



13. Management Options

13.1 General

In this section recommended management options for each of the identified key coastal issues identified in Section 11 are presented along with a description of the statutory requirements that would have to be satisfied before the options are implemented. The management options are in no particular order, however, comments on the priority of options is provided in the text. Ultimately the priority of implementation of any of the options presented is a matter that needs to be considered by the Moreton Bay Regional Council taking into account the consequences of not addressing the issue, budgetary constraints, community support/ concern and the statutory approvals required.

Ongoing monitoring is strongly recommended to provide the basis of prioritising the implementation of remedial works, in conjunction with an assessment of the approvals required as outlined for each of the issues discussed in the following sections.

Management options recommended here are summarised at the end of Section 13 in Table 7.

13.2 Sand accumulation (Bongaree Jetty)

Sand accumulation at Bongaree Jetty has been occurring for some time and there is currently concern that it is affecting the useability of the jetty and pontoons for boating and recreational use. A detailed description of the issue and recommended options is provided below.

However, it is strongly recommended that prior to committing to the recommended option, the water depths around the structure be monitored to determine the current rate of change. Ideally this should be done in conjunction with the detailed survey of the area mentioned in Section 13.2.3. It is suggested that an assessment of the current level of useability of the jetty and pontoons and the rate of change of the available water depths will provide the basis of prioritising the implementation of remedial works.

13.2.1 Description

The 1942 photography of this area shows a jetty located on the site and there is evidence at this time of shoreline progradation in the vicinity of the jetty, although it is unclear whether this was a result of interruption to longshore transport by the jetty or if it was a natural feature that resulted in this location being specifically chosen as the jetty site. Nevertheless, since that time there is evidence of further accretion on both sides of the jetty, indicating that the jetty has had some influence on the coastal processes at this site. With sediment transport occurring in both directions but in a net northerly direction, the jetty appears to be causing a local buildup of sand that can be likened to the beginnings of a tombolo like feature even though there is no island offshore for it to connect to. The definition of a tombolo is a sandbar that connects an island to the mainland or to another island and is usually formed by the interaction of waves refracting from opposite directions.

The tombolo like feature formed as a result of interaction between the jetty structure and the longshore transport of sand that occurs when waves break at an angle to the beach. The formation then acts as a groyne trapping further sediment and building up the beach south or



north of the tombolo depending on the direction of the longshore transport. When sediment is being transported from south to north, it is trapped by the tombolo on the southern side and no sediment reaches the shoreline further north. Conversely, when sediment is being transported from north to south it is trapped by the tombolo on the northern side. However, because there is a net longshore transport to the north there is a corresponding net buildup of sand to the south of the jetty over time and a net deficit of sand to the north resulting in erosion of the coast north of the jetty.

Therefore there are two interrelated mechanisms that are causing accretion around the jetty. Firstly there is the westwards progradation of the tombolo like feature and secondly there is the build up of the beach on each side of the jetty due to longshore transport. The effects of these mechanisms is exacerbated by the pontoons attached to the north and south of the jetty as they provide additional shelter to the adjacent foreshore from wave action and slow the tidal currents in their vicinity, resulting in the deposition of sand.

If accretion at the jetty continues unchecked, the functionality of the jetty and the attached pontoons for recreational use will be severely compromised, with reduced water depths around the structure and possible damage to the pontoons should they end up aground on the low tides. As the tombolo like feature increases in size it will trap more and more sand on its southern side. This will gradually cause the beach compartment to fill with sand and a wider beach will be created. However, this will be at the expense of the beach to the north of the jetty, which will be exposed to further erosion. Sediment supply to the beach north of Bongaree Jetty will only resume once the tombolo like feature stops growing, the southern beach compartment is full, and sand is able to be transported around the end of the tombolo.

There are two factors that will limit, to some extent, accretion of sand as described above. The first of these are the tidal currents in the channel which will transport sand away from the end of the tombolo as it progrades westward into the main channel. The second is the deeper waters in the channel which will slow the rate of growth to the west.

At the present time, there is very limited water space on the landward side of the pontoons for the safe berthing of boats and there is anecdotal evidence that the available depth of water at the head of the jetty has been reducing over the last few years.

In order to reinstate and maintain the functionality of the jetty and pontoons, it is necessary to remove some of the sand landward of the jetty and pontoons within the next 12 months to 2 years. This would provide increased water space between the landward side of the pontoons and the shoreline and ensure that there was sufficient water for the pontoons to float in all combinations of the tide and waves.

The removed sand would need to be placed as beach nourishment on the coastline approximately 120 metres to the north of the jetty.

13.2.2 Recommended Option

The recommended option consists of removing the excess sand from the beach landward of the jetty and pontoons and placing it on the coastline to the north commencing approximately 120 metres north of the jetty and up to a further 300 metres to Shirley Creek.

The area of sand removal would be the “bulge” in the beach immediately landward of the jetty and pontoons extending approximately 50 metres along the beach each side of the jetty stem



and under and in front of the pontoons to provide a navigable water depth at low tide. This area is expected to yield a quantity of sand of the order of 5,000 cubic metres.

The removed sand should be placed on the eroded beach to the north of the jetty. The minimum deposition rate assuming that the bed level in front of the wall is 0.3m below LAT would be 20 m³/m with a beach slope of around 1:8 from the top of the wall to low water. At this rate, the sand removal from behind the jetty will nourish 200 metres of coastline. The deposited sand will need to be trimmed with suitable earth moving machinery to achieve a cross section suitable for recreational use.

The work could be done with a long arm land based excavator operating from the beach and placing sand into trucks for transport to the deposition area north of the jetty. The pontoons may need to be removed temporarily in order to access the material under and in front of the pontoons.

Alternatively a small suction dredge could be used with sand pumped directly to the beach to the north. Depending on the dredge, it may be necessary to temporarily remove the pontoons to provide access to the body of sand behind the jetty. A dredge would also be able to relocate sand from the area in front of the jetty should it be necessary.

13.2.3 Data and Technical Requirements

The information required to progress this option to an approval stage is as follows:

1. Detailed survey of the area between the seawall and the outside of the jetty and pontoons and extending 70 metres each side of the jetty.
2. Core sampling of the material to be removed to verify the suitability of the material as beach nourishment, and check on the presence of ASS and/or PASS and other contaminants.
3. Flora and fauna survey of the area to be removed and the proposed deposition area to quantify the impact of the work on environmental values.

13.2.4 Statutory Approvals and Policies

Dredging works associated with Bongaree Jetty are likely to require a number of statutory approvals. Those associated with the removal of material have been discussed below.

Work within a Coastal Management District

The Coastal Act is regulated by the DERM and is administered under SPA. The Coastal Act aims to:

- ▶ Protect, conserve, rehabilitate and manage the coast's resources and biological diversity;
- ▶ Maintain regard for the National Strategy for Ecologically Sustainable Development; and
- ▶ Improve and encourage knowledge of the coastal zone resources and the effects of human activities on the coastal zone.

The Coastal Act designates Coastal Management Districts through the State Coastal Management Plan and Regional Coastal Management Plans. Coastal Management Districts are declared for various reasons, such as the occurrence of erosion prone areas, undeveloped areas, and areas that may be subject to high impacts in the future.



Relevance to Management Option

This management option would necessitate the requirement to obtain an allocation for quarry material below high water mark pursuant to Section 73 of the Coastal Act. An approval would also be required for disposing of dredge spoil or other solid waste material in tidal water depending on deposition location of removed sand, however it is assumed this would occur in the Coastal Management District of Pumicestone South. The latter activity requires a development permit for operational work triggered under Schedule 3, Part 1, Table 4, Item 5b(ii) of the *Sustainable Planning Regulation 2009* (SPR). Application for the allocation of quarry material would occur under the Coastal Act, while the disposal of dredge material would be made to DERM through the IDAS system. Under the provisions of Schedule 7, Table 2, Item 13 of the SPR, referral of the latter permit application would be required to DERM (administrator of the Coastal Act) as a concurrence agency where part of a broader application when DERM does not function as assessment manager. In addition, notice of the application for disposing dredge spoil or other solid water material would be submitted to Maritime Safety Queensland (MSQ) within the Department of Transport and Main Roads (DTMR) as a concurrence agency under Schedule 7, Table 2, Item 15 of the SPR.

It is unlikely that any acid sulfate soils (ASS) would exist in the material to be removed. However, this would need to be confirmed as part of the investigative works completed for the assessment. Referral of the above applications to DERM (administrator of the *Land Act 1994*) as an advice agency triggered under Schedule 7, Table 3, Item 3 of the SPR is anticipated as the area is mapped as below 5m AHD and dredging of >1000 cubic metres of material is expected. Sampling and laboratory analysis of the material to be removed should confirm the presence/absence of ASS.

Environmentally Relevant Activities

The EP Act was created to protect Queensland's environment whilst allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends. The Act, which is administered by the DERM, utilises a number of mechanisms to achieve its objectives. These include creating a General Environmental Duty (GED), Duty to Notify, licensing of ERAs, and administering EPPs and Regulations including:

- ▶ *Environmental Protection (Water) Policy 2009;*
- ▶ *Environmental Protection (Noise) Policy 2008;*
- ▶ *Environmental Protection (Air) Policy 2008; and*
- ▶ *Environmental Protection (Waste Management) Regulation 2000.*

The EPPs hold the status of a regulation under the EP Act and act to set out environmental values that must be protected and provide for specific offences. As subordinate legislation to the EP Act, the EPPs bind all persons.



Relevance to Management Option

Extraction of material surrounding the jetty will comprise dredging which is defined as ERA 16 under the *Environmental Protection Regulation 2008* as the works are likely to involve dredging of more than 1,000 tonnes per year. This activity will require a development permit for material change of use triggered under Schedule 3, Part 1, Table 2, Item 1 of the SPR. An application would need to be made to DERM (as the assessment manager) and would follow the IDAS process. In addition, a registration certificate will be required from DERM to undertake dredging at the site, although it is anticipated that this will be obtained by the contractor engaged to undertake the work. Documentation to be submitted with the application for an ERA is expected to include the relevant IDAS forms, the prescribed fee, supporting documentation and a dredge management plan (as required).

Fisheries Interests

The *Fisheries Act 1994* is regulated through the SPA where development approval is required for disturbance to marine plants, fish habitat or fish passage in freshwater and tidal waterways. Activities that require approval include:

- ▶ Disturbance to marine plants – trimming, removing or damaging marine plants (including mangroves, seagrass, saltmarsh plants and marine algae) for any purpose on any tenure;
- ▶ Works within a declared Fish Habitat Area (FHA) – including any operational or building work; and
- ▶ Constructing or raising a waterway barrier – temporary or permanent barriers to fish movement, where the barrier is completely or partially across a waterway and has a potential impact on fish passage.

Works are self-assessable under codes if they consist of the maintenance of existing lawful structures, however maintenance does not include upgrading or extending structures.

Relevance to Management Option

In the event that marine plants are removed, destroyed or damaged as a result of site works, a development permit for operational work would be required under Schedule 3, Part 1, Table 4, Item 8 of the SPR. This is a possibility dependant on where sand removed from underneath the pontoons is deposited. Application for this permit would be made to the Department of Employment, Economic Development and Innovation (DEEDI) through the IDAS system. Referral of the application to dredge sand from the jetty area would be provided to DEEDI (administrator of *Fisheries Act 1994*) as a concurrence agency triggered under Schedule 7, Table 2, Item 30 of the SPR.

Marine Parks

The *Marine Parks Regulation 2006* (MPR) classifies marine parks into seven zones including;

- ▶ General use zone;
- ▶ Habitat protection zone;
- ▶ Conservation park zone
- ▶ Buffer zone;



- ▶ Scientific research zone;
- ▶ Marine national park zone; and
- ▶ Preservation zone.

The zones are listed in ascending order of level of protection, with the highest level of protection in the preservation zone.

Moreton Bay Marine Park is managed through the *Marine Parks (Moreton Bay) Zoning Plan 1997* (the Zoning Plan). The Zoning Plan establishes a number of zones in the Marine Park and stipulates the activities that may occur in these zones and instances in which Marine Parks permits are required. Marine Park Permits are required for (but not limited to) the following activities within Moreton Bay Marine Park:

- ▶ Discharging waste;
- ▶ Building structures such as jetties, buoys or pile moorings;
- ▶ Dredging and disposing of dredged material; and
- ▶ Works.

Relevance to Management Option

As this management option will involve work below the high water mark in a habitat protection zone of the Moreton Bay Marine Park, a Marine Parks Permit will be required. Application for this permit will be made to DERM through the Permit and Licence Management unit (PALM) and the proposal will need to comply with the objectives of the Marine Park zone in which the works are located.

Environmental Protection and Biodiversity Conservation Act (Commonwealth)

The EPBC Act, 1999 is Commonwealth legislation that primarily provides for Commonwealth intervention on a range of actions or activities which are likely to have a significant impact on a matter of National Environmental Significance (NES). Matters of NES related to the following:

- ▶ World Heritage properties;
- ▶ Ramsar wetlands;
- ▶ Nationally threatened species and ecological communities;
- ▶ Migratory species;
- ▶ Commonwealth marine areas; and
- ▶ Nuclear actions (including uranium mining).

Initially, a self-assessment must be conducted to determine whether the action has potential to result in significant impacts to matters of NES using the Australian Government Matters of National Environmental Significance, Significant impact guidelines.

Any activity that has the potential to significantly impact a matter of NES must be referred to the Commonwealth. If the activity is determined through the referral process to significantly impact a matter of NES and trigger the EPBC Act, it is classified as a Controlled Action.

If proposed activities trigger the EPBC Act, the activities will be subjected to an assessment and approval process, which may be conducted by the Commonwealth or under delegation to State



governments. Responsibility for subsequent approval of the activities after assessment remains primarily with the Commonwealth, although may, in limited circumstances, be delegated to State governments.

Relevance to Management Option

The works are within close proximity to the mapped boundary of the Moreton Bay Ramsar site, which is a wetland of international significance. In addition, the EPBC Act Protected Matters Search Tool indicates that 38 listed threatened species and 63 migratory species have the potential to occur in the study area. However, it should be noted that the EPBC Act Protected Matters Search Tool is based on bioclimatic predictive modelling and is only an indication of potential matters of NES. A self-assessment will be required to be completed at the time that works are proposed to determine if referral to the Commonwealth is necessary for this project. If doubtful, referral to the Commonwealth may be appropriate to enable the Federal Government to make a decision on whether the works constitute a controlled action or not.

13.3 Beach and foreshore erosion

Under this heading, only those areas that are not backed by a revetment wall along the foreshore will be included. Areas requiring the reinstatement of a recreational beach are listed in the following section and the issues of undermining in front of the existing revetment wall are dealt with in Section 13.4.

13.3.1 Description and Recommended Actions

This section provides a description of the issue to be addressed at particular locations and recommended actions for Council's consideration.

Buckleys Hole

The area in question is on the western-facing shoreline at the southern end of South Esplanade, immediately north of Buckley's Hole itself, where the shoreline appears to have fluctuated in the order of approximately 30m. Of most concern is a short length of foreshore between the end of the seawall and the last residential lot to the south where there appeared from the inspection to have been some sand placed on the esplanade above high water mark in the past.

Nevertheless this area is showing signs of erosion and the following actions are recommended:

- ▶ Monitor the rate of erosion with regular inspections of the foreshore and the spit offshore.
- ▶ Give consideration to the extension of the seawall to the south to provide a last line of defence to the infrastructure in this area. This would also move the erosion caused by the "end effects" of the hard structure into the reserve area to the south of the last residential lot.
- ▶ In the event that erosion becomes more critical the following short term strategies are recommended:
 - Place sand along the erosion scarp to increase available buffer against erosion. Sand could be sourced:
 - From Council foreshore maintenance activities (clearing of sand from drains and boat ramps); and



- From a land based source, subject to the grainsize and quality of the sand.
- Place emergency erosion protection works in accordance with the emergency works provisions in the Coastal Act. Council needs to be aware that such action is required to be carried out in a safe manner and after the emergency has passed, the emergency works must be removed or a tidal works approval is obtained for their ongoing use. It should be noted that such an application will undergo the same level of assessment as an application for a new structure and approval is not guaranteed, in which case the emergency works may be ordered to be removed.

Separate from the above issues, the outfall from the freshwater system landward of the beach system is also in need of attention. The Council has advised that it is undertaking a project to maintain the integrity of the internal shoreline of the seaward lagoon by creating a controlled outfall discharge zone for the freshwater system onto the grassed perimeter sand wall. This will be designed to limit the opportunity for tidal flows to penetrate the freshwater systems as a result of erosion caused by high storm water discharges.

Sylvan Beach North - Pirate Park

There is a section of boardwalk adjacent to Sylvan Beach Esplanade that meanders through an area of mangroves surrounding a protected lagoon area (receiving drainage from three culverts under the road – refer to [Photo Plate 7-1](#)). Some of the timber boardwalk's concrete footings are exposed above the sand (refer to [Photo Plate 7-2](#)). There are some other areas protected by sand build-up that have mangrove seedlings established in the protected water. North of this area are park and playground facilities, including a toilet block approximately 10 m from the shoreline.

The transport rates along Sylvan beach are small as this beach is largely sheltered from waves from the south. The net longshore transport is to the south at 2,500 m³/yr.

The very low sediment transport rates at the northern end of Sylvan Beach indicate that overall the shoreline should continue to be reasonably stable. However, pockets of erosion and accretion will continue to occur from time to time as “slugs” of sand move along the foreshore from the south to north.

Given the inherent overall stability of this section of the foreshore, localised erosion problems should be addressed with the placing of sand along the erosion scarp in the first instance, with sand sourced as indicated for Buckleys Hole above.

Alternative strategies involving the placement of sand bags along the erosion scarp are not recommended because of adverse effects on the adjacent beach seaward of the bags caused by the reflected wave energy from the bags, and the erosive effects along the erosion scarp due to the drainage of water from waves overtopping the bags. For these reasons, State agencies would generally not support the placing of hard engineered structures in natural areas unless there is a need to protect important infrastructure and there is no alternative, such as the relocation of the infrastructure further landward.

Regular monitoring of sand levels against selected piles that support the boardwalk would also be useful to understand the magnitude of the sand movement in this area.



Sylvan Beach North

The width of the beach is minimal with only a narrow buffer between the high water mark and the esplanade road. This means that any erosion that occurs will quickly become critical as it threatens the road formation and associated infrastructure.

It is recommended that consideration be given to implementing a beach nourishment program for this beach in order to provide a wider beach area as a buffer against future erosion and changes in beach alignment, and a more useable recreational beach. It is anticipated that the area requiring beach nourishment will extend about 300m south of the Marina Boulevard roundabout to result in an approximate beach width at high water of 5 m. The beach should be maintained at this width through the implementation of further beach nourishment programs in the future.

The original timber groynes appear to have been shortened from when they were first installed, presumably as a result of the outer ends of the groynes being damaged by wave action and the damaged sections removed as part of ongoing maintenance. From the aerial photography the groyne field does not appear to have made a significant impact on the shoreline, although small localised changes are evident at ground level. This indicates that the local longshore sediment transport rates (north and south) are very low and leads to the conclusion that groynes at this beach are unnecessary in terms of stabilising the beach alignment.

The existing groynes could remain in place as they are not having any adverse effects on the existing beach and are providing a small degree of stability to the upper beach. However, a program of beach nourishment will likely cover these structures largely negating any stabilisation attributes they may have and Council should assess whether they should be removed for safety reasons as part of the beach nourishment program.

Banksia Beach

The foreshore along Banksia Beach north of the boat ramp is subject to erosion and accretion depending on the occurrence of storm events, strong winds from the westerly sector that generate significant waves, the state of the tide when storm events occur, the movement of “slugs” of sand from the south, and storm water runoff from the adjacent park area. All of these events, either in isolation or in combination, may produce erosion of the foreshore or areas of accretion. Nevertheless, the gross movement of the erosion scarp in a landward direction is unlikely to be more than 3 metres for any one event and over a period of time the average landward movement of the foreshore is minimal as sand moving along the foreshore from the south is deposited and subsequently colonised by mangroves and other marine vegetation, although the erosion scarp further landward may remain for some time.

The comments about the use of alternative strategies such as sand bags laid along the erosion scarp as discussed in the Sylvan Beach North – Pirate Park section above also apply here.

It is understood that Council has an existing maintenance program for this beach that includes the placing of small amounts of sand along the worst of the erosion scarps using sand from the stormwater drain and boat ramp clearing maintenance operations.

It is recommended that:

- ▶ The state of the foreshore of Banksia Beach be monitored regularly with ground photography of particular locations and measurements of the location of the erosion scarp



from a fixed point, and that this information be assessed to determine long term trends on a yearly basis. Consideration could be given to enlisting the assistance of local residents in collecting the monitoring data.

- ▶ The existing maintenance program of placing sand at the worst affected areas as sand sources become available should continue with documentation of the sand quantity, location of the source, placement location, and the date of placement being recorded and included in the monitoring data above. In addition care should be taken when placing sand on the foreshore, not to smother any marine plants or mangrove roots and pneumatophores.

South of Spinnaker Sound Marina entrance

South of the Spinnaker Sound Marina entrance, mud flats extend out beyond a small beach zone, with foreshore erosion evident and impacting landscaped plants and maintained lawns. The erosion is likely to be the result of “end effects” from the southern marina entrance seawalls. At this stage the erosion is not threatening any infrastructure apart from the Council controlled land between the foreshore and the residential development. However, the situation should be monitored to determine the rate of landward movement of the erosion scarp to provide Council with sufficient time to address the problem should it progress to the point where it is threatening the integrity of the southern end of the marina entrance seawall.

Separate to the above issue is the potential undermining of the toe of the marina entrance seawall. This appears to have progressed to the point where it may be threatening the stability of the seawall, if not now, then in the near future. It is recommended that this matter be brought to the attention to the body responsible for the maintenance of this structure so that appropriate action can be put in train to repair the seawall and reinstate the beach seaward of the wall with beach nourishment.

Turners Camp

The foreshore at Turners Camp shows evidence of minor erosion where fill has been placed for the car park. The lower shoreline features seagrass beds along its length, providing important habitat for marine animals and birds.

This location is exposed to waves propagating up the Pumicestone Passage and refracting onto the beach and to local waves from the south-east as well as local waves generated by east to north winds. These local waves are unlikely to be the cause of the erosion that has occurred due to their small size, a function of the relatively short fetch across to Bribie Island.

It is only the upper beach where it adjoins the car park that is suffering erosion. The beach below high tide is sandy and in good condition. Beach nourishment is not recommended at this site because of the potential problems associated with the nourishment sand smothering the offshore seagrass beds and possibly affecting the fish habitat area to the north.

It is recommended that the seaward edge of the car park be relocated 10 metres landward of its present location and the resultant vacant strip be revegetated with dune and salt water tolerant marine plants.

13.3.2 Notes on Recommended Options

Beach nourishment is the favoured option for reinstating a recreational beach as it provides the most natural solution that has minimal adverse effects on adjacent coastal areas.



The principal considerations in relation to beach nourishment are as follows:

- ▶ A source of sand that is compatible with the in-situ sand is required. Suitability is usually measured in terms of grain size and particle size distribution and colour.
- ▶ Is a retaining structure at either end of the nourished area required? This requires a consideration of the offshore profile and the net sediment movement, driven by longshore transport and tidal currents. A detailed assessment of the impacts of the proposed retaining structure on adjacent areas would be required as part of the approval process and this would be undertaken as a component of the detailed design of the works. Impacts may include the following:
 - Erosion of the beach and foreshore areas at either end of the retaining structure;
 - Accretion of sediment further down the coastline;
 - Wave refraction resulting in erosion at the base and seaward of the structure;
 - Potential change to wave run-ups;
 - Benefit of the protection of the foreshore and infrastructure situated landward of the structure resulting from erosion; and
 - Potential impact to public access to the beach

13.3.3 Data and Technical Requirements

In this section the principal data requirements for the design and justification of the options discussed above are provided. A comprehensive list of requirements for the approval processes required for these activities is provided on relevant Government websites.

In areas where structures below high water mark are proposed the following data will be required:

1. A detailed hydrographic survey in the vicinity of the structure;
2. An ecological survey to identify any flora and fauna that may be impacted by the structure; and
3. Where the structure is likely to affect geotechnical stability, a geotechnical investigation may be required. This may also be required to cover analysis for acid sulphate soils in addition to engineering assessments.

In locations where substantial beach nourishment is required, the following data will be required:

1. At the site and adjacent areas:
 - (a) Detailed hydrographic survey over the area to be nourished;
 - (b) Ecological survey of the area to identify flora and fauna that may be impacted by the sand placement;
 - (c) Grain size and particle size distribution of the in-situ sand; and
 - (d) Assessment of sediment movement of the nourished sand from tidal currents and longshore transport from waves.
2. At the source of the nourished sand:
 - (a) If from below low water mark



- i. Detailed hydrographic survey of the source area;
 - ii. Ecological survey of the area to identify flora and fauna that may be impacted by the sand removal;
 - iii. Grain size and particle size distribution of the source sand, from representative samples over the full depth and area of the source;
 - iv. Assessment of the effects on adjacent areas of the removal of the sand; and
 - v. Appropriate environmental investigations to satisfy the requirements of relevant state legislation.
- (b) If from a land based source
- i. Grain size and particle size distribution of the source sand, from representative samples over the full depth and area of the source;
 - ii. Appropriate environmental investigations to satisfy the requirements of relevant state legislation; and
 - iii. Local government requirements.

13.3.4 Statutory Approvals and Policies

Work within a Coastal Management District

The Coastal Act is regulated by the DERM and is administered under the SPA. The Coastal Act aims to:

- ▶ Protect, conserve, rehabilitate and manage the coast's resources and biological diversity;
- ▶ Maintain regard for the National Strategy for Ecologically Sustainable Development; and
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The Coastal Act designates Coastal Management Districts through the State Coastal Management Plan and Regional Coastal Management Plans. Coastal Management Districts are declared for various reasons, such as the occurrence of erosion prone areas, undeveloped areas, and areas that may be subject to high impacts in the future.

Relevance to Management Option

Depending on where the sand is sourced from, the following Coastal Act approvals may relate to this extraction of sand:

- ▶ Approval for the interference of quarry material on State coastal land above the high water mark in the Coastal Management District of Pumicestone South where sand is removed for the purposes of beach nourishment. In such instances, a development permit for operational work may be triggered under Schedule 3, Part 1, Table 4, Item 5b(i) of the SPR.
- ▶ Where dredging occurs below the watermark, an allocation for quarry material below high water mark would be required pursuant to Section 73 of the Coastal Act.

An approval would also be required for disposing of dredge spoil or other solid waste material in tidal water dependant on deposition location of removed sand, however it is assumed this would



occur in the Coastal Management District of Pumicestone South. This would require a development permit for operational work triggered under Schedule 3, Part 1, Table 4, Item 5b(ii) of SPR. Under the provisions of Schedule 7, Table 2, Item 13 of the SPR, referral of the permit application would be required to DERM (administrator of the Coastal Act) as a concurrence agency where part of a broader application when DERM does not function as assessment manager. In addition, referral of the application for disposing dredge spoil or other solid water material would be submitted to MSQ within DTMR as a concurrence agency under Schedule 7, Table 2, Item 15 of the SPR.

It is unlikely that any acid sulfate soils (ASS) would exist in the material to be removed. However, this would need to be confirmed as part of the investigative works completed for the assessment. Referral of the above applications to DERM (administrator of the *Land Act 1994*) as an advice agency triggered under Schedule 7, Table 3, Item 3 of the SPR is anticipated as the area is mapped as below 5m AHD and dredging of >1000 cubic metres of material is expected. Sampling and laboratory analysis of the material to be removed should confirm the presence/absence of ASS.

Environmentally Relevant Activities

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- ▶ *Environmental Protection (Water) Policy 2009;*
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The EPPs hold the status of a regulation under the EP Act and act to set out environmental values that must be protected and provide for specific offences. As subordinate legislation to the EP Act, the EPPs bind all persons.

Relevance to Management Option

Extraction of material below the surface of naturally occurring waters comprises dredging which is defined as ERA 16 under the *Environmental Protection Regulation 2008* where works involve dredging of more than 1,000 tonnes per year. This activity will require a development permit for material change of use triggered under Schedule 3, Part 1, Table 2, Item 1 of the SPR. An application would need to be made to DERM (as the assessment manager) and would follow the IDAS process. In addition, a registration certificate will be required from DERM to undertake dredging at the site, although it is anticipated that this will be obtained by the contractor engaged to undertake the work. Documentation to be submitted with the application for an ERA is expected to include the relevant IDAS forms, the prescribed fee, supporting documentation and a dredge management plan (as required).



Disturbance of Marine Plants

The *Fisheries Act 1994* is regulated through the SPA where development approval is required for disturbance to marine plants. Disturbance to marine plants includes trimming, removing or damaging marine plants (including mangroves, seagrass, saltmarsh plants and marine algae) for any purpose on any tenure.

Works are self-assessable under codes if they consist of the maintenance of existing lawful structures; however maintenance does not include upgrading or extending structures.

Relevance to Management Option

Dependant on where sand is deposited and whether any marine plants exist at a site, this management option may result in the disturbance of marine plants. If this is the case, a development permit for operational work that is the removal, destruction or damage of marine plants would be required under Schedule 3, Part 1, Table 4, Item 8 of the SPR. Referral of any development application would be required to DEEDI (administrator of *Fisheries Act 1994*) through the IDAS system as a concurrence agency pursuant to Schedule 7, Table 2, Item 30 of the SPR.

Fish Habitat Area

The *Fisheries Act 1994* is regulated through the SPA where development approval is required for works within a declared Fish Habitat Area including any operational or building work.

Works are self-assessable under codes if they consist of the maintenance of existing lawful structures; however maintenance does not include upgrading or extending structures.

Relevance to Management Option

A declared fish habitat area (Pumicestone Channel) is mapped (2008 mapping) at Buckleys Hole. Therefore, any works in the area will require an operational work development permit for works completely or partly within a declared fish habitat area made assessable under Schedule 3, Part 1, Table 4, Item 7 of the SPR. Referral of any application to DEEDI (administering the *Fisheries Act*) through the IDAS system will be required pursuant to Schedule 7, Table 2, Item 26 of the SPR as a concurrence agency where the works are within a fish habitat area, and pursuant to Schedule 7, Table 2, Item 27 of the SPR as an advice agency where the works are adjacent to a fish habitat area.

Marine Parks

The *Marine Parks Regulation 2006* (MPR) classifies marine parks into seven zones including:

- ▶ General use zone;
- ▶ Habitat protection zone;
- ▶ Conservation park zone
- ▶ Buffer zone;
- ▶ Scientific research zone;
- ▶ Marine national park zone; and



- Preservation zone.

The zones are listed in ascending order of level of protection, with the highest level of protection in the preservation zone.

Moreton Bay Marine Park is managed through the *Marine Parks (Moreton Bay) Zoning Plan 1997* (the Zoning Plan). The Zoning Plan establishes a number of zones in the Marine Park and stipulates the activities that may occur in these zones and instances in which Marine Parks permits are required. Marine Park Permits are required for (but not limited to) the following activities within Moreton Bay Marine Park:

- Discharging waste;
- Building structures such as jetties, buoys or pile moorings;
- Dredging and disposing of dredged material; and
- Works.

Relevance to Management Option

Where this management option will involve work below the high water mark in a habitat protection zone of the Moreton Bay Marine Park, a Marine Parks Permit will be required. Application for this permit will be made to DERM through the PALM and the proposal will need to comply with the objectives of the Marine Park zone in which the works are located.

Protected Flora and Fauna Species

The *Nature Conservation Act 1992* (NCA) seeks to achieve the conservation of nature through an integrated and comprehensive strategy for the whole of Queensland. This strategy involves, among other things, gathering of information and community education, dedication and declaration of protected areas, management of protected areas, protection of wildlife and its habitat, and to ensure that the use of protected wildlife and areas is ecologically sustainable. The NCA is administered by the DERM.

All native Australian flora and fauna are protected in Queensland under the NCA. Under this legislation, wildlife is classified into separate categories ('endangered', 'vulnerable', 'near threatened', 'special least concern' or 'least concern') to assist in the management and conservation of the species. Species within each category are listed within the *Nature Conservation (Wildlife) Regulation 2006*. The specific management intent for each class is articulated within the Regulation. The taking or destruction of protected wildlife requires a permit from DERM, unless exemptions apply.

Relevance to Management Option

Flora species of conservation significance listed under the NCA have been previously recorded on Bribie Island. If these protected species are observed and there are potential for impacts from the proposed works, permits will be required to be obtained from DERM.

A number of 'least concern' plants (common native vegetation) may be disturbed by any works in this area.



Site Specific Requirements

Based on preliminary investigations and in the absence of detail design, the following approvals are considered necessary for the management of beach and foreshore erosion through the details described in section 13.3.1:

- ▶ To nourish the beach with sand along the erosion scarp at Buckleys Hole:
 - Development permit for operational work that is the removal, destruction or damage of marine plants;
 - Operational work development permit for works completely or partly within a declared fish habitat area;
 - Development permit for operational work that is disposing of dredge spoil or other solid waste material in tidal water; and
 - Marine Parks Permit.

Where disturbance of native vegetation is required on land other than land under freehold tenure, a permit to disturb least concern plants under Section 89 of the *Nature Conservation Act 1992* would also be required.

- ▶ For beach nourishment at Sylvan Beach North Pirate Park:
 - Development permit for operational work that is the removal, destruction or damage of marine plants;
 - Development permit for operational work that is disposing of dredge spoil or other solid waste material in tidal water; and
 - Marine Parks Permit.

Where disturbance of native vegetation is required on land other than land under freehold tenure, a permit to disturb least concern plants under Section 89 of the *Nature Conservation Act 1992* would also be required.

- ▶ For beach nourishment at Sylvan Beach North:
 - Development permit for operational work that is the removal, destruction or damage of marine plants;
 - Development permit for operational work that is disposing of dredge spoil or other solid waste material in tidal water; and
 - Marine Parks Permit.

Where disturbance of native vegetation is required on land other than land under freehold tenure, a permit to disturb least concern plants under Section 89 of the *Nature Conservation Act 1992* would also be required.

- ▶ For beach nourishment at Banksia Beach if avoiding marine plants:
 - Development permit for operational work that is disposing of dredge spoil or other solid waste material in tidal water; and
 - Marine Parks Permit.

- ▶ For beach nourishment south of Spinnaker Sound Marina Entrance:
 - Development permit for operational work that is the removal, destruction or damage of marine plants;



- Development permit for operational work that is disposing of dredge spoil or other solid waste material in tidal water; and
- Marine Parks Permit.

Where disturbance of native vegetation is required on land other than land under freehold tenure, a permit to disturb least concern plants under Section 89 of the *Nature Conservation Act 1992* would also be required.

- ▶ For relocation of the seaward edge of the Turners Camp car park and rehabilitation of the area:

- Development permit for operational work that is for interfering with quarry material as defined under the Coastal Act on State coastal land above high-water mark.

Where disturbance of native vegetation is required on land other than land under freehold tenure, a permit to disturb least concern plants under Section 89 of the *Nature Conservation Act 1992* would also be required.

Further to each of the above requirements, the provisions of the EPBC Act and Aboriginal Cultural Heritage Act will continue to apply.

It should be noted that additional approvals will relate to sourcing of sand for nourishment purposes. These may include a number of additional approvals to those mentioned above, including local government approvals, approvals under the *Vegetation Management Act 1999* where sand is obtained from terrestrial areas outside of the Coastal Management District and containing remnant vegetation.

13.4 Beach Reinstatement

In this section, the reinstatement of recreational beaches is discussed. In the study area the locations that are in this category are sites where there no existing recreational beaches at high water and there is a revetment wall along the foreshore that separates the parkland from the tidal foreshore. Typically the water based recreational activities for these areas are restricted to fishing.

The principal decision that needs to be made is whether a recreational beach is required at the particular location. Having decided that a recreational beach is needed, the design of the beach reinstatement works needs to consider why the beach eroded, the potential sediment transport regime under tidal currents and longshore transport from waves, and whether any structures are required to ensure a reasonable useable life for the works.

The following areas have been identified as possibilities for beach reinstatement:

- ▶ North of Bongaree jetty;
- ▶ North of Shirley Creek;
- ▶ North of Bribie Gardens Estate canal entrance; and
- ▶ Bribie Bridge (Bongaree/Bellara end).

The recommended option would comprise beach nourishment using sand from a source that is not part of the active beach system but is compatible with the in-situ sand, possible retained at the northern end with suitable length groyne to ensure a reasonable life without having to carry out major maintenance works.



The design of this option will depend on the conditions at the particular location, minimising adverse effects on the environment, and satisfying statutory requirements.

The data and technical requirements for this option are discussed in the previous section.

13.4.1 Statutory Approvals and Policies

The Coastal Act is regulated by the DERM and is administered under the SPA. The Coastal Act aims to:

- ▶ Protect, conserve, rehabilitate and manage the coast's resources and biological diversity;
- ▶ Maintain regard for the National Strategy for Ecologically Sustainable Development; and
- ▶ Improve and encourage knowledge of the coastal zone resources and the effects of human activities on the coastal zone.

The Coastal Act designates Coastal Management Districts through the State Coastal Management Plan and Regional Coastal Management Plans. Coastal Management Districts are declared for various reasons, such as the occurrence of erosion prone areas, undeveloped areas, and areas that may be subject to high impacts in the future.

Relevance to Management Option

Depending on where the sand is sourced from, the following Coastal Act approvals may relate to this extraction of sand:

- ▶ Approval for the interference of quarry material on State coastal land above the high water mark in the Coastal Management District of Pumicestone South where sand is removed for the purposes of beach nourishment. In such instances, a development permit for operational work may be triggered under Schedule 3, Part 1, Table 4, Item 5b(i) of the SPR.
- ▶ Where dredging occurs below the watermark, an allocation for quarry material below high water mark would be required pursuant to Section 73 of the Coastal Act.

An approval would also be required for disposing of dredge spoil or other solid waste material in tidal water dependant on deposition location of removed sand, however it is assumed this would occur in the Coastal Management District of Pumicestone South. This would require a development permit for operational work triggered under Schedule 3, Part 1, Table 4, Item 5b(ii) of the SPR. Under the provisions of Schedule 7, Table 2, Item 13 of the SPR, referral of the permit application would be required to DERM (administrator of the Coastal Act) as a concurrence agency where part of a broader application when DERM does not function as assessment manager. In addition, referral of the application for disposing dredge spoil or other solid water material would be submitted to MSQ within the DTMR as a concurrence agency under Schedule 7, Table 2, Item 15 of the SPR.

It is unlikely that any ASS would exist in the material to be removed. However, this would need to be confirmed as part of the investigative works completed for the assessment. Referral of the above applications to DERM (administrator of the *Land Act 1994*) as an advice agency triggered under Schedule 7, Table 3, Item 3 of the SPR is anticipated as the area is mapped as below 5m AHD and dredging of >1000 cubic metres of material is expected. Sampling and laboratory analysis of the material to be removed should confirm the presence/absence of ASS.

Environmentally Relevant Activities



The EP Act was created to protect Queensland's environment whilst allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends. The Act, which is administered by the DERM, utilises a number of mechanisms to achieve its objectives. These include creating a GED, Duty to Notify, licensing of ERAs, and administering EPPs and Regulations including:

- ▶ *Environmental Protection (Water) Policy 2009;*
- ▶ *Environmental Protection (Noise) Policy 2008;*
- ▶ *Environmental Protection (Air) Policy 2008; and*
- ▶ *Environmental Protection (Waste Management) Regulation 2000.*

The EPPs hold the status of a regulation under the EP Act and act to set out environmental values that must be protected and provide for specific offences. As subordinate legislation to the EP Act, the EPPs bind all persons.

Relevance to Management Option

Extraction of material below the surface of naturally occurring waters comprises dredging which is defined as ERA 16 under the *Environmental Protection Regulation 2008* where works involve dredging of more than 1,000 tonnes per year. This activity will require a development permit for material change of use triggered under Schedule 3, Part 1, Table 2, Item 1 of the SPR. An application would need to be made to DERM (as the assessment manager) and would follow the IDAS process. In addition, a registration certificate will be required from DERM to undertake dredging at the site, although it is anticipated that this will be obtained by the contractor engaged to undertake the work.

Relevance to Management Option (continued)

Documentation to be submitted with the application for an ERA is expected to include the relevant IDAS forms, the prescribed fee, supporting documentation and a dredge management plan (as required).

Marine Parks

The *Marine Parks Regulation 2006* (MPR) classifies marine parks into seven zones including:

- ▶ General use zone;
- ▶ Habitat protection zone;
- ▶ Conservation park zone
- ▶ Buffer zone;
- ▶ Scientific research zone;
- ▶ Marine national park zone; and
- ▶ Preservation zone.

The zones are listed in ascending order of level of protection, with the highest level of protection in the preservation zone.

Moreton Bay Marine Park is managed through the *Marine Parks (Moreton Bay) Zoning Plan 1997* (the Zoning Plan). The Zoning Plan establishes a number of zones in the Marine Park and



stipulates the activities that may occur in these zones and instances in which Marine Parks permits are required. Marine Park Permits are required for (but not limited to) the following activities within Moreton Bay Marine Park:

- ▶ Discharging waste;
- ▶ Building structures such as jetties, buoys or pile moorings;
- ▶ Dredging and disposing of dredged material; and
- ▶ Works.

Relevance to Management Option

As this management option will involve work below the high water mark in a habitat protection zone of the Moreton Bay Marine Park a Marine Parks Permit will be required. Application for this permit will be made to DERM through the PALM and the proposal will need to comply with the objectives of the Marine Park zone in which the works are located.

Protected Flora and Fauna Species

The NCA seeks to achieve the conservation of nature through an integrated and comprehensive strategy for the whole of Queensland. This strategy involves, among other things, gathering of information and community education, dedication and declaration of protected areas, management of protected areas, protection of wildlife and its habitat, and to ensure that the use of protected wildlife and areas is ecologically sustainable. The NCA is administered by the DERM.

All native Australian flora and fauna are protected in Queensland under the NCA. Under this legislation, wildlife is classified into separate categories ('endangered', 'vulnerable', 'near threatened', 'special least concern' or 'least concern') to assist in the management and conservation of the species. Species within each category are listed within the *Nature Conservation (Wildlife) Regulation 2006*. The specific management intent for each class is articulated within the Regulation. The taking or destruction of protected wildlife requires a permit from DERM, unless exemptions apply.

Relevance to Management Option

Flora species of conservation significance listed under the NCA have been previously recorded on Bribie Island. If these protected species are observed and there are potential for impacts from the proposed works, permits will be required to be obtained from DERM.

A number of 'least concern' plants (common native vegetation) may be disturbed by any works in this area.

Site Specific Requirements

Based on preliminary investigations and in the absence of detail design the following approvals are considered necessary for beach reinstatement through the methods described in section 13.4:



- ▶ For beach nourishment to the north of Bongaree Jetty, north of Shirley Creek, north of Bribie Gardens Estate Canal Entrance and Bribie Bridge (Bongaree/Bellara end).:
 - Development permit for operational work that is the removal, destruction or damage of marine plants;
 - Development permit for operational work that is disposing of dredge spoil or other solid waste material in tidal water; and
 - Marine Parks Permit.

Where disturbance of native vegetation is required on land other than land under freehold tenure, a permit to disturb least concern plants under Section 89 of the *Nature Conservation Act 1992* would also be required.

Further to each of the above requirements, the provisions of the EPBC Act and Aboriginal Cultural Heritage Act will continue to apply.

It should be noted that additional approvals will relate to sourcing of sand for nourishment purposes. These may include a number of additional approvals to those mentioned above, including local government approvals, approvals under the *Vegetation Management Act 1999* where sand is obtained from terrestrial areas outside of the Coastal Management District and containing remnant vegetation.

13.5 Stabilisation of Stepped Revetment Wall

This section describes the requirements for stabilising the stepped concrete revetment wall where the bed level in front of the wall is such that undermining of the wall is imminent or that the wall is exhibiting signs of failure (e.g. outwards movement of the top of the wall, cracking of the wall, and / or differential movement at the vertical construction joints).

The locations where this situation is occurring or has the potential to occur is:

- ▶ North of Bongaree jetty;
- ▶ North of Shirley Creek;
- ▶ North of Bribie Gardens Estate canal entrance; and
- ▶ Bribie Bridge (Bongaree/Bellara end).

13.5.1 Recommended Option

The recommended option comprises stabilisation of the toe of the wall with a flexible system that can absorb wave energy and withstand tidal currents. Typical materials that can be used are rock protection and geotextile sand containers. Mass concrete is not recommended in this situation as it is inflexible and therefore unable to adjust to future changes in bed level and is limited in its ability to absorb wave energy.

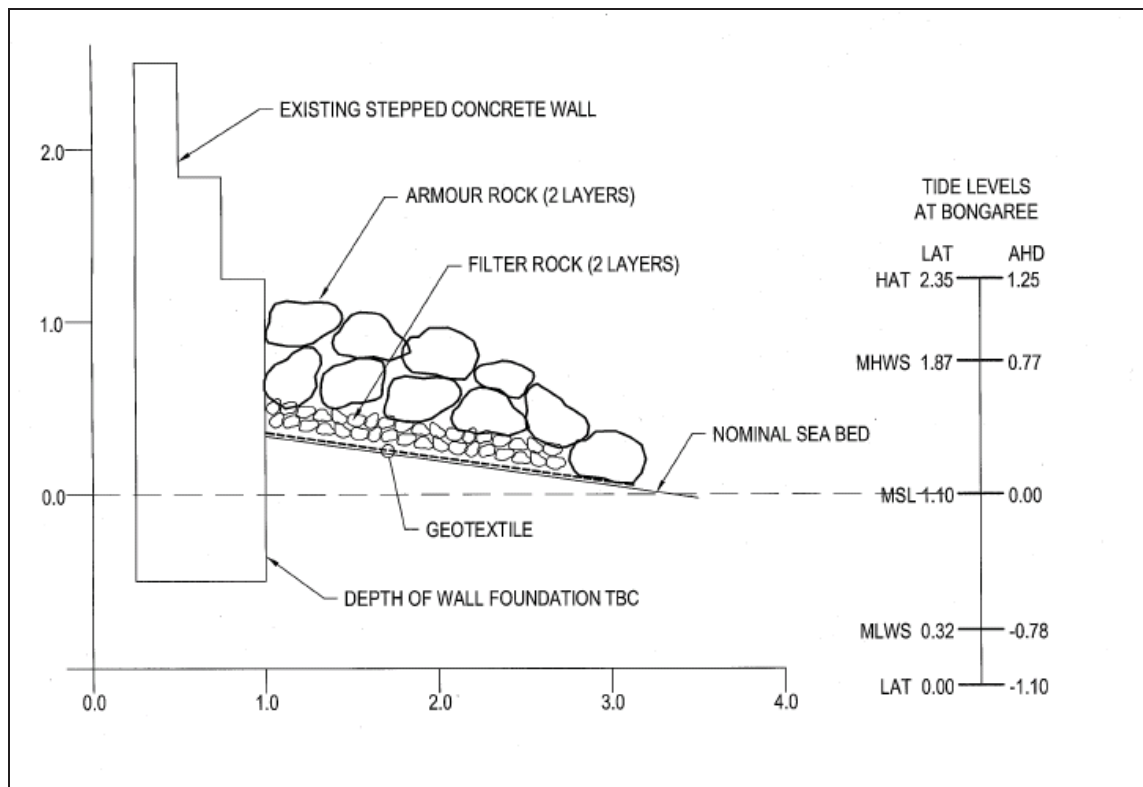
For rock, a geotextile filter material is laid on the bed, then a secondary small rock filter layer, then two layers of a suitable armour rock sized in accordance with the wave and current conditions. The outer slope of the rock structure should be not steeper than 1 vertical to 2 horizontal and should extend a minimum of 3 metres out from the wall face. The level of the toe of the wall should be at LAT or lower. A typical profile is shown in [Figure 49](#). Appropriate treatments at the back of the existing wall may also be necessary where insufficient filter rock



has not been included in the original construction works to mitigate the impacts of seawater penetrating through weep holes in the structure. Such details would require consideration at detailed design stage.

Another possibility would be to install a permanent sand shifter similar to that used to take sand from near the Noosa River entrance back to Noosa main beach. However, as the rate and quantity of sand accumulation at this site is relatively small, it is unlikely that this will be an economic solution and has not been considered further in the SEMP.

Figure 49 Stabilisation of Stepped Concrete Seawall



13.5.2 Data and Technical Requirements

The following additional data and technical information will be required in order to design the stabilising works:

1. Detailed surveys of the area in front of the wall out to 10 metres; and
2. Information on the level of the base of the wall.

The surveys will provide the basis of the design of the toe protection works and the information on the wall foundations will allow the most critical areas to be prioritised.

13.5.3 Statutory Approvals and Policies

Prescribed Tidal Works

Part 4, Section 14 of the *Coastal Protection and Management Regulation 2003* (CPMR) designates the following activities as prescribed tidal works if they are conducted completely or partly within a local government tidal area and not within the tidal area of strategic port land:

- ▶ Work that is completely tidal work;
- ▶ Work consisting of:



- tidal work; and
- a part that is not tidal work if the part is an integral part of the work.

Relevance to Management Option

Work in tidal areas is necessary to achieve this management option. Therefore, an operational work development permit that is prescribed tidal work would be required under Schedule 3, Part 1, Table 4, Item 5a of the SPR. Application would be made through the IDAS system to the local government as the assessment manager, and referral provided to MSQ within DTMR pursuant to Schedule 7, Table 2, Item 15 of the SPR as a concurrence agency, and to DERM as a concurrence agency triggered under Schedule 7, Table 2, Item 13 of the SPR.

Marine Parks

The MPR classifies marine parks into seven zones including;

- ▶ General use zone;
- ▶ Habitat protection zone;
- ▶ Conservation park zone
- ▶ Buffer zone;
- ▶ Scientific research zone;
- ▶ Marine national park zone; and
- ▶ Preservation zone.

The zones are listed in ascending order of level of protection, with the highest level of protection in the preservation zone.

Moreton Bay Marine Park is managed through the *Marine Parks (Moreton Bay) Zoning Plan 1997*. The Zoning Plan establishes a number of zones in the Marine Park and stipulates the activities that may occur in these zones and instances in which Marine Parks permits are required. Marine Park Permits are required for (but not limited to) the following activities within Moreton Bay Marine Park:

- ▶ Discharging waste;
- ▶ Building structures such as jetties, buoys or pile moorings;
- ▶ Dredging and disposing of dredged material; and
- ▶ Works.

Relevance to Management Option

As this management option will involve work below the high water mark in a habitat protection zone of the Moreton Bay Marine Park a Marine Parks Permit will be required. Application for this permit will be made to DERM through the PALM and the proposal will need to comply with the objectives of the Marine Park zone in which the works are located.

Site Specific Requirements

Based on preliminary investigations and in the absence of detail design the following approvals are considered necessary for the stabilisation of the stepped revetment wall at north of



Bongaree Jetty, north of Shirley Creek, north of Bribie Gardens Estate Canal Entrance, and Bribie Bridge (Bongaree/ Bellara end) through the methods described in section 13.5.1:

- ▶ Development permit for operational work that is prescribed tidal work; and
- ▶ Marine Parks Permit.

13.6 Sedimentation at Stormwater Outlets and Boat Ramps

The removal of sand build up in front of stormwater drains and on boat ramps is a recognised maintenance activity that is carried out by local governments. Many aspects of this work are excluded work under the Coastal Act and does not require an operational works approval under SPA. However, whether approvals are required will depend on the location of the specific site in relation to statutory plans such as Fish Habitat Areas and Marine Parks.

13.6.1 Description

There are numerous stormwater outlets along the foreshore that need periodic removal of sand that is blocking the outlet in order to minimise flooding upstream in the event of a storm.

There are also a number of boat ramps in the study area on which sand is deposited by natural processes from time to time. Council needs to remove the sand as required to facilitate the continued operation of these ramps.

The sand removed during these maintenance activities should be placed back into the active beach system unless there are environmental reasons that preclude this. The sand can either be placed directly on the beach nearby or be removed by truck to another beach in the study area that would benefit from the input of sand.

The relevant approvals and adherence with code requirements need to apply to the deposition of the sand as well as the removal.

13.6.2 Recommended Option

Current practices should continue. Regular review of legislative requirements is recommended. Records detailing the work carried out should be kept and analyses to obtain data on coastal processes at the site. Typical data that should be recorded includes location, date, description of location and extent of sand bank, description of sand (colour, grain size, presence of fines) to be removed, estimate of volume of sand removed, deposition location (with reference to a recognisable point of feature) and description of result achieved.

13.6.3 Statutory Approvals and Policies

It is understood that Council currently holds a number of approvals for this type of work. Furthermore, exemptions exist for certain types of operational work if it is for the maintenance of existing lawful structures as outlined below. In this regard, additional approvals may not be necessary to carry out this management option.

Disturbance of Marine Plants

The *Fisheries Act 1994* is regulated through the SPA where development approval is required for disturbance to marine plants. Disturbance to marine plants includes trimming, removing or



damaging marine plants (including mangroves, seagrass, saltmarsh plants and marine algae) for any purpose on any tenure.

Operational work that is the removal, destruction or damage of a marine plant is self-assessable under codes under Schedule 3, Part 2, Table 4, Item 4b of the SPR if the work is reasonably necessary for the maintenance of existing structures if the structures were constructed in compliance with all the requirements under any Act. This includes the following structures:

- ▶ Boat ramps, boardwalks, drains, fences, jetties, roads, safety signs, swimming enclosures and weirs;
- ▶ Drainage structures; or
- ▶ Powerlines or associated powerline infrastructure.

However, maintenance does not include upgrading or extending structures.

Relevance to Management Option

As the recommended options described in section 13.6.2 are for the maintenance of drains and other structures, the works are self-assessable under codes if they consist of the maintenance of existing lawful structures.

Work within a Coastal Management District

The Coastal Act is regulated by the DERM and is administered under the SPA. The Coastal Act aims to protect, conserve, rehabilitate and manage the coast's resources and biological diversity; maintain regard for the National Strategy for Ecologically Sustainable Development; and improve and encourage knowledge of the coastal zone resources and the effects of human activities on the coastal zone. The Coastal Act designates Coastal Management Districts through the State Coastal Management Plan and Regional Coastal Management Plans. Coastal Management Districts are declared for various reasons, such as the occurrence of erosion prone areas, undeveloped areas, and areas that may be subject to high impacts in the future.

Relevance to Management Option

The de-sedimentation of stormwater outlets and boat ramps is likely to result in the interference of quarry material on State coastal land above the high water mark in the Coastal Management Districts of Pumicestone South. However, if the works are for maintenance purposes it is not considered to be assessable under the SPR. Maintenance work includes:

- ▶ Replacing a structural element of an approved structure (e.g. jetty or pontoon, weir, community facility on State coastal land) in accordance with approved plan;
- ▶ Replacing displaced material (e.g. rocks, soil, etc) from an approved structure (e.g. rockwall, bundwall, seawall); and
- ▶ Re-surfacing an existing approved structure (e.g. boat ramp) in accordance with approved plan.

Maintenance work does not include:

- ▶ Replacing or rebuilding whole structures; and
- ▶ Changes in a structure which will lead to a lower structural capacity.



If the works fall under the criteria of maintenance works they are considered to be excluded work and a development permit is not required.

Prescribed Tidal Works

Part 4, Section 14 of the CPMR designates the following activities as prescribed tidal works if they are conducted completely or partly within a local government tidal area and not within the tidal area of strategic port land:

- ▶ Work that is completely tidal work;
- ▶ Work consisting of:
 - tidal work; and
 - a part that is not tidal work if the part is an integral part of the work.

Relevance to Management Option

The de-sedimentation of stormwater outlets and boat ramps is likely to involve work in tidal areas. However, if the works are for maintenance work it is not considered to be assessable under the SPR. Maintenance work includes:

- ▶ Replacing a structural element of an approved structure (e.g. jetty or pontoon, weir, community facility on State coastal land) in accordance with approved plan;
- ▶ Replacing displaced material (e.g. rocks, soil, etc) from an approved structure (e.g. rockwall, bundwall, seawall); and
- ▶ Re-surfacing an existing approved structure (e.g. boat ramp) in accordance with approved plan.

Maintenance work does not include:

- ▶ Replacing or rebuilding whole structures; and
- ▶ Changes in a structure which will lead to a lower structural capacity.

If the works fall under the criteria of maintenance works they are considered to be excluded work and a development permit is not required.

13.7 Siltation of Bribie Gardens Estate Canal Entrance

This section discusses the issues in relation to the removal of siltation at the entrance to approved canal estates in the study area, specifically the Bribie Gardens Estate and Pacific Harbour for the purposes of maintaining a navigable channel from Pumicestone Passage to the canal waterways.

13.7.1 Description

The need for removal of siltation in the entrance to the canal estates will be determined by boat users in consultation with the Council and the Harbour Master. Providing that the spoil material meets standards in terms of contaminants and grain size it should be placed on the adjacent foreshore on the northern side of the entrance, given the predominant northerly drift of sand at these locations. The extent of dredging will be determined by the approved design profile of the access channel and the volume of siltation that has occurred.



It is important that the removal of sediment from the entrance channel conforms with the original design for this canal as any deepening or widening of the waterway would be considered to be new capital works. This would subject to a high level of environmental assessment with no guarantee of approval, given its location in a Marine Park and adjacent to other environmental jurisdictions.

As the shoreline south of the southern breakwater at the mouth of Bribie Gardens Estate Canal has filled, sediment is starting to bypass the breakwater. Initially, this sediment will deposit into the creek mouth, where it is likely to eventually become a concern for navigation. Ultimately, a regular program of dredging may need to be initiated in this area. Any clean sand removed through dredging should be used for beach nourishment purposes on beaches north of the canal mouth.

13.7.2 Recommended Option

The recommended option would be to use a small cutter suction or suction dredge (depending on the strength of the material to be removed), pumping directly to the foreshore receiving the sand or a temporary settling pond from where the dredged material would be progressively removed by truck for disposal at an approved disposal site. In addition, in the long term a permanent sand shifting operation could be considered to manage the constant accumulation of sand in this area. Such an operation will also have the benefit of enabling the natural flow of sand along the coastline immediately to the north but would need to be investigated to match a suitable system to the location and the prevailing sediment transport characteristics of the site.

It is unlikely that land based plant would be suitable for this work as most of the sand deposits will be beyond their reach. The preference in relation to disposal of the dredged spoil is to re-use the material as beach nourishment directly onto the adjacent foreshore. In the event that this is not acceptable on environmental grounds then the material will need to be removed to an approved disposal site at considerably increased cost.

13.7.3 Data and Technical Requirements

The following data will provide the basis of the design of the dredging works and the quantity of dredge spoil, and will assist in determining the potential environmental impact and the setting of appropriate conditions and required actions to mitigate the impact:

1. Detailed bathymetric survey of the area to be dredged and the proposed deposition area on the foreshore; and
2. Investigation drilling and coring to determine the nature of the material (strength, grain size distribution, presence of contaminants, presence of ASS/PASS).

13.7.4 Statutory Approvals and Policies

Work within a Coastal Management District

The Coastal Act is regulated by the DERM and is administered under the SPA. The Coastal Act aims to protect, conserve, rehabilitate and manage the coast's resources and biological diversity; maintain regard for the National Strategy for Ecologically Sustainable Development; and improve and encourage knowledge of the coastal zone resources and the effects of human activities on the coastal zone. The Coastal Act designates Coastal Management Districts



through the State Coastal Management Plan and Regional Coastal Management Plans. Coastal Management Districts are declared for various reasons, such as the occurrence of erosion prone areas, undeveloped areas, and areas that may be subject to high impacts in the future.

Relevance to Management Option

This management option would necessitate the requirement to obtain an allocation for quarry material below high water mark pursuant to Section 73 of the Coastal Act. The disposal of dredge spoil or other soil waste material in tidal water within a Coastal Management District may also be required, dependant on where the sand is to be deposited. This is assessable development under Schedule 3, Part 1, Table 4, Item 5b(ii) of the SPR triggering the need for a development permit for operational work. Application for this permit would be made to DERM through the IDAS system. Referral to MSQ within the DTMR would be required as a concurrence agency pursuant to Schedule 7, Table 2, Item 15 of the SPR.

It is unlikely that any ASS would exist in the material to be removed. However, this would need to be confirmed as part of the investigative works completed for the assessment. Referral of the above applications to DERM (administrator of the *Land Act 1994*) as an advice agency triggered under Schedule 7, Table 3, Item 3 of the SPR is anticipated as the area is mapped as below 5m AHD and dredging of >1000 cubic metres of material is expected. Sampling and laboratory analysis of the material to be removed should confirm the presence/absence of ASS.

Environmentally Relevant Activities

The EP Act was created to protect Queensland's environment whilst allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends. The Act, which is administered by the DERM, utilises a number of mechanisms to achieve its objectives. These include creating a GED, Duty to Notify, licensing of ERAs, and administering EPPs and Regulations including:

- ▶ *Environmental Protection (Water) Policy 2009;*
- ▶ *Environmental Protection (Noise) Policy 2008;*
- ▶ *Environmental Protection (Air) Policy 2008; and*
- ▶ *Environmental Protection (Waste Management) Regulation 2000.*

The EPPs hold the status of a regulation under the EP Act and act to set out environmental values that must be protected and provide for specific offences. As subordinate legislation to the EP Act, the EPPs bind all persons.

Relevance to Management Option

Extraction of material surrounding the canals will comprise dredging which is defined as ERA 16 under the *Environmental Protection Regulation 2008* as the works are likely to involve dredging of more than 1,000 tonnes per year. This activity will require a development permit for material change of use triggered under Schedule 3, Part 1, Table 2, Item 1 of the SPR. An application would need to be made to DERM (as the assessment manager) and would follow the IDAS process. In addition, a registration certificate will be required from DERM to undertake dredging at the site, although it is anticipated that this will be obtained by the contractor engaged to undertake the work. Documentation to be submitted with the application for an ERA is expected



to include the relevant IDAS forms, the prescribed fee, supporting documentation and a dredge management plan (as required).

Marine Parks

The MPR classifies marine parks into seven zones including;

- ▶ General use zone;
- ▶ Habitat protection zone;
- ▶ Conservation park zone
- ▶ Buffer zone;
- ▶ Scientific research zone;
- ▶ Marine national park zone; and
- ▶ Preservation zone.

The zones are listed in ascending order of level of protection, with the highest level of protection in the preservation zone.

Moreton Bay Marine Park is managed through the *Marine Parks (Moreton Bay) Zoning Plan 1997*. The Zoning Plan establishes a number of zones in the Marine Park and stipulates the activities that may occur in these zones and instances in which Marine Parks permits are required. Marine Park Permits are required for (but not limited to) the following activities within Moreton Bay Marine Park:

- ▶ Discharging waste;
- ▶ Building structures such as jetties, buoys or pile moorings;
- ▶ Dredging and disposing of dredged material; and
- ▶ Works.

Relevance to Management Option

As this management option will involve work below the high water mark in a habitat protection zone of the Moreton Bay Marine Park a Marine Parks Permit will be required. Application for this permit will be made to DERM through the PALM and the proposal will need to comply with the objectives of the Marine Park zone in which the works are located.

Site Specific Requirements

Based on preliminary investigations and in the absence of detail design the following approvals are considered necessary for the management of siltation of canal estate entrances at Bribie Gardens Estate and Pacific Harbour canal estate (Solander Canal) through the methods described in section 13.7.2:

- ▶ Allocation for quarry material under the Coastal Act;
- ▶ Development permit for operational work that is the disposal of dredge spoil or other soil waste material in tidal water within a Coastal Management District;
- ▶ Material change of use development permit for an ERA; and
- ▶ Marine Parks Permit.



13.8 Additional Legislative Requirements

Any works conducted on reserve tenure, or Unallocated State Land will require a Resource Entitlement. In addition, any works effecting fisheries resources will require a Resource Allocation.

13.8.1 *Environment Protection and Biodiversity Conservation Act 1999*

The EPBC Act is Commonwealth legislation that primarily provides for Commonwealth intervention on a range of actions or activities which are likely to have a significant impact on a matter of NES. Matters of NES related to the following:

- ▶ World Heritage properties;
- ▶ Ramsar wetlands;
- ▶ Nationally threatened species and ecological communities;
- ▶ Migratory species;
- ▶ Commonwealth marine areas; and
- ▶ Nuclear actions (including uranium mining).

Initially, a self-assessment must be conducted to determine whether the action has potential to result in significant impacts to matters of NES using the Australian Government Matters of National Environmental Significance, Significant impact guidelines.

Any activity that has the potential to significantly impact a matter of NES must be referred to the Commonwealth. If the activity is determined through the referral process to significantly impact a matter of NES and trigger the EPBC Act, it is classified as a Controlled Action.

If proposed activities trigger the EPBC Act, the activities will be subjected to an assessment and approval process, which may be conducted by the Commonwealth or under delegation to State governments. Responsibility for subsequent approval of the activities after assessment remains primarily with the Commonwealth, although may, in limited circumstances, be delegated to State governments.

Relevance to Project

The works are within the mapped boundary of the Moreton Bay Ramsar site, which is a wetland of international significance. In addition, the EPBC Act Protected Matters Search Tool indicates that 38 listed threatened species and 63 migratory species have the potential to occur in the study area. However, it should be noted that the EPBC Act Protected Matters Search Tool is based on bioclimatic predictive modelling and is only an indication of potential matters of NES. Nevertheless, due to the location of the works within the Ramsar wetland and the potential for nationally threatened species to occur there, a self-assessment is required to determine if referral to the Commonwealth is necessary for this project.



13.9 Monitoring

Monitoring of the beach levels along the foreshore within the study area has been undertaken by the Council from February 1985 to January 2002. This has entailed regular repetitive surveys of a number of fixed cross sections across the foreshore between South Point and Marine Parade. A full analysis of the data available was beyond the scope of this report, however, preliminary analysis of selected locations provides an insight into the sand levels on the foreshore and supports the premise of sand movement as periodic “slugs” of sand in the form of sand bars in the intertidal area moving from south to north.

It is recommended that a comprehensive analysis of the existing data be carried out and an assessment made of the value of the monitoring program and recommendations on how the program could be improved and possibly extended to other parts of the study area not covered by the existing program. The information from the monitoring program will be an important data component in the assessment of future management options, particularly those that include the design of coastal works discussed in the previous sections.

13.10 Summary

A summary of the management options discussed above is provided in Table 7.

Table 7 Summary of Management Options

Location	Text Ref	Recommended Action	Priority / (Frequency)	Estimated Cost (\$)	Likely Approvals Required
Bongaree Jetty	13.2	Monitoring – Survey	1 – immediately / (Yearly)	\$10,000 to \$20,000	Allocation for quarry material below HWM under the Coastal Act.
		Monitoring – Visual/Photo	1 – immediately / (3 mthly)	Council Staff/Community Assisted	Disposal of dredge spoil or other waste material in tidal water in a CMD. Material change of use for ERA 16 - Dredging. Disturbance to marine plants. Marine Parks Permit. Potential for EPBC Act referral.
		Beach nourishment – moving excess sand from the beach landward of the jetty and pontoons and placing it on the coastline to the north commencing approximately 120 metres north of the jetty and up to a further 300 metres to Shirley Creek	2 – as monitoring dictates	\$80,000 to \$100,000	
Buckleys Hole	13.3	Monitor the location – Visual/Photo	1 – immediately / (3 mthly)	Council Staff/Community Assisted	Disposal of dredge spoil or other waste material in tidal water in a CMD. Disturbance to marine plants.
		Short term – beach nourishment and	1 – As required	\$10,000 to \$20,000	Works within a declared Fish Habitat Area (FHA). Marine Parks Permit.
		Short term – emergency protection measures as required.	1 – As required	\$5,000 to \$10,000	Disturbance to least concern plants under Section 89 of the <i>Nature Conservation Act 1992</i> .
		Long term – extension of the seawall	3 – 2+ yrs	\$10,000 to \$20,000	
Sylvan Beach North – Pirate Park	13.3	Localised beach nourishment along the erosion scarp.	3 – As required	\$2,000 to \$5,000	Disposal of dredge spoil or other solid waste material in tidal water in a CMD. Disturbance to marine plants. Marine Parks Permit. Disturbance of least concern plants under Section

Location	Text Ref	Recommended Action	Priority / (Frequency)	Estimated Cost (\$)	Likely Approvals Required
Sylvan Beach North	13.3	Beach nourishment to provide a wider beach area.	3 – 2+ yrs	\$40,000 - \$50,000	89 of the <i>Nature Conservation Act 1992</i> . Disposal of dredge spoil or other solid waste material in tidal water in a CMD. Disturbance to marine plants. Marine Parks Permit. Disturbance of least concern plants under Section 89 of the <i>Nature Conservation Act 1992</i> .
Banksia Beach	13.3	Monitoring of the foreshore of Banksia Beach. – Visual/Photo Continue with existing maintenance program of beach nourishment.	1 – immediately / (3 mthly) 1 – As required	Council Staff/Community Assisted \$2,000 to \$5,000	Disposal of dredge spoil or other solid waste material in tidal water in a CMD. Marine Parks Permit.
South of Spinnaker Sound Marine Entrance	13.3	Monitor the location – Visual/Photo Responsible authority to investigate the potential undermining of the toe of the marina entrance seawall	1 – immediately / (3 mthly) 1 – immediately	Council Staff/Community Assisted Notify responsible authority – Spinnaker Sound Marina	Disposal of dredge spoil or other solid waste material in tidal water. Disturbance to marine plants. Marine Parks Permit. Disturbance of least concern plants under Section 89 of the <i>Nature Conservation Act 1992</i> .
Turners Camp	13.3	Relocate the seaward edge of the car park 10 m landward of its present location and revegetate the resultant vacant strip.	2 – 2 yrs	\$125,000 to \$175,000	Interference with quarry material on State coastal land above the high water mark in a CMD. Disturbance of least concern plants under Section 89 of the <i>Nature Conservation Act 1992</i> .
North of Bongaree Jetty	(i) 13.5 (ii) 13.4	i) Stabilisation of the toe of the revetment wall with a flexible system that can absorb wave energy and withstand tidal currents. 2C 2C	1C	\$100,000 to \$150,000	(i) Prescribed tidal works Marine Parks Permit. (ii) Disposal of dredge spoil or other solid waste

Location	Text Ref	Recommended Action	Priority / (Frequency)	Estimated Cost (\$)	Likely Approvals Required
		ii) Beach reinstatement works comprising beach nourishment and the construction of a short groyne at the northern end as required.		\$100,000 to \$150,000	material in tidal water. Disturbance to marine plants. Marine Parks permit. Disturbance of least concern plants under Section 89 of the <i>Nature Conservation Act 1992</i> .
North of Shirley Creek	(i) 13.5	i) Stabilisation of the toe of the revetment wall with a flexible system that can absorb wave energy and withstand tidal currents.	1D	\$175,000 to \$225,000	(i) Prescribed tidal works Marine Parks Permit.
	(ii) 13.4	ii) Beach reinstatement works comprising beach nourishment and the construction of a short groyne at the northern end as required.	2D	\$125,000 to \$175,000	(ii) Disposal of dredge spoil or other solid waste material in tidal water. Disturbance to marine plants. Marine Parks permit. Disturbance of least concern plants under Section 89 of the <i>Nature Conservation Act 1992</i> .
North of Bribie Gardens Estate Canal Entrance	(i) 13.5	ii) Stabilisation of the toe of the revetment wall with a flexible system that can absorb wave energy and withstand tidal currents.	1A	\$200,000 to \$250,000	(i) Prescribed tidal works Marine Parks Permit.
	(ii) 13.4	i) Beach reinstatement works comprising beach nourishment and the construction of a short groyne at the northern end as required.	2A	\$175,000 to \$225,000	(ii) Disposal of dredge spoil or other solid waste material in tidal water. Disturbance to marine plants. Marine Parks permit. Disturbance of least concern plants under Section 89 of the <i>Nature Conservation Act 1992</i> .

Location	Text Ref	Recommended Action	Priority / (Frequency)	Estimated Cost (\$)	Likely Approvals Required
Bribie Bridge (Bongaree/Bellara end)	(i) 13.5	i) Stabilisation of the toe of the revetment wall with a flexible system that can absorb wave energy and withstand tidal currents.	1B	\$60,000 to \$80,000	(i) Prescribed tidal works Marine Parks Permit.
	(ii) 13.4	ii) Beach reinstatement works comprising beach nourishment and the construction of a short groyne at the northern end as required.	2B	\$60,000 to \$80,000	(ii) Disposal of dredge spoil or other solid waste material in tidal water. Disturbance to marine plants. Marine Parks permit. Disturbance of least concern plants under Section 89 of the <i>Nature Conservation Act 1992</i> .
Stormwater outlets and boat ramps	13.6	Continuation of regular maintenance work consisting of removal of sand build-up in front of stormwater drains and on boat ramps. For minor works records should be kept of Works Undertaken including; date, location and quantity of material removed or disposed of.	1 / (Yearly)	\$15,000 to \$25,000	If the works fall under the criteria of maintenance works they are considered to be excluded work and a development permit is not required.
Bribie Gardens Estate Canal	13.7	Removal of siltation in the entrance to the canal estate, and canal maintenance dredging. Approx 5,000m ³	3 – As required / (every 5 to 10 yrs)	\$100,000 to \$150,000	Allocation for quarry material below HWM under the Coastal Act. Disposal of dredge spoil or other soil waste material in tidal water within a CMD Material change of use for ERA 16 – Dredging. Marine Parks Permit.

Location	Text Ref	Recommended Action	Priority / (Frequency)	Estimated Cost (\$)	Likely Approvals Required
Pacific Harbour Canal Estate	13.7	Removal of siltation in the entrance to the canal estate, and canal maintenance dredging. Approx 40,000m ³	3 – As required / (every 2 to 3 yrs)		Allocation for quarry material below HWM under the Coastal Act. Disposal of dredge spoil or other soil waste material in tidal water within a CMD Material change of use for ERA 16 - Dredging. Marine Parks Permit.

Priority Rating - 1 is highest priority and **3** is lowest priority.

Sub-Rating for 13.4-13.5 works – **A** is of highest priority and **D** is lowest priority

Note; 1. Other permits may be required relating to the source of the beach nourishment material dependant on the location of source if sand is sourced externally. 2. There are no specific permits required for monitoring activities.