

Shell sand dredging project, Owen Anchorage

Cockburn Cement Limited

Proposed change to environmental conditions

**Report and recommendations
of the Environmental Protection Authority**

**Environmental Protection Authority
Perth, Western Australia
Bulletin 792
October 1995**

THE PURPOSE OF THIS REPORT

This report contains the Environmental Protection Authority's environmental assessment and recommendations to the Minister for the Environment on the environmental acceptability of the proposal.

Immediately following the release of the report there is a 14-day period when anyone may appeal to the Minister against the Environmental Protection Authority's report.

After the appeal period, and determination of any appeals, the Minister consults with the other relevant ministers and agencies and then issues his decision about whether the proposal may or may not proceed. The Minister also announces the legally binding environmental conditions which might apply to any approval.

APPEALS

If you disagree with any of the contents of the assessment report or recommendations you may appeal in writing to the Minister for the Environment outlining the environmental reasons for your concern and enclosing the appeal fee of \$10.

It is important that you clearly indicate the part of the report you disagree with and the reasons for your concern so that the grounds of your appeal can be properly considered by the Minister for the Environment.

ADDRESS

Hon Minister for the Environment
12th Floor, Dumas House
2 Havelock Street
WEST PERTH WA 6005

CLOSING DATE

Your appeal (with the \$10 fee) must reach the Minister's office no later than 5.00 pm on 27 October, 1995.

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Summary and recommendations

The Environmental Protection Authority (EPA) has been requested by the Minister for the Environment under Section 46 of the *Environmental Protection Act 1986* to report on the proposed modification to Cockburn Cement Limited's (Cockburn's) shellsand dredging operation in Owen Anchorage.

Continuation of dredging on Success Bank, Owen Anchorage by Cockburn was assessed by the EPA in May 1994. In August 1994 the Minister for the Environment approved dredging in the short-term, with further dredging in the medium-term being conditional upon Cockburn developing an acceptable Environmental Management Programme (Appendix 1).

As part of the Environmental Management Programme Cockburn is required to investigate the feasibility of beneficiation of low grade shellsand. Commercial beneficiation would allow alternative areas to be used without the loss of substantial areas of seagrass which are associated with high grade shellsand. In particular, early success in the development of a suitable beneficiation process may reduce pressure to dredge shellsand on Success Bank.

However, while the Minister for the Environment's 1994 statement of approval requires Cockburn to commit to detailed studies on beneficiation, it does not address from where, or how, shellsand to be used in these studies should be taken. Cockburn has therefore sought a modification to the statement of approval to address these issues.

Cockburn is seeking access to low grade shellsand for use in the beneficiation studies. Suitable grade shellsand for beneficiation trials is not available from the area currently approved for dredging on Success Bank, but is known to exist on Parmelia Bank. Cockburn is therefore proposing that 20,000 tonnes of material be dredged from Parmelia Bank for use in the beneficiation studies, affecting an area of 4,000 square metres to a depth of 4 metres. Approximately 4,000 tonnes, a single day's dredging, would be removed on a maximum of five separate occasions. The area proposed for dredging has less than 1% seagrass cover.

The EPA considers that any potential impacts arising from the current proposal to dredge 20,000 tonnes of material from Parmelia Bank can be effectively managed, and that access to the material will progress the beneficiation studies being conducted by Cockburn to meet the Minister's conditions of approval. Following assessment of the environmental review document, and the management commitments already made by the proponent, the EPA finds the project environmentally acceptable.

The EPA recommends that relevant existing conditions in the Minister's statement for the Owen Anchorage dredging project be amended accordingly.

The EPA also recommends that, without changing the intent or effect of the conditions, several improvements to wording and structure should be made to the new environmental statement.

Recommendation Number	Summary of EPA Recommendations
1	The proposal to dredge material from Parmelia Bank for beneficiation studies could proceed subject to the proponent's environmental management commitments.
2	Current conditions should be restructured and reworded to accommodate Recommendation 1, and achieve minor improvements.

1. Introduction and background

1.1 Purpose of this report

The Environmental Protection Authority (EPA) has been requested by the Minister for the Environment under Section 46 of the *Environmental Protection Act 1986* to report on the proposed modification to Cockburn Cement Limited's (Cockburn's) shellsand dredging operation in Owen Anchorage.

This document responds to expectations arising from the Minister's statement of approval for dredging shellsand from Success Bank by reviewing the environmental effects, and providing advice to the Minister, on Cockburn's intention to dredge lower grade shellsand from Parmelia Bank for beneficiation trials.

This report and recommendations provides the EPA's advice to the Minister for the Environment on the environmental acceptability of the proposed modification to the statement of approval.

1.2 Background

Cockburn Cement Limited (Cockburn) has dredged shellsand from Owen Anchorage since 1972 in accordance with the Cement Works (Cockburn Cement Limited) Agreement Act. This State Agreement Act provides access to the shellsand resources up to the year 2011, with rights of extension to 2021.

To date most of the dredging has taken place along the alignment of a second shipping channel through Success and Parmelia Banks, running parallel to the existing Fremantle Port Authority (FPA) Channel (Figure 1).

In order to resolve environmental concerns associated with the shellsand dredging, in particular substantial loss of seagrass habitat, the EPA assessed and reported on Cockburn's dredging programme in May 1994.

In August 1994, the Minister for the Environment issued his approval for the proposal and the conditions under which it could be implemented (Appendix 1). The Minister for the Environment's approval addresses access to shellsand in the short term (two years), the medium term (approximately 5 years), and the long term.

Specifically, Condition 4 gives approval for access to 67 ha in the short term. Condition 5 requires that, to gain approval for medium-term access, Cockburn must prepare an acceptable Environmental Management Programme (EMP). Condition 6 states that long term access to the shellsand resource will be contingent upon the results of the EMP studies.

The EMP must incorporate studies on seagrass rehabilitation, the ecological significance of seagrass, and wave climate. It must also include commitments to studies on both beneficiation of shellsand and identifying alternative resources to supply lime.

In response to Condition 5, Cockburn submitted its proposed EMP in February this year (Cockburn Cement Ltd, 1995a). The EMP was released for a four week public review period, and the EPA also sought expert advice from several international scientists. The Authority and the Department of Environmental Protection are currently discussing with Cockburn the issues raised in the public and expert submissions, with the main focus for these discussions being the studies into rehabilitation and ecological significance. The EPA and the Department expect to report to the Minister on the EMP later this year.

1.3 Structure of the report

This document has been divided into seven sections.

Section 1 describes the historical background to dredging in Owen Anchorage, and describes the structure of this report. Section 2 describes the current proposal to amend the environmental conditions (more detail is provided in the proponent's document which contains a review of environmental impacts of the project, Cockburn Cement Ltd, 1995b). Section 3 explains the environmental assessment process and provides an analysis of public submissions.

Section 4 provides an evaluation of the key environmental issues associated with the proposal. For each environmental issue, the objectives of the assessment and an evaluation framework are defined. In addition, the likely effect of the proposal, the advice to the EPA from submissions, and the proponent's response to submissions are described. Finally, the EPA's analysis and recommendations with respect to the identified issues are contained in this section.

Section 5 discusses the necessary changes to the current statement of approval. Section 6 summarises the conclusions and recommendations, while Section 7 describes the recommended environmental conditions. References cited in this report are provided in Section 8.

2. The proposal

Consistent with the Ministerial statement of approval, Cockburn has made a commitment in the proposed EMP to beneficiation studies and has provided a detailed research and development programme to be completed by 2001 (Cockburn Cement Ltd, 1995a). Cockburn has already started investigations into beneficiation techniques, and has conducted preliminary trials of a process involving electrostatic separation (Cockburn Cement Ltd, 1995b).

For the next stage of the beneficiation studies, Cockburn requires access to lower grade shellsand, similar to what would be required if a full scale beneficiation plant is installed. Suitable grade shellsand is not available from the area currently approved for dredging on Success Bank, but is known to exist on Parmelia Bank.

However, while Condition 5-4 of the Minister for the Environment's 1994 statement of approval requires Cockburn to commit to detailed studies on beneficiation, it does not address from where, or how, shellsand to be used in these studies should be taken.

Condition 5-4 states:

"The proponent shall include, in the Environmental Management Programme, commitments to detailed studies on both beneficiation and identifying alternative resources."

Cockburn has therefore written to the Minister for the Environment requesting that the Minister's statement of August 1994 be amended to allow for the proposed dredging of Parmelia Bank.

Cockburn is proposing that 20,000 tonnes of material be dredged from Parmelia Bank for use in the beneficiation studies, affecting an area of 4,000 square metres to a depth of 4 metres (Figure 1). Approximately 4,000 tonnes, a single day's dredging, would be removed on a maximum of five separate occasions. The area proposed for dredging has less than 1% seagrass cover (Cockburn Cement Ltd, 1995b).

3. Environmental impact assessment method

3.1 Steps in the procedure of assessment

The purpose of the environmental impact assessment is to determine whether a proposal is environmentally acceptable or under what conditions it could be environmentally acceptable.

The environmental impact assessment process for this proposed amendment to environmental conditions followed the *Environmental Impact Assessment Administrative Procedures, 1993*.

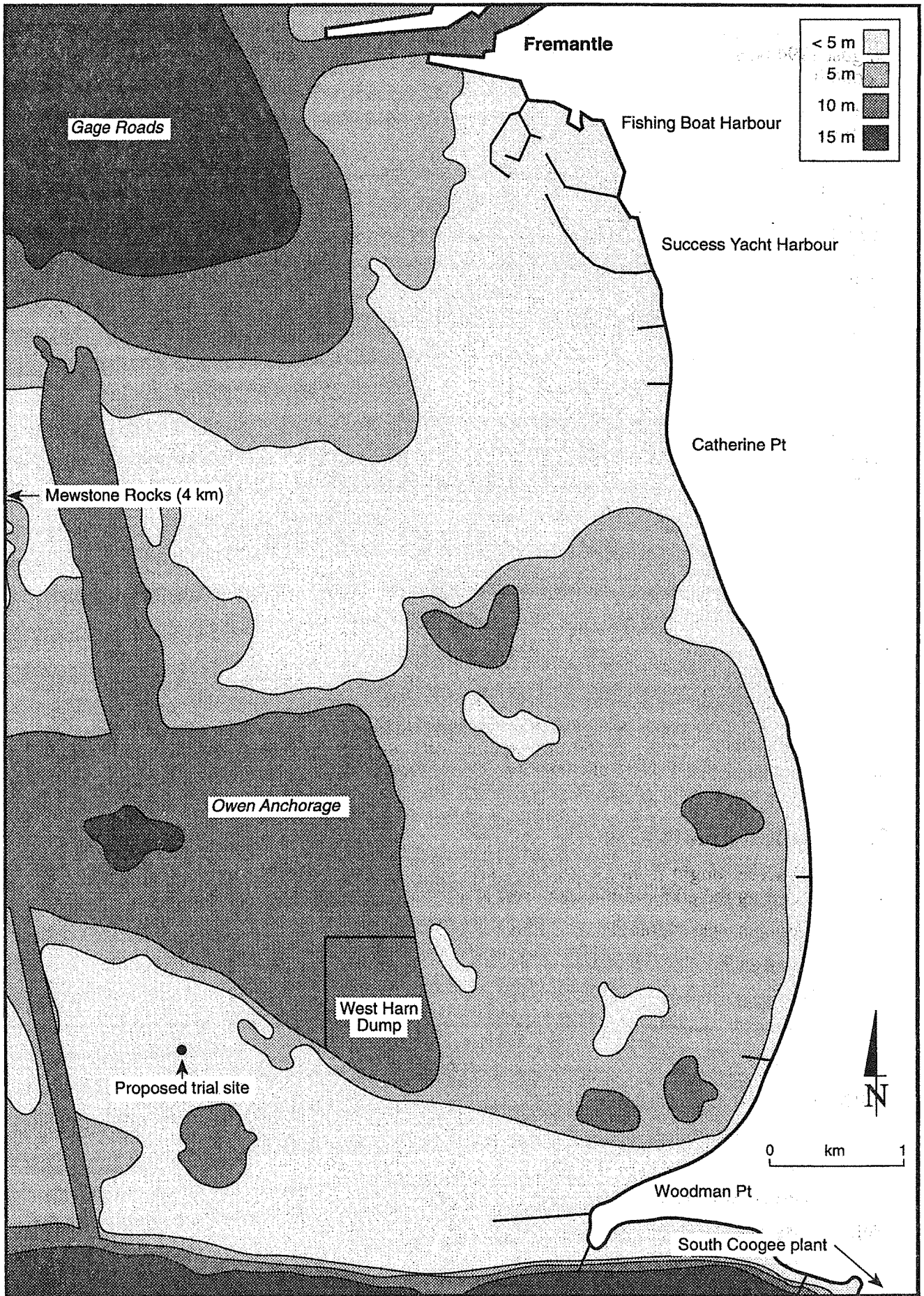


Figure 1. Proposed trial site, Owen Anchorage.

Cockburn wrote to the Minister for the Environment requesting that the Minister's statement of August 1994 be amended to allow dredging on Parmelia Bank for beneficiation trials. Appendix 1 contains the Minister's 1994 statement of approval.

The Minister then requested under Section 46 of the *Environmental Protection Act, 1986* that the EPA report on the proposed amendment.

The environmental issues to be considered were identified, and these were then considered by Cockburn in their environmental review document. The review document was checked by the Department of Environmental Protection on behalf of the EPA to ensure that each topic had been discussed in sufficient detail by the proponent prior to release for government agency and public comment. The document was available for comment for a period of three weeks between 17 July 1995 and 7 August 1995.

The submissions received were summarised by the Department of Environmental Protection on behalf of the EPA, and Cockburn was invited to respond to the issues raised in the submissions. Appendix 2 contains a summary of the issues raised in submissions and the proponent's response to those issues. A list of submitters appears as Appendix 3.

This information, namely the Minister's 1994 statement of approval, the proponent's environmental review document, the submissions and the proponent's response, were then subjected to analysis for environmental acceptability. For each environmental issue, an objective was defined and an evaluation framework established for the EPA's consideration of the issue.

The expected impact of the proposal, with due consideration to the proponent's commitments was then determined by the EPA.

In conducting its assessment, the EPA has also taken the opportunity to update the Minister's 1994 statement of approval.

Limitation

This evaluation has been undertaken using information currently available. The information has been provided by the proponent through preparation of the environmental review document, by Department of Environmental Protection officers utilising their own expertise and reference material, by utilising expertise and information from other government agencies, information provided by members of the public, and by contributions from EPA members.

3.2 Public submissions

Comments were sought from the public, community groups and local and State Government agencies. During the public submission period, eight (8) submissions were received.

The submissions were within the following categories:

- two from individual members of the public;
- four from groups and organisations; and
- two from State government agencies.

The principal issues of concern raised in the submissions included:

Biophysical impacts associated with dredging

- impacts on seagrass habitat;
- impacts on sediment stability;
- alternative sources of lower grade shellsand;

Pollution issues associated with beneficiation

- beneficiation trials;
- commercial beneficiation;

Other issues

- timing of the beneficiation trials, and availability of results;
- merit of proposal in context of three other new projects;
- setting a precedent for future applications to dredge Parmelia Bank; and
- Government responsibilities in relation to alternative sources and seagrass values.

A synopsis of the public submissions is provided below. Table 1 summarises the issues raised, the characteristics of the proposal and the comments received in order to identify the key environmental issues requiring evaluation by the EPA.

3.2.1 Synopsis of public submissions

Submissions received by the EPA were primarily concerned with the impact of dredging on seagrass. Three submissions were opposed to any further dredging in Owen Anchorage, while three other submissions supported the proposal because it could contribute to the development of dredging of lower grade shellsand in less environmentally sensitive areas. Several submissions also raised more general issues not directly related to the dredging proposal but associated with the beneficiation trials and commercial beneficiation.

Impacts on seagrass habitat

The potential impact of the dredging upon the seagrass and associated marine fauna was identified in submissions. Reference was made to the impacts of previous and current dredging by Cockburn, and also unsuccessful attempts to date to rehabilitate seagrass. Another submission questioned the future use of the excavation site.

This issue requires evaluation by the EPA.

Impacts on sediment stability

One submission indicated that Parmelia Bank is already subject to erosional pressures and should not be further compromised. Another submission questioned the likely effect of wave action on the excavation/s.

Impacts on sediment stability require consideration by the EPA.

Alternative sources of lower grade shellsand

Submissions suggested that the beneficiation process should be developed from alternative sources with less risk of destroying seagrass. In particular, the Mewstone leases and the waste dump areas were suggested, as were terrestrial sources (see Figure 1).

This issue requires evaluation by the EPA.

Pollution associated with beneficiation trials

Pollution issues associated with the beneficiation trials was questioned in one submission. The trials involve investigations into an electrostatic separation process, and management of waste from the trials of this process was raised.

This issue requires evaluation by the EPA.

Pollution associated with commercial beneficiation

Pollution issues associated with commercial beneficiation, if and when it is established, were also raised in submissions. In particular, disposal of large volumes of freshwater, disposal of reject material, and water recycling were raised.

These issues will be dealt with by the EPA if a proposal to establish commercial beneficiation is developed. Therefore this report will not deal with these matters further.

Timing of trials, availability of results

Two submissions suggested that the beneficiation studies outlined in Cockburn's Environmental Management Programme could be completed in considerably less time than

Table 1. Identification of issues requiring EPA evaluation.

TOPICS	PROPOSAL CHARACTERISTICS	GOVERNMENT AGENCY'S COMMENTS	PUBLIC COMMENTS	IDENTIFICATION OF ISSUES
Biophysical impacts (dredging)				
Impacts on seagrass habitat.	Percentage of seagrass cover <1%.	Impacts on adjacent seagrass areas. Minimal seagrass cover. Within proposed shipping channel.	Opposed to further loss of seagrass.	Requires EPA evaluation.
Impacts on sediment stability.	Area 4,000 square metres, depth 4 metres.	Effect of wave action on excavation/s.	Erosion of Parmelia Bank.	Requires EPA evaluation.
Alternative sources of shellsand for beneficiation.	Mewstone leases and West Ham Dump considered.		Non-marine source will avoid pollution problems.	Requires EPA evaluation.
Pollution issues (beneficiation)				
Beneficiation trials	Electrostatic separation requiring disposal of waste water and silica.		Impact of waste water and silica on receiving environment.	Requires EPA evaluation.
Commercial beneficiation.	No proposal at this stage.		Do not use pollution issues as reason to not pursue beneficiation.	Issues addressed if/when proposal submitted.
Other issues				
Timing of trials, and availability of results.	Five year programme outlined in Cockburn's EMP.		Complete trials as soon as possible. Access to results.	Issue being considered separately by EPA in review of EMP.
Merit of proposal.			Competing in same market as three other new projects.	Appropriately managed by Dept of Resources Development.
Future applications to dredge Parmelia Bank.			Approval of proposal will set a precedent.	Future proposals will require separate assessment.
Government responsibilities.			Alternative resource should now be found by Government. Government position paper should be completed before further dredging considered.	Appropriately addressed through EPA's review of EMP.

proposed (Cockburn Cement Ltd, 1995a). Other submissions also raised the issue of availability of results from the studies (both past and future).

The EPA is currently reviewing Cockburn's Environmental Management Programme, and these issues will be considered in that process. They are therefore not addressed further in this report.

Merit of proposal

One submission suggested that there was questionable merit in allowing Cockburn to dredge Parmelia Bank for low grade shellsand to compete in the same market as three other new projects.

The purpose of the dredging on Parmelia Bank is to provide material for beneficiation trials, not to provide a resource which would be competing with other developments. This issue is more appropriately dealt with by the Department of Resources Development, and is therefore not considered further in this report.

Setting a precedent

Several submissions raised the issue of precedent. That is, concern that approval for the current dredging proposal would see further applications for dredging on Parmelia Bank which would then be hard to refuse. Another submission wanted to make the point that approval for this dredging for beneficiation trials should in no way be misconstrued as condoning Cockburn's dredging of Owen Anchorage.

The EPA's assessment of the current dredging proposal will not set a precedent for any future applications for dredging Parmelia Bank. The proposal is a discrete dredging project, and any future proposals will be assessed separately by the Authority and on their merits.

Government responsibilities

One submission suggested the Government should be identifying for Cockburn an alternative supply of shellsand to Owen Anchorage

This issue refers to one of the State's obligations under the Cement Works (Cockburn Cement Limited) Agreement Act 1972. The State is to use every endeavour to find a reasonable alternate supply of shellsand to Cockburn's Coogee works should the Success or Parmelia Bank resource become unavailable. Cockburn has approval to continue dredging Success Bank in the short-term, and medium-term access is currently being considered by the EPA in the light of Cockburn's Environmental Management Programme (Cockburn Cement Ltd, 1995a). This report will not deal with this issue any further.

Another submission referred to the EPA's commitment to prepare a position paper to examine the statewide distribution and values of seagrasses by December 1995 (Environmental Protection Authority, 1994). The submission suggested the paper should be completed before any further dredging is considered.

It should be noted that the area proposed for dredging has <1% of seagrass cover, and on this basis, the EPA does not consider loss of seagrass to be a significant environmental issue (discussed further in Section 4). Completion of the paper is therefore not necessary to assess the current dredging proposal.

4. Evaluation of key environmental issues

The EPA has considered the issues raised during the environmental impact assessment process including matters identified in public submissions.

The EPA believes the key environmental issues requiring evaluation are:

- impacts on seagrass habitat;
- impacts on sediment stability;
- alternative sources of lower grade shellsand; and
- pollution associated with beneficiation trials.

The EPA has evaluated these issues, based on existing information and advice from other Government agencies.

As indicated in Section 3.2, other issues raised during the environmental impact assessment process can either be appropriately dealt with during the assessment of future proposals or by other agencies, or are issues being considered separately by the EPA in its review of Cockburn's Environmental Management Programme.

The EPA's evaluation of the key environmental issues is discussed below and summarised in Table 2.

4.1 Impacts on seagrass habitat

4.1.1 Objective

The EPA's objective is to ensure that the individual or cumulative impacts from development proposals do not result in any loss of functional role of seagrasses in the Cockburn Sound/Owen Anchorage area.

4.1.2 Evaluation framework

Existing policy framework

Over recent years the EPA has been involved in the assessment of Cockburn's dredging programme in Owen Anchorage. The EPA's recent views on seagrass protection are contained in its 1994 assessment of Cockburn's dredging programme (Environmental Protection Authority, 1994).

Technical information

The proposed area for dredging on Parmelia Bank is 4,000 square metres in size, and is an area of minimal seagrass cover (<1%). Several *Posidonia* species are widely distributed along the Western Australian coast. Also, the area to be dredged lies in the alignment of the proposed second shipping channel which is intended to provide access to Cockburn Sound.

4.1.3 Public submissions

Submissions from the public expressed concern at further loss of seagrass in the light of dredging that has already occurred in Owen Anchorage, and unsuccessful attempts to rehabilitate the seagrass.

The Department of Minerals and Energy questioned whether seagrass meadows existed adjacent to the trial dredging area, and what the likely impacts on these areas might be.

The Department of Resources Development supported the proposed dredging on Parmelia Bank, noting that the proposed area has minimal seagrass cover and lies in the alignment of the proposed second shipping channel, a portion of which Cockburn has already dredged through Success Bank and a small part of Parmelia Bank. The Department stated that it is the Government's intention that the channel is continued through Parmelia Bank to provide access to Cockburn Sound when a process becomes available to use the dredged spoil.

4.1.4 Response from the proponent

In response the proponent indicated that the area proposed for dredging has < 1% seagrass cover, and is within the alignment of the proposed second shipping channel. With regard to the suggestion that the area is degraded, the proponent stated that it is instead an area where significant sand movement occurs, a process that is not conducive to seagrass growth.

The proponent is finalising a detailed habitat map which was used for the selection of the proposed dredge site, and the site was also inspected by divers in June 1995 to confirm the

Table 2. Summary of EPA's evaluation.

Issue	Objective	Evaluation framework	Proponent's commitment	EPA's evaluation
Impacts on seagrass habitat.	Maintain ecological function associated with seagrass.	Parmelia Bank at this site is virtually devoid of seagrass cover.	Dredging restricted to <1% seagrass coverage, and within shipping channel alignment.	Dredging would not result in loss of ecological function of seagrass.
Impacts on sediment stability.	No unacceptable impact on stability of banks and shoreline.	Previous dredging caused negligible impact on sediment stability.	Dredging area 4,000 square metres to a depth 4 metres.	Sediment stability would not be adversely affected by dredging.
Alternative sources of shellsand for beneficiation trials.	Alternative sources adequately considered.	Consider grade, accessibility, location.	Four sources considered, three rejected.	Adequate consideration given to alternative sources.
Pollution associated with beneficiation trials.	No unacceptable impacts from waste management.	Electrostatic separation producing waste water and silica.	Waste water recycled, waste silica to quarries for backfill.	Waste management acceptable.

seagrass-free nature of the area. Also, the proponent stated that there are no areas of dense seagrass meadows adjacent to the area to be dredged, and there are no likely adverse impacts on adjacent seagrass as a result of the dredging.

In regard to the dredging area, the proponent has stated that prior to dredging the site will be buoyed at each corner to demarcate its outer extent. As each separate days dredging is completed, the area dredged will be marked, and this will then indicate the location for the commencement of the next dredging operation. The dredged area will be a single unit.

4.1.5 Evaluation

The EPA has reviewed the information contained within the proponent's environmental review document and response to public submissions, and notes that the area to be dredged and surrounding areas have minimal seagrass cover (<1%). The EPA also notes that the trial dredging site is located in the alignment of the proposed second shipping channel.

In regard to dredging management, the EPA notes Cockburn's commitment included in the 1994 statement of approval to accurately mark the boundaries of all areas to be dredged (Appendix 1).

The EPA concludes that on this basis, the proposed dredging will not result in unacceptable loss of seagrass habitat or loss of ecological function.

4.2 Impacts on sediment stability

4.2.1 Objective

The EPA's objective is to ensure there is no unacceptable impact on wave characteristics and the stability of the submarine banks and shoreline of Owen Anchorage.

4.2.2 Evaluation framework

Technical information

The area proposed for dredging is 4,000 square metres of submarine banks, approximately 4 metres deep. The dredging would occur over a total of five days.

Findings of work carried out previously in Owen Anchorage show that dredged slopes older than 10 years have appeared to stabilise and effects of dredging on wave climate, navigation, and the shoreline has been negligible (Cockburn Cement Limited, 1994; Lawson and Treloar, 1987). More recent work by Cockburn Cement suggests that dredged slopes have stabilised after 3 - 5 years (P Tencate, pers. comm.).

4.2.3 Public submissions

Public submissions suggested that Parmelia Bank is already subject to erosional pressures and should not be further compromised by dredging.

The Department of Minerals and Energy questioned the likely effect of wave action on the excavation, and also the future use of the site.

4.2.4 Response from the proponent

In response, the proponent stated that, while sands in the area to be dredged are certainly mobile, evidence indicates that overall Parmelia Bank is not eroding but is actually accreting (growing).

In response to the concerns about wave action, the proponent stated that because of the small extent and location of the proposed dredging, there is not expected to be any significant change

in wave conditions on the adjacent shoreline due to the dredging. Also, the wave induced orbital currents on the seabed in the dredged area would be decreased because of the increase in water depth. The proponent also stated that wave action over time would cause the sides of the dredged area to slump to a stable slope of between 1 in 5 and 1 in 10. This would provide a gradual and stable slope of up to 40m width.

The proponent stated that the final depth of 8-9m will not require recontouring, and provides an area for potential use in seagrass rehabilitation studies (recognising the location is within the proposed second shipping channel).

4.2.5 Evaluation

The EPA has reviewed the information within the proponent's environmental review document and the work previously undertaken on sediment stability and wave climate changes in Owen Anchorage which indicates past dredging has had negligible effect (Cockburn Cement Limited, 1994; Lawson and Treloar, 1987).

The EPA notes the proponent's commitments included in the 1994 statement of approval to dredge the boundaries of the area so as to maximise the rate of slope stabilisation, and to monitor compliance with the dredging area boundary. The proponent has also made commitments to monitor slope stability and seagrass dynamics of dredged slopes, and to monitor the shoreline between Woodman Point and Catherine Point. It is expected that remedial action would be taken if monitoring indicates a problem.

The proposal to dredge Parmelia Bank is a very small scale operation. It is expected that over several years the sides of the dredged area would slump before stabilising at a slope of between 1 in 5 and 1 in 10. Notwithstanding this temporary period of minor bank instability, the EPA believes the consequential effect of the dredging on both bank and coastal stability is considered to be negligible.

The EPA concludes that based on the above information, sediment stability would not be unacceptably affected by the dredging.

4.3 Alternative sources of shellsand

4.3.1 Objective

The EPA's objective is to ensure that alternative sources for the material required for the beneficiation trials have been adequately considered by the proponent and that the proposed alternative is superior to other options.

4.3.2 Evaluation framework

Technical information

Cockburn has investigated four areas for potential use as a source of shellsand for the beneficiation trials. The area around Mewstone Rocks on Success Bank has suitable quality shellsand, but the site is too deep to be dredged by the available equipment. The West Ham Dump was rejected because of the shellsand quality and shallow depth of dumped material, and the fact that the dump could be used as an emergency reserve for any future beneficiation plant. Shellsand on Success Bank is of too high a grade to require beneficiation. Access to Parmelia Bank is sought because it offers appropriate quality shellsand and would allow the current barges to be used effectively. Figure 1 includes the location of the alternatives considered.

4.3.3 Public submissions

Public submissions suggested Cockburn should develop its beneficiation process from alternative sources with little danger of destroying remaining seagrass areas. For example, Mewstone leases, waste dumps established in Cockburn Sound, or terrestrial sources.

4.3.4 Response from the proponent

In response, Cockburn restated the information provided in their environmental documentation regarding the sites considered for providing material for the beneficiation trials, and also the reasons most of those sites were rejected.

The EPA also notes that Cockburn has made a commitment to develop its beneficiation process for both shore based and marine based calcareous materials.

4.3.5 Evaluation

The EPA has reviewed the information contained within the proponent's environmental review document and response to the public submissions.

The EPA concludes that Cockburn has given adequate consideration to possible alternative sources of material, and has justified why the sites other than Parmelia Bank have been rejected.

Terrestrial sources would have their own environmental issues, and these may or may not be more significant than the marine impacts. No comparative study has been undertaken.

4.4 Pollution from the beneficiation trials

4.4.1 Objective

The Environmental Protection Authority's objective is to ensure that waste material resulting from the trials of the beneficiation process is managed such that there are no unacceptable environmental impacts.

4.4.2 Evaluation framework

Technical information

The beneficiation process being trialled by Cockburn involves electrostatic separation. This process requires the shellsand to be washed in freshwater to remove salts before it is dried and treated. Waste from the process is primarily water and reject silica.

4.4.3 Public submissions

One public submission was concerned about pollution issues associated with the beneficiation trials, in particular the management of waste products.

4.4.4 Response from the proponent

In response, Cockburn has indicated that the trials are being conducted at Cockburn's South Coogee plant, and all waste water will be discharged into the existing drainage system and recycled for use in the established ore milling process. All waste silica will be used as backfill for the existing quarries at the South Coogee site.

4.4.5 Evaluation

The EPA has reviewed the information contained within the proponent's environmental review document and its response to the public submission.

The EPA concludes that the management of waste from the beneficiation trials as outlined by Cockburn is not likely to have an environmentally significant effect on the environment.

5. Changes to current statement

Dredging in Owen Anchorage by Cockburn is currently subject to environmental conditions and commitments set as a result of a previous environmental impact assessment (Appendix 1). This section considers how the conditions could be varied to allow dredging on Parmelia Bank to take samples for beneficiation trials. This section also considers revisions to the current conditions to facilitate improvements in clarity.

5.1 Objectives

The changes to the current statement are to achieve two objectives. The first objective is to cover where and how the dredging for the beneficiation studies required in the Minister for the Environment's 1994 statement of approval can take place.

The second objective is to review the existing conditions and commitments to achieve one environmental statement and one list of proponent commitments that provides for adequate protection of the environment and for efficient and effective environmental auditing. This objective will assist the public, the proponent and relevant involved agencies to easily identify the environmental requirements associated with the Owen Anchorage dredging project.

5.2 Changes to environmental conditions

As discussed in Section 4, the EPA considers the proposal to allow dredging on Parmelia Bank for beneficiation trials to be environmentally acceptable. The EPA recommends that the new statement include a condition which allows the dredging to proceed.

The EPA has also taken the opportunity to recommend the revision and consolidation of four of the existing environmental conditions to reflect the current proposal, and to update the wording of the original conditions.

The recommended changes are summarised in Table 3 which should be examined in conjunction with the original environmental conditions (Appendix 1). A revised statement containing the recommended environmental conditions arising from this assessment is included in Section 7. There are no changes to the proponent's commitments, which are included with Appendix 1.

Table 3. Summary of recommended changes to environmental conditions

Condition number	Intent of original condition	Evaluation	Intent of proposed condition
1	Proponent to implement the proposal and implement the commitments.	Update condition to include modification to allow dredging of Parmelia Bank.	Add references to July 1995 modified proposal.
4-1	Proponent to dredge shellsand within area identified in Figure 7 of 1994 CER.	Attach Figure 7 to statement.	Add sentence stating a copy of Figure 7 is attached.
5-9 (new condition)	-	July 1995 proposed amendment to dredge Parmelia Bank acceptable.	Include new condition allowing dredging in accordance with July 1995 proposed modification.
8-1	Annual reporting may provide basis for Minister to initiate changes to conditions.	Clarify insubstantial changes to proposal made through condition 2.	Separate into two sentences.
10-1	Time limit on approval.	Modify to recognise modified proposal and new statement.	Remove "as granted in this statement".

6. Conclusions and recommendations

The EPA concludes that Cockburn Cement Limited's proposal to amend its environmental conditions to allow dredging on Parmelia Bank for beneficiation trials, is environmentally acceptable.

The proposed modification to Cockburn's environmental conditions to allow dredging on Parmelia Bank should be made subject to the proponent's commitments and the recommendations contained in this report. This conclusion is embodied in Recommendation 1.

Recommendation 1

The Environmental Protection Authority concludes that Cockburn Cement Limited's proposal to amend the statement of 4 August 1994 so as to allow 20,000 tonnes of shellsand to be dredged from Parmelia Bank for beneficiation trials is environmentally acceptable.

In reaching this conclusion, the Environmental Protection Authority identified the main environmental issues requiring consideration as:

- impacts on seagrass habitat;
- impacts on sediment stability;
- alternative sources of shellsand; and
- pollution from the beneficiation trials.

The Environmental Protection Authority concludes that the environmental issues mentioned above have been addressed adequately by the proponent's environmental management commitments.

Accordingly, the Environmental Protection Authority recommends that the proposal could proceed subject to the proponent's environmental management commitments.

The EPA also concludes that it is appropriate to restructure and reword the Minister for the Environment's 1994 statement of approval in line with Recommendation 1, and to make minor improvements to the statement. This conclusion is embodied in Recommendation 2.

Recommendation 2

The new statement issued from this assessment should be structured to reflect the changes to the conditions summarised in Table 3.

Finally, the EPA concludes that every opportunity should be given to Cockburn to complete as soon as possible the environmental investigations required in the Minister's statement of approval, including the beneficiation studies. These investigations offer significant environmental benefits to the current dredging programme. The Authority notes that flexibility exists in the Ministerial statement of approval allowing any reasonable modifications to the environmental investigations which are of a minor nature to be carried out with the approval of the Minister for the Environment.

7. Recommended environmental conditions

The recommended changes to the Minister for the Environment's statement allowing dredging in Owen Anchorage are detailed below. If the changes are agreed to by the Minister for the Environment, in agreement with the Minister for Resources Development, this statement would replace the previous statement of approval, and would be legally binding on the proponent.

The recommended changes to the original conditions (see Appendix 1) are in italics for easy reference.

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

PROPOSAL: SHORT-TERM CONTINUATION OF SHELL SAND
DREDGING, SUCCESS BANK, OWEN ANCHORAGE
& STRATEGY TO ADDRESS LONG-TERM
ENVIRONMENTAL ISSUES OF SHELL SAND
DREDGING (859/937)

CURRENT PROPONENT: COCKBURN CEMENT LIMITED

CONDITIONS SET ON:

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 documented modifications of July 1995*), the proponent shall fulfil the relevant environmental management commitments made in documentation on the dredging of Parmelia Bank for beneficiation trials (July 1995), reported on in Environmental Protection Authority Bulletin 78X; in the Consultative Environmental Review (January 1994); and published in Environmental Protection Authority Bulletin 739 as Appendix 3, and those made in response to issues raised in submissions; provided that the commitments are not inconsistent with the conditions or procedures contained in this statement.

A copy of the environmental management commitments (August/September 1995) which will be audited by the Department of Environmental Protection is attached.

2 Implementation

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

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

3 Proponent

These conditions legally apply to the nominated proponent.

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

4 Access to Shell Sand Resource (Short-term)

4-1 The proponent shall only dredge for shell sand resource within the area identified in Figure 7 of its Consultative Environmental Review (January 1994) as the "2 Year Dredging Area" to a depth consistent with previous dredging operations. (*A copy of Figure 7 is attached*).

5 Access to Shell Sand Resource (Medium-term)

The "medium term", for the purposes of this statement, means that period of time immediately following the depletion of resource as approved in condition 4-1 up to the depletion of resource identified in condition 5-7 and subject to the results of the wave climate studies required under condition 5-3.

5-1 The proponent shall obtain approval of the Minister for the Environment for any dredging beyond that approved by condition 4-1. Any approval will be based on the acceptance of an Environmental Management Programme to meet the requirements of the Minister for the Environment following advice of the Environmental Protection Authority, the Department of Environmental Protection, the Department of Conservation and Land Management and the Fisheries Department and in consultation with the Department of Resources Development, the Department of Minerals and Energy and the Fremantle Port Authority.

5-2 The Environmental Management Programme shall be subject to a four week public review period, managed by the Department of Environmental Protection prior to the Minister for the Environment considering approval of the Environmental Management Programme.

5-3 Within six months of the formal authority issued to the decision-making authorities under Section 45(7) of the Environmental Protection Act 1986, the proponent shall prepare and submit a detailed Environmental Management Programme incorporating the following studies on:

- 1 seagrass rehabilitation;
- 2 the ecological significance of seagrass; and
- 3 wave climate and the implications resulting from dredging between the Fremantle Port Authority channel and the second channel as a result of the short-term and medium dredging operations.

5-4 The proponent shall include in the Environmental Management Programme commitments to detailed studies on both beneficiation and identifying alternative resources.

5-5 The proponent shall include also, in the Environmental Management Programme, details of:

- 1 amount of resource required on an annual basis for the medium term from between the Fremantle Port Authority channel and the second channel;
- 2 when the resource would be accessed;
- 3 where the resource would be accessed and to what depth; and
- 4 how long the amount of resource determined by condition 5 would last.

- 5-6 The reports required by conditions 5-3 and 5-4 shall be reported upon annually to the Department of Environmental Protection and shall be made publicly available.
- 5-7 The proponent shall be confined in the medium term to dredging resource between the Fremantle Port Authority channel and the second channel on Success Bank, subject to condition 5.
- 5-8 The Minister for the Environment may set such requirements on the Environmental Management Programme as considered appropriate following advice from the Environmental Protection Authority, the Department of Environmental Protection, the Department of Conservation and Land Management and the Fisheries Department and in consultation with the Department of Resources Development, the Department of Minerals and Energy and the Fremantle Port Authority.
- 5-9 *The proponent shall only dredge shell sand material on Parmelia Bank for use in beneficiation studies as described in the document "Trials using Parmelia Bank shell sand for beneficiation" (July 1995) submitted to the Environmental Protection Authority.*

6 Access to Shell Sand Resource (Long-term)

- 6-1 The proponent shall submit its proposal for long term access to shell sand resource not less than 15 months before depletion of the approved medium term resource.
- 6-2 Access by the proponent to shell sand resource in the long term, which would impact upon seagrasses, will be contingent upon the results of the studies required under this statement demonstrating that seagrass on Success Bank and its surrounds can be successfully rehabilitated, or that its removal through dredging would have acceptable ecological and wave climate consequences.

7 Rehabilitation

- 7-1 The proponent shall rehabilitate any areas dredged from the date of this statement, consistent with the results of the studies required by condition 5-3.

8 Changes to Environmental Conditions

- 8-1 Annual reporting by the proponent on the results of studies required under this statement may provide the basis for the Minister for the Environment to initiate changes to conditions in this statement through Section 46 of the Environmental Protection Act. *Insubstantial changes to the proposal may be made through condition 2 of this statement.*

9 Lead-up Time for Beneficiation

- 9-1 Annual reporting to the Department of Environmental Protection shall include the results of beneficiation and alternative resource studies. The proponent shall recognise that, consistent with condition 6, the proponent shall include in its scheduling, the time to secure necessary approvals and to build a beneficiation plant or relocate to alternative resources before depletion of the approved medium term resource.

10 Time Limit on Approval

The environmental approval for this proposal is limited.

- 10-1 If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal * shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced.

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

**"as granted in this statement" removed*

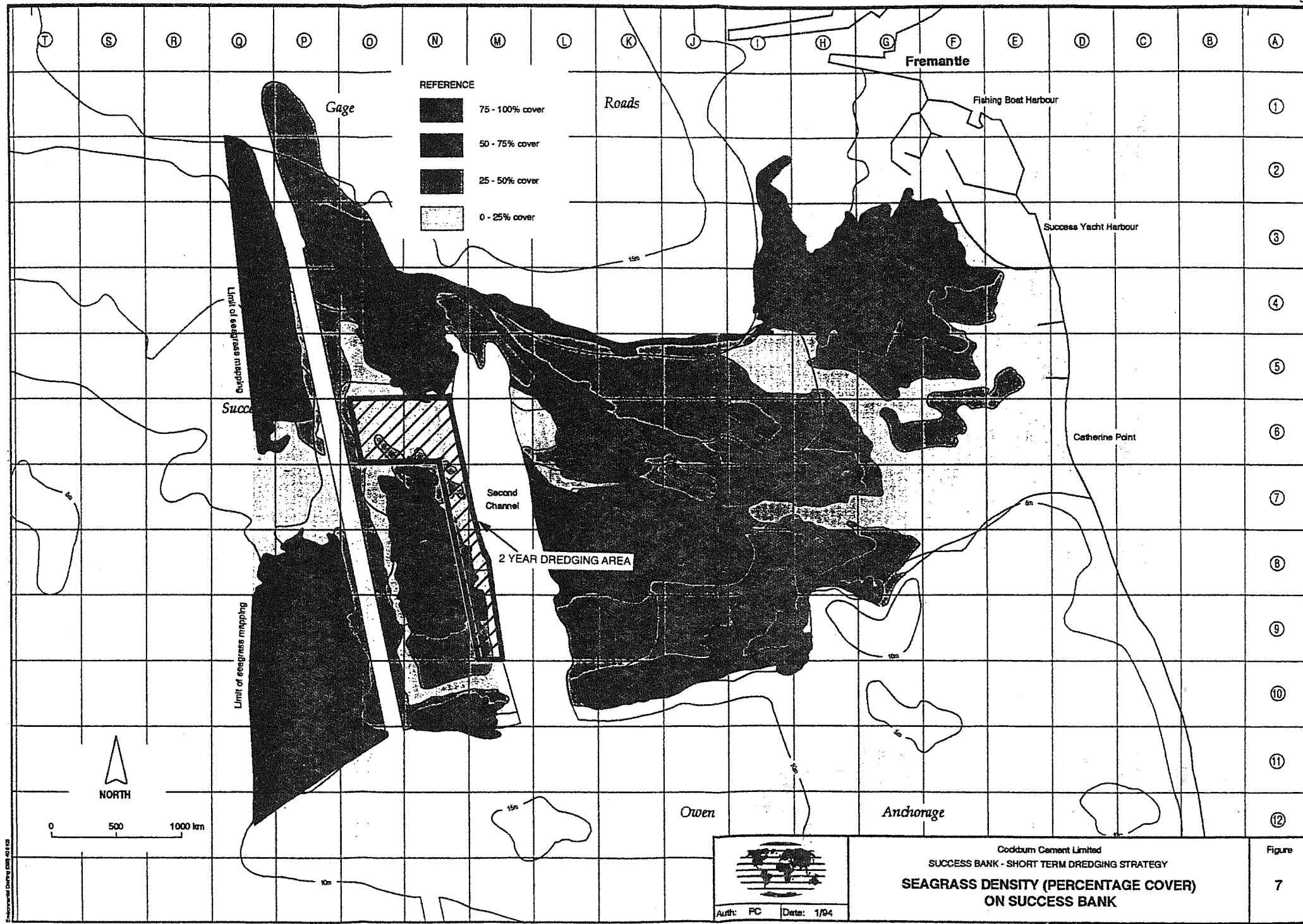
11 Compliance Auditing

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

- 11-1 The proponent shall prepare periodic Progress and Compliance Reports, to help verify the environmental performance of this project, 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 any dispute arises concerning compliance with the conditions contained in this statement, that dispute will be determined by the Minister for the Environment.



Environmental Dredging 2008 01 12 2

8. References

- Cockburn Cement Ltd, 1994, *Consultative Environmental Review, Proposal to Continue Dredging of Shellsand on Success Bank (1994 to 1996)*. Cockburn Cement Limited.
- Cockburn Cement Ltd 1995a, *Shellsand Dredging - Environmental Management Programme*, Cockburn Cement Limited, Perth.
- Cockburn Cement Ltd 1995b, *Trials Using Parmelia Bank Shellsand for Beneficiation - Proposal for S46 Amendment to Ministerial Conditions*, Cockburn Cement Limited, Perth.
- Environmental Protection Authority 1993, *Environmental Impact Assessment Administrative Procedures*, Environmental Protection Authority, Perth.
- Environmental Protection Authority 1994, *Proposed short-term continuation of dredging of shell sand on Success Bank, Owen Anchorage; and proposed strategy to address the long-term environmental issues of shell sand dredging - Report and Recommendations of the Environmental Protection Authority*, Bulletin 739, Environmental Protection Authority, Perth.
- Lawson & Treloar, 1987, *Cockburn Cement Ltd Dredging Maintenance Plan. Cockburn Sound - Wave Climate Changes*. Draft report to Maunsell & Partners Pty Ltd by Lawson & Treloar Pty Ltd, Sydney, New South Wales, Report No. 1189.

Appendix 1

Statement of Conditions of Approval (August 1994)



Ass # 859

Bull # 739

State # 360

WESTERN AUSTRALIA

MINISTER FOR THE ENVIRONMENT

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

SHORT-TERM CONTINUATION OF SHELL SAND DREDGING, SUCCESS BANK,
OWEN ANCHORAGE
&
STRATEGY TO ADDRESS LONG-TERM ENVIRONMENTAL ISSUES OF SHELL SAND
DREDGING (859)

COCKBURN CEMENT LIMITED

This proposal may be implemented subject to the following conditions:

1 Proponent Commitments

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

- 1-1 In implementing the proposal, the proponent shall fulfil the commitments made in the Consultative Environmental Review and in response to issues raised in submissions, provided that the commitments are not inconsistent with the conditions or procedures contained in this statement. These commitments are attached.

2 Implementation

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

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

3 Proponent

These conditions legally apply to the nominated proponent.

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

Published on

- 4 AUG 1994

4 Access to shell sand resource (short term)

- 4-1 The proponent shall only dredge for shell sand resource within the area identified in Figure 7 of its Consultative Environmental Review, January 1994 as the "2 Year Dredging Area" to a depth consistent with previous dredging operations.

5 Access to shell sand resource (medium term)

The medium term, for the purposes of this statement, means that period of time immediately following the depletion of resource as approved in Condition 4-1 up to the depletion of resource identified in Condition 5-7 and subject to the results of the wave climate studies required under Condition 5-3.

- 5-1 The proponent shall obtain approval of the Minister for the Environment for any dredging beyond that approved by Condition 4-1. Any approval will be based on the acceptance of an Environmental Management Programme to meet the requirements of the Minister for the Environment following advice of the Environmental Protection Authority, Department of Environmental Protection, Department of Conservation and Land Management and the Fisheries Department and in consultation with the Department of Resources Development, Department of Minerals and Energy and Fremantle Port Authority.
- 5-2 The Environmental Management Programme shall be subject to a four week public review period, managed by the Department of Environmental Protection prior to the Minister for the Environment considering approval of the Environmental Management Programme.
- 5-3 Within six months of the formal authority issued to the decision-making authorities under Section 45(7) of the Environmental Protection Act 1986, the proponent shall prepare and submit a detailed Environmental Management Programme incorporating the following studies on :
- (1) seagrass rehabilitation;
 - (2) the ecological significance of seagrass; and
 - (3) wave climate and the implications resulting from dredging between the Fremantle Port Authority channel and the second channel as a result of the short-term and medium dredging operations.
- 5-4 The proponent shall include, in the Environmental Management Programme, commitments to detailed studies on both beneficiation and identifying alternative resources.
- 5-5 The proponent shall include also, in the Environmental Management Programme, details of:
- amount of resource required on an annual basis for the medium term from between the Fremantle Port Authority channel and the second channel;
 - when the resource would be accessed;
 - where the resource would be accessed and to what depth; and
 - how long the amount of resource determined by Condition 5 would last.
- 5-6 The reports required by conditions 5-3 and 5-4 shall be reported upon annually to the Department of Environmental Protection and shall be made publicly available.
- 5-7 The proponent shall be confined in the medium term to dredging resource between the Fremantle Port Authority channel and the second channel on Success Bank, subject to Condition 5.

5-8 The Minister for the Environment may set such requirements on the Environmental Management Programme as considered appropriate following advice from Environmental Protection Authority, Department of Environmental Protection, Department of Conservation and Land Management and the Fisheries Department and in consultation with the Department of Resources Development, Department of Minerals and Energy and Fremantle Port Authority.

6 Access to shell sand resource (long term)

6-1 The proponent shall submit its proposal for long term access to shell sand resource not less than 15 months before depletion of the approved medium term resource.

6-2 Access by the proponent to shell sand resource in the long term, which would impact upon seagrasses, will be contingent upon the results of the studies required under this statement demonstrating that seagrass on Success Bank and its surrounds can be successfully rehabilitated, or that its removal through dredging would have acceptable ecological and wave climate consequences.

7 Rehabilitation

The proponent shall rehabilitate any areas dredged from the date of this statement, consistent with the results of the studies required by condition 5-3.

8 Changes to environmental conditions

Annual reporting by the proponent on the results of studies required under this statement may provide the basis for the Minister for the Environment to initiate changes to Conditions in this statement either through Section 46 of the Environmental Protection Act or Condition 2 of this statement.

9 Lead up time for beneficiation

Annual reporting to the Department of Environmental Protection shall include the results of beneficiation and alternative resource studies. The proponent shall recognise that, consistent with Condition 6, the proponent shall include in its scheduling, the time to secure necessary approvals and to build a beneficiation plant or relocate to alternative resources before depletion of the approved medium term resource.

10 Time Limit on Approval

The environmental approval for this proposal is limited.

10-1 If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced. Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period, to the Minister for the Environment 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.)

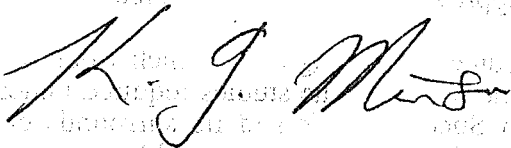
11 Compliance Auditing

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

11-1 The proponent shall prepare periodic Progress and Compliance Reports, to help verify the environmental performance of this project, 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 any dispute arises 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

- 4 AUG 1994

**PROPONENT'S ENVIRONMENTAL MANAGEMENT
COMMITMENTS**

**SHORT-TERM CONTINUATION OF SHELL SAND
DREDGING, SUCCESS BANK, OWEN ANCHORAGE
&
STRATEGY TO ADDRESS LONG-TERM
ENVIRONMENTAL ISSUES OF SHELL SAND
DREDGING (859)**

COCKBURN CEMENT LIMITED

COMMITMENTS

Cockburn Cement Limited confirms that it has no option but to dredge on Success Bank, and that it will dredge only within the agreed boundaries of the short-term dredging strategy over the two year period of the CER.

Furthermore, the Company reaffirms its commitment to its Environmental Policy, to the preparation of an ERMP for its long-term dredging strategy, and the associated Environmental Investigation Programme outlined below:

- continue existing DMP study commitments;
- test and develop mitigation techniques for the long-term dredging strategy;
- minimise the effects of the short-term dredging strategy.

DMP Commitments include:

- shoreline monitoring between Woodman Point and Catherine Point;
- monitoring of stability and seagrass dynamics of dredged slopes;
- detailed seagrass mapping of Success Bank resources;
- characterisation and quantification of the biotic component of dredged habitats;
- photographic monitoring of the study area.

Mitigation Techniques include:

- investigations by Murdoch University into means of restoring seagrass to dredged areas;
- investigations into improved dredging techniques to minimise seagrass loss;
- investigations into techniques for bulk transport of seagrasses;
- investigations of beneficiation of lower grade sands to enable dredging in alternative areas;
- investigations into enhancement of dredged areas for recreational use by establishing artificial reefs.

Dredging Management will include:

- accurately marking the boundaries of the dredging area;
- dredging the boundaries to maximise the rate of slope stabilisation;
- monitoring of slope stability and compliance with dredging area boundary proposed.

Appendix 2

Summary of submissions and the proponent's response

Part 1 - Summary of submissions

Part 2 - Proponent's response

Part 1 - Summary of submissions

1. Impacts of dredging on physical and biological environment

- 1.1 The fact that the proposed dredging site is degraded does not justify this proposal, nor the purpose for which CCL requires the 20,000 tonne sample.
- 1.2 What are the results of beneficiation trials already undertaken by Cockburn Cement?
- 1.3 Parmelia Bank is important to the ecology of Owen Anchorage/Cockburn Sound. It has been scientifically proven that previous and current dredging by CCL has resulted in the near complete destruction of the more important varieties of seagrasses and seaweeds required as breeding grounds for many local species of fish. This effect is regardless of the unsuccessful attempts to replant seagrasses. Further dredging is therefore unacceptable and should not be approved.
- 1.4 Rather than dredging Parmelia Bank, CCL should develop its beneficiation process from alternative sources with little danger of destroying remaining seagrass areas. For example, CCL should use material from the Mewstone leases where there is little seagrass, or alternatively from the waste dumps they have established in Cockburn Sound.
- 1.5 Parmelia Bank is already subject to erosional pressures and should not be further compromised by dredging.
- 1.6 CCL state that they intend to dredge a total of 20,000 tonnes of shellsand - approximately 4,000 tonnes on five separate occasions. Why is there a need to do bulk sampling for the beneficiation trials? Will bulk sample areas be joined to form a single excavation, or will they be separate pockets?
- 1.7 Does "20,000 tonnes" mean raw material obtained or beneficiated shellsand?
- 1.8 What is the likely effect of wave action on the excavation/s?
- 1.9 CCL state that the proposed dredging site is bare sand with less than 1% coverage of seagrass. What about adjacent areas? Are there dense meadows close to the trial area? A map indicating seagrass location and density on the Parmelia Bank may be useful. If there are seagrass meadows close to the trial dredging area, what are the likely impacts (if any) going to be on these seagrass meadows?
- 1.10 Can CCL provide a guarantee that no seagrass will be disturbed during the trials?
- 1.11 CCL does not give a good explanation for the future use of the site. The document refers to previous dredging at Parmelia Bank to a depth of 13-14 metres where seagrasses have regrown to depths of 8 metres. How deep will the dredged area be? Will the site be recontoured and attempts made at revegetating? If the shellsand does prove suitable for beneficiation purposes, will the same area be mined to a greater depth?

2. Timing of the beneficiation studies

- 2.1 The beneficiation studies could be completed in considerably less time (1 year) than the proposed 4-5 years. The only constraint appears to be the funding programme imposed by CCL. As the ability to beneficiate could reduce significantly the amount of seagrass dredged, these studies should be accelerated.

2.2 There is no physical constraint on taking samples now from all proposed alternate sites and shipping the materials to testing facilities located in Australia and elsewhere - this type of testing has already been undertaken by other parties using existing technology.

3. Pollution issues associated with commercial beneficiation

3.1 CCL refers to an environmental cost to commercial beneficiation of sand dredged from Cockburn Sound - disposal of freshwater and reject material (silica). CCL appears to be using this to avoid pursuing beneficiation as a viable alternative to dredging high grade shellsand beneath seagrasses. There would however be a net environmental benefit from beneficiation - that is, the environmental cost of beneficiation would be less than the environmental cost of destroying the seagrasses.

3.2 CCL could avoid having to use freshwater for washing by using an alternative non-marine resource for beneficiation. Has CCL investigated water recycling options?

4. General comments

4.1 If CCL receives approval to start dredging on Parmelia Bank, it will be difficult, if not impossible, to eventually remove them. Also, if the beneficiation trials are successful, there will be further applications for S46 amendments to allow further dredging.

4.2 Approval for the trials should in no way be misconstrued as condoning CCL's dredging of Owen Anchorage.

4.3 There are three new projects proposing to process high grade shellsand or limestone (Dongara - 2, Cape Range - 1). There is questionable merit in allowing CCL to dredge Parmelia Bank for low grade shellsand to compete in the same market - should wait until feasibility studies for the new projects have been completed and a course of action disclosed.

4.4 Will the results from the monitoring of these trials be made available to the public?

5. Government responsibilities (if you wish to comment)

5.1 It is the Western Australian Government's responsibility to now assist in identifying and supporting the development of an alternative supply of shellsand close to Cockburn Sound to meet increasing demand.

5.2 The position paper to examine the statewide distribution and values of seagrasses (referred to in Bulletin 739, Summary and Recommendations) has not been completed yet - this paper should be completed and made available for public comment before any further dredging is considered.



17 August 1995

Mr Colin Sanders
Dept of Environmental Protection
Westralia Square
141 St George's Terrace
PERTH WA 6000

Dear Mr Sanders

DREDGING OF SHELLSAND, OWEN ANCHORAGE - CHANGE TO ENVIRONMENTAL CONDITIONS (859)

Thank you for your letter of 10 August 1995 to Mr Don McDonald, Chief Executive, Cockburn Cement Limited, providing a list of issues raised in response to the application for an S46 modification to Ministerial Conditions. The responses are attached, along with a restatement of Cockburn's commitments in respect to the Environmental Management Programme.

Please let us know if further information is required.

Sincerely

FF Fred E Wells

DREDGING OF SHELLSANDS, OWEN ANCHORAGE CHANGE TO ENVIRONMENTAL CONDITIONS (859)

Response to Public Submissions from Cockburn Cement Limited

1 Impacts of dredging on physical and biological environment

- 1.1 The fact that the proposed dredging site is degraded does not justify this proposal, nor the purpose for which CCL requires the 20,000 tonne sample.

The proposed dredging site is not considered to be degraded, rather, it has very low (<1%) seagrass cover. This is an area where significant sand movement occurs, a process that is not conducive to seagrass growth.

As explained in the Shellsand Environmental Management Plan, Ministerial Condition 5-4 required Cockburn to conduct investigations: (1) into the technical and economic feasibility of beneficiation and (2) investigations to identify alternative lime resources to those of Success Bank. The present proposal is to dredge shellsand of approximately 85% grade from Parmelia Bank for use in the beneficiation trials.

Several areas were investigated for potential use as a source of shellsand for the beneficiation trials. The Parmelia Bank location was chosen for several reasons:

- *Quality on the bank varies from 85 to 92% within metres. Cockburn requires material from the lower end of this range for beneficiation.*
- *Shellsand from Parmelia Bank is coarser and more variable than that from Success Bank. This coarser material will respond differently to beneficiation and needs to be evaluated.*
- *The area is 3 km from Woodman Point compared to the 7 km at which the dredge is currently operating. Use of the site would utilise the current barges more effectively and defer the need for capital expenditure. The material to be dredged is harder, requiring the installation of a cutter on the dredge, but this cost has been included in the capital forecast.*

- 1.2 What are the results of beneficiation trials already undertaken by Cockburn Cement?

Further testing of a pilot plant has been completed and feedback to the supplier has been provided for modifications required. A kiln trial will be implemented when these modifications have been made using medium grade shellsand. Hence, further tests are required using low grade shellsand as per this proposal.

- 1.3 Parmelia Bank is important to the ecology of Owen Anchorage/Cockburn Sound. It has been scientifically proven that previous and current dredging by CCL has resulted in the near complete destruction of the more important varieties of seagrass and seaweeds required as breeding grounds for many local species of fish. This effect is regardless of the unsuccessful attempts to replant seagrasses. Further dredging is unacceptable and therefore should not be approved.

Substantial losses of seagrass occurred in Cockburn Sound in the 1970s as a result of pollution and environmental degradation. Considerable expenditure was made by the State government to build a pipeline down the eastern shore of the Sound to take wastes from various sources and release them into the sea near Cape Peron. While the loss of seagrasses and the attendant flora and fauna in Cockburn Sound is regrettable, it had nothing to do with the dredging activities of Cockburn Cement Limited to the north of Cockburn Sound.

- 1.4 Rather than dredging Parmelia Bank, CCL should develop its beneficiation process from alternative sources with little danger of destroying remaining seagrass areas. For example, CCL should use material from the Mewstone leases where there is little seagrass, or alternatively from the waste dumps they have established in Cockburn Sound.

As stated in the answer to question 1.1, the area proposed for dredging of the 20,000 tonnes of shellsand is free of seagrass.

Reasons for not using material from Mewstone and the waste dumps are included in our submission:

(1) The area around Mewstone Rocks. The bottom in this region is sandy, and avoids the problems associated with dredging within the seagrasses. The shellsand is of suitable quality for beneficiation. However, the site is too deep to be dredged by the equipment presently available to Cockburn.

(2) Material from West Ham Dump. This site was rejected because of the following points:

- *The shellsand is variable in quality, and is in the range of 89 to 91%. This range of quality would not provide a sufficiently accurate test of the ability of beneficiating material high in silica from the required 80% level.*
- *The dump is in a shallow depth, which requires continual movement of the dredge and reduces output. An alternative would be to use a trailer suction dredge but this would require considerable capital expenditure.*
- *There is no record of the quality of the shellsands as they were deposited, making planning of the process extremely difficult from a quality point of view.*
- *Material from the dump could be used as an emergency reserve during bad weather for a beneficiation plant installed in the future.*

Of note is that Cockburn has made a commitment to develop its beneficiation process for both shore based and marine based calcareous materials and has already spent more than \$ 1million progressing techniques.

- 1.5 Parmelia Bank is already subject to erosional pressures and should not be further compromised by dredging.

The area to be dredged is bare sand on the northern side of Parmelia Bank where seagrass coverage is less than 1%. Sands in this area are mobile and appear to be moving off the bank. The location is within the proposed second shipping channel to Cockburn Sound.

In addition, evidence indicates that overall Parmelia Bank is not eroding but is actually accreting (growing).

- 1.6 CCL state that they intend to dredge a total of 20,000 tonnes of shellsand - approximately 4,000 tonnes on five separate occasions. Why is there a need to do bulk sampling for the beneficiation trials? Will bulk sample areas be joined to form a single excavation, or will they be separate pockets?

The need for bulk samples is to carry out kiln trials on a sufficiently large sample from the beneficiated material in order to ascertain final product quality and kiln performance. Prior to dredging the site would be buoyed at each corner to demarcate its outer extent. As each of the five separate days dredging is completed, the area dredged will be marked. These marks will then indicate the location for the commencement of the next dredging operation, making the dredged area a single unit.

- 1.7 Does "20,000 tonnes" mean raw material obtained or beneficiated shellsand?

The 20,000 tonnes requested refers to the raw material required.

- 1.8 What is the likely effect of wave action on the excavation(s)?

Because of the small extent and location of the proposed S46 dredging, there is not expected to be any significant change in wave conditions on the adjacent shoreline due to the S46 dredging.

The wave induced orbital currents on the seabed in the dredged area would be decreased because of the increase in water depth from about 4-5 m to 8-9 m. Wave action over time would cause the sides of the dredged area to slump to a stable slope of between 1 in 5 and 1 in 10. This would provide a gradual and stable slope of up to 40 m width suitable for rehabilitation.

We agree that a detailed habitat map would have added to the review of the proposal. Such a map is presently being finalised, and was used for the selection of the proposed dredge site. Further, the proposed dredge site was inspected by divers (June 1995) to confirm the seagrass-free nature of the area.

- 1.9 CCL state that the proposed dredging site is bare sand with less than 1% coverage of seagrass. What about adjacent areas? Are there dense meadows close to the trial area? A map indicating seagrass location and density on the Parmelia Bank may be useful. If there are seagrass meadows close to the trial dredging area, what are the likely impacts (if any) going to be on these seagrass meadows?

The proposed area for beneficiation is on the northern side of Parmelia Bank where the surface of the bank is bare sand with less than 1% seagrass coverage. No areas of dense seagrass meadows are adjacent to the area to be dredged, and there are no likely adverse impacts on adjacent seagrasses as a result of dredging.

- 1.10 Can CCL provide a guarantee that no seagrass will be disturbed during the trials?

The area to be dredged is bare sand with less than 1% seagrass coverage, and no seagrass in other areas will be disturbed.

- 1.11 CCL does not give a good explanation for the future use of the site. The document refers to previous dredging at Parmelia Bank to a depth of 13-14 metres where seagrasses have regrown to depths of 8 metres. How deep will the dredged area be? Will the site be recontoured and attempts made at revegetating? If the shellsand does prove suitable for beneficiation purposes, will the same area be mined to a greater depth?

The area to be dredged is currently 4-5 m deep. This depth will be increased by 4 m by the dredging, making the final depth of 8-9 m consistent with depths which have regrown naturally. This depth will not require recontouring, and provides an area for potential use in seagrass rehabilitation studies.

All of the dredging undertaken by Cockburn on Parmelia Bank is part of a proposed shipping channel to allow greater shipping access to Cockburn Sound. The proposed dredging for beneficiation trials is part of the area in the designated second channel, but no decision has been made on whether the channel will in fact be dredged.

2 Timing of the beneficiation studies

- 2.1 The beneficiation studies could be completed in considerably less time (1 year) than the proposed 4-5 years. The only constraint appears to be the funding programme imposed by CCL. As the ability to beneficiate could reduce significantly the amount of seagrass dredged, these studies should be accelerated.

The detailed programme for the beneficiation trials is outlined in the EMP in sections A3.1 to A3.6. The overall scope of the project is to:

- *Review existing equipment and techniques available for possible testing on various raw materials.*
- *Research and develop techniques, and recommend equipment available for production of a large scale suitable for beneficiating limestone and shellsand commercially.*

- *Recommend a research and development programme for other unproven alternative techniques for the beneficiation of shellsand and limestone.*
- *Assess environmental impacts, capital and operating costs, and timing associated with the implementation of large-scale commercial beneficiation equipment that may be suitable.*
- *Compare costs of this process against costs associated with rehabilitation and ecological significance of seagrass.*

Cockburn is committed to a number of studies running concurrently at substantial commitments for R&D funding over the \$ 1 million already spent. As can be seen from the programme above, the nature of the work is such that is impossible to complete the work in one year. Cockburn is committed to the completion of the programme within the 4-5 year period.

- 2.2 There is no physical constraint on taking samples now from all the proposed alternate sites and shipping the materials to testing facilities located in Australia and elsewhere - this type of testing has already been undertaken by other parties using existing technology.

Before any proponent can remove samples of the quantities that are required for these trials, environmental approval for land based as well as marine based resources is required from the Environmental Protection Authority. Hence the need for this submission.

There is to date no commercially operating plant of the scale required by Cockburn available. Other parties may have tested materials, but none has carried out the large scale kiln production trials needed to prove up the final quality of material nor invested in constructing a plant of the scale required for this operation.

3 Pollution issues associated with commercial beneficiation

- 3.1 Cockburn refers to an environmental cost to commercial beneficiation of sand dredged from Cockburn Sound - disposal of freshwater and reject material (silica). CCL appears to be using this to avoid pursuing beneficiation as a viable alternative to dredging high grade shellsand beneath seagrasses. There would however be a net environmental benefit from beneficiation - that is, the environmental cost of beneficiation would be less than the environmental cost of destroying the seagrasses.

Cockburn is serious about the investigation of the possibility of beneficiation to alleviate the need for high grade shellsand resource, which in the Success Bank area occurs in seagrass areas. The CSIRO has been contracted to assist in the development of techniques for beneficiation. The S46 proposal is to dredge shellsand for use in the beneficiation trials.

The EMP attempted to point out that while beneficiation is an attractive proposition if a successful process can be developed, there are environmental costs associated with it. The purpose of the beneficiation research is to develop a commercially viable process and to determine whether its use would be environmentally acceptable.

- 3.2 CCL could avoid having to use freshwater for washing by using an alternative non-marine resource for beneficiation. Has CCL investigated water recycling options?

Cockburn has, together with the suppliers of equipment, investigated and tested washing methods using alternatives to freshwater. However, to date we have been unsuccessful in finding an alternative because of equipment sensitivities to impurities in the separation process.

4 General comments

- 4.1 If CCL receives approval to start dredging on Parmelia Bank, it will be difficult, if not impossible, to eventually remove them. Also, if the beneficiation trials are successful, there will be further applications for S46 amendments to allow further dredging.

The proposed dredging requires an S46 amendment to the Ministerial Conditions and is specifically for the purpose of providing test material for beneficiation studies. The long term dredging area proposed by Cockburn is on Success Bank.

- 4.2 Approval for the trials should in no way be misconstrued as condoning CCL's dredging of Owen Anchorage.

This is a personal viewpoint.

- 4.3 There are three new projects proposing to process high grade shellsand or limestone (Dongara - 2, Cape Range - 1). There is questionable merit in allowing CCL to dredge Parmelia Bank for low grade shellsand to compete in the same market - should wait until feasibility studies for the new projects have been completed and a course of action disclosed.

An investigation of the potential use of alternative resources is in fact one of the 12 projects described by Cockburn in the EMP document. This aspect is under active consideration. One of the projects mentioned for Dongara is in fact a proposal by Cockburn. The suite of EMP studies is proceeding simultaneously so that in five years there will be sufficient information available to make valid decisions on where to go from there.

- 4.4 Will the results from the monitoring of these trials be made available to the public?

As part of the EMP procedures, Cockburn presents an annual report on progress to 30 June each year to the Department of Environmental Protection and the Environmental Protection Authority. These reports are public and contain reports on all of the EMP studies.

Since the EMP has not yet been approved by the Minister for the Environment no annual report was required for the year to 30 June 1995, nor in fact was Cockburn required to initiate the studies themselves. In order to maximise the use of the five year time period Cockburn has already commenced the studies and released an annual report on 30 June 1995.

5 Government responsibilities (if you wish to comment)

- 5.1 It is the Western Australian Government's responsibility to now assist in identifying and supporting the development of an alternative supply of shellsand close to Cockburn Sound to meet increasing demand.

The Cement Works (Cockburn Cement Limited) Agreement Act 1986 confers a number of rights and obligations on the Company and places the following obligation on the State:

"If and when it should become impracticable for the Company to obtain shellsand pursuant to this clause, the state will use every endeavour to find shellsand within a reasonably economic distance from the jetty, and if other shellsand is not available, then other equivalent material."

- 5.2 The position paper to examine the statewide distribution and values of seagrasses (referred to in Bulletin 739, Summary and Recommendations) has not been completed yet - this paper should be completed and made available for public comment before any further dredging is considered.

Cockburn is aware of the DEP commitment to present this report by December 1995 and looks forward to its release. Such a document would have simplified the task of developing the EMP. However a decision on the EMP is required to allow the maximum amount of time for studies on the ecological significance of seagrass and seagrass rehabilitation to proceed during dredging in the medium term dredging area.

It should be noted that the recently released report of the Marine Parks and Reserves Working Group examined the entire Western Australian coastline for potential sites for marine parks and reserves. Owen Anchorage was not among the 72 recommendations made by the working group.

Shellsand Dredging Environmental Management Programme Commitments:

Cockburn Cement Limited made a number of commitments in the Environmental Management Programme. The EMP is currently under consideration by the Minister for the Environment. All of the commitments made in the EMP remain as indicated in the document:

The basic objectives of the EMP are:

- to minimise the potential for adverse environmental effects arising out of the short- and medium-term dredging operations; and
- to resolve the issue of long-term resource access.

The key principles which have been used to guide the design and implementation of this EMP, and to which Cockburn have committed, are:

- an adaptive environmental management approach will be used whereby the EMP will be regularly reviewed and modified as appropriate as the results of technical studies become available;

- non-renewable natural resources are to be used as efficiently as current technology allows;
- the long-term shellsand dredging operations and rehabilitation programme should aim to maintain ecological function and to result in environmental benefit in the Owen Anchorage/Cockburn Sound area; and
- implementation of the EMP will be conducted in an open manner, involving regular reporting to the authorities, independent peer review of the studies, dissemination of study results in the scientific literature where appropriate, and consultation with the local community.

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Appendix 3

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