

**ENVIRONMENTAL IMPACT ASSESSMENT
FOR THE
ADDITIONAL WORKS REQUIRED DUE TO A CHANGE IN
SCOPE OF EMBOODHOOFUSHI-OLHUVELI RESORT
DEVELOPMENT PROJECT, DHAALU ATOLL**



SEPTEMBER 2010

O & E HOLDINGS PVT LTD.

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EIA01/07

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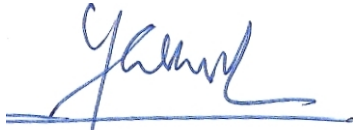
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Declaration of the Consultant

I certify that the statements made in this Environmental Impact Assessment study are true complete and correct.

A handwritten signature in blue ink, appearing to read 'MS Adam', is written over a horizontal line.

MS Adam (EIA01/07)
20 September 2010

1 SUMMARY

1. This supplementary note for Emboodhoofushi-Olhuveli resort development project arises due to a change in the scope of the development works proposed earlier. EIA for development of Emboodhoofushi-Olhuveli was undertaken in 2008/2009 and the Decision Note following the approval of the EIA was issued in September 2009. The construction work for the project began in 2009. At the time of this writing about 60% of the construction works of the back-of-the house buildings are complete
2. The developer has proposed changes Olhuveli layout which has been approved and endorsed by the Ministry of Tourism, Arts and Culture. The major change has been to relocate the over-water bungalows from the western side to the eastern side. Five water-villa structures are also proposed to be placed on the northern tip of the Olhuveli.
3. The reasons for this relocation are due to consideration on guest privacy, to accommodate plans for water sports activities on the western side and to provide better vista and uninterrupted view of the horizon for the guests. Western side is the main area of entrance to the islands with arrival and supply jetties and therefore will be noisy and aesthetically unpleasant. Part of the reason was also related to need to move over-water villas to a quieter and peaceful area. The shallow eastern reef flat provide and ideal setting for the over-water villas.
4. In the Maldives, the appeal for the over-water villas is also the private swimming area right in front of the room. Unfortunately, the eastern side is dangerously shallow (<1.0m) for any type of swimming. In order to create a swimming area, the area has to be at least 1-5 to 1.8 m deep. The developer is therefore proposing to scrap 0.5 m from the lagoon floor of an area about 4,000 sq m. This would generate 2,000 cubic meters of dredged material.
5. The dredged material will be used for the enhancement of the eastern beach on the Emboodhoofushi. The sorted material when spread over the beaches extends the beaches no more than 5 m, well below the limit of the beach extension allowed by the EPA.
6. Reef flat on the eastern side (atoll rim) is well developed with clear and distinct algal ridge. Spur and groove formation is evident all the way across the reef, but more so on the southern side towards Emboodhoofushi. The width of the reef flat (reef crest to beach) is 500-600 m along the proposed area for over-water bungalows. Passed the algal ridge a shallow sandy lagoon extends all the way to the beach. Small isolated patches of coral exist in the area. Dense patches of *Helopora* sp (blue coral) were present close to the breaker zone.
7. Deepening will be done by an excavator which will also have to be used during setting up of the concrete footings (piles) for the over-water villas. The dredged material will be used to enrich the beach of eastern side of the Emboodhoofushi. It is proposed that dredged material be sorted first and appropriate sizes are used for different sections of the beach.

8. Impacts related to the development of over-water villas on the eastern side are due to the dredging and use of the material for the beach enrichment on Emboodhoofushi. The impacts from dredging are direct and immediate loss of bottom habitats and disturbance of fish fauna in the area. Re-suspension of the sediments will occur but is expected to disperse quickly during tidal flushes. Overall the impact from dredging and beach enrichment is considered to be minimal relative to the overall development activities. The monitoring programme was revised to include impacts identified in this supplementary note.

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2 INTRODUCTION

This EIA report arises due to a change in scope of work originally proposed for the development of the tourist resort on Emboodhoofushi and Olhuveli, Dhaalu Atoll. The report has been prepared in order to meet the requirements of the Clause 5 of the Environmental Protection and Preservation Act of Maldives to assess the impacts of the proposed changes and to re-evaluate the over-all project impact from this change in project scope. A scoping meeting between the key stakeholders was held on 18 April 2010 at EPA. The agreed TOR for this change in scope is given in Appendix 1.

The reports looks evaluates the justification of the proposed change and propose alternatives. Impacts arising during development and operations evaluated and mitigation measures have been proposed accordingly.

The Environmental Impact Assessment study for the resort development on the islands was undertaken in two phases during 2008-2009 and the final Decision Note of approval for the EIA was issued the September 2009. The development works of the project started in late 2008 and presently 60% of back-of-the-house buildings for the two islands have been complete

2.1 PROPOSED CHANGE IN SCOPE

The draft layout plan submitted with the EIA shows the over-water bungalows on Olhuveli facing the western side (40 water pool villas and 2 water suites). The developer now proposes to relocate them to the shallow reef-flat on the eastern side. The revised plan approved and endorsed by the Ministry of Tourism, Arts and Culture is given in Appendix 2.

The decision to switch the side for the over-water villas is essentially to make effective use of the existing environmental setting to provide a better tourism product for the guests. The specific reasons for this decision are as follows:

1. **Privacy:** One of the issues raised in the EIA report was potential conflict with the Maaemboodhoo people making use of lagoon (of the western side) as their passage to Kudahuvadhoo. The arrangement of the over-water villas was such that any boat travelling in the lagoon would come very close the villas. The issue is not completely resolved but discussions with Maaemboodhoo people have lead to believe that once the resort becomes fully operational they will have to use the main channel close to Maaemboodhoo. Also the harbor and supply jetties are all located on the western side and therefore the main area of activity of the resort is on the west. The other reason for the decision to place the over-water bungalows on the eastern side was to provide guests a peaceful and quiet environment.
2. **Plans for Water Sport Activities:** The western side of Olhuveli has a relatively deep lagoon (3-5 m) between the reef and shallow lagoon close to the beach. The area is perfect for water-sports such as jet-ski, wind-surfing and banana riding. It was immediately obvious that there will be major issues of privacy, even safety, if the water sports activities are to take place close to the over-water villas.
3. **Noise Level:** Points #1 and #2 all related to the noise. Virtually all guests prefer a quiet and peaceful time during their holidays. In a perception survey undertaken in

Fullmoon Resort prior to a dredging activity for an entrance channel, a large proportion of respondents indicated noise level an issue and wished that activities are restricted only during the mid-day hours. The reef flat on the eastern side wide and faces on the ocean and offers quiet and peaceful vistas. It was considered that eastern side would be ideal of over-water bungalows.

4. **Better vista and uninterrupted horizon:** The eastern side of the Olhuveli has large shallow sandy reef flat / lagoon. Oceanic waves continuously pound on the reef spilling the waves onto the shallow reef flat. The horizon is unending and vistas much better than the noisy western side.
5. **Ease of Construction:** The proposed area is very shallow much lower wave energy compared with the western side. This has implication for ease of construction. Shallow, clam areas with the sandy bottom would face little difficulty in arranging and placement of the pile structure. Favorable conditions on the eastern side would make the construction slightly cheaper as well.

Along with the proposal to relocate the over-water bungalows following other changes are made (Figure 1). The revised layout of the development has been approved by the Ministry of Tourism, Arts and Culture. These changes are:

1. Relocation the over-water villas from western side to the eastern side of Olhuveli
2. Inclusion 6 over-water villas on the north eastern end Olhuveli
3. Inclusion of an underwater bar on the western side of Olhuveli
4. Inclusion of jetty and pavilion on the western side of Olhuveli

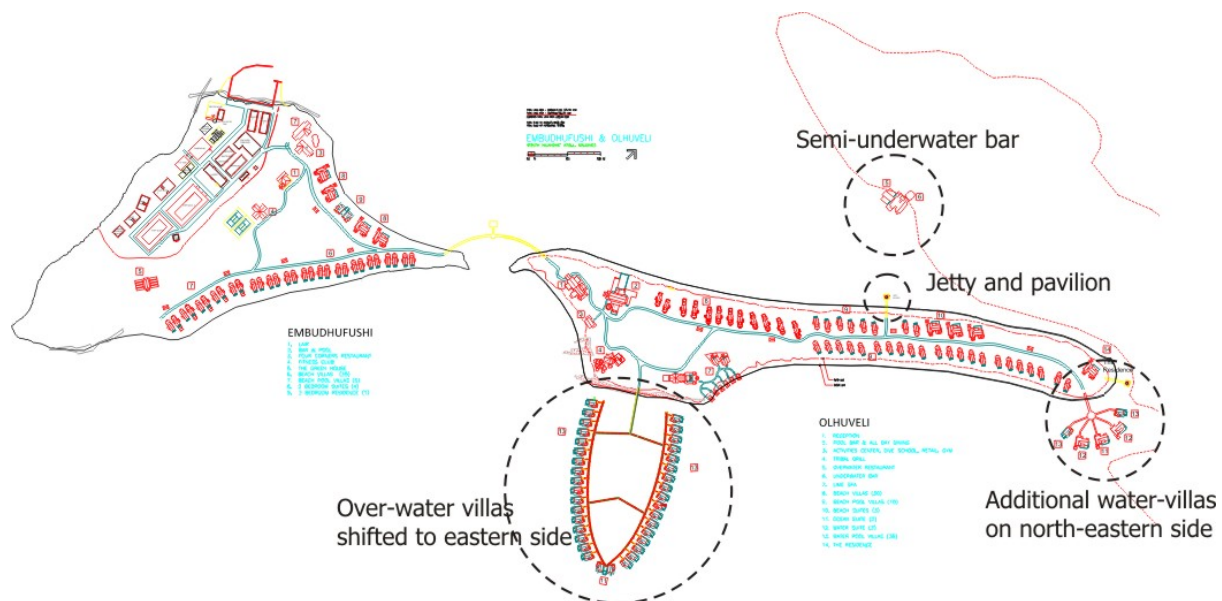


Figure 1: Revised layout plan to show the change in scope in Emboodhoofushi-Olhuveli Project as approved by the Ministry of Tourism, Arts and Culture.

2.2 DEEPENING REQUIREMENT AROUND OVER-WATER VILLAS

Part of the appeal of the over-water villas in the Maldives is that guests have their private swimming area right in front of the villas. It is normal to have stairs leading to the swimming

area on every water-villa. To enable this however, the area has to be deep – about 1.5- 2.0m. Unfortunately the lagoon on the eastern side of Olhuveli is about 0.6m at low tide, dangerously shallow for swimming.

With this change in scope, therefore, the developer is proposing to deepen the area in front of the over-water villas. From air the deepening area will look like a thin strip along the edge of the water-villas. The deepening area will be kept to a minimum, not exceeding to 6 m wide from the edge of the bungalow (Figure 2).

A rough sketch of the proposed area for deepening is given below (Figure 2). The total area to be deepened is about 4,000 sq m. Assuming the required depth is about 1.5 m, and on average 0.5 m of material will have to be removed should produce 2,000 cubic meters of dredged material.

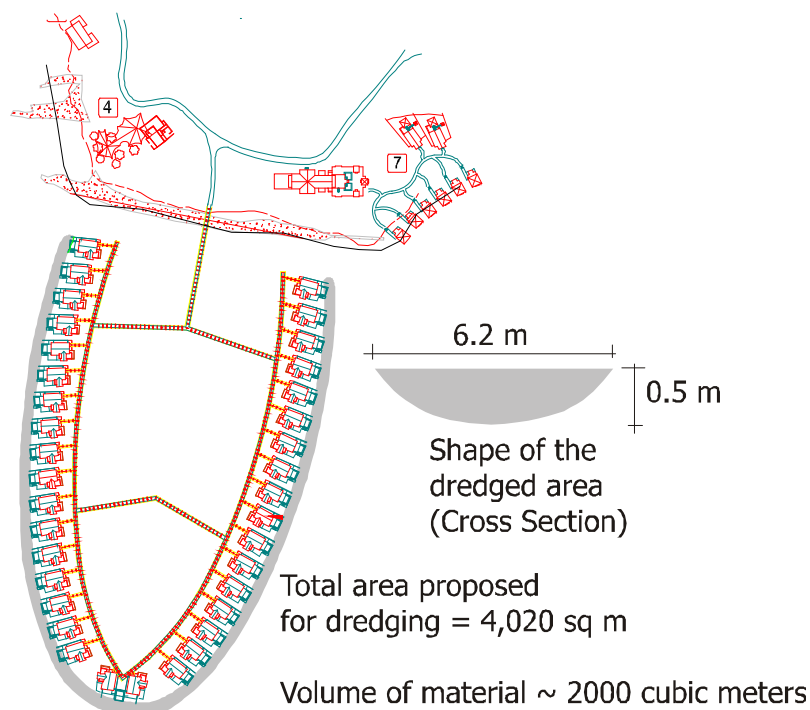


Figure 2: Over-water villas to show the dredged area – a thin strip in front of the over-water bungalows.

The substrate cover of the area is almost entirely of coarse sand, which will be easy to remove. More details on the description of substrate are given in the section on Environmental Description.

The method proposed for deepening is using an excavator. This is the most practical and cost effective method for this type of work. It should be noted construction of the over-water bungalows also requires the use of the excavator (as described in the full EIA report). Excavators are used to deepen the areas for pile footings and also to lift the concrete piles

(stilts) to place in position. Often the excavator and the stilts are transported to the site on a flat-topped barge which has shallow draught.

2.3 USE OF DREDGED MATERIAL

The dredged material will be used to enrich the beach on the eastern side of Emboodhoofushi. The beaches there are not so well developed, particularly on south eastern section of the island. The beach widths on the eastern side of Emboodhoofushi range 2-4 meters, with some exposed rocks, some of them loosely embedded on the sand. This is a common feature on the north-eastern end. Moving towards the south eastern side, the beach is poorly developed. Beach width is narrow with compacted beach rock (Figure 3). A complete description of the beach environment of the islands including the beach profiles were given in the EIA, section 6.5.3, pages 51-56.

It has been estimated that about 2,000 cubic meters of sand will have to be dredged from the area to get the required depth. Assuming the sand is spread to 5 linear meters of beach to 0.5m depth it would cover 800 m of beach. The total length of the beach on the eastern side of Emboodhoofushi is 650 m which should leave 385 cubic meters of excess material. This excess will spread out on the northern section on Emboodhoofushi. EPA guidelines are that beaches may not be extended more than linear 10 m across. This enrichment is well below the limit and should not be a problem.



Figure 3: Eastern beach of Emboodhoofushi; image taken in 2008 (left) and image taken on 25 June 2010.

2.4 TERMS OF REFERENCE

A scoping meeting was held at EPA on 18 April 2010 to discuss the activities that would be undertaken (Appendix 1). The meeting was attended by the consultant, the developer and officials from Ministry of Tourism, Arts and Culture and the Environmental Protection Agency. The main areas that needs to be addressed in the revision should include

1. Descriptive account of the environment where the over-waters will be relocated
2. Likely impacts from the proposed deepening works and how the environmental impacts would be mitigated

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3. Proposed methods of the disposal of the dredged material
4. Re-evaluation of the overall project impact in the light of the proposed change in scopes.

This short report is focused on these three main areas, but will address all the issues identified in the TOR.

3 ENVIRONMENTAL DESCRIPTION

A field visit was made on 26 June 2010. The work undertaken includes:

1. Survey of the proposed area for relocation of the over-water villas
2. Survey of the beaches on both the islands.
3. Assessment of the construction works.

To avoid repetition only material related to this supplementary note are presented here.

3.1 SUBSTRATE COVER

A transect swim across the reef were made taking photographs at every two to three fin strokes. A separate swim was slow made to observe faunal composition and abundance. A selection of the photographic images is shown in Figure 5. Starting from the beach, a shallow sandy area extends some 300 m without much coral cover. The sand is coarse to medium with small pieces of rock / rubble of branching corals. Small patches of isolated corals of *Acropora* sp were also present. On these patches of coral about 60-70% of were dead coral, rest were rock and rubble.

Moving along towards to the reef, some 350 m away from the beach, a large area of blue coral *Heliopora* sp were present. Fish diversity and composition were much higher in *Helopora* beds. The blue coral patches extended up to the boulder zone.

The diversity and abundance of fish fauna is minimal on the sandy area. Lizard fish (Fam: Synodontidae) appear to common. Species belonging to Labridae, Pomacentridae and few Chaetodontidae were seen. The former two families are quite common on shallow reef flats (Table 1).

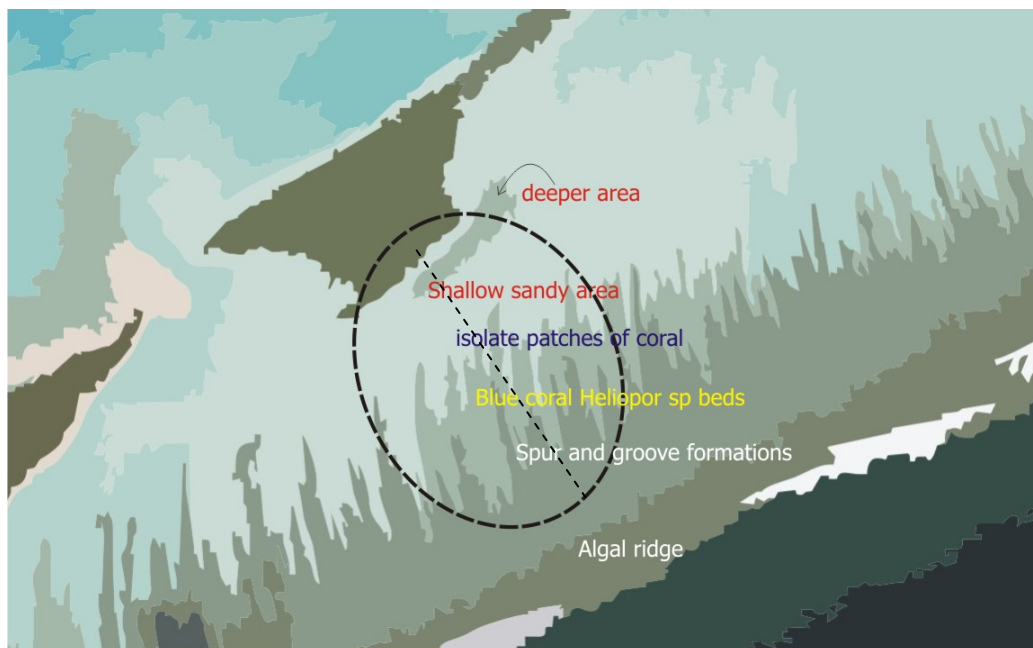


Figure 4: Enhanced image of the area to show different ecological habitats in the proposed area of development on Olhuveli. The survey area is marked with the transect line where photographs were taken.

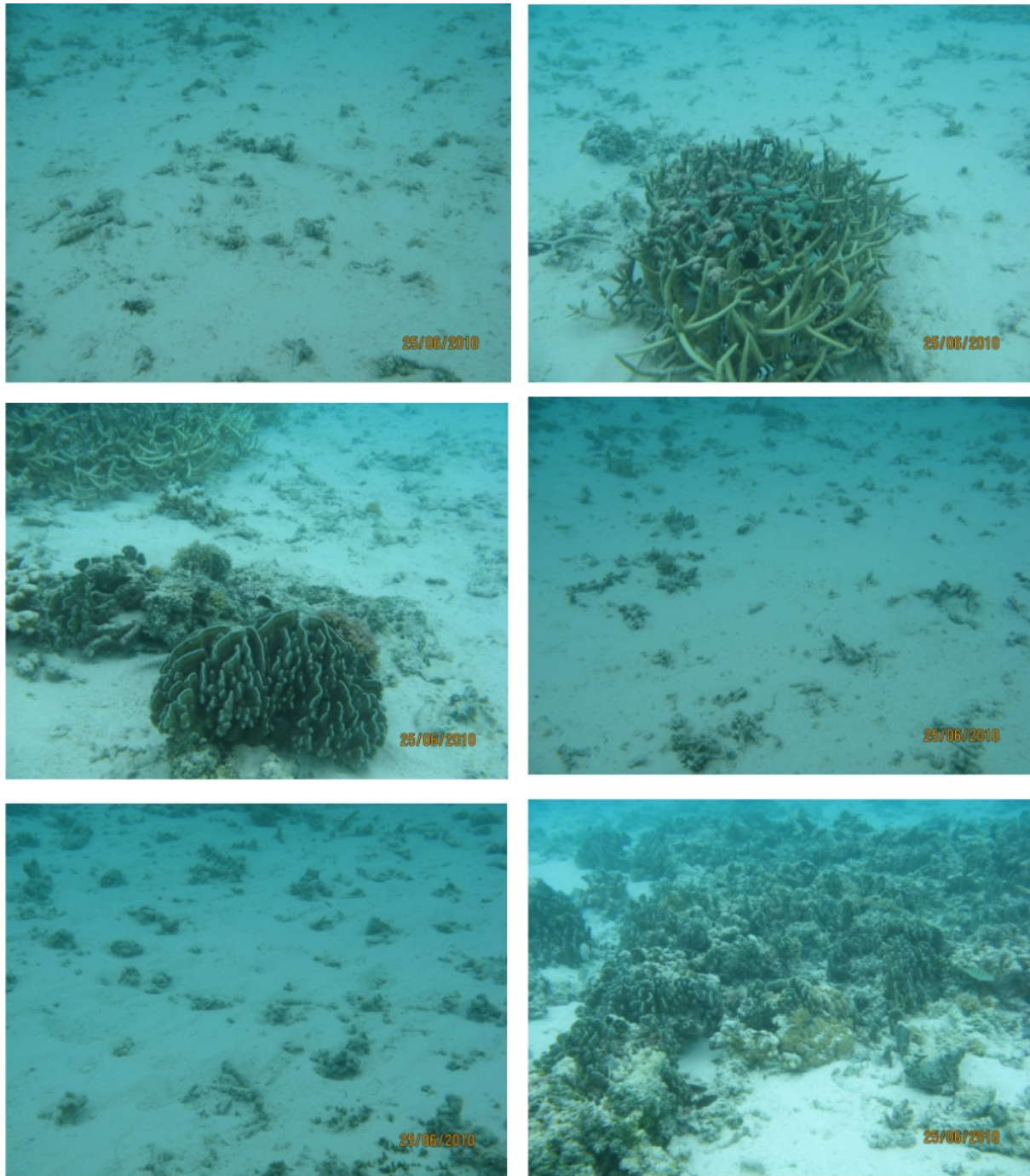


Figure 5: A selection of images taken on transect swim to show the bottom cover of the proposed dredged area on the eastern side of the Olhuveli (26 June 2010).

3.2 BATHYMETRY OF THE AREA

Depth measurements were taken manually (using a stick and measuring the depth) at random. On average the depth of the area is between 0.5 - 0.6 m at low tide. Summary of depth measurements are given in Figure 6. It is obvious that area is relatively flat.



Figure 6: Approximate depth measurements at low tide in the proposed development area (circled).

Table 1: Summary table showing the abundance of fish observed during the swim.

| Family | Abundance score |
|----------------|-----------------|
| Labridae | ***** |
| Pomacentridae | *** |
| Acanthuridae | *** |
| Chaetodontidae | ** |
| Synodontidae | ** |
| Balistidae | * |
| Monoacanthidae | * |
| Tetrodontidae | * |

3.3 WATER QUALITY

The water quality tests were done during July 2009 (Table 2). There is no reason to believe that water quality has deteriorated in the lagoon since then. The water quality tests of the lagoon and channel are normal and no different to water quality of tests undertaken for other resort development projects.

Table 2: Water Quality tests undertaken in Emboodhoofushi-Olhuveli July 2009. The relevant samples for this study are outlined in red.

| | #1: Emboodhoofushi Medhu, Fenvaraa Valhu | #2: Emboodhoofushi Kulhi | #3: Olhuveli (Middle) | #4: Lagoon, Close to proposed jetty | #5: Channel |
|-------------------------|---|--------------------------------------|--|---|------------------|
| Physical Appearance | Pale yellow with suspended solids | Pale yellow with suspended solids | Pale yellow with suspended solids | Clear | Clear |
| Suspended solids | 0 mg/L | -- | 0 mg/L | 1 mg/L | 1 mg/L |
| Salinity | 5300 mg/L | -- | 13000 mg/L | 34500 mg/L | 34500 mg/L |
| Ammonia | 0.55 mg/L | -- | 0.56 mg/L | 0.31 mg/L | 0.32 mg/L |
| pH | 7.4 | -- | 7.6 | 8.3 | 8.3 |
| Electrical conductivity | 9530 μ S/cm | -- | 21800 μ S/cm | 52500 μ S/cm | 52400 μ S/cm |
| Nitrate | 0.0 mg/L | -- | 0.1 mg/L | 0.0 mg/L | 0.0 mg/L |
| Sulphate | 302.5 mg/L | -- | 1010 mg/L | 2975 mg/L | 2995 mg/L |
| Nitrite | 0.008 mg/L | -- | 0.008 mg/L | 0.001 mg/L | 0.001 mg/L |
| Turbidity | 4 NTU | | 5 NTU | 1 NTU | 1 NTU |
| BOD | -- | 34 mg/L | -- | -- | -- |
| COD | -- | 16 mg/L | -- | -- | -- |

PREDICTED IMPACTS AND ITS MITIGATION

This section describes the impacts from the proposed activities, namely the deepening of the proposed area and enrichment of the beach on Emboodhoofushi. Although these are specific activities restricted to specific areas it is likely that that they will have an impact on marine and littoral environments of the eastern side. The extent of the predicted impact footprint is given in Figure 7.

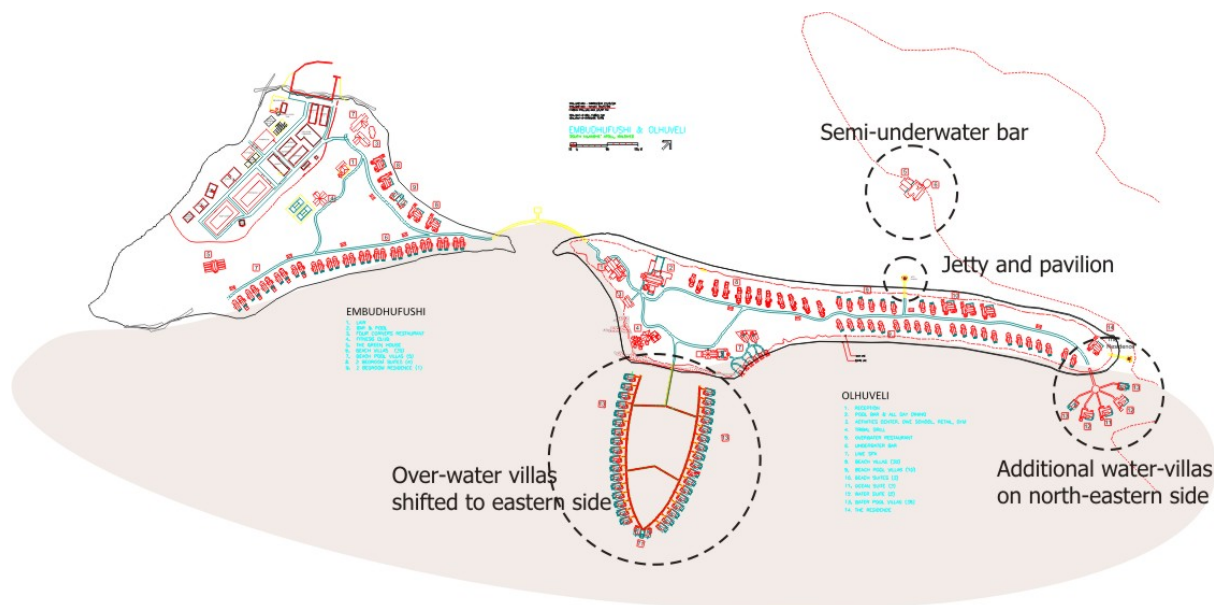


Figure 7: Likely impact footprint area from the proposed activities.

Dredging and beach enrichment are common activities that are almost routinely undertaken in resort development in the Maldives. These have been described in many instances, in almost every EIA reports on resort development.

Coral reefs in the Maldives are homogeneous in nature and therefore much of what's described below are largely based on experiences and outcomes from other similar projects. However, the surveys and assessment of the local environmental conditions help to single out aspects of the environment that stand out in a given reef.

Impacts resulting from proposed activities are based on the following:

1. Technical aspects of the project (activities proposed in the project)
2. Survey of the existing environment (Section 3)
3. Experience and observations on other similar projects in the Maldives
4. Expert opinions of personal in such project developments and assessments

3.4 DEEPENING WORKS

Dredging using an excavator will produce copious amounts of fine sediments which will remain in suspension for short period of time. This cannot be avoided. Experience from other similar dredging activities on reefs suggests that suspended sediments disperse quickly after the dredging stops. Given the small size of the area to be dredged it is considered this method is most suitable for this project. It is also understood that dredging will only take place for about 10 working days. Although dredging will take place on a shallow reef flat protected from the atoll reef where water movements may be restricted it is likely that sediments will diffuse to negligible levels once the dredging stops.

Impacts: Impacts of sedimentation are well known on coral reefs. Corals and coral reef organisms are simply “suffocated” by settling of fine sediments. Loss of habitats for fish and small marine life is possible. Settling fine sediments may create an anoxic layer of soft sediments at the bottom of the lagoon if the area is shallow and with minimal water movement.

It is noted the area has small patches of corals sparsely distributed on the shallow sandy floor. Coral were virtually absent close to the shore – the area where 90% of the footprint of the over-water villas falls. But removal and disturbance of the over 4,000 sq meters of reef flat will have impact on the biota in the region. Fish fauna will be disturbed, but they will swim away and therefore unlikely to be directly affected by the dredging works. Animal that live underneath the sandy floor will be affected. They will be killed in the process. It should be noted the dredge area relative to the total reef flat is insignificant (about 1% of the total reef flat of the reef) and animal population that will get killed is likely to replace within few years or probably even quicker.

Coral reefs are known to have very tight recycling of nutrient due to its large diversity of animals with diverse life histories. Dredging will release amounts of nutrients (nitrates and phosphates, silicates) that would be help to increase productivity in the area in the short term. Sediments on the reef flat were coarse and therefore duration of their suspension in the water column will be limited.

Mitigation: Dredging (or excavation) should be carried out from an excavator mounted on flat-top barge. The material should be kept on barge itself for transporting back to the shore as required. The transport should ensure dredge spoil is not released into the lagoon.

In order to avoid the seepage of fines into the lagoon, piling of the dredged material may be placed high on the beach. Seepages may also occur during the sorting and sieving of the material and re-transporting of the larger material. Close supervision of this work is important to ensure sound environmental practice is maintained in the work flow.

3.5 BEACH ENRICHMENT

Studies on responses of shorelines to seasonal climate oscillations have shown that reefs in Maldives are quite dynamic (Kench and Brander, 2006)¹. The dynamicity is highly variable depending on the shape and orientation of the islands. In general elongate island with pointed beach areas when oriented off-axis to the main direction of the prevailing wind may show quite large seasonal shifts in shorelines. The islands are oriented to NE_SW axis which is more or less direction of the wind (see Figure 9, page 45, for L. Kadhdhoo wind data in the EIA report). Accordingly both Emboodhoofushi and Olhuveli may be considered as islands that do not undergo marked seasonal shifts in beaches². It should be noted that this observation may not be entirely applicable to islands on atoll reefs such as Emboodhoofushi and Olhuveli which experience strong oceanic swells from south. In this case the wave energy on the reef flat may be dominated by swell driven waves rather than wind driven waves which are more seasonal influence the sediment depositional environments.

The eastern side of the Emboodhoofushi is quite dynamic owing to the high energy waves reaching the beach. The wave energy is stronger as one move further south and south western corner. A well developed ridge on the southern side of the Emboodhoofushi is evident followed spur and groove formations moving along the north (Figure 8). These are features that are effective in dissipating the wave energy reaching the beaches.



Figure 8: Images of Emboodhoofushi southern corner (left) and Emboodhoofushi and a section of Olhuveli (right) to show features (well developed ridge and spur and groove formations) on reef flat that shows the levels of wave energy experienced on the beach (images taken in February 2008 by the Proponent)

The grain size of the sand that is used for beach enrichment is important. It is normal practice to ensure that grain size of the borrowed sand match with the grain size of the on the beach under questions. Grain size increases rapidly as one move from north to south on eastern side of the Emboodhoofushi.

¹ Kench, Paul and Brander, Robert W (2006). Response of reef island shorelines to seasonal climate oscillations: South Maalhosmadulu atoll, Maldives. *Journal of Geophysical Research*, Vol III. F01001, doi: 1029/2005JF000323, 226.

² The northern tip of the Olhuveli is pointed and it was noticed that northeastern tip has sand spit that moves with the season

This suggest that sorting of the sand is important before the beach enrichment. Fortunately the sand on the reef flat is not medium coarse to coarse which is likely to be suitable for northern section. Coarser and rubble sand is appropriate for the southern section of the beach.

Impacts: The slope and extent (width) of the beach on islands is dictated, among other things, by the prevailing wave energy – the tractive forces that are important for creating the depositional environments and beach sorting. Extension of the beaches by artificial enrichment may disrupt the balance in the sediment depositional rates. It is important to enrich the beach with the right grain size. Too small a grain size would result losing all material to sea and too large size would results in obstruction of the wave energy and therefore diversion of that energy to other areas.

In practice it is almost impossible to enrich with perfectly right size grain. Therefore there will always be some sediment that gets washed away and create the sediment plume. It is unlikely that the plume persist for extended periods of time and thus the impact will be only be short term. In the case of the Emboodhoofushi, ideally one would want to have slightly large grain size so that they do not get washed away.

Emboodhoofushi-Olhuveli is currently being developed. Both islands were uninhabited with little or no human intervention for a long period. Beach enrichment on Emboodhoofushi is only relatively minor development activity compared to, for instance, the development of harbour. It is therefore almost impossible to accurately predict impacts from different activities. It is therefore important to have adequate monitoring mechanism established following the development phase.

Mitigation: Sediments should be sorted before being deposited on the beach. In order to avoid seepage and retain maximum amount it is therefore recommended to deposit fines to coarse sediment on the northern end and more coarser material on the southern end.

4 ALTERNATIVES

Resort development process in the Maldives starts with selection of the islands by the Government. Once an island is awarded a commitment is already made by the developer and the Government for the development to take place. EIA process always comes after the island selection and awarding process. Thus strategic environmental assessment does not yet exist in the Maldives.

More recently the Ministry of Tourism, Art and Culture, the resort regulator has initiated a more formal process of ‘approving the resort development concept’ - the layout of the resort infrastructure, before the proper examination of the environment.

These two approval process actually limit what the EIA exercise can propose in terms of alternatives to development.

In the EIA report submitted in 2009 for the development of Emboodhoofushi and Olhuveli some alternatives were proposed. One of the options provided in the EIA report was to have the over-water villas on the eastern side. The area is much calmer, shallower and so constructions would be much easier.

Several alternatives layouts may be proposed. An arrangement along the beach would block the view of the horizon and from the beach front bungalows whereas perpendicular extension across the reef may requires having the pile footings on areas of high coral cover.

Over-water bungalows are prime features of Maldives’ tourism and it now a must-have feature in high end resorts. It adds value to the tourism product and therefore managements are able sell those beds at significantly higher rates.

There are few islands where construction of over-water bungalows is an issue. In general the environmental impact of its construction and operations is considered to be insignificant. The impact during the construction phase is minimized through judicious management of logistics and adopting sound, but simple, environmental standards.

The area proposed for the over-water development is an ideal setting. It is shallow and therefore easy for construction. The bottom is clear of corals and boulders and should not pose any problems during the setting up of the piles.

An alternative to the decision by the developer would be to have it on Emboodhoofushi side or move to the northern end of the Olhuveli. The former is not a good choice because of the increased wave energy and amount of coral on the reef flat. The latter is not ideal because the northern end of the Olhuveli is much deeper would be difficult for construction works.

5 MONITORING AND FOLLOW UP

Environmental monitoring is an important part of the development and operational phase of the development project. Monitoring is often intended to demonstrate that the implemented management practice is delivering the expected environmental performance. Monitoring is particularly important to further reduce uncertainty for a specific project or for evaluation of management practices. Monitoring is the first step in determining whether corrective actions will be necessary to ensure the required outcomes.

The Maldives does not have adequate regulatory and legal framework and environmental performance standards for activities such as dredging and reclamations (beach enrichment) activities. In its absence and with limited resources only post-development monitoring is undertaken

The monitoring programme proposed here is an extension of the activities proposed the EIA document submitted in 2009. Emphasis here is given to areas on Olhuveli and Emboodhoofushi that area likely to be impacted from the change in scope of the project. Monitoring reports should be submitted to EPA at the intervals given in the table below.

The revised monitoring programme is as follows:

| Parameter | Frequency of Monitoring / Locations | Approximate cost of monitoring & reporting per event/ Responsibility |
|---|--|--|
| Substrate cover (live coral, dead coral, rock, rubble, sand) | Once every three months 50 m on each side around channel clearance area; After that depending on favorable outcome once every six months | US\$ 250.00; Proponent |
| Fish Census | Once every three months along the same transects established to measure benthic cover. | US\$ 250.00 Proponent |
| Water Quality (Nitrate, Nitrite, Phosphorus, Ammonia, faecal coliforms) | Once every three months; after that once every six months | US\$ 150; proponent |
| Beach profiles / beach line (high and low water) and vegetation lines | Once every three months for the first year from the start of operational phase; following that once every six months. The area of coverage should include the entire perimeter of the islands. | US\$ 1000.00; Proponent |

6 APPENDICES

1. Appendix 1: Approved TOR for the change in scope
2. Appendix 2: Revised layout plan for the resort.
3. Appendix 3: Commitment letter from the management of the resort