First Addendum

ENVIRONMENTAL IMPACT ASSESSMENT

For the Proposed Sewerage System

Hulhudheli

Dhaalu Atoll, Maldives

Proponent: Ministry of Environment and Energy

Sandcays

July 2016

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Consultant Declaration

This first addendum to the proposed sewerage system for Dh. Hulhudheli has been prepared according to the EIA Regulations 2012. I certify that the statements in this Environmental Impact Assessment study are true, complete and correct to the best of my knowledge and abilities.

Ahmed Zahid

Consultant Registration No. EIA 08/07

Proponent's Declaration

On behalf of the Proponent, I guarantee that I have read the report thoroughly and that to the best of my knowledge all information provided here is accurate and complete.

Ministry of Environment and Energy

Executive Summary

This report addresses the environmental concerns of the proposed changes to the vegetation clearance component in the vegetated areas of the island, the details of which were not provided in the original EIA for the Proposed Sewerage System in Dh. Hulhudheli.

During the construction phase it was found necessary to remove some vegetation, which had not been considered in the initial planning and design. In order to provide some of the newly registered plots with sewerage connections, the pipe network in these areas required vegetation clearance consisting mainly of coconut palms.

Compensation has to be paid for some of the trees which are owned by the community. Therefore, a special announcement was made by the Council and only 2 members of the community claimed ownership of 2 coconut palms. According to the Council, they would make the necessary arrangements to pay compensation to these 2 parties. Since the trees in consideration being mature coconut palms with a few younger palms, the younger palms will be replanted and the rest will be used for timber wood. For each tree that is cut down, two trees will be planted in the newly reclaimed area where extensive plantation of coconut palms have been already carried out by the community in the recent past.

Therefore, the proposed vegetation clearance would not have any additional impacts and no additional mitigation measures would be necessary. There are also no additional requirements for monitoring. However, the number of coconut palms cut down and those transplanted as well as the number of coconuts planted as compensation will be included within the revised monitoring programme provided in this report.

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މިރިޕޯޓަކީ ދ. ހުޅުދެލީގައި މިހާރު ހިންގަމުން ގެންދާ ނަރުދަމާގެ ނިޒާމުގެ ސަބަބުން ތިމާވެށްޓަށް އަސަރު ކުރާނެ މިންވަރު ބަޔާންކުރާ ރިޕޯޓުގައި ހިމެނިފައިނުވާ ބައެއް ކަންކަން ނިޒާމުގެ ސަބަބުން ތިމާވެށްޓަށް އަސަރު ބަޔާންކުރުމުގެ ގޮތުން ތައްޔާރުކުރެވިފައިވާ ރިޕޯޓެކެވެ.

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1 Introduction

This is the First addendum to EIA report for the proposed Sewerage system at Dhaalu Hulhudheli. This Addendum covers the vegetation clearance which was identified in the construction phase and were not included in the initial sewerage system design. However, the EIA did consider the need to "make access to areas where work will be carried out (e.g. locations for pump stations)" and estimated only a few coconut palms and vegetation would require to be removed. During the construction phase, in order to provide some of the newly registered plots, the pipe network in these areas required vegetation clearance comprising mainly of coconut palms.

The findings of this report are based on the EIA for the proposed sewerage project in Hulhudheli. This report has been prepared in accordance with the EIA Regulations 2012.

The impact matrices that have been done for the EIA report had considered the impacts of the vegetation clearance and given that there are no major changes in the impacts the matrices remain the same.

2 Project Description

2.1 Project Proponent

The Proponent is the same as that given in the EIA report, i.e. Ministry of Environment and Energy.

2.2 Project Location and Boundaries

The project takes place at Hulhudheli, Dhaalu Atoll, Maldives. The details of location have been provided in the EIA report. The vegetation clearance needs to be done on the southern side mainly to the east as shown in Figure 2-1. The project boundary include the areas shown in the Figure 2-1.

2.3 The Project

The project, as described in the EIA report, involves development of sewerage system at Dhaalu Hulhudheli where pump station locations and vegetation on the road needs to be cleared before excavation for laying of the main pipelines based on the existing road network, which is cleared of vegetation. During the construction phase, in order to provide some of the newly registered plots, the pipe network in these areas required vegetation clearance comprising mainly of coconut palms.

The proposed change involves the removal of 34 coconut palms and 5 on the roads at the periphery of the existing built-up area from where new plots have been allocated. These areas have mature trees which have been kept as there is no proper road yet.

The machinery required for the project are currently on site as the main project is underway and nearing completion. The trees will be removed using excavator and moved to a stockpile location on the east of the harbour. The trees will be used for wood except for the few that would be transplanted in the island. The leaves would be taken and placed at the wooded area on the west of the island. The Contractor, MTCC, currently at site, will take the remaining green waste during demobilization for disposal at Thilafushi.

The holes made by removal of the trees would be filled by using excess sand from pump station location or piping works and any additional sand will be taken from the island lagoon

at the location(s) shown in Figure 2-1. The volume of sand required is very small; estimated at 250m^3. Only a fraction of this will have to be taken from the lagoon.

The project is expected to take about 3 months to complete the removal of trees and laying of pipe network.

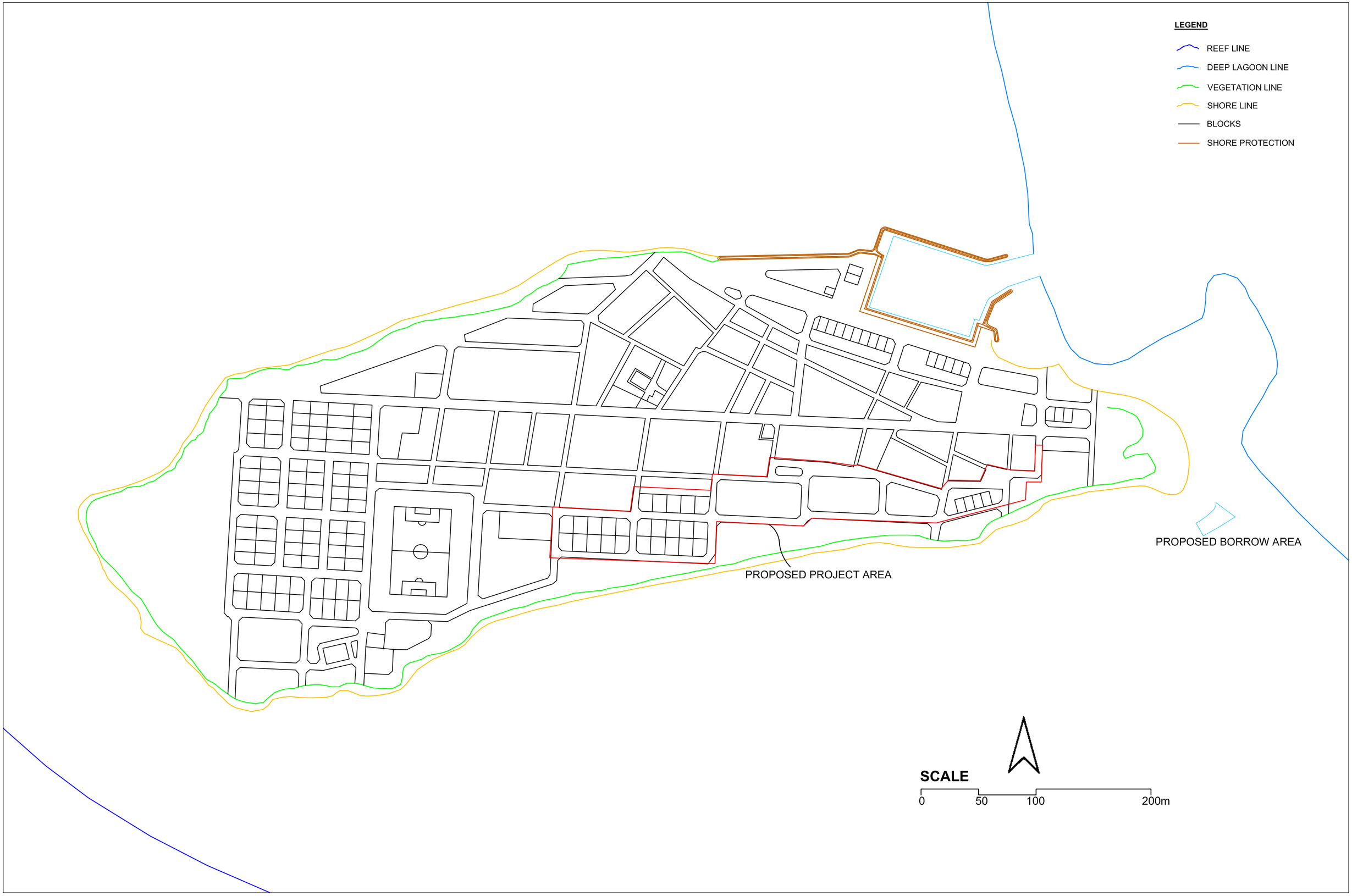
The following measures will be taken to protect environmental values during tree removal and waste disposal.

- Trees removed will be disposed at a convenient location close to the harbour and away from residential areas to minimize disturbance due to noise during sawing or cutting of wooded parts of the trees. The disposal location is the eastern end of the island and would minimize dust and noise in the island as the works are undertaken during the southwest monsoon.
- As many trees as possible will be transplanted in an appropriate location in the island.
- The small volume of sand required will be taken from an area as far from the beach as possible to minimize any possible erosion subsequent to the works. Deep holes will be avoided.

2.4 Need and justification

Building plots have been recently allocated in the peripheral areas where mature trees have been kept after removing undergrowth and smaller trees. These are roads through which the proposed sewerage pipe network would be laid for the new plots. Since these plots have been allocated, it is imperative that the sewerage network is laid in these areas while the work is ongoing. Therefore, it is required to remove the matures trees from their roots and clear the areas for laying the pipes. Only those plants that fall in the way of the pipes will be removed and no other vegetation would be cleared.

Figure 2-1: Proposed project plan



3 Existing Environment

The existing environment of the island has been discussed in detail in the EIA report. This report will focus on the relevant project areas, i.e. the trees that will be removed and water quality from the vicinity of the project sites.

3.1 Field surveys

3.1.1 Flora and fauna

There is a total of 34 coconut palms (*Cocos nucifera*) and 5 mature tulip trees (*Thespesia populnea* or locally known as *hirundhu*) in the affected area. Most of these trees would be cut down while a few not so mature (about 8 to 12m high) coconut palms would be transplanted to the reclaimed area close to the beach. According to the Council, the trees that are cut down would be auctioned as wood to local people or sold to other parties who may be interested in buying the trees for wood.

The location of the coconut trees and tulip trees marked for removal have been mapped using handheld GPS. The locations are shown in Figure 3-1.

There are no protected trees in the project area. There is also no significant flora in the area except the palms and tulip trees. There is also no significant fauna in the project area. All project areas are devoid of vegetation except for the palm trees and few mature trees.

3.1.2 Water quality

Water quality at the site was measured using handheld water quality meter. The readings are given in the table below. These are provided as baseline data for the purpose of this report. Water quality was measured from groundwater wells in 3 representative locations of the island.

Ground water quality has no direct link with the proposed project components. However, it has relevance to the proposed sewerage system. The results given here would help understand specific changes in the salinity levels of the groundwater lens of the island with reference to the baseline data given in the EIA report. However, it shall be noted that the reading given here are taken during the rainy season following a considerable amount of rainfall and may not represent an accurate analysis if compared. Long term data would be necessary.

Table 3-1: Ground water quality results

	Units	Site 1	Site 2	Site 3
Coordinates	UTM	260722.92m E 316170.25m N	260583.86m E 316164.82m N	260509.34m E 316221.13m N
Temperature	ºC	31.54	29.46	29.94
pH		8.39	8.74	8.71
Electrical conductivity	µS/cm	882	1112	1221
Total dissolved solids	mg/l	574	723	794
Dissolved oxygen	mg/l	6.71	2.63	3.51

3.1.3 Consultations

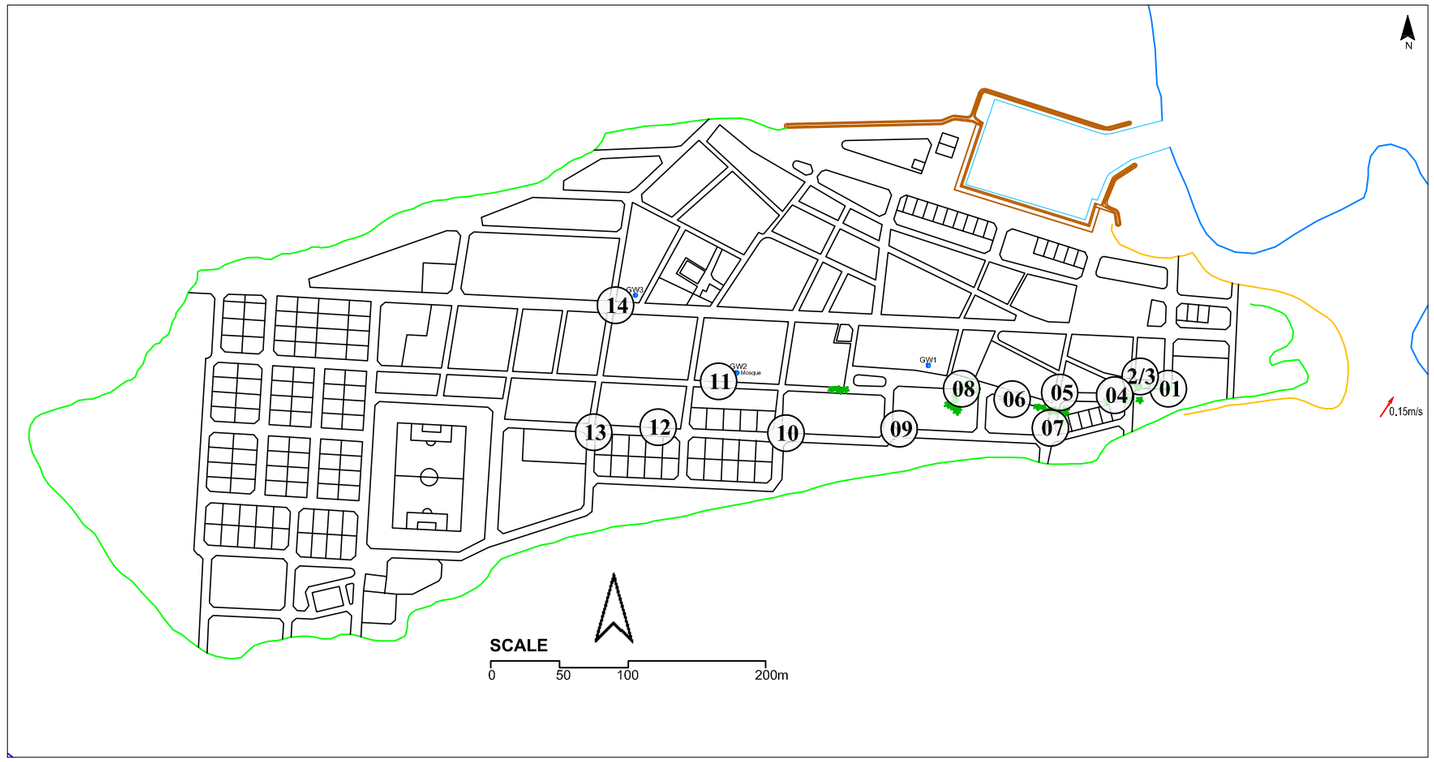
A scoping meeting was considered unnecessary due to the small scope of the project. Therefore, EPA issued a final Terms of Reference following the application for environmental assessment.

Discussions were held with the Council members who participated with the team during the field visit. They showed the project location, where the Council had marked all the trees that required removal. The Councillors also informed that they have made a public announcement requiring those who own any of the trees to inform the Council and only 2 parties declared their ownership of one coconut tree each. According to the Councillors, the Council will make the necessary arrangements to settle compensation for these two parties.

The Council also indicated that the purpose of this additional component of the sewerage project is to ensure that those who have been allocated lots in the area would have sewerage connections too. However, they also identified that these new users would not have the free connection which is currently being provided under the agreement with the Contractor and would have to pay for the connections.

Figure 3-1: Survey locations

Figure 3-2: Photographic summary of the project areas



4 Legislative and regulatory considerations

The proposed component of the sewerage project involves the cutting down or removal of mature vegetation in the project area. Therefore, the Regulation on Felling, Uprooting and Transplantation of Mature Trees and Law on Trees in Inhabited Islands are of specific relevance to the project. The Dredging and Reclamation Regulation of the Maldives is also of some relevance.

4.1 Relevant regulations

4.1.1 Regulation on Felling, Uprooting and Transplantation of Mature Trees

This Regulation was implemented on 1 February 2006 by the then Ministry of Environment, Energy and Water. The Regulation on the Felling, Uprooting and Transplantation of Mature Trees was enforced to ensure that large scale felling or transplantation of trees are undertaken in a manner in which landuse, pest control and other environmental issues such as leftover dug holes are dealt with appropriately. The regulation states that the felling, uprooting, and transplantation of mature trees and coconut palms from one island to another can only be done if it is absolutely necessary and there is no other alternative. It further states that for every tree (including coconut palm) removed from any island two trees should be planted and grown on the same island.

The Regulation prohibits the removal of the following vegetation areas and types:

- The coastal vegetation growing around the islands extending to about 15 meters into the island;
- All the trees and palms growing in mangrove and wetlands spreading to 15 meters of land area;
- All the trees that are in a protected area;
- Trees that are being protected by the Government in order to protect species of animal/organisms that live in such trees;
- Trees/palms that is abnormal in structure.

This Regulation is of relevance to this project and shall be clearly followed in all aspects of the project. It is recommended that the Project Manager be familiar with the contents of this regulation. The overall project execution work has to be carried out in line with this Regulation. As such some of the mitigation measures proposed in this report are requirements

of this Regulation and shall be strictly adhered to. This EIA itself is a requirement of this Regulation, wherein Clause 5a of the Regulation states that any project(s) that would require the indiscriminate removal and transplantation of trees/palms from one island to another is required to proceed after an Environment Impact Assessment Report has been approved.

Clause 7 of the Regulation states that the Ministry of Environment would decide the number of trees that can be removed based on the number and type of vegetation on the island. Clause 8 states that if more than ten coconut palms measuring above 15feet height above ground is to be felled or removed from an island, permission should be sought from the Ministry of Environment whereas for smaller palms permission from the Island Office shall be sought. In the latter case, only less than a third of the trees in the area can be felled or removed. Clause 5(e) states that the roots of coconut palms measuring above 15feet should be cleared of sand before moving from its original location to another location. Clause 5(f) states that only those trees that are proposed to be removed shall be removed and no other trees (mature) shall be affected during the removal process. Clause 9 states that the holes created from uprooting of trees shall be covered with sand or soil *only* and made firm and level.

4.1.2 Law on Trees in Inhabited Islands

The above Regulation specifically states that it does not apply to the scope of provisions in Law No. 21/98 (Law on Trees in Inhabited Islands). Clause 11b of the Law on Trees in Inhabited Islands (Law No. 21/98) is of specific relevance to this project. It states that felling or removal of trees outside house plots, which have not been declared to be protected by the Government, is allowed only if it is removed with its roots, i.e. carefully uprooted.

4.1.3 Dredging and Reclamation Regulations

The Dredging and Reclamation Regulations was gazetted on 2 April 2013 as Regulation No. 2013/R-15. Clause 6 of the Regulation requires applying for approval under this Regulation by submitting the project details, land use plan, project justification and scaled maps of existing site plan -and site plan with proposed project components. For this project, the dredging and reclamation approval is not required due to the small scale of excavation.

5 Environmental Impacts and Mitigation Measures

The following account describes potential environmental impacts that will be associated with the proposed vegetation clearance in areas requiring new sewerage connections, both during construction and operation phases. The impact matrices that have been given in the original EIA report are still relevant. The following section discusses the direct, indirect and cumulative impacts related to the project with their magnitude, significance, duration and spatial extent.

5.1 Impacts related to the proposed components

The proposed project has a net negative impact due to removal of trees, the holes that remain at the location of the removed trees and some sedimentation impacts and hydrodynamic changes due to the excavation of sand from the lagoon for filling the holes. These impacts are discussed in some detail in the following sections.

Table 5-1: Simple impact matrix for the proposed components

Impact	Direct/ indirect/ cumulative	Magnitude	Significance	Duration	Spatial extent
Loss of wooded trees	Direct	Moderate negative	Low	Long term	Island specific
Impact on carbon sequestration from trees	Direct	Minor negative	Low	Medium term	Global
Loss of habitat for fauna	Direct	Negligible	Insignificant	Shor term	Island specific
Sedimentation due to excavation of fill material		Negligible	Insignificant	Short term	Location specific
Loss of aesthetic and health benefits from trees	Direct	Minor negative	Low	Medium term	Location specific

5.1.1 Removal of trees

Trees provide oxygen and helps in maintaining carbon balance by carbon sequestration. Mature trees have a high degree of carbon stored in them. They also have a good degree of carbon absorption and carbon sequestration in the leaves that grow and fall. As long as they photosynthesize this process continues.

Furthermore, trees provide shade and act as wind breakers, which are important for human well-being, especially in a tropical climate. It is also economically important in its use in building and construction. Therefore, trees play an important ecological and social function.

Carbon sequestration or the process by which trees, oceans or other natural reservoirs or carbon sinks remove carbon dioxide from the atmosphere, is the primary process that helps to maintain the natural balance and minimize the effects of global warming and climate change. Carbon sequestration is the process by which CO_2 is transformed into above- and below ground biomass and stored as carbon.

Trees play an important role and the Kyoto Protocol promotes the use of trees for offsetting carbon emissions. As one of the first countries to ratify the Kyoto Protocol and as the first country to initiate the difficult goal of achieving carbon neutrality by 2020, the Maldives would have every reason to protect and preserve its wooded areas.

Once trees die or are cut down, they begin to decompose and return stored carbon to the atmosphere. The rate of decomposition differs greatly based on the fate of the wood. Wood from coconut trees can be salvaged for use in wood products which can survive for over 100 years before gradually decomposing. This is one of the few reasons why new plantings with coconut trees under this project would have a profound positive impact and this is considered as one of the most important mitigation measures while it is also a legal requirement under the Regulation on Felling, Uprooting and Transplantation of Mature Trees.

The 34 coconut trees and 5 tulip trees to be removed under the project would sequester about 3.5tonnes of CO_2 annually, which represents a small fraction of the total CO_2 emissions of the island. Considering that the transplanted trees do not necessarily provide additional carbon sequestration, it is important to consider the annual carbon sequestration from the new trees that have been and would be planted at Hulhudheli. These are expected to offset a large percentage of carbon dioxide emissions from the island in the future.

5.1.2 Holes from uprooting

Holes that are left after the uprooting process has been identified as a major issue related to tree removal or transplantation projects. This has to be appropriately dealt with. The proposed removal of trees would result in 39 dug holes or pits. There are impacts related to the holes if they are left untreated. These include mosquito breeding in these holes following rain and public safety as people may fall into these holes after rain and even under low light conditions. Vehicular movements and safety would also be affected. For this reason, the Regulation on the Felling and Transplantation of Mature Trees require that such holes be backfilled and compacted.

5.1.3 Sand to cover holes left after tree removal

Since the Regulation on Tree Transplantation requires that the holes shall be backfilled with sand, it is proposed to dredge approximately 250m^3 of sand from the island lagoon on the southeastern end where there is a sandspit and provides adequate conditions for getting the small volume of sand required at low tide. Alternatively, the material can be taken from the harbour. The impacts of this are considered to be almost negligible as sedimentation would be low, site specific and short term. This area also has some growth of seagrass, the removal of which at this sand spit area would improve the aesthetics of this area while it helps to condition the soil that goes into the ground. The sand can be placed immediately at the location of fill without having to remove the salt as it would be dry and would not negatively affect the freshwater lens owing to the small volume of sand.

5.1.4 Transplantation of trees

The transplantation of any palm trees that can be transplanted helps to preserve the trees. This helps to offset the negative impacts of tree removal. Given that there would be zero mortality of the palm trees in their new environment, it is important to transplant as many trees as possible. In addition, branches of the tulip (*hirundhu*) trees can also be planted in other locations.

If coconut trees were to be transplanted, according to Pittenger et al (2005), a rootball of 12-inch radius is adequate for the survival of any palm. Therefore, the trees should be dug from around two or three feet from the trunk. It is also important to make sure that prior to digging, the soil around the root system is thoroughly wetted to help keep the root ball together (pinknursery.com; Meerow and Broschat 1997). The rootball shall be kept wet at all times during transport and replanting at the new site.

It is also important to ensure that the transplant location has holes that are ready by the time the trees are transported to site. When planting, it is necessary to carefully set root ball into hole and back fill with original soil and not add any organic matter to backfill, so the new transplant can adapt more quickly to its surrounding native soil. It is also important to keep the transplanted tree wet by spraying water on it including the tree trunk during the first few days of transplantation. It would be necessary to ensure that the transplanted palm is watered regularly and protected from shakes or other impacts (by wooden bracing, for instance) for about four months or until the roots begin to spread out again.

5.1.5 Impacts on groundwater quality

As stated earlier, the only impact on groundwater quality would be that of the salty nature of the infill at the location of the removed trees. This is not a significant impact due to the small volume of fill at each hole or each location.

5.1.6 Social impacts

There are no major social impacts. Noise is not of significance due to the intermittent nature of works and the short duration. There have been no major concerns related to dust and noise during the installation of pipe works so far, and the community is pleased that the project is nearing completion.

The potential issue of ownership of coconut trees have already been taken care of by the island council. The Council will make compensation for the two parties who have acknowledged their ownership of the two coconut palms.

5.2 Uncertainties

There are no uncertainties in the data, however, there may be uncertainties in impacts. The degree of uncertainty lies with some of the social components, however, would be small if any. This impact would be better understood within the proposed monitoring programme.

5.3 Mitigation Measures

There are very few mitigation measures that apply specifically to the proposed components. These measures listed below would not incur significant additional project costs and will be undertaken in coordination with the Council, the Proponent and the Contractor.

1. Undertake the dredging or excavation of sand at low tide and at a considerable distance from the beach.

2. The dredge area should be kept at a similar depth as the surrounding without making the area too deep. This would allow the area to come to equilibrium quickly and without significantly affecting the nearshore sediment regime.

3. Plant 2 coconuts for each tree felled and transplant as many palms as possible.

6 Environmental Monitoring

The monitoring programme given in the EIA report is considered sufficient to cover the data needed to assess impacts from the proposed component as there were no additional major components to the project. However, no. of trees removed, no. transplanted and fate of trees felled has been incorporated in the revised monitoring programme given in this report.

It is also recommended to undertake monitoring at the end of the construction phase and to include the bathymetry of the area dredged under this project and its surrounding within the end of construction monitoring programme.

Table 6-1: Revised monitoring programme

No.	Indicator/locations	Parameters to be monitored	Frequency and duration	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	Total	Rate (RF)	Total (RF)
1	Marine water quality (outfall location and control)	Water quality: DO, pH, Turbidity, TSS, Hydrogen sulphide, BOD, COD	Every six months	2						2						4	750.00	**3,000.00**
2	Marine life/biodiversity (2 locations: Outfall location and control used in EIA)	Live coral cover and fish survey - Photo quadrates/LIT and fish survey	Every six months	2						2						4	450.00	**1,800.00**
	Bathymetry of the area dredged for sand to fill holes from tree removal	Depth (bathymetry)	At the end of construction	1												1	1,500.00	**1,500.00**
3	Currents/hydrodynamics (4 locations close to outfall location)	Drogue tracks	Every three months for one year	4			4			4			4			16	300.00	**4,800.00**
4	Groundwater quality (including those locations provided in the Addendum)	Water quality: temperature, pH, salinity/TDS/EC, dissolved oxygen, hydrogen sulphide, nitrate, phosphate, total and faecal coliform	Once a year	10												10	1,125.00	**11,250.00**
5	Tree removal under the project	No. and type of plants removed/transplanted	At the end of construction	1												1	-	**-**
6	Air quality at pump station, middle of island and northern end of island (3 locations)	Hydrogen sulphide, ammonia (optional)	Every three months	3			3			3			3			12	375.00	**4,500.00**
7	Fuel and energy data	Total monthly fuel use, energy production	Daily statistics (regularly collected by operator)													0	-	**-**
8	Annual Monitoring Report														1	1	7,500.00	**7,500.00**
TOTAL																		**34,350.00**

Note:

M indicates Month

7 Conclusions

The proposed removal of 34 coconut palms and 5 tulip trees on the new roads where sewerage pipeline of Dh. Hulhudheli is to be laid involves the removal from the roots of the trees. Most of these trees would be felled and auctioned as wood for local builders or other parties who may be interested in buying the wood while any palms that can be transplanted would be transplanted in the island. Most of the trees are quite old and may not be suitable for transplanting.

There are no environmental impacts of significance from the proposed components under the sewerage project. The impacts are mainly related to changes in the natural environment including the loss of carbon sequestration from the trees. The ownership of the trees have been confirmed by the Council and Council would make compensation for two coconut trees that belong to two particular individuals. Due to the small magnitude and low significance of the impact, no major mitigation measures have been proposed. It has been recommended, as per the requirements of the Regulation, to cover the holes left after removing the trees with sand excavated from the island lagoon. The amount of sand required is small and does not constitute a major cost. The Contractor would undertake this component within the current scope of works without additional costs. During the dredging, it is recommended to undertake the excavation at low tide and at over 30m from the shoreline and to keep depths shallow.

The monitoring programme has been slightly revised to include monitoring of the bathymetry of the excavated area and its surrounding and the numbers of plants removed, transplanted and the fate of the green waste to be included in the monitoring report.

8 Bibliography

http://www.pinkynursery.com/transplantation.php

Meerow, A. W and Broschat, T. K (2007), Transplanting Palms. In Circular 1047 issued by Institute of Food and Agricultural Service, Corporative Extension Service, University of Florida.

Pittenger, D. R., Hodel, D. R. and Downer, A. J (2005), Transplanting Specimen Palms: A Review of Common Practices and Research based Information. In HortTechnology 15 (1), Jan-Mar2005

Sandcays (2015a), EIA for the proposed sewerage system in Dh. Hulhudheli

9 Appendices

Appendix 1: Approved Terms of Reference

Appendix 2: Commitment letter

203-EIARES/438/2016/119

Terms of Reference for Addendum to the Environmental Impact Assessment for Vegetation Removal for the Proposed Sewerage System in Hulhudheli, Dhaalu Atoll

The following is the Terms of Reference (ToR) or undertaking an addendum to EIA of the proposed which includes removal of trees and coconut palms required for the Sewerage System development project in Hulhudheli, Dhaalu Atoll.

While every attempt has been made to ensure that this TOR addresses all of the major issues associated with development proposal, they are not necessarily exhaustive. They should not be interpreted as excluding from consideration matters deemed to be significant but not incorporated in them, or matters currently unforeseen, that emerge as important or significant from environmental studies, or otherwise, during the course of preparation of the EIA report.

1. **Introduction to the project** – Describe the purpose of the Addendum and the background of the project and the tasks already completed. Clearly identify the rationale and objectives to enable the formulation of alternatives.

2. **Study area** – Submit a minimumA3 size scaled plan with indications of the proposed modifications. Specify the agreed boundaries of the study area for the environmental impact assessment highlighting the proposed development location, size and important elements of the proposed changes. The study area should include adjacent or remote areas, such as relevant developments and nearby environmentally sensitive sites (e.g. coral reef, sea grass, mangroves, marine protected areas, special birds site, sensitive species nursery and feeding grounds). Relevant developments in the areas must also be addressed including residential areas, all economic ventures and cultural sites.

3. **Scope of work** – Identify and number tasks of the project including site preparation, construction and decommissioning phases. The following tasks shall be completed:

Task 1. Description of the proposed project – Provide a full description and justification of the relevant parts of the project, using maps at appropriate scales where necessary. Discuss the following project details.

- Provide the details of types and quantity of trees that require removal under the project;
- Machinery and manpower requirements for the project;
- Methods of managing the green waste;
- Project duration and scheduling;
- Methods for backfilling holes
- How sand will be obtained for backfilling of holes
- Possibility of relocation of trees
- Measures to protect environmental values during construction and operational phase;

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Task 2. Description of the existing environment – Assemble, evaluate and present the environmental baseline studies/data regarding the *study area and timing of the project* (e.g. monsoon season). Identify baseline data gaps and identify studies and the level of detail to be carried out by consultant. Consideration of likely monitoring requirements should be borne in mind during survey planning, so that data collected is suitable for use as a

baseline. As such all baseline data must be presented in such a way that they will be usefully applied to future monitoring. The report should outline detailed methodology of data collection utilized.

In addition to the baseline data provided in the EIA report, the following data/information shall be provided.

Ecology

- Any protected trees in the project area;
- Significant flora in the project area(s);
- Significant fauna in the project area(s)
- Groundwater quality at project area(s);
- Tree survey of the project area(s) – quantification of significant vegetation types

Socio-economic environment

- Sites with historical or cultural interest or sacred places (mosques, graveyard) in the project area(s);
- Ownership of trees or palms in the project areas;
- Compensation mechanisms for trees belonging to private parties.

Task 3. Legislative and regulatory considerations – Identify the pertinent legislation, regulations and standards, and environmental policies that are relevant and applicable to the proposed project, and identify the appropriate authority jurisdictions that will specifically apply to the project.

Task 4. Potential impacts of the proposed project– The EIA report should identify all the impacts (direct, indirect and cumulative) and evaluate the magnitude and significance This shall include:

Terrestrial impacts from construction

- Loss of vegetation and fauna from land clearance activities;
- Changes in ground water quality;

Social impacts:

- Noise impacts;
- Impacts on landscape integrity/scenery;
- Increased demands on natural resources and services;
- Land use displacement and economic opportunities;
- Disturbance to local natural resource users such as any tourism ventures.

The methods used to identify the significance of the impacts shall be outlined. One or more of the following methods must be utilized in determining impacts; checklists, matrices, overlays, networks, expert systems and professional judgment. Justification must be provided to the selected methodologies. The report should outline the uncertainties in impact prediction and also outline all positive and negative/short and long-term impacts. Identify impacts that are cumulative and unavoidable.

Task 6. Mitigation and management of negative impacts – Identify possible measures to prevent or reduce significant negative impacts to acceptable levels. Mitigation measures must also be identified for both construction and operation phase. Cost of the mitigation measures, equipment and resources required to implement those measures should be specified. The confirmation of financial commitment of the developer to implement the proposed mitigation measures shall also be included. In cases where impacts are unavoidable arrangements to compensate for the environmental effect shall be given.

Task 7. Development of monitoring plan – If there are additional monitoring requirements for the proposed components of the projects, identify the critical issues requiring monitoring and present a monitoring plan. The baseline study described in task 2 of section 2 of this document is required for data comparison. Detail of the monitoring programme including the physical and biological parameters for monitoring, cost commitment from responsible person to conduct monitoring in the form of a commitment letter, detailed reporting scheduling, costs and methods of undertaking the monitoring programme must be provided.

The baseline study described in task 2 of section 2 of this document is required for data comparison. Detail of the monitoring programme including the physical and biological parameters for monitoring, cost commitment from responsible person to conduct monitoring in the form of a commitment letter, detailed reporting scheduling, costs and methods of undertaking the monitoring programme must be provided.

Presentation- The Environmental Empact Assessment report, to be presented in digital format, will be concise and focus on significant environmental issues. It will contain the findings, conclusions and recommended actions supported by summaries of the data collected and citations f or any references used in interpreting those data. The environmental assessment report will be organized according to, but not necessarily limited by, the outline given in the Environmental Impact Assessment Regulations, 2012

Timeframe for submitting the EIA report – The developer must submit the completed EIA report within 6 months from the date of this Term of Reference.

13 July 2016

بسم الله الرحمن الرحيم

Ministry of Environment and Energy
Male', Republic of Maldives.

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Date: 3rd August 2016

No: 438-POLPU/203/2016/60

Ibrahim Naeem
Director General
Environmental Protection Agency
Maldives

Dear Sir,

This is in reference to the First Addendum to the Environmental Impact Assessment (EIA) for the Sewerage Project in Dh. Hulhudheli.

As the Proponent of the project, we assure you our commitment to undertake the proposed mitigation measures and monitoring programme given in the EIA Report.

Thank you.

Sincerely yours,

Ajwad Musthafa
Permanent Secretary

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ފަންނުގަ، ހިންގުން، ދަ، 20392، ދިވެހިރާއްޖެ.
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Subject: Hulhudheli Sewerage Additional info
From: "Hassan Jameel" <hassan@sandcays.com>
Date: Mon, Aug 01, 2016 11:12 am
To: secretariat@dhaal.gov.mv
Cc: "Mohamed Azmeel" <azmeel@sandcays.com>, "Ahmed Zahid" <zahid@sandcays.com>
Attach: Hulhudheli Sewerage Addendum.pdf

Dear Hamdhy
Please find the attached herewith Dhaalu Atoll Hulhudheli First Addendum to the EIA for sewerage project for your kind perusal. Please acknowledge the receipt of this E□ail.

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