

AFRICAN DEVELOPMENT BANK

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FOR INFORMATION

## MEMORANDUM

**TO :** THE BOARD OF DIRECTORS

**FROM :** Kordje BEDOUMRA  
Secretary General

**SUBJECT :** GHANA & NIGERIA: MAIN ONE SUBMARINE CABLE

### ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT EXECUTIVE SUMMARY

Please find herto attached, the above mentioned document

**Attach. :**

**Cc: The President**

**\*Questions on this document should be referred to:**

Mr. T. TURNER	Director	OPSM	Extension 2051
Ms. H. CHEIKHROUHO	Division Manager	OPSM.3	Extension 2140
Mr. Y. VYAS	Lead Environmentalist	OIVP.0	Extension 2178
Ms. A. NALIKKA	Principal Investment Officer	OPSM.3	Extension 2272
Mr. J. MALAN	Investment Officer	OPSM.3	Extension 2620



## 1. INTRODUCTION

This document is a summary of the Environmental and Social Impact Assessment (ESIA) study reports for the Main One Submarine Cable System: Phase 1 (hereafter referred to as 'the Project') <sup>(1)</sup>. The reports were prepared by Environmental Resources Management (ERM) and Fugro Consultants Nigeria Limited (FCNL) on behalf of Main Street Technologies (MST).

This summary is prepared in accordance with the African Development Bank's (AfDB) Environmental and Social Assessment Procedures (ESAP) for Private Sector Operations (2001).

### EIA Approach

A comprehensive EIA process was carried out for the Project. The EIA process and reports were structured to meet the requirements in the respective countries. Two separate reports were prepared and submitted to support the Project's application for environmental authorisation in Nigeria and Ghana. For Nigeria, authorisation is being sought from the Federal Ministry of Environment (FME) under the Environmental Impact Assessment Act No. 86 (1992). For Ghana, authorisation is being sought from the Ghana Environmental Protection Agency (EPA) (part of the Ministry of Environment and Science) under the Environmental Assessment Regulations of 1999, as amended.

## 2. PROJECT DESCRIPTION AND JUSTIFICATION

### Background

Main Street Technologies, a 100% Nigerian company is the main sponsor of a Mauritius-based company, the Main One Cable Company. Main One Cable Company is proposing to build a new subsea telecommunications cable along the Atlantic coast of West Africa. The proposed **Main One Submarine Cable System** would include a new open-access fibre-optic submarine cable system which would expand international telecommunication services to countries on the Atlantic coast of Africa. The network would facilitate transmission of data, voice, internet and television signals allowing for inter country transmission of information, thereby bridging the information gap between West Africa and the rest of the world.

Phase 1 of the submarine cable system would include installation of approximately 7,290 km of subsea cable running from Seixal, Portugal to shore crossing and landing sites in two West African countries: Accra in Ghana; and Lagos in Nigeria. A desk top study (DTS) was completed as part of the feasibility studies for Phase 1 (Tyco, 2008). The DTS identified the preferred route for the cable between Portugal, Ghana and Nigeria. Further expansion of the submarine cable system is planned for subsequent

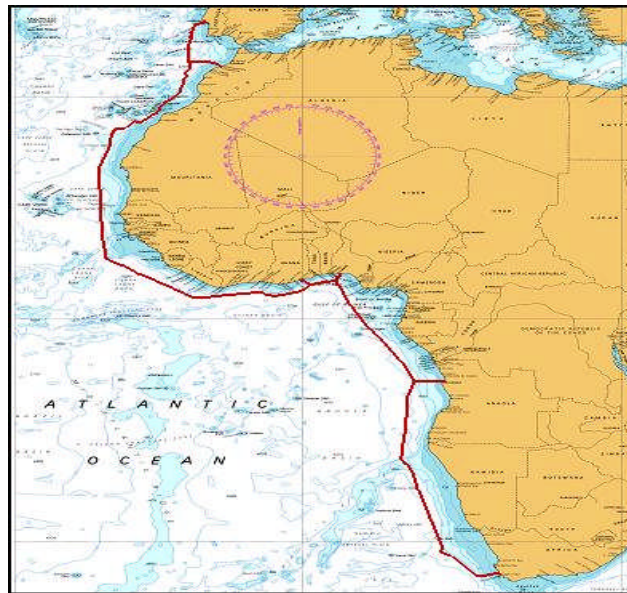
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*(1) Two reports were prepared in accordance with national legislation: An Environmental Impact Assessment (EIA) report for Nigeria and a Preliminary Environmental Report (PER) for Ghana. This document provides a summary of both reports.*

phases, where the cable network would be extended to other West African countries, including Morocco, Senegal and Angola, providing intra-country transmission of data potentially to as far south as Cape Town, South Africa (Figure E.1). The cable system will span up to approximately 14,500 km along the entire route.

The Project components and activities that are covered by the EIAs include the pre-installation, installation, operation, maintenance and decommissioning of seven cable segments between Portugal and Branching Unit (BU) number 6, to be located off Bonny, Nigeria. The assessment also includes assessment of branching route segments into Accra, Ghana and Lagos, Nigeria and associated cablestations.

**Figure E.1 Project Location**



Source: [www.mainstreettechnologies.net](http://www.mainstreettechnologies.net)

### **Nigeria Landing Site**

The preferred landing site in Nigeria is located at Okunaja, Lagos, approximately 30 km east of Victoria Island. The proposed Beach Manhole (BMH) location is set approximately 65 m from the high water mark. It is located on a grassy, long established, coastal dune system. A Cable Landing Station (CLS) will be required in order to connect the Main One cable to the domestic cable infrastructure. The preferred location for the CLS is along the Lagos-Epe road. The cable will be routed from the BMH to the CLS along an existing road. The cable will be installed in a conduit that will be buried alongside the road.

**Figure E.1 Proposed Landing Site (Nigeria)**



### **Ghana Landing Site**

The preferred landing site in Ghana is located in the Teshie-Nungua Estate in Accra, Ghana near Shining Beach. The site is set toward the eastern end of the bay at Teshie and is characterized by a relatively gentle sandy slope from the location of the planned BMH to the sea. The BMH will be located approximately 30 m north of the high water mark and will be at approximately 5 m above sea level in elevation. A CLS will be required in order to connect to the Main One cable to domestic cable infrastructure. The preferred location for the CLS is on the road near the site.

**Figure E.2 Proposed Landing Site (Ghana)**



### **System Components**

Cable engineering specifications for the proposed Project will be based on cable industry standards. The diameter of the subsea cables will vary between 17 and 20 mm for sections without protective armor; armored cables may be as large as 50 mm in diameter. The cable consists of an inner optical fibre, surrounded by a polyethylene or fibreglass core for strength and fibre separation. Repeaters are installed along the cable to boost the signal because the signal loses strength en route. Approximately 150 repeaters are planned along the total route length. BUs are pieces of equipment used in submarine telecommunications cable systems to allow the cable to split to serve more than one destination. There are five BUs planned for the route segments under consideration.

### **Installation**

Prior to installation of the cable, a marine geophysical survey will be performed to investigate the safest route for the cable system. A detailed topographic survey will be performed to assess the conditions and feasibility of the landing. A limited seabed-sampling program will also be conducted to supplement the side-scan sonar and sub-bottom profiler data in the areas where the cable will be buried.

For installation, a purpose built ship will accurately place the cables on or under the seabed along the route determined by the pre-installation survey. Shallow water laying may be aided by scuba divers while deepwater laying is sometimes aided by remote operated vehicles. Due to the shallow water depth, cable burial at each of the shore ends may be undertaken by excavation of a trench using a single grab dredger and through the placing of the cable within the trench by divers. Offshore, cables would be buried in a narrow (<1 m wide) trench that would be cut by a water jet or plough while the cable is being laid.

### **Operations**

Once in place and connected, the cable system requires no intervention. Power is provided to the system through electrical connection in the cable. This also provides power to the repeaters. The electrical current is fully shielded from the environment. Cable repair and maintenance may be required as a result of damage, failure, age /redundancy or clearance of congested routes.

Onshore, the CLSs will require power for their operations. Power will come from the national electricity grid with backup provided by diesel-powered generators. Due to the current power shortages in Nigeria, the generators may operate for extended periods. Both CLSs have been designed to incorporate an out building to house the generators and to provide noise suppression.

### **Decommissioning**

The current plan for decommissioning is to power-down the system and to leave the cable in place. The cable would be registered with the appropriate authorities as 'out of service' and the cable's position would be maintained on maps and nautical charts. Portions of the cable may be cleared during installation of new cables. Otherwise the cable would remain on the seabed and serve as substrate for marine organisms and no further disturbance of the seafloor would occur. A full decommissioning plan will be developed near the end of the Project's expected 25-year lifetime. The plan will be based on best practices at the time and with consideration of environmental and safety issues.

### **Project Justification**

The proposed Project includes a new open-access fibre optic submarine cable system. The Project is intended to increase the capacity for international telecommunication services initially to Ghana and Nigeria and eventually to other counties along the west coast of Africa. This region has experienced explosive growth in phone use in recent years. In fact, Nigeria overtook South Africa in early 2008 to become the continent's largest telecommunications market with over 44 million mobile phone subscribers. The region however remains severely constrained with respect to access to cable capacity for international transmission and global connectivity.

Project benefits include:

**Increased Capacity.** The Project will have direct benefits through the increase in available international transmission capacity and the lower cost for such access. The Project will increase the existing international capacity to Europe by 100 times in Nigeria and 50 times in Ghana. For existing businesses, increased capacity and lower cost will allow for faster and more reliable transmission for data and voice. Lower entry costs will also facilitate the start-up of new businesses. The Project will also improve the connectivity between African countries on the system.

**Local Content and Technology Transfer.** The operating company would have its headquarters in West Africa (Nigeria) making the Project the first African-based submarine cable company. Hiring of staff for the operation would draw from the local skills pool and employees would be trained in telecommunications operations and international best practices. The experience would further enhance the local skills base.

**Indirect Benefits.** Significant indirect social and economic benefits would be associated with the proposed development. These include:

- improved educational opportunities through increase in access to information and education resources;
- development of a regional sense of community through greater equality of information sharing across geographical regions and across groups in society;
- economic benefits from the enhanced opportunities for new and small enterprises that may have previously been excluded from technologies by high costs; and
- macroeconomic benefits of the potential expansion of technology-reliant industries in West Africa, such as information technology services and software development businesses.

### 3. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

The cable will be installed in international waters as well as the national waters of Nigeria and Ghana. The Project will interact with both the marine and terrestrial environments. The Project would thus be subject to:

- Nigeria and Ghana administrative and legal requirements; and
- international conventions and standards to which Nigeria and Ghana are signatory and with which the Project must therefore comply.

In addition to a commitment to compliance with Nigerian and Ghanaian regulations, the Project intends to meet International Finance Corporation (IFC) Performance Standards, AfDB environmental and social performance standards, as well as other directly relevant policies of the IFC and AfDB. These requirements were therefore considered in the EA process.

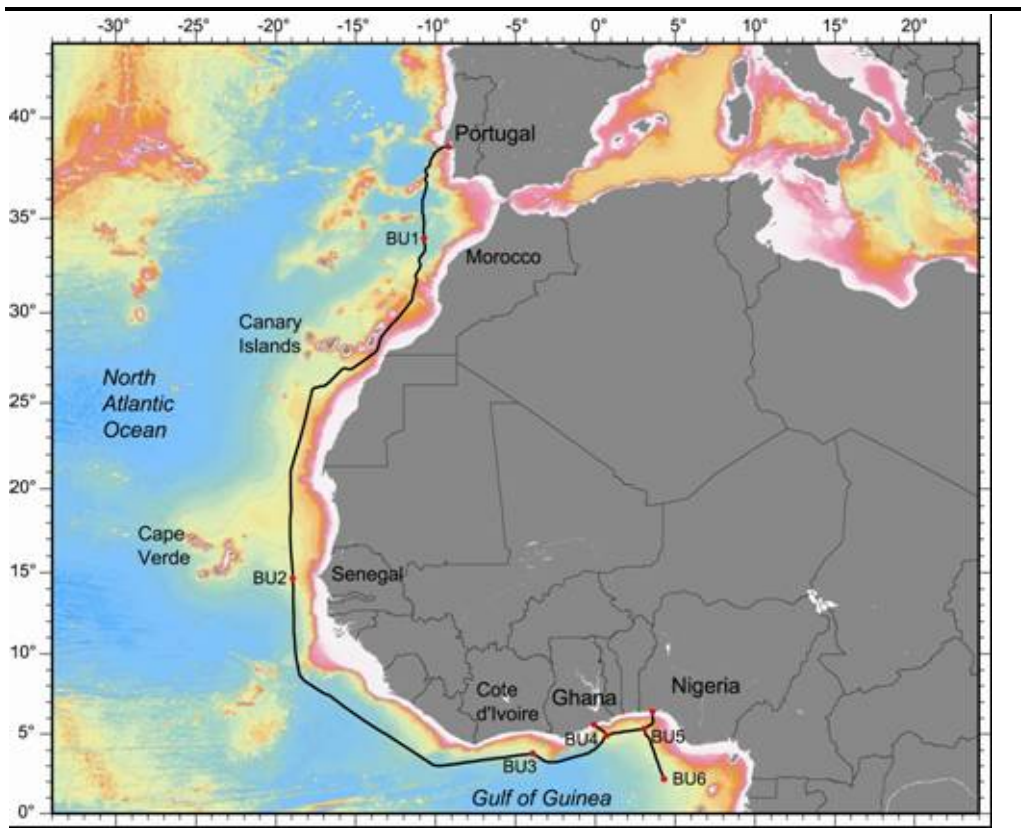
#### 4. DESCRIPTION OF THE PROJECT ENVIRONMENT

##### Introduction

Local and international specialists collaborated on studies of the existing conditions to inform the EIA. Both primary and secondary sources of information were used.

The cable system will run from a landing site in Seixal, Portugal, across the Gulf of Cadiz to the west coast of Africa, continuing to landing sites in Ghana and Nigeria (see Figure E.4). The Project area is predominated by deep water environments as much of the cable route corridor lies within deep international waters. It also includes the far shore environments where the cable enters the waters within the country's Exclusive Economic Zone (EEZ) and nearshore, shore, and terrestrial environments at the shore landing sites in Ghana and Nigeria.

Figure E.3 Locality Map



Source: Tyco (2008)

##### Physical Environment

The climate in the Gulf of Guinea and the Central Eastern Atlantic is strongly influenced by Inter-tropical Convergence Zone (ITCZ) weather patterns. Maritime tropical air masses, characterized by warm, humid southwesterly winds and the continental air mass, characterized by hot, dry northeasterly winds, converge in the ITCZ. The alternating wet season and dry season phenomenon is determined by the north-south oscillation of air masses. The wind direction in the area is dependent on

the prevailing atmospheric circulation - Monsoon or Harmattan. During the day, the prevailing wind circulation is generally from the south-west. During the night, the wind circulation is generally from the west and north-west due to the land breeze during the night. The study area is generally warm throughout the year, with an average daily temperature of 28 °C and a mean daily minimum of 25 °C.

The oceanic hydrography of the Gulf of Guinea, is largely influenced by the subtropical gyres of the north and south Atlantic Ocean. The water masses off the coast flow under the influence of the eastward flowing Guinea Current; a small westward counter current, which lies beneath the Guinea Current; and the westward flowing South Equatorial Current, which is located offshore, beyond 370 km.

The marine environment enjoys atmospheric conditions generally free of air pollutants. Onshore, emissions from anthropogenic point sources such as vehicles, industries, and dusts from untarred roads tend to create atmospheric pollutants within their immediate environments. In Ghana, the terrestrial area is in an urban setting and background noise levels are high and typical of an urban setting. In Nigeria, background noise levels are lower but still relatively high, at the coast line due to ocean roar and at the CLS due to urban traffic.

The residual soil within the site consists of dark gray calcareous /sandy clays in areas of poor drainage, and sandy/clayed sand in areas of good drainage. Information gathered about the proposed cable landing sites did not indicate any evidence of geological instability or major geological discontinuities such as fault lines. There are no major watercourses or standing water bodies within or near the terrestrial locations.

### **Biological Environment**

The offshore aspects of the Project will occur mostly in the Guinea Current Large Marine Ecosystem (GCLME). It is ranked among the most productive coastal and offshore waters in the world with rich fishery resources, oil and gas reserves, precious minerals, a high potential for tourism and serves as an important reservoir of marine biological diversity of global significance.

Turbidity is generally low in the offshore, oceanic waters; however, there is a coastal zone of turbid, greenish water, which meets the clearer oceanic water 6 km to 8 km from the coast. Physicochemical properties of the water column in the far and near shore environment off the coast of Ghana indicate a healthy marine environment. On the seabed, the benthic communities are mature and in equilibrium with local physical conditions indicating little disturbance; biological composition of the benthos is generally homogeneous.

Marine mammals that inhabit the waters of the Gulf of Guinea are mainly cetaceans (whales and dolphins). Of special importance is the Atlantic humpbacked dolphin which is an endangered species. The GCLME supports many species of sea birds,

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including species that are resident within the region and those that pass along the Atlantic coast during annual migration, and marine sea turtles.

The coastal zone is the home for significant fauna populations of biodiversity interest, some of which are threatened or endangered. These include the West Africa manatee and five species of marine turtles. Coastal environments of both countries also support a number of seabird species. The characteristic vegetation cover in the intertidal zone is classified as coastal savannah consisting predominantly of grass and shrub species.

The fisheries resources of the ecosystem, consisting of the freshwater and marine environment, include a diverse assemblage of fishes. Marine fisheries fleets include those classed as artisanal, inshore or semi-industrial, and industrial. In Ghana, most domestic marine fish supply is from the artisanal fishery and the most important marine resources are the small pelagic fish. These species account for about 70% of the total marine fish landed in Ghana. Artisanal fishing is equally important in Nigeria.

Terrestrial habitats within the cable landing sites and near surrounds support a grassy habitat with open (bare) sandy ground and scattered palm trees. The landing sites also feature sandy beaches which are open to the wave regime of the Atlantic Ocean and daily tidal movements. This beach area may provide a suitable habitat for nesting sea turtles and seabirds (both resident and migratory species).

In Nigeria, the preferred landing site at Lagos (Okunaja) is characterized by its sandy foreshore and beach front dunes. No rock outcrops are apparent in this predominantly low-lying area, and beyond the open beach partially vegetated sand dunes are present, which appear to be largely static and stable. The beach front features fine sand and a relatively steep slope below the mean high-water mark (evidence that the beach regularly experiences surf conditions). There are no major watercourses or standing water bodies in the near vicinity of the selected cable landing site.

In Ghana, low hills bisected by shallow valleys define the topography of the general Project area. The preferred landing site at Accra (Shining Beach) is characterized by a relatively gentle sandy slope stretching from the proposed BMH to the mean high water mark, which is approximately 30 m from the BMH site. The elevation of the BMH is approximately 5 m above sea level. Sand and compacted sand are present in this predominantly low-lying area, and beyond the open beach partially vegetated sandy habitats are present, which appear to be largely static and stable.

### **Protected Areas**

Within the GCLME region there are various marine and coastal protected areas including those which are statutorily protected by international and national legislation, and those which are afforded non-statutory protection and recognition as important environmental and social resources. Our knowledge to date suggests that the terrestrial proportion of the development in Ghana does not fall into any protected areas. One of the closest protected areas to the Study Area is the Sakumo Ramsar Site,

which is located 3 km west of Tema towards Accra. There are no marine protected areas near the proposed Project site.

At least 26 species of marine mammals and five species of sea turtles occur in the region, including several endangered, critically endangered, or vulnerable species. Endangered and threatened flora and fauna are protected through national law. There are eight globally threatened bird species in Ghana, but none are seabirds or are specifically associated with marine habitats.

Ghana's coastal wetlands provide feeding and roosting sites for thousands of resident and migratory birds including at least 11 species of tern. 36 sites in Ghana have been designated as Important Bird Areas, of which five are along the coast. Two sites, the Anlo-Keta and Songor Lagoons, each support over 100,000 shore birds as well as internationally important numbers of several species of wading birds.

Lagos State has no listed UNEP World Heritage sites. In addition, there are no known nationally protected cultural resources in the area of the Project.

Nigeria has at present no nationally legislated coastal or marine protected areas and there are no international conservation programmes that cover the Project area. The Lekki Conservation Center (LCC) is located relatively near the proposed landing sites in Lekki, Nigeria.

### **Socioeconomic Environment**

Although the coastal zone of Nigeria and Ghana represents a relatively small portion of the total land area, a significant portion of the population (about the 25%) resides there. In addition to the major urban centres, a large number of minor towns and settlements are scattered along the coast, the majority of which are fishing and agricultural communities. Beaches are noted for fishing or fishing related activities including landing sites for canoes, markets for fish trading and various centres/sheds for smoking of fish.

The most common cash crop found along the beaches is coconut plantations. However, some coastal dwellers cultivate staple crops such as maize, cassava and vegetables. The major source of employment for the coastal settlers is fishing, fish mongering and related works. Other activities of economic importance that occur in the coastal zone are agriculture, transportation, salt production, oil and gas exploration, sand and stone winning, recreation, industrial development, food vending, masonry and carpentry.

In Nigeria, the landing site is near to two small communities: Okun Ajah and Mopo Akinlade. The total population of the communities is less than 80 people. The major economic activity in Okun Ajah is fishing. In Ghana the landing site is in an urbanised area. Fishing is still practiced by members of the nearby communities.

## 5. PROJECT ALTERNATIVES

In terms of technology alternatives, fibre optic networks have a number of advantages over satellite and microwave transmissions and radio has largely been phased out due to restricted bandwidth and poor data transmission. Modern fibre optic networks transmit high volumes of voice and data traffic with higher security and reliability and at a lower cost than satellite systems. Cable also has a more dependable installation and repair record.

Routing alternatives were also considered. In principle, land-based fibre optic cables are an alternative to the proposed submarine system. In this alternative, the cable would be routed on the land, generally along the coastal areas where telecommunications use is concentrated. The cable would need to be installed below the ground and given the lack of existing infrastructure this would require extensive trenching to bury the cable. The cable would also have to be installed across surface water bodies (eg rivers, streams, and wetlands). In practise it has been found that installation costs are higher for terrestrial systems due to the increased complexity. In addition, permitting can be more complex and time consuming and cable faults are known to be more frequent.

If the Project was not executed, assuming that no other telecommunications cable was installed, the region would continue to be constrained by the lack of telecommunications capacity, especially in the area of international data transfer. The demand for capacity would continue to grow along with the overall economic growth. At some point in time, a different transmission technology (eg satellite) may become more viable either due to the increased demands of the marketplace or the relative decrease in the cost of the technology. This would reduce the need for a cable-based system but maybe only temporarily.

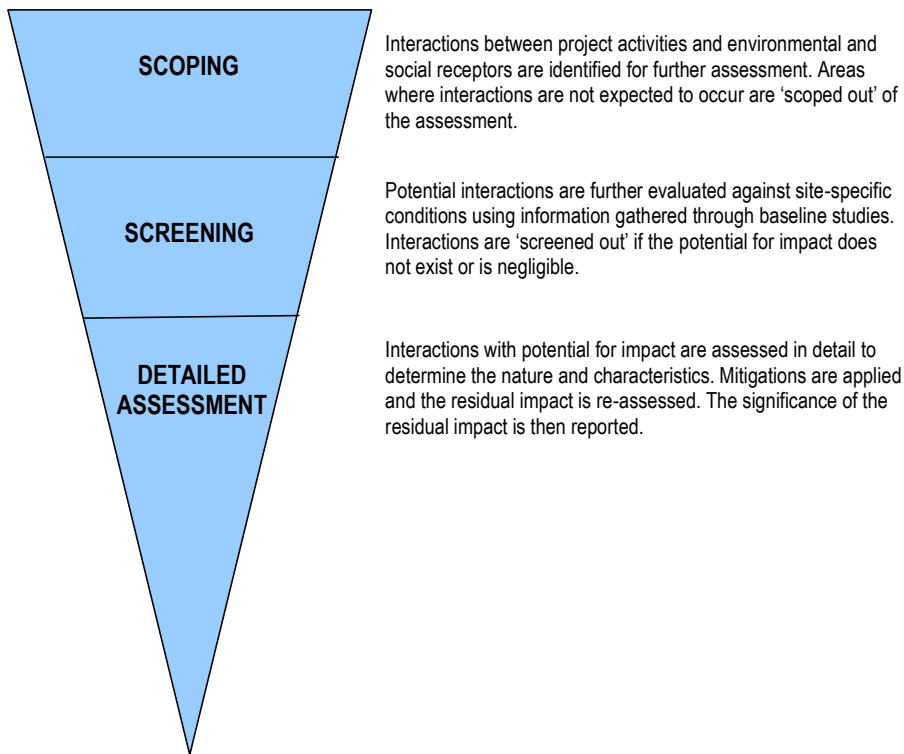
## 6. POTENTIAL IMPACTS AND MITIGATION/ENHANCEMENT MEASURES

### Impact Assessment Process

A comprehensive assessment of potential Project impacts was carried out. The process included scoping, screening and detailed impact assessment as presented in Figure E.5.

Figure E.4 Impact Assessment Process

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### Impacts Eliminated During Scoping

Likely interactions between the Project aspects and environmental and social resources and receptors were identified as part of the Scoping process. During scoping, it was determined that the Project had potential for impacts during the Pre-installation and Installation phases only. During the scoping process, the following aspects were 'scoped out' of the detailed environmental and social impact assessment:

**Operational Impacts.** During operation it is expected that the Main One cable will have no significant negative environmental or social impacts. During the operational phase there will be no routine maintenance of the cable and the cable will have a passive influence on the environment.

**Decommissioning.** It is expected that the cable will be abandoned in place at the end of the Project's lifetime. No impacts are predicted to occur in association with the cable during this stage of the Project. The cable will continue to have a passive influence on the environment and will be benign, so will not degrade or pollute the environment. A full decommissioning plan will be developed at the end of the cable's useful life and it will consider best practice at that time. The plan will consider the potential for environmental and social impacts for the decommissioning alternatives.

In addition, the following impact areas were scoped out:

**Odor, Heat and Radiation.** The project will not result in any significant increases in odor, heat or radiation conditions.

**Physical Displacement.** The Project will not result in the permanent physical or economic displacement of any communities or businesses, so no resettlement actions will be required as part of the Project mitigation. The landing site areas are privately owned, and there are no current settlements within the site boundary or on the beach front.

**Transport Infrastructure.** There are no formal or regularly used transport networks (eg roads, ferries) within the site area and no major shipping routes will be impacted by the development. No impacts to transport networks and their function are predicted to occur as a result of the development.

**Education.** No negative impacts on education levels or educational facilities are predicted to occur as a result of the proposed development.

#### **Impacts Eliminated During Screening**

Following the Scoping process, further detailed baseline information was collected and potential impacts were then assessed in order to 'screen out' those that were not predicted to have a significant impact on environmental and social resources and receptors. The following impact areas were screened out:

**Protected Areas.** There are no marine or terrestrial protected areas within the development area. Protected areas do occur in the general region but given the distance between the development area and protected areas, it is not anticipated that any impacts to protected sites or their designated features of interest will occur.

**Air Quality.** The Project's use of engines is limited to the cable laying vessel, diesel-powered generators used during construction, and the diesel-powered generator that will provide power at the CLS. Assuming that the engines are well maintained, emissions of pollutants will be minimal and within allowable limits. Dust related impacts are largely reversible within a short timescale (as rain removes the particles from the air and vegetation).

**Landscape and Visual Receptors.** There will be small amounts of increased light pollution during the construction period at the BMH as a result of security lighting. There will be no permanent lighting at the beach area.

**Noise and Vibration Receptors.** There may be some increased noise in terrestrial areas during site preparation activities and due to CLS operations. Impacts to sensitive local receptors such as nearby residences are not predicted to occur as the increase in noise levels associated with the construction of the landing site will only be small, will be limited to the short construction period, and because construction will take place

during day-light hours only. Out buildings housing generator equipment at the CLSs will provide noise suppression.

**Traffic.** Cable survey and installation could cause temporary disruption to the flow of shipping traffic. However, these operations are limited to short periods of time and other marine traffic can generally avoid the work area without significant diversion. Construction traffic associated with activities onshore will be limited to infrequent journeys over the short construction period only.

**Marine Biology and Fisheries.** Some minor disturbance to marine sediments and benthos will occur during pre-installation and installation activities where the sea bed is disturbed for sampling, the pre-lay grapple run, any trenching or ploughing and when the cable is installed on the sea bed. This disturbance is predicted to be localized to the area in which the activities occur and near surrounds only, and will be short-term. No permanent changes to the physiochemical properties of the water column will occur. Any disturbance to fisheries will be temporary.

**Soils and Geology.** The pre-laying grapple run and cable installation will have some minor physical impact on sea bed geology. This impact will be limited to the area where the cable will be installed only and will vary in magnitude depending on the installation method and the seabed geology. During the detailed pre-installation surveys areas of potential geological sensitivity will be identified (such as ocean trenches and bedrock outcrops) and subsequently avoided by the detailed cable route design, thus avoiding any significant impacts to seabed geology. In the terrestrial environment small amounts of soil will be disturbed during the excavation of the cable trench and during construction of the BMH and CLS. All soil that is disturbed during trench digging will be restored to approximate original depths as the trenches are back-filled.

**Hydrology.** The installation of the BMH will not involve the construction of any new access roads or large impermeable surfaces that may impact the current surface or ground water flow. The design of the CLS will include a proper drainage system. There are no rivers or waterbodies within the development area that will be directly impacted by the construction activities. The impacts on hydrology are therefore predicted to be negligible.

**Vulnerable Groups.** No negative impacts on vulnerable groups such as the elderly, disabled, women, children and minority groups will occur as a result of the proposed development. Conversely, the Project is likely to have positive impacts on some vulnerable and minority groups as a result of increased access to information technology.

**Social and Cultural Structure.** The Project will have no negative impacts on social and cultural structures as the Project activities will have very little interaction with or impact upon population, social or cultural processes and activities or customs.

**Cultural Heritage.** There are no known sites of significant cultural heritage or archaeological interest in the vicinity of the terrestrial components of the development. The risks to cultural heritage would be to buried resources encountered during excavation on land or by trench ploughing at sea. Coastal wrecks are likely to be the most probable cultural resources within the development area and near vicinity. The Project will implement a chance finds procedure to be used by contractors in the event that a cultural heritage feature is encountered.

**Infrastructure and Services.** Potential negative impacts on other infrastructure (predominantly other submarine cables and pipelines) are possible if damage to these networks occurs as a result of the installation activities, but as the route of the cable has been designed to avoid other developments, this negative impact is not predicted to occur.

**Employment and Economic Activities.** The Project will not result in any disruption or disturbance of other economic activities so no negative impacts on employment or economic activities are predicted to occur.

### Detailed Assessment of Impacts

Detailed impact assessment was carried out for four potential impact areas:

- habitats and flora;
- fauna;
- coastal processes and water quality; and
- human health and safety.

#### Habitats and Flora

The proposed development will result in the loss of small amounts of common and widespread terrestrial habitat. Habitats and flora (both terrestrial and marine) may also be indirectly impacted due to changes in ecological processes or other changes in the biophysical environment including disturbance or damage to habitats caused by movement of vehicles and personnel, dust, disturbance and sedimentation during cable installation in the marine environment.. In addition it is possible that invasive (predominantly non-native) species may be unintentionally introduced during construction onshore and from marine vessels.

Terrestrial habitats in the development area in particular are largely already impacted by human activity such as clearance, and now support flora communities that are representative of secondary growth and disturbed coastal grassland and scrub.

The extent of the impact is limited to on-site and local. The duration will range from temporary to permanent as some impacts will last only a short while (eg effects of disturbance during construction) and some will cause a permanent change (eg habitat

removal). Although the habitat type and flora species present are predominantly common and widespread, the magnitude of the change will be low as some natural processes will be affected as a result of small amounts of habitat loss, degradation or disturbance. It is likely that very small amounts of wildlife habitat and flora will be lost and disturbed/degraded. The impact significance pre-mitigation is minor.

The Project will implement mitigation measures to minimize the extent of the impact to the terrestrial environment and to restore areas that are disturbed. This will include:

- limiting clearing and restoring areas of disturbance;
- using controls to prevent incursion into adjacent areas;
- implementing a hazardous materials management plan;
- requiring that marine vessels adhere to International Maritime Organization (IMO) regulations.

Only a small amount of common and widespread habitat will be impacted by the proposed development, and indirect impacts to habitats will be short-lived in any one area. If mitigation measures are properly implemented, no residual impacts on habitats and flora are predicted to occur as a result of the Project activities.

#### Impacts on Fauna

Common terrestrial and marine fauna are present in the Project area and near surrounds. It is also possible that sensitive marine mammals may occur in the development area and near surrounds. The Project pre-installation and installation activities will result in the temporary disturbance of small numbers of common terrestrial fauna during the site clearance and cable installation. Pre-installation and installation vessels may strike species such as marine mammals and turtles and vessels cause temporary increases in noise and physical disturbance which can result in marine species leaving the areas where they may be feeding, breeding, or nursing. Sediment caused by cable laying and survey activities may also smother marine organisms that dwell in the upper sections of the sediment layer.

The Project will implement mitigation measures to reduce the risks of impacts on fauna with particular attention is paid to sensitive marine species including marine mammals and turtles. This will include:

- daily checks of beach areas for signs of turtle nesting prior to any work;
- monitoring for the presence of marine mammals and turtles during marine activities;
- working with an appropriate environmental organization to develop a notification process; and
- minimizing the impact of lighting at the beach areas.

With appropriate mitigation the significance of impacts on fauna are predicted to be negligible.

### Coastal Processes and Water Quality

The Project installation activities will result in a temporary disturbance of coastal processes such as longshore sediment transport and beach erosion/accretion during the installation of the cable at the shore crossing site. If the disturbed areas remain unstable there is potential for increased erosion and sediment transport. Direct impacts may also occur on marine water quality during the pre-installation, installation and repair activities due to release of waste water from vessels or due to disturbance of sediments and resulting increased turbidity. Increased pollutants or suspended sediments would result in reduced water quality and potential impacts on sensitive marine flora and fauna such as static species and species that are particularly sensitive to changes in turbidity. Similar impacts to terrestrial water resources could occur as a result of unintentional spills and sedimentation associated with soil erosion and surface runoff during construction.

The Project will implement mitigation measures to minimize increased sedimentation, avoid unplanned spills of fuel and waste, and to minimize or avoid impacts to coastal flow dynamics and sediment transport systems. If suitable mitigation measures are successfully employed, impact on coastal processes or water quality will be negligible.

### Human Health and Safety

There is potential for impacts on human health and safety to occur as a result of accidents and unplanned events that may occur during the Project installation activities. At particular risk are artisanal fishermen and other vessels that may move at night-time or in reduced visibility conditions when the Project activities are taking place. Collision of Project vessels with fishing boats and nets or other vessels could result in damage of vessels and equipment, injury or loss of life. In the terrestrial environment, human health and safety could be impacted through road traffic accidents involving construction vehicles.

The Project will implement mitigation measures to reduce the risk of health and safety incidents such as vehicle and vessel accidents. This will include development of an Environmental, Health and Safety (EHS) plan which will outline procedures for avoiding health and safety incidents and for emergency medical treatment. The Project will also require contractors to implement procedures to reduce the risk of accidents involving local fishing vessels. If suitable mitigation measures are successfully employed, significance of impacts on human health and safety will be negligible.

### Potential Cumulative Impacts

The terrestrial areas along the coast are currently under pressure due to development activities. Known development planned or active in the marine environment includes:

- oil and gas exploration and development activities in Ghana and Nigeria;
- deepwater port developments in Nigeria near Lagos;

- competing submarine telecommunication cable project to/from Nigeria; and
- reclamation project involving significant sandfilling near Lagos, Nigeria.

The impacts associated with the Project are all minor and would not have a significant interaction with the activities associated with the other planned activities in terms of environmental and social impacts.

Positive cumulative impacts on social and economic receptors resulting from the Project and other developments in West Africa are likely to occur during the progressive development of the region facilitated by improved communications infrastructure and broad access.

## **7. ENVIRONMENTAL HAZARD MANAGEMENT**

The Project will develop an Environmental, Health and Safety (EHS) plan which will outline procedures for avoiding health and safety incidents and for emergency medical treatment. The Project will also require contractors to implement procedures to reduce the risk of accidents involving local fishing vessels.

Contractors will be required to develop their own plan for EHS. Marine vessels will be required to comply with the guidelines set forth in the International Safety Management (ISM) Code developed by the International Maritime Organization (IMO). Vessels will also be required to comply with the regulations set forth in MARPOL as the standard for preventing pollution from ships.

## **8. MONITORING PROGRAM**

To ensure that the actions are managed fully and that unforeseen or unidentified impacts of the Project are detected and resolved the Project has developed an Environmental and Social Management Plan (ESMP, referred to as EMP in the EIA documents). As the project proponent, the Main One Cable Company ('Company') will have the ultimate responsibility for ensuring the measures are delivered. In this respect the Company will review and approve contractor plans for delivery of the actions contained in the ESMP during project installation and operation and will review contractor performance through monitoring, audits and inspection. The Company will appoint an Environmental Health and Safety Coordinator (EHSC) to oversee the implementation of the ESMP.

The contractors will be responsible for ensuring compliance with all relevant legislation as well as adherence to all environmental and social mitigation measures specified in the ESMP. The contractors are also responsible for managing the potential environmental, social, health and safety impacts of all contract activities whether these are undertaken by themselves or by their subcontractors. The Contractor will be required to undertake regular environmental and social inspections and provide

reports to allow the Main One Cable Company to monitor and evaluate performance against the measures and objectives established in the ESMP. Contractor implementation of the requirements of the ESMP will be ensured through review and specific agreement of work plans and/or specific contractual obligation.

Detailed action plans will be developed by the contractors to implement the mitigation and management measures outlined in the ESMP.

Approximately US\$250,000 has been allocated for the ESMP implementation during the installation phase. This is to cover the development of detailed management plans and for oversight of contractor activities. Thereafter, approximately US\$150,000 per year will be allocated for ongoing environmental and social monitoring. This is to cover the cost of an Environmental Health and Safety Coordinator and for regular inspections of the landing sites.

## **9. PUBLIC CONSULTATIONS AND DISCLOSURE**

The EIA process included a stakeholder engagement programme of consultations and disclosure. Stakeholder engagement activities were carried out during all phases of the process.

Project stakeholders were identified during scoping to understand the individuals, groups, and organizations that may be affected by or may influence project development positively or negatively. Meetings were held with key authorities to inform the design of the cable route and shore landing. The consultations served to gather information on permitting and notification requirements to inform the development of the plan for cable laying and for construction at the cable landing sites.

In Nigeria meetings were held with Nigeria Maritime Administration and Safety Agency (NIMASA); Nigeria Navy; Nigeria Naval Hydrographic Department; and Nigerian Ports Authority. Representatives from FME visited the site with EIA team members and MST representatives as part of the Scoping activities.

In Ghana, meetings were held with the Ghana Maritime Authorities and Ghana EPA. Representatives from Ghana EPA visited the site.

Engagement activities during the EIA study included consultations designed to introduce the Project to stakeholders that could potentially be affected by the Project (ie those near the cable landing sites). An initial outreach program was undertaken to introduce the Project to local community leaders and to communities and individuals near the shore landing site. This program also included a social baseline study around the shore landing site to better understand the stakeholders that live nearby.

A Background Information Document (BIDs) was produced for the Project. The BID explained the Project and the EIA process and provided details on how and where comments and input could be given. The BID was widely distributed.

In Nigeria, the draft Environmental Impact Assessment report will be reviewed by experts empanelled by FME. The FME will make a public notice of the opportunity for information and comment on the draft EIA report for the Project.

In Ghana, the draft Preliminary Environmental Report will be reviewed by internal experts. The Project will engage the public during the review process by making a public notice of the opportunity for information and comment.

Ongoing engagement after submission of the reports will be taken forward within the framework of a Stakeholder Engagement Plan (SEP) to be developed by the Project. The SEP will describe the process by which the Project will interact with authorities and with the public on an on-going basis. The Project will develop and implement a formal Grievance Mechanism prior to initiating major activities (ie pre-installation survey).

## 10. COMPLEMENTARY INITIATIVES

There are no complementary initiatives associated with this project.

## 11. CONCLUSION

### Environmental and Social Acceptability

For the large part, Project activities are expected to have no effect on the environmental or social environment. This is mainly a result of the benign nature of the Project and the associated activities as well as the result of the integration of preventative measures into the project design.

The environmental assessment does indicate some potential for limited environmental and social impacts to habitats and flora; fauna; coastal processes and water quality; and human health and safety. The potential is reduced through the implementation of standard mitigation measures and industry best practices, none of which are excessive in cost.

Given the low potential for negative impacts and the high potential for significant positive benefits (both direct and indirect), the Project would be deemed to have a high level of environmental and social acceptability.

### Loan Condition and Covenants

The Company and the contractors will need to comply with all local and national regulations with respect to environmental and social protection. In addition they will need to implement the preventative measures set forth in the EIA and the associated ESMP. Specific requirements of the ESMP are provided in an annex to this Executive Summary (Annex A).

The Company will need to be required to report on environmental and social performance to AfDB on a quarterly basis and to local and national authorities at a frequency specified in each environmental permit.

The Company will need to be required to develop and implement a Stakeholder Engagement Plan (SEP) to ensure on-going consultation and disclosure of Project Activities. The SEP will need to include a Grievance Mechanism so that stakeholders can voice concerns and so that any unforeseen problems can be effectively resolved.

## 12. REFERENCES AND CONTACTS

### References

Fugro Seafloor Surveys, Inc. (2008) Main One Submarine Cable Network, Phase 1, Desktop Study. Report Number: 0802J003\_Main1\_DTS.

International Cable Protection Committee. About Submarine Telecommunications Cables: Communicating via the ocean. <http://www.iscpc.org/> accessed November 2008.

Main Street Technologies website: <http://www.mainstreettechnologies.net/>

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## EXECUTIVE SUMMARY

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The EIA is registered in Ghana as CI 1531/01/03 and in Nigeria as FMENV/CONF/EIA/123.1179/Vol. 1/16.

Annex A

## Environmental and Social Management Plan

EXECUTIVE SUMMARY

**Table A.1 ESMP Actions**

Impact	Measures/ Commitments in EIA	Monitoring/ Implementation	Verification	Project Stage	Responsibility
Impact on Habitats and Flora	<ul style="list-style-type: none"> <li>• Clearing will be limited to the minimum needed for safe implementation of the works.</li> <li>• Areas of habitat that are temporarily disturbed during cable installation will be restored upon the completion of the installation phase. Trenches will be back filled and vegetation recolonization will be encouraged by ripping any compacted soil and replacing any topsoil or subsoil to the approximate original depths.</li> <li>• The Project will ensure that measures are adopted to avoid incursion into areas adjacent to the work site or any secondary affects from pollution, altered drainage regimes, dust, sedimentation, or accidental spills.</li> <li>• Opportunities will be taken to educate the Project workforce and local communities to ensure that the importance of environmental protection and nature conservation are effectively communicated and that wider appreciate of environmental issues and construction best practice are fostered.</li> <li>• Where possible the development design will be micro-sited to avoid mature trees. Mature trees in the vicinity of the development (that will not be removed as part of the site clearance operations) will be clearly marked with high-visibility tape or fenced off to prevent unnecessary damage during installation activities.</li> <li>• The Project will require contractors to implement a hazardous materials management plan that includes specification for proper storage and handling of fuels, oil, wastes, and other potentially hazardous materials on the site. The Project will also require that marine vessels have a similarly comprehensive plan for storage and handling of hazardous materials as well as a plan for containment and cleanup of accidental spills into the marine environment.</li> <li>• Marine vessels will be required to adhere to International Maritime Organization (IMO) regulations on bilge and ballast water discharge in order to avoid unintentional introduction of non-native species to the marine environment.</li> </ul>	<ul style="list-style-type: none"> <li>• Construction Site Management Plan</li> <li>• Erosion Control and Restoration Plan</li> <li>• Waste Management Plan;</li> <li>• Marine Logistics Plan</li> <li>• Hazardous Materials Management Plan</li> </ul>	<ul style="list-style-type: none"> <li>• Daily self checks and verification by contractors</li> <li>• Monthly reports on performance by contractors to Company</li> <li>• Spot checks and audits by Company</li> <li>• Weekly review of grievances recorded</li> </ul>	Pre-Installation and Installation	<ul style="list-style-type: none"> <li>• Contractors</li> <li>• EHSC</li> </ul>

## EXECUTIVE SUMMARY

Impact	Measures/ Commitments in EIA	Monitoring/ Implementation	Verification	Project Stage	Responsibility
Impacts on Fauna	<ul style="list-style-type: none"> <li>• During the turtle nesting period, a survey will be carried out each day prior to start of work. If a turtle nest is discovered in the work area, Project activities will cease and the Project will consult with an ecology specialist to determine the appropriate course of action. This may include moving the nest out of the Project area. If the beach area at the site and nearby is determined to be a common nesting area (ie more than one nest is discovered over the construction period), the Project will engage the assistance of an ecology specialist or organization to develop a suitable plan.</li> <li>• Contractors will implement a suitable system for spotting marine mammals and turtle whilst pre-installation and installation vessels are at sea. Should these species be observed in the vicinity of the work area, the vessels will execute measures to avoid collision or disturbance. Vessel operators will maintain a distance of 100 m or greater and will travel at 10 knots or less when safety permits until animals are more than 500 m away. Abrupt changes in direction will be avoided.</li> <li>• Vessel crews must report sightings of any injured or dead marine mammals and sea turtles immediately, regardless of whether the injury or death is caused by a Project vessel. The report should include the date and location (latitude/longitude) of the animal/strike, the name of the vessel involved, and the species identification or a description of the animal. The report should be made to a designated ecology organisation.</li> <li>• Security lighting will be aimed on the area it is required at an adequate level of illumination only to avoid impacts on sensitive fauna. Spillage of illumination outside the direct work area will be avoided.</li> </ul>	<ul style="list-style-type: none"> <li>• Marine Fauna Protection Procedure</li> <li>• Daily fauna observation report;</li> <li>• Lighting plan</li> <li>• Env. training and awareness-raising for contractor personnel</li> <li>• Notification procedure</li> </ul>	<ul style="list-style-type: none"> <li>• Daily self checks and verification by contractors</li> <li>• Monthly reports on performance by contractors to Company</li> <li>• Spot checks and audits by Company</li> <li>• Weekly review of grievances recorded</li> <li>• Lighting plan to approved by EHSC</li> </ul>	Pre-Installation and Installation	<ul style="list-style-type: none"> <li>• Contractors</li> <li>• EHSC</li> </ul>

## EXECUTIVE SUMMARY

Impact	Measures/ Commitments in EIA	Monitoring/ Implementation	Verification	Project Stage	Responsibility
Impacts on Coastal Processes and Water Quality	<ul style="list-style-type: none"> <li>• The Project will ensure that measures are adopted to avoid incursion into areas adjacent to the work site or any secondary affects from pollution, sedimentation, or accidental spills.</li> <li>• Areas of the nearshore environment that are disturbed during installation activities (such as trench digging) will be rehabilitated as soon as possible after the cable has been installed.</li> <li>• All rehabilitated areas will be surveyed on a weekly basis for the first month after rehabilitation, and a monthly basis for the subsequent five months, to monitor levels of coastal erosion in the vicinity of the development. If observations indicate that significant erosion and sediment transport is taking place (ie that rehabilitation has been unsuccessful and that the safety of the cable may become compromised) additional mitigation will be employed to reduce erosion.</li> <li>• Marine vessel anchors will not be dragged along the seabed and they will be retrieved vertically to avoid unnecessary sediment disturbance.</li> <li>• The maximum speed of the cable laying will not exceed 6 knots per hour so that the amount of seabed sediment disturbed and dispersed during the cable laying process can be kept to a minimum.</li> <li>• Marine vessels will be required to comply fully with the requirements of the MARPOL Protocol (1978) at all times.</li> </ul>	<ul style="list-style-type: none"> <li>• Journey Management Plan</li> <li>• Spill Prevention Control, Containment and Emergency Response Plan</li> <li>• Waste Management Plan</li> <li>• Hazardous Materials Management Plan</li> <li>• Erosion Control and Restoration Plan</li> <li>• Marine Logistics Plan (for marine activities)</li> </ul>	<ul style="list-style-type: none"> <li>• Daily self checks and verification by contractors</li> <li>• Monthly reports on performance by contractors to Company</li> <li>• Spot checks and audits by Company</li> <li>• Weekly review of grievances recorded</li> <li>• Weekly check of beach restoration for one month followed by check once per month for five months</li> </ul>	Pre-Installation and Installation	<ul style="list-style-type: none"> <li>• Contractors</li> <li>• EHSC</li> </ul>

## EXECUTIVE SUMMARY

Impact	Measures/ Commitments in EIA	Monitoring/ Implementation	Verification	Project Stage	Responsibility
Impacts on Human Health and Safety	<ul style="list-style-type: none"> <li>• The Project will require all contractors to implement an Environmental, Health and Safety (EHS) plan which will outline procedures for avoiding health and safety incidents and for emergency medical treatment. This will be achieved by making it a component of contractual agreement.</li> <li>• Contractors will be required to wear suitable Personal Protective Equipment (PPE) including hard hats, high-visibility vests, safety boots and gloves and life vests as appropriate in accordance with the EHS plan.</li> <li>• All construction and cable repair workers will be sufficiently trained in the safe methods of working with fiber optic cables to avoid injury associated with laser lights and fibers.</li> <li>• Except for areas secured by fencing, all active construction areas will be marked with high-visibility tape to reduce the risk accidents involving pedestrians and vehicles.</li> <li>• All open trenches and excavated areas will be backfilled as soon as possible after the construction has been completed. Access to open tranches and excavated areas will be secured to prevent pedestrians or vehicles from falling in.</li> <li>• Vessels will increase watch when navigating in areas that are known to be used by fishermen and other vessels. If other vessels are observed within the near vicinity, the Project vessel will stop moving, make contact with the other vessel if possible, and wait until it has been confirmed that the course of both vessels will not result in collision or damage to equipment.</li> <li>• While a ship is laying cable its manoeuvrability is restricted, as such it will display the day signals and lights of a hampered vessel to avoid collision with other vessels at sea.</li> </ul>	<ul style="list-style-type: none"> <li>• Env.l Health and Safety Plan</li> <li>• Health and safety training and training records</li> <li>• Health and safety incident register</li> <li>• Regular (site and office based) health and safety meetings with all parties in attendance and official minutes taken.</li> <li>• Marine Logistics Plan</li> </ul>	<ul style="list-style-type: none"> <li>• Daily self checks and verification by contractors</li> <li>• Monthly reports on performance by contractors to Company</li> <li>• Spot checks and audits by Company</li> </ul>	Pre-Installation and Installation	<ul style="list-style-type: none"> <li>• Contractors</li> <li>• EHSC</li> </ul>

## EXECUTIVE SUMMARY

Impact	Measures/ Commitments in EIA	Monitoring/ Implementation	Verification	Project Stage	Responsibility
Impacts on Air Quality	<ul style="list-style-type: none"> <li>• The Project should require that construction contractors operate only well maintained engines. In addition the Project should implement a maintenance program for the CLS power generation engine.</li> <li>• Should considerable dust generation occur during construction, causing plumes of dust in the vicinity of the works and behind construction vehicles (a potential occurrence during construction during the dry season), a routine wetting program of all unpaved surfaces including roads and construction areas will be undertaken to ensure sufficient moisture content is maintained to suppress dust generation.</li> <li>• Construction traffic speed control measures will be enforced on unpaved roads (reduced dust generation levels are often consistent with reduced traffic speeds).</li> </ul>	<ul style="list-style-type: none"> <li>• Construction Site Management Plan</li> <li>• Journey Management Plan</li> <li>• Placement of traffic signs indicating the speed limit along the route used by construction vehicles.</li> <li>• Enforcement of fines and a penalty system for non-compliances.</li> <li>• Vehicle maintenance records</li> </ul>	<ul style="list-style-type: none"> <li>• Daily self checks and verification by contractors</li> <li>• Monthly reports on performance by contractors to Company</li> <li>• Spot checks and audits by Company</li> <li>• Weekly review of grievances recorded</li> </ul>	Pre-Installation and Installation	<ul style="list-style-type: none"> <li>• Contractors</li> <li>• EHSC</li> </ul>

## EXECUTIVE SUMMARY

Impact	Measures/ Commitments in EIA	Monitoring/ Implementation	Verification	Project Stage	Responsibility
Impacts on Noise and Vibration Receptors	<ul style="list-style-type: none"> <li>• The Project will require contractors to use equipment and vehicles that are in good working order, well maintained, and that have all noise suppression equipment (eg mufflers, noise baffles) intact and in working order.</li> <li>• Contractors will be required to implement best driving practices when approaching and leaving the site to minimize noise emissions created through activities such as unnecessary acceleration and breaking squeal.</li> </ul>	<ul style="list-style-type: none"> <li>• Construction Site Management Plan</li> <li>• Journey Management Plan</li> <li>• Placement of traffic control signs indicating traffic rules and enforcement of fines and a penalty system for non-compliances.</li> <li>• Vehicle maintenance records</li> </ul>	<ul style="list-style-type: none"> <li>• Daily self checks and verification by contractors</li> <li>• Monthly reports on performance by contractors to Company</li> <li>• Spot checks and audits by Company</li> <li>• Weekly review of grievances recorded</li> </ul>	Pre-Installation and Installation	<ul style="list-style-type: none"> <li>• Contractors</li> <li>• EHSC</li> </ul>