species.	**Government Departments:** There should be a commitment for dredges, hoppers and associated vessels to be inspected to ensure they do not introduce exotic marine species, and for the equipment to be appropriately cleaned if a risk of introductions is identified. **Public**: The public believes that consideration should be given to GPA's accountability should toxic algae and/or marine pests become established in the port or its surrounds. Concern was expressed that a detailed risk assessment of translocation of exotic marine organisms into Champion Bay was not undertaken as part of the PER.	The GPA will ensure that the dredging contracts will require dredgers to arrive with non-fouled hulls, and to have performed adequate hopper washing and ballast water exchanges in accordance with the AQIS ballast water management requirements prior to arrival in Geraldton Port. The GPA will undertake a diving survey on the hull and on-board inspection for mud and sediment to confirm the fulfilment of contract conditions. The control of ballast water and management of introduced species is managed by the Australian Quarantine Inspection Services (AQIS). Provided the GPA continues to enforce the IMO Ballast Water Protocols and AQIS's Mandatory Ballast Water Requirements during port operations, there is unlikely to be a significant increase in the risk of introductions. The GPA is committed to undertaking regular port surveys (2-5years) to assess the effectiveness of the GPA's measures and

Preliminary Environmental Factors	Preliminary Environmental Issues	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factor/Issue
				enforcement of the requirements. **This factor does not require further EPA evaluation in the report.**
POLLUTION				
Marine water and sediment quality	Dredging, spoil disposal and on-going operation of the port	<u>Dredging and Spoil Disposal</u> Dredging, spoil disposal and reclamation activities may result in the release of nutrients and contaminants from marine sediments, and increase turbidity levels in the vicinity of the activities leading to reduced marine water quality. <u>Ongoing Port Operations</u> Increased flushing is likely to result in water quality impacts in the harbour waters and Town Beach.	**Government Departments:** An assessment of the consequences of the eastern breakwater on water quality in Town Beach and the harbour should be undertaken. The change in water quality will – in addition to its dependence on flushing times – also be dependent on the contaminant and nutrient flux into the water column, the background water quality and vertical stratification. What will be the water quality objectives and criteria for the port and Town Beach? What management measures are available should the water quality objectives not be met? The environmental assessment should predict the degree of turbidity and light attenuation to be experienced in Champion Bay as a result of dredging and should interpret its ecological consequences particularly on seagrass health and productivity. The GPA should develop an EMP, which includes 'alert' and 'action' levels for turbidity and light attenuation and reactive management measures in the event action levels are breached for the dredging operations to ensure seagrass health is not compromised. **City of Geraldton:** More detailed modelling is required to accurately assess the effects of the proposed changes to the foreshore on water quality in the bay (Francis Street groyne to Forrest Street groyne). The GPA should commit to monitoring of turbidity and its impacts during dredging. **Public:** Increased loading, product handling associated with the upgrade will increase the risk of product spillage and the accumulation of contaminants and nutrients in marine sediments and harbour waters. Increased shipping movements may increase accumulation rates of TBT and accidental discharges of sewage waste and ballast waters. Concerns were raised over the influence of the eastern	The GPA have undertaken investigations into the risk of dredging impacting on water quality by way of contaminant and nutrient release from marine sediments. As the PEP involves the dredging of clean/undisturbed marine sands and limestone rock, the risk of water quality deterioration due to unacceptable contaminant and nutrient release is considered to be low. Any minor amounts of copper, zinc and organotins or other contaminants released from the sediments will experience immediate dilution and turbulence-induced dispersal after their release at the dumpsite. Sediment and elutriation tests undertaken in accordance with the *Interim Ocean Disposal Guidelines* (ANZECC 1998) have shown that the material is environmentally suitable for unconfined sea disposal. **The impacts of dredging and dredge spoil disposal on turbidity and water clarity is considered to be a relevant environmental factor/issue and addressed under the issue of *Dredging Impacts* in section 3.1.2 of the report.** **The impacts of increased flushing times in the inner harbour basin and Town Beach on water quality are addressed under the issue of *Eastern Breakwater Impacts* in section 3.2.2 and 3.2.3 of the report.**

Preliminary Environmental Factors	Preliminary Environmental Issues	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factor/Issue
			breakwater on quality of marine waters at Town Beach. The change in water flushing time as a result of the eastern breakwater may result in potential public health issues. Submissions consider that water quality in Town Beach should be maintained at the highest quality. What is the potential for nutrients and bacteria from septic tanks in Geraldton to leach into the groundwater and eventually make its way to the Town Beach area? How will water quality in the harbour area influence the water quality of Town Beach?	
Contamination	Dredge spoil	Dredging of the silty sediments within the harbour basin will be relocated to the new northern reclamation area for burial. Dredged material from the channel will be disposed at an off shore, deep water (25-30 metre depth) disposal ground southwest of Point Moore.	**Government Departments:** The DEP has provided advice to the GPA on the Ore Spillage and Remediation Works programme. The remediation programme was included within the Port's Bulk Handling Facility Action Plan that addresses a number of DEP Licence non-compliance issues that have been identified through inspections and water quality and sediment quality monitoring results. The DEP is in general agreement with the remediation plan and the associated environmental management plans submitted to date. **Public:** The public requested assurance from the GPA that the silty sediments from the harbour basin will be successfully contained in the northern reclamation bund. Concern was expressed that the Ore Spillage Remediation Works was not treated as part of the PEP proposal and subject to public scrutiny. A submitter suggested that the ore and sediments collected from the harbour basin should be transported to a licensed waste disposal site where the risk of contaminants leaching into the marine environment is reduced. The northern reclamation bund is located near the inlet pipes for the live lobster holding facility. It is believed that there will be an increased risk of contaminants impacting on the live lobster exporting industry.	Sediment samples taken from the harbour basin have indicated all contaminant levels, apart from TBT, copper, lead and zinc were below screening levels recommended in ANZECC *Interim Ocean Disposal Guidelines*. Some contaminant levels were too high to enable environmentally acceptable disposal in unconfined open waters. As the silty sediments from the harbour is unlikely to be suitable for unconfined disposal at sea it will be secured and buried within the northern reclamation area, to be lined. The relocation of the contaminated silts from the harbour basin is part of the Ore Spillage and Remediation Works (OSRW) and not part of the PEP proposal. The OSRW is required to be implemented irrespective of the PEP proceeding. The OSRW is part of GPA's Port Bulk Handling Facility Action Plan, which addresses the DEP Licence conditions for the port. 3.5 million cubic metres of undisturbed clean marine sediments will be relocated from the channel to the offshore disposal site. The material will include marine sands and limestone rock. Testing of the material in accordance with procedures documented in ANZECC *Interim Ocean Disposal Guidelines*

Preliminary Environmental Factors	Preliminary Environmental Issues	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factor/Issue
				confirms the material is clean and suitable for disposal. The dredged material is not likely to require confined or remedial disposal strategies The disposal of material offshore needs to be carried out in accordance with the Commonwealth *Environmental Protection (Sea Dumping) Act 1981,* which is managed by Environment Australia. The GPA will be required to obtain a Sea Dumping Permit that will specify conditions of dredge material disposal, prior to disposal occurring. **This factor does not require further EPA evaluation.**
	Additional fill material	The source of sand for the reclamation of the Town Beach will be old dune deposits along the Southern Transport Corridor (STC) alignment.	**Government Department:** MRWA has indicated that it is not the agent responsible for placement of sands for the Town Beach Foreshore Redevelopment but rather a potential supplier of sand for the project. If it is decided to use STC fill for the foreshore redevelopment works, MRWA and its contractor will be responsible for the day to day activities of carting and placing the sand to the site but the GPA will remain the proponent and responsible authority for any environmental commitments.	MRWA has completed geo-technical investigations of the material to be excavated for the STC project. The investigation has confirmed that there are substantial quantities of suitable medium grained sands available for construction of the Town Beach Foreshore. The material will come from clean, undisturbed dunes. An environmental management plan will be required to be prepared for the use of the fill for beach nourishment at Town Beach. **This factor does not require further EPA evaluation.**
	Oil Spill	Increased shipping operations may lead to an increased risk of fuel spillage, resulting either from ship collisions or refuelling activities.	**Government Department:** The redevelopment of Geraldton Port to provide for larger vessels raises the question of the continued security of the Abrolhos Islands from the impacts of shipping. The Department of Fisheries is interested to know the position of the GPA with regard to the potential for increased risk of pollution or other environmental damage at the Abrolhos Islands from larger ships transiting to Geraldton following the redevelopment of the port.	The GPA has indicated that the PEP is not proposing to introduce larger ships into the port. The PEP would allow for the full loading of existing size vessels that presently must go to other ports to 'top up' due to depth restriction at Geraldton Port. The PEP upgrade would therefore not increase the risk of pollution to the Abrolhos Islands associated with the introduction of larger ships. The GPA has in place emergency procedures and an Oil Spill Contingency Plan, which has

Preliminary Environmental Factors	Preliminary Environmental Issues	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factor/Issue
				been approved by the WA State committee for Combating Oil Pollution at Sea. No offshore refuelling occurs at the Geraldton Port. Dredges will be required to follow normal vessel bunkering procedures within the harbour area to reduce the risk of a fuel spill during refuelling. The GPA's existing spill response procedures have been reviewed for applicability for the dredging and post-dredging period. **This factor does not require further EPA evaluation.**
Air	Particulate/dust emissions during construction	Dust generated from reclamation and other land based, construction activities may impact on nearby residences in proximity to the port.	**Government Departments:** DEP advised that operational measures the GPA should give consideration to in effectively managing dust emissions on sensitive receptors include; • A formalised record keeping system for dust and odour complaints made by the community; • Speed restrictions and upward discharging exhaust gases and cooling systems on mobile plant will reduce dust generation from the ground and roads; • Truck movements should be controlled, both in relation to times of operation and routing near the site, if there are houses nearby; • All loading and unloading transfer points should be protected from the wind; • Observation reports; • Assessment of short term data trends; • The specification of dust criteria of short-term total suspended particulate (TSP) criteria applied to areas downwind of construction operations. • Background monitoring of dust levels; and • Monitoring of wind speed and direction.	The GPA will give due consideration to the DEP's advice in the development of the Breakwater and Reclamation Management Plan (Commitment 11). The plan will address dust management and will require DEP approval on advice of the CoG and MRWA prior to construction commencing. Provided there is a satisfactory dust management plan in place, it is considered that dust emissions and wind blown sands can be managed to acceptable levels. Truck movements to and from the construction site will be the subject of the contractor's traffic management plan, which will require the approval of the CoG and MRWA. **This factor does not require further EPA evaluation.**
Noise	Construction	Construction activities, which include dredging, reclamation and associated traffic, may adversely affect the amenity of residential areas in proximity to the port.	**Public:** The PER does not discuss the need for compaction of fill during the construction of the Eastern Breakwater and placement of sands on Town Beach. As a result it does not discuss the management of vibration from construction equipment.	Vibrating compaction equipment and blasting will not be required during the construction phase. GPA's proposed earthworks and truck noise management measures are documented in the PER and will be further documented and

Preliminary Environmental Factors	Preliminary Environmental Issues	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factor/Issue
				expanded in the Breakwater and Reclamation Management Plan (Commitment 11) to be developed on the advice of the CoG and MRWA. The GPA has also committed to submit a noise management plan to the DEP, seven days prior to works occurring. Construction activities are to be carried out in accordance with Section 6 of AS2436-1981 *Guide to Noise Control on Construction, Maintenance and Demolition Sites* using equipment which is the quietest reasonably achievable. Regulation 13 of the *Environmental Protection (Noise) Regulations 1997* requires construction activities to be carried out to reasonable standards between the hours of 7am and 7pm Monday to Saturday (excluding Sundays and Public Holidays). **This factor does not require further EPA evaluation.**
	Port operation & Transport	Current operations include the movement of large vessels into and out of the port, the movement of long trains through Geraldton and the loading of ships using conveyors associated with the Bulk Materials Handling Facility and grain conveyors. Shunting trains on the proposed eastern breakwater may increase noise levels in some areas.	**City of Geraldton:** The noise emissions with regard to the proposed rail spur on the eastern breakwater should comply with current DEP standards. **Public:** The assessment of noise from locomotives, shunting and wheel rail interaction as a result of locating the rail spur on the eastern breakwater only concentrated on the impacts of noise on the Francis, Gregory and Fitzgerald Streets area. The assessment does not provide an indication as to the noise levels predicted for future residential areas at the Batavia Coast Marina and the upper foreshore areas. Submissions believe that sound travels further across the open water and therefore the amenity of residents in the new marina area may be impacted by the trains on the eastern breakwater spur line.	The port operations are required to comply with the *Environmental Protection (Noise) Regulations 1997* and any noise mitigation requirements could be managed under Works Approval, Licensing, or Registration under Part V of the *Environmental Protection Act (1986).* The noise implication of ongoing port operations does not require further EPA evaluation. **The noise implications of relocating the rail spur on the eastern breakwater is considered to be a relevant environmental factor/issue and addressed under the issue of *Eastern Breakwater Impacts* in section 3.2.4 of the report.**

Preliminary Environmental Factors	Preliminary Environmental Issues	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factor/Issue
SOCIAL SURROUNDINGS				
Commercial activity	Rock Lobster Fishery and other commercial activities	Dredging and dredge spoil disposal operations may temporarily interfere with the live lobster holding commercial operations by affecting the quality (specifically turbidity) of seawater pumped to live lobster-holding tanks. The loss of approximately 6 hectares of reefal habitats used by juvenile lobsters in Champion Bay is likely to influence future lobster catch rates. Turbid marine waters may also affect the lobster pot deployment efficiency and lobster catch rates in Champion Bay and west of Point Moore	**Government Departments:** In the PER Addenda Report on Water Quality Assessment, the GPA has not recognised the live lobster holding facilities as aquaculture facilities. For the purpose of water quality protection, the receiving water for the live lobster intake pipelines should be considered an aquaculture protection objective. **Public:** The northern reclamation bund is located near the inlet pipes for the live lobster holding facility. It is believed that there will be an increased risk of contaminants impacting on the live lobster exporting industry.	The GPA has indicated that it intends to offset the loss of reefal habitats used by lobsters and potential reduction in lobster catch rates by establishing artificial deepwater reef-ridges at the off-shore spoil ground. The aim of the artificial reef is to produce a more productive, topographical diverse habitat with many surfaces and niches suitable for plants and reefal biota, which is attractive to rock lobsters for settlement, shelter, feeding and resting (URS, 2001). **The management of marine water turbidity levels caused by dredging at the seawater intakes is considered to be a relevant environmental factor/issue and addressed under the issue of *Dredging Impacts* in section 3.1.3 of the report.**
Recreational activity	Fishing, swimming, sailing/boating, windsurfing, diving.	The construction of the Eastern Breakwater, reclamation of Town Beach and construction of groynes in Town Beach will permanently displace some recreational activities (eg. sailing and water skiing) from the port area for safety reasons. Temporary restriction of public access to Town Beach will occur during the construction phase.	**Government Department:** Consideration should be given to the impacts of changes in water quality on recreation and visual amenity. Water quality guidelines are provided in ANZECC/ARMCANZ (2000) for both these environmental values and it is likely that these guidelines will not be met in parts of Champion Bay during the dredging phase. **Public:** The loss of current recreational uses in the inner Geraldton harbour and waters in Town Beach due to the construction of the eastern breakwater is considered to be unacceptable. How will the GPA intend to offset the loss of open water used for recreational activities? Concerns were expressed that approximately 4 hectares of sheltered beachfront water will be lost as a result of extending the shoreline some 200 metres offshore.	Sailing and water skiing will no longer be possible within the inner harbour. The GPA has indicated that the port basin will not become available to the public for safety reasons in the near future, irrespective of the PEP and the eastern breakwater gaining approval. Therefore, there will be no net loss of water available to the public and recreational activities as a result of the PEP. The GPA intends to maintain an 'open port' policy to the extent that it can be safely achieved. With respect to sheltered waters off Town Beach, the GPA has indicated that the

Preliminary Environmental Factors	Preliminary Environmental Issues	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factor/Issue
				extension to the northern breakwater will provide protection to all of Town Beach, rather than just the western half, which is protected at present. The GPA has also indicated that the sheltered beachfront water will not be permanently lost, but will move north as the reclaimed beach is developed. A similarly protected embayment will therefore result following the PEP. The PEP will not permanently remove recreational beaches or prevent any existing recreational activities from occurring in the Town Beach area, post PEP. The CoG is the principle coordinator of the Town Beach Foreshore Redevelopment project. Following community consultation, workshops and negotiations with key stakeholders, the CoG adopted a concept plan in December 2001. One of the main principles underpinning the foreshore redevelopment project, of which the eastern breakwater is an essential part, is to greatly enhance and provide recreational activities in the Town Beach area. **The above does not require further EPA evaluation.** **The impact of turbidity generation on recreational activities is considered to be a relevant environmental factor/issue and addressed under the issue of the *Dredging Impacts* in section 3.1.4 of the report.**
Visual amenity	Proposed port infrastructure	The Eastern Breakwater will impact upon the existing ocean panorama viewed from Town Beach.	**City of Geraldton:** The GPA should be required to provide facilities or visual treatments on the proposed eastern breakwater to screen the proposed rail and port related facilities from the recreational areas of the foreshore. **Public:** The eastern breakwater and associated rail line will reduce or eliminate the ocean vistas from Town Beach. Some submissions consider that the impact on ocean panoramas as viewed from Town Beach is an unacceptable	**Considered to be a relevant environmental factor/issue and addressed under the issue of the *Eastern Breakwater Impacts* in section 3.2.5 of the report.**

Preliminary Environmental Factors	Preliminary Environmental Issues	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factor/Issue
			impact on visual amenity.	
Heritage	Aboriginal culture and heritage	No known Aboriginal or archaeological sites are present in the area.	**Government Department:** The Department of Indigenous Affairs (DIA) would like to be consulted during further developmental stages of the project.	The GPA intends to consult the DIA during further development stages of the PEP. In addition, further consultations will be held with the Yamatji Land and Sea Council and its working groups and other heritage groups. **This factor does not require further EPA evaluation.**
	Maritime shipwrecks	Dredging and dredge spoil disposal can potentially impact on offshore shipwrecks.	No comments received.	Three substantial wrecks remain in the region. The PEP is not expected to impact on any of the wreck remains identified. In the even that any wreckage is encountered during the dredging works, the GPA will bring it to the attention of the Maritime Museum. **This factor does not require further EPA evaluation.**
Risk (Public Health and safety)	Port Construction	Increased traffic as a result of the construction phase may compromise public safety.	No comments received	Public access to construction works will be restricted by fencing and signage where appropriate, to ensure public risk is minimised. The Breakwater construction and Traffic Management Plan (Commitment 11) proposed by the GPA will address the issue of traffic impacts with advice from the CoG and MRWA. **This factor does not require further EPA evaluation.**
	Port Operation	Increased vessel movements and port activities will increase the risks associated with these activities, including hazardous waste handling and spillage.	**Public:** The PER suggests that hazardous material may be transported through the port. Some submissions are concerned that the port will be used to accept and export nuclear waste. The PER has not addressed the impacts of the additional road and rail movements on the people of Geraldton as a result of the PEP.	Any increase in vessel movements is controlled through standard marine operation procedures for vessel approach, pilotage and berthing. At present the port handles two hazardous materials on a regular basis, petroleum fuels and lead ore concentrates. A Safety Management Plan documents the procedures for the safe and secure management of both materials. Any increase in hazardous cargo

Preliminary Environmental Factors	Preliminary Environmental Issues	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factor/Issue
				handling through the port resulting from the PEP will require approval in accordance with the provisions of the *Explosives and Dangerous Goods (Port Regulation) Transport Act.* The GPA considers that the management of impacts of increased traffic access to the port post-PEP has been addressed in the environmental assessment and community consultation program that was conducted for the STC project. The STC has been designed to significantly improve rail and heavy traffic access to the port. **This factor does not require further EPA evaluation.**
OTHER				
Management	Management responsibility	The GPA's EMP and EMS should provide a holistic framework for the port's environmental management, following the completion of the PEP.	**Public:** No comments received.	The GPA has initiated the development of an EMS in accordance with the guidelines and standards provided in AS/NZS ISO 14001. The EMS is likely to be completed in 2002. The GPA is also currently developing an EMP for the PEP project. **This factor does not require further EPA evaluation.**

Abbreviations:
CALM: Department of Conservation and Land Management
DEP: Department of Environmental Protection
GPA: Geraldton Port Authority
MRWA: Main Roads Western Australia
EPA: Environmental Protection Authority
MOU: Memorandum of Understanding
EMP: Environmental Management Program
CoG: City of Geraldton
PER: Public Environmental Review
STC: Southern Transport Corridor
PEP: Port Enhancement Project

Appendix 4

Recommended Environmental Conditions and Proponent's Consolidated Commitments

RECOMMENDED CONDITIONS AND PROCEDURES

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

GERALDTON PORT ENHANCEMENT AND PREPARATORY WORKS FOR TOWN BEACH FORESHORE REDEVELOPMENT

Proposal: The upgrade of the Geraldton Port which includes deepening and widening of the shipping channel, deepening of the harbour basin, reclamation of land, offshore disposal of dredge spoil, reconfiguration and construction of breakwaters, the construction of a railway line on the eastern breakwater, the construction of beach stabilisation groynes in Town Beach and the reclamation of Town Beach by sand nourishment, as documented in schedule 1 of this statement.

Proponent: Geraldton Port Authority

Proponent Address: 298 Marine Terrace, Geraldton WA 6530

Assessment Number: 1379

Report of the Environmental Protection Authority: Bulletin 1050

The proposal referred to above may be implemented subject to the following conditions and procedures:

Procedural conditions

1 Implementation and Changes

1-1 The proponent shall implement the proposal as documented in schedule 1 of this statement subject to the conditions of this statement.

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

1-3 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment and

Heritage determines, on advice of the Environmental Protection Authority, is not substantial, the proponent may implement those changes upon receipt of written advice.

2 Proponent Commitments

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

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

3 Proponent Nomination and Contact Detail

3-1 The proponent for the time being nominated by the Minister for the Environment and Heritage under section 38(6) or (7) of the *Environmental Protection Act 1986* is responsible for the implementation of the proposal until such time as the Minister for the Environment and Heritage has exercised the Minister's power under section 38(7) of the Act to revoke the nomination of that proponent and nominate another person as the proponent for the proposal.

3-2 If the proponent wishes to relinquish the nomination, the proponent shall apply for the transfer of proponent and provide a letter with a copy of this statement endorsed by the proposed replacement proponent that the proposal will be carried out in accordance with this statement. Contact details and appropriate documentation on the capability of the proposed replacement proponent to carry out the proposal shall also be provided.

3-3 The nominated proponent shall notify the Department of Environmental Protection of any change of contact name and address within 60 days of such change.

4 Commencement and Time Limit of Approval

4-1 The proponent shall provide evidence to the Minister for the Environment and Heritage within five years of the date of this statement that the proposal has been substantially commenced or the approval granted in this statement shall lapse and be void.

Note: The Minister for the Environment and Heritage will determine any dispute as to whether the proposal has been substantially commenced.

4-2 The proponent shall make application for any extension of approval for the substantial commencement of the proposal beyond five years from the date of this statement to the Minister for the Environment and Heritage, prior to the expiration of the five-year period referred to in condition 4-1.

The application shall demonstrate that:

- the environmental factors of the proposal have not changed significantly;
- new, significant, environmental issues have not arisen; and
- all relevant government authorities have been consulted.

Note: The Minister for the Environment and Heritage may consider the grant of an extension of the time limit of approval not exceeding five years for the substantial commencement of the proposal.

Environmental conditions

5 Compliance Audit and Performance Review

5-1 The proponent shall prepare an audit program in consultation with and submit compliance reports to the Department of Environmental Protection which address:

- the implementation of the proposal as defined in schedule 1 of this statement;
- evidence of compliance with the conditions and commitments; and
- the performance of the environmental management plans and programs.

Note: Under sections 48(1) and 47(2) of the *Environmental Protection Act 1986*, the Chief Executive Officer of the Department of Environmental Protection is empowered to audit the compliance of the proponent with the statement and should directly receive the compliance documentation, including environmental management plans, related to the conditions, procedures and commitments contained in this statement. Usually, the Department of Environmental Protection prepares an audit table which can be utilised by the proponent, if required, to prepare an audit program to ensure that the proposal is implemented as required. The Chief Executive Officer is responsible for the preparation of written advice to the proponent, which is signed off by either the Minister or, under an endorsed condition clearance process, a delegate within the Environmental Protection Authority or the Department of Environmental Protection that the requirements have been met.

5-2 The proponent shall submit a performance review report one year after the completion of construction and every five years thereafter to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority, which addresses:

- the major environmental issues associated with the project, the targets for those issues, the methodologies used to achieve these; and the key indicators of environmental performance measured against those targets;

- the level of progress in the achievement of sound environmental performance, including industry benchmarking, and the use of best available technology where practicable;

- significant improvements gained in environmental management, including the use of external peer reviews;

- stakeholder and community consultation about environmental performance and the outcomes of that consultation, including a report of any on-going concerns being expressed; and

- the proposed environmental targets over the next five years, including improvements in technology and management processes.

6 Public Availability of Environmental Management Programmes and Plans

6-1 Prior to the implementation of the environmental management programmes and/or plans referred to within the commitments, the proponent shall make the following programmes and plans publicly available, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority:

1. Environmental Management Programme (see commitment 1);
2. Water Quality Monitoring and Management Plan (see commitment 3);
3. Artificial Reef Management Plan (see commitment 5);
4. Seagrass Monitoring Plan (see commitment 7);
5. Marine Mammal Monitoring Plan (see commitment 9);
6. Breakwater Construction and Reclamation Management Plan (see commitment 11);
7. Northern Beaches Stabilisation Programme (see commitment 13); and
8. Dredging Management Plan (see commitment 15).

7 Marine Management

7-1 The proponent shall manage and monitor water quality of the inner harbour basin and Town Beach to achieve the following Environmental Quality Objectives as defined in the Environmental Protection Authority document "Perth's Coastal Waters, Environmental Values and Objectives":

1 Maintenance of ecosystem integrity;

The levels of protection to apply are as follows;

a. "High level" of protection for the waters of Town Beach as delineated in figure 3 of schedule 1; and
b. "Moderate level' of protection for the waters of the inner harbour basin as delineated in figure 3 of schedule 1.

2 Maintenance of aquatic life for human consumption;

3 Maintenance of aquaculture (Town Beach only);

4 Maintenance of primary contact recreational values;

5 Maintenance of secondary contact recreational values; and

6 Maintenance of aesthetic values,

to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

Note: The above Environmental Quality Objective zones are subject to review in both extent and the guideline values and standard criteria applying to them, and may be varied from time to time on advice of the Environmental Protection Authority.

7-2 In meeting the requirements of condition 7-1, the proponent shall address the following which are in addition to the requirements included in commitment 3 in schedule 2 (Water Quality Monitoring and Management Plan):

- the identification of ecosystem health and social value indicators appropriate to the inner harbour basin, and Town Beach based on the threats to the environmental quality and the cause and effect pathways;
- development and implementation of site-specific guideline values and standard criteria for the indicators, if available generic environmental quality criteria are not appropriate; and
- the development and implementation of adaptive management strategies to ensure that the Environmental Quality Objectives are achieved and maintained in the event that agreed guidelines and standards are not met,

to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

8 Town Beach Management

8-1 The proponent shall prepare and establish a new, stable Town Beach, as documented in schedule 1, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority and the City of Geraldton.

8-2 The proponent shall monitor the stability of Town Beach at a frequency consistent with the requirements of commitment 13 (Northern Beaches Stabilisation Programme), documented in schedule 2, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

8-3 The proponent shall manage the reclaimed Town Beach to achieve long term stability and shall include replenishment/nourishment on an “as needs” basis for a period of at least four years, but not exceeding seven years, to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority.

Note: In the implementation of this proposal, as it relates to Town Beach management, the proponent should have regard for environmental matters which may be the subject of a Memorandum of Understanding between the City of Geraldton and the proponent.

Procedures

1 Where a condition states "to the requirements of the Minister for the Environment and Heritage on advice of the Environmental Protection Authority", the Chief Executive Officer of the Department of Environmental Protection will obtain that advice for the preparation of written advice to the proponent.

2 The Environmental Protection Authority may seek advice from other agencies, as required, in order to provide its advice to the Chief Executive Officer of the Department of Environmental Protection.

Notes

1 The Minister for the Environment and Heritage will determine any dispute between the proponent and the Environmental Protection Authority or the Department of Environmental Protection over the fulfilment of the requirements of the conditions.

Schedule 1

The Proposal (Assessment No. 1379)

The proposal is To upgrade the Port of Geraldton and undertake preparatory works as part of the Town Beach Foreshore Redevelopment Project. The objective of the proposal is to enable vessels to sail from the port fully laden.

The main elements of the proposal are shown in Figures 2 and 3 (attached) and are;

- deepening by dredging of the harbour basin from 9.3 metres depth to 12.1 metres depth;
- widening of the existing channel and extension out to sea from 90 metres to 200 metres at the entrance to the harbour basin, from 150 metres to 250 metres wide around the corner, and from 150 metres to 200 metres along the outer straight;
- disposal of dredge spoil (3.5 million cubic metres of limestone material) from channel dredging offshore to create artificial rock lobster habitat reefs approximately 3 to 5 kilometres south-west of Point Moore (see figure 3);
- reconfiguration and construction of breakwaters;
- relocation of the existing northern breakwater;
- reclamation of land adjacent to the existing northern breakwater requiring 0.3-0.4 million cubic metres of fill and within and adjacent to the new eastern breakwater;
- sand nourishment of Town Beach 0.5 million cubic metres of spoil from the Southern Transport Corridor; and
- construction and operation of a railway line on the eastern breakwater.

The key characteristics of the proposal are summarised in Table 1 below.

Table 1: Summary of key proposal characteristics

Element	Description
Deepen harbour basin and access channel	• Deepen harbour basin from 9.3 metres depth to 12.1 metres depth. • Deepen access channel to between 12.5 metres at the inshore end, and 14.2 to 14.7 metres at the offshore end.
Widen the access channel.	• Widen the access channel from 90 metres to 200 metres at the straight entrance to the harbour basin, from 150 metres to 230 metres wide around the corner, and from 150 metres to 200 metres along the outer straight.
Disposal of dredged material	Dispose of approximately 3.5 million cubic metres of dredged limestone material offshore to the south-west of Point Moore in sand veneered pavement habitat, between 25 metres and 30 metres deep to create artificial rock lobster habitat reefs.

Reconfigure outer breakwater	Remove 50 metres from the western end of the outer breakwater and relocate the rocks adjacent to the channel entrance to form an 'L'-shape.
Relocate existing northern breakwater.	Remove existing northern breakwater on the western side of the port entrance, and relocate it some 50 metres to the west and extend it a further 200 metres north.
Construct eastern breakwater	• Fill deep hole north of Geraldton Port Authority recreational boat harbour with marine sands from harbour entrance using small cutter suction dredge. • Construction of new eastern breakwater between the Geraldton Port Authority Recreational Boat Harbour and almost to the outer breakwater but leaving a 10 metre wide water buffer.
Wharf modifications	• Modify wharves to access the deeper harbour basin. Install navigational aids. • Install new navigational aids to mark the external boundaries of the widened channel.
Reclaim land adjacent to existing northern breakwater	• Up to 0.4 million cubic metres of dredged material will be pumped directly in to the northern reclamation area to provide future hard standing and cargo storage capacity for two future berths adjacent to the northern breakwater.
Construction of railway line on eastern breakwater	Up to 1 kilometre of double railway track from the grain unloading facility to end of the eastern breakwater.
Reclaim land within eastern breakwater and sand nourishment of Town Beach	Up to 600 000 cubic metres of clean fill material from the Southern Transport Corridor project will be used to provide the fill required.
Construction of beach stabilisation groynes in Town Beach.	• The existing breakwaters at Town Beach will be lengthened by approximately 50 metres. • A new groyne will be constructed on the north-west corner of the Batavia Coast Marina.

Figures (attached)

Figure 1: Locality of the Port Enhancement Project

Figure 2: Channel alignment, reclamation and modification to Geraldton Port and Town Beach

Figure 3: Location of spoil grounds

Figure 4: Environmental Quality Objective for Maintenance of Ecosystem Integrity – Levels of Protection

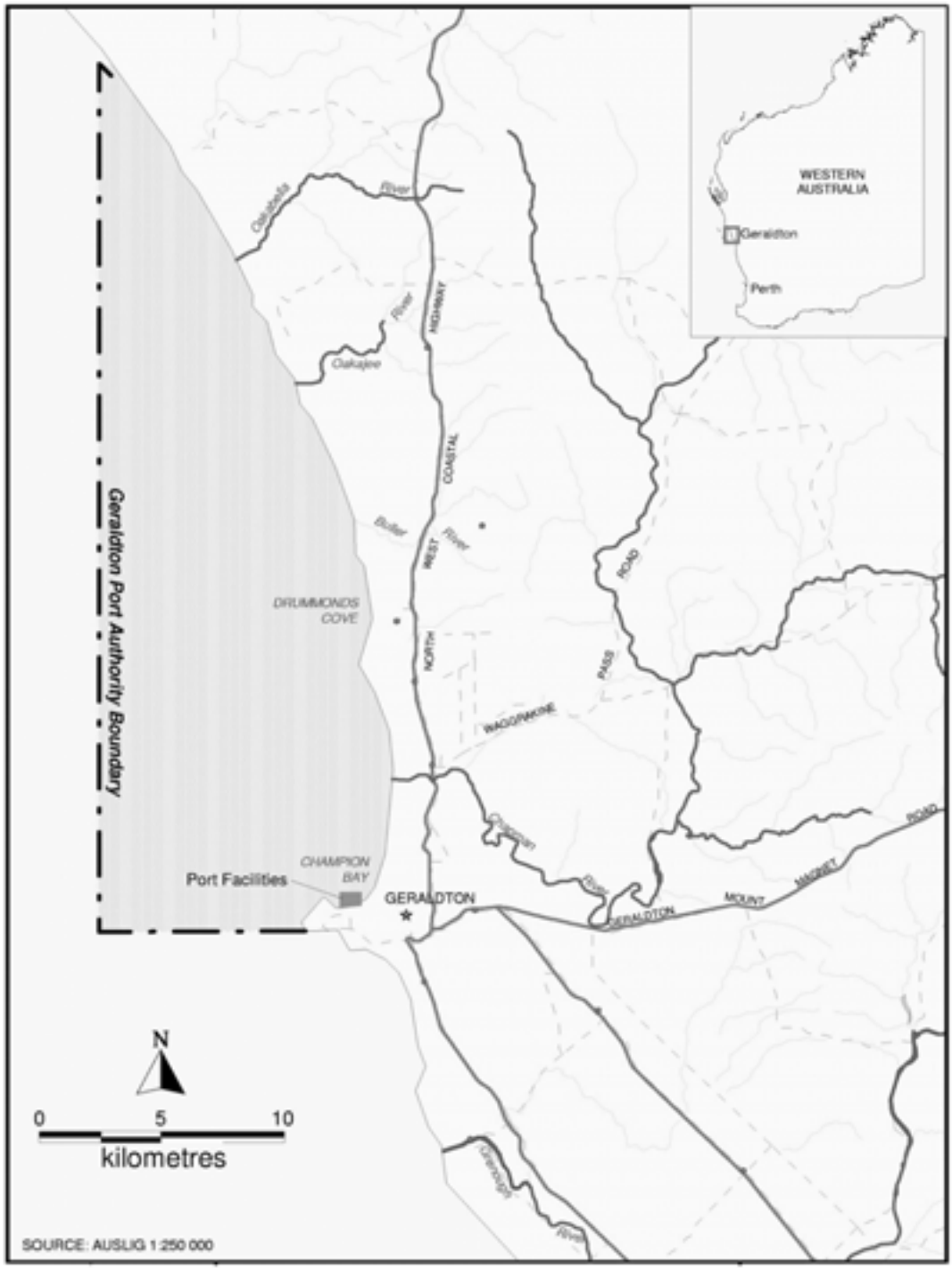

Figure 1: Locality of the Port of Geraldton (Source: Port Enhancement Project PER, URS, 2001)

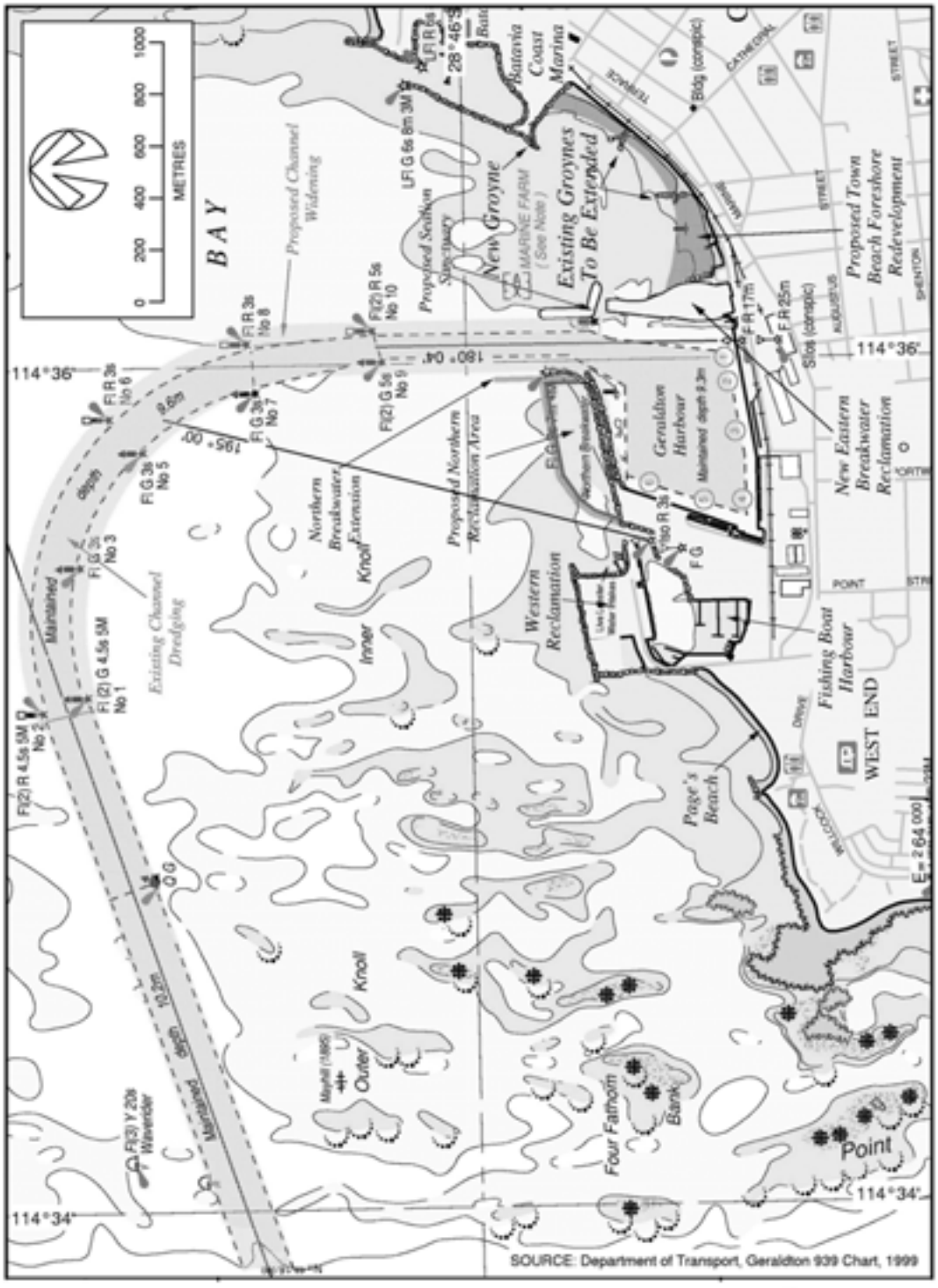

Figure 2: Proposed modifications to the channel alignment, the Geraldton Port and Town Beach (Source: Port Enhancement Project PER, URS, 2001)

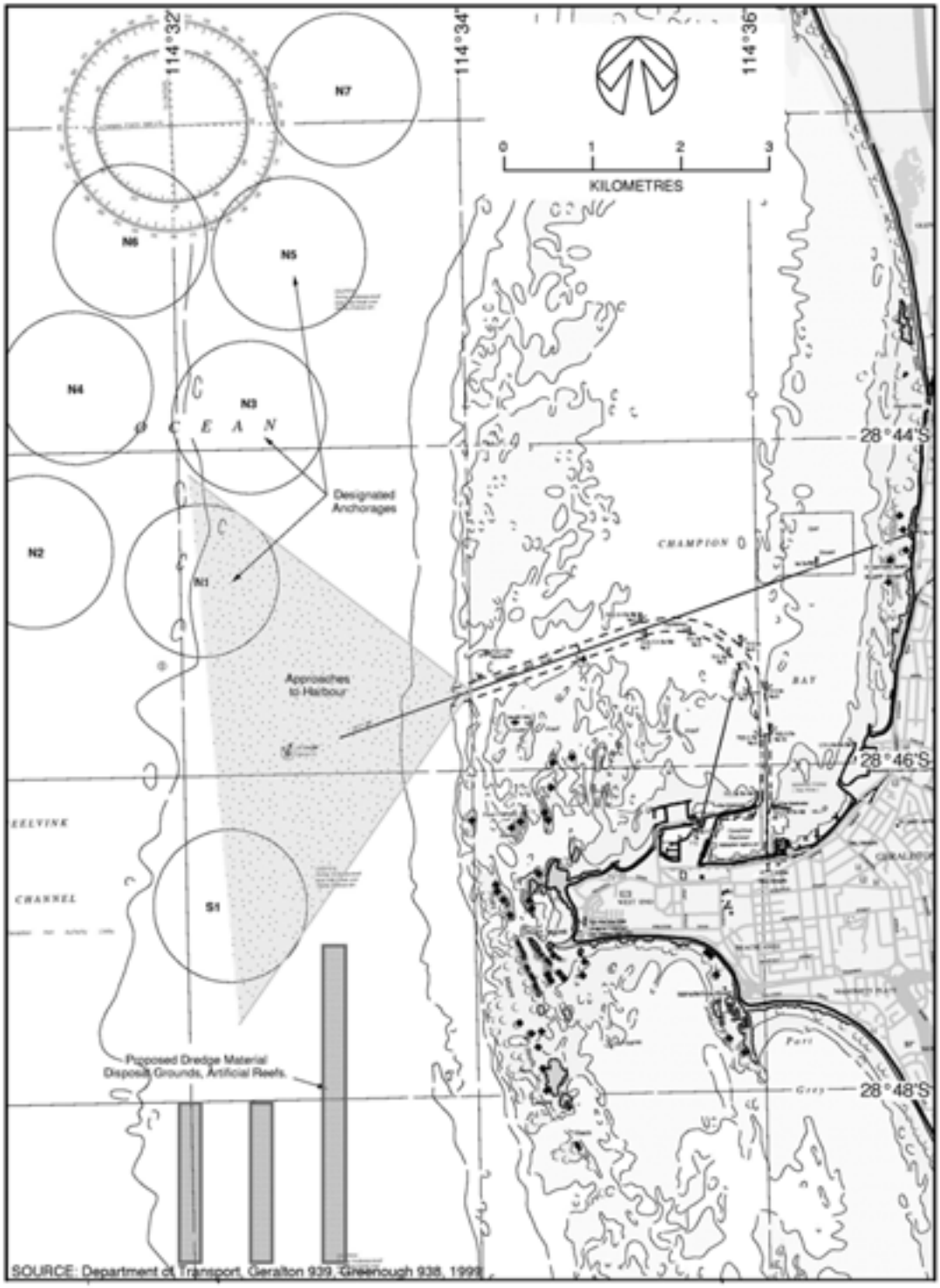

Figure 3: Location of proposed dredged material disposal area (Source: Port Enhancement Project PER, URS, 2001)

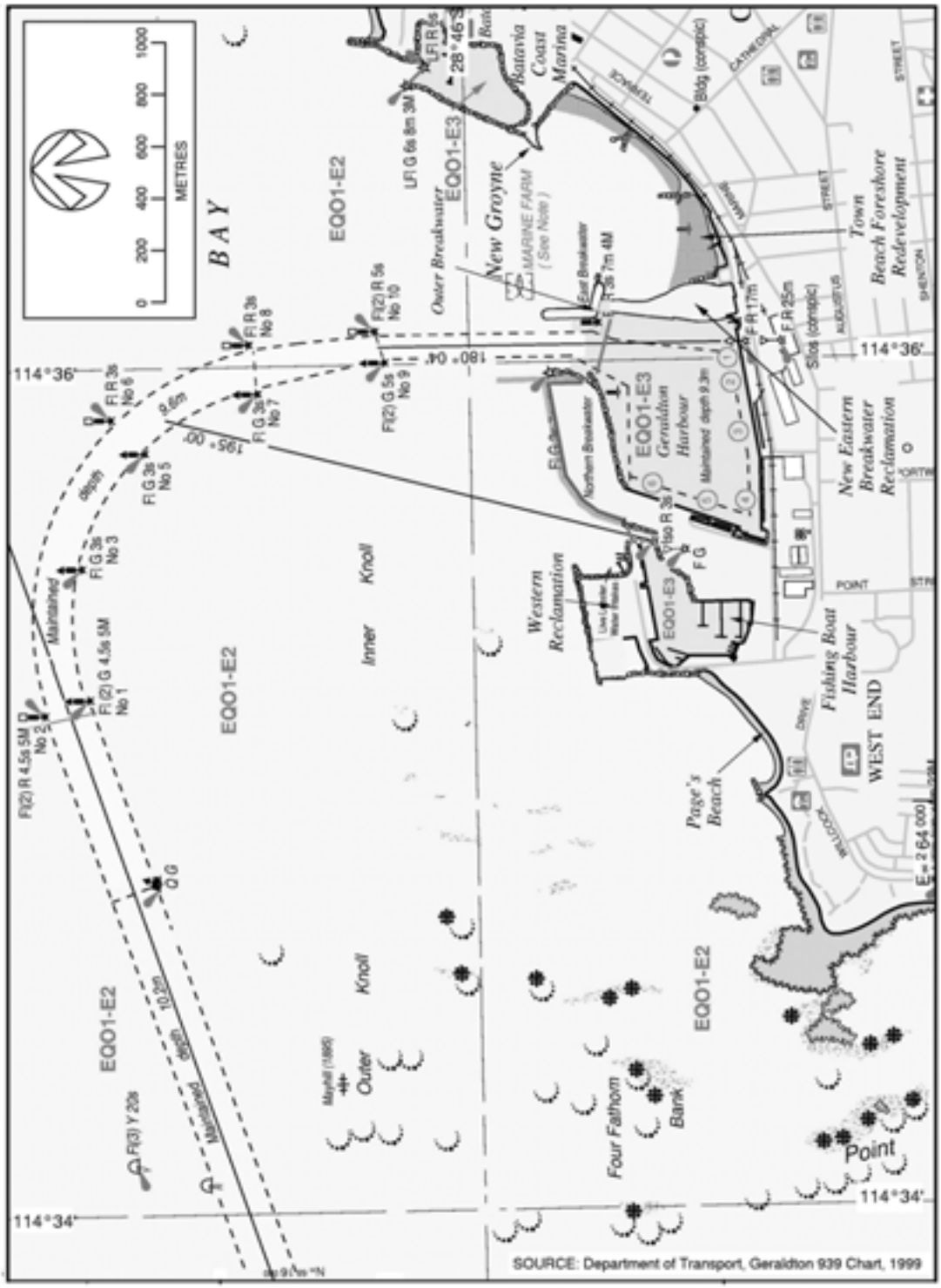

Figure 4: Environmental Quality Objective for Maintenance of Ecosystem Integrity – Levels of Protection

Schedule 2

Proponent's Environmental Management Commitments

31 May 2002

GERALDTON PORT ENHANCEMENT PROJECT AND PREPARATORY WORKS FOR TOWN BEACH FORESHORE REDEVELOPMENT

Geraldton Port Authority

(Assessment No. 1379)

Summary of Environmental Management Commitments - Geraldton Port Enhancement Project and Preparatory Works for the Town Beach Redevelopment Project

	Activity/Topic	Action	Objective	Timing	Advice
1	Environmental Management Programme (EMP)	Prepare an EMP containing the following elements: • Water Quality Management and Monitoring Programme (WQMMP) (commitment 3); • Seagrass Management and Monitoring Programme (SMMP) (commitment 7); • Artificial Reef Management Programme (ARMP) (commitment 5); • Marine Mammal Management and Monitoring Programme (MMMP) (commitment 9) • Breakwater Construction and Town Beach Reclamation Management Plan (BCRMP) (commitment 11); • Northern Beaches Stabilisation Programme (NBSP) (commitment 13); and • Dredging Management Plan (DMP) (commitment 15). Each element will address: (1) plans to meet environmental management requirements of specific project activities; (2) implementation (method and timing) of above plans; (3) measurement and evaluation of environmental performance; and (4) reporting and compliance auditing of environmental performance.	To minimise the potential for adverse environmental impacts and to confirm the reliability of impact predictions.	Prior to commence ment of construction	CoG CALM EA DoF
2.	EMP	Implement the EMP.	Achieve the objectives of commitment No. 1.	Pre-, during and post-construction stages of project.	CoG CALM EA DoF
3.	Water Quality Management and Monitoring Programme (WQMMP)	Finalise the WQMMP which addresses the following key elements: (1) environmental quality objectives, environmental quality criteria and locations to be protected; (2) definitions of agreed 'alert' and 'action' levels of water turbidity and light attenuation and locations at which they will apply; (3) definitions of 'alert' and 'action' levels agreed with the lobster exporters to protect water quality at the seawater intakes for the live lobster holding activities; (4) definition of management actions applicable to agreed 'alert' and 'action' levels; (5) location of monitoring stations and sampling frequency; and (6) means by which monitoring results will be reported.	To protect water quality at the seawater intakes for the lobster holding facilities. To protect ecological, recreational and aesthetic values of marine waters.	Prior to commence ment of construction	Lobster exporters
4.	WQMMP	Implement the WQMMP	Achieve the objectives of commitment No. 2	During construction and operational phase of	Lobster exporters

Summary of Environmental Management Commitments - Geraldton Port Enhancement Project and Preparatory Works for the Town Beach Redevelopment Project

	Activity/Topic	Action	Objective	Timing	Advice
				project	
5.	Artificial Reef Management Plan (ARMP)	Prepare an ARMP which addresses the following key elements: (1) detailed design and location of reefs; (2) pre-construction baseline survey of habitat character and lobster catch productivity; (3) confirmation of impact predictions during construction stage; (4) post-construction survey of bathymetry and reef habitat character; (5) post-construction monitoring of reef habitat development and lobster catch productivity; and (6) reporting of survey results.	To design and construct artificial reefs using rocky dredged material to improve the biological and fishing productivity of the seafloor in deep water south west of Point Moore to satisfaction of DoF and local professional lobster fishermen and recreational fishermen.	Prior to commencement of dredging activities	EA DoF Professional fishermen's associations Recreational fishermen
6	ARMP	Implement the ARMP	Achieve the objectives of commitment No. 5	2001 – 2005 As necessary prior to, during, and for up to 3 years after completion of construction	EA DoF Professional fishermen's association
7.	Seagrass Monitoring	Prepare an SMP which addresses the following: (1) anticipated impacts and objectives of monitoring;	To confirm the predicted scale of	Prior to commence	

Summary of Environmental Management Commitments - Geraldton Port Enhancement Project and Preparatory Works for the Town Beach Redevelopment Project

	Activity/Topic	Action	Objective	Timing	Advice
	Programme (SMP)	(2) location of monitoring sites; (3) sampling frequency; (4) parameters to be monitored; and (5) reporting of monitoring results.	impacts on seagrass resources of Champion Bay.	ment of construction	
8.	SMP	Implement the SMP	Achieve the objectives of commitment No. 7	2001 – 2005 prior to, during and post construction for up to 3 years after completion of construction	
9.	Marine Mammal Management and Monitoring Plan (MMMP)	Prepare an MMMP to address the following: (1) collection of data during whale migrations; (2) recording of any whale encounters by trailer hopper dredge (THD) during dredged material disposal activities; (3) avoiding whales in accordance with the conditions of the dredging permit and permit t disturb cetaceans issued by EA; (4) collection of data to determine present and future abundance of Sealions in the vicinity of Geraldton port; (5) incorporate flat rock surfaces slightly above the high tide level to create suitable haul-out locations for Sealions (*Neophoca cinerea*); (6) monitor use of replacement breakwater as a Sealion haul-out location; (7) design and construct a viewing shelter and wall across the end of the breakwater, to minimize the potential for disturbance to Sealions; (8) design and implementation of a series of tests to simulate the disturbance to Sealions associated with train movements on the eastern breakwater, prior to construction of the railway; (9) monitor and record the presence and abundance of dolphins in the port area, prior to, during and for one year following completion of the dredging programme; and (10) reporting results of all monitoring undertaken to DEP, CALM and the CoG.	To confirm the migration routes followed by the majority of the WA Humpback Whale (*Megoptera novaeangliae*) population during the 2001, 2002 and 2003 migration periods. To confirm the predicted low level of project impact on migrating	Prior to commence ment of construction	

Summary of Environmental Management Commitments - Geraldton Port Enhancement Project and Preparatory Works for the Town Beach Redevelopment Project

	Activity/Topic	Action	Objective	Timing	Advice
			Humpback Whales (*Megoptera novaeangliae),* the local sea lion colony and dolphins in southern Champion Bay. To maximise the opportunity for Sealions (*Neophoca cinerea*) to return to the area. To confirm the impact of the proposal on Sealions (*Neophoca cinerea*).		
10.	MMMP	Implement the MMMP	To achieve objectives of commitment No. 9.	Prior to, during and for one year after completion of construction	EA CALM CoG
11.	Breakwater Construction and Town Beach Reclamation	Prepare a BCRMP to ensure the public's safety and amenity to address the following environmental issues: • impact of dust; • impact of wind-blown sand;	To minimise adverse effects of breakwater construction and	Prior to commence ment of construction	CoG MRWA

Summary of Environmental Management Commitments - Geraldton Port Enhancement Project and Preparatory Works for the Town Beach Redevelopment Project

	Activity/Topic	Action	Objective	Timing	Advice
	Management Plan (BCRMP)	• impact of noise; • impact of odour; • impact of traffic; and • impacts on public safety.	Town Beach (and breakwater) reclamation earthworks on the public as a result of dust, noise, odour, traffic and public safety.		
12.	BCRMP	Implement BCRMP	To achieve objectives of commitment No. 11	During the construction phase of project	DEP CoG MRWA
13	Northern Beaches Stabilisation Programme (NBSP)	Prepare an NBSP to address the following key elements: (1) beach monitoring locations and frequency; (2) determine volume of sand nourishment and timing of placement; • location and scale of stabilisation works (if any); and (4) management of dust , noise and traffic impacts during nourishment.	To contribute to the CoG's Northern Beaches Stabilisation and Enhancement Strategy in association with CoG and DPI (Coastal and Facilities Management Branch)	Prior to commence ment of construction	CoG DPI
14	NBSP	Implement the NBSP	To achieve the objectives of commitment No. 13	Ongoing	CoG DoF Professional fishermen's associations Geraldton community
15.	Dredging Management Plan (DMP)	Prepare a DMP to address the following: • management of dredging based on the results of turbidity and light attenuation monitoring required under commitment 3; • best practice dredging management including operational strategies in the event of	To minimise adverse effects of dredging activity on all users of	Prior to commence ment of dredging	CoG DoF Professional fishermen's

Summary of Environmental Management Commitments - Geraldton Port Enhancement Project and Preparatory Works for the Town Beach Redevelopment Project

	Activity/Topic	Action	Objective	Timing	Advice
		exceedences of the agreed action levels; • produce a detailed description of proposed dredging works and timing once contractors selected; • publish Notices to Mariners and public regarding location and timing of works; • confirm dredging equipment on arrival is free from sediment (holds) and of marine organisms (ballast water and hull fouling); and • management of works to minimise location of turbid water plumes, and interference to recreational activities in Town Beach area.	Champion Bay including the Port and Town Beach		associations Geraldton community
16.	DMP	Implement the DMP.	To achieve the objectives of commitment No. 15	During dredging programme	CoG DoF Professional fishermen's associations Geraldton community

Appendix 5

Summary of Submissions and
Proponent's Response to Submissions

R E S P O N S E T O S U B M I S S I O N S

Geraldton Port Enhancement Project and
Preparatory Works for
Town Beach Foreshore Redevelopment

Public Environmental Review
Assessment No. 1379

Response by the Geraldton Port Authority
to the
Summary of Public Submissions
prepared on behalf of the
Environmental Protection Authority (EPA)
by the EPA Service Unit

16 April 2002

Plate 1 : Epiphyte-encrusted *Posidonia australis*, western Town Beach, depth <1 m.

Plate 2 : Heavily epiphytised and silt-encrusted *Posidonia sinuosa*, offshore western Town Beach, depth ~4 m.

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Australian Antarctic Division
[redacted]
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The Editor
The Geraldton Guardian
PO Box 128
GERALDTON WA 6531

31 January 2002

Dear Sir/Madam

I have received a copy of the front page article entitled "Sea lion threat in question" published in the Geraldton Guardian on Wednesday 30th January 2002, and wish to clarify an important point that is misleading in the opening paragraph. In the article it states that I claim to have been misquoted in the "Geraldton port upgrade's environmental report". This is not the case. Your article is based on an email from me. This email was originally sent to a concerned member of the Geraldton public who contacted me, and was subsequently used, with my permission, by Geraldton City Councillor Paul Robb. In the email I comment that "It sounds like some of my comments may have been taken out of context so I will now briefly outline what I think about the likely impact of development at or near the sea lion haul-out site." This statement was made in response to a telephone conversation, during which the subject of the sea lions and the development was widely discussed. The comment was not making specific reference to the PER.

In relation to the comments attributed to me in the PER, I was shown a copy of the quotes that would be used by URS, and agreed to their use. Consequently, I do not claim to have been misquoted.

I hope you understand the importance of this clarification. I hope it does not act as a distraction from the serious issue of considering the potential for impact on the sea lions that utilise the Port. Whilst my comments in the PER stand, so do the comments in the email tabled by Paul Robb, which you have a copy of (now that the issue of being "out of context" is resolved).

I must stress that I do not have a detailed knowledge of exactly what is now proposed in the Geraldton port. Whilst I have visited Geraldton many times, and have sailed in and out of the port often, I am now resident in Hobart and am not able to evaluate first hand the situation and what is planned.

As I stated in my email, the long term impact on the sea lions will depend on how long they are to be disturbed for, the magnitude of the disturbance, and the quality (in sea lion terms) of what haul-out is available to them when the work is finished. By "quality" I mean a combination of physical issues of substrate, and protection, as well as the degree to which the animals are disturbed. If the magnitude of disturbance is

significantly greater, then the potential of the sea lions returning is diminished. If it is similar or less, then I believe they should return. Disturbance is very much an issue of proximity, as well as sound, so the location of the haul relative to sources of disturbance will be important.

The Geraldton sea lions are a rare and important coastal species and the situation at Geraldton is almost unique. It is very encouraging to see such a strong focus being put on efforts to ensure their future and I am very happy to be able to help with this wherever possible.

Dr Nick Gales
Principal Research Scientist
Applied Marine Mammal Ecology

cc Ian le Provost, URS
Peter Duplex, GPA
Kaye Verboon, Mills Wilson

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DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

Your ref:
Our ref: GER2002F004V01
Contact: Anthony DESMOND

Mr Ian LeProvost
URS Australia Pty Ltd
Level 3 Hyatt Center
20 Terrace Road
East Perth WA 6004

Dear Ian

Geraldton Port Authority Public Environmental Review

In an e-mail to District Wildlife Officer Kevin Marshall on 11 February 2002 you requested he to provide comments on your attached report. This report was detailed the response to issues raised during the public comment phase of the Public Environmental Review (PER) concerning noise and disturbance of the sealions in the Geraldton Port.

Please understand that while Mr Marshall has some local knowledge of the sealion population in the Geraldton area, resulting from ad hoc observations and dealing with injured and derelict animals over the last 15 years, he has no formal qualifications relating to the study of sealions or any other pinniped, has done no formal study of pinnipeds and has never published a refereed paper on any pinniped. In this context it is not appropriate to cite Mr Marshall as an expert in the field. However, as a matter of interest, it is Mr Marshall's observation that during the past 15 years the local population has remained relatively stable.

Whilst the sealions in the port area are habituated to a certain level of disturbance, very little of this disturbance currently occurs at night or in close proximity to the current haul out sites. Although each period of disturbance from the train is not considered to be lengthy the implications of three trains per night during the rest period for the sealions may be very significant. Disturbance from the locomotive is likely to be in the form of both sound and light interference. It is also considered likely that the noise of the carriages will be significant even from distances of 150m given that the activities will occur at night.

In addition the access to the proposed viewing shelter and wall appears to provide the opportunity for members of the public to be close enough to the current haul out sites for swimming access. This may have significant impacts on the sealions and presents the potential risk of swimmers being bitten should a sealion become aggressive.

In conclusion it is considered that the presence of the spur line in close proximity to the sealion haul out sites will provide a continued, regular and ongoing disturbance to the sealions. The ability of members of the public to access areas close to the haul outs sites and potentially the haul out sites themselves is also of concern. In this context it is reasonable to expect that these disturbances may cause the sealions to relocate from the Geraldton Harbour.

Yours sincerely

for Sue Hancock
A/REGIONAL MANAGER
MIDWEST REGION

22 February 2002

Rochdale Holdings Pty Ltd A.B.N. 85 009 049 067 trading as:
HERRING STORER ACOUSTICS
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P.O. Box 219, Como, W.A. 6952
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ALLAN HERRING M.I.E. AUST. M.A.A.S.
LYNTON STORER M.A.I.E.A., M.A.A.S.
TIM REYNOLDS M.I.E. AUST. M.A.A.S.

Our ref: 10792-1-01159

7 February 2002

URS
Level 3, Hyatt Centre
20 Terrace Road
EAST PERTH WA 6004

Attention: Anthony Bougher

Dear Sir,

TRAIN UNLOADING AT PORT OF GERALDTON
ADDITIONAL INFORMATION ACOUSTICS

As requested, we have carried out further analysis of the noise emissions from the two possible options for train unloading at the Port of Geraldton. We herewith present the calculations and provide comments relating to the noise received at noise sensitive premises located further north from the area covered in our previous report.

OPTIONS

Option 1 - Breakwater.

Option 2 - Using existing line and splitting train.

The original analysis concentrated on the area closest to the railway line, as these premises are the most affected by either option. Also noise sensitive premises located further to the north benefit from trains entering the Port from the south and no longer passing-by on the way in and out of the Port.

CALCULATIONS

Calculations were carried out using the the "Environmental Noise Model" program ENM. Single point calculations were carried out to determine the noise level that would be received at the following noise sensitive premises located to the north of the existing unloading facility:

- Hotel on corner of Foreshore Drive and Cathedral Avenue.
- Residential area within the new Marina.

The calculations were carried out using the same data as used for the previous assessments.

The results are summarised in Table 1.

TABLE 1 - CALCULATION NOISE LEVELS

Location	Calculated Noise Level dB(A)			
	Option 1		Option 2	
	Loco	Take-up	Loco	Take-up
Hotel	58	68	57	66
Marina	51	62	49	59

DISCUSSION

The calculations indicate that noise received at noise sensitive premises further north is marginally higher for Option 1 compared to Option 2. However, the difference would be considered as insignificant and in either case noise received from either Option would comply with the appropriate criteria.

At locations between the hotel and the marina, noise levels from Option 1 would be up to 3 dB(A) higher than for Option 2. This difference would be considered marginal and would in either case comply with the appropriate criteria.

We also point out that the with the proposed changes to the railway line, trains will enter the Port from the south and will no longer run along the beach front, and these residences will benefit significantly by no longer having the noise of the locomotive and wagons passing by on the way in and out of the Port.

CONCLUSION

Noise propagation over the water from Option 1 is marginally greater for noise received from Option 2. However, would be considered as insignificant and with the changes to the rail system, we believe that the acoustic amenity of the noise sensitive premises further to the north would be improved with either option.

With the benefits of Option 1 (breakwater) to premises located close to the Port, we believe that the construction of the new breakwater would be the preferred option.

Yours faithfully,
for **HERRING STORER ACOUSTICS**

T.C. Reynolds

Tim Reynolds

Geraldton Port Authority
Box 1856
GERALDTON 6530

19 Feb 2002

49 Volute Street
GERALDTON

Dear Geraldton Port Authority

Thank-you for the talk Peter Duplex gave the other night to the Geraldton Windsurfing Club to which I have been a member of long standing. I found it to be informative but I also need to follow-up some concerns I have with the Geraldton Port Authority Project as it stands as a windsurfer and as a resident of Sunset Beach.

One of the issues that became apparent from your talk is the level of unknown variables for the project, namely, the impact that the GPA Project particularly the extension of the inner harbour breakwater and the huge outer artificial reefs created by dredging, will have on the immediate coastline from Point Moore to Sunset Beach.

I must stress that as a long term resident of Sunset Beach since 1988, I have watched our coastline change dramatically in the area north of Chapman River. The problem was recognised later by the introduction of the artificial dune which has also changed in shape substantially since 1994 with steady erosion since then.

My main points are:

1. Does the Geraldton Port Authority recognise that a problem does exist with the Sunset dune ?
2. Does the Geraldton Port Authority recognise responsibility to the constant erosion of the dune by the introduction of breakwater groynes in the harbour area ?
3. Does the Geraldton Port Authority recognise a responsibility that erosion of the Sunset Dune may be accelerated by the extension of the new breakwater, the large artificial reefs , and the deepening of the channel ?

In essence, I would like to know what plan the Geraldton Port Authority has in maintaining the status quo of the Sunset Dune given that the natural sand replenishment cycle on its northern coastal direction, is impeded by breakwaters further south in the inner harbour area and the impact of the large offshore reefs on swell.

I recognise that the Geraldton Port Authority has an agenda to deepen and expand the Port Of Geraldton. The large offshore artificial reefs and the breakwater extension is a concern. Therefore, there must be a contingency plan set in place to maintain the coastal areas around the Port, namely , of major concern to me , the Sunset Dune. A sand nourishment programme must be introduced soon, as the dune erosion is continuing at an alarming rate. I would suggest using beach sand as opposed to other materials not inherent in the natural coastal environment.

I realise there is a Consultant currently employed by the Geraldton Port Authority looking specifically at the Northern harbour coastal area up to and including the Sunset Dune. I wish for my concerns to be passed on to him.

As a windsurfer, this dredging may provide a one-off opportunity to create a major tourist attraction in the form of one or many artificial surf reefs on the coast. Many tourists come here for the windsurfing but many non-windsurfing tourists do not come here because "it is too windy" or "the wave quality is not up to international standard apart from the Sunset Beach wave which only works in a big swell". Now is our chance to get it right and capitalise on our natural resources or enhance the existing unique resources in this area. A World Class quality wave would have enormous benefit to Geraldton , adding value to the Geraldton Port Authority's Project. Please review artificial reef sites on the Gold Coast and in Florida which has been terribly successful in attracting tourists.

As a resident and business person of Geraldton, I wish every success with the Project, but I also hope that deep thought and consideration is given to my concerns and value be added to the Project. Our future depends on it.

Ross McKay

COASTAL ENGINEERING SOLUTIONS

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21st February 2002.

02-172-wa-hprlr-020221a

Mr Tony Byrne
URS Australia Pty Ltd
Level 3, 20 Terrace Road
East Perth WA 6004

Dear Tony,

Point Moore – Impact of Dredge Spoil on Waves for Windsurfing

Background

Much of the spoil material that will be dredged as part of the Geraldton Port Enhancement Project is coarse material that will be disposed off in deep water to the west of Point Moore.

The proposed spoil disposal scheme consists of three long mounds of spoil, each having a height of about 3 metres above the seabed and a width of about 200 metres. The natural water depth varies from 22 to 29 metres. The arrangement of the spoil areas is shown in attachment A(URS figure 1.4). The two outer spoil areas are about 1 kilometre long and the spoil ground closest to Point Moore is two kilometres long.

The height and arrangement of the spoil grounds has been chosen for the following reasons:

- To provide an additional habitat for rock lobsters;
- To avoid the mooring area set aside for ships waiting to enter the port. Consequently the spoil ground cannot be located further north; and
- To minimise the impact on waves crossing the spoil ground. The impact tends to be minimised if the spoil ground is aligned with the natural seabed contours.

Despite these considerations, there has been concern voiced by the windsurfing fraternity that the spoil grounds will reduce the height of waves that cross over them and thereby reduce the wind surfing amenity off Point Moore.

This letter report describes the outcome of wave studies that were undertaken to determine if there was likely to be a reduction in wave energy reaching the Point Moore area.

Wave Studies

A wind surfing spokesperson identified six locations off Point Moore that were of specific importance. These are marked as sites A, B, C, D, E and F on attachment B.

Wave transformation studies were conducted to define the wave climate at each of these 6 sites for existing conditions and for the conditions that will occur when the spoil ground has been filled. The seabed schematisation utilised the same grid spacing (and seabed digitisation) as for all of the wave modelling for the Port Enhancement studies. The offshore spoil grounds were represented by a 100 and 200 metre grid, and the Point Moore area by a 50 metre grid.

It is noted that the spoil ground will impact on waves in two ways:

- The spoil grounds consist of a rough, dredged limestone material, the surface of which will tend to be rougher than the natural sandy seabed. Consequently there can be some additional loss of wave energy as waves pass over the rough surface. This situation will mainly occur during strong storms. During average wave conditions, the sandy seabed surface will be covered with sand ripples which have a similar roughness characteristic as the limestone spoil material.
- The spoil ground forms a shallow shoal feature off Point Moore. The water depth over the spoil area averages at about 22 to 23 metres and the average water depth adjacent to the spoil area is 25 to 26 metres. Such a spoil feature will tend to concentrate wave energy and will result in some focussing at Point Moore for wave directions form the south-west sector.

Wave refraction computations were carried out for the six sites to determine the effect of the spoil ground on waves, excluding the effect of the spoil ground roughness. It was found that site B was the most effected.

Consequently site B was investigated in more detail by taking into account seabed friction and all waves that were generated from the south west from 1992 through to 1999 (for all other directional sectors the wave height change is negligible).

Detailed Results of Wave studies at Site B

Based on the full 8 year wave data set transformed to Point Moore:

- Waves that had a significant wave height of greater than 3 metres were on average reduced in height by less than 3% when the spoil ground is simulated. These high wave conditions occurred for up to 8% of the time.
- All waves that had a height of 3 metres and less either were unaffected by the spoil ground, or the spoil ground resulted in a slight increase in wave height.
- A maximum increase in wave height of up to 5% occurred for average wave conditions. The average significant wave height (throughout the year) is about 1.3 metres. Note that when the significant wave height is 1.3 metres the larger waves in the wave train may have a height of about 2.5 metres.

There is a significant variation in the wave climate from year to year. The reef mainly impacts on the average amount of wave energy arriving at the shoreline at Point Moore. It has little impact on the maximum waves which are controlled by the various reef breaks offshore from Point Moore.

Finally if all of the wave height values over the eight year data set (wave height determined every 3 hours) are averaged for the south west wave sector, there is a slight (less than 1%) increase in wave height at Site B, Point Moore. The implication is that the wave energy focussing effect of the spoil ground slightly exceeds any energy losses due to increased seabed friction from the spoil ground.

Since wave refraction effects (as a result of the spoil ground) at the other wind surfing sites were less than for site B, it is reasonable to deduce that at all of these sites the average wave height (energy) will not be less than for existing conditions.

Yours sincerely,

Peter Riedel
(Director Coastal Engineering Solutions P/L)

Appendix 6

Ministerial statements 87 and 367

WESTERN AUSTRALIA
MINISTER FOR ENVIRONMENT

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

PROPOSED GERALDTON PORT EXPANSION

GERALDTON PORT AUTHORITY

This proposal may be implemented subject to the following conditions:

1. The proponent shall adhere to the proposal as assessed by the Environmental Protection Authority and shall fulfil the commitments made in the Notice of Intent (copy of commitments attached).

2. Prior to commencement of any major additional dredging activity not addressed within the Notice of Intent, the proponent shall refer the proposal to the Environmental Protection Authority for assessment.

3. The proponent shall ensure that water within the Geraldton Inner Harbour is maintained at a quality acceptable to the Environmental Protection Authority, so that it does not have an adverse impact on the marine environment or on the beneficial uses outside the Inner Harbour. The document 'Water Quality Criteria for Marine and Estuarine Waters of Western Australia' (EPA Bulletin 103) shall be used as a guide in determining acceptable water quality.

4. In order to minimise environmental impacts that could occur from sediment plumes resulting from dredging, the proponent shall, prior to commencement of dredging, bund all reclamation areas (for both Stages 1 and 2) and take such other action as is required to meet this objective to the satisfaction of the Environmental Protection Authority.

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In addition, should sediment plumes extend beyond the Inner Harbour breakwater, the proponent shall take remedial action to minimise environmental impact as soon as possible, to the satisfaction of the Environmental Protection Authority.

5. All refuelling facilities and fuel links in both the Inner Harbour and Fishing Boat Harbour shall be designed and sited so as to minimise the risk of spills into the Inner Harbour area.

The storm water drainage system and discharge points shall be designed and sited so as to minimise any detrimental impact on the marine environment and accordingly, shall be referred to the Environmental Protection Authority for comment prior to construction.

6. Prior to construction, the proponent shall identify appropriate environmental management for the quarrying and transport of rock associated with the construction of the bund walls, to the satisfaction of the Environmental Protection Authority following consultation with the City of Geraldton.

Bob Pearce, MLA
MINISTER FOR ENVIRONMENT

22 DEC 1989

SUMMARY OF COMMITMENTS

The GPA is responsible for all activities with regard to the Port of Geraldton, including the present proposal. As such the Authority makes the following commitments:

- The GPA commits to managing the increase in turbidity generated by dredging. This will be performed by constructing the bund walls well in advance of reclamation in order to contain the extent of the plume. In addition the discharge outlet will be located as far away from the overflow outlet as possible to allow the maximum amount of suspended sediment to settle out before discharge to the harbour. Dredging of Stage 1 will be limited to one month while dredging for Stage 2 will be limited to four months so as to minimise the period over which turbidity will be generated. Management of turbidity will be performed to the satisfaction of the EPA.

- The GPA commits to managing the reclamation activities in such a way as to minimise the generation of noise and dust. In the unlikely event that complaints are received the GPA commits to taking appropriate action to rectify the problem. This action will be performed to the satisfaction of the EPA.

- The GPA commits to locating the dredge and associated pipelines such that continued access to the fishing boat harbour and to the berths within the main harbour will be provided. This will be carried out after consultation with port users along the lines of normal practice during other similar dredging programmes.

- The Department of Marine and Harbours has undertaken to monitor the beaches on either side of the Geraldton Foreshore Development Marina in order to identify any unforeseen shoreline instability as a result of that project. The GPA commits to remaining in communication with the DMH with regard to the results of this monitoring programme and if necessary, take appropriate management actions in conjunction with the DMH.

- The GPA commits to managing stormwater runoff from factories and hardstanding surfaces within the reclaimed area so that spills of chemicals, and other potential pollutants at the Port are directed into drains and captured in silt traps. The design of the drainage system will include a soak well and high level overflow and will be designed to the satisfaction of the EPA.

- The GPA commits to not allowing crayfish processing industries to establish on the reclaimed land of Stages 1 and 2. This is mainly because of effluent disposal problems associated with this type of industry.

- The GPA commits to not allowing the disposal of effluents from industries into any septic tanks installed on the reclaimed land.

- The GPA commits to carrying out management and monitoring programmes designed to detect and address foreseeable contingencies associated with the reclamation works. This includes monitoring of heavy metals in soils to be dredged, modification of contingency programmes designed for hydrocarbon spillage and fire events and the repair of any stabilising structures associated with the works should they fail. These management and monitoring programmes shall be performed to the satisfaction of the EPA.

367

WESTERN AUSTRALIA

MINISTER FOR THE ENVIRONMENT

STATEMENT TO AMEND CONDITIONS APPLYING TO A PROPOSAL (PURSUANT TO THE PROVISIONS OF SECTION 46 OF THE ENVIRONMENTAL PROTECTION ACT 1986)

PROPOSAL:	GERALDTON PORT EXPANSION (239/871)
CURRENT PROPONENT:	GERALDTON PORT AUTHORITY
CONDITIONS SET ON:	22 DECEMBER 1989

The implementation of this proposal is now subject to the following conditions which replace all previous 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, including the proposed extension of the breakwater as reported in Environmental Protection Bulletin 752, the proponent shall fulfil the commitments made during the assessment in 1989 (summarised and published in Environmental Protection Authority Bulletin 411 as Appendix 2) and the revised commitments of May 1994 (published in Environmental Protection Authority Bulletin 752 as Appendix 2); provided that the commitments are not inconsistent with the conditions or procedures contained in this statement.

A schedule of environmental management commitments (August 1994) which will be audited by the Department of Environmental Protection is attached.

2 Dredging

2-1 Prior to commencement of any major additional dredging activity not addressed within the Notice of Intent, the proponent shall refer that activity to the Environmental Protection Authority.

3 Water Quality

3-1 Prior to construction, the proponent shall prepare a water quality monitoring programme for the Port, including the Inner Harbour.

3-2 Prior to construction, the proponent shall establish a baseline for comparison of water quality.

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3-3 The proponent shall ensure that waters within the Geraldton Inner Harbour are maintained at a quality acceptable to the Department of Environmental Protection, so that they do not have an adverse impact on the marine environment or on the beneficial uses of the waters outside the Inner Harbour.

The criteria which should be used for determining acceptable water quality are published in the draft document 'Western Australian Water Quality Guidelines for Fresh and Marine Waters', Environmental Protection Authority Bulletin 711, October 1993.

3-4 The proponent shall implement the water quality monitoring programme required by condition 3-1.

4 Bunding

4-1 In order to minimise environmental impacts from sediment plumes resulting from dredging, prior to commencement of dredging, the proponent shall bund all reclamation areas (for Stage 2) and take such other action as is required to meet this objective.

5 Not applicable.

6 Quarrying

6-1 Prior to construction, the proponent shall identify and subsequently implement appropriate environmental management for the quarrying and transport of rock associated with the construction of the bund walls, to the requirements of the Department of Environmental Protection following consultation with the City of Geraldton.

7 Shoreline Stability

7-1 The proponent shall undertake shoreline monitoring in order to confirm shoreline stability and to identify any littoral drift problems resulting from the port expansion.

7-2 The proponent shall prepare a shoreline monitoring plan.

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

8 Implementation

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

8-1 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. Where, in the course of that detailed implementation, the proponent seeks to change those designs, specifications, plans or other technical material 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.

9 Proponent

These conditions legally apply to the nominated proponent.

9-1 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.

10 Time Limit on Approval
The environmental approval for the proposal is limited.

10-1 If the proponent has not substantially commenced the modified project within five years of the date of this statement, then approval to implement the proposal as granted in the statement of 22 December 1989 shall lapse and be void. The Minister for the Environment shall determine any question as to whether the modified 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 by way of a request for a change in the condition under Section 46 of the Environmental Protection Act. (On expiration of the five year period, further consideration of the proposal can only occur following a new referral to the Environmental Protection Authority).

11 Compliance Auditing
In order to ensure that environmental conditions and commitments are met, an audit system is required.

11-1 To help verify environmental performance, the proponent shall prepare periodic Progress and Compliance Reports in consultation with the Department of Environmental Protection.

Procedure

1 The Department of Environmental Protection is responsible for verifying compliance with the conditions contained in this statement, with the exception of conditions stating that the proponent shall meet the requirements of either the Minister for the Environment or any other government agency.

2 If the Department of Environmental Protection, other government agency or proponent is in dispute concerning compliance with the conditions contained in this statement, that dispute will be determined by the Minister for the Environment.

Kevin Minson MLA
MINISTER FOR THE ENVIRONMENT

Schedule of Environmental Management Commitments

August 1994

GERALDTON PORT EXPANSION (239/871)

GERALDTON PORT AUTHORITY

Pre-construction:

1. Dredging for Stage 2 will be limited to four months so as to minimise the period over which turbidity will be generated. Management of turbidity will be performed to the satisfaction of the Department of Environmental Protection.
2. The Geraldton Port Authority will monitor on an annual basis the impact, if any, of sand moving around the reclaimed area on nearby seagrass communities. The monitoring programme will be prepared in consultation with the Department of Environmental Protection and the results will be supplied to the Department of Environmental Protection as they become available.

During Construction

3. The Geraldton Port Authority will manage the reclamation activities in such a way as to minimise the generation of noise and dust. In the unlikely event that complaints are received the Geraldton Port Authority will take appropriate action to rectify the problem. These actions will be performed to the satisfaction of the Department of Environmental Protection.

Post-construction

4. The Geraldton Port Authority will carry out management and monitoring programmes of the dredging and reclamation works. These will include monitoring of heavy metals in dredged sediments to ensure that future industrial land does not contain contaminated sediment. The programmes will be designed and implemented to the satisfaction of the Department of Environmental Protection.
5. The Geraldton Port Authority will modify existing contingency programmes designed for hydrocarbon spillage and fire events to include the reclaimed area and will prepare a contingency plan for the repair of breakwaters and any other stabilising structures associated with the works should they fail.
6. The Geraldton Port Authority will upgrade the existing common user refuelling facility at the Fishing Boat Harbour by replacing the earth bund with a concrete floor and brick bund wall.