PROPOSED DREDGING FOR THE HARRINGTON WATERS ESTATE – MANNING RIVER
REPORT ON THE ASSESSMENT OF A DEVELOPMENT APPLICATION
(DA 122-5-2002) PURSUANT TO SECTION 79C OF THE
ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

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1. INTRODUCTION AND BACKGROUND

1.1 The Applicant

The Applicant for the proposal is Roche Group Pty Limited (Roche Group).

1.2 Overview of the proposal and its location

Roche Group seek approval for the extraction of up to 1,000,000 m^3 of material from the bed of the Manning River. The location of the proposed dredge site is approximately 4 kilometres upstream of the township of Harrington, within the Greater Taree Local Government Area (refer to Figure 1). The application involves the extraction of a fluvial sand shoal located on the inside bend of the lower Manning River. The material to be extracted is generally classified as mainly fine to coarse grained sands with some traces of silt, clay and shell material. The extracted material is to be used to fill the areas known as Stages 3 and 4 of the Harrington Waters Estate, which is adjacent to the proposed dredge site.

The proposed extraction area covers approximately 0.34 km^2, spanning a river length of approximately 1250 metres between Mangrove Island to the west and Pelican Point to the east. The dredging would be undertaken to a depth of approximately 7.6 m below the Australia Height Datum, and maintaining a maximum underwater slope no steeper that 1 in 8.

The proposed method for removal of the resource will utilise a bucket wheel cutter section dredger, achieving a production rate of around 400m^3/hour. Material from the bucket wheel cutting head will be delivered to a discharge pipeline which would convey the material ashore as hydraulic slurry to on-shore processing facilities. The works associated with onshore fill activities are the subject of separate development approvals from Council.

The Applicant advised that the capital investment in the establishment and operation of the dredge and contractor costs will be approximately $3.6 million. The dredging operation and the associated earthworks will provide employment opportunities for 16 contractors.

1.3 State Significant, Integrated, Designated Development

The proposal is defined as State Significant Development under the *Environmental Planning and Assessment Act 1979* ("the Act"). As such, the Minister for Planning is the consent authority for this DA.

Under Section 91 of the Act, the development proposal is also an 'integrated development', as, in addition to requiring development consent, the application requires another approval or licence from another government agency. Should the proposal be granted development consent, the Applicant will be required to apply for an environment protection licence with the Environment Protection Authority (EPA) under section 48 of *the Protection of the Environment Operations Act 1997*.

The proposal is also Designated Development under the *Environmental Planning and Assessment Regulation 2000* ("the Regulation") and an EIS has therefore been prepared in support of the application.

1.4 Lodgement of DA and exhibition

On 22 April 2002 Roche Group lodged the DA and EIS with the Department of Planning. The DA and EIS were publicly exhibited from 8 May 2002 until 11 June 2002, in accordance with the *Environmental Planning and Assessment Act, 1979*. Submissions were received until close of the exhibition period. A detailed summary of submissions resulting from the public exhibition of the proposal is given at Appendix 1.

Public notification of the DA involved the placement of notices in the *Manning River Times*, and the placement of site signs at various locations around the DA area. The Department also advised all adjoining and surrounding landowners of the proposal in accordance with legislative requirements.

The Department is satisfied that the requirements for public exhibition of the DA and EIS and public participation have been fully met.

1.5 Local Council position

Greater Taree City Council (GTCC) expressed support for the proposal, subject to the proposed mitigation measures in the EIS being implemented.

1.6 Government agencies' position

A total of 7 submissions were received from government agencies. Submissions were received from the Department of Land and Water Conservation (DLWC), EPA, Waterways, Coastal Council, NSW Heritage Office, National Parks and Wildlife Service (NPWS) and NSW Fisheries. A number of the agencies raised concerns about the project. The main concerns included the potential impacts on the river and the time-frame for remediation. It is considered that these issues were either resolved by further assessment or that measures are included in the recommended conditions of consent to adequately minimise the impacts of the proposal.

1.7 Local community position

Four submissions were received from the local community. Three of these submissions objected to the proposal on environmental and public amenity grounds. One submission supported of the Project on the grounds of reducing siltation of the river and through encouraging development.

1.8 Special interest groups

Nature Conservation Council (NCC) made a submission on the project which raised a number of concerns and objected to the proposal due to the potential for environmental impacts and the level of assessment provided in the EIS. These issues are addressed throughout the assessment report.

1.9 Request for Commission of Inquiry

No submissions were received requesting a Commission of Inquiry for this proposal.

2.0 THE PROPOSAL

2.1 Site details and infrastructure

The proposed extraction site is upstream of the Harrington Waters Estate, as illustrated in Figure 1. The proposed extraction area covers approximately 0.34 km^2, spanning a river length of approximately 1250 metres between Mangrove Island to the west and Pelican Point to the east. The proposed dredging area is located between 6 and 7.5 kilometres upstream of Harrington Inlet. The Applicant proposes to undertake the dredging to a depth of approximately 7.6 m below the Australia Height Datum, and maintain a maximum underwater slope no steeper than 1 in 8.

The sediments within the proposed dredging area are classified as fluvial muds and sands under the Manning River Estuary Process Study. Due to the upstream distance from the Harrington Inlet, the Applicant describes that the sediments could be expected to contain a mixture of reworked coastal sands and mixed fluvial muds and sands. However, the EIS describes that although the material contains reworked coastal material, the location of the proposed dredging is not within the active coastal zone. It is estimated that the downstream end of the dredge site is located approximately 2 kilometres upstream of the marine delta.

The footprint of the dredge is constrained by the presence of oyster leases and sea grasses adjacent to the riverbank in the vicinity of the proposed dredging site. The footprint has been designed to be at least 50 metres from the edge of any active oyster leases and seagrass beds, and 100 metres from the frontage of Newton's Shipyard site.

The current application requires minimal approval for associated surface infrastructure. The Applicant advises that as the development of the Harrington Waters Estate has been ongoing for a number of years, many of the activities associated with providing essential site services are already approved and in place. In addition as most of the work will be undertaken over water, there is no need to establish further additional site facilities. However, the EIS describes that site establishment would involve the following activities:

- Road transport of the dredging plant and assembly adjacent to the river;
- Construction of minimal mooring and launching facilities, for use during refuelling activities and the day to day movement of personnel, and for launching the dredging plant;
- Installation of the dredging pipeline; and
- Launching of the dredging platform.

The location, construction and disestablishment of the mooring facilities will be addressed under a separate development application to GTCC.

2.2 Ownership

The DA area consists of the bed of the Manning River. The beds of tidal rivers, up to high water mark, are Crown land. Under the provisions of the Crown Lands Act 1989, DLWC is considered to be landowner of all Crown land. Consent to lodge the DA was therefore gained from DLWC and the Application has been extensively reviewed by DLWC.

2.3 Production, hours of operation and employment

The EIS details that a total of approximately 1,000,000 m^3 of material would be removed from the proposed dredge area over the life of the operation. The maximum production capacity of the dredge is reported to be around 400m^3/hour, but given an allowance for delays and down time, an average production rate of around 300m^3/hr would be an achievable rate. This equates to a production rate of approximately 900,000m^3 per annum.

It is proposed that the dredge would generally operate for eleven hours (7am to 6pm) per day, Monday to Friday and five hours (8am-1pm) on Saturday with no work on Sunday and Public Holidays. An extra hour would be used each day for maintenance activities. Based on these figures, and allowing downtime and other delays, it is expected that the work would be finished within 18 months of commencement, but could take up to 2 years depending on any constraints in extracting the material.

The Applicant advised that the capital investment in the establishment and operation of the dredge and contractor costs will be approximately $3.6 million. The dredging operation and the associated earthworks will provide employment opportunities for 16 contractors.

2.4 Extraction process and stages of development

The Applicant advises that it is proposed to commence extraction works within the most upstream section of the dredge area and progress in a downstream direction. The dredge area is divided into three sections and within each section dredging would be carried out by working from the middle of the river towards the bank.

The poorest fill material has been identified by the Applicant to occur towards the downstream end of the designated dredge area. It is proposed to extract the material from this area last to minimise the need for storage of fines on-site, and if possible depending on the amount of material extracted from the rest of the lease area, exclude this area from being dredged.

2.5 Transport of material

The EIS describes that material will be transported via hydraulic slurry from the point of extraction to the onshore facilities. The hydraulic slurry would be pumped ashore through 400 mm diameter flanged steel pipelines. As the dredges are capable of pumping the slurry a distance of around 800 metres, booster pumps will be required to transport material from the extraction site to the onshore processing facilities. Between one and three booster pumps would be required, depending on the removal and fill locations at any given time during the operation. The location of the shoreline crossing for the pipeline would be determined when the pipeline is installed in order to select an area where damage to seagrasses will be minimised.

The slurry from the dredge will be hydraulically pumped to ponds within Stage 3 and 4 of the Harrington Estate, where the supernatant water will be allowed to discharge and the sediment allowed to settle prior to application at the fill sites. The return waters from the settling ponds will be held and treated prior to discharge to the river to ensure compliance with EPA water quality requirements. Control points will be established for the different fill areas and testing of return waters will be undertaken to ensure compliance prior to release to the Manning River.

2.6 Justification

The Applicant provides various justifications for the proposal proceeding in Section 7 of the EIS. The Applicant submits that the quantity of material required to carry out the housing project is 1.8 – 2 million tonnes, assuming a volume of 1,000,000 m^3 and a density of 1.8-2 tonnes/m^3. The EIS describes that there are a number of pits operating within 50 kilometres of the site, however none have the capacity to deliver the quantity of sand individually. If the Project was to be carried out using land based resources, it is likely that most, if not all of local sand suppliers would be required to meet the necessary demands.

The EIS outlines that consideration was given to alternative locations for sediment removal, however all locations containing an appropriate quantity of material are downstream of the proposed dredge site and were determined to be located within the active marine sand delta. Under the provisions of the NSW Coastal Policy 1997, dredging is not permitted in areas that have the potential to impact on coastal processes. Given that the marine delta is an integral part of the coastal environment, removal of material from the delta would likely impact the coastal processes.

Sites upstream were also considered, however removal of material from locations further away to the fill site would also require additional effort in terms of transportation of material. Should the proposal not proceed then the existing Harrington Waters residential development cannot be completed. The EIS submits that the Harrington Waters Estate will have economical benefits for the township of Harrington.

3.0 STATUTORY PLANNING MATTERS

Various State, regional and local statutory planning provisions apply to the proposed dredge. The proposal is a "designated development" under Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* and an EIS has been prepared in support of the application.

3.1 Local Planning Considerations

The Project is within the Greater Taree local government area. The DA site is zoned 1(a) Rural General. Extractive industries are not listed as being prohibited nor considered to be inconsistent with zone objectives.

3.2 Regional Environmental Plans

The Hunter Regional Environmental Plan (REP) 1989 applies to the proposal. The REP provides a framework to guide and control growth and development in the region. The REP includes objectives relating to the management of extractive industries in the region. The Department considers that the proposal is consistent with the objectives of the REP.

3.3 State Environmental Planning Policies (SEPP)

SEPP No. 33 (Hazardous and Offensive Development)

SEPP 33 was introduced in 1992 to ensure that in considering any application to carry out potentially hazardous or offensive development, the consent authority has sufficient information to assess whether the development is hazardous or offensive and to impose conditions to reduce or minimise any adverse impact.

The Department has reviewed the proposed development and concluded that it is not considered to be "potentially hazardous development" as it does not pose a significant off-site risk impact (unmitigated scenario). As such the proposal does not trigger the risk impact provisions of the SEPP and a Preliminary Hazardous Analysis is not required.

SEPP No. 44 (Koala Habitat Protection)

SEPP 44 applies to all land within the Greater Taree local government area, as it is identified in Schedule 1 of the policy as a local government area where koalas are known to occur. The SEPP applies to DA's involving more than 1 hectare of land. As the DA area consists of the bed of the Manning River, it does not constitute core or potential koala habitat.

3.4 Schedule 3 of EP&A Regulation

Under Schedule 3 of the *Environmental Planning and Assessment Regulation* (the Regulation), the proposed development is defined as 'designated development' since it is an extractive industry which meets several of the criteria listed in Clause 19 of Schedule 3 of the Regulation. Subsequently, the proposal required the preparation of an EIS in support of the Application.

Director-General's requirements for the EIS were issued to the Applicant on 25 September 2001, the EIS was prepared by WBM Oceanics Australia and submitted with the DA. The Department was satisfied that the Director-General's requirements had generally been addressed and the EIS was adequate to be placed on exhibition.

Procedures relating to the preparation and public notification of the EIS have been followed.

3.5 Environment Protection and Biodiversity Conservation Act, 1999 (EPBC Act)

The Commonwealth EPBC Act commenced operation on 16 July 2000, with the primary objective of providing protection for the environment, particularly those aspects of the environment that are matters of "national

environmental significance". The EPBC Act establishes a scheme requiring environmental assessment and approval of proposals likely to significantly impact on such matters and a determination by the Minister as to whether the proposal is a "controlled action" under the EPBC Act.

The proposal was not referred to Environment Australia under the EPBC Act. Although two migratory species, listed under the Act were recorded in the study area, these species or their habitat are unlikely to be significantly affected by the proposal. The Department concurs that a referral was not required.

3.6 Threatened Species Conservation Act, 1995

The EIS addresses each of the matters set out in section 5A of the EP&A Act, and concludes that there was unlikely to be a significant impact on threatened species and therefore a species impact statement (SIS) was not required. The Department's assessment of flora and fauna, which is detailed in the "Department's Consideration" section below concludes that the proposal is unlikely to significantly impact on any threatened species.

3.7 Conclusion

The proposal is in accordance with the provisions of all the relevant environmental planning instruments.

4.0 SUBMISSIONS RECEIVED

In accordance with section 79 of the EP&A Act, the Department received a total of 13 submissions in response to the exhibition of the proposal. Seven submissions were received from government agencies, four from the local community, one from a special interest group and one from GTCC. The issues raised in these submissions are discussed below and summarised in detail in Appendix 1. The position of GTCC is considered in Section 1.5 of this Report.

4.1 Government agencies

- DLWC

DLWC made a submission raising a number of concerns with the assessment provided in the EIS. The overriding concern of DLWC was the potential for significant environmental impacts from the extraction of a large amount of material over a relatively short period of time. Several issues were raised regarding the proposed extraction, including the potential occurrence of acid sulfate soils; risk of increased turbidity; increased bed and bank erosion; the effect on benthic organisms; impact on wetlands and ongoing impact on the river. Many of the issues were subsequently resolved by undertaking further assessment or providing additional specialist studies. The remaining issues were agreed to be addressed through the preparation of an Extraction Management Plan, to be prepared by a suitably appointed independent expert panel. The Plan will address issues such as monitoring, justification for the selected extraction footprint and remediation measures should an unacceptable impact be detected. DLWC will also require the provision of a bank guarantee from the Applicant as a condition of granting a license under the *Crown Lands Act 1989*.

- EPA

Following their review of the EIS, the EPA resolved that they were able to issue GTAs for this proposal. However, in providing these requirements, the EPA raised concern about the disturbance of acid sulfate soils and recommended that a plan for the management of these soils should be developed. This requirement has been incorporated in the conditions of consent.

The EPA submitted their general terms of approval (GTAs), which have generally been adopted as conditions in the recommended instrument of consent. The EPA was consulted in relation to the consent conditions and are satisfied that their general terms of approval have been included in the conditions.

- Waterways

Waterways did not raise any objection to the proposal however submitted that all vessels used in association with the works must comply with the provisions of the relevant legislation and all structures must be clearly marked and adequately lit. Conditions of consent have been included accordingly.

- NSW Fisheries

NSW Fisheries raised several concerns in relation to the proposal, including a position that the impact on benthic organisms was understated in the EIS, and that the proposal would result in significant long term decline in the ability of benthic animals to recolonise. Fisheries also sought assurance that the proposal would not impact on adjacent oyster leases, wetland areas or on the habitat of the Black Cod. These concerns were raised with the Applicant, and either further information was provided or conditions incorporated to address them.

- NPWS

In their submission, NPWS raised a number of points concerns about the proposal. Concerns were raised about the cumulative impacts of this proposed extraction; the effects of the discharge of the treated dredge water on benthic communities; and impact on avifauna. The Department raised these concerns with the Applicant. An appropriate response was provided and/or addressed by the conditions of consent. These measures include the preparation of an Extraction Management Plan and a Flora and Fauna Management Plan in consultation with NPWS and to the satisfaction of the Director-General.

- NSW Heritage Office

NSW Heritage Office submitted that the EIS did not adequately address historic shipwreck sites that have the potential to be retained within the river base deposits. NSW Heritage requested that a study of the likely impacts on the underwater cultural heritage be undertaken. This matter was raised with the Applicant, and a further assessment was subsequently provided. NSW Heritage expressed satisfaction with the methodology and findings of this report.

- Coastal Council of NSW

The Coastal Council raised numerous concerns about the proposed extraction and more broadly in regard to the approval of the Harrington Waters Estate without consideration being given to the source of the fill for the estate. Concerns were also raised about the cumulative impacts of this extraction, which were raised with the Applicant. It is considered that appropriate consideration to cumulative impacts has now been provided. The Coastal Council expressed support for the recommendations made by DLWC and these recommendations have been incorporated as conditions of consent.

4.2 Public submissions to the proposal

The Department received four submissions from the local community. Three of these submissions objected to the proposal and one submission supported the proposed extraction.

Concerns raised in these submissions included environmental impacts, such as:

- impacts on aquatic flora and fauna;
- impacts on amenity of the river;
- preferred dredging of the back water of Harrington;
- impact on coastal processes; and
- cumulative impacts.

The submission in support of the proposal considered that the river is badly silted, the material is in need of removal and that the Harrington Estate will provide employment opportunities.

The Department also received one submission from a special interest group. NCC made a submission opposing the development on a number of grounds. These issues related to the potential environmental impacts of the proposed extraction, including alteration to the natural flow regime, riverbank stability; impacts on water quality; impacts on flora and fauna; acid sulfate soils management and cumulative impacts. All these issues were raised with the Applicant and either a detailed response was provided, or appropriate conditions have been included in the consent to address them.

4.3 Consideration of Need for COI

In response to the exhibition period, no submissions were received requesting a COI for the Proposal. The key issues have been addressed to the satisfaction of the Department and other government agencies, and a number of stringent consent conditions have been recommended to ensure the predicted impacts from the extraction can be adequately managed and mitigated, including environmental monitoring. The Department does not consider that a COI is warranted and it would not add any further value to the assessment process.

5. PLANNING NSW CONSIDERATION

Key issues

In the Department's opinion, the key issues for assessment, taking into consideration the submissions received on the proposal and the contents of the EIS, are:

- Impacts on river bed and banks;
- Impact on water quality
- Acid sulphate soils
- Noise impacts
- Impacts on flora and fauna
- Aboriginal and European heritage.

5.1 Impacts on river bed and banks

The Applicant identified and assessed the key impacts as follows:

- tidal hydronamics
- flood hydraulics
- sediment transport, erosion and accretion, and
- bank erosion

Applicant's position

Tidal hydronamics

The EIS acknowledges that the removal of a substantial amount of material from the riverbed could potentially impact upon the high and low tide levels both upstream and downstream of the site, though increased hydraulic efficiency in the vicinity of the proposed dredge site. However, a comparison between the predicted high and low tide levels for the existing and expected tides has shown that the change in these levels is minimal for a mean spring tide condition, with the likely change to the tidal range being very close to zero.

The Applicant describes that tidal velocities within the immediate vicinity of the dredged area would fall, however velocities around the edges of the dredge hole could slightly increase. The modelling in the EIS indicates that the area of increased velocities would remain localised to within 1 kilometre upstream and downstream of the dredging site with expected localised increases in peak flood velocity. This assessment concluded that given the localised nature of these impacts it is highly unlikely that any interaction with impacts from the previous dredge area would result. However, the EIS considers that the potential increase of currents adjacent to the shoreline does require further consideration, and is addressed in the Bank Erosion section of the this report.

Flood hydraulics

The Applicant advises that the proposed dredging would move the thalweg closest to the middle of the river, which may direct a greater proportion of the flood flow through the central part of the river section, as opposed to the outside of the river. The EIS describes that this has the possible consequence of reducing velocities affecting riverbanks, and thereby reducing the likelihood of future bank erosion. Overall, the EIS concludes that there would be minimal impacts on river flood hydraulics as the reduction in flood velocities is limited to a river length of 1200 metres.

However, the EIS submits that the proposed dredging would cause a slight increase in peak flood flows for a 20 year event of up to 0.1m/s, which would be localised and most notable in the vicinity of the extraction site. The EIS considers that these impacts will be minimal and restricted to the immediate vicinity of the dredge area. Regardless, the modelling in the EIS demonstrates that small localised changes will be experienced irrespective of

the location or configuration of the dredge hole and the changes expected would not impact significantly on the flood hydraulics regime of the River.

Sediment transport, erosion and accretion

The EIS describes that the upstream extent of the active coastal processes is around 1 kilometres downstream of the proposed dredge area. The modelling undertaken in the EIS demonstrates that the point bar shoal that is to be removed by the proposed dredging works has formed mostly from fluvial processes and is not part of the active marine environment.

The EIS identifies that the removal of the point bar shoal will alter the local sediment transport processes within the river. The EIS considers that the local reduction in tidal and flood velocities is likely to result in accelerated sedimentation at this location, and possibly result in reduced sediment transport rate at more downstream locations. It is also expected there would be an increase in erosion immediately upstream of the proposed area of dredging due to the introduction of converging streamlines causing a local increase in velocities. However it is expected that these changes will be less than 1% for both fluvial and tidal transport rates, and not expected to interact with sediment processes within the coastal zone.

The modelling in the EIS describes that in time the dredge hole will fill with fluvial sediments, primarily following the erosion of material immediately upstream of the dredge hole and deposition of that material into the upstream end of the dredge hole. However, the Applicant acknowledges that the time frame under which the infilling process will occur is difficult to accurately predict, but is likely to be in the order of decades.

Bank erosion

The EIS draws upon a previous bank management study which was undertaken to address the issue of bank erosion in the Manning River. This study identifies two areas in the vicinity of the proposed dredge site that are susceptible to erosion, as follows:

- An area on the northern bank of the channel downstream of the site. This area is described to begin approximately 50 metres downstream of the proposed dredging site. The first 500 metres of this length of eroding river bank was assessed as being subject to a moderate degree of erosion; and
- An area along the southern bank of the river in the vicinity of the site which was assessed as being subject to a moderate degree of erosion.

The EIS describes that recent bank erosion is also evident, particularly on the northern riverbank adjacent to the downstream end of the proposed dredge area.

The Applicant identifies two potential erosion processes within the vicinity of the proposed dredge site which may be influencing these sites: wave attack and current scour. In respect of the erosional wave attack process, the EIS considers that the proposed dredging is unlikely to have a significant impact on bank erosion in the river, as the fetch lengths will be unaltered and the bed depths immediately in front of the eroding bank will not be changed. If the more dominant process is scour the Applicant submits that the proposed dredging is likely to reduce velocities and therefore shear stress along most of the riverbank, thereby reducing the likelihood of continued bank erosion in the future. However the EIS identified that there is the possibility that altered flow paths could direct flows to sections of the riverbank that were previously unaffected by bank erosion, and will require monitoring to assess these impacts.

In addition, the Applicant notes the area north of the proposed dredge site may be subject to increased velocities, due to the creation of deeper water within the proposed area of dredging. This site will be monitored and armoured as necessary, however the EIS considers that the proposal is not likely to significantly affect the stability of the riverbank. Otherwise, the Applicant concludes that it is not expected that bank erosion will be exacerbated by the proposed dredging, nor is it likely that the proposal will have any significant impact on underway river slopes which would affect the stability of the riverbanks.

Mitigation measures

As the modelling in the EIS indicates that the proposed extraction would not significantly impact on the tidal hydrodynamics and flood hydraulics of the river, the Applicant does not propose any mitigation measures. Similarly, in regard to any impacts on the sediment transport, no specific mitigation measures are proposed as the modelling indicates that the sediment transport rates downstream of the site will not be greatly impacted by the works. In relation to the infilling of the dredge hole, the EIS envisages that this process will occur naturally and that the erosion/ accretion process will gradually even out as the upstream slope of the of the dredge hole flattens and the cross-sectional area is reduced. As outlined above, this process will take in the order of decades and no mitigative measures are available.

Even though significant impacts are not predicted, the Applicant does propose that the riverbank adjacent to the downstream end of the proposed extraction footprint will be monitored for erosion caused by dredging following the works. The EIS details that monitoring would involve hydrographic survey of the river to ascertain underwater slope of the riverbank. Should monitoring show that significant recession of the toe of the riverbank has occurred, and that the overall stability of the slope may be compromised if left untouched, then appropriate ameliorative measures will be carried out. It is proposed that this would involve armouring of the underwater slope to prevent any further recession and to stabilise the toe of the riverbank.

Issues raised in submissions

Two submissions raised specific concern about the impact of the proposal on the acceleration of erosion of river banks and impact on river processes.

NCC submitted that the proposal could result in a greater level of bed and bank erosion and increase in flood velocities which may undermine river banks. This issue was raised with the Applicant and the Applicant replied that the surveying and modelling demonstrated that the proposal would have an insignificant impact on tidal and flood flows and consequently minimal impacts on erosion. The response acknowledges that substantial riverbank erosion has occurred adjacent to the site previously and will continue regardless of dredge activity. This erosion is however largely the result of wind generated wave activity and the dredge "hole" created is unlikely to exacerbate this process significantly. Although the rate of erosion is unlikely to significantly increase as a consequence of the dredging, monitoring is proposed, and if necessary further armouring will be undertaken.

DLWC also raised a number of concerns regarding the potential for increased bank and bed erosion. These concerns primarily related to the large quantity of material to be removed over a short time period, and the depth to which the extraction would occur. DLWC requested that further consideration be given to the design of the dredge footprint, suggesting that the extraction depth could more appropriately replicate the natural base of the river bed. Concern was also raised about the long time frame for the infilling of the dredge hole and the difficulty in monitoring and ensuing remediation over a period of decades. In light of the significance of these concerns, the Department convened a meeting between the Applicant and DLWC to resolve these issues, provide further discussion of the assessment of these impacts and to formulate appropriate management and monitoring of river process and bank and beds. These measures include a requirement that the Applicant provide further assessment of the depth of extraction and design of the extraction footprint. This remodelling must be approved by the Director-General and the DLWC prior to the commencement of extraction. DLWC have been consulted extensively about the appropriate management framework for the proposal, and have expressed satisfaction with the recommended conditions of consent.

Department's position

The Department recognises that considerable concern was raised throughout the assessment process about the impacts of extracting such a large quantity of material over such a short time frame, and the potential impact this extraction may have on river processes and bed and bank stability. The Department is satisfied that the modelling provided by the Applicant offers an appropriate assessment of the impacts on river processes and bank and bed erosion. However, it is noted that there is inherent uncertainty in the prediction of such impacts and the timeframes for rehabilitation.

Accordingly, following this assessment the Department recommended that an Independent Expert Panel be convened to prepare an Extraction Management Plan prior to commencement of extraction. This Plan is to provide further independent consideration of the proposed design of the extraction footprint and to establish mitigation measures and contingency plans should the extraction be demonstrated to result in impacts on the river and banks.

In addition, the consent requires that monitoring be carried out in accordance with the requirements of DLWC. This program shall include a survey of the dredge material removed and a survey of the river banks at set physical and temporal intervals. The monitoring program will continue following the cessation of dredging for the duration of the consent. The Applicant will be required to remediate all impacts that are identified by the monitoring program to the satisfaction of DLWC. Should the Applicant fail to remediate these impacts to the satisfaction of DLWC, DLWC may call upon a bank guarantee provided by the Applicant in accordance with the license to be granted under the *Crown Lands Act 1989* to undertake this work.

The Department considers that the management and monitoring program provided by the conditions of consent will provide an appropriate framework to minimise the impacts of the extraction, ensure that the footprint for extraction is designed appropriately and provide for appropriate remediation where impacts are demonstrated to occur.

5.2. Water quality

Applicant's position

The Applicant describes that the water quality of the Manning River at the proposed dredge site location is considered to be relatively good, given its proximity to the ocean entrance and the frequency of tidal flushing. The EIS identifies a number of potential impacts from the dredging operation as follows:

- Turbidity associated with dredging – the EIS describes that material to be removed is a slightly silty sand, with some layer of more siltier/ clayier material. The EIS acknowledges that the disturbance of this material could result in resuspension of fines, which would locally increase turbidity around the dredge head.
- Oil and petrol spillage – the EIS notes that there is the potential for oil, chemical and petrol spillage when fuel and oil are transferred from the shoreline to the work boat and from the work boat to the dredge.
- Turbidity due to discharge pipeline – the Applicant advises that should the discharge pipeline rupture it is possible that dredge slurry could be released into the Manning River.
- Pollution due to suspended solids and low pH in return waters – due to the nature of the material being removed, it is possible that the return waters from filling areas will contain low pH resulting from acid sulfate soils, or high levels of turbidity due to the presence of significant fines in the material.

Mitigation measures

The Applicant commits to a number of mitigation measures in the EIS to mitigate the impacts of the dredging operation on water quality. The EIS describes that turbid waters around the dredge head would be contained by the placement of a turbidity curtain around the active dredge area and/ or restricting the dredge to certain stage of the tide. A turbidity curtain would be maintained on site for deployment as required.

The Applicant also commits that bunding would be provided at all fittings on the fuel barge and on the dredge so that any spillage of fuel can be isolated before entry into the river.

In addition, the Applicant advises that continuous monitoring of equipment will assist in avoiding water quality impacts arising from the breakage of the discharge pipeline. Should leakage be detected, the EIS describes that pumping will cease, while the pipeline is cleared and the damage is repaired.

In order to minimise the impact on water quality, the Applicant proposes to implement a monitoring and treatment program. This will involve the testing of discharge waters at the water quality control points identified in the EIS. If necessary, the waters will be treated with gypsum, or other appropriate flocculant prior to discharge. Discharge waters will also be treated with hydrated lime to correct the pH as required prior to discharge from the site into the Manning River.

The Applicant describes that a water quality monitoring program has been implemented for the construction of stages 3 and 4 of the Harrington Waters Estate. The EIS considers that this program will be appropriate to monitor impacts from the proposed dredging operation. Should this water quality program reveal unacceptable impacts from the proposal during the establishment and operational phases of the operation, the Applicant commits that modifications to increase the efficiency of the mitigation measures will be implemented in consultation with the EPA.

Issues raised in submissions

NCC noted concern about the potential for the proposal to impact on water quality, and recommended that a water quality monitoring program be implemented for the river and the return waters and that appropriate contingency measures be formulated to be prevent spillage of pollutants into the river. It is considered that the conditions of consent adequately address these concerns, as described below.

The assessment has been reviewed by the EPA, and EPA provided GTAs for the proposal. These GTAs established water quality limits for discharge waters from the dewatering ponds, and stipulated requirements for water quality sampling and monitoring. These conditions have been incorporated in Condition 3.4 of the recommended conditions. The EPA has expressed satisfaction with the conditions.

Department's position

The Department is satisfied that an appropriate assessment has been undertaken by the Applicant in regards to the potential impact on water quality, both in relation to the impacts of the river water quality and impacts from discharge of the return waters.

The conditions of consent provide for a comprehensive water quality monitoring program for both river water quality and discharge waters in line with the commitments in the EIS and recommendations from the EPA. The conditions also require the preparation of a Water Management Plan which will outline methods for managing water quality impacts and will provide contingency measures should mitigation measures prove ineffective in preventing impacts on water quality.

5.3. Acid sulphate soils

The Applicant's position

The Applicant undertook a preliminary assessment of acid sulfate soils within the proposed dredge area. The results of the assessment are included in Appendix A of the EIS and reported in Section 4.15 of the EIS. The Applicant advises that the interpretation of the preliminary screening for acid sulfate soils indicated that there was some potential for acid generation should the soils be allowed to oxidise following placement within the fill areas.

The potential screening revealed that acid sulfate soils are generally limited to the areas at the upstream and downstream end of the proposed dredge footprint. More comprehensive testing revealed that:

- there is no actual acid sulfate (ASS) soil within the sediments tested from the proposed dredging site, however there is the presence of potential acid sulfate soils (PASS);
- the pH of the soil after oxidisation remained between 6.6 and 7.4, which is well above the pH suggested in the ASSMAC guidelines as being an indication of acid sulfate conditions; and
- there is a low probability of acid being created once these sediments are oxidised.

The report concluded that due to the sporadic distribution of PASS found within the extraction area that all materials to be dredged should be considered to contain PASS, unless otherwise confirmed during dredging

Mitigation measures

The Applicant commits to the following mitigation measures in the EIS and supplementary material:

- all dredging will be carried out in accordance with an Acid Sulfate Soil Management Plan (ASSMP);
- extracted material will be suitably treated through the mixture of agricultural lime either at the outlet of the slurry discharge pipe or through mixing into the dewatered soil; and
- ongoing monitoring will also be undertaken in accordance with standard methods, which will be specified in the ASS management plan.

Issues raised in submissions

The EPA raised concern about the disturbance of acid sulfate soils by dredging operations and submitted that a plan of management must be prepared in accordance with the Acid Sulfate Soils Assessment Guidelines in the 1998 NSW Acid Sulfate Soils Management Advisory Committee Acid Sulfate Soils Manual. This requirement has been incorporated in the conditions of consent.

In their submission, NCC also raised concern about the high potential for ASS and the uncertainty of some of these occurrences throughout the dredge area as identified in the EIS. NCC also noted with concern the very high level of soil treatment required. As an overriding comment, NCC recommended that fill for the development be sourced elsewhere the ASS will not be disturbed. Failing this, NCC recommended that an ASS Management Plan be developed.

These concerns were raised with the Applicant and additional information was provided to offer a more comprehensive assessment of the occurrences of the PASS. The additional assessment was reviewed by the EPA and indicated that the assessment was appropriate. As indicated above, the Applicant has also committed to the preparation of an ASS Management Plan, and the conditions of consent provide that this plan must be prepared prior to commencement of extraction. It is considered that the additional assessment along with the provisions of the recommended consent conditions adequately addresses NCC's concerns in relation to ASS.

Department's position

The Department considers that an appropriate level of assessment has been undertaken by the Applicant, drawing upon the preliminary assessment included in the EIS, along with the supplementary assessment provided subsequent to the review of the EIS. In order to ensure that any ASS or PASS soils are adequately identified and managed, the Department has included in the conditions of consent a requirement that the Applicant prepare an ASSMP. The Plan shall be prepared in accordance with the Acid Sulfate Soils Assessment Guidelines. It is considered that this plan will adequately present strategies and procedures for the management of potential acid sulfate soils during the dredging process.

5.4. Noise

The Applicant's position

The Applicant commissioned Environmental Resources Management Australia Pty Ltd (ERM) to assess the potential noise impacts associated with the Proposal. The key findings of these results are outlined in Section 4.11 of the EIS and reported in full in Appendix F of the EIS.

On-site monitoring indicated that the main sources of ambient noise in the area arise from the ocean, birds, insects and wind in the trees. The monitoring indicated that the background noise levels were 34dB(A) for daytime and 32 dB(A) for evening.

The EIS considered the impacts on the residences predicted to be worst affected by noise from the dredging operations. Three residences are situated on the southern bank on Pelican Point opposite the dredging site, and three residences are situated at the northern bank. The noise impact on these residences was determined at the nearest, average and farthest points from each receiver using the Environmental Noise Model. The report also assessed the noise impacts on residences under adverse meteorological conditions (a wind of 3m/s blowing directly from the dredge to the receiver).

The Applicant assessed the use of a sound conditioned and non-sound conditioned dredge. The results revealed that the use of a non-sound conditioned dredge would result in exceedance of the construction criteria for almost the entire dredging operation at the two closest residences during still conditions. The use of the non-sound conditioned dredge was therefore considered unacceptable.

Table 1. The predicted noise levels at the closest point to each residence is shown in Table 1.

Location	Sill conditions - dB(A)	Wind conditions 3m/2
North 1 & 2 (100m from dredge)	44	49
North 3 (220m from dredge)	34	41
South 1 (160 m from dredge)	38	44
South 2 (360 m from dredge)	34	40
South 3 (680m from dredge)	29	37
EPAs Environmental Noise Control Manual	Commencement of extraction to week 26 - 54dB(A)	
	Week 26 of extraction to 2 years after commencement – 44dB(A)	

These results indicate that under adverse wind conditions there will be exceedances of the constructive noise criterion at two properties when the dredge is located at the closest point to the residence.

Mitigation measures

The Applicant commits to a number of mitigation measures in the EIS, as follows:

- use of a sound conditioned dredge;
- restriction of the operation of the dredge to the hours between 7am to 6pm, Mondays to Friday, and 8am to 1pm on Saturdays; and
- informing residents in advance that dredging is to occur and is likely to generate noise levels in excess of the criteria.

Issues raised in submissions

The Department did not receive any submissions raising direct concerns about noise impacts from the dredging operations. Two submissions however raised concern about the loss of amenity as a result of the proposal. It is considered that given the limited duration of the extraction activity and the employment of the sound conditioned dredge, noise impacts will be adequately managed if the construction noise limits are complied with at all times.

The Department's position

The Department is satisfied that the noise impacts have been adequately assessed by the Applicant, however raised question as to the appropriate noise limits to be applied to the project. Due to the limited duration of the activities and the low density of residential properties, the EPA recommended that construction noise criteria should be applied to the project in accordance with the Environmental Noise Manual. The Department agrees with this approach. These criteria are as follows:

Table 2. Noise limit criteria

Period of extraction	Noise limit
Commencement of extraction to week 26	54
Week 26 of extraction to 2 years after commencement – 44dB(A)	44

The results of the modelling in Table 1 above indicate that during the period defined as commencement of extraction to week 26, there are no predicted exceedances of the 54dBA criteria. However in the period of week 26 to 2 years after commencement, where the noise criteria is reduced to 44dBA, there are two residences predicted to exceed the criteria.

In order to minimise the potential noise impacts on surrounding residences the Applicant is required to prepare a Noise Management Plan for the Project. The Plan is to outline:

- a noise reduction protocol where the noise criteria are predicted to be exceeded, or are exceeded during extraction activities;
- discussions with relevant property holders to assess concerns;
- consideration of acoustical mitigation at receivers;
- outline of mitigation measures to be employed on the site to limit noise emissions;
- outline the procedure to notify property owners and occupiers likely to be affected by noise from the operations; and
- a protocol for handling noise complaints that includes recording, reporting and acting on complaints.

In addition, given the predicted exceedances, the recommended conditions of consent provide that the Applicant shall enter into an agreement as to an alterative noise limit with all landowners identified to exceed the noise limits in Table 2. Should the Applicant be unable to enter into such an agreement, the Applicant shall advise the Department that such an arrangement has not been reached and consult with the landowner or occupants affected to determine their concerns. Where possible, the Applicant shall modify the activity in accordance with the noise reduction protocols proposed as part of the Noise Management Plan to the satisfaction of the Director-General.

5.5. Aboriginal archaeology and European Heritage

5.5.1. Aboriginal archaeology

The Applicant commissioned a consultant to undertake an Aboriginal archaeological assessment of the proposed dredging site. This key findings of the report are contained in Section 4.14 and included in full in Appendix G of the EIS.

Given that the proposed dredging site lies on the bed of the Manning River the assessment was restricted to a review of the relevant literature and Aboriginal site records, in consultation with the Purfleet-Taree Local Aboriginal Land Council and Elders and a review of previous studies of the land based resource.

Surveys of the Harrington Waters Estate recorded three middens and two artefact scatters. Previous consents to destroy have been issued for these sites to allow the area to be filled and developed for residential purposes. The EIS considers that the available evidence indicates that no known sites/ places of Aboriginal cultural significance would be directly affected by the proposed dredging operation. The only Aboriginal relics with any real potential to be directly affected by dredging would be those which may have washed into the river as a result of erosion and flooding. The EIS considers that the potential for this is very limited, but appropriate mechanisms should be in place should any relics be detected during the operation.

In addition, although no surface evidence was detected, a previous field survey identified the bank of a defunct tidal channel near the western boundary of Harrington Waters Estate as having the potential to contain further archaeological evidence. The area, designated Potential Archaeological Deposit 1 (PAD 1) lies 150 metres from the river bank adjacent to the eastern end of the proposed dredging site. However, the Applicant advises that the site appears to contain little archaeological material and the probability that any of this material will be directly affected by dredging is considered to be remote. It is acknowledged in the EIS that the dredging proposal would have an indirect affect on the PAD 1 site if the dredged fill is to be used in this location.

Mitigation measures

Given that no sites are identified to be impacted by the proposal as described, the Applicant does not describe any specific mitigation measures. However, the EIS acknowledges that an appropriate NPWS consent will be required before dredged material can be applied to the surface of any Aboriginal site for which such a consent is not already held. NPWS records indicated that legal responsibilities have not been met for the site identified as PAD 1, and that such consent would be required prior to any further work which would directly affect the site.

In addition, the Applicant commits that:

- prior to commencement of the dredging operation that all relevant contractors and their employees will be advised of their legal obligation with regard to Aboriginal cultural materials; and
- should any materials thought to be of Aboriginal origin be discovered, either within the dredged fill, or on the surface of any area being filled which is not subject to a appropriate NPWS consent, work must immediately cease in that locality. NPWS and the Purfleet-Taree LALC should then be contacted for management advice and clearance given by both organisations before work commences.

Issues raised in submissions

No submissions received by the Department raised concern about the potential impacts on the Aboriginal heritage resource. The EIS was reviewed by NPWS and no objections or concerns were raised.

The Department's position

The Department is satisfied that an appropriate assessment of the existing or potential remains of the archaeological resource has been undertaken. In addition, written evidence is provided from the Purfleet-Taree Local Aboriginal Land Council indicating that the Land Council has no objections to the dredging proposal proceeding.

As no sites of cultural significance would be affected either directly or indirectly by the dredging as currently described (unless PAD 1 is affected by fill), the Department has not required the preparation of an Archaeological cultural management plan. However, prior to the commencement of the operation, the conditions of consent provide that the Applicant shall implement induction procedures and provide guidance to all relevant personnel about the management of cultural heritage/ archaeological values within the extraction area and locations potentially impacted by the activities associated with consent. The conditions also provide that in the event that dredged fill is to be applied to the site PAD1, the Applicant shall obtain a Section 90 consent to destroy from NPWS prior to any activity being undertaken which may potentially impact on the integrity of this site. Further, the Applicant becomes aware of any archaeological material not previously identified or covered by a Consent to Destroy, all work likely to affect the material shall cease immediately and the relevant authorities contacted.

5.5.2. European heritage

Applicant's position

The Applicant undertook an assessment of the impact of the extraction operation on the European heritage resource. This report is discussed in Section 4.14.2 of the EIS and included in full in Appendix H of the EIS. Following the review of this information, the NSW Heritage Office requested additional assessment regarding the maritime historical resource. The Applicant provided this assessment in a supplementary maritime archaeology assessment report.

The EIS recognises that shipbuilding was historically significant in the development of the lower Manning Valley. The largest of these yards was at Newton's Shipyard at Pelican Bay, adjacent to the proposed dredging site. The site of Newtown Shipyard is deemed to be significant relics under a number of criteria under the *Heritage Act 1997*, and is considered in the EIS to have the potential to yield much archaeological information. However, the only known evidence remaining of the shipyard consists of the remains of timber stumps or posts and the occasional fragment of rusted iron. The EIS reports that there is no evidence of submerged or partly submerged remains of ships, slipways, wharves or other structures. Although the possibility of historical material lying within the expected extraction area appears to be extremely remote, the EIS considers that the possibility should not be excluded. The EIS concludes that the loss of material from the site would result in the loss of information and loss of an insight into early shipbuilding in this state.

Mitigation measures

The primary mitigative commitment by the Applicant is the establishment of a 100 metre extraction exclusion zone in front of Newtown's Shipyard site to protect the cultural remains at the site. In addition, the Applicant acknowledges that the Heritage Act requires that an application for an excavation permit should be lodged with the NSW Heritage Office, prior to any works with the potential to disturb 'relics'. Newton's shipyard and all of the cultural deposits off shore associated with the sites are considered to be relics under the Act. Should any such relics be identified within an area of impact, all work likely impact on the site shall cease and the relevant authority contacted about an appropriate course of action.

Issues raised in submissions

NSW Heritage Office reviewed the information in the EIS and submitted that the assessment did not adequately address the range of fragile archaeological sites that currently lie undetected within the Manning River, the potential for their disturbance or exposure through the proposed works. The report was considered to not adequately address historic shipwreck sites that have the potential to be retained within the river base deposits. It was recommended that a comprehensive maritime archaeological study be undertaken for the area over which extraction is likely to occur.

These concerns were raised with the Applicant and a comprehensive study was undertaken to address the likely impact of the proposed development on the underwater cultural heritage. NSW Heritage Office subsequently expressed satisfaction with this additional assessment. NSW Heritage Office concurred with the recommendations, however noted that the exclusion zone would be adequate to protect these cultural resources and that monitoring of the extraction site would not be required. The NSW Heritage Office also submitted that should heritage structures be located during the dredging phase of works that the Office would need to be notified immediately and works cease in that area of affectation.

Department's position

The Department is satisfied that the Applicant has provided an adequate assessment of the potential for impacts of the proposal on the cultural resource. The Department has not required the preparation of a Heritage Management Plan, however has included a number of conditions to ensure that these impacts are minimised. The conditions provide that the Applicant shall not undertake extraction activities within 100 metres of Newton's shipyard site to ensure the protection of cultural remains from the direct effect of dredging activities.

The Applicant is also required to implement induction procedures and provide guidance to all relevant personnel about the management of cultural heritage/ archaeological values within the extraction area and locations potentially impacted by activities associated with this DA, both for known sites and sites that may be encountered during the course of extraction activities.

The conditions also provide that If during the course of the establishment of any surface facilities or extraction activities the Applicant becomes aware of any heritage material not previously identified or covered by an Excavation Permit, all work likely to affect the material shall cease immediately and the relevant authorities consulted about an appropriate course of action prior to recommencement of work.

5.6. Flora and Fauna

The Applicant's position

Marine Pollution Research Pty Limited was commissioned to undertake an assessment of flora and fauna impacts associated with the proposal. The key findings are presented in Section 4.9 of the EIS. The full report was not included in the EIS, however was subsequently provided to the Department upon request. This assessment was also supplemented by a more detailed assessment of the impact on threatened species.

The EIS describes that the aquatic ecology of the lower Manning River in the vicinity of the proposed dredging includes plant communities such as seagrass beds along the river shallows, macro-algae on hard structures in the river, mangrove stands and salt marsh communities along the intertidal fringes of the river. Animal communities include the macro-invertebrates, fish, marine mammals and aquatic birds.

The main ecological units are displayed in Figure 4.7 of the EIS, comprising: intertidal wetlands; other emergent vegetation including small isolated clumps of reeds, and shallow shoaling areas with and without seagrass cover. The only hard substratum habitat in the locality is associated with oyster racks and jetties.

The Applicant advises that a search of the NSW National Parks and Wildlife Service (2002) Wildlife Atlas database was conducted for protected and threatened fauna recorded within the Manning Area. This search revealed nineteen threatened mammal and amphibian species that may be present in the area. However, based on the habitats present and the extent of the impacts of the proposal, the Applicant considered that all these species of mammals and amphibians were considered unlikely to be impacted. The Applicant considers that the species listed in Atlas are unlikely to be affected, and provides justification for this conclusion.

The Applicant also identified seventeen species of wading and marine birds which may utilise the water and shorelines and are considered to have the potential to be affected by the proposal as they utilise waterways, mudflats, sand bars and shorelines. Identified impacts are related to disturbance of individuals due to noise from the dredge itself and service boat and visible activity within the dredge area. The EIS considers these impacts to be limited due to the absence of mudflats and shoals within the dredge area. The Applicant advises that no foraging areas will be lost as a consequence of the dredging nor will they be alienated during operations. The Applicant undertook and provided details of the eight part tests applied for these species and determined that the proposal is not likely to have a significant impact on any threatened species or its habitat.

The Applicant also identified two species listed under the EPBC Act within the study area. These species are the White Bellied Sea Eagle and the Cattle Egret. The Applicant concludes that the proposed development will not result in any significant impact on any threatened species and provides appropriate justification.

Mitigation measures

The Applicant proposes to design the extraction footprint to limit the impact of the proposal on aquatic and fringing flora and fauna. In order to ensure that the proposal will not result in any significant loss of existing wetland area or any fish habitat or seagrass bed, the dredging will be confined to an extraction area which leaves a 50 metre buffer zone between the upper edge of the dredging batter and adjacent seagrass beds.

In light of the assessment provided, no additional mitigation commitments are made in the EIS or supplementary information, apart from the mitigation measures described throughout the report as may be relevant to minimising impacts on the ecological communities.

Issues raised in submissions

- **NCC**

NCC raised a number of concerns in regard to the proposal including impacts on aquatic and fringing ecology, and impacts on threatened species and aquatic birds. Concern was raised that the assessment provided in the EIS did not provide adequate detail of the impacts of the dredging on the benthic communities. The EIS was also considered to be deficient in its assessment of the impacts on aquatic birds, particularly migratory species. NCC requested that the complete flora and fauna assessment be made publicly available and that further consideration be given to these impacts where the assessment was considered to be lacking in detail. Further details of this assessment and additional consideration about the impacts on threatened species and aquatic ecology was requested by the Department. This information was provided to the Department and was considered to adequately address these concerns.

- **NSW Fisheries**

NSW Fisheries noted the impacts of the dredging operation on benthic communities and a corresponding suppression of fisheries productivity in the river and reduction of health of the estuary.

- **NPWS**

NPWS raised concern regarding the lack of assessment of the impact of noise on migratory birds and other marine mammals. The Applicant provided further assessment of these impacts to the satisfaction of the Department which predicted no significant impact on these species.

The Department's position

The Department has reviewed the assessment provided in the EIS and the supplementary information, and is satisfied that the Applicant's assessment of flora and fauna is adequate. The conclusions drawn by the Applicant following the Eight Part tests for threatened species are supported by the Department.

The Department notes that the proposal was not referred to Environment Australia under the EPBC Act. Although two migratory species, listed under the Act were recorded in the study area – the White Bellied Sea Eagle and the Cattle Egret, these species or their habitats are also unlikely to be significantly effected by the proposal. This justification is supported.

In order to ensure that impacts are minimised the Applicant will be required to prepare a flora and fauna management plan, in consultation with NPWS. The Plan shall be prepared by an appropriately qualified and/or experienced ecologist. The ecologist shall be responsible for providing advice to minimise potential impacts upon threatened and protected fauna species that may utilise the site and to provide expert advice on the management of these species.

5.7. Air quality

Environmental Resources Management (ERM) were commissioned by the Applicant to undertake an air quality and green house gas assessment for the proposal. These results are included in Section 4.10 of the EIS and reported in full in Appendix E.

The EIS describes that the existing air quality in the vicinity of the dredge is characterised by low air pollution, with the exception of combustion products from forest fires and localised dust originating from unpaved roads and areas of bare soil.

Impacts during construction include emissions from vehicles used to establish the pipeline and booster pump sites and launching the dredge and barge. In addition, the EIS identified that there is the potential for windblown particulate emissions from disturbed areas through removing or damaging vegetation during the installation of the piping.

The EIS describes that air quality impacts of the proposed dredging operation are likely to be associated with the diesel engines used in dredging and the booster pumps. In addition, it is possible that odours will emanate from disturbed anaerobic areas of the river bed. However, the Applicant considers that significant impacts are unlikely given the depth at which the material is disturbed, the episodic nature of the source of the material and that once disturbed the material is transferred in enclosed pipes which minimises fugitive emissions.

The EIS identified that most of the pollutants from combustion engines are emitted through the exhaust and the results are summarised in Table 3. The primary pollutants emitted from combustion engines are volatile organic compounds, carbon dioxide, oxides of nitrogen, PM_{10} particulate matter and sulphur dioxide. Other pollutants are also emitted in trace amounts as products of incomplete combustion. Ash and metallic additives in the fuel contribute to the particulate content of the exhaust.

Table 3. Identified pollutant and likely emission rate

Pollutant	Emission (kg/week)
Volatile organic compounds	26.4
Carbon monoxide	280
Oxides of nitrogen	1052
PM_{10}	32.8
Sulphur dioxide	49.8

The EIS concludes that based on the emission estimates and the location of the nearest receptors it is anticipated that air quality impacts from the sources identified will not have a significant impact on the surrounding region.

Mitigation measures

The Applicant does not propose any mitigation measures.

Issues raised in submissions

The Department did not receive any submissions raising concern about the air quality impacts of the proposal. The EPA did not provide any comment on the assessment provided in the EIS, and submitted GTAs for the project. The GTAs provided that the Applicant must not allow any offensive odour to be emitted from the premises and activities must be carried out so as to minimise emissions of dust and sand from the premises. These requirements have been incorporated in the recommended conditions of consent.

Department's position

The Department considers the air quality assessment undertake by the applicant to have appropriately assessed the impacts on the surrounding environment. The Department concurs with the Applicant's conclusion that air quality impacts as a result of this extraction will not have a significant impact on the surrounding region.

6.0 SCOPE OF CONDITIONS OF CONSENT

The recommended conditions of consent at Attachment "A" have been prepared taking into consideration the General Terms of Approval and other issues raised by Government agencies, Council, and all other submitters including special interest groups.

The recommended conditions of consent provide for appropriate management and monitoring of bed and bank erosion, river processes, water quality, archaeological issues and flora and fauna. The conditions of consent also include specific noise and water quality criteria, require the preparation of a number of environmental management plans, and the provisions for consultation with affected residences.

The Department has undertaken extensive consultations with the Applicant concerning the content and intent of the conditions of consent.

7.0 CONCLUSION

The Department considers that there are no environmental impacts from the proposed extraction which could not be effectively managed through the recommended consent conditions. The proposal is consistent with State and regional planning objectives.

8.0 RECOMMENDATION

It is RECOMMENDED that the Minister approve the development application (DA 122-5-2002) for the proposed extraction of 1,000,000 m^3 of material from the bed of the Manning River, as submitted by the Roche Group, subject to the attached conditions of consent.

Endorsed

Nick Agapides
Director, Major Development Assessment

Sam Haddad
Executive Director

Stacy Warren
Environmental Planning Officer, Mining and Extractive Industries

79C Evaluation

(1) Matters for consideration - general

In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:

(a). the provisions of:

- **any environmental planning instrument, and**
- **any draft environmental planning instrument that is or has been placed on public exhibition and details of which have been notified to the consent authority, and**
- **any development control plan, and the regulations (to the extent that they prescribe matters for the purposes of this paragraph), that apply to the land to which the development application relates,**

The Department's consideration of these matters is contained in Section 3.1 through to Section 3.7 of this Report (pages 5-6). The Department is satisfied that all relevant planning issues have been addressed and considered in the determination of the development application. The Department concludes that the proposal is consistent with the aims, objectives and provisions of all the applicable planning instruments, plans and policies.

(b). the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality.

The likely environmental impacts of the proposal are considered and assessed in Section 5 of the Report (pages 9-21). The Department has considered all the environmental, social and economic impacts of the proposal and concludes that the proposed development can be managed, subject to the imposition of the recommended conditions of consent. The recommended conditions of consent address performance criteria, environmental management plans, environmental monitoring and remediation, which would apply to the development if approved.

(c). the suitability of the site for the development,

The suitability of the site for the development is considered in Section 3 (pages 5-6) and Section 5 (pages 9-21) of this Report. The proposal is consistent with land use objectives; the potential impacts of the proposal can be effectively managed and a number of alternatives have been considered yet rejected. The Department concludes on the basis of this assessment that the site is suitable for the proposal.

(d). any submissions made in accordance with this Act or the regulations.

A detailed discussion of the issues raised in submissions is contained in Section 4 (pages 6-8) and referenced in Section 5 (pages 9-21) of this Report, including consideration of submissions from government agencies, local council, private individuals and special interest groups. The issues raised in the submissions have been addressed in this assessment of the proposal and/or appropriate conditions of consent have been incorporated to manage these concerns and potential impacts.

(e). the public interest.

The public interest of the proposal is considered in Section 1 through to Section 5 of this Report (pages 1-22). It is considered that the proposal is consistent with State and regional planning objectives relating to environmental management, sustainable economic development and employment generation. The Department therefore considers that the proposal is in the public interest and all environmental, economic and social issues have been addressed in the assessment of the proposal.