

Coastal Works Review

Cleveland Dilbert – Saltwater Pond Marina – Excavation offshore to create a marine boat channel. Block: 95C Parcel: 39



PREPARED FOR: MINISTRY OF FINANCIAL SERVICES, COMMERCE AND ENVIRONMENT

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Authored by: Technical Review Committee - Department of Environment

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Project Proposal



FIGURE 1: PROPOSED LOCATION OF CHANNEL AND ROCK GROYNES BREAKWATER.

As a prerequisite to the required Development Control Board planning permission, the applicant, Mr. Cleveland Dilbert, has submitted a Coastal Works Application for the creation of a boat channel and associated breakwater to provide navigable access to the Crown owned Saltwater Pond; the proposed site of a future marina development. In accordance with international best practice and as is customary with development applications of this nature, the Department of Environment (DOE) has provided comments and recommendations not only for the coastal works aspects of the applications but also for the overall development concept.

The channel will be dredged to a depth of 12 feet seaward to meet the 12 foot contour, requiring the removal of 167,500 cubic yards (17 acres) of near shore reef and seabed communities. Additionally a rock groyne breakwater will be constructed from shore, adjacent and seaward of the channel to reduce exposure to normally rough sea conditions experienced in this area.

The applicant proposes to create the rock groyne breakwater by placing large boulders onto the seabed. The groyne will form the pad from which the channel will be excavated using a mechanical excavator and dump trucks to haul away the material.

The application proposes the removal of a significant amount of seabed in both a Marine Park and Replenishment Zone, impacts a turtle nesting beach and interrupts alongshore pedestrian access. The public

road will also have to be relocated through a residential neighbourhood and approximately one-third of the Crown-owned pond will be excavated and deepened (no depth has been indicated).

Background

The Coastal Works application is for the marine works associated with a concurrent Development Control Board marina application to be sited in the Crown owned Salt Water Pond.

Based on international best practice, on an Island as small as Cayman Brac, the siting of a marina/berthing facility should be the subject of a Strategic Assessment which would be framed within the context of a Development Plan for the Island. Such an Assessment would help identify the best potential site(s) for berthing and would identify sensitive or vulnerable sites where such development(s) should not be permitted. The objectives of the Assessment would include:

- Identifying the need and demand for berthing facilities e.g. type of facility (e.g. all-weather safe harbour); origin of vessels – local or visiting; visitation levels; tourism strategy for boating;
- Operational requirements such as: number of berths; size and draft of anticipated vessels; requirements for ancillary services such as fuelling, sewage pump out, water supply, launching ramps, boat storage, repair shop, rigging shop etc.;
- Selecting the most appropriate sites where such facilities could be established with the least environmental disturbance taking into account socio-economic factors, and
- Determining and assessing the likely environmental impacts and proposing measures to mitigate the negative impacts and maximize the benefits of such projects.

Ideally this Assessment would be formulated with the benefit of input from civil engineers, coastal engineers and environmental scientists. When considering options, the biophysical, economic and social costs and benefits throughout the whole life cycle of the proposal/facility should be considered. If such marina developments are not properly planned they will inevitably lead to the degradation of an already stressed natural environment, which will not only be detrimental to the country in general, but will jeopardize the tourism industry. The tourism industry in the Cayman Islands depends to a large extent on its coastal and marine resources. The environmental degradation of beaches, lagoons and coral reefs through ill-conceived and poorly-planned developments in Cayman Brac will have a profound negative impact on the number of tourist arrivals and the tourism product.

However, in the absence of an overarching strategic framework against which to assess these proposals, the DoE has carried out a review of the application based on the information provided. The following review is provided for Cabinet's consideration:

Environmental Impacts

- The **proposed works are located in a Marine Park** and Replenishment Zone.
- The works will result in the **permanent removal of a significant quantity of living coral reef** resources including fringing reef and hard bottom communities.
- The works will require the **removal of active turtle nesting beach**.
- The placement of the rock groyne breakwater will significantly alter the nearshore wave and current climate that will have significant repercussions for longshore transport of sand resources. The physical interruption of this process could result in **significant erosion to adjacent beach properties**.
- The beaches in this location have already experienced significant erosion as a result of the historical dredging activity carried out within Dick Sessinger Bay. The **severance of the sediment transport system** in the near-shore environment and the adjacent beach will starve the already impacted beaches to the west of the proposed channel, having a profound impact upon conservation (e.g. loss of turtle nesting beach) and amenity value.

- The proposed methodology for excavation of the channel will result in the creation of **significant and detrimental sedimentation plumes that will be transported by local currents to surrounding reef resources and dive sites**. The applicant states that silt screens will be deployed to control sedimentation. The use of silt screens in the rough offshore conditions in this area is simply not feasible. Additionally the applicant states the rock groyne will serve as the road from which the channel will be excavated. The typical reach of a mechanical excavator is less than 40 ft so it will not be possible to dig the entire 100 ft width of the channel from a single groyne. The oblique angle of the end of the seaward end of the channel will require a significant fill pad to create the required reach for the excavator. The fill pads will be vulnerable to wave activity and will generate a significant amount of sediment for the many months the construction will require.



FIGURE 2: CHANNEL CLEARING BY MECHANICAL EXCAVATORS AND FILL PAD, NORTH COAST, GRAND CAYMAN. (DOE)

- The applicant has provided no supporting report derived from any geotechnical investigations to determine the rock hardness and feasibility of excavating the channel with a mechanical excavator and/or requirement for blasting. The DoE has heard from owners of adjacent properties that they are concerned about the potential effects of blasting on their properties and would strongly

recommend that the required due diligence on this aspect of the proposal is carried out prior to any further consideration of the application.

- The **requirement for frequent maintenance dredging** to keep the channel clear following storms and the routine deposition of sand as it moves westwards along the coast will present an ongoing disturbance issue from mechanical clearing and sedimentation.
- The coastline immediately in front of Saltwater Pond is a storm ridge, comprised predominantly of sand, rocks and rubble. Breaching this protective storm ridge with a 100ft wide channel will **expose both coastal and inland properties (potentially as far as the airport through the westerly ponds drainage basin connections) to increased flood risk and storm damage** from the sea. The predicted extent of the potential exposure to wave overtopping, flooding and increased risk of wave and flood induced storm damage to surrounding properties, including the applicant's hotel and all properties to the west within the drainage basin depicted in Fig 3, has not addressed in the applicant's submission.
- The pond acts as a water catchment area for the surrounding wetlands. During the rainy season this water collects in the pond and the sediment and nutrients are able to settle out. Excavating the pond and directly opening it to the sea will result in an **increase loading of detrimental nutrients and sediment to the marine environment on a permanent basis**. This is of particular concern due to the prevailing westerly currents in the vicinity of the healthiest reefs and popular dive sites, which depend on clear, nutrient-free water, Figure 4 and 5. Figure 5 which is derived from the DoE's long-term coral reef monitoring programme clearly shows that the location of the healthiest coral reef on the Brac is immediately to the west of the proposed channel and therefore in the direct line of influence of the outflow of the channel.

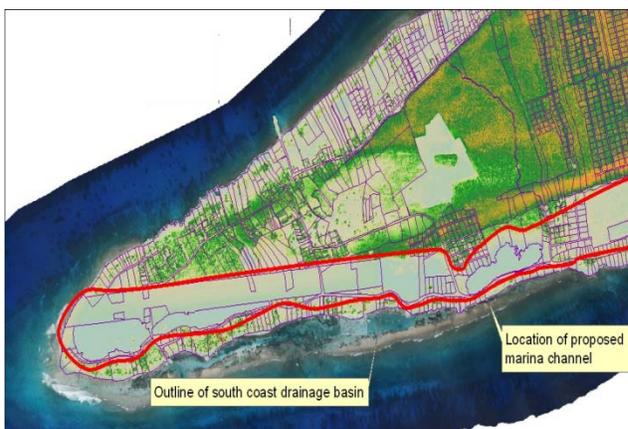


FIGURE 3: SOUTH WEST COAST DRAINAGE BASIN (SOURCE: DOE/LIS, 2013)



FIGURE 4: TANNIN STAINED FRESHWATER AT THE SAND BAR, NORTH SOUND, DRAINING FROM THE RUM POINT WETLANDS FOLLOWING HEAVY RAIN.

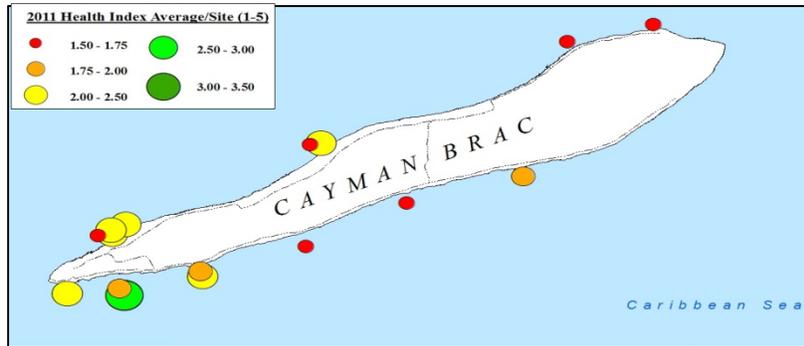


FIGURE 5: MARINE RESOURCES HEALTH INDEX SHOWING THE SOUTH WEST CAYMAN BRAC AS HEALTHIEST REEFS. (DOE)

- The operation of a marina in an existing wetland will further exacerbate water quality conditions through the addition of pollutants associated with fueling, bilge and effluent discharge and associated operations. Additionally the **deeper water requirements of the marina will lead to a loss of biological productivity within the basin** further impacting water quality through low oxygen.
- The operation of a marina will add **additional risk to the surrounding reef and marine resources** through navigational errors and incidents resulting in boat groundings and wrecks, as are common with many existing channels around the Cayman Islands (Figure 6).

- The introduction of a direct connection to the open sea for the Saltwater Pond and the connected wetlands will **significantly alter the seasonal cycles of the pond's ecosystem** which could have dramatic impacts to the ecology of the area, particularly for the wetland birds that continue to utilise this area as a migratory stop over, as well as for populations of breeding birds.



FIGURE 6: BRAC REEF DIVERS ON THE REEF JANUARY 2014.

- The requirements to **relocate the public road** (presumably at considerable public expense) will lead to considerable impacts to the surrounding wetland habitats that will have to be filled to relocate the road around the edge of the pond and through a residential subdivision.

Need and Justification for the project

Evidence of the need and requirements for a marina facility in this location has not been provided. The scale and extent of impacts associated with this project, including impacts to surrounding properties, are too significant to adopt a “build it and they will come” approach. In addition to the fact that the seabed is Crown

property, Saltwater Pond is still a Crown-owned parcel (despite the fact that its protected status has been removed) and the Government has a duty to ensure the best and highest use of this property for the benefit of **all** the people of the Cayman Islands. The applicant should therefore be required to produce detailed market research and a robust business case which is commensurate with the significance and magnitude of the predicted impacts to public resources.

Comments & Recommendations

- Information detailing offshore bathymetry and prevailing oceanographic and meteorological conditions to support the safe and desired operation of the channel design, orientation and placement has not been provided. Given the proximity to deep water, lack of a protective fringing reef and the prevailing wind conditions, the offshore wave climate in this location is rarely conducive to safe navigable access, particularly through a channel orientated broadside to the waves.
- With reference to the point above regarding the proximity of deep water and the exposure of this coastline to high energy wave activity, any breakwater or groyne structure will need to be properly engineered to withstand these conditions without damage to the structure or neighbouring coastline properties. There is no evidence of any such engineering exercise having been undertaken by the applicant. The Department would have expected to see documentation of the engineering considerations utilized in the design of the rock groyne breakwater, including a cross section profile drawing depicting height and slopes employed, size of rocks etc.
- The Department of Environment has received a considerable number of objections and requests for plan review meetings from concerned individuals that believe the project represents a considerable environmental and social risk.
- A proposal of this scale and location would ordinarily require an Environmental Impact Assessment to aid in decision making and potential mitigation. However given the probability, magnitude and significance of the potential impacts, the DOE is confident that an EIA would likely not provide any additional justification or mitigation opportunities that would support approval or demonstrate that the benefits of the projects outweigh the costs.
- The DoE feels that it is unnecessary for the applicant to incur the cost associated with an EIA for a project that is so demonstrably damaging to the environment and fundamentally flawed.

Taking the above environmental concerns into consideration the DOE recommends that this application not be approved.



Timothy J. Austin
Deputy Director, Research and Assessment
For Director of Environment