Proposed Pontoon at Engineer’s Wharf, Thursday Island - Review of Environmental Factors (seagrasses and other benthic habitats).

Report to
Queensland Department of Main Roads

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Introduction

Consultancy Brief

The Queensland Department of Main Roads (QDMR), as the owner and manager of the State’s road network, strategically plans and develops road infrastructure. By identifying community needs, and setting departmental priorities and program objectives, QDMR manages a road network that contributes to the State’s development and progress. QDMR adopts a program of works that optimises and balances economic growth and community benefits, while recognising social and environmental impacts.

Due to an identified community need, QDMR are planning to begin construction of a pontoon, baffles and excavation to the pontoon basin at the Engineer’s Wharf (Thursday Island) in the near future. Prior to construction, QDMR is required to conduct a review of environmental factors (REF) for the propose works. QDMR contracted the Queensland Department of Primary Industries (QDPI) Northern Fisheries Centre (NFC) to conduct a Review of Environmental Factors within the proposed development area.

This report presents the results of an inspection conducted in January-February 1998. For the REF the following objectives were set:

1. Conduct a rapid assessment of benthic habitats, specifically seagrasses, at Engineer’s Wharf, Thursday Island (in an area 40m x 40m covering proposed works),

2. Compile a report which will
   - Identify any likely environmental impacts (including their level of significance) associated with the construction and operational phases of the proposed pontoon and basin excavation,
   - Identify alternative strategies for planning, design, construction or maintenance of proposed facilities, including timing of works, to minimise any likely impacts, and
   - Recommend whether further detailed assessment is required.

Site Description & background

There are three wharves on the southern shore of Thursday Island. The eastern wharf is associated with a slipway and private shipping support facility; the middle wharf is the main shipping wharf and tie up location for Government vessels. It also incorporates a loading ramp for inter island vessels. The third wharf (the Engineers wharf) is more a public wharf with facilities for the Thursday Island to Horn Island Ferry traffic and shelter at the shore carpark for people waiting to cross between the islands (Plates 1 & 2).

The site proposed for development is to the west of the Engineers wharf and adjacent to the existing shelter shed and previous reclamation area. I understand the land is vested in the Torres Shire Council as administrators. It is shallow and the proposed development would require excavation of some 2500 cubic metres of sediment. Total area of the proposal is some 40 metres by 40 metres.

Support for proposed works

Many local people travel between the settlements on Horn Island, Prince of Wales Island and Entrance Island by private dinghy. There is also some traffic in private dinghies from the mainland and coastal pearl farms to complete banking and shopping in Thursday Island township.

These dinghies generally tie up to the Engineers wharf or beach to the West of the wharf.
There is a good case to provide a more suitable tie up facility in the form of a pontoon and there is fishing industry and community support for the proposal.

**General Seagrass Ecology**

The importance of seagrass meadows as structural components of coastal ecosystems is well recognised. These marine angiosperms are important for stabilising coastal sediments; providing food and shelter for diverse organisms; as a nursery ground for many prawn and fish of commercial importance; and for nutrient trapping and recycling.

Destruction or loss of seagrasses has been reported from most parts of the world, often from natural causes, eg "wasting disease", or high energy storms. More commonly destruction has resulted from human activities, eg. as a consequence of eutrophication, or land reclamation and changes in land use. Anthropogenic impacts on seagrass meadows are continuing to destroy or degrade coastal ecosystems and decrease their yield of natural resources.

**Site assessment**

Objective 1  Conduct a rapid assessment of benthic habitats, specifically seagrasses, at Engineer’s Wharf, Thursday Island (in an area 40m x 40m covering proposed works)

The surface sediment in the proposed excavation area is silty sand/mud with rock, and contains several species of marine plants including seagrasses (Plates 3, 4 & 5). Marine plants cover approximately 65% of the area to be excavated (Map 1). Seagrass species were identified according to Kuo and McComb (1989) and algae according to Cribb (1989). Specimens of seagrass and algae were collected for later taxonomic verification if necessary.

**Marine plants**

The dominant seagrass species on the site is *Enhalus acoroides* - a strap like plant species that can grow to one metre in height (Plate 6). This is a common species in tropical Far-north Queensland. It is found in small patches and is restricted to the inner part of the site as it is a species that cannot pollinate if it is unable to reach the surface. Other species present in small quantities were *Halophila ovalis* and *Halodule uninervis* - both colonising species common in the Torres Strait.

The site also has a light covering of marine algae, dominated by *Hypnea* sp. and *Tolypodiadopsis* sp. (Plate 7). These species can appear in greater abundance in summer months and generally occur in the lower intertidal region on sheltered and semi-exposed shores.

Seagrasses and marine plants are common in the sheltered Thursday Island Harbour and it is likely that any suitable location for a dinghy pontoon would involve some destruction of marine plants.

There are also dense beds of seagrass between the Main and Engineers wharves which could be effected by sediment loads during excavation work.

**Other benthos**

No other benthic habitats exist on the site, although some corals and algae exist on the pylons of the wharf. In the near vicinity, coral/rock reefs occur approx. 200m seaward and to the west, and pearl farms are present several nautical miles from the works near Friday island.
Review of Environmental Factors

Objective

Compile a report which will

- Identify any likely environmental impacts (including their level of significance) associated with the construction and operational phases of the proposed pontoon and basin excavation,
- Identify alternative strategies for planning, design, construction or maintenance of proposed facilities, including timing of works, to minimise any likely impacts, and
- Recommend whether further detailed assessment is required.

Impacts

The facility itself is likely to have only a minor impact on fisheries productivity. The most significant form of impact to the site would be the excavation of the site. Three excavation plans have been suggested for the site:

1. Excavate the site and push spoil seaward into the channel,
2. Cutter suction dredge and slow discharge of excavated material to mid channel during times of maximum tidal flow, and
3. Cutter suction dredge and removal/relocation of excavated material (to be used as capping for the Thursday Island dump).

Excavation plans would be expected to include methods of reducing sediment loads on surrounding fisheries habitat and to include appropriate storage/location and containment of excavated sediment. This would include taking into account any contaminants and the possibility of acid sulphate soils.

We would recommend excavation plan 3 as it would have the least impact on the adjacent benthic habitats. We would also recommend that excavation of the site occur during time of high tidal flow to aid efficient dispersal of any suspended sediments in the area.

Other fisheries issues

The engineers wharf and the rock and coral reefs to the west of the wharf are areas with fish populations and are used for recreational fishing. Areas of reef in deeper water to the west of the wharf are occasionally worked by commercial TRL fishers. Juvenile TRL settle out on the wharf pylons at times during the year.

Legislative requirements under the Fisheries Act 1994

Excavation at this site would require a permit under the Fisheries Act 1994. A permit if issued may include conditions designed to protect fisheries resources. I would not foresee major problems with the proposed works provided sediment loads on adjacent fisheries habitats were minimised and excavated material was located and contained where it could have no detrimental effect on fisheries values.

Other issues & recommendations

I do not consider a more detailed flora/fauna assessment of the site would be necessary to fulfil the requirements for a marine plants permit application. We do recommend that further engineering and hydrographic information be supplied with the final excavation plan to aid assessment for a Section 86 permit from DoE. I would support an environment management plan for the work to identify methods of minimising detrimental effects on fisheries values.
Plate 1. Site of proposed excavation and pontoon development - Engineer's Wharf, Thursday Island. (photo looking south-east)

Plate 2. Site of proposed excavation and pontoon development - Engineer's Wharf, Thursday Island. (photo looking south)
Plate 3. Site of proposed excavation and pontoon development - Engineer's Wharf, Thursday Island.
NB: submerged dark patches are marine plants (photo from wharf, looking north-west)

Plate 4. Site of proposed excavation and pontoon development - Engineer's Wharf, Thursday Island.
NB: submerged dark patches are marine plants (photo from reclaimed area, looking west)

Plate 5. Site of proposed excavation and pontoon development - Engineer's Wharf, Thursday Island.
(photo from reclaimed area, looking north-west)
MAP 1. Distribution of benthos in the area proposed for excavation/pontoon development - Engineer's Wharf, Thursday Island.


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Plate 6. *Enhalus acoroides*
Plate 7. Benthic macro-algae from development site.

a. *Toiyiocladia* sp.

b. *Hypnea* sp.