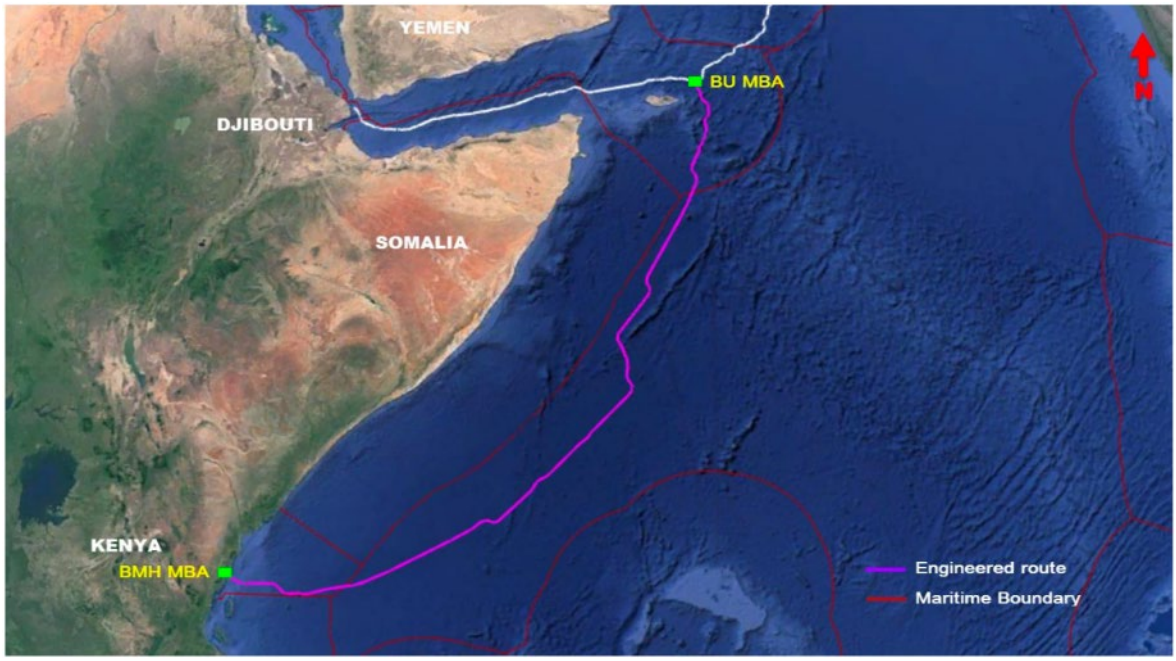
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT



PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBRE OPTIC CABLE IN KENYA TERRITORIAL WATERS UP TO THE KENYA BEACH MANHOLE IN NYALI, MOMBASA COUNTY

PROPONENT	
Telkom	**TELKOM KENYA LIMITED** **P.O BOX 30301-00100.** **NAIROBI - KENYA**
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JULY 2023	

CERTIFICATION

Environtech Consultancy Africa (ECA) Limited submits the following Environmental and Social Impact Assessment (ESIA) Study Report for the proposed installation of Africa 1 submarine fibre optic cable in Kenya territorial waters up to the Kenya Beach Manhole (BMH) in Nyali, Mombasa County.

We, certify that the information provided is accurate and truthful.

Proponent: Telkom Kenya Limited (TKL)

Assignment: ESIA for the proposed Installation of Africa 1 submarine fibre optic cable in Kenya territorial waters up to the Kenya Beach Manhole in Nyali, Mombasa County.

Report Title: Environmental and Social Impact Assessment Study Report

FIRM OF EXPERTS:

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Air Quality Monitor **AQM/030**

ENVIRONTECH CONSULTANCY AFRICA LTD.

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NAIROBI - KENYA

Signed: _____ **Date:** 13th July 2023

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ACRONYMS

AF1	Africa 1 Submarine Cable
ALARP	As Low As Reasonably Practicable
AOI	Area of Influence
Asl	Above Sea Level
BAP	Barrel Assemblies
BID	Background Information Document
BMH	Beach Manhole
BMP	Best Management Practices
BMP	Best Management Practices
BOD	Biological Oxygen Demand
BTL	Bell Telephone Laboratory
CA	Communication Authority
CDA	Coast Development Authority
CHS	Community Health and Safety
CIDP	County Integrated Development Plan
CLS	Cable Landing Station
COMRED	Coastal and Marine Resources Development
Covid-19	Corona Virus Disease of 2019
CPP	Consultation and Public Participation
CRVA	Climate Risk Vulnerability Assessment
CTD	Conductivity, Temperature, and Depth
DARE 1	Djibouti-Africa Regional Express
DGPS	Differential Global positioning system
DMP	Disaster Management Plan
DoEWE	Department of Environment, Waste Management and Energy
DOIM	Deputy Offshore Installation Manager
DOSHS	Directorate of Occupational Safety and Health Services
EACC	East African Coast Current
ECA	Environtech Consultancy Africa Ltd
ECO	Environment Compliance officer
EEZ	Exclusive Economic Zone
EMCA	Environmental Management and Coordination Act
EOB	End of Burial
ESF	Environment and Social Framework
ESIA	Environmental and Social Impact Assessment
ESM&MP	Environmental and Social Management and Monitoring Plan

FwD	Forward
GcGPS	Globally corrected Global Positioning System
GDP	Gross Domestic Product
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GRM	Grievance Redress Mechanism
GS	Gravity Sample
HRA	High Risk Area
HRA	High Risk Area
ICT	Information and Communication Technology
IPCC	Intergovernmental Panel on Climate Change
KCGS	Kenya Coast Guard Services
KeMFRI	Kenya Marine and Fisheries Institute
KeNHA	Kenya National Highways Authority
KeRRA	Kenya Rural Roads Authority
KMA	Kenya Maritime Authority
KURA	Kenya Urban Roads Authority
KWS	Kenya Wildlife Service
LK	Product name of specific cable tie
MEA	Multilateral Environmental Agreement
MMP&R	Mombasa Marine Park and Reserve (MMP&R)
MOG	Mogadishu
NEMA	National Environment Management Authority
NEs	Network Elements
NMK	National Museums of Kenya
NMS	Network Monitoring Systems
ODSs	Ozone Depleting Substances
OIM	Offshore Installation Manager
OOS	Out of Service
OOW	Officer of the Watch
OS	Operation System
PCBs	Polychlorinated Biphenyls
PEACE	Pakistan & East Africa Connecting Europe
PLGR	Pre-Lay Grapnel Run
RA	Risk Assessment
RCO	Route Clearance Operation
ROV	Remotely Operated Vehicle
RPL	Route Position Lists

SQL	Structured Query Language
Stbd	Starboard
TKL	Telkom Kenya Ltd
TSS	Traffic Separation Scheme
UHF	Ultra-High Frequency
UKMTO	United Kingdom Maritime Trade Operations
UKMTO	United Kingdom Maritime Trade Operations
UNFCCC	United Nations Framework Convention on Climate Change
VEC	Valued Ecosystem Component
VRA	Voluntary Reporting Area
VRA	Voluntary Reporting Area
WBG	World Bank Group
WD	Water Depth
WGS	World Geodetic System

EXECUTIVE SUMMARY

There are numerous challenges to the Kenyan environment today. This has occurred because of unsustainable development projects, many of which have led to environmental degradation. To address this problem, the Kenya Government came up with legislation enshrined in the Environmental Management and Coordination Act, 1999 (Revised, 2015). Through this Act, the National Environment Management Authority (NEMA) was instituted, which has the statutory mandate to supervise and coordinate all environmental activities. EMCA's main role is to advocate, oversee and enforce environmental management. Under EMCA, it is a mandatory requirement that all projects are economically viable, socially acceptable, and environmentally sound. For this reason, all new development projects are required to undergo an Environmental and Social Impact Assessment (ESIA). ESIA assesses the environmental and socio-economic impacts of a project before it is implemented to identify the likely environmental and social impacts of projects and propose mitigation measures for the adverse impacts.

The Environmental (Impact Assessments and Audit) Regulations, 2003 (Legal Notice 101) provide for the procedure and conduct for conducting environmental impact assessments and audits. The second schedule of the EMCA, 1999 that lists the projects that must undergo EIA has been amended by Legal Notice No. 31 & 32 of 2019 (The Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019. Legal Notice No 31 has reclassified the projects and facilities requiring EIA based on their risk to as Low, Medium, and High-risk projects. Legal Notice No. 32 of 2019 amended section 7 of legal notice 101 to require proponents of low risk and medium risk projects to submit an Environmental Impact Assessment (EIA) Summary project Report (SPR) while the proponents of High-Risk projects are required to submit a Comprehensive Study Report (CPR) to NEMA. The installation of Africa 1 Submarine fibre optic cable on Kenya Territorial Waters is classified high risk project. The study has also been undertaken in line with the requirements of World Bank Group (WBG) Environment and Social Framework (ESF) (2017).

Telkom Kenya Ltd (hereafter referred to as the Project Proponent/TKL), appointed **Environtech Consultancy Africa Ltd**, a registered Firm of Environmental Experts, Firm Registration No **6085**, to carry out the Environmental and Social Impact Assessment (ESIA) study for the proposed installation and operation of approximately 32km of the Africa 1 submarine fibre optic cable (hereafter referred to as the Project) in Kenya Territorial Waters. This was to comply with the EMCA, 1999 (Revised, 2015). The Project involves the installation and operation of approximately 32km of the submarine cable. TKL is the landing party of in Kenya for the Africa 1 submarine Optic Cable. The Africa 1 Seg 2 cable system is an intercontinental submarine cable system which consists of 11 segments running between United Arab Emirates, Saudi Arabia,

Pakistan in Asian Continent and Kenya, Djibouti and Egypt in African Continent. The whole route lies within the Gulf of Oman, Gulf of Aden, Red Sea, Arabian Sea & East Coast of Africa.

1 INTRODUCTION

1.1 Background information

Africa 1 (AF1) Submarine Cable project is designed to install a submarine cable system, connecting United Arab Emirates, Pakistan in Asian Continent and Kenya. The whole cable route lies within the Gulf of Oman, Gulf of Aden, Arabian Sea and East Coast of Africa. This submarine cable route system has been referred to as Africa-1 Segment 2 Cable Route System.[1] Africa 1 is targeted for completion in 2023.

Despite Africa 1 Submarine OFC being owned by Alcatel Submarine Network (ASN), Telkom, as its cable landing partner in Kenya, is responsible for the effective implementation of the approved Environmental and Social Management Plan (ESMP) and environmental license conditions.

1.2 Project Proponent

Telkom Kenya Limited (TKL) or Telkom is a technology company that provides integrated solutions to individuals, Small and Medium-sized Enterprises (SMEs), Government and large corporates in Kenya, drawing from a diverse solutions suite that includes voice, data/connectivity, digital financial services, as well as network services. Powered by its vast fibre optic infrastructure, it is also a major provider of wholesale carrier-to-carrier traffic, within the country and the region.

These services are primarily offered through our Service Delivery Units (SDUs): **Digital** (that offers: Data Centre Services, Cloud, Managed Services, Connectivity, Broadband, Carrier-to-Carrier traffic, and Backbone Infrastructure); **Consumer** (that offers: Data, Voice, VAS, and Content) and **Digital Financial Services** (through our platform T-kash).

Established as a telecommunications operator in April 1999, Telkom has 4,152 km of its own terrestrial fibre cabling, serving as a key conduit for broadband connectivity, inland.

Telkom Kenya owns a 22.5% stake in The East African Marine System (TEAMS), a 5,000km undersea fibre optic cable through Fujairah, UAE. Telkom also hosts and operates this cable.

Telkom also owns a 10% stake in the Lower Indian Ocean Network II (LIONII), a 2,700km undersea fibre optic cable through Mauritius. It also owns a stake in the Eastern Africa Submarine Cable System (EASSy) through shareholding in the West Indian Ocean Cable Company (WIOCC). Eassy is a 10,000km cable from Mtunzini, South Africa to Djibouti. Telkom was also the landing partner for the LIONII, EASSy, the Djibouti Africa Regional Express 1 (DARE 1) a 4,854km cable

[1] Cable Survey Report

from Djibouti to Mombasa, and lately, the Pakistan and East Africa Connecting Europe (PEACE) Cable, a 15,000km cable from Marseilles, France through to Singapore and South Africa.[2]

1.3 Purpose of the Report

The information contained in this Environmental and Social Impact Assessment (ESIA) Project Report, along with comments and inputs received from stakeholders and commenting authorities, will assist the competent authority, the National Environment Management Authority (NEMA), in deciding whether to grant environmental authorization for the Project, and to inform the conditions associated with such authorization.

The ESIA process involves the identification, prediction, and evaluation of actual and potential environmental and social impacts of the Project and outlines the mitigation measures for negative impacts and enhancement measures for positive impacts which the Project Proponent will implement.

The objectives of this document are to:

- Communicate the results of the ESIA process for the Project and alternatives considered;
- Ensure that the impacts identified during the ESIA process are assessed;
- Present the mitigation and enhancement measures which will be implemented by the Project Proponent to manage the impacts identified;
- Provide a record of comments and responses received from Stakeholders during the ESIA process; and
- Facilitate an informed decision-making process by the relevant authorities.

1.4 Project Justification

The Africa 1 Seg 2 cable system is an intercontinental submarine cable system which consists of 11 segments running between United Arab Emirates, Saudi Arabia, Pakistan in Asian Continent and Kenya, Djibouti, and Egypt in African Continent. The whole route lies within the Gulf of Oman, Gulf of Aden, Red Sea, Arabian Sea & East Coast of Africa.

Part of the Africa 1 Seg 2 cable system running in Gulf of Oman, Gulf of Aden, Arabian Sea & East Coast of Africa named Segment 2.01 to Segment 2.07 has been commissioned to E- Marine PJSC to survey by ASN on behalf of Africa 1 Consortium. The detailed listing of segments under E-Marine scope for survey operations is as follows:

- Seg 2.01 – BMH Kalba (KBA) to BU Karachi (KHI)
- Seg 2.02 – Gwadar Stub End (GWA Stub) to BU Gwadar (GWA)
- Seg 2.03 – BU Gwadar (GWA) to BU Karachi (KHI)

[2] See https://telkom.co.ke/about-us/who-we-are/

- Seg 2.04 – BMH Karachi (KHI) to BU Gwadar (GWA)
- Seg 2.05 – BU Karachi (KHI) to BU Mombasa (MBA)
- **Seg 2.06 – BMH Mombasa (MBA) to BU Mombasa (MBA)**
- Seg 2.07 – BU Mombasa (MBA) to BU Djibouti (DJB)

1.5 Scope, Objectives and Terms of Reference (TOR)

1.5.1 Overall objective of the ESIA study

The objectives of the ESIA are to:

- Identify all potentially significant adverse environmental and social impacts of the Project and recommend measures for mitigation;
- Gather baseline data to inform the assessment of impacts and to monitor changes to the environment as a result of the Project as well as evaluate the success of the mitigation measures implemented;
- Recommend measures to be used to avoid or reduce the anticipated negative impacts and enhance the positive impacts; and
- Prepare an ESIA Project Report compliant to Environmental Management and Coordination Act (EMCA) and the Environmental (Impact Assessment and Audit) Regulations of 2003 (and the Amendments of 2016 and 2019), detailing findings and recommendations for review by NEMA.

1.5.2 Scope of EIA

The proposed scope of works for the study follows EMCA of 1999 (and 2015 Amendments) and the Environmental (Impact Assessment and Audit) regulations of 2013 (and the Amendments of 2009, 2016 and 2019) and include:

- Determination of baseline data using primary data generation and secondary data available from various government published on air, meteorology, water, soil, flora & fauna, socio- economics, infrastructure, sensitive areas (forest, archaeological, historical etc.);
- Detailed description of all elements of the project activities during the preconstruction, construction, and operational phase. The elements analyzed include the infrastructures of the project including waste collection, disposal and management, utility requirements and anticipated sea traffic changes;
- Identification of the source of pollution and assessing the impacts on the environment due to proposed project if any;
- Preparation of ESIA documents with recommendations on preventive and mitigative measures for limiting the impact on environment to the desired level during various stage of project;

- Development of a suitable post-study monitoring program to comply with various environmental and social regulations;
- Risks assessment (RA) and Disaster Management plan (DMP) describing the probable risks and preventive & precautionary measures to be followed in the event of emergency situations such as accidents, fire etc., and
- The social, economic, and political impact of the proposed project.

1.5.3 Terms of Reference (TORs) for the ESIA

The TORs for the proposed project ESIA are in accordance with EMCA of 1999 (and 2015 Amendments) and the Environmental (Impact Assessment and Audit) regulations of 2013 (and the Amendments of 2009, 2016 and 2019):

1) Describe location/site, objectives, scope, nature of the proposed project;
2) Describe the proposed project activities during the proposed project cycle; construction, operation, decommissioning phases;
3) Analyze materials to be used in the construction and implementation of the project, and wastes to be generated proposing alternative/appropriate options/technologies;
4) Establish the suitability of the proposed project in the proposed location;
5) Review and establish all relevant baseline information as will be required by NEMA (Physical, Biological and Social Cultural and Economic) and identify any information gaps;
6) Describe and analyze the policy, legal and institutional framework including but not limited to Kenyan policies, laws, regulation and guidelines; international guidelines related to the proposed project, which have a bearing on the proposed project and will also serve as benchmarks for monitoring and evaluation, and future environmental audits;
7) Undertake an in-depth description of the proposed project and associated works together with the requirements for carrying out the works;
8) Analyze the efficacy of the designs, technology, procedures and processes to be used, in the implementation of the works;
9) Carry out Consultation and Public Participation (CPP): Identify key stakeholders and affected persons; and hold a public meeting (as need be) and provide /collect written evidence i.e., minutes/questionnaires;
10) Identify and analyze proposed project alternatives including but not limited to Project site alternatives, no project alternatives, design alternatives, material alternatives and technologies alternatives;
11) Identify, predict and carry out in-depth analysis of all actual potential and significant impacts on flora, fauna, soils, air, water, the social, cultural and community settings; the direct, indirect, cumulative, irreversible, short-term and long-term effects anticipated to

be generated by the proposed project, both positive and negative throughout the project lifecycle;

12) Analyze occupational health and safety issues associated with the proposed project;
13) Recommend sufficient enhancement and mitigation measures for all the potential positive and negative impacts identified and analyzed;
14) Develop an Environmental and Social Management and Monitoring Plan (ESM&MP) proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment, including the cost, timeframe and responsibility to implement the measures;
15) Prepare a comprehensive ESIA study report in accordance with EMCA 1999 and EMCA (amendment) 2015 and legislation under it;
16) Submit a draft ESIA Study report to the client for review;
17) Incorporate comments into the ESIA study report after review by client into a final ESIA study report;
18) Submit 10 hard copies and one soft copy of the ESIA study report to NEMA for the purposes of seeking a NEMA license that will approve the proposed project; and
19) Submit to the client one copy of NEMA referenced ESIA study report, one soft copy of the ESIA study report and acknowledgment letter from NEMA;

1.6 Methodology of the EIA full study

1.6.1 Screening

The Project was screened to determine the need to undertake an ESIA based on:

- Project characteristics;
- Project area characteristics;
- The Second Schedule of EMCA (as amended in the Environmental (Impact Assessment and Audit) Regulations amendments of 2016, which lists the projects that must undergo an EIA; and
- World Bank Group (WBG) Environmental and Social Standards, 2017.

Based on the above criteria, it was concluded that an ESIA resulting in the preparation of an ESIA Project Report would be required for the Project due to the following aspects:

- Legal Notices no. 149 of the National Environment (Impact Assessment and Audit) (Amendment) Regulations of 2016 and no 31 National Environment (Impact Assessment and Audit) (Amendment) Regulations of 2019 classifies the Project (Telecommunication

Infrastructure) as Medium Risk which can be approved through the preparation and submission of an ESIA Project Report[3];

- Legal Notice no. 32 of the National Environment (Impact Assessment and Audit) (Amendment) Regulations of 2019 which states that every proponent undertaking a project specified in the Second Schedule of the Act as being a low-risk project or a medium risk project, shall submit to the Authority a Summary Project Report of the likely environmental effects of the project;
- The fact that the Project is located within both natural and critical habitats; and
- The nature and extent of the potential impacts of the Project on the natural and critical habitats.

1.6.2 Desk Reviews

A literature review was undertaken based on the findings of the reconnaissance process, which involved reviewing legislation, policies, the County Integrated Development Plan (CIDP), and previous studies carried out in the area to determine the baseline conditions and establish the legal, institutional, and biophysical/socio-economic environmental setting of the Project area.

The desk-based study also included the development of fieldwork tools, fieldwork schedules as well as the approach to stakeholder engagement.

1.6.3 Site Visits

A site investigation was undertaken from June 18-19, 2023, during which detailed environmental and social baseline data was collected and preliminary stakeholder engagement undertaken. Data was collected through:

- Sharing the Project's Background Information Document (BID), and presented as Annex C) to identified formal stakeholders and requesting them to share their views/ comments on the Project;
- Focus Group Discussions (FGD) with the Area Chief, BMU members**,** village elders; and
- Site walkovers.

Photography and Global Positioning Systems (GPS) were used to record the salient features and baseline conditions at the Project site and surroundings.

[3] As per the 2016 and 2019 amendments of the National Environment (Impact Assessment and Audit) Regulations, Projects are classified as Low, Medium and High Risk based on their environmental and social risks. Low and Medium Risk projects maybe approved through the submission of ESIA Project Reports; however, these amendments specify that High Risk projects shall require submission of an ESIA Study Report.

1.6.4 Baseline Data Collection

To understand the existing baseline environmental and social conditions in the project area, a variety of data collection methods were used. These are described below:

1.6.4.1 *Remote Sensing and GIS Analysis*

Remote sensing was undertaken and ground-truthing done by the consultants at the time of the site visit. Remote sensing was based on available satellite imagery of the Project area.

1.6.5 Data Analysis and Evaluation of Alternatives

The analytical process involved physical, socio-cultural, mathematical, and economic models, including evaluating costs and benefits. The models required expert judgment for accurate predictions. The emphasis was on the project location, design, technology, scale, or any other aspect that may be deemed significant in evaluating project alternatives.

1.6.6 Stakeholder Engagement

Undertaking stakeholder engagement process conforming to the NEMA regulation as provided in Regulation 17 of the Environmental (Environmental Assessment, Impact and Audit) Regulations, 2003. Best international practice [World Bank Group (WBG)] requiring that public consultation and disclosure process leading to Environmental and Social Assessment and Management Systems was also done.

1.7 Impact Assessment Methodology

1.7.1 Impact Assessment Process

The purpose of impact assessment is to identify and evaluate the significance of potential impacts on identified receptors and resources according to defined assessment criteria and to develop and describe mitigation measures that will be taken to avoid or minimize any potential adverse effects and to enhance potential benefits.

The impacts of the Project were identified based on the findings of stakeholder consultation, the existing baseline conditions, the Project activities, and professional knowledge of the consultants. Impacts are first distinguished as either positive or negative. The cross-sectoral issues and aspects are aquatic habitat alteration, hazardous materials and waste, emission to air, noise, and vibration; social aspects particularly employment and economy, labour and working conditions, and partial loss of access to productive assets.

1.7.2 Definition of Key Terminology

Project - The features and activities that are a necessary part of the Project Proponent's development plans without which the Project cannot proceed. The Project is also the collection of features and activities for which authorization is being sought.

Project Site - The (future) primary operational area for the Project activities.

Project Footprint - The area that may reasonably be expected to be directly affected by Project activities, across all phases. The Project footprint includes land used on a temporary basis such as construction lay down areas, materials yards, borrow pits or construction haul roads, as well as disturbed areas in transport corridors, both public and private.

Area of Influence (AOI) -The area where impacts could reasonably be expected.

Project Area - Also referred to as the Study Area is the area that needs to be studied to adequately understand and describe the baseline likely to be affected by the Project. The Project Area encompasses the Project footprint, Project site and the AOI.

1.7.3 Impact Types and Definitions

An impact is any change to a resource or receptor brought about by the presence of a Project component or by the execution of a Project related activity. The evaluation of baseline data provides crucial information for the process of evaluating and describing how the Project could affect the bio-physical and socio-economic environment.

Impacts are described according to their nature or type, as summarized in Table 1-1.

Table 1-1 Impact Nature and Type

Nature or Type	Definition
Positive	An impact that is considered to represent an improvement on the baseline or introduces a positive change.
Negative	An impact that is considered to represent an adverse change from the baseline or introduces a new undesirable factor.
Direct impact	An impact that results from a direct interaction between a planned project activity and the receiving environment/receptors (e.g., between occupation of a site and the pre-existing habitats or between an effluent discharge and receiving water quality).
Indirect impact	An impact that results from other activities that are encouraged to happen because of the Project (e.g., labor influx placing a demand on resources).
Induced impact	An impact that results from other activities (which are not part of the Project) that happen because of the Project (e.g., influx of camp followers resulting from the importation of a large Project workforce).

Nature or Type	Definition
Cumulative impact	An impact that acts together with other impacts (including those from concurrent or planned future third-party activities) to affect the same resources and/or receptors as the Project.

1.7.4 Assessing Significance

Impacts are described in terms of 'significance'. Significance is a function of the magnitude of the impact and the sensitivity/vulnerability/importance of resource/receptor.

1.7.4.1 *Determining Impact Magnitude*

Impact magnitude (sometimes termed severity) is a function of the type, extent, duration, scale, and frequency of the impact. These characteristics apply to both planned and unplanned events/impacts and are briefly described in Table 1-2.

An additional characteristic that pertains only to unplanned events is likelihood. The likelihood of an unplanned event occurring is designated using a qualitative scale, as described in Table 1-3.

Table 1-2 Impact Characteristics Methodology

Characteristic	Definition	Designations
Type	A descriptor indicating the relationship of the impact to the Project (in terms of cause and effect) as explained in Table 1-1.	• Direct • Indirect • Induced
Extent	The "reach" of the impact (e.g., confined to a small area around the Project Footprint, projected for several kilometers, etc.).	• Local - impacts that affect an area in a radius of 20km around the development site. • Regional - impacts that affect regionally important environmental resources or are experienced at a regional scale as determined by administrative boundaries, habitat type/ecosystem. • International - impacts that cross national borders, affect nationally important environmental resources or affect an area

Characteristic	Definition	Designations
		that is nationally important/or have macro-economic consequences.
Duration	The time over which a resource/receptor is affected.	• Temporary - impacts are predicted to be of short duration and intermittent/occasional. • Short-term - impacts that are predicted to last only for the duration of the construction period. • Long-term - impacts that will continue for the life of the Project but ceases when the Project stops operating. • Permanent - impacts that cause a permanent change in the affected receptor or resource (e.g., removal or destruction of ecological habitat) that endures substantially beyond the Project lifetime.
Scale	The size of the impact (e.g., the size of the area damaged or impacted, the fraction of a resource that is lost or affected, etc.)	[no fixed designations; intended to be a numerical value or a qualitative description of "intensity"]
Frequency	A measure of the constancy or periodicity of the impact.	[no fixed designations; intended to be a numerical value or a qualitative description]

Table 1-3 Definition for Likelihood Designations

Likelihood	Definition
Unlikely	The event is unlikely but may occur at some time during normal operating conditions.
Possible	The event is likely to occur at some time during normal operating conditions.
Likely	The event will occur during normal operating conditions (i.e., it is essentially inevitable).

The overall magnitude of an impact is a combination of the above characteristics. The universal magnitude designations are:

- Negligible;
- Small;
- Medium; and
- Large.

1.7.4.2 *Determining sensitivity/vulnerability/ importance of resource/receptor*

There are a range of factors to be considered when defining the sensitivity/vulnerability/ importance of the resource/receptor, which may be physical, biological, cultural, or human. Other factors may also be considered when characterizing sensitivity/vulnerability/ importance, such as legal protection, government policy, stakeholder views and economic value.

As for the case of magnitude, the sensitivity/vulnerability/importance designations themselves are universally consistent, but the definitions for these designations vary on a resource/receptor basis. The sensitivity/vulnerability/importance designations used herein for all resources/ receptors are:

- Low;
- Medium; and
- High.

Table 1-4 presents an illustrative example of the sensitivity/vulnerability/importance of the resource/receptor.

Table 1-4 Illustrative Example of Sensitivity/Vulnerability/Importance of the Resource/Receptor

Designation	Receiving environment	
	Biophysical environment	**Socio-economic environment**
Low	The impact affects the environment in such a way that natural functions and processes are not affected.	People/communities can adapt with relative ease and maintain pre-impact livelihoods.
Medium	Where the affected environment is altered but natural functions and processes continue, albeit in a modified way.	People/communities can adapt with some difficulty and maintain pre-impact livelihoods but only with a degree of support.

Designation	Receiving environment	
	Biophysical environment	**Socio-economic environment**
High	Where natural functions or processes are altered to the extent that they will temporarily or permanently cease	Affected people/communities will not be able to adapt to changes or continue to maintain-pre impact livelihoods.

1.7.4.3 *Determining Impact Significance*

As earlier stated above, Impact Significance is a function of the magnitude of the impact and the sensitivity / vulnerability / importance of resource / receptor. This is the ultimate impact classification. As presented in Table 1-5 below, the impact significance can be Negligible, Minor, Moderate or Major.

Table 1-5 Impact Significance

		Sensitivity/Vulnerability/Importance of Resource/Receptor		
		Low	**Medium**	**High**
Magnitude	**Negligible**	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	High	Moderate	Major	Major

Table 1-6 below presents a brief description of the different categories of Impact Significance.

Table 1-6 Significance Definitions

Significance Level	Definition
Negligible	An impact of negligible significance (or an insignificant impact) is where a resource or receptor (including people) will not be affected in any way by a particular activity, or the predicted effect is deemed to be 'negligible' or 'imperceptible' or is indistinguishable from natural background variations.

Significance Level	Definition
Minor	An impact of minor significance is one where an effect will be experienced, but the impact magnitude is sufficiently small (with and without mitigation) and well within accepted standards, and/or the receptor is of low sensitivity/value.
Moderate	An impact of moderate significance is one within accepted limits and standards. The emphasis for moderate impacts is on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that 'moderate' impacts must be reduced to 'minor' impacts, but that moderate impacts are being managed effectively and efficiently.
Major	An impact of major significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. A goal of the ESIA process is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into the long term or extend over a large area. However, for some aspects, there may be major residual impacts after all practicable mitigation options have been exhausted (i.e., ALARP has been applied). An example might be the visual impact of a development. It is then the function of regulators and stakeholders to weigh such negative factors against the positive factors such as employment, in coming to a decision on the Project.

1.7.4.4 *Identification of Mitigation and Enhancement Measures*

For activities with significant impacts, the ESIA process is required to identify, in collaboration with the Project Developer/Proponent, suitable and practical mitigation measures that can be implemented. Mitigation that can be incorporated into the Project design, to avoid or reduce the negative impacts or enhance the positive impacts, have been defined and require final agreement with the Project Proponent as these are likely to form the basis for any conditions of approval by NEMA. The implementation of the mitigation is ensured through compliance with the Environmental and Social Management and Monitoring Plan (ESM&MP).

1.7.4.5 *Residual Impact Evaluation*

After first assigning significance in the absence of mitigation, each impact is re-evaluated assuming the appropriate mitigation measure(s) is/are effectively applied, and this results in a significance rating for the residual impact.

Note: It is important to note that positive impacts are not rated, they are merely stated. It is considered sufficient for the purpose of the Impact Assessment to indicate that the Project is expected to result in a positive impact, without characterizing the exact degree of positive change likely to occur.

1.8 Team Members

Environtech Consultancy Africa Ltd (ECA) was appointed by the Project Proponent to undertake the ESIA for the Project. ECA have no financial ties to, nor are they a subsidiary, legally or financially, of the Project Proponent. ECA is a multi-disciplinary and independent company of consulting environmentalists and scientists with world-wide experience. The Company headquarters are in Nairobi, Kenya.

The ESIA team for this Project is presented in Table 1-7.

Table 1-7 ESIA Team

No.	Name	Terms of Reference
1	Stanley Mathenge Mwangi-(**lead Expert-2930**) Environmental and resources Management) ***Environmentalist/ Team Leader***) Kevin Musiega **(Lead Expert 1682**) (***Environmentalist***) Ambuya John (**Lead expert -8618**) (***Environmentalist***)	• Coordinating the other team members in the execution of the assignment. • Preparation of specific Terms of reference for each team member. • Keeping record of the assignment progress and reporting the same to client • Guidelines on the ESIA reporting/formats • Undertaking a flora and fauna survey of the study site by identifying and describing plant and animal communities present. • Identifying species and features of importance • Undertaking a fauna survey of the study site identifying and describing fauna communities present. • Identification of fauna species and features of importance • Compiling the final report
	Dr. Christopher Mulanda Aura (PhD) **Marine and aquatic specialist**	**Marine and aquatic sciences-** Remote Sensing and GIS, Modeling & Projections, Environmental & Aquatic Sciences, Advanced Oceanography & Limnology, Climate Change Scenarios, Fisheries, Aquaculture,

No.	Name	Terms of Reference
		Socioeconomics, Sustainability Sciences, Ecology, Data Analysis, Monitoring & Evaluation, Scientific/Art Writing & Reporting.
2	Joy Nabwire Wasirimba **-(Lead expert 6551) (sociologist/ Environmentalist)**	• Collecting socioeconomic and cultural baseline data of the project area • Mobilizing members of public for consultation exercise • Facilitating Consultation and public participation exercise • Identifying the socioeconomic and cultural impacts likely to emanate from the project. • Developing mitigation measures for the negative impacts socioeconomic impacts. • Consultation of stakeholders.
3	Eng. Andrew Gitau Gathekia-(Civil and structural Engineer/ Environmentalist -**Associate Expert 8002**)	• Interpreting the designs of the project • Giving the details of the construction activities of the project • Identifying the materials to be used for construction
4	Eng James Ngunjiri **Telecommunication engineering**	Interpreting and advising on Fibre optic Cable and telecommunication Matters
5	Job Mucoki (Assistant)-(**Lead expert -6803**)	Assisting the team as per assigned duties.

1.9 Report Structure

The ESIA full study report will be prepared in accordance to section 58 of the Environmental EMCA and in accordance with part II of the Environmental (Impact Assessment and Audit) Regulation, 2003, legal notice No. 101. The structure of this ESIA Project Report is outlined in Table 1-8.

Table 1-8 Report Structure

Section	Contents
Chapter 1: Introduction	Contains an overview of the Project, Project justification, Project Proponent, ESIA Objectives and Scope, Environmental and Social Impact Assessment Consultant and an outline of the report structure. Also outlines the approach to the ESIA and summarizes the process undertaken by the Project to date.
Chapter 2: Project Description	Includes a detailed description of the Project activities.
Chapter 3: Biophysical and Socio-economic Baseline	Describes the receiving biophysical and socio-economic baseline environment.
Chapter 4: Legal and Institutional Framework	Outlines the legislative, policy and administrative requirements applicable to the Project.
Chapter 5: Consideration of Alternatives	Describes the alternatives that have been considered and the reasons for the selection of the preferred alternative.
Chapter 6: Stakeholder Engagement	Describes the approach to and outcomes of the stakeholder engagement and public participation process.
Chapter 7: Impacts Assessment and Mitigation Measures	Describes and assesses the potential environmental and social impacts of the Project. Mitigation measures are also presented.
Chapter 8: Climate Risk and Vulnerability Assessment	Quantifies risks and identifies adaptation options that can be integrated into the project design.
Chapter 9: ESM&MP	Specifies the mitigation and management measures to be undertaken and shows how the Project will mobilize organizational capacity and resources to implement these measures.
Chapter 10: Conclusions and Recommendations	Summarizes the key findings of the ESIA process and provides recommendations for the mitigation of potential impacts and the management of the Project.
References	Contains a list of references used in compiling the report.

In addition, the Report includes the following Annexes:

Annex A: ECA NEMA Registration and 2021 Practicing License

Annex B: NEMA Correspondences

Annex C: Background Information Document (BID) used during the Stakeholder engagement exercise.

Annex D: Detailed minutes of stakeholder engagement meetings conducted during the ESIA process, including meeting photos and attendance registers/stakeholders' comments.

2 PROJECT DESCRIPTION

2.1 Project Overview

The Africa 1 Seg 2 cable system is an intercontinental submarine cable system which consists of 11 segments running between United Arab Emirates, Saudi Arabia, Pakistan in Asian Continent and Kenya, Djibouti, and Egypt in African Continent. The whole route lies within the Gulf of Oman, Gulf of Aden, Red Sea, Arabian Sea & East Coast of Africa.

Part of the Africa 1 Seg 2 cable system running in Gulf of Oman, Gulf of Aden, Arabian Sea & East Coast of Africa named Segment 2.01 to Segment 2.07. The detailed listing of segments is as follows:

- Seg 2.01 – BMH Kalba (KBA) to BU Karachi (KHI)
- Seg 2.02 – Gwadar Stub End (GWA Stub) to BU Gwadar (GWA)
- Seg 2.03 – BU Gwadar (GWA) to BU Karachi (KHI)
- Seg 2.04 – BMH Karachi (KHI) to BU Gwadar (GWA)
- Seg 2.05 – BU Karachi (KHI) to BU Mombasa (MBA)
- **Seg 2.06 – BMH Mombasa (MBA) to BU Mombasa (MBA)**
- Seg 2.07 – BU Mombasa (MBA) to BU Djibouti (DJB)

Seg 2.06 – BMH Mombasa (MBA) to BU Mombasa (MBA) is the subject of this ESIA. Figure 2-1 shows the overview of the Africa 1 Seg 2.06 submarine cable system highlighted in Magenta and the maritime limits as Red lines.

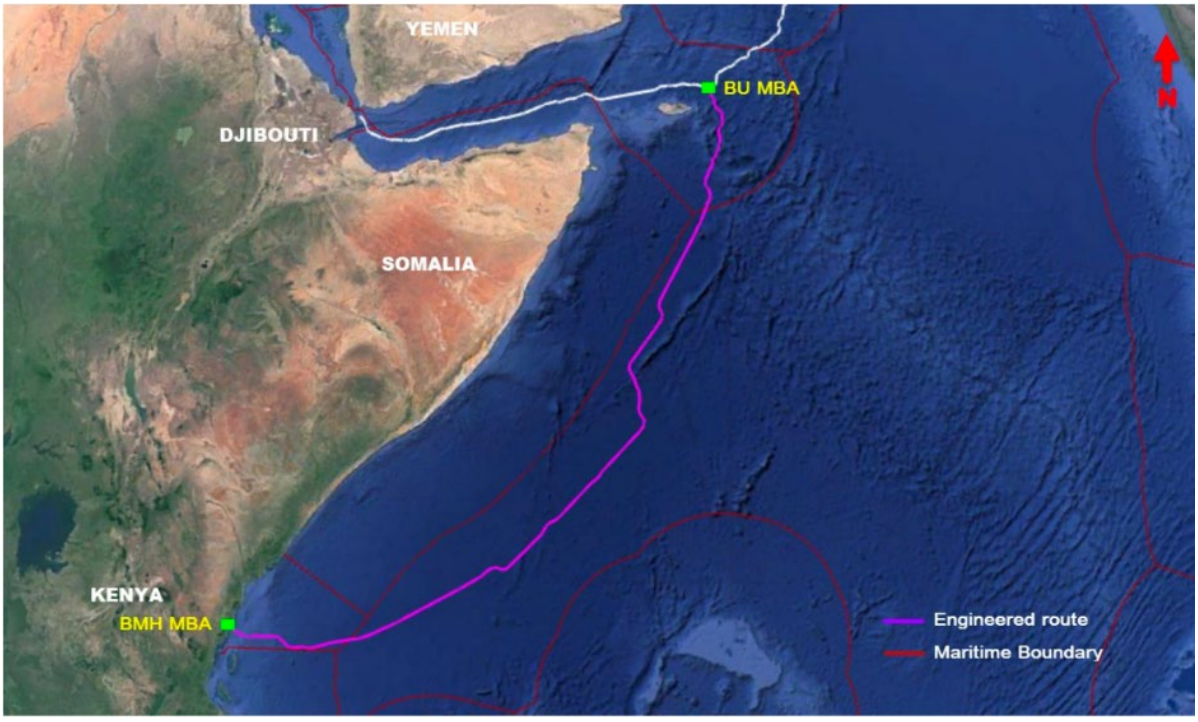

Figure 2-1 Overview of the Africa 1 Seg 2.06 Submarine Cable System

2.2 Project Description

The project proponent intends to install a submarine cable in the Indian Ocean waters within the Kenyan territorial waters. The project will consist of both marine and terrestrial components. For the marine component, the project will entail installation of a submarine cable, totaling to approximately 475.363 Kms in Kenyan waters and 501.694 Kms in Yemeni EEZ waters. The 35.99mm diameter cable will be installed from the Kenyan Exclusive Economic Zone (EEZ) to Nyali beach. It is expected to traverse along the Mombasa marine reserve. The initial route span of the will be constrained to 500 meters corridor span however the actual installation footprint will be less than 1m in width.

The terrestrial component will consist of a portion of stretch of land of approximately 70 meters from the intertidal zone to the Beach Manhole (BMH). The coordinates of the beach manhole will be 4° 3'1.39"S, 39°42'25.70"E and are within Nyali Sub-county, Mombasa county. The cable will lay a further 1.7 km from the BMH to the Cable Landing Station (CLS) at Nyali Telkom Exchange, next to Nyali Primary School. The CLS GPS coordinates are 4° 2'42.10"S, 39°41'53.22"E. BMH and CLS locations are shown in Map 1.

The BMH is accessible via Nyali Links Road – Oleander Drive – Moyne Drive. It is approximately 5km from Mombasa City CBD. The settlement located within the project's 250m radius of influence from BMH and the buffer zone of 250metres on either side cable route are the Nyali estate, Fishermen houses, Freedom Church, and business establishments e.g., Sun Africa Hotel, Early Birds Banda, etc.

Map 1 BMH and CLS Location (Source Google Earth Pro)

2.2.1 Proposed Project GPS Coordinates

The proposed project GPS coordinates is shown in Table 2-1.

Table 2-1 Africa 1 Submarine Cable GPS Coordinates and Distance

Index	Label	Latitude (WGS 84) deg min N/S			Longitude (WGS 84) deg min E/W			Distance Segment (Km)	Distance Total (Km)
1	BMH MOMBASA	4	3.709	S	39	40.821	E	0	0
2	cx	4	3.7097	S	39	40.8232	E	0,004	0.004
3	CX FO	4	3.7187	S	39	40.8495	E	0.051	0.055
4	WD 8m	4	3.7229	S	39	40.8618	E	0.024	0.079
5	AC98	4	3.7255	S	39	40.8695	E	0.016	0.095
6	WD 15m	4	3.7315	S	39	40.8791	E	0.02	0.115
7	POL	4	3.7349	S	39	408,846	E	0.012	0.127
8	AC97	4	3.7354	S	39	40.8855	E	0.002	0.129
9	CX	4	3.7361	S	39	40.8866	E	0,003	0,132
10	cx oos	4	3.7363	S	39	40.8869	E	0	0.132
11	AC96	4	3.7447	S	39	40.9004	E	0,030	0,162

Index	Label	Latitude (WGS 84) deg min N/S			Longitude (WGS 84) deg min E/W			Distance Segment (Km)	Distance Total (Km)
12	CX OOS TELE	4	3.7527	S	39	40.9093	E	0.022	0.184
13	AC95	4	3.7541	S	39	40.9108	E	0.004	0.188
14	CX	4	3.7581	S	39	40.9137	E	0,009	0.197
15	AC94	4	3.7653	S	39	40.9188	E	0.016	0.213
16	CX FO	4	3.7806	S	39	40.9248	E	0,030	0.243
17	AC93	4	3.7996	S	39	40.9322	E	0.038	0.281
18	AC92	4	3.8166	S	39	40.9438	E	0.038	0.319
19	CX OOS TELE	4	3.8246	S	39	40.9501	E	0.019	0.338
20	AC91	4	3.8272	S	39	40.9522	E	0.006	0.344
21	AC90	4	3.8511	S	39	40.9672	E	0.52	0.396
22	AC89	4	3.8662	S	39	40.9753	E	0.032	0.428
23	AC88	4	3.8825	S	39	40.9797	E	0.31	0.459
24	AC87	4	3.8988	S	39	40.9822	E	0.03	0.489
25	CX OOS TELE	4	3.9354	S	39	40.9868	E	0.68	0.557
26	AC86	4	4.0756	S	39	41.0042	E	0.261	0.818
27	CX OOS TELE	4	4.1406	S	39	41.0173	E	0.122	0.94
28	CX OOS TELE	4	4.1997	S	39	41.0293	E	0.111	1.051
29	AC85	4	4.2905	S	39	41.0476	E	0.171	1.222
30	CX OOS TELE	4	4.3712	S	39	41.0605	E	0.15	1.372
31	WD 50m	4	4.4284	S	39	41.0697	E	0.107	1.479
32	AC84	4	4.4548	S	39	41.0739	E	0.049	1.528
33	CX OOS TELE	4	4.4597	S	39	41.076	E	0.1	1.538
34	AC83	4	4.4639	S	39	41.078	E	0.009	1.547
35	AC82	4	4.4697	S	39	41.0825	E	1013	1.56
36	CX FO	4	4.4822	S	39	41.0958	E	0,034	1.594
37	AC81	4	4.4961	S	39	41.1105	E	0.037	1.631
38	AC80	4	4.5095	S	39	41.1192	E	0.03	1.661
39	AC79	4	4.5286	S	39	41.1274	E	0.038	1.699
40	CX OOS TELE	4	4.5472	S	39	41.1324	E	0.036	1.735
41	AC78	4	4.5546	S	39	41.1344	E	0.014	1.749

Index	Label	Latitude (WGS 84) deg min N/S			Longitude (WGS 84) deg min E/W			Distance Segment (Km)	Distance Total (Km)
42	AC77	4	4.5938	S	39	41.1424	E	0.074	1.823
43	WD 50m	4	4.5998	S	39	41.1423	E	0.011	1.834
44	AC76	4	4.637	S	39	41.-1414	E	0.068	1.902
45	AC75	4	4.6974	S	39	41.1304	E	0.113	2.015
46	CX OOS TELE	4	4.7644	S	39	41.1018	E	0.135	2.15
47	AC74	4	4.8161	S	39	41.0797	E	0.103	2.253
48	CX OOS TELE	4	4.9238	S	39	41.0293	E	0.22	2.473
49	AC73	4	4.9253	S	39	41.0287	E	0.003	2.476
50	AC72	4	4.9398	S	39	41.0266	E	0.027	2.503
51	CX OOS TELE	4	4.9443	S	39	41.0268	E	0.008	2.511
52	AC71	4	4.9591	S	39	41.0272	E	0.027	2.538
53	AC70	4	4.9851	S	39	41.0342	E	0.05	2.588
54	AC69	4	5.0047	S	39	41.0452	E	0.041	2.629
55	AC68	4	5.0261	S	39	41.0655	E	0-055	2.684
55	AC68	4	5.0261	S	39	410,655	E	0,055	2.684
56	AC67	4	5.0508	S	39	41.0971	E	0.074	2.758
57	CX OOS TELE	4	5.0629	S	39	41.1195	E	0.047	2.805
58	AC66	4	5.1088	S	39	41.2038	E	0.178	2.983
59	AC65	4	5.1312	S	39	41.2378	E	0.075	3.058
60	AC64	4	5.1528	S	39	41.2583	E	0.055	3.113
61	AC63	4	5.1654	S	39	41.2678	E	0.029	3.142
62	AC62	4	5.1825	S	39	41.2753	E	0.034	3.176
63	AC61	4	5.2071	S	39	41.2793	E	o. 046	3.222
64	AC60	4	5.2582	S	39	41.2759	E	0.095	3.317
65	AC59	4	5.3282	S	39	41.2618	E	o. 131	3.448
66	AC58	4	5.3886	S	39	41.254	E	0.113	3.561
67	AC57	4	5.4273	S	39	41.2537	E	0.071	3.632
68	AC56	4	5.4806	S	39	41.2664	E	0.101	3.733
69	AC55	4	5.5093	S	39	41.2774	E	o.087	3.79
70	AC54	4	5.5646	S	39	41.301	E	0.11	3.9

Index	Label	Latitude (WGS 84) deg min N/S			Longitude (WGS 84) deg min E/W			Distance Segment (Km)	Distance Total (Km)
71	AC53	4	5.6119	S	39	41.3266	E	0.1	4
72	AC52	4	5.6851	S	39	41.3937	E	0.183	4.183
73	AC51	4	5.7413	S	39	41.4802	E	0.191	4.374
74	AC50	4	5.7684	S	39	41.5632	E	0.161	4.535
75	CX OOS TELE	4	5.7913	S	39	41.6696	E	0.202	4.737
76	AC49	4	5.8263	S	39	41.8323	E	0.308	5.045
77	AC46	4	5.6732	S	39	42.0546	E	0.42	5.465
78	50m	4	5.8943	S	39	42.2619	E	0.385	5.85
79	WD 50m	4	5.9012	S	39	42.3305	E	0.128	5.978
60	AC47	4	5.9064	S	39	42.4009	E	0.131	6.109
81	CX OOS TELE	4	5.9197	S	39	42.6668	E	0.493	6.602
62	WD 50m	4	5.9231	S	39	42.7487	E	0.151	6.753
83	AC46	4	5.9263	S	39	42.8236	E	0.139	6.892
84	CX OOS TELE	4	5.917	S	39	42.6994	E	0.141	7.033
85	CX Fo	4	5.8992	S	39	43.0446	E	0.271	7.304
86	CX OOS TELE	4	5.6699	S	39	43.1203	E	0.141	7.445
87	CX OOS TELE	4	5.8835	S	39	43.1725	E	0.097	7.542
88	CTPort Lirnit Enter	4	Jan-00	S	39	43.1779	E	0.011	7.553
89	AC45	4	5.8669	S	39	43.3076	E	0.241	7.794
90	AC44	4	5.8665	S	39	43.6392	E	0.614	8.408
91	TR SA-17/DA-17	4	6.01	S	39	44.1672	E	1.012	9.42
92	CT PLUP	4	6.0566	S	39	44.3384	E	0.329	9.749
93	WD 300rrn	4	7.07	S	39	46.0664	E	6.947	16.696
94	CX OOS TELE	4	7.6551	S	39	50.2167	E	4.126	21.022
95	cx oos	4	7.6551	S	39	50.2187	E	0	21.022
96	AC43	4	7.9011	S	39	51.124	E	1.736	22.758
97	AC42	4	7.9026	S	39	51.3942	E	0.5	23.258
98	AC41	4	7.8352	S	39	51.6559	E	0.5	23.758
99	cx	4	7.5936	S	39	52.0422	E	0.642	24.6
100	cx	4	6.547	S	39	53.7177	E	3.652	28.252

Index	Label	Latitude (WGS 84) deg min N/S			Longitude (WGS 84) deg min E/W			Distance Segment (Km)	Distance Total (Km)
101	AC40	4	6.2683	S	39	54.1637	E	0.972	29.224
102	WD 500m	4	6.0441	S	39	54.796	E	1.241	30.465
103	MB EZ KEN,'TW KEN	4	5.6935	S	39	55.7847	E	1.94	32.405

2.2.2 Submarine Cable Specifications

The submarine cable to be used for the Africa 1 project will be repeatered submarine cables. HORC-1 cable could be used for this project. The cables are specifically designed for repeatered submarine cable system with full range of protection/armours to meet all types of seabed conditions. The HT HORC-1 cable family has been specifically designed for regional and trans-oceanic submarine networks with a full range of protection techniques to meet the many different types of seabed conditions.

The key features of this product are as follows:

- The fibers have a defined excess length relative to the loose tube. The tube is filled with a water blocking compound to prevent the progression of water ingress in the event of a break;
- Layers of polypropylene yarn, flooded in bitumen, are applied over the armouring to provide corrosion protection;
- The cable design ensures that no strain is exerted on the fibres during normal operation;
- There is several different armour versions to suit different seabed conditions, the specific characteristics of the cables used in the draft RPL; and
- The cable has a design life of 25 years. Extensive ageing tests have been performed which ensure continuous system performance over the design life.

The appearance and typical characteristics of HORC-1 cables are shown in Figure 2-2.

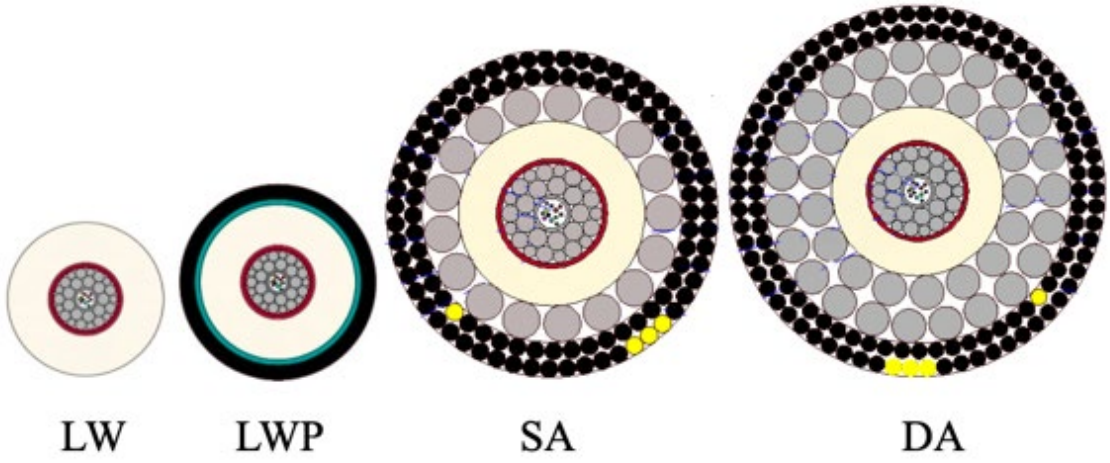

Figure 2-2 Overview of HT HORC-1

Table 2-2 Typically Characteristics of HT HORC-1

HT HORC-1	Unit	LW	LWP	SA	DA
Weight in air	Kg/m	0.6	0.8	2.4	4.5
Max Deploy Water Depth	m	8000	7000	2000	6000
Nominal Transient Tensile Strength (NTTS)	kN	50	50	210	420
Cable Breaking Load (CBL)	kN	60	60	275	560
DC resistance @ 20°C	Ohms/km	1.1	1.1	1.1	1.1
Operation Voltage	kV	12	12	12	12

2.2.2.1 *Repeater*

For Africa 1 Project, RPT 1660 R2 which can support up to 8 fibre pairs is proposed. The RPT 1660 adopts EDFA technology to amplify the optical signals.

Redundancy pumps and high reliability components are used in repeater to provide higher reliability.

Figure 2-3 Appearance of the HMN RPT 1660 R2

2.3 Project Activities

2.3.1 Cable Installation Steps

The installation of submarine optic fiber cables involves several key activities. Here are the typical steps involved in the installation process:

1. **Route Planning**: The first step in the installation process is route planning. This involves extensive research and surveying to determine the most suitable path for the submarine cable. Factors such as water depth, geological conditions, existing infrastructure, and potential hazards are considered to identify the optimal route. The survey for Africa 1 submarine cable was done by E-marine PJSC as follows:
    a) Inshore Survey date: June 4 – 10, 2022; and
    b) Offshore Survey date: Nov. 05 - 24, 2021 May 9 – 24, 2022.
2. **Pre-lay Shore End Survey**: Before the cable is deployed, a survey is conducted at the shore end to assess the conditions and plan the landing point. This includes determining the appropriate location for the cable landing station, assessing the seabed conditions, and planning the cable's transition from the shore to the ocean. This was covered under the survey in one (1) above. Conducting thorough route surveys is crucial to identify the optimal path for the submarine cable installation. This involves assessing factors such as water depth, seabed conditions, existing infrastructure, potential hazards, and the shortest distance between endpoints.
3. **Cable Loading:** The manufactured cables are loaded onto specialized cable-laying ships, also known as cable ships or vessels. These ships are equipped with cable tanks and tensioning systems to handle the delicate and heavy cables. The cables are typically stored on huge rotating spools, known as carousels, on the ship.
4. **Cable Deployment:** The cable-laying ship transports the loaded cables to the designated starting point of the installation route. The cables are then carefully laid onto the ocean floor. This process involves paying out the cable from the ship while maintaining tension and controlling the speed of deployment.
5. **Burial or Securing:** After the cable is laid, it is often buried or secured to the seabed to protect it from potential damage. Burial involves using remotely operated vehicles (ROVs) to cover the cable with sediments or specialized protective coverings. Alternatively, the cable may be anchored to the seabed using heavy weights or other anchoring mechanisms.
6. **Post-lay Inspection:** Once the cable is installed, post-lay inspections are conducted to ensure its integrity and proper functioning. This may involve using ROVs or specialized

equipment to verify the cable's position, check for any signs of damage, and confirm that the installation meets the required specifications.

7. **Cable Connection:** The shore end of the submarine cable is connected to the cable landing station, which serves as the interface between the submarine cable and the terrestrial communication network. The cable is terminated, spliced, and connected to the network equipment within the landing station. The CLS for Africa 1 submarine cable is Nyali Telkom Exchange.
8. **Testing and Commissioning:** After the cable is connected, extensive testing and commissioning activities are performed to ensure its functionality and reliability. This includes testing the transmission quality, measuring signal loss, verifying data transfer rates, and conducting performance assessments.
9. **Maintenance and Monitoring**: Once the cable is operational, it requires ongoing maintenance and monitoring to ensure its continued functionality. Regular inspections, repairs, and maintenance activities are carried out to address any potential issues or faults that may arise over time.

2.3.2 Equipment Used in Submarine Cable Installation

Table 2-3 Equipment Used in Submarine Cable Installation

Phase	Equipment	Description
Survey Operations	Swath Bathymetry	A hull-mounted Kongsberg-Simrad EM-122 (12kHz) deep water multi-beam echo sounder and Reson 7101 will be used. Where multiple lines are run, data will be collected to ensure that a minimum 20% data overlap is achieved.
	Conventional Bathymetry	A Simrad EA400 conventional single beam echo sounder is available on the vessel and used as a QA/QC tool.
	Side Scan Sonar	An Edgetech DSS2000 Dual frequency Chirp/Side Scan Sonar Combined System (or equivalent) will be employed from the inshore handover point to the 1000m contour. Side-scan sonar range will be adjusted so that over 100% overlapping coverage of the survey corridor is obtained.
	Sub-Bottom Profiler	A hull mounted GeoAcoustics 4x4 Pinger sub-bottom profiling system will also be available on this project.
	Magnetometer	A Geometric G-882 magnetometer or equivalent technology will be deployed to locate existing pipelines and/or cables that cross the route as

Phase	Equipment	Description
		identified from the EGS database during the Desktop Study.
	Burial Assessment Survey	A Datem MCPT 3000 will be used to acquire geotechnical data for the burial assessment survey (BAS). EGS can deploy this system in 2000m of water and provides interpretation and reporting of CPT data in near real time.
	Seabed Sampling	Interpretation of the geophysical data onboard the survey vessel will be used as the basis for selecting seabed sampling locations. A gravity corer and a Shipek type grab sampler will be used for obtaining surface samples. Standard sampling procedure is to deploy the gravity corer and if it fails to obtain a decent sample at the first attempt, it will deploy a second time, if it fails again, the Shipek grab will be deployed. Sample locations will be selected by our on-board geophysicists in consultation with the HMN representative.
	Underwater Positioning	Towfish positioning will be by Sonardyne Fusion USBL (or equivalent) acoustic positioning to the limitation of the system. Beyond the reliable range of the acoustic positioning system, tow fish position will be determined by the application of layback corrections.
	Geophysical Software	Geophysical data including side-scan sonar and sub-bottom profiling data is acquired and processed digitally within the C-View Seabed Data Management System. This system provides optimum accuracy and resolution of data. The digital data can either be acquired in an EGS propriety format or Client specific format (SEGY, XTF, etc).
	Navigation Software	The vessel's computed position from Veripos DGPS will be interfaced to the navigation computer system and Qinsy navigation software. This system will provide track guidance information for the survey crew and output the vessels position to a remote VDU monitor on the bridge which will provide a display to assist the helmsman in maintaining the selected track guidance line. The VDU displays the selected survey line, the vessel's position in relation to that line and numerical data to assist the helmsman such as the along-line and off-line distances, vessel speed and course made

Phase	Equipment	Description
		good, gyro heading, distance and bearing to end of line and water depth.
	Gyrocompass	Two gyrocompasses are provided onboard. The gyrocompasses will interface to the Qinsy navigation system to enable accurate heading and offset calculations.
Design (shore End Landing Equipment)	Cable Quadrant, Inline Tension Meter, Dead Man Anchor, 2x12 Ton swivel, Wires / Shackles. Kevlar Stopper, UHF Radio – VHF Radio as backup. Digger / Excavator, 750cfm Air Compressor c/w 100m Air Hose and Fittings Air Compressor for Divers Diver Airlift, Handheld Jetting Tool	
Installation and construction	Cable ship Cable Plough Remotely Operated Vehicle (ROV) Safety boat/Guard boat Host ship Tether management system Pre-Lay Grapnel Run (PLGR) Equipment Sliding Prong (Long Sliding Prong) Spear point Sand Grapnel Son of Sammy	
Operation & Maintenance	Equipment	Manufacturer/Model
	Digital Multimeter	FLUKE 179
	Optical Power Meter	FPM-302MAX
	Optical Attenuator	JDSU 2280
	Optical Spectrum Analyzer	TK-200-5240S

Phase	Equipment	Description
	Video Fiber Scope	EXFO FIP-400-D-DUAL
	DC Test Set	Tinsley 5910
	Splicing Machine	SEI TYPE-39
	OTDR	Yokogawa AQ7275
	COTDR Test Set	Function supported by SLM
	Electroding Generator	Function supported by PFE
	Test Equipment in Cable Depots	
	Digital Multimeter	FLUKE, FLUKE 287
	Optical Power Meter	EXFO, FPM-302X
	Variable Optical Attenuator	JDSU, 2280/31
	DC Power Supply	Gwinstek, PSP-603
	Optical Light Source	EXFO, FLS-300-23BL
	Super Megohmmeter	MEGGER, S1-568
	Fiber Inspection Probe	EXFO, FIP-410B
	SLM for power switch function testing of spare BU	HMN, SLM1630
Decommissioning	None	

2.3.3 Pre-Lay Grapnel Run (PLGR)

2.3.3.1 *General*

Prior to the main lay installation operation, a Route Clearance Operation (RCO) & pre-lay grapnel run (PLGR) shall be carried out along the proposed cable route, in sections designated for burial. Out of service cables (OOS) shall be removed from the route as designated within the RPL. PLGR operations shall clear all debris that may prevent efficient installation & burial by the burial tool. The intention is to clear any seabed debris, for example, wires or hawsers, fishing equipment etc. that may have been deposited along the route. It is intended that, at the conclusion of PLGR and RCO, the route will be, as far as possible:

- Clear of OOS submarine cable systems;
- Clear of any chains, wires, ropes, warps, fishing equipment and any other items of equipment jettisoned, lost, or abandoned; and
- Declared safe for cable laying and burial within the confines of the cleared route at the time of undertaking the route clearance operation.

Confirmation of the latest version of the RPLs will be established prior to operations, this being the primary source of reference for PLGR/RCO activity of the burial sections of the route. Wet-plant configurations

2.3.3.2 *Cable Crossings*

No towed equipment shall be used within 500m of any known and proven pipeline or in use submarine cable system unless specific written agreement has been reached between the Facility Owner and the Customer. Whilst within the 500m-exclusion zone, all towed equipment shall be recovered and secured on deck. At the time of writing, there are no known Pipelines or In-service cables along the cable route.

2.3.3.3 *PLGR Operations*

PLGR Activities

The PLGR may carried out by a tug or cable ship for buried area.

2.3.3.4 *Deploying the Grapnels*

The choice of grapnels to be used will depend on the nature of the seabed and burial depth proposed for the burial operations.

The PLGR vessel will pay out the grapnels until they are almost bottomed as the ship is maneuvered down the cable route. The amount of grappling wire to be paid out will be dependent on the depth of water and the graphs. The speed of the ship will be at the OIM's discretion but will be typically in the region of 1.5 to 2.0 Km/Hr. Once the required length of rope has been paid out, rope pay-out will be stopped, and the vessel will run down the advised cable route using the latest RPL provided.

2.3.3.5 *Recovery of Grapnels*

The grappling wire tension is monitored with Survey system and displayed in graphical form on the Bridge. During grappling, a steady rise in tension would normally indicate that an obstruction has been hooked. The Surveyor, OIM or DOIM will instruct the OOW to bring the vessel gradually to a stop.

The vessel will then maneuver to recover the grappling wire catenary. If the option is for a standard recovery, the grapnels are recovered with the vessel being maneuvered either ahead or

astern as required to maintain a satisfactory lead. Once the grapnels have been recovered to the stern they will be brought onto the aft deck with the hooked wire/obstruction. Debris will be stoppered off using chain stoppers and the grapnel disengaged. Depending on the extent of the debris it will either be recovered onto the working deck or may be slipped clear of the route. If slipping, a clump weight will be attached to the wire end and, by use of a slip rope, lowered to the seabed clear of the route.

The grapnels will be recovered periodically to check that they are clear of debris which may hinder their grappling ability or due to a change in seabed. The timing for these recoveries will be at the discretion of the OIM & DOIM and will be based on but not limited to the following: project schedule, weather, currents, and seabed characteristics.

2.3.4 Marine Installation Operations

2.3.4.1 *Introduction*

After the PLGR work, marine installation will start as per installation plan. The installation plan is that the cable will be laid by a cable ship which equips with a cable plough and ROV. Normally, safety boat or guard boat will be mobilized to accompany the main lay vessel during marine operations, for the purpose of warding off possible interference from nearby boats (such as fishing boat).

2.3.4.2 *Ploughing Operations*

The plough will be launched at a distance as specified within RPL planned position after cable landing in. The ploughing will be conducted on a reasonable endeavors basis to a target depth according to project's technical requirement.

Below are the basic procedures for Plough:

Loading the Plough

- Ensure cable is initially being laid on the starboard (STBD) side of the plough in between the share and the STBD skid & stbd Stabilizer;
- Plough to raise depressor, then isolate power to plough, open bellmouth and have plough open to receive cable;
- Ensure power off cable;
- When ready to load plough, stop ship and stop payout on cable. Ensure cable is in speed control;
- Apply BTL Stopper, pre-form stopper or appropriate Yale grip to the cable as far aft as possible. You will be able to attach stopper alongside the share (provided the plough is traversed far enough to port), ensure no personnel stand in between cable & share;
- Attach equalizing wire to stopper and attach end of wire to deck;

- Payout on cable until weight is transferred to stopper, continue to payout until you have enough slack on deck forward of the plough to load the plough;
- One man with a safety harness is to climb on the plough to assist loading the cable into the plough;
- Raise cable into plough starting from the stern and working forward, ensure cable passes under roto in plough;
- Close bell mouth (will need chain block), close side parts on plough cable trough. Power up plough and lower depressor to ensure cable becomes located in the share. (60cm depressor height – higher may result in cable escaping the share) (All personnel clear of depressor when lowering). Ensure repeater doors on plough share are closed;
- Ensure that all the pins that hold the hinged parts of the plough are back in place and their safety retaining clips are also in place. There are 3 pins that are removed to load the plough;
- Pick Up easy on cable engine to take weight off deck stopper. Bring stopper close enough in to disconnect the wire from the end; and
- Plough is now ready for launch.

Launching the Plough

Good communications and operational awareness are essential for successful ploughing operations. It is very important that the role of each person involved in the procedure is understood and that a clear chain of command is established and made known to all personnel.

Throughout the Launch operation the Deck Supervisor controls the Ship moves and Cable payout instructions by UHF radio. Plough Supervisor controls the A Frame, Tow Winch, Umbilical Winch and Plough movements by Clearcoms but with UHF radio also to hand.

- Drawbar at 110 degrees, depressor 35cm. Ensure cable travel wheel is lowered and bell mouth is correctly secured. Umbilical tied off to stbd fwd motor cage with max 2x rubber cord bungee or LK 5 cable ties. Camera covers removed. Umbilical winch standing by in render and ready to pay out.
- Confirm with the Deck Supervisor that Bridge has given permission to launch the Plough.
- Assuming the Tow Apex is already engaged in the Rhino's horn and with the scissor frame in float, commence outboarding a frame to lift plough off deck. Pay out Tow wire as required to maintain slack.
    - Alternatively, if Rhino's horn is not yet engaged...Pick up on Tow winch, lifting plough off deck, pickup into scissor frame high enough to engage rhino's horn. Pay out on tow winch so weight on horn. Outboard A frame paying out Tow wire as required]
- Call clearly 'All stations Plough off deck'.

  - When plough is clear of deck start plough motor and fully raise both skids. Plough motor off.

- Continue out boarding A frame. Just before vertical start plough motor and move drawbar to 85 degrees in small steps to allow skids to clear aft whiskers. Monitor share clearance visually. Plough motor off. A frame stops at 65 degrees.
- Tow block is put in place by deck crew. (Alternatively, if there is sufficient water depth (i.e., time available) the tow block may be put in position as the plough is lowered to the seabed)
- A frame fully out to 76 degrees at which point skids just in the water.
- Pickup on tow wire, release Rhino's horn, pay out tow wire. Payout slack on umbilical (NOT render). Plough in Water
- This is a critical moment for umbilical handling. It is very important that the umbilical does not pass under the drawbar at the surface. Ideally an area of slack will form between termination and fwd tie off point that clears the drawbar. Once the plough descends the bungees should break off and the umbilical lead establish to the side of/behind the draw bar.
  - If the Umbilical DOES pass under the draw bar, stop payout on the Tow wire. Pickup on Tow until top of drawbar above the surface. Slowly pickup on Umbilical to approx. 1.5 tonnes. Plough heading will turn slightly to port, separating umbilical from drawbar. Payout simultaneously on both Tow and Umbilical, verify visually/plough aft camera that the umbilical is now clear.
- Vessel commences moving ahead (approx 0.1km/h). Payout Tow, payout Umbilical quickly (slight slack on surface) for the first 30m of descent after which allow Umbilical to render (this is at the discrepancy of the CSE/Deck Supervisor).
- Plough wet checks, skids fully down and Drawbar returned to 110 degrees position during descent.
- Tow wire pays out, rate determined by application of buoys to umbilical. Umbilical winch continue to render at 0.6-1.0 tonnes always standing by to payout if needed.
- Plough Cab monitor carefully for 1) cable transit through plough 2) Depth and altitude. Maintain communications to bridge and deck. Call at 30m altitude and countdown clearly to seabed.
- Call 'on seabed'. Tow winch to pay out 2m extra of Tow wire and stop.
- Vessel continues moving ahead, Plough lowers drawbar to 80 degrees then monitors tow angle and tow force.
- Constant communication between the Plough control and Tow winch is now critical

- If Tow angle < zero, Tow winch and drawbar stay stopped. Tow angle and force will rise as ship moves ahead.
- If Tow angle in range zero to 15 degrees, Plough cab instruct Tow winch to speed up/slow down as needed to maintain 3-5 tonnes tow force at plough. Bring drawbar down slowly not letting tow angle drop below zero degrees.
- If Tow angle > 15 degrees, Plough cab instruct Tow winch to payout quicker until angle within range.

Monitor bridles visually using plough cameras if possible.

- Plough Cab call all stations when drawbar at 45 degrees. Commence bringing in A frame.
- A frame stops before fully inboard position with tow wire still rotating A frame roller. Scissor frame is adjusted to lay level and prevent the Rhino's horn rubbing on the Tow wire. Then scissor frame is put back into float.
- Continue paying out Tow and rendering Umbilical. When drawbar is fully down engaging the drawbar latches. When catenary is established (approx. 2.5x water depth). Tow winch stop paying out, umbilical payout additional 20m then leave in render.
- Call bridge when Plough starts moving off. Lower Depressor fully down, Grade in slowly by raising skids and stabs manually, then stabs in float. Keep plough share near level whilst grading in.

Recovering the Plough

Good communications and operational awareness are essential for successful ploughing operations. It is very important that the role of each person involved in the procedure is understood and that a clear chain of command is established and made known to all personnel.

Throughout the Recovery operation the Deck Supervisor controls the Ship moves and Cable payout instructions by UHF radio. Plough Supervisor controls the A frame, Tow winch, Umbilical Winch and Plough movements by Clearcoms but with UHF radio also to hand.

- Grade out plough, stabs in fixed. Raise depressor to 35cm (no higher). Ship stops.
- Ship starts backing up, commence picking up Tow wire. Umbilical winch picks up as required under direction of Plough supervisor not exceeding 1 tonne tension. Umbilical winch operator drives winch from local control to monitor fleeting of umbilical and pickup tension.
- Plough releases drawbar latches and raises drawbar to maintain tow angle between 0 and 15 degrees, 3-5 tonnes on bridles with plough not moving. Plough Control to maintain constant communications with Tow winch to achieve this. Grade back in slightly if needed to stop plough moving.
- With drawbar at 45 degrees commence booming out A frame.

- As vessel closes on plough, pickup speed on Tow winch will slow down. Pick-up on Tow wire very slowly as vessel comes above plough. Constant communications to be maintained between Plough and Tow winch.
- Once stern above plough (vessel ideally 5m ahead, NOT astern of plough) ensure drawbar is at 110 degrees. Vessel stops moving astern and starts moving ahead. Tow winch picks up in one continuous pull, weight comes onto the plough. Plough cab to monitor all signs and call 'All stations Plough off bottom' promptly as plough lifts.
- In water column set drawbar angle to 85 degrees. Ensure skids are down and level, stabs slightly raised and level.
- At surface plough motor and lights off. Stop picking up umbilical. Continue picking up tow wire to bring Plough through the splash-zone into the swing frame. Engage rhino's horn. Plough motor on and fully raise both skids. Plough motor off.

  – Due to the shape of the Tow Bridle Apex it is difficult to pull it around the A frame roller in one smooth motion. To overcome this, stop picking up on the Tow wire when the apex is just below the roller. Raise/inboard the A frame approx. 15 degrees ensuring that the Plough skids remain clear of the stern whiskers. Pick up again on the tow wire to put the Apex back below the roller. Lower/outboard the A frame whilst leaving Tow wire stationary. This will allow the Apex to move around the roller. Engage Rhino's horn when Apex sufficiently clear of roller]
- Inboard A frame from 76 to 65 degrees.
- Deck crew remove towing block from whiskers. (Alternatively, this may be done between items 6 and 7 if the water depth is sufficient that enough time is available to complete this move)
- Inboard plough on A frame. As A frame passes through vertical, plough motor on and move drawbar from 80 to 110 degrees in small steps, always watching that the plough share is clear of all parts of the vessel and other equipment. When plough is safely inboard of stern sheaves fully lower both skids.
- Visually monitor cable at back of plough and over stern roller as plough is inboarded and lowered to deck. Be prepared to stop if necessary.
- Call clearly 'All stations Plough on deck'. Lower stabs as needed and. Plough motor off.

Un-loading the Plough

- Confirm vessel is stopped.
- Cable engine drum into speed control, stop payout.
- Power up Plough and raise depressor.

- Isolate the Plough.
- Cable tank manned.
- Apply stopper at aft end of Plough in between share and stern roller. Note that there is not much space here, consider Kevlar stopper. If it is not possible to apply a stopper here apply it forward of the Plough then pay out the cable until the stopper is clear of the Plough.
- Connect stopper to equalizing wire, connect to deck on the stbd side of the Plough.
- Payout on cable until weight is transferred to the stopper, continue payout until there is enough slack on deck to unload Plough.
- One man with harness to climb on the Plough to assist with cable removal.
- Open bell mouth on the plough (Chain Block to assist) and side parts to plough cable trough.
- Lower cable to deck.
- Pick up on cable until weight is removed from deck stopper; continue picking up until stopper is inboard.
- Remove stopper.
- Plough is now unloaded, if you need to remove plough from cable area pick up Plough on Tow Winch and traverse out of way. Lifting of relevant skids and stabilizers will assist. If the cable will be sitting too high on aft deck, consider this process before taking off stopper after unloading Plough. The Plough may be traversed to port to just clear the share or lifted and traversed all the way to starboard to completely clear it from the cable. The latter is the preferred option for long cable installations with Repeaters to lay over the stern.

2.3.4.3 *In Service Cable Crossings*

At a position of 500 meters before the charted in-service cable (or as found from survey data, whichever comes first), the plough burial tool will be recovered, and cable will surface lay over the in-service cable.

At a position 500 meters passed the charted in-service cable (or as found from survey data, whichever comes later) the plough will be lowered back into the seabed and cable burial will resume.

2.3.4.4 *ROV Burial Operations*

Cable Tracking

There are several different tracking systems available; TSS, Inovatum, etc. It is important to remember to setup the surface control units (SCU) for the cable types before burial operations commence to ensure correct location and depth measurement can be achieved. TSS350 requires the correct tone frequency input to the SCU. Note that a certain frequency can be picked up on the seabed for example the vessel (60Hz) so this and any other multiple of this frequency will result

in bad and 'ghost' data being received. Also note not to run the water pumps at the same frequency as the cable.

Cable samples can be sent for analysis so a target scaling factor can be inputted for the TSS 440 system. If a target scaling factor is not available, then the cable diameter can be input for better results.

Burial

The optimum speed of the ROV whilst jetting will depend on many factors, including the soil strength and cohesion of the seabed; the ROV mode, tracks, or free fly; ROV maneuverability in adverse current; quality of cable tracker signal; whether the depressor can be used etc.

Burial speed will usually be determined by pre-trenching surveys/runs and be laid out in the job specific contracts.

Pre-Burial Inspection

For all areas where burial is required, it is beneficial to perform a pre-burial inspection pass. This will highlight any potential hazards, for example, suspensions and debris, and indicate the status of the laid cable, for example, its tension and straightness.

A Final Splice area should always be inspected prior to attempting burial and multiple fixes taken around the bight as visibility is usually poor during jetting operations. Significant objects should also be fixed, for example, the splice box, ropes, Joint boxes, etc.

Although a pre-burial inspection will increase the overall time spent on the PLIB operation, it will significantly decrease the risk to both the ROV and the cable.

During operations (wind farm especially) a pre-burial inspection may be neglected. It may simply not part of the contract, or the cable may have already been surveyed by another ROV after it was laid. The data collected from this survey may be deemed satisfactory for Excalibur to commence operations.

Final Splice Burial

Burial of a Final Splice area will involve maneuvering the ROV around a bight of cable. The jet legs should be opened to maximum width, to allow for the turning movement of the ROV. The ROV pilot must also allow for the distance between the cable tracker and the burial tool. This applies particularly when tracking the cable with the TSS440 system where the distance from cable tracker is significantly ahead of the actual cables position under the ROV. This is not so much of an issue with the TSS350 system, but still applies during particularly tight cable radiuses.

Cable Crossings

Where the product cable crosses a 3rd party's cable which is surface laid or buried shallower than the required burial depth, it will support the cable and negate any jetting in that area.

With permission from the owner, it is beneficial to bury the 3rd party cable to the target burial depth for a reasonable distance each side of where the cable crosses. 50m each side is usually considered the minimum distance, but this will depend on the size and characteristics of the 3rd party cable.

If it is not feasible to bury a section of the 3rd party's cable at the crossing point, then jetting should stop, and the burial tool be graded out and stowed at least 10m before the crossing. The ROV should then traverse the crossing and resume jetting at least 10m from the crossing point.

2.3.5 Shore End Landing Operations

2.3.5.1 *Introduction*

This section describes the details of the shore end landing operations. The cable landing operation will be undertaken by cable ship, assisted by a subcontractor on the beach site.

The resources stated herein are for reference only and could be replaced with any equivalent resources for the fulfilment of the project scope.

2.3.5.2 *Organization and Communications*

The success of the operation depends on good communications between the Beach Master, and ship, and other crafts to be used during the operation. The main communicating language for the operation is English, and communications will be established on a dedicated channel to be agreed between all parties.

The Master on the cable ship will control the operations on board the cable ship. Control of landing the cable initially is by the beach master, coordinating with the cable ship master. To standardize the method of communication it may be necessary for the cable ship to provide an UHF transceiver from their stock on board, to the Beach Master.

2.3.5.3 *Beach Personnel*

The following personnel are required for the cable landing operation:

- Beach Master: Coordination of beach operation.
- Diver/Rigger: Shore-end works, including installation and burial of articulated pipe / cable.
- Local Laborers: Cable landing operations, and beach works.
- Excavator Operator: Operate excavator for setting of dead man anchors, trenching and back filing on the beach and inshore.
- Watchmen: Keeping watch on the operational sites, as required.

2.3.5.4 *Beach Preparation*

Prior to the day of the cable landing several milestones will have been completed as listed below:

- Beach Manhole (BMH) should be prepared and ready for cable pull in. A suitable strong point for anchoring off the cable end is required.
- 2.0 m depth of trench will be created by using an Excavator from Beach Manhole to low water mark. Trenching on the terrestrial and beach section should be completed. If the trenching is still being constructed, the landed cable will be anchored and coiled on the beach in the interim until such time when the trenching is completed.
- A cable quadrant, or Beach Sheave if required, should be installed, and suitably anchored to a pre-installed dead man anchor.
- A calibrated Tension Meter or load cell will have to be installed, in-line at the quadrant or beach sheave to measure the in-line cable tension. The dead man anchor is to be proof load tested.
- The sub-contractor responsible for the shore-end scope of work should have completed a divers' survey and ensure that the landing route is clear of debris and obstacles.
- The beach area should be cordoned off with warning tape for public safety and awareness.
- A meeting between the beach team and the cable barge should be arranged prior to commencement of the operation. This will enable the communication procedure to be established, potential problems highlighted, and each party's method and procedure understood.

2.3.5.5 *Shore end Landing Operations*

The general outline of the cable landing operation is described below:

- ***Step 1*** **–** A small boat will receive the end of the messenger rope from the cable barge.
- ***Step 2*** **–** The messenger rope will be hauled to the beach and handed over to the beach team, who will receive it through the cable quadrant or beach sheave and attach it to the beach machinery (e.g., excavator). Due to the accessibility of some of the sites and the lack of suitable machinery the landing may be done using local labor.
- ***Step 3*** **–** The light messenger rope will have been attached to the buoyant shore end rope, the length of which will approximate the total distance of cable to be floated ashore.
- ***Step 4*** **–** On board the cable barge the shore end rope is connected to the sealed cable end with a swivel and stoppers suitable for the type and size of cable to be landed.
- ***Step 5*** **–** Barge divers are positioned in the water at the point where the shore end rope/cable enters the water.
- **Step 6 –** The cable haul will commence with the cable barge divers, attaching floatation to the cable in the form of A4 floats or similar at suitable intervals as dictated by the weight

of the cable in water. Upon instruction the beach master will commence the shore end pull and the divers will commence attaching floats at the prescribed interval. To indicate the position of the cable end, two floats and or a larger float should be attached and if possible, of a different color or marked with tape.

- ***Step 7*** **–** Guard boats will be positioned, either side of the cable line to ward off any oncoming craft.
- ***Step 8*** **–** At a suitable position on the shoreline the floats will be removed. With the cable floatation attached and confirmation that the cable line is straight the divers will commence removal of the floats from the shoreline towards cable barge. The divers will closely monitor the cable to ensure no excess slack or suspensions are present on touchdown.
- ***Step 9*** **–** Suitable small craft will be employed to collect all the floats as they are cut off by the divers. For ease of recovery, it is recommended that these small craft are supplied with a strop so that the floats can be threaded on for towing back to the cable barge.
- ***Step 10*** **–** Once the cable has been hauled into the BMH, a permanent manhole stopper will be applied in the beach manhole.
- ***Step 11*** **–** Removal of the cable armor wires will commence and when completed the cable will be coiled into the BMH prior to making the beach joint.
- ***Step 12*** **–** Cable ship landing operations are assumed to be completed when all the floats and other equipment and personnel are safely returned on board.

2.3.5.6 *Articulated Pipes Installation*

Installation of Articulated Pipes will be conducted after the cable has been fed into the BMH and fixed with anchor plate inside of the BMH. Articulated pipes will start from the BMH duct and up to 100m in length.

The Articulated Pipes will be locked and tightened by bolts and nuts at every 10m interval.

2.3.5.7 *Beach Restoration*

When the cable has been installed and beach burial has been completed, including the back filling of any trenches that have been dug, the beach area is to be restored to its original condition. Only when reach restoration is complete, can demobilization of the beach equipment can be carried out.

2.3.5.8 *Cable Burial by Divers (Post Lay Jetting)*

Cable burial by divers will utilize a jet pump or airlift. Jetting will take place from the end of the point at which either mechanical or shore labor trenching finishes to the Injector burial stop position.

2.3.6 Maintenance

The following test equipment is equipped for **submarine cable** project at **terminal stations** and **cable depots** for system operation and maintenance purpose.

2.3.6.1 *Routine Maintenance*

This chapter describes the suggestions for secure running, the method of obtaining the technical support for the Network Monitoring System (NMS), and how to perform routine maintenance on a daily, weekly, monthly, or quarterly basis. Through routine maintenance, you can detect and rectify the potential faults to ensure the secure, stable, and reliable running of the NMS.

Daily Maintenance

This topic describes how to perform daily maintenance. Daily maintenance allows you to collect the information about the running status and trend of the NMS in real time, which improves the efficiency of handling emergencies:

- Viewing Current Alarms;
- Querying the NMS Security Logs;
- Checking the Resource Usage of the NMS Server;
- Checking the Status of Network Communications Between the NMS and NEs;
- Checking the Running Status of the Processes and Services of the NMS;
- Checking the HA System Resource Status;
- Checking the Status of Data Replication Between the Primary and Secondary Sites in the Veritas High Availability System; and
- Backing Up the NMS Data

Weekly Maintenance

This topic describes how to perform weekly maintenance. Weekly maintenance allows you to find defects such as function failure or performance degradation during the running of the NMS in a timely manner. This helps you to take proper measures to handle the problem as soon as possible and eliminate potential risks and avoid accidents:

- Checking the Disk Status of the NMS Server;
- Checking the Disk Space of the NMS Server;
- Checking the Logs of the OS;
- Checking the Logs of the SQL Server Database;
- Checking the Logs of the Sybase Database;
- Checking the Running Status of Anti-Virus Software; and
- Checking the Database Status.

Monthly Maintenance

This topic describes how to perform monthly maintenance. Monthly maintenance keeps the NMS health in a good state for a long time, which ensures secure, stable, and reliable running of the system:

- Checking User Configurations;
- Backing Up System Files;
- Viewing Alarm Statistics;
- Checking the Server Time of the NMS;
- Changing the Password of the Current User; and
- Releasing the Disk Space of the NMS Server.

Quarterly Maintenance

This topic describes how to perform quarterly maintenance. Quarterly maintenance keeps the equipment room environment of the NMS in good condition, which ensures the reliability of power supply and related hardware:

- Checking the Equipment Room Environment;
- Checking the Power Supply of the NMS Server; and
- Checking Hardware and Peripherals of the NMS Server.

2.3.7 Decommissioning Phase

After 25-year lifespan, the cable will be officially decommissioned, the system owner will cut off the system power supply and leave the cable in the seabed. No further activities will be implemented.

3 PROJECT AREA ENVIRONMENTAL AND SOCIAL BASELINE/CONTEXT

3.1 Introduction

This Chapter provides a description of the existing physical, biological, and socio-economic conditions, which are directly or indirectly affected by Project activities. It is essential that the baseline conditions of the environment are characterized to accurately predict the potential effects the proposed project will have on the environment and society. The collection of baseline data therefore focused on providing information to support the assessment of any potential impact of the project.

3.2 Physical Environment

3.2.1 Size, Location and Geography

Mombasa County is in the Southeastern part of the Coastal region of Kenya. It covers an area of 229.9Km^2 excluding 65Km^2 of water mass which is 200 nautical miles inside the Indian Ocean. It borders Kilifi County to the North, Kwale County to the Southwest and the Indian Ocean to the East. The County lies between latitudes 3° 56' and 4° 10' South of the Equator and between longitudes 39° 34'and 39° 46' East of Greenwich Meridian. The County also enjoys proximity to an expansive water mass as it borders the EEZ of the Indian Ocean to the East.[4]

3.2.2 Climate

The County lies within the coastal strip in the hot tropical region where the climate is influenced by monsoon winds.

The rainfall pattern is characterized by two distinct long and short seasons corresponding to changes in the monsoon winds. The long rains occur in April – June with an average of 1,040 mm and correspond to the Southeastern Monsoon winds. The short rains start towards the end of October lasting until December and correspond to the comparatively dry Northeastern Monsoons, averaging 240mm. The annual average rainfall for the county is 640mm.

The annual mean temperature in the county is 27.9°C with a minimum of 22.7°C and a maximum of 33.1°C. The hottest month is February with a maximum average of 33.1°C while the lowest temperature is in July with a minimum average of 22.7°C. Average humidity at noon is about 65 per cent.[5]

[4] Mombasa City County CIDP 2018-2022

[5] Ibid

3.2.3 Geology, Topography and Soils

3.2.3.1 *Geology*

Geological map of Mombasa indicates that the solid geology near the survey area is dominant by Coral reefs and Breccia.

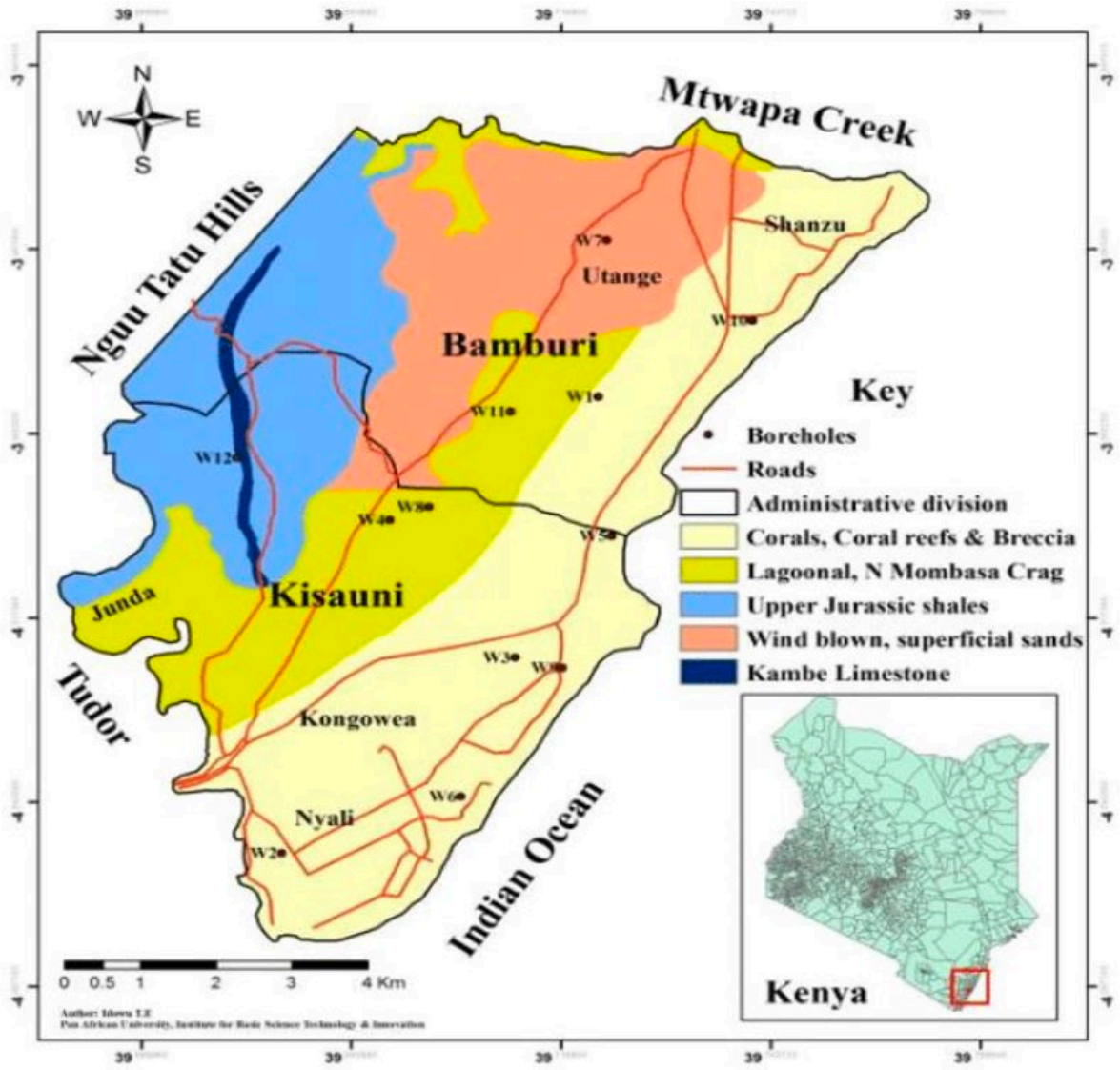

Figure 3-1 Geological Map of Mombasa

3.2.3.2 *Topography*

Mombasa County lies within the coastal lowland which rises gradually from the sea level in the East to about 132m above sea level in the mainland. The terrain is characterized by three distinct physiographic features, which includes the coastal plain, which is are found along the shoreline, covering parts of the South Coast, the Island, parts of Changamwe and the North Coast. The plain consists of an expansive flat land with raised beach terraces covered mainly by coral limestone and back reef sand deposits that not only provide firm foundation for construction but also provide building materials.

The second category is the hilly areas mainly found within the Western part of the County that is underlain by shells and rises gently from 45m to 132m above sea level. This is characterized by poorly drained clay soils which restrict settlement and infrastructural development. The third category is the Indian Ocean and the shoreline covered with geologically sedimentary rocks of Jurassic to recent age. The topography has evolved because of the lowering of the sea level over time leading to severe erosion by the storm water draining into the sea. In addition, the Subsequent rise in sea level led to the submergence of the valleys and the creation of Mombasa Island surrounded by deep natural creeks, ports, and harbors such as Kilindini, Tudor, Makupa, and Old Port creeks.

Other notable physiographic features include the fringing coral reefs, cliffs and tidal flats, sandy beaches, the coastal plain and a hilly severely dissected and eroded terrain. These features have greatly influenced the economic development of the County in several ways. For instance, the sea supports maritime trade while the fringing coral reefs, creeks and tidal flats with extensive mangrove forests are breeding grounds for fish. The fringing coral reefs in North Coast are an important marine conservation area hosting the Mombasa Marine National Park and Reserve.

3.2.3.3 *Soils*

The basic soil (sediment) types along the submarine cable route are BOULDERS, COBBLES, GRAVEL, SAND, SILT and CLAY.

3.2.4 Water Resources

Mombasa highly dependent on trans-basin transfer of water i.e., Mzima springs, Baricho water works and Marere boreholes and the ground water aquifers and boreholes spread across the entire County. At least three permanent springs, four water pans and several borewells are operated by private investors, NGOs and CBOs accounting for about 10,360m^3 per day. The projected piped water supplies for the County by the year 2035 is in the range of between 150,000 to 200,000m^3.

3.3 Biological Environment

3.3.1 Flora

The lagoon area at Nyali is densely covered with a thick mattress of seagrass with some rare patches of macroalgae. The thickness would usually be around 20 to 40 cm from the seabed and the seagrass would be generally healthy.

The seagrass is dominated by large meadows of *Cymodocea sp* while some patches of *Syringodium isoetifolium, Thalassodendron sp, Halodule sp and Halophila sp*. Those small patches house intermixed species of seagrass and are generally less dense as compared to the *Cymodocea sp* meadows. The meadows tend to be monospecific with a net dominance of *Cymodocea sp*.

Patches of algae are also present along the transects. The algae are intermixed with the seagrass and coverage varies. It has been observed that the algae are more present at locations with the seabed made up with a high percentage of rubbles. Also noted during the survey was the presence of algae immediately outside the lagoon area, beyond the reef, from point 42 to 51. The algae observed beyond the reef include *Ulva sp, Dictyota sp, Jania sp* and *Gracilaria sp*. It is believed that water from Mombasa area with its nutrient's loads would be responsible for the presence of *Ulva sp* in the area. Otherwise in the lagoons small patches of algae would include *Padina sp, Sargassum sp, Caulerpa sp., Dictyota s7p, Jania sp* and *Gracilaria sp.*

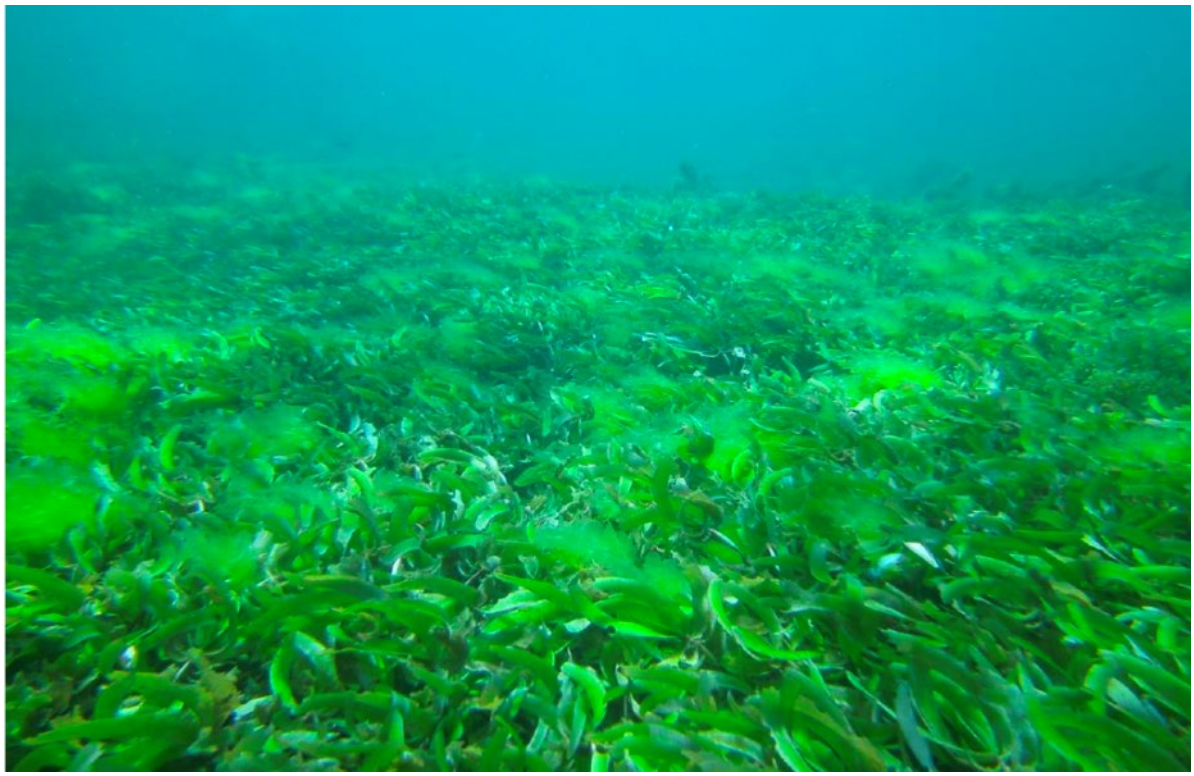

Photo 3-1 Seagrass meadow with some macro algae

Coral colonies were very rarely encountered along the area surveyed except for the deeper area between point 44 and 46. This area while the coverage remains insignificant (<<0.01%) has a few live coral species present and these are mostly from the family of

Poritidae and Acroporidae. In very rare places along the transects would a *Porites sp* head be observed.

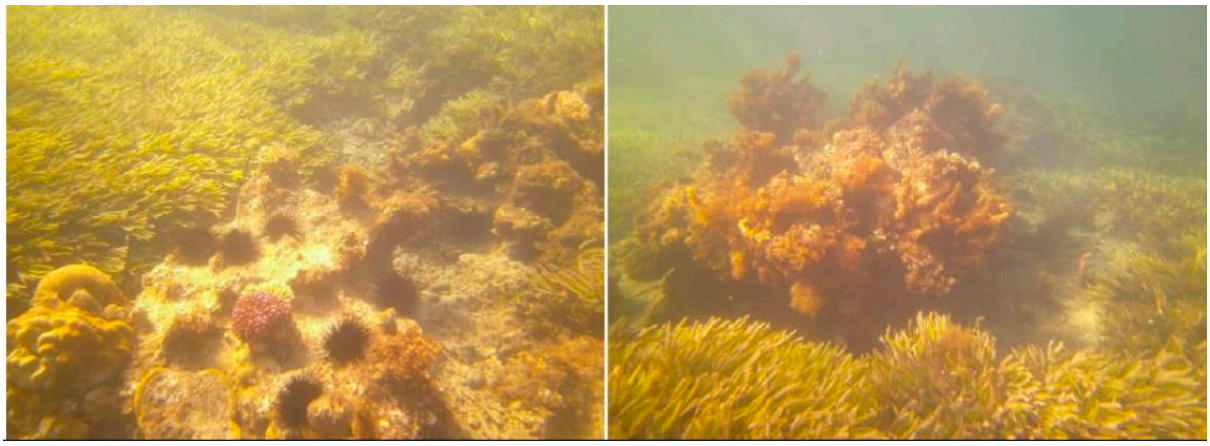

Photo 3-2 Hard substrate with some urchins with both live and dead standing corals and macro-algae

3.3.2 Marine Fauna

Fish were rarely encountered along the transects. Fish were observed mainly near small coral colonies, and they would be small sized fish and not the commercial ones.

The fish encountered were of the families of *Labridae* (wrasses), *Acanthuridae* (surgeonfishes), *Haemulidae* (grunts/sweetlips), *Scaridae* (parrotfishes), *Lutjanidae* (snappers), *Chaetodontidae* (butterflyfishes), *Siganidae* (rabbitfishes), *Mullidae* (goatfishes), *Lethrinidae* (emperors), *Pomacanthidae* (angelfishes), *Balistidae* (triggerfishes), and *Serranidae* (groupers). These were basically individuals which were observed and only in rare places were fish observed in groups.

The deeper area between the points 44 and 46 has a greater population of fish, coincidentally with more live coral colonies.

While the lagoon appears to hold the appropriate habitat and is a good feeding ground for marine turtles, none were observed during the underwater survey nor from the sea surface.

3.3.3 Coastal and mangrove forests

The coastal forests exist as isolated blocks covering a total area of about 83,800 hectares in a narrow belt which extends inland for about 30km. The largest of these forest patches is the Arabuko Sokoke forest reserve. Other forest patches include the Boni-Lungi, Dakacha, Dodori, the Shimba Hills Forest reserve and the Kaya forests.

These coastal forests bear unique communities of flora with high drought resilience, high levels of adaptation of birds, mammals, and other fauna. These coastal forests are vital in biodiversity resilient support.

There are between 53,000 - 61,000 hectares of mangrove forests along the coast with the largest stands occurring in Lamu County (67 %) and the Funzi-Vanga system in the south coast. The mangrove ecosystem is a critical habitat for a variety of fish species and invertebrates, which depend on it for feeding and nursery grounds. The habitat also hosts a wide variety of bird life and

provides a line of defense against shoreline erosion and excessive suspended sediment from terrestrial sources. Coastal and mangrove forests are important carbon sinks.

Kaya forests are of spiritual and cultural importance to the Mijikenda community.

The proposed cable route does not traverse any areas mentioned above.

3.4 Socio-economic Conditions

3.4.1 Population structure

Mombasa is the second largest city in Kenya after Nairobi. The population of Mombasa County stands 1,208,333 people, according to the 2019 Kenya Population and Housing Census. The county has a population density of 5,495 persons per square kilometer.

3.4.2 Politics, Ethnicity, and languages

Mombasa has a cosmopolitan population. However, the Swahili and Mijikenda people are the majority. Other communities include the Taita, Akamba and Kikuyu as well as a significant population of Luo and Luhya people from Western Kenya. Mombasa's unique blend of Africa, India, and Arabia can be attributed to its history as a major port of trade between Europe, Asia and Africa. The major religions practiced in the city are Islam, Christianity, and Hinduism.

3.4.3 Land Use and Economic Activities

3.4.3.1 *General*

Mombasa Island is urbanized. Most land is used for commercial activity and residential settlement. Tourism is the main economic activity in Mombasa and the Kenyan coast area at large. Tourism is estimated to be contributing 45% to the regional economy. Mombasa is well known for tourism. It is a center of coastal tourism in Kenya. Mombasa Island's main attractions are the Old Town and Fort Jesus. The Nyali, Bamburi, and Shanzu beaches are located north of the city. The Diani and Tiwi beaches are located south of Mombasa. Several luxury hotels exist on these beaches and attract large numbers of visitors. Mombasa is a major trade center and home to Kenya's largest seaport in Kenya, the Kilindini Harbor.

The port of Mombasa is a major contributor to the economy of Mombasa and Kenya at large. Shipping and port activities contributes about 15% to the regional economy. Many people in Mombasa are employed at the port. Others also come from different parts of the country too to work at the port. Manufacturing and processing industries also contribute to the economy of the region. Other industries in Mombasa include Limestone mining, cement manufacturing and Oil refinery.

Many Kenyans living in Nyali and Mombasa County derive a living by selling retail products along the Mombasa coastline. They depend on the tourist visiting the Nyali beach for recreation activities such as swimming, diving, and sun-bathing.

The resorts situated along the Nyali beach are a tourist destination because of the sandy beaches. The tourist books these places due to ease of accessing the sandy beaches and Indian ocean to rejuvenate themselves.

The residents of Nyali, larger Mombasa County and rest of Kenyan occasionally visit Nyali for family outing or for work excursions. The associated reaction activities at Nyali beach are swimming in the Indian ocean, viewing the crystalline sandy beach, sunbathing, playful activities such as engaging in soccer, sand car racing. The beach manhole site lies squarely on the high traffic sandy road which is the main access route to beach for the public living in Nyali housing and the inhabitants of Mombasa County.

3.4.3.2 *Shipping*

Shipping vessels were frequently encountered during survey operation. There are no formal traffic separation schemes operating along the eastern coast of Africa. For southern Africa (South Africa and Mozambique), the dominating factor for marine shipping is the influence of the Agulhas Current which streams south with considerable strength and are responsible for the heavy and dangerous seas sometimes encountered. Mariners northeast bound, if hugging the coast to avoid the strength of the current and possibly gain the benefit of an inshore counter current must proceed with caution and try keep their depths greater than 75m. Vessels running south may save time by keeping within the fast current but it should be appreciated that heavy and dangerous seas may be encountered, especially south of Cape St. Lucia (28° 31'S, 32° 24'E).

3.4.4 Fishing Activities

There is no significant marine activity including fishing along the survey corridor during the survey operations.

3.4.5 Dumping & Dredging

There are no activities or records of dumping and dredging along the survey corridor during the survey operations.

3.4.6 Piracy

No piracy incidents were reported during course of survey operations.

3.4.7 Wrecks

No charted wrecks are located within the area of survey. There were no suspected wrecks observed from the data records.

3.4.8 Hydrocarbon Exploitation

No active hydrocarbon exploitation was observed within the survey corridor. Below mentioned is the hydrocarbon concession blocks boundaries crossed by the proposed Seg 2.06 route.

3.4.9 Transport

3.4.9.1 *Roads*

There is a total of 257.17km of bitumen surface roads, 127km of gravel surface roads and 91.29km of earth surface roads in the county. Main classified roads include Mombasa-Nairobi highway, Mombasa-Malindi Road and Likoni - Lunga Lunga Road connecting Kenya and Tanzania. While the major roads are in fair condition, access roads within the residential and industrial areas are in deplorable state. The situation is worsened by the poor storm drainage systems most of which are in dilapidated conditions. The roads are maintained by the national government through Kenya Rural Roads Authority (KeRRA) and overseen by Sub- County Road Committees, Kenya Urban Roads Authority (KURA) and the Kenya National Highways Authority (KeNHA) and the private sector. The County has key bridges linking the Island with the mainland and other coastal areas; these include Nyali and Mtwapa bridges. The construction of the Dongo-Kundu by-pass will ease congestion at the central Business Sub- County as traffic from Nairobi to South coast shall be diverted at Miritini towards Likoni and Diani.

3.4.9.2 *Ferries*

The Likoni Ferry links the Island to Likoni and subsequently to Kwale and Tanzania through the Lunga-Lunga Border. Kenya Ferry Services operates more than 7 ferries and carries over 250,000 people and over 5,000 vehicles per day across the Likoni channel. It also operates in Mtongwe area at peak hours to minimize congestion at the Likoni Ferry crossing.

3.4.9.3 *Railway*

The County has ten kilometers of railway line and three railway stations from the colonial era. The Standard Gauge Railway replaces this parallel and colonial Uganda Railway that was originally built during the British colonial rule in the 19th century. It is the country's largest infrastructure project since independence. Under the East African Railway Master Plan, the Mombasa–Nairobi SGR will link up with other standard gauge railways that are being built in East Africa. This will tremendously revolutionize the transport industry.

3.4.9.4 *Port*

The port of Mombasa is also a key resource and the gateway to the East and Central African region, as it serves the entire region 's export and import needs. In 2012, dredging was being undertaken with a view of deepening the Likoni channel to facilitate usage of the port by larger post panamax vessels. The figure below depicts the container terminal at the port of Mombasa.

3.4.9.5 *Airports*

The County has one international airport, the Moi International Airport in Changamwe sub-county. The airport is the second largest airport in Kenya and is used by both domestic and

international flights. The airport is essential in the promotion of tourism and investment opportunities in the county and in the coast region.

3.4.9.6 *Cultural and Historical Heritage Setting*

Mombasa has a rich 2,000-year-old record of history with a variety of cultural and historical heritage sites. One of the most renowned sites is the historic Fort Jesus. The fort has been classified as World Heritage Site by UNESCO. This 16th Century Fort was the apex of a historic struggle for control of the Kenya coast between the Portuguese army and the Shirazi Arabs. The war fought around Mombasa for hundreds of years with endless battles over this period.

The Old Town (Mji wa Kale) of Mombasa is embellished in Arab architecture and interlaced streets and alleys. Mombasa town has some old buildings and structures (including temples, mosques) which date back decades. Due to its historical and strategic status as a port gateway town and trade center, Mombasa is a melting pot of diverse peoples and cultures. The richly diverse fusion of Indian, Arabic and African in Mombasa is incredibly exhilarating and this bustling, heaving, colorful commercial and cosmopolitan port town is a stimulating, fascinating experience. Contemporary Mombasa is an astonishing city where many cultures are woven into its rich tapestry and become a part of its atmosphere. Some other important sites include Mama Ngina Waterfront Park, and some old buildings and structures (e.g., temples, mosques)

The proposed cable route does not traverse any Cultural or Historical Heritage areas mentioned above.

3.4.10 Employment profile

3.4.10.1 *Wage Earners*

The total number of people engaged in agricultural activities stand at approximately 6,797 which is 1 per cent of the entire labour force. However, taking into consideration wage earners, in all other sectors, the figure rises to over 408,830 which represent 60 per cent of all the labor force in the county. Major employers include the hotel industry, the Kenya Ports Authority, the Government of Kenya, Container Freight Terminals, and various private institutions such as banks.

3.4.10.2 *Self-employed*

The rural self-employed stands at 2 per cent, which translates to 13,594 individuals out of the current labor force, while those engaging in self-employment in the urban centre are 24.4 per cent, numbering 165,851. This is significant because the county is predominantly urban.

3.4.10.3 *Labor force*

The total county labour force stands at 679,717 of which 6,791 are employed in the agricultural sector, 13,594 are engaged as rural self-employed while 408,830 are wage-employed. The remaining 165,857 are engaged as urban self-employed.

3.4.10.4 *Unemployment Levels*

The number of people either involved in self-employment, formal employment or agriculture stands at 594,752, which is 87.5per cent of the labour force in the county. The unemployment rate, therefore, stands at 13.5 per cent.

3.4.11 Poverty profile

Current estimates indicate that 37.6 per cent of the population in Mombasa County is poor. The number is expected to increase rapidly given the high population growth that is not commensurate with the rate at which investment and employment are created. The immediate causes of poverty in the county are landlessness, high and increasing cost of living, inaccessibility to credit facilities, lack of technical and entrepreneurial skills especially among the youth, unemployment, low incomes, HIV/AIDS, and gender discrimination. Other factors include poor resource management, poor governance, ignorance, and marginalization of the disadvantaged.

The poor in the county are found in all the locations but according to the Basic Report on Well–being in Kenya 2005/06, Mwakirunge was ranked the poorest followed by Kisauni. The poor are predominantly squatters living on land owned by absentee landlords. Few pockets of the poor also live in formal settlements side by side with the high- and medium-income groups.

3.4.12 Education

Mombasa county's literacy rate stands at 57 per cent due to high accessibility to learning institutions. The Free Primary Education Programme, the Subsidized Secondary Education

Programme, adult literacy programmes along with numerous bursary schemes from the CDFs, LATF and Government are expected to contribute to a higher literacy rate in the future.

There are 770 ECDE centres within the county, 85 public and 685 private centres with a total enrolment of 47,867 students and 1,714 teachers.

There are a total of 645 primary schools (95 public and 550 private) in the county with an enrolment of 70,345 students in public and 76,301 in private. Teacher-pupil ratio in public primary schools stands at 1:41 which compares favorably with the recommended ratio of 1:40.

The county hosts one Technical Training Institute (Mombasa Technical Training Institute) an Industrial Training Centre (Mombasa Industrial Training Centre), a Medical Training College (Kenya Medical Training College in Mombasa and Port Reitz) and a Teacher Training College (Shanzu Teachers Training College). There is one polytechnic, one fully fledged University (the Technical University of Mombasa, formerly Mombasa Polytechnic) and seven university campuses where four are public and three are privately owned.

Light Academy Primary and International School are 1.5km Southwest of the BMH.

3.4.13 Water

3.4.13.1 *Water Resources and Quality*

Water in the County is managed by the Mombasa Water and Sewage Company. Water supply for the county is from Mzima Springs in Taita Taveta County, Marere, and Sabaki/Baricho in Kilifi County and Tiwi Boreholes in Kwale County. This supply only meets 65 per cent of the county water demand. Additionally, most residents rely on borehole water that contains a high percentage of fecal contamination and not very safe for domestic use. In total, 73.9 per cent of the total population has access to safe water.

3.4.13.2 *Water Supply Schemes*

The county also sources its water from 452 shallow wells spread across the entire county, three permanent springs, four water pans found in the rural areas of the county and several boreholes operated by private investors, NGOs and local CBO's. These sources are complemented by the pipe water system that is sourced from Mzima springs, Marere, Sabaki/Baricho and Tiwi Boreholes. The piping system is currently under rehabilitation by the Coast Water Services Board.

3.4.13.3 *Water Sources (distance to nearest water points)*

The average distance from the water source is estimated at 0.1km which is close compared to the national average of 1.2km. This is because of the geographical size of the county and the multiple sources of water.

3.4.14 Sanitation

Sanitation coverage in the county stands is 71 per cent. More efforts are being put in place to ensure that this coverage is increased. Some of the efforts being put in place include the community strategy where the Ministry of Health is establishing community units manned by community health workers to try and address sanitation, hygiene and health issues as well as stepping up the water and sanitation programme compliance in the county.

3.4.15 Energy Access

The main source of cooking energy for the county residents is paraffin at 53.6 per cent, charcoal at 30 per cent, firewood at 8.8 per cent LPG at 4.7 per cent and electricity at 1.7 per cent. This trend continues when it comes to lighting where paraffin also leads at 51.5 per cent followed closely by those relying on electricity at 47.5 per cent. The Kipevu power plant produces power which is fed into the national grid. The county has a high potential for generation of solar and wind energy, but this remains unexploited.

3.4.16 Waste management

The main source of cooking energy for the county residents is paraffin at 53.6 per cent, charcoal at 30 per cent, firewood at 8.8 per cent LPG at 4.7 per cent and electricity at 1.7 per cent. This trend continues when it comes to lighting where paraffin also leads at 51.5 per cent followed closely by those relying on electricity at 47.5 per cent. The Kipevu power plant produces power which is fed into the national grid. The county has a high potential for generation of solar and wind energy, but this remains unexploited.

3.4.17 Health

The county hosts the Coast Level Five Hospital which is a referral facility serving the entire coast region. Other notable private hospitals include the Aga Khan Hospital, the Mombasa Hospital and Pandya Memorial Hospital. Other lower-level hospitals include the Tudor and Port Reitz level four hospitals. These are further complemented by fifteen private hospitals, four nursing homes, nine health clinics of which two are public and seven privately managed. There are 27 dispensaries out of which 25 are public and two private. Additionally, there are 106 private clinics, some specializing on ailments while others being general clinics.

The five most common ailments in the county are malaria, which accounts for 48 per cent followed by flu and other ailments accounting for 18.7 per cent while stomachaches account for 5.2 per cent and respiratory infections of which upper respiratory infections account for 0.7 per cent and lower respiratory infections account for 3.3 per cent cumulatively accounting for 4.1 per cent. Diarrhoea is also rampant and accounts for 2.3 per cent of all disease incidences in the county.

3.4.18 Safety and security

Mombasa is a safe destination. Other than occasional terrorist threats and election atmosphere, the county has been peaceful and has even attracted local tourism during high peak season. The National police and County inspectorate have been working in harmony to ensure order on the roads and on heavily populated areas as expected.

3.4.19 Access to telecommunication services

Mobile telephone coverage stands at 95 per cent with the major telecommunication providers, including Safaricom, Airtel, Telkom, having a strong presence within the county. This has led to diminishing popularity of landline telephone services. The use of mobile phones for internet access has also increased, especially among the youth. There are approximately 3700 land line telephone connections which are increasingly losing business to the fast-growing mobile telephone service.

4 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

4.1 Overview

This Chapter outlines the existing national and international environmental and social legislation, policies, and institutions applicable to the proposed Project. Since Kenya is a signatory to various international conventions and laws, relevant international conventions, and Multilateral Environment Agreements (MEAs) on Biodiversity, Endangered Species, Law of the Sea, and Marine Dumping are also presented.

4.2 Policy Framework

4.2.1 Constitution of Kenya

Kenya has undergone regulatory reforms over the past two decades, culminating in the enactment of a new constitution in 2010. The Constitution is the supreme law in Kenya and gives a lot of emphasis on environmental conservation and sustainable development. For instance, in the Preamble, the Constitution states that "We, the people of Kenya will be respectful of the environment, which is our heritage, determined to sustain it for the benefit of future generations".

Article 2(5) of the Constitution states that the general rules of international law shall form part of the laws of Kenya. For the purposes of protection of the environment, several principles of international environmental law are incorporated, viz:

- the polluter pays principle;
- principle of public participation;
- principle of sustainability;
- principle of inter & intra-generational equity;
- principle of prevention; and
- precautionary principle.

The principle of sustainable development is entrenched in Article 102(d) of the Constitution as one of the national values and principles of governance.

The Constitution guarantees the right to a clean and healthy environment in Article 42. Article 42 further guarantees the right to have the environment protected for the benefit of present and future generations through legislative and other measures particularly those contemplated in article 69 and the right to have obligations relating to the environment fulfilled under Article 70. Article 69 imposes obligations on the state. The state is required to:

a) ensure sustainable exploitation, utilization, management, and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits;
b) work to achieve and maintain a tree cover of at least ten percent of the land area of Kenya;

c) protect and enhance the intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources of the communities;
d) encourage public participation in the management, protection, and conservation of the environment;
e) protect genetic resources and biological diversity;
f) establish systems of environmental impact assessment, environmental audit, and monitoring of the environment;
g) eliminate processes and activities that are likely to endanger the environment; and
h) Utilize the environment and natural resources for the benefit of the people of Kenya.

Article (69) (2) imposes obligations on every person, to cooperate with state organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources.

Article 70 provides an avenue for redress for any person who alleges that the right to a clean and healthy environment has been or is likely to be denied, violated, infringed, or threatened. The Court is empowered to issue preventive, cessation, or compensatory orders.

Article 70 relaxes the rule on locus standi because of which, there is no need to prove loss or injury by an applicant. Anyone may institute a claim seeking to enforce the environmental rights and obligations stipulated in the Constitution.

Enforcement contemplated by Article 70 will be done through the Environment and Land Court established under Article 162 (2) (b). The Court has the same status as the High Court. This effectively denies High Court jurisdiction over environmental matters under Article 165 (5) (b).

TKL should ensure project activities do not compromise the right to a clean and healthy environment. Requisite measures should be put in place to guarantee the sustainability of the Project. Such measures should include but not limited to pollution prevention and control, and sustainable utilization of natural resources.

4.2.2 Sessional Paper No.10 of 2014 on the National Environment Policy, 2014

The overall goal of this Paper is to ensure better quality of life for present and future generations through sustainable management and use of the environment and natural resources.

Section 5.6 of this Policy focusses on infrastructure development and environment and makes explicit policy statements to ensure sustainable management and use of the environment and natural resources during the construction and operation of infrastructure developments including roads.

These policy statements require the commitment of the Government to:

- Ensure Strategic Environmental Assessment (SEA), Environmental Impact Assessment (EIA), Social Impact Assessment (SIA) and Public Participation in the planning and approval of infrastructural projects;
- Develop and implement an environmentally friendly national infrastructural development strategy and action plan; and
- Ensure that periodic Environmental Audits are carried out for all infrastructural projects. Relevance to this Project.

TKL has commissioned this ESIA study process to ensure environmental and social issues are appropriately addressed.

4.2.3 Kenya Vision 2030

The Vision 2030, Kenya's long-term development blueprint aims to create a globally competitive and prosperous nation, transforming Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030 in a clean and secure environment. Vision 2030 has three pillars, namely the Economic, Social, and Political are anchored on macroeconomic stability; continuity in governance reforms; enhanced equity, and wealth creation opportunities for the poor. The Economic Pillar captures the expectations of the ICT market seeks to improve the prosperity of all regions of the country and all Kenyans.

Africa 1 submarine cable should be connected to National Optic Fibre Backbone Infrastructure (NOFBI) to ensure maximum utilization of capacity and connectivity.

4.2.4 National Information, Communications and Technology (ICT) Policy, 2019

This policy is designed to realize the potential of the digital economy by creating an enabling environment for all citizens and stakeholders. The ICT Policy defines the forward-looking position of the Government on various areas of the evolving ICT sector landscape in Kenya. Again, the Policy provides guidelines on making available capital-intensive ICT public infrastructure for use by Kenyan private and commercial operators on fair and equitable terms, and this is a welcome move.

Africa 1 submarine cable should also be utilized by Internet Service Providers (ISPs).

4.2.5 The Kenya National Digital Master Plan 2022-2032

The Kenya National Digital Masterplan 2022-2032 is a sequential progression of the Masterplan 2014-2017. A plan for leveraging and deepening the contribution of ICT to acceleration of economic growth. It adopts a conceptual model that espouses the critical elements necessary for a socio-economic growth. The Master Plan has the four pillars namely: Digital Infrastructure; Digital Service & Data Management; Digital Skills and Digital Innovation; and Enterprise and Digital Business.

Africa 1 submarine cable will extend Kenya's broadband access through providing internet backbone and fixed broadband.

4.2.6 National Policy for the Sustainable Development of Northern Kenya and other Arid Lands, 2012

The focus of this policy is on promoting social and economic development and the provision of easily accessible services throughout Kenya, and in the arid and semi-arid Lands. The goal is to ensure that Kenya, and in the arid and semi-arid Lands, develops into regions of opportunity and potential, eliminating historical challenges.

Its key objectives are to; strengthen the integration of Northern Kenya and other arid lands with the rest of the country and mobilize the resources necessary to ensure equity and release the region's potential; improve the enabling environment for development in Northern Kenya and other arid lands by establishing the necessary foundations for development; develop alternative approaches to service delivery, governance and public administration which accommodate the specific realities of Northern Kenya and pastoral areas; and, strengthen the climate resilience of communities in the ASALs and ensure sustainable livelihoods.

In terms of access to Infrastructures like (transport, water, energy, and ICTs), it recognizes that only one county, Isiolo, is currently connected to the national electricity grid with mobile telephone operators expanding their networks, although the coverage is still limited to the major towns. It further states that The ICT infrastructure is inadequate and expensive. Despite, the fibre-optic cable reaching several locations in the north, for the most part communication remains heavily reliant on satellite.

The Proposed Project will extend broadband access to Northern Kenya and other arid lands through NOFBI's last mile connectivity.

4.2.7 National Policy on Gender and Development (2019)

The National Policy on Gender and Development seeks to create a just, fair and transformed society free from gender-based discrimination in all spheres of life practices. The National Policy highlights the fact that the patriarchal social order supported by statutory, religious, and customary laws and practices; and the administrative and procedural mechanisms for accessing rights have continued to hamper the goal of attaining gender equality and women's empowerment.

The Policy promotes inclusion of women in ICT through increasing access to STEM education, removing social barriers and fostering opportunities for women in ICT[6]. This also policy specifies

6 http://psyg.go.ke/wp-content/uploads/2019/12/NATIONAL-POLICY-ON-GENDER-AND-DEVELOPMENT.pdf.

the need to "Collect and disseminate gender data on ICT access and use to inform policy and decision making" recognizing these central gaps.

The Project shall support this policy through providing internet broadband for furthering internet access for women (including through supporting public Wi-Fi hotspots, for instance).

4.2.8 National Land Policy, 2009

The National Land Policy sets out goals and direction for the present and future management of land in Kenya. It contains measures and guidelines which enable the government to achieve optimal utilization and management of land. The policy highlights rapid urbanization, inadequate land-use planning unsustainable production, poor environmental management, inappropriate ecosystem protection, and management as the major concerns affecting land in Kenya. Further, the policy recognizes environmental problems facing the country. These problems include the degradation of natural resources such as forests, wildlife, water, marine, and coastal resources as well as soil erosion and the pollution of air, water, and land. The policy requires environmental assessments and audits to be undertaken to conserve and manage the environment to achieve sustainable management of land resources.

Relevance

During the construction and operation phases, appropriate measures should be put in place to protect both marine and terrestrial ecosystems from pollution and degradation.

4.2.9 The National Biodiversity Strategy and Action Plan (2019-2030)

The overall objective of the National Biodiversity Strategy and Action Plan (NBSAP) is to address the national and international undertakings elaborated in Article 6 of the Convention on Biological Diversity (CBD). It is a national framework of action to ensure that the present rate of biodiversity loss is reversed, and the present levels of biological resources are maintained at sustainable levels for posterity. The general objectives of the strategy are to conserve Kenya's biodiversity to sustainably use its components; to share the benefits arising fairly and equitably from the utilization of biological resources among the stakeholders; and to enhance technical and scientific cooperation nationally and internationally, including the exchange of information in support of biological conservation.

Relevance

The project should not interfere with marine and terrestrial ecosystems. Marine wildlife should be protected as well as other terrestrial flora and fauna species.

4.2.10 National Policy for Disaster Management, 2009

National Policy for Disaster management policy provides for disaster risk management which encompasses a full continuum from preparedness, relief, and rehabilitation, mitigation, and

prevention. The Policy aims to increase and sustain the resilience of vulnerable communities to hazards through diversification of their livelihoods and coping mechanisms. The policy notes that disasters in Kenya that have occurred over the years are from diverse hazards such as droughts, floods, fires, terrorism, collapsing buildings, accidents in the transport sector, and disease/epidemics. The hazards that lead to disaster are grouped into the following clusters:

- Environmentally triggered (Climate-related; - droughts, floods, storms landslides)
- Geologic disasters include volcanic eruptions, tsunamis, earthquakes,
- Human-made disasters such as socio-economic, technologic industrial, human,
- Biologically triggered (epidemics i.e., disease, pests for human, livestock and crops and wildlife)

The overall goal of Disaster Management policy is to build a safe, resilient, and sustainable society. The policy focuses on the following elements: Disaster Prevention, mitigation, preparedness, response, and recovery.

Relevance

The proponent and the contractor should collaborate with other agencies such as the Kenya Coast Guard, Disaster Management units, Kenya Maritime Authority (KMA) for early warning signs and be informed of any likely disaster.

4.2.11 The Kenya Kwanza Manifesto

The Kenya Kwanza administration has made the following ICT commitments:

- Universal broadband availability through-out the country within five years. Increase and fast track broadband connectivity across the country by the construction of 100,000km of national fibre optic connectivity network;
- Enhance government service delivery through digitization and automation of all government critical processes and make available 80 percent of government services online; and
- Establish Africa Regional Hub and promote development of software for export.

The Proposed Project will indirectly contribute towards realization of these ICT commitments.

4.3 Legal Framework

Table 4-1 shows a summary of key provisions of relevant legal frameworks.

Table 4-1 Relevant Legal Frameworks

Legislation	*Key Provisions*	*Relevance to the Project*
Environmental Management and Coordination Act, 1999 (Revised 2015)	Requires ESIA for all projects listed in the Second Schedule	This ESIA has been conducted in accordance with this Act.
EMCA (Impact Assessment and Audit) Regulations, 2003 (Amendment 2019)	requires that the EIA/EA be conducted by a registered lead or firm of experts in accordance with the terms of reference developed during the scoping exercise. Categorizes all telecommunication projects as medium risk and thus a comprehensive project report (CPR) must be prepared submitted to NEMA for licensing.	This ESIA was conducted by a registered firm of experts. The Project must undergo annual environmental audits (EA).
EMCA (Air Quality) Regulations, 2014	prohibits any person from causing air pollution either directly or indirectly	Machinery used in project works must be well maintained to minimize exhaust emissions.
EMCA (Waste Management) Regulations 2006	requires waste generators to segregate waste by separating hazardous waste from non-hazardous waste for appropriate disposal. prohibits any industry from discharging or disposing of any untreated waste in any state into the environment	e-waste from the Project installation and operation activities will require appropriate disposal in line with these regulations.

Legislation	*Key Provisions*	*Relevance to the Project*
EMCA (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009	prohibits any person to make or cause to be made excessive vibrations which annoy, disturb, injure, or endanger the comfort, repose, health or safety of others and the environment.	Project works should be planned in a way that limits excessive noise and vibration especially near sensitive receptors like schools and health facilities.
EMCA (Fossil Fuel Emission Control) Regulations, 2006	promotes use of clean fuels, use of catalysts and inspection procedures for engines and generators.	Machinery and equipment in the project will require unleaded fuels in line with the regulations.
Sustainable Waste Management Act, 2022	requires preparation of Waste Management Plans (WMPs) by counties, private entities, and individuals. Empowers counties to enforce the requirement.	Waste from the project will require appropriate disposal in line with prepared Waste Management Plan (WMP), by licensed waste handlers, and in coordination with Mombasa City County.
Wildlife Conservation and Management Act, 2013	requires Kenya Wildlife Service (KWS) approval for any civil works in protected areas.	Obtain KWS approval for any project works within Mombasa Marine National Park and Reserve (MMNPR).
Climate Change Act, 2016	encourages persons to put in place measures for elimination of climate change including reduction of greenhouse emission and use of renewable energy and implementation of measure to mitigate against adverse effects of climate change.	The project should focus on resilience of the investment considering location specific risks and considering relevant mitigation measures for greenhouse gas (GHG) emissions from project.
The Access to Information Act, 2016	mandates project proponents to disclose pertinent information to stakeholders during the project lifecycle.	Identify project stakeholders and disclosure pertinent information.

Legislation	*Key Provisions*	*Relevance to the Project*
The Kenya Information and Communications Act, 2011 and Amendment, 2013	requires telecommunication operator to ensure that as little damage as possible is caused to the land and to the environment and shall pay fair and adequate compensation to the owner or occupier of the land for any damage or loss sustained by reason thereof. requires deployers of national infrastructure to obtain **Network Facilities Provider, TIER 1 License.**	Implement the E&S requirements stipulated in this ESIA. Compensate water users for any temporary loss of livelihoods. TKL has **Network Facilities Provider, TIER 1 License.**
The Kenya Information and Communications Act, 2011 and Amendment, 2013 ***Guidelines for Installation and Maintenance of ICT Infrastructure, 2018***	requires compliance with the EMCA, 1999, WBG IFC Environmental, Health & Safety Guidelines for Telecommunication, for any ICT infrastructure works. requires annual environmental audits (EA) for ICT infrastructure	Implement the E&S requirements stipulated in this ESIA. Conduct annual EA for the projects.
Public Health Act, Cap 242	prohibits a person/institution to cause nuisance or condition liable to be injurious or dangerous to human health. Empowers county governments to enforce the same.	Implement the E&S requirements stipulated in this ESIA.
The Standards Act, Cap 496	requires that all materials, machines, and equipment meet set standards to safeguard property, project workers and community at large.	Materials, machines, and equipment used in the project should meet set KEBS standards.

Legislation	*Key Provisions*	*Relevance to the Project*
The National Construction Authority Act, 2012	requires construction works are carried out by NCA registered contractors and supervised by qualified engineers. requires construction sites to have permits.	Only engage NCA registered contractors. Register the project with NCA.
The Occupational Health and Safety Act (OSHA), 2007	requires Project sites to be registered by DOSHS. requires workplace and fire safety audits for internal environments. requires examination and testing of plants and equipment. requires accident investigation and reporting to DOSHS within 24 hours (fatal accidents) and 7 days (non-fatal accidents).	Register project as a workplace. Conduct annual workplace and fire safety audits for project's internal environment (buildings). Ensure all machines and equipment are serviced and inspected as per manufacturers' specifications. All accidents or incidents should be reported to Directorate of Safety and Health Services (DOSHS) 24 hours.
Work Injury Compensation Benefit Act 2007	requires compensation for employees on work related injuries and diseases. requires employer to report an employee's injury to DOSHS county offices within 24 hours (fatal accidents) and 7 days (non-fatal accidents).	All Project workers should have WIBA insurance. All accidents or incidents should be reported to DOSHS Mombasa City County offices within 24 hours.
The Employment Act No 11, 2007	prohibits forced and child labour, discrimination, and sexual harassment in employment.	Provide all project workers with contracts.

Legislation	*Key Provisions*	*Relevance to the Project*
	requires employers to provide contracts to all employees and annual leave.	Recruit semi and unskilled labor through the Chief's office.
National Gender and Equality Commission Act No. 15 of 2011	requires projects to offer equal opportunities to women, men, persons with disabilities, the youth, children, the elderly, minorities, and marginalized communities.	Provide equal opportunities in the project to men, women, and youth.
The Sexual Offences Act (No. 3 of 2006)	requires elimination of sexual offences e.g., sexual exploitation and harassment, e.g., everywhere including workplaces.	Prepare and implement a mechanism for reporting on gender-based violence, SEAH, etc.
County Government Act No. 17 of 2012 **Physical and Land Use Planning Act, 2019**	requires project proponents to seek development approval from county governments.	Seek development approval from respective Mombasa City County.
Traffic Act, Cap 403 & Traffic (Amendments) Act 2015, 2017, 2022	requires licensing of drivers and vehicles. requires drivers to give way to pedestrians. requires all road users to follow traffic rules and regulations.	Only licensed drivers and vehicles should be used in the project. Contractors should develop and implement a driving for work policy.
The National Museums and Heritage Act (2006) And its Revised Edition (2012)	requires project proponents to notify National Museums of Kenya (NMK) of any cultural heritage discovery and sets restrictions on moving objects of archaeological or paleontological interest.	Prepare and implement chance finds procedures.

Legislation	*Key Provisions*	*Relevance to the Project*
HIV/AIDS Prevention and Control Act (Act No.14 of 2006, Revised in 2012)	requires HIV/AIDs education in the workplace.	Implement HIV/AIDs awareness programmes throughout project lifecycle.
Coast Development Authority Act (CDA), 1990	requires integrated regional planning for sustainable utilization and management of coastal resources, based on environmental carrying capacity.	Consult and engage CDA during ESIA process and throughout project implementation
Fisheries Management and Development Act, 2016 (No. 35 of 2016).	requires sustainable management and conservation of fishery resources. provides for the establishment of fisheries (beach) management units.	Consult and engage BMUs during ESIA process and throughout project implementation
Kenya Coast Guard Services Act, 2018	enforces pollution control.	Consult and engage KCGS during ESIA process and throughout project implementation
Kenya Maritime Authority Act, 2006	regulates activities regarding shipping in the inland waterways including the safety of navigation. implements and undertakes co-ordination in maritime security.	Consult and engage KMA during ESIA process and throughout project implementation

4.4 Multilateral Environment Agreements

4.4.1 Convention on Biological Diversity (1992)

International treaty that was adopted at the Earth Summit in Rio de Janeiro in 1992, its objective is to develop national strategies for the conservation and sustainable use of biological diversity. It is often seen as the key document regarding sustainable development.

Relevance

The project should protect and conserve both marine and terrestrial biodiversity.

4.4.2 United Nations Framework Convention on Climate Change (UNFCCC)

The UNFCCC is an international environmental treaty adopted on 9 May 1992 and opened for signature at the Earth Summit in Rio de Janeiro from 3 to 14 June 1992. It then entered into force on 21 March 1994, after enough countries had ratified it. The UNFCCC objective is to "stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". The framework sets non-binding limits on greenhouse gas emissions for individual countries and contains no enforcement mechanisms. Instead, the framework outlines how specific international treaties (called "protocols" or "Agreements") may be negotiated to specify further action towards the objective of the UNFCCC.

Relevance

The proponent should adopt measures to minimize GHGs and implement appropriate measures to mitigate and adapt to climate change.

4.4.3 United Nations Convention on the Law of the Sea

The United Nations Convention on the Law of the Sea lays down a comprehensive regime of law and order in the world's oceans and seas establishing rules governing all uses of the oceans and their resources. It enshrines the notion that all problems of ocean space are closely interrelated and need to be addressed.

The convention bides states to prevent and control marine pollution and is liable for damage caused by violation of their international obligations to combat such pollution.

Relevance

The proponent and contractor should prevent marine pollution through appropriate waste disposal and spillage prevention.

4.4.4 International Convention for the Prevention of Pollution from Ships (MARPOL)

International Convention for the Prevention of Pollution from Ships (MARPOL) 1973/78 The MARPOL Convention is the main international convention covering prevention of pollution by

ships from operational or accidental causes. It is a combination of two treaties adopted in 1973 and 1978 respectively and includes the Protocol of 1997 (Annex VI). MARPOL has been updated by amendments through the years. The Convention covers pollution by oil & oily water, noxious liquid substances in bulk, harmful substances in packaged form, sewage and garbage and air pollution from ships.

The Convention includes regulations aimed at preventing and minimizing pollution, both accidental pollution and that from routine operations. Kenya became a signatory to the convention in 1973. Therefore, the country is obliged to comply with the provisions of the Convention in preventing pollution of the environment by ships from the discharge of harmful substances or effluents containing substances in contravention of the convention. The designated national competency authority responsible for prevention of ship pollution is the Kenya Maritime Authority.

Relevance

The proponent and contractor shall prevent marine pollution.

4.4.5 Convention for the Protection of Submarine Telegraph Cables, 1888

The **Convention for the Protection of Submarine Telegraph Cables** is a multilateral treaty that was signed in 1884 to protect submarine communications cables that had begun to be laid in the 19th century.

The convention made it a punishable offence to damage submarine communications cables. In addition, all ships were to be regulated to staying 1 nautical mile (1.9 km) away from cable laying ships when in operation. Any ship that accidentally hooked a cable and sacrificed its fishing nets to avoid breaking it would be compensated for the lost equipment.

Relevance

The cable will be protected under this convention.

4.5 WBG Environmental and Social Framework

The World Bank Environmental and Social Framework sets out the World Bank's commitment to sustainable development, through a Bank Policy and a set of Environmental and Social Standards that are designed to support Borrowers' projects, with the aim of ending extreme poverty and promoting shared prosperity. This Framework comprises:

- **A Vision for Sustainable Development**, which sets out the Bank's aspirations regarding environmental and social sustainability;
- **The World Bank Environmental and Social Policy for Investment Project Financing**, which sets out the mandatory requirements that apply to the Bank; and

- **The Environmental and Social Standards (ESSs)**, together with their Annexes, which set out the mandatory requirements that apply to the Borrower and projects. There are 10 ESSs as listed below:
    - **Environmental and Social Standard 1:** Assessment and Management of Environmental and Social Risks and Impacts;
    - **Environmental and Social Standard 2**: Labor and Working Conditions;
    - **Environmental and Social Standard 3**: Resource Efficiency and Pollution Prevention and Management;
    - **Environmental and Social Standard 4**: Community Health and Safety;
    - **Environmental and Social Standard 5**: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement;
    - **Environmental and Social Standard 6**: Biodiversity Conservation and Sustainable Management of Living Natural Resources;
    - **Environmental and Social Standard 7**: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities;
    - **Environmental and Social Standard 8**: Cultural Heritage;
    - **Environmental and Social Standard 9:** Financial Intermediaries; and
    - **Environmental and Social Standard 10:** Stakeholder Engagement and Information Disclosure.

4.5.1 WBG Environmental and Social Standards

Eight (8) of the ten (10) ESSs are relevant to the project. Table 4-2 highlights the relevant ESSs.

Table 4-2 WBG Environmental and Social Standards

ESS No.	ESS Title	Key Requirement	Relevance to the Project
ESS1	Assessment and Management of Environmental and Social Risks and Impacts	Requires the assessment, management and monitoring of E&S risks and impacts of the project throughout the project lifecycle. Requires the application of the Bank's EHS Guidelines, or other more stringent measures where these exist. Requires the preparation of an ESCP as part of the legal agreement with material measures and actions required for the project to achieve compliance with the ESSs.	Relevant. TKL has commissioned this ESIA study to assess, manage and monitor environmental and social (E&S) risks and impacts of the project throughout the project lifecycle.
ESS2	Labour and Working Conditions	Requires development and implementation of labor management procedures. Workers to be provided with clear information and documentation on terms and conditions of employment. Nondiscrimination of workers in employment and treatment.	ESS2 is relevant to this project due to different classes of labour working on the project: (i) direct workers, (ii) contracted workers, and (iii) primary supply workers.

ESS No.	ESS Title	Key Requirement	Relevance to the Project
ESS3	Resource Efficiency and Pollution Prevention and Management	Implementation of technically and financially feasible measures for improving efficient consumption of energy, water, and raw materials, as well as other resources. Avoidance of the release of pollutants or, when avoidance is not feasible, minimization and control the concentration and mass flow of their release using the performance levels and measures specified in national law or the EHSGs, whichever is most stringent.	The relevance of ESS3 is mainly related to ensuring energy efficient ICT and electronic equipment are procured where practical by the Project. During implementation, the Project will generate solid waste and e-waste. For any ICT equipment that may be replaced it will have to be disposed of in an appropriate manner.
ESS4	Community, Health, Safety and Security	Requires the assessment, management and monitoring of E&S risks and impacts of the project on the health and safety of the affected communities (vulnerable) during the project life cycle. Requires an assessment of how use of security by the Project to safeguard personnel and property could impact on community considering human rights.	ESS4 is relevant to this project given potential risks to the community health and safety that could result from accidents at project sites, the transmission and spread of diseases, and GBV/SEA/SH risks. Moreover, the project may also cause risks to community health stemming from inappropriate disposal of generated e-waste, vehicle traffic, dust, noise and vibrations, generation of hazardous material and

ESS No.	ESS Title	Key Requirement	Relevance to the Project
			conflicts, limited access to residences, businesses and institutions, and security and community conflicts.
ESS5	Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement	Anticipate and avoid physical and economic displacement or, where avoidance is not possible, to minimize adverse social and economic impacts.	Relevant. Ninety-nine percent of the project will be implemented in water. Cable laying from BMH to CLS will be done through an existing duct. Thus, no new land acquisition is envisaged. However, during inshore cable laying the turbidity of water may increase preventing fishing and recreational use of the waters. A compensation plan should be implemented for the temporary loss of access to water resource.
ESS6	Biodiversity Conservation and Sustainable Management of Living Resource	E&S assessment as set out in ESS1 but considers direct, indirect, and cumulative project-related impacts on habitats and the biodiversity they support. This assessment should consider threats to biodiversity, for example pollution and incidental take, as well as projected climate change impacts. E&S assessment of the systems and verification practices used by the primary suppliers.	Relevant. Indian Ocean is an ecosystem with various biodiversity that may be negatively affected during submarine cable laying. Again, if waste generated from the project is not properly managed, it may pollute the environment negatively impacting biodiversity.

ESS No.	ESS Title	Key Requirement	Relevance to the Project
ESS7	Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Full consultation and provision of opportunities for Indigenous Peoples / Sub-Saharan African Historically Underserved Traditional Local Communities in project design and in the determination of project implementation arrangements. Obtain the Free Prior and Informed Consent (FPIC) of the affected Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities. Culturally appropriate and accessible grievance mechanism for the project.	Not relevant.
ESS8	Cultural Heritage	E&S assessment as set out in ESS1 but considers direct, indirect, and cumulative project-related impacts on cultural heritage. Stakeholder consultation during cultural heritage identification process. Listing of all legally protected cultural heritage areas affected by the project.	Relevant. The project has a ginormous footprint and involves a lot of inshore and offshore civil works. As such, there is a likelihood to encounter cultural heritage. This ESIA includes Chance finds procedures to guide any cultural heritage finding. Annex F.

ESS No.	ESS Title	Key Requirement	Relevance to the Project
		Chance finds procedures.	
ESS9	Financial Intermediaries	Development and implementation of an environmental and social management system (ESMS). Stakeholder engagement.	Not relevant.
ESS10	Stakeholder Engagement and Information Disclosure	Stakeholder engagement during project preparation. Stakeholder Engagement Plan (SEP). Stakeholder engagement during project implementation and external reporting. Grievance redress mechanism. Organizational capacity and commitment.	Relevant. Different stakeholders should be engaged during both the ESIA process and throughout implementation.

4.5.2 WBG Environmental, Health and Safety Guidelines (EHSGs)

The Environmental, Health and Safety (EHS) Guidelines are technical reference documents that address the Bank's expectations regarding the EHS performance of its projects. They are designed to assist managers and decision makers with relevant industry background and technical information. This information supports actions aimed at avoiding, minimizing, and controlling EHS impacts during the construction, operation, and decommissioning phase of a project or facility. The EHS Guidelines serve as a technical reference source to support the implementation of the ESSs.

4.5.2.1 *General EHSGs*

General EHS Guidelines exist which contain information on cross-cutting environmental, health, and safety issues potentially applicable to all industry sectors; these are listed in Table 4-3.

Table 4-3 WBG General EHS Guidelines

Environmental • Air Emissions and Ambient Air Quality • Energy Conservation • Wastewater and Ambient Water Quality • Water Conservation • Hazardous Materials Management • Waste Management • Noise • Contaminated Land	**Occupational Health and Safety** • General Facility Design and Operation • Communication and Training • Physical Hazards • Chemical Hazards • Biological Hazards • Radiological Hazards • Personal Protective Equipment (PPE) • Special Hazard Environments • Monitoring
Community Health and Safety • Water Quality and Availability • Structural Safety of Project Infrastructure • Life and Fire Safety (L&FS) • Traffic Safety • Transport of Hazardous Materials • Disease Prevention • Emergency Preparedness and Response	**Construction and Decommissioning** • Environment • Occupational Health and Safety • Community Health and Safety

4.5.2.2 *Telecommunication EHSGs*

The EHS Guidelines for Telecommunications are applicable to telecommunications infrastructure such as fixed line and wireless voice and data transmission infrastructure, including long distance terrestrial and submarine cables (e.g., fiber optic cables), as well as radio and television

broadcasting, and associated telecommunications and broadcasting installations and equipment.[7]

These telecommunication sector-specific EHS Guidelines contain information on cross-cutting environmental, health, and safety issues in the industry, these are listed in Table 4-4.

Table 4-4 WBG Telecommunication EHS Guidelines

Environmental	**Occupational Health and Safety**
• Terrestrial habitat alteration • Aquatic habitat alteration • Visual impacts • Hazardous materials and waste • Electric and magnetic fields • Emissions to air • Noise	• Electrical safety • Electromagnetic fields (occupational) • Optical fiber safety • Elevated and overhead work • Fall protection • Confined space entry • Motor vehicle safety
Community Health and Safety	**Construction and Decommissioning**
• Structural and site access issues • Aircraft navigation safety • Driver safety and cellular phones	Environment Occupational Health and Safety Community Health and Safety

Where applicable, the above-mentioned EHSGs will be applied to the Project.

4.5.2.3 *Parameter Specific EHS Guidelines*

Air Emissions and Ambient Air Quality

The WBG recommend that the air quality guidelines as set out by the World Health Organisation (WHO) be utilized in such an assessment. The WHO standards are divided into several stages, which have interim targets and a final guideline target. The WHO guidelines are recognised to be particularly conservative, as they make no consideration of the economic burden of achieving the stipulated guidelines. The WHO final guideline target is aspirational, and as such, this target should be progressively worked towards. In the case of the proposed Project, progression towards the achievement of the final guideline target may be assisted by regulatory changes to the quality of fuel used for construction and project-owned vehicles (for example, low sulphur fuels) and the regular maintenance and potential mandatory testing of those vehicle emissions.

[7] Associated installations and equipment include cellular, microwave, and other radio-based systems; satellite receivers; wire line and wireless receiving, transmitting, and switching stations, and related equipment such as masts and towers, cables and connectors, equipment housing such as shelters and cabinets, backup batteries, and auxiliary power units (generators).

Based on the above, Table 4-5 sets out the Kenyan Air Quality Emission Standards for industrial areas, which will be used for construction subprojects' E&S assessment.

Table 4-6, on the other hand, shows WHO ambient air quality guidelines.

Table 4-5 Kenya's Ambient Air Quality Tolerance Limits for Industrial Areas

Pollutant	Time Weighted Average	Tolerance Limit
SOx	Annual average	80 µg/m³
SOx	24 Hours	125 µg/m³
NOx	Annual average	80 µg/m³
NOx	24 Hours	150 µg/m³
NO_2	Annual Average	150 µg/m³
NO_2	24 Hours	100 µg/m³
Suspended Particulate Matter (SPM)	Annual average	360 µg/m³
Suspended Particulate Matter (SPM)	24 Hours	500 µg/m³
Respirable Particulate Matter (<10µm) (RPM)	Annual average	70 µg/m³
Respirable Particulate Matter (<10µm) (RPM)	24 Hours	150 µg/m³
$PM_{2.5}$	Annual average	35 µg/m³
$PM_{2.5}$	24 Hours Maximum	75 µg/m³
Lead	Annual average	1.0 g/Nm³
Lead	24 Hours	1.5 g/m³
Carbon monoxide (CO)/ Carbon dioxide (CO2)	8 Hours	5.0 mg/m³
Carbon monoxide (CO)/ Carbon dioxide (CO2)	1 Hour	10.0 mg/m³
Hydrogen Sulphide	24 Hours	150 µg/m³
Non-methane hydrocarbons	Instant peak	700 ppb

Pollutant	Time Weighted Average	Tolerance Limit
Total Volatile organic Compounds (VOC)	24 Hours	600 µg/m^3
Ozone	1 Hour	200 µg/m^3
Ozone	8 hour (instant Peak)	120 µg/m^3

Table 4-6 WHO Ambient Air Quality Guidelines

Pollutant	Averaging Period	Guideline Value in µ g/m3
Sulfur dioxide (SO2)	24-hour	125 (Interim target-1) 50 (Interim target-2)
Sulfur dioxide (SO2)	10 minute	20 (guideline) 500 (guideline)
Nitrogen dioxide (NO2)	1-year	40 (guideline)
Nitrogen dioxide (NO2)	1-hour	200 (guideline)
Particulate Matter (PM_{10})	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
Particulate Matter (PM_{10})	24-hour	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter ($PM_{2.5}$)	1-year	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)
Particulate Matter ($PM_{2.5}$)	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)

Pollutant	Averaging Period	Guideline Value in µ g/m3
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

Since Kenya's air quality standards are more specific, they shall be applied to the proposed project.

Noise

The WBG EHS Guidelines – General EHS Guidelines: Environmental Noise Management 1.7 Noise (WBG 1.7 Noise) is an internationally recognised guideline document containing information for the assessment and management of noise.

Table 4-7 presents the WBG noise guidelines that should not be exceeded at the nearest Noise Sensitive receptor (NSR) locations offsite. In addition to the absolute values provided in Table 4-8, the WBG also requires that noise increase above existing (background) levels should not exceed 3 dB.

Table 4-7 WBG Noise Level Guidelines

Receptor	One Hour LAeq (dB(A))	
	Daytime (07:00 – 22:00)	**Night (22:00 – 07:00)**
Residential; institutional; educational	55	45
Industrial; commercial	70	70

LAeq = A-weighted equivalent sound levels over a measurement period, dB(A) = A-weighted decibel

Table 4-8 Maximum Permissible Noise for Construction Sites in Kenya

	Facility	Maximum Permissible Noise Level in dB(A)	
		Day (0601-1800, LAeq 12 hour)	**Night (1801-0600, LAeq 12 hour)**
(i)	Health facilities, educational institutions, homes for disabled, etc.	60	35
(ii)	Residential	60	35
(iii)	Areas other than those prescribe in (i) and (ii) (and of applicability to this Project).	75	65

WBG Guidelines are designed to apply to noise emissions from facilities and stationary noise sources such as factories. The value of 70 dB(A) at the property boundary differs to the Kenyan standard (Table 4-8); hence the Kenyan noise standard of 75 dB(A) and 65 dB(A) for day and nighttime at the property boundary will apply to this Project.

4.6 Institutional Framework

The following key administrative agencies regulate ICT and its E&S implications in Kenya:

Table 4-9 E&S Institutional Framework

No	Institution/Ministry	Description of their role	Relevance to the project
1.	Ministry of Environment and Forestry (ME&F)	Facilitate good governance in the protection, restoration, conservation, development and management of the environment and natural resources for equitable and sustainable development.	Sets environmental management policy
2.	National Environment Management Authority (NEMA)	Exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government in the implementation of all policies relating to the environment.	• Grants ESIA approval for projects • Monitor and assess project activities
3.	National Environmental Complaints Committee (NECC)	Investigates allegations and complaints of suspected cases of environmental degradation. The Committee also prepares and submits to the NEC periodic reports of its activities.	Members of the public can register or appeal to this committee regarding any aspects of the project that violates the law and its licenses.
4.	National Environment Tribunal (NET)	• reviews administrative decisions made by NEMA relating to issuance, revocation or denial of license and conditions of license.	Members of the public can register or appeal to this committee regarding any aspects of the project that

No	Institution/Ministry	Description of their role	Relevance to the project
		• provides legal opinion to NEMA on complex matters where the Authority seeks such advice. • has powers to change or give an order and direction regarding environmental issues in dispute.	violates the law and its licenses.
5.	Communications Authority of Kenya (CA)	• regulator of communications sector / digital economy in Kenya. • responsible for facilitating the development of the information and communications sectors including broadcasting, cybersecurity, multimedia, telecommunications, electronic commerce, postal and courier services. • mandate to administer the Universal Service Fund (USF)	Issues **Network Facilities Provider, TIER 1 License** (For deployment of infrastructure nationally)
6.	Ministry of Labour and Social Protection	• formulate and implements the national labor legislation and policy. • Parent to Directorate of Occupational Safety and Health Services (DOSHS).	• DOSHS monitors working conditions at project sites. • WIBA insurance for staff. • Workplace registration for all project sites. • Annual occupational and safety audits.
7.	Ministry of Sports, Culture and Heritage	develop, promote, preserve, and disseminate Kenya's diverse cultural, artistic and sports heritage through formulation and implementation of policies which enhance national pride and improve the livelihood of the Kenyan people.	Must be informed of any chance finds during project implementation.
8.	KWS	facilitate good governance for sustainable development,	Obtain approval for any works within protected areas.

No	Institution/Ministry	Description of their role	Relevance to the project
		management and marketing of tourism and wildlife.	
9.	KURA	Responsible for the management, development, rehabilitation, and maintenance of National Trunk Roads in the urban areas.	Obtain permission for road reserve utilization.
10.	Water companies	Water utility companies within the project footprint.	Notify them of planned works
11.	Telcos	Telecommunication companies with fiber networks in Kenya.	Notify them of planned works.

5 PROJECT ALTERNATIVES

5.1 Overview

Regulation 16 (b) of Environmental (Impacts assessment and Audit) Regulations, 2003, requires identification and analysis of project alternatives when undertaking an ESIA. An ESIA should identify and assesses alternatives to the proposed project. Only the best feasible alternative should be selected based on less negative impacts and cost-benefit analysis. An important alternative to be analyzed is the "no project" alternative. This is a fundamental analysis because it helps the proponents measure the impacts of the project against those which would have taken place without the project. Several options were considered in designing alternatives for the proposed project. These included the following options:

- Technology Alternative
- Alternative Routes
- Installation configuration Alternative

5.2 Project Alternatives

5.2.1 Use of Alternative Routes

This option would result in use of alternative routes for the Africa 1 Optical Fibre Cable project. Majority of the cable route for Africa 1 Seg 2.06 (BMH MBA to BU MBA) lies in deep water area of Indian Ocean which is mainly in the High Seas (International Waters) of approx. 2124.92 Kms. The route also lies approx. 475.363 Km in Kenyan waters and 501.694 Kms in Yemeni EEZ waters. Majority of the deep-water section, the route traverses the smooth, very gentle to gentle slope abyssal planes. Occasional occurrences of seamounts, ridges with very steep slope gradients are observed within the survey corridor. Three route developments were conducted to widen the survey corridor to avoid these features. The route has effectively avoided most of the seamounts. Few of the ridges are unavoidable due to their existence across the corridor. However, the current route has been engineered to minimize the higher slope gradients associated with these ridges.

The pre-survey route position lists (RPLs) are presented in Table 5-1 while post-survey RPLs are presented in Table 5-2.

Table 5-1 The Summary of the Pre-Survey RPLs

	Cable Type	Survey Route SR03-08-NOV-21	Survey Completed (Km)
Overall Route Length	N/A	3085.962	3085.962
Overall Cable Length	N/A	3176.312	3176.312
By Cable Type (Based on Cable Length)	MDA-17	11.945	11.945
	SAL-17	138.007	138.007
	LWP-17	72.471	72.471
	LW-17	2953.889	2953.889

Table 5-2 The Summary of the Post-Survey RPLs

Description	Cable Type	Survey Route SR01 24-AUG-21	Post Survey Route PSRIO 25-OCT-22
Overall Route Length		3085.962	3101.977
Overall Cable Length		3176.312	3198.985
By Cable Type (Based on Cable Length)	MDA30	-	12.116
	SAL30	-	92.666
	LWP30	-	224.308
	LW30	-	2869.895

5.2.2 Installation Configuration Alternative

Different installation configurations for fibre optic cable, which include the aerial and underground installations.

5.2.2.1 *Aerial installation configurations*

Although most optical fibre cables are intrinsically lightweight, they are subject to stresses caused by environmental and weather factors they are installed in. Aerial run cable can be affected by wind and storms, creating a situation that can cause the cable to stretch or sag, pulling on the fibers. Under most conditions aerial optical fibre cables needs to be supported by an external support member, suspension strand, or "messenger". Unlike direct burial installations, aerial installations will often be executed by utility companies with specialized equipment for long haul runs. This making the process more expensive to install and maintain. This option of

installation was disregarded because aerial installation is not feasible given the length of the cable and multiple uses of the ocean.

5.2.2.2 *Underground Cable Installation Configurations*

The underground cable installation configuration is designed to provide extra protection for the cables but can also offer certain installation advantages. The cables are plowed in or buried in a trench when buried directly and the installation process can be very quick. Duct or conduit for underground burial is manufactured using rigid, very rugged, abrasion resistant material. Underground cable installation is a series of ducts placed under the streets, accessible by utility vaults or Manholes. Installed conduit is advantageous because it offers a route for new cable installation or old removal without damage to streets, pavements, edifices, etc. Considering the challenges that comes with aerial installation like weather challenges and destruction of cable from external forces, the underground conduit was considered to the most optimal installation configuration.

5.2.3 Technology Alternatives

Several technological alternatives that either did not fulfill the purpose of the project or did not meet the agreed criteria were evaluated. The major factors that affected the acceptability of those options were potentially adverse environmental effects and problems related to technical feasibility. The following alternative technologies were considered as alternative to the fibre optic cable.

5.2.3.1 *Wireless Network Alternative*

A wireless network alternative could address some elements of the project purpose and need but would be unable to provide the capacity or speed needed to fully meet the purpose. In addition, the installation of wireless infrastructure would require ground disturbance. Unlike the proposed alternative, which uses existing ROWs, development of a wireless network typically requires disturbance of undeveloped areas for necessary site improvements and construction of access roads. At the current level of technological development, fiber-optics is up to 250,000 times faster than wireless, and a single fiber can carry 69,000 times more data than the entire bandwidth delivered by a wireless tower. As a result of above-mentioned challenges, a wireless network was eliminated from further consideration due to its inability to fully meet the purpose and need, and its greater potential for ground disturbance and associated environmental impacts.

5.2.3.2 *Radio*

Radio waves carry information over the air from one point to another. Along the way, the waves encounter various obstacles or obstructions that can impact range and performance, depending on the characteristics of the radio wave. In addition, regulatory rules govern the use and

limitations of radio waves. Signals using these radio frequencies are generally limited to a one to three-mile radius, or three to 28 square miles, which makes application in less densely populated areas less economical. These frequencies are inherently more susceptible to weather and environmental interferences which made this option does not meet the purpose of the project.

5.2.3.3 *Telephony*

The telephone industry predominantly uses copper twisted pair for the delivery of communications services to commercial and residential customers. Plain old telephone systems have been the primary means of communicating both locally and long distance. The problem is that it was designed for the transmission of voice communications. It's a mature technology, but inadequate by design, the amount of bandwidth that can be delivered is restricted by the characteristics of the copper twisted pairs installed between the customer and central office.

Services such as Digital Subscriber Line (DSL) delivered across a local exchange carrier's existing copper wire system can deliver very high speeds. However, DSL suffers performance limitations based on the distance from the customer premises to the serving central office. Distances are limited to about four to five miles from a central office for the lowest speed solutions and 10,000 feet or less for the fastest. Additionally, much of the plant is physically incapable of providing broadband service. *The option does not meet the purpose of the project.*

5.2.3.4 *Satellite Data Transmission*

A non-cable option of replacing the proposed telecommunication and data transmission services is satellite communications. The use of communications satellites to provide the services identified as necessary would require no construction or interference with environment but would not provide the capacity or quality of service proposed under the project. Satellite networks, such as direct broadcast satellite, currently offer only one-way Internet access. Upstream access is limited to existing copper telephone lines. Other alternatives like Low Earth Orbit (LEO) Satellite Systems are not scheduled to be completed for years and have not proven capable of providing "carrier-class" voice or data services. Fibre optic cables transmit voice and data traffic with higher reliability and security at a cheaper rate than satellite. While a satellite call must travel 27,000 miles (35,780 km) from the earth to the satellite and then another 27,000 miles back, Mombasa City County fiber optic call need only travel about 200 miles point- to-point. At the speed of light this helps to eliminate the delays suffered during a satellite data transmission. Additionally, users will have to buy equipment and only a limited number of users can be served in one region, high signal latency hampers certain applications, environmental factors may reduce signal quality, and data traffic is typically capped monthly or daily in current commercial offers. In view of all these issues concerning quality and affordability of service, satellite broadband, like wireless broadband, is a complementary rather than an alternative

infrastructure, even though in specific circumstances (for example very remote/mountainous areas) it may be the only viable alternative[8]. The option does not meet the purpose of the project.

5.2.3.5 *Laser Radio Transmission*

A laser radio transmitter transmits data via a semiconductor laser, opening the door to ultra-high-speed WIFI. The laser that can emit microwaves wirelessly, modulate them, and receive external radio frequency signals, enabling it to function as a laser radio transmitter.

Unlike conventional lasers that emit a single frequency of light, laser frequency combs emit multiple frequencies simultaneously — evenly spaced to resemble the teeth of a comb. Inside the laser, the different frequencies of light beat together to generate microwave radiation. The light inside the cavity of the laser causes electrons to oscillate at microwave frequencies that are within the communications spectrum.

The first thing the device needed to transmit microwave signals was an antenna. To create the antenna, a gap is etched into the top electrode of the device, creating a dipole antenna (like the rabbit ears on the top of an old TV). The frequency comb was modulated to encode information on the microwave radiation created by the beating light of the comb. Using the antenna, the microwaves are radiated out from the device, containing the encoded information. The radio signal is received by a horn antenna, filtered, and sent to a computer.[9]

This technology is still nascent and under development, therefore, not available for consideration in this Project.

5.2.4 Fibre Optic Cable Alternatives

The growing need for fast broadband 'connectivity' in society and the economy requires a reliable, affordable, and scalable state-of-the art communications infrastructure network. Internet Protocol (IP) traffic has been growing exponentially for years, as human activities are increasingly going online, and there is no let-up in this trend. Services such as HDTV, 3D TV, 4K, video on demand, video conferencing, and new online applications in every profession and business imaginable are all driving further growth in data traffic. The following details the advantages of incorporating a high-speed data fibre-optic cable for the proposed project, when compared with other technologies are outlined in Table 5-3.

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[8] A study completed in April 2022 by the A4AI and funded by United States Agency for International Development (USAID), analyzed in detail the costs of connecting schools in three counties—Garissa, Mandera, and Wajir—and concluded that a mixed technology solution is most cost-effective. Furthermore, costs could be further reduced by up to 60 percent once services provided by LEO satellites become available in Kenya, e.g., Starlink or OneWeb. See USAID and A4AI. 2022. *Policy Roadmap: Last-Mile Connectivity for Community Anchor Institutions in Kenya*.

[9] The TechBriefs website: https://www.techbriefs.com/component/content/article/tb/pub/techbriefs/communications/36378 Accessed on 4/3/2021

Table 5-3 Fibre Optic Cable Advantages

Speed:	Fibre optic networks operate at high speeds - up into the gigabits
Bandwidth:	large carrying capacity and Low attenuation (data loss)
Distance:	Signals can be transmitted further without needing to be "refreshed" or strengthened.
Resistance:	Greater resistance to electromagnetic noise such as radios, motors or other nearby cables.
Maintenance:	Fibre optic cables costs much less to maintain
Durability:	Longer life expectancy than copper or coaxial cable

Additionally, the quality of sound received over fibre optic cables is extremely clear and it does not vary with atmospheric conditions. Cables offer excellent confidentiality, light weight, and reliability. The fact that the optic cable system will lead to increased speeds and reduced internet costs is a welcome idea for the business and corporate world in Kenya. This is the most optimal option in terms of technology and reduction of redundancies and uses mostly existing wayleaves of mostly road infrastructures remains the most optimal option.

5.3 The "No-Action (No Project)" Alternative

Under the '**No Action'** alternative, the proponent would not carry out the intended proposed installation of the optic fibre cable and the anticipated negative impacts resulting from commissioning and operation of the development as proposed, would not occur. Additionally, the resultant socio-cultural/economic benefits that would be created by the proposed installation of the optic fibre cable project would also be foregone. This decision is not favorable if the vision 2030 are to be achieved.

While the "**No Action"** alternative may ensure non-interference in the biodiversity, social conditions, the resultant implication is that there will be no improvement to the Kenya telecommunication status hence no growth will be experience as a result in improved speed and ways of doing business. Additionally, this will imply that the proponent will not be able to meet the growing customers' needs of better and faster internet without the project. This project is anticipated to create employment in the participating countries. The enhancement of communications and global connectivity through this project will directly affect local businesses, education, and employment opportunities within the country. The Africa 1 Cable System is a priority project for the enhancement of ICT infrastructure in the regions and a robust and reliable

international telecommunications link will have significant benefits for the citizens of the region. Therefore, this alternative was excluded from further consideration.

5.4 The Proposed Development

This report has identified social, physical, and economic impacts for this proposed fibre optic installation. This alternative will have minimal impacts on the physical and social environment and has considered the necessary mitigation measures to either eliminate completely or reduce the impacts to negligible. Since the proposed project will not interfere with any sensitive environment and negative impacts are very minimal and when mitigated they are reduced to negligible levels. Maximum benefits shall be realized with the implementation of the project. This will in turn determine the way business is done in Kenya, in sectors such as entertainment, political, education and training. Additionally, the implementation of the project will result to magnitude of benefits to the country and neighboring ones as well. Thus, the proposed fibre optic installation is the best and most viable option.

6 CONSULTATION & PUBLIC PARTICIPATION (CPP)

6.1 Overview

This Chapter presents a summary of the stakeholder engagement undertaken as part of the ESIA process for the Project. The engagement process has been designed to meet both Kenyan legal requirements for CPP in relation to an ESIA Project Report, and international requirements for engagement as outlined in the WBG ESSs.

6.2 Objectives of Stakeholder Engagement

The objectives of engaging stakeholders and the community during the ESIA process and beyond include, to:

- **Ensure understanding** – stakeholders were informed about the project through disclosure of pertinent information (e.g., activities, inputs, outputs, etc.);
- **Involve stakeholders in the assessment** – after informing the stakeholders about the project, they were invited to offer their views, opinions or suggestions that included potential positive and negative environmental and social impacts, enhancement, mitigation, and management measures;
- **Build relationships** – stakeholders were invited to partner with the proponent to ensure that all project positive impacts during construction and operation phases are realized and project ESMP is implemented to avoid, minimize, and reduce negative impacts;
- **Engage vulnerable people** – apart from key informants, the engagement included potential Project Affected Persons (PAPs). PAPs within one kilometer radius of the project site were engaged through a meeting and questionnaires;
- **Manage expectations** – the engagement was also used for understanding and helping to manage stakeholder and community expectations about the project; and
- **Ensure compliance** – engagement process was designed to ensure compliance with both local regulatory requirements and international best practice (WBG ESS 1).

One of the key outcomes of engagement should be free, prior, and informed consultation of stakeholders, where this can be understood to be:

- **Free**: engagement free of external manipulation or coercion and intimidation;
- **Prior**: engagement undertaken in a timely way, for example the timely disclosure of information; and
- **Informed**: engagement enabled by relevant, understandable, and accessible information.

6.3 Project Stakeholders

A **stakeholder** is defined as **any individual or group which is potentially affected by the Project or who has an interest in the Project and its potential impacts**. Different issues are likely to concern different stakeholders; as such, stakeholders have been grouped in accordance with their connections to the Project.

Table 6-1 presents the range of stakeholder groups that have been identified and included within the stakeholder engagement process to date.

Table 6-1 Project Stakeholders

Stakeholder Category	Stakeholder Group	Connection to the Project	Stakeholders to be Consulted	Comment
National Government	National Regulatory Bodies Government Agencies	National Government are of primary importance in terms of establishing policy, granting permits or other approvals for the Project, and monitoring and enforcing compliance with law throughout all stages of the Project life cycle.	National Environment Management Authority (NEMA) Kenya Wildlife Service (KWS) Kenya Maritime Authority (KMA) Kenya Marine and Fisheries Research Institute (KEMFRI) Kenya Fisheries Service (KeFS) Coast Development Authority (CDA)	The aim was to conduct a stakeholder engagement meeting with the relevant departments at the County Level and determine whether further engagements are required at the national level. In all cases NEMA was consulted.

Stakeholder Category	Stakeholder Group	Connection to the Project	Stakeholders to be Consulted	Comment
			Kenya Ports Authority (KPA) National Museums of Kenya (NMK)	
County Government	Mombasa County (001)	The County Government is also of primary importance as it is responsible for implementation of legislation, and development plans and policies at the County level. The County Government also have a role in issuing permits and processing applications. Finally, the County Government has a role in ensuring the views of the communities it represents are presented to the Project.	Various County Departments	This the department identified as being relevant to project development. It was engaged via questionnaires.
Traditional Authorities	Administrative and customary authorities	Local community leaders acting as representatives of their local	Area Chiefs Sub-Chief Elders	These stakeholders were key to community mobilization and

Stakeholder Category	Stakeholder Group	Connection to the Project	Stakeholders to be Consulted	Comment
	such as Village Elders	community. The traditional leaders and local authorities are the gatekeepers and play a key role in mobilization and maintaining law and order	Beach Management Unit (BMU) Tube renters Boat operators	determination of Project's environmental and social impacts and mitigation measures. They were engaged through a community meeting.
Neighbours	PAPs	People living within 1 kilometer of the project site that may be directly or indirectly affected by project activities.	Project area residents	These were engaged through a meeting and questionnaires at the project site.

6.4 Approach to Stakeholder Engagement

Stakeholder engagement for the Project was and will be undertaken using a phased approach in line with the various phases of development:

- ESIA process engagement; and
- Post-ESIA engagement.

6.4.1 ESIA Process Engagement

The objectives of the ESIA process engagement were same as those described in Section 6.2.

Table 6-2 presents a summary of the stakeholder engagements conducted during the ESIA process, while a summary of the key issues raised/comments made is presented in Section 6.4.2. The results of the stakeholder consultations have been incorporated into the baseline information as well as into the impact assessment Chapter (Chapter 7 of this ESIA Project Report).

Table 6-2 Details of ESIA Process Stakeholder Engagement

Stakeholder	Mode of Engagement	Engagement Date	Venue
Kenya Wildlife Service (KWS)	Meeting and questionnaire	29/6/2023	KWS Office Mombasa
Kenya Ports Authority (KPA)	Virtual Meeting	4/7/2023	Online
Kenya Coast Guard Service (KCGS)	Questionnaire	27/06/2023	Mombasa office
Coast Development Authority (CDA)	Questionnaire	20/06/2023	Mombasa Office
County Government of Mombasa	By email and Key Informant Interview (KII)	22/6/2023 – 21/6/2023	Mombasa office
Nyali Beach Management Unit	Meeting	June 19 2023	Nyali Beach
Nyali Administrators and General Public	Meeting	June 19 2023	Nyali Beach
Tube Renters	Meeting	June 19 2023	Nyali Beach
North Coast Ratepayers & Residents Association (NCRRA)	By email and meeting	20/6/2023 21/6/2023	Nyali Mombasa
Kenya Ports Authority (KPA)	By email	30/5/2023 – 29/6/2023	Mombasa
North Nyali Residents Association	Questionnaire	21/06/2023	Nyali, Mombasa
Fort Jesus National Monument	Questionnaire and meeting	21/06 2023	Mombasa
Coastal & Marine Resources Development (COMRED)	Questionnaire	16/6/2023	Nyali, Mombasa
Kenya Maritime Authority (KMA)	Questionnaire	20/06/2023	Mombasa
Kenya Marine and Fisheries Research institute	Physical Meeting	21 June 2023	Mombasa Nyali office

Port Reitz Sub- County Hospital	Questionnaire	29/6/2023	Mombasa

6.4.2 Outcomes of Engagement Conducted to Date

As indicated in Table 6-2 stakeholder engagement meetings were held during the ESIA process of the Project.

The key questions and concerns raised by stakeholders during the ESIA process are outlined in Table 6-3 and Table 6-4. The BID, detailed minutes of the stakeholder engagement meetings conducted during the ESIA process, meeting photos, attendance registers, and the developed stakeholder engagement database, are all presented in Appendix D and Appendix E.

Table 6-3 Outcomes of Stakeholder Engagement Meeting

Main Theme brought up by Stakeholders	Key stakeholders' issues/ comments
On Potential Project Positive Impacts	• Creation of employment opportunities. • Improvement of the telecommunication network. • Provision of stable internet data services. • Contribution to the economic development of the country. • Provision of inter-globe connections through fibre optic infrastructure.
On Potential Project Negative Impacts	• Possible interference with marine life during seabed trenching. • Disruption of beach activities such as swimming and skating. • Disruption of fishing activities. • Possible destruction of fish breeding sites. • Safety concerns such as injuries.
On outstanding CSR Project during installation of Africa 1 submarine cable	**Engineer Kibet of TKL**, regretted that Telkom has not been able to implement the CSR project requested by the Beach Management Unit which involved the construction of a public toilet at the beach and gave the reason that the BMU has not been able to identify a suitable site which on public land for construction of the toilet. He assured the meeting that TKL shall take into consideration the comments of the public and stakeholders and shall strive to work harmoniously with the BMU and the members of the public within the project area. He assured the meeting that this proposal was accepted and allocated about Ksh. 2.5million. However, the BMU

Main Theme brought up by Stakeholders	Key stakeholders' issues/ comments
	had not identified a suitable site, which must be public land for the construction of the toilet, and this is the reason the CSR project has not been executed.
On compensating beach users and fishermen	**Said A Juma, Fisherman,** reiterated the issue of CSR and the construction of a public toilet as Mr. Bilal had mentioned it. He complained that TKL was not compensating the beach users and fishermen for the losses incurred because of disruption and gave an example of the previous project that involved the installation of PEACE submarine cable in the previous year. He added that the proponent does not engage further the public during the project implementation. In response, **Engineer Kibet of TKL,** told the meeting that TKL was not able to compensate because there is no specific list containing the number of people to be compensated and the nature of losses incurred. He gave an example where TKL had received two different lists of people claiming compensation and therefore the issue of direct compensation was not considered.
On health effects of the submarine cable	**Said A Juma, Fisherman** Wanted to know the negative impacts of the project; he asked if research that had been conducted to show the effects of the fibre optic cable on human health fearing that the undersea cable could have health effects on beach users and fishermen. In response, **Engineer Kibet, TKL**, assured the meeting that fibre optic cables are safe and utilize light to transmit data using low energy. He also said the fibre cables are strong enough and not easy to cut.
On stakeholder engagement	**Dominic Mwamburi, Village Elder,** emphasized the importance of cooperation between Telkom Kenya Limited and the locals. He maintained that compensation should be done for loss of livelihoods because of disruption during project implementation. He advised that all the opinions either supporting or against the project should be considered to ensure support and ownership of the project. Moreover, he said that there should be continuous

Main Theme brought up by Stakeholders	Key stakeholders' issues/ comments
	engagement between the proponent and all stakeholders including members of the public.
On community health and safety	**Chairman – Tube Renters,** the chairman informed the meeting that swimmers have encountered injuries due to exposed rocks because of excavations. He said that sometimes the operators must instruct one of them to guide the swimmers to avoid unsafe areas. He asked that safety measures should be put in place during the installation and that Telkom should make sure that there is a good relationship with all the stakeholders.
On the dislodged LION submarine cable	**Engineer Kibet, TKL**, assured the meeting that maintenance had been scheduled to take place in August.
Management of negative impacts	• Continuously engage fishermen throughout the cable installation process. • Ensuring total cable burial (no hanging cables) to avert boat entanglement and ease navigation. • Employ residents in the cable installation and maintenance process. • Muffle generators and use fully serviced machines and equipment. • Erect signage during installation and restore disturbed areas. • Compensate fishermen for lost days. • Avoid routing cable through coral reefs, seagrass and faunal breeding areas. • Conduct public awareness during cable installation to avert conflicts. • Cable ship to constantly broadcast position when working near high marine traffic areas. • Develop and implement waste management. Includes hazardous waste. • Avoid installing cable during both northern and southern humpback whale migration. • Plough should suck all the sediments along the trench area to avoid them being dispatched by the water currents and the

Main Theme brought up by Stakeholders	Key stakeholders' issues/ comments
	waves to the coral heads, the sea grass beds and other critical habitats where they are likely to suffocate them.

All stakeholder comments were noted and were considered in the assessment of the Project at all phases. Where necessary, responses were given by both the ECA team present in the various meetings (refer to Appendix D for detailed minutes of the stakeholder engagement meetings).

Table 6-4 Other ESIA Process Key Stakeholder Engagement Outcomes

No.	Name of Stakeholder	Positive Impacts	Negative Impact s	Suggested mitigation measures
1.	**COMRED**	• Creation of employment opportunities to various people during construction • Improvement of network and telecommunication services.	• Water pollution from ship/boats discharge affects the functioning of marine organisms. • Destruction of corals and habitats through activities such as drilling when installing cables • Noise from equipment may disrupt fish and other marine creatures. • Sedimentation due to drilling when placing cables may cause smothering of some marine plants and coral. • During the laying of the cables, people may be denied access to the area reducing tourism activities. • Threatened species such as turtles might experience stress and move away from the habitat.	• Ensure all workers have Personal Protective Equipment (PPEs). • Disposal of cable materials in accordance with environmental regulations. • Ensure all sensitive areas identified are avoided.
2.	**National Museums of Kenya – Coastal Archaeology**	• The proposed Africa 1 submarine fibre cable system is a notable project that will contribute to the social and economic development. • The project will increase the telecommunication	The project will impact the potential national heritage resources in the project area. These assets may include archeological, historical, artifacts, venerated places with sacred plant species. If such assets lie along the cable system route, they may be destroyed when trenching.	• The terrestrial sector 1.7km between BMH and CLS in Nyali area should be survey by coastal archaeological team prior to trenching. • The team from NMK should also undertake survey to identify any underwater artifact.

No.	Name of Stakeholder	Positive Impacts	Negative Impact s	Suggested mitigation measures
		and internet connectivity and other related services in Kenya. • The project will support attainment of Kenya Vision 2030 and the digital economy sector.		• A heritage impact assessment should be done to address heritage sector concerns. • The proponent should support climate change mitigation and adaptation measures such as planting trees and restoring natural and cultural heritage sites along the shorelines.
3.	**Kenya Wildlife Service (KWS)**	• Communication within and without the country will improve. • Jobs and increased incomes. • MMNPR publicity.	• Destruction of biodiversity e.g., coral reefs, seagrass, etc. • Tourism affected due to noise and poor visibility. • Machine and equipment at the beach can injure users.	• Pay for biodiversity restoration and monitoring by KWS. • Implement CSR project for boat users as compensation for blocking tourism. • Avoid using heavy machines. • Avoid working during peak hours for tourists at MMNPR. • Support KWS install solar at MMNPR offices.
4.	**Kenya Ports Authority (KPA)**	Supports the project	• Interrupted vessel passage. • Floating cable	• Installation schedule, emphasizing the need to coordinate with the KPA Pilot station to ensure uninterrupted vessel passage to and from ports.

No.	Name of Stakeholder	Positive Impacts	Negative Impact s	Suggested mitigation measures
				• Proper burial of the cable to prevent resurfacing or floating, which could interfere with shipping routes.
5.	**NCRA – North Coast Ratepayers & Resident Association.**	The project will enhance technology and network connectivity.	Digging up pavements	• Restore and backfill trenches. • Avoid oil spillage in the ocean. • Hasten the process to prevent more/prolonged emission of CO_2
6.	**Kenya Maritime Authority**	The project will improve communication in the country and promote economic growth in Kenya and the region.	Interference of safety of navigation of other sea users during the project installation stage.	
7.	**Administrator – Nyeli Resident Association**	• The project will improve technological advancement of the country and Africa at large. • Economic growth as result of job creation. • The project will also promote delivery of quality services in the tourism sector.	• Interfere with the marine life. • Environmental degradation • Soil erosion.	• Avoid destruction of marine life by utilizing friendly technology. • Repair/restore any damaged road immediately.
8.	**Coastal development Authority**	• The project will contribute to improved internet connectivity in the country	• It may endanger marine life as result of entanglement.	• Appropriately bury the cable to avoid interfering with aquatic life.

No.	Name of Stakeholder	Positive Impacts	Negative Impact s	Suggested mitigation measures
		thereby leading to improved economy. • Direct employment of the locals. • Increased business opportunities e.g. online business. • Affordable internet. • The project will enhance innovation and creativity. • It will improve access to education and research. • It will improve health access and education e.g., video conferencing.	• Water pollution due to excavation works. • Risk of cable being vandalized by sharks and whales. • Electromagnetic waves may affect the marine animals. • Destruction of marine animals and habitats. • Destruction of fish breeding sites may result to reduced fish yield. • Clearing vegetation on the landing site	• Align the cable route away from critical marine habitats. • Use highly insulated cables to minimize effects of electromagnetic radiations and cable destruction. • Minimize noise. • Minimize dust emissions during trenching on the terrestrial side. • Minimize clearing of vegetation.
9.	**Deputy County Commissioner – Nyali Sub-county**	• The project will link Kenya with other nations. • The cable will improve communication and connectivity and more so ease the burden of doing business.	• The project may interfere with the marine ecosystem. • Possible environmental pollution of both air and water.	• Involve all the stakeholders. • Prevent pollution. • Take care of marine life and avoid generation of high noise which may make marine animals to migrate. • Continuously undertake public participation.

No.	Name of Stakeholder	Positive Impacts	Negative Impact s	Suggested mitigation measures
10.	**Assistant County Commissioner**	• Increased connectivity and improvement of network. • Local employment thus generation of income. • Affordable communication network.	• Environmental degradation. • Water pollution and noise during installation. • Disturbance of economic activities along the beach. • Conflict between the proponent and beach uses/BMU.	• Minimize environmental degradation. • Undertake installation within shortest time possible to minimize disturbance. • Minimize ecosystem disturbance. • Undertake a CSR project in the community.
11.	**Assistant Chief – Maweni Sub-location Location**	• Job creation • Improve communication.	• Disturbance of marine life. • Disturbance of fishing activities during the construction phase. • Environmental pollution. • Carbon emissions.	• Use environmentally friendly technology during installation to minimize environmental pollution. • Adopt recycling of materials to prevent pollution. • Use less emitting equipment.
12.	**Benard Omollo – Chief Maweni Location**	• The project will boost network. • The beach operators will be affected during the installation. • Possibility of environmental degradation.	• Involve the residents and beach operators and avoid disruption of businesses. • Carbon emissions accelerating global warming.	• Prevent and avoid environmental pollution. • Minimize carbon emissions.

No.	Name of Stakeholder	Positive Impacts	Negative Impact s	Suggested mitigation measures
		• The project will create employment opportunities.		
13.	**Thomas Ruwa – Assistant Chief, Ziwa La Ngombe Sub-Location**	• The project will lead to improvement of the network. • The project will lead to creation of employment opportunities. • Disruption of fishing activities.	Possible destruction of submarine cable by natural calamities.	Work continuously with experts to ensure that the project is sustainable.
14.	**Kenya Coast Guard Services**	• Increased connectivity, communication and trade between Kenya, middle east countries and the rest of Asian countries. • The project will also increase ICT job opportunities for the Kenyan youth in line with Kenya Kwanza Government Economic Agenda. • The project will also enhance of Kenya's Blue Economic growth by	• The negative environmental impacts expected include the following (1) The Marine cables may need to be buried under the seabed meaning that there will be need to make trenches on the seabed. The shallow water areas where the marine cable is a marine protected area (Marine reserve) rich in biodiversity. Digging trenches in the area will destroy the environment and may kill some benthic flora and fauna. The marine debris generated during the trench making may affect the turbidity of the water decreasing the visibility of the	• To mitigate against environmental damage and interference with flora and fauna, the project proponent should use highly qualified personnel and experienced in lying the marine cables. During the digging of trenches, the project proponent should make sure that minimum debris are generated so that the water turbidity is not increased. • To mitigate against negative social impacts, the proponent should ensure that all the maritime communities including the fisherfolk are well sensitized on the upcoming project.

No.	Name of Stakeholder	Positive Impacts	Negative Impact s	Suggested mitigation measures
		enhancing network, trade, and commerce with the rest of the world.	water which may interfere with movement of the sea organisms. • The negative social impact will include interference with fishing which is an economic activity especially for small scale fishermen who fish in the reserve area where the cables will be passing through and landing at Nyali especially during the digging of trenches and the laying down of cables. This may have a negative impact as it will interfere on fishers' source of livelihoods, employment and food security. Sometimes this may call for compensation for the loss of fishing days or fishing grounds by infrastructural development projects. • The negative safety impacts may include include the interference of safety of navigation especially in the EEZ and shallow waters if the cables are not well buried or tethered on the seabed. These cables should not be left hanging or suspended in the water. These cables if they are electrified, they can cause harm to	The proponent should set up a grievance address mechanism and a desk in case any of the maritime stakeholders has an issue to raise. If the project may waste many fishing days, the proponent should think of setting a comprehensive compensation scheme for those livelihoods and economic activities are interfered with. • To mitigate against negative safety issues, the proponent should ensure that the marine cable will bury, secured or tethered to the sea bed so that the sea creatures, the swimmers and the fisherfolk are not entangled by these marine cables. The proponent should do a proper signage indicating the route that the cables are passing and be provided to ships and other mariners. • The Kenya Coast Guard Service mandate is to enforce maritime security, safety, and the protection of marine resources. The project proponent should work closely with the Kenya coast Guard service during

No.	Name of Stakeholder	Positive Impacts	Negative Impact s	Suggested mitigation measures
			the fish, swimmers, and the fishing boats and therefore they should be well buried or tethered. • The project can only be affected by the climate change if there will be sea level rise or sea level decrease as this may affect the cost of installation of the marine cables.	the laying of the cables to provide security and safety of the workers. Any maritime emergencies should be reported to the Kenya Coast Guard Service
15.	**Port Reitz Sub-county Hospital**	• Digitalization of medical services • Increased incomes	• Biodiversity destruction. • Social and safety concerns.	• Engage security agencies. • Ensure Project staff are trained in safety and health and emergency response.

6.4.3 Post-ESIA Engagement

The Project is committed to continuous engagement with stakeholders throughout the life of the Project, from the current stages of planning and design, through construction into operation, and eventually to closure and decommissioning.

Plans and activities implemented during the next stages of Project planning and development will therefore feed into and inform on-going stakeholder engagement as the Project moves into these stages, ensuring that two-way dialogue with those affected, both positively and negatively by the proposed Project is maintained.

The aim will be to ensure that the Project remains in contact with all interested parties and cognisant of their concerns, and that these are addressed in an effective and timely manner. At each stage, a detailed schedule of activities and events will be developed and widely disseminated so that people know how to interact with and participate in the Project.

Post-ESIA stakeholder engagement is expected at the following Project stages:

- **Mobilisation phase:** At this stage, information regarding the exact locations of specific Project infrastructure, detailed construction schedule, expected construction team (including employment opportunities) will be shared with the Project stakeholders.
- **Construction phase:** Periodic Project updates as well as any changes in planning will be shared with Project stakeholders.
- **Demobilisation phase:** Notifying the stakeholders the end of the construction activities and close-out of outstanding construction phase related grievances. This is also expected to mark the start of the operation phase.
- **Operations Phase:** Periodic updates to Project stakeholders on the operations issues, share operation information where required or deemed necessary and communicate any changes in operation plans.
- **Decommissioning Phase:** Inform stakeholders when the Project comes to an end as well as future for the Project Site.

7 ANTICIPATED ENVIRONMENTAL & SOCIAL RISKS AND IMPACTS & MITIGATION

7.1 Overview

The predicted impacts to the physical, biological, and socio-economic environment because of the Project are described in this Chapter. This Chapter also details potential mitigation measures to avoid, minimize, reduce, remedy, or compensate for potentially negative impacts, and enhance potential benefits of the Project. Furthermore, this Chapter provides a prediction of the residual impacts that will remain, assuming that the appropriate mitigation measures are implemented.

Whenever possible, the impact assessment laid out in this Chapter follows this sequence:

- Each section begins with the type of impact being assessed;
- Background information relating to the impact is then provided. This includes a description of the baseline environment that will be affected, the Project aspect or activities that will cause the impact and a description of the effected receptors;
- The significance of the impact pre-mitigation is then assessed and rated through use of a rating table;
- Following the pre-mitigation rating tables, a section describing the recommendations and mitigation/management measures are provided; and
- Once the recommended mitigation/management measures are provided, a residual impact (post-mitigation) is rated through use of a less detailed rating table.

7.2 Installation/Construction Related Impacts

7.2.1 Aquatic Habitat Alteration

The habitats in the Project Area are natural and critical, therefore, contain important biodiversity habitats of conservation concern. As earlier indicated, the submarine cable traverses Mombasa Marine Park and Reserve (MMP&R), a home to a colorful variety of marine species including crabs, starfish, stone fish, cucumbers sea urchins, corals, turtles, sea grasses and interesting migratory birds including crab plovers. MMPR is part of the Western Indian Ocean (WIO) region, a hotspot of biodiversity hosting over 2,200 species of fish, five species of marine turtles and more than thirty-five marine mammal species. The region boasts of the longest unfragmented fringing reef in the world, with over 350 species of corals, and a diverse assemblage of coastal forests, mangrove forests and seagrass beds. It is estimated that about 22% of the species found in the WIO region are unique to this region. The ecosystem services provided by this rich marine

environment are estimated at over 25 billion US$ per year and more than 60 million people directly depend on these ecosystems.[10]

Humpback whale migration also occurs in the project area; Northern humpback whale migration normally occurs between July-August; and southern migration that takes place between October/November. These cetaceans may become entangled by these cables unless these cables are well pegged to the seafloor.

Project activities that can alter aquatic habitats are:

- **The pre-laying grapple run (PLGR) –** The grapnel will penetrate the seabed to a depth of up to 0.8 meters. Due to the intrusive nature of this operation some negative impact is unavoidable. The PLGR and cable installation will have some minor physical impact on seabed geology. This impact will be limited to the area where the cable will be installed only and will vary in intensity depending on the installation method (cable burial in a trench or laying on the seabed). Impacts include the generation of:
    - a small amount of turbidity; and
    - through physical contact mortality or injury to marine organisms, particularly plants and other organisms that have low mobility.
- ***Cable laying* –** The laying of cables leads to seabed disturbance and associated impacts of damage, displacement or disturbance of flora and fauna, increased turbidity, release of contaminants, and alteration of sediments. These effects are mainly restricted to the installation, repair works and/or removal phase and are generally temporary. In addition, their spatial extent is limited to the cable corridor (in the order of 5m width if the cable has been ploughed into the seabed). Some mobile benthos can avoid disturbance and though sessile species (bivalves, tubeworms etc.) will be impacted.
    - The cable installation process will only result in short term direct impacts to the subtidal bottom habitats and assemblage present on intertidal area at the beach landing point. The short-term loss of benthic organisms directly along the cable routes is not considerate to represent an unacceptable ecological impact. The rapid natural reinstatement of the seabed will result in the area being available or rapid recolonization and hence, no permanent impacts are anticipated from cable project. Raised turbidity and suspended sediment levels can have several adverse effects on marine organisms, particularly in areas that would normally have clear waters. Where suspended sediment concentrations are present for prolonged

[10] IUCN Website: https://www.iucn.org/regions/eastern-and-southern-africa/our-work/coastal-and-ocean-resilience Retrieved on 5/3/2021.

periods, or are particularly high and widespread, visibility can be reduced affecting the ability of some fish to feed.

- Raised turbidity can also reduce light penetration in the water column and reduce photosynthesis/ productivity in sea grasses and affecting the coral reef presents in the area (2 fringing reefs). However, the duration, spatial extent and level of suspended sediment associated with route clearance and cable installation in this project are unlikely to cause such problems. Nevertheless, turbidity levels should be minimized during cable lay operations by minimizing the duration and extent of physical seabed disturbance.

The main sensitive receptors are intertidal vegetation and marine life, including marine mammals, and life support systems along the cable route.

Based on the analysis provided above, the impacts on aquatic habitats will be a "**Major Negative Impact**" pre-mitigation as summarized in Table 7-1.

Table 7-1 Impact on Aquatic Habitat Alteration (Pre-mitigation)

Type of impact		
Direct Negative Impact		
Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	The impact on aquatic habitats is expected to be restricted to the construction/installation area footprint.
Duration	Short-term	Adverse effects will cease shortly after construction/installation phase.
Scale	Major	This impact will be manifested within the Project footprint (approx. 3,000km*5m cable corridor = 1,500 hectares).
Frequency	Continuous	Impact will be manifested throughout the construction phase.
Magnitude		
High		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Significant Rating Before Mitigation		

Major Negative

Recommended measures to prevent and control impacts to marine habitats include:

- Locating and siting cable routes, and shore access, to avoid critical marine habitats, such as coral reefs and breeding grounds;
- Burying submarine cables when traversing sensitive intertidal habitat;
- Monitoring cable laying path for presence of marine mammals;
- Avoiding laying of submarine cable during fish and marine mammals breeding periods, calving periods, and spawning seasons;
- Marine vessels will be required to adhere to IMO regulations on bilge and ballast water discharge to avoid tensional introduction of non-native species to the marine environment;
- Working with an appropriate environmental organization to develop a notification process;
- The Project will ensure that measures are adopted to avoid incursion into areas adjacent to the work site or any secondary effects from pollution, sedimentation, or accidental spills;
- Consider an appropriate means by which exposure to Electromagnetic Fields can be minimized or reduced to reduce its effects on marine wildlife and ecosystem; and
- Select suitable burial techniques to minimise disturbance effects of benthic species and habitats and the release of contaminants.

Based on the implementation of the mitigation measures, the significance of the impacts on biodiversity will be a **"Moderate Negative"** post-mitigation as per Table 7-2.

Table 7-2 Impact on Aquatic Habitat Alteration (Post-mitigation)

Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	Negative impact on aquatic habitats will be restricted to the construction footprint.
Duration	Short-term	Negative impact will cease immediately after construction phase.
Scale	Moderate	The Project footprint remains huge (approx. 3,000km*5m cable corridor = 1,500 hectares).
Frequency	Continuous	Aquatic habitats will be altered throughout the construction / installation phase.

Magnitude
Medium
Significant Rating After Mitigation
Moderate Negative

7.2.2 Hazardous Materials and Waste

Marine litter is becoming a significant contributor to pollution in the world oceans and WIO, is not exempt. Over 80% of marine pollution that constitute marine litter and microplastics is from land-based sources, largely associated with the increasing use of synthetic materials, industrialization, and urbanization of coastal areas, where disposal and waste management practices are inadequate. Many types of marine litter particularly plastics persist for hundreds of years and are the most damaging to the marine environment. They have a wide range of adverse impacts to the ecological, socio- economic, recreational, and aesthetic values of coastal and marine ecosystems.[11]

Telecommunications processes do not normally require the use of significant amounts of hazardous materials. However, the operation of certain types of switching and transmitting equipment may require the use backup power systems consisting of a combination of batteries (typically lead-acid batteries) and diesel-fueled backup generators for electricity. Operations and maintenance activities may also result in the generation of electronic wastes (e.g. nickel-cadmium batteries and printed circuit boards from computer and other electronic equipment as well as backup power batteries). The operation of backup generators and service vehicles may also result in the generation of used tires, and waste oils and used filters. Transformer equipment may potentially contain Polychlorinated Biphenyls (PCBs) while cooling equipment may contain refrigerants (potential Ozone Depleting Substances [ODSs]).

Hazardous wastes can clearly have a toxic effect on organisms and can in some circumstances lead to bioaccumulation and ultimately lethal or sub-lethal affects if badly managed. In addition, some non-hazardous waste types can be equally harmful, particularly non-degradable plastics that can remain at sea for many years posing an entanglement risk to sea birds and marine life.

Annex V of MARPOL[12] prohibits the disposal to sea of any plastics whilst restricting the discharge of other non-hazardous waste in coastal waters and in designated "Special Areas".

[11] Nairobi Convention Website: https://nairobiconvention.org/Meeting%20Documents/December%202018/WIO-RAPMaLi_Full%20Revised%20Draft_29102018_Final.pdf Retrieved on 5/3/2021

[12] See http://www.mar.ist.utl.pt/mventura/Projecto-Navios-I/IMO-Conventions%20%28copies%29/MARPOL.pdf

Effluents, on the other hand, can include sewage water, grey waters (discharge from showers and sinks) and potentially contaminated drainage from the ship deck. Sewage and grey waters can have high bacteria levels, surfactants, and a high Biological Oxygen Demand (BOD), all which can result in potential human health issues and harm to marine organisms, particularly in sensitive areas or locations with poor mixing and dilution potential.

MARPOL, Annex 1 also addresses discharge of oily waters, for example, bilge waters. For ships of 400 gross tonnage and above, for control of oil from machinery spaces, wastewater must have an oil concentration below 15ppm without any prior dilution. More specifically:

- Within special areas – discharges are prohibited, except when the ship is proceeding enroute, and the oil content of the effluent without dilution does not exceed 15 ppm, and the ship has in operation oil filtering equipment with automatic 15 ppm stopping device; and
- Outside special areas - discharges are prohibited, except when the ship is proceeding enroute, the oil content of the processed bilge water (from machinery spaces) effluent is less than 15 ppm, and the ship has in operation an oil discharge monitoring and control systems, oily-water separating or filtering equipment.

The sensitive receptors to poor hazardous materials and waste management will be other users of the Indian Ocean waters, and marine life therein.

Based on the analysis provided above, the impact on hazardous materials and waste will be a "**Moderate Negative Impact**" pre-mitigation as shown in Table 7-3.

Table 7-3 Impact on Hazardous Materials and Waste (Pre-mitigation)

Type of impact		
Direct Negative Impact		
Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	The impacts are expected to be restricted to the installation area footprint.
Duration	Medium-term	If appropriate waste management measures are not put in place, the impacts of poor waste and effluent management will continue to be manifested even after the construction phase.

Scale	Medium	This impact will be manifested throughout the Project footprint (approximately 1,500 hectares).
Frequency	Daily	Wastes will be generated daily throughout the construction and operation phases.

Magnitude

Medium

Sensitivity/Vulnerability/Importance of the Resource/Receptor

Medium

Any poor waste management practices will be of a major concern in the Project Area.

Significant Rating Before Mitigation

Moderate Negative

Recommended measures to manage, prevent and control hazardous materials and waste impact include:

- Hazardous waste should be stored on board the vessel until it can be disposed at a suitably equipped port and through a NEMA licensed waste handler, respecting the requirements of the Basel Convention on Transboundary Shipment of Hazardous Wastes;
- Waste management is required to avoid the risk of harm to the environment and human health;
- When mitigated by compliance with MARPOL requirements and the impact of aqueous discharges (excluding ballast waters) in vessel operations is assessed as being of low significance;
- When mitigated by compliance with MARPOL requirements, the impact of solid waste in vessel operations is assessed as being of low significance;
- Implementing procedures for the management of lead acid batteries, including temporary storage, transport and final recycling by a licensed facility;
- Ensuring that new support equipment does not contain PCBs or ODSs. PCBs from old equipment should be managed as a hazardous waste; and
- Purchasing electronic equipment that meets international phase out requirements for hazardous materials contents and implementing procedures for the management of waste.

With implementation of the mitigation measures, the significance of the impact on hazardous materials and waste will be a "Minor Negative" post-mitigation as per Table 7-4.

Table 7-4 Impact on Hazardous Materials and Waste (Post-mitigation)

Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	The impacts are expected to be restricted to the construction vessels and Project footprint.
Duration	Short-term	With application of appropriate hazardous materials and waste management measures, the impact will cease to manifest shortly after the construction phase.
Scale	Low	The scale of this impact refers to the amount of waste that is likely to be generated. With the application of appropriate waste management measure, less waste will be generated.
Frequency	Daily	Wastes will be generated daily throughout the construction phase.
Magnitude		
Small		
Significant Rating After Mitigation		
Minor Negative		

7.2.3 Impact on Employment, Procurement, and the Economy

TKL is an operational telecommunication company in Kenya with employees in its various ranks exemplifying availability of skilled labor within the company. The Project will provide a myriad of additional employment opportunities during the construction/installation phase.

TKL also requires their contractors to employ at least 70% of the labor force within the local and surrounding communities.

Additionally, materials for construction/installation can be sourced from within Kenya, particularly, in Mombasa and Nairobi cities, further benefiting the local economy.

The project will have a positive impact on the employment. The enhancement of communications and global connectivity will directly affect local businesses, education, and employment opportunities in Kenya, and is likely to have an indirect effect of attracting more tourism to current tourist centers because of the ease of communication. A robust and reliable international

telecommunications link will have significant benefits for Kenyan residents, regardless of gender or ethnic community, in the following ways:

- Providing better quality services at reduced operational costs and user charges;
- Providing more reliable international communications;
- Providing competitive prices for national and international connectivity;
- Stimulating investment and economic growth;
- Increasing employment opportunities; and
- Easing access to education and broad knowledge such as medicine

These impacts support Kenya government, UN, and World Bank goals of reducing poverty, increasing economic development and opportunity for all, and enabling social changes through universal internet access.

The inhabitants of communities in Mombasa County, especially the neighboring Nyali area will be able to benefit from direct and indirect employment opportunities and the supply of the required goods and services, especially those experienced in the installation of submarine cables. Again, internet users all over Kenya.

Table 7-5 Impact on Employment, Procurement, and the Economy

Type of Impact
Positive Impact
Direct and indirect employment opportunities and the procurement of construction materials, goods and services, and combined multiplier effect of this economic growth will result in increased incomes for successful candidates and their local communities; promoting some degree of an increase in standards of living.

To enhance this positive impact, the following management measures will be implemented:

- The contractor should prioritize the recruitment of workers (unskilled, semi-skilled) from the local communities in Mombasa County, where available.
- The Contractor should notify identified representatives of the County Government and Local Administration (i.e., the Area Chief) of the specific jobs and the skills required for the Project, during the recruitment process.
- Advertisements on the employment and procurement opportunities during the construction phase should be placed at the Chief's Office notice board. If the position cannot be filled from within the Project Area, it will be advertised further country-wide then nationally.

- No recruitment is to take place on the Project site. This is particularly important with respect to casuals.
- The Contractor should aim at procuring locally available materials where feasible and use local suppliers where appropriate.

7.2.4 Emissions to Air

The Project area is located within Kenya territorial waters where the only source of air pollution emanates from ships movements burning fossils.

Cable laying will require use of dedicated cable lay vessels resulting in a few general environmental impacts and risks. During normal operational activities vessels emit exhaust gases. Assuming that the vessels are well maintained, emissions of pollutants will be minimal and within allowable limits.

The main sensitive receptors are the beach users and other ocean users. There are no affected households (residential areas) at the Project area given its location in Kenya territorial waters.

Based on the analysis provided above, impacts on emissions to air during the construction phase will be **"Minor Negative Impact"** pre-mitigation as shown in Table 7-6.

Table 7-6 Emissions to Air Impact (Pre-mitigation)

Type of impact		
Direct Negative Impact		
Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	Emissions to air will be localized within the project area (submarine cable route).
Duration	Short-term	Effects will cease shortly after construction
Scale	Small	No significant impacts are predicted to occur because of exhaust emissions.
Frequency	Continuous	This impact will be manifested throughout the construction phase
Magnitude		
Small		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		

Low
Significant Rating Before Mitigation
Minor Negative

To minimize air emissions the Project's cable laying vessels will operate in line with the requirements specified under MARPOL 73/78 Annex VI, Prevention of air pollution from ships:

- The Project should require that construction contractors operate only well maintained engines;
- Construction vehicles, 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;
- Construction traffic speed control measures will be enforced on unpaved roads (reduced dust generation levels are often consistent with reduced traffic speeds); and
- Operation in line with the requirements specified under MARPOL 73/78 Annex VI.

With implementation of the mitigation measures, the significance of the emissions to air impact will be **"Negligible Negative Impact"** post mitigation per the assessment in Table 7-7.

Table 7-7 Emissions to Air Impact (Post-mitigation)

Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	Emissions to air will be localized within the construction site
Duration	Short-term	Effects will cease shortly after construction phase
Scale	Small	No significant impacts are predicted.
Frequency	Continuous	This impact will be manifested throughout the construction phase
Magnitude		
Negligible		
Significant Rating After Mitigation		
Negligible		

7.2.5 Impact on Noise Environment and Vibration

Anthropogenic sound is created in the ocean both purposefully and unintentionally. The result is noise pollution that is high-intensity and acute, as well as lower-level and chronic. The locations of noise pollution are along well-traveled paths in the sea and particularly encompass marine waters. Increased use of the sea for commercial shipping, geophysical exploration, and advanced warfare has resulted in a higher level of noise pollution over the past few decades. Informed estimates suggest that noise levels are at least 10 times higher today than they were a few decades ago.

Sound is an extremely efficient way to propagate energy through the ocean, and marine mammals have evolved to exploit its potential. Many marine mammals use sound as a primary means for underwater communication and sensing. The sound environment of the ocean is an important aspect of marine mammal habitat, and we can expect marine mammals to choose their locations and modify their behavior based, in part, on natural and anthropogenic sounds.

Human presence at sea is normally on the surface, and the sounds that we produce within the water are rarely given much consideration. The air-sea interface creates a substantial sound barrier. Sounds waves in the water are reduced in intensity by more than a factor of a thousand when crossing the air-sea boundary. This means that we are effectively insulated from the noise produced by rotating propellers that drive our ships or by high-intensity sonars used to measure the depth or probe the interior of the sea. The conflict between human and marine mammal use of the sea is fundamentally a consequence of the fact that we do not inhabit the same sound environment. Marine mammals live with their ears in the water, and we live, even at sea, with our ears in the air.[13]

The main sensitive receptors to this impact are marine life both fauna and flora, and other users of WIO.

Based on the analysis provided above, the impacts on noise environment and vibration during construction phase will be “Minor Negative Impact” pre-mitigation as per

Table 7-8.

Table 7-8 Impact on Noise Environment and Vibration

Type of impact
Direct Negative Impact
Rating of Impact

[13] Marine Mammal Commission Website: https://www.mmc.gov/wp-content/uploads/hildebrand.pdf Retrieved on 6/3/2021.

Characteristic	Designation	Justification of Choice
Extent	Local	The noise and vibrations will be localized and limited to the project area.
Duration	Short-term	Effects will cease after construction is completed
Scale	Small	The noise and vibrations generated will not exceed the maximum levels permitted in the National Environmental Management and Coordination Act (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009
Frequency	Continuous	Noise and vibrations will be generated throughout the construction phase (daytime); however, no noise will be generated at night since construction activities are expected to be limited to daytime activities only.

Magnitude
Medium
Sensitivity/Vulnerability/Importance of the Resource/Receptor
Low
Significant Rating Before Mitigation
Minor Negative Impact

Recommended mitigation measures:

- The project will require the contractor to use equipment and vehicles that are in good working order, well maintained, and that have all noise suppression equipment intact and in working order; and
- Contractor will be required to implement best driving practices when approaching and leaving the site to minimize noise emissions.

7.2.6 Occupational Health and Safety (OHS) – Optical Fiber Safety

Workers involved in fiber optic cable installation or repair may be at risk of permanent eye damage due to exposure to laser light during cable connection and inspection activities.[14] Workers may also be exposed to minute or microscopic glass fiber shards that can penetrate

[14] When extending a cable or mounting a cable connector, a microscope is typically attached to the end of the fiber optic cable allowing the worker to inspect the cable end and prepare the thin glass fibers for extension or connection assembly.

human tissue through skin or eyes, or by ingestion or inhalation. Optical fiber installation activities may also pose a risk of fire due to the presence of flammable materials in high-powered laser installation areas.

Based on the analysis provided above, Optical fiber safety impact during the construction phase will be **"Moderate Negative Impact"** pre-mitigation as shown in Table 7-9.

Table 7-9 Optical Fiber Safety Impact (Pre-mitigation)

Type of impact		
Direct Negative Impact		
Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	The impact is only relevant for the workforce (including direct, third party and supply chain workers) all of who may come from Kenya or globally).
Duration	Short-term	Generally, the implications of inadequate OHS will cease to manifest after the construction phase; however, some of the effects such as major injuries will continue to affect the concerned individuals.
Scale	Moderate	Some of the emanating impacts such as major injuries can be severe including loss of life which can significantly affect households and communities ability to maintain their quality of life and livelihoods.
Frequency	Intermittent	Impact is likely to recur / occur intermittently throughout the construction phase.
Magnitude		
Medium		
Sensitivity/Vulnerability/Importance of the Resource/Receptor		
Medium		
Receptors to this impact will include those contracted or subcontracted to work on the Project. The Project workers will be highly sensitive to any inadequate labour and working conditions if this happens at the Project.		
Significant Rating Before Mitigation		

Moderate Negative

Recommendations to prevent, minimize, and control injuries related to fiber optic cables installation and maintenance include:

- Worker training on specific hazards associated with laser lights, including the various classes of low and high power laser lights, and fiber management;
- Preparation and implementation of laser light safety and fiber management procedures which include:
  - Switching off laser lights prior to work initiation, when feasible;
  - Use of laser safety glasses during live optical fiber systems installation;
  - Prohibition of intentionally looking into the laser of fiber end or pointing it at another person;
  - Restricting access to the work area, placing warning signs and labeling of areas with potential for exposure to laser radiation, and providing adequate background lighting to account for loss of visibility with the use of protective eyewear;
  - Inspecting the work area for the presence of flammable materials prior to the installation of high- powered laser lights;
- Implementation of a medical surveillance program with initial and periodic eye examinations; and
- Avoiding exposure to fibers through use of protective clothing and separation of work and eating areas.

With implementation of the mitigation measures, the significance of the optical fiber safety impact will be **"Minor Negative Impact"** post-mitigation per the assessment in

Table 7-10.

Table 7-10 Optical Fiber Safety Impact (Post-mitigation)

Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	The impact is only relevant for the workforce (including direct, third party and supply chain workers) all of who may come from Kenya or globally).
Duration	Long-term	The implications of poor health and safety practices can be severe including loss of life which can significantly affect

		households and communities' ability to maintain their quality of life and livelihoods.
Scale	Very small	With the implementation of the management measures, the number of Project workers exposed to optical fiber safety risks will be very small.
Frequency	Rare	With the implementation of the management measures, exposure of Project workers to optical fiber safety risks will be rare.
Magnitude		
Small		
Significant Rating After Mitigation		
Minor Negative		

7.2.7 Impact on Community Health and Safety (CHS)

There is potential for impacts on CHS to occur because of accidents and unplanned events that may occur during the Project installation activities. The project activities have the potential to results in a direct and indirect negative impact on human health and safety within the development area and near surrounds.

At particular risk are artisanal fishermen and other vessels (divers, jet ski...) that may move at night-time or in reduced visibility conditions when the Project activities are taking place. Collision of Project vessels with fishing boat and nets or other vessels could result in damage of vessels and equipment, injury, or loss of life.

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.

Based on the analysis provided above, CHS impacts will be a **"Minor Negative Impact"** pre-mitigation as per the assessment in Table 7-11.

Table 7-11 CHS Impacts (Pre-mitigation)

Type of impact
Direct Negative
Rating of Impact

Characteristic	Designation	Justification of Choice
Extent	Local	The impact is limited to the Project Area
Duration	Short-term	Some impacts will last only a short while (minor injury)
Scale	Small	The impact is limited to the Project Area
Frequency	Intermittent	Impact is likely to recur/occur intermittently throughout the construction phase.

Magnitude

Small

Sensitivity/Vulnerability/Importance of the Resource/Receptor

Medium

Significant Rating Before Mitigation

Minor Negative

Recommendations to prevent, minimize, and control CHS impacts related to fiber optic cables installation and maintenance include:

- All active construction areas will be marked with high-visibility tape to reduce the risk accidents;
- All open trenches and excavated areas will be backfilled as soon as possible after the construction has been completed;
- While a ship is laying its maneuverability is restricted, as such it will display the day signals and lights of a hampered vessel to avoid collision with other vessels at sea;
- 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;
- Works have to take place outside of periods of festival periods as much as possible;
- Cable survey and installation could cause temporary disruption to the flow of recreational sea use. However, these operations are limited to short periods of time and other activities can generally avoid the work area without significant diversion; and
- The project will notify the ports authority and other activities, so that vessels in the area would be warned of the ongoing operations through a "Notice to recreational sea users" report transmitted daily.

Based on the implementation of the mitigation measures, the significance of the residual impact on CHS will be a **"Negligible Negative Impact"** post-mitigation.

7.2.8 Partial Loss of Productive Assets

Fishing activity near Mombasa landfall is intense, especially near the water breaks along the south-eastern margin of the reef. During the marine survey, fishing traps, marker buoys and fishing boats with artisanal fishing gears were observed. Again, there some commercial and recreational activities (e.g., boating, diving, swimming, etc.) being undertaken along the route of the cable.

Excavation and backfilling operations required to install the submarine and underground optical fiber cable may: (i) Impact partially benthic and aquatic life or even destroy their breeding areas; (ii) Temporarily impede access to fishing areas, commercial establishments, and residential buildings, and undertaking of touristic activities such as diving, marine park visits, boating, etc. Turbidity may also force the fish and other marine animals to migrate away from the project area.

The receptors for partial loss of productive assets will be the fishermen, tourists, and owners of the recreational businesses.

Based on the analysis provided above, traffic impacts during the construction phase will be **"Moderate Negative"** pre-mitigation as per the assessment in Table 7-12.

Table 7-12 Partial Loss of Productive Assets (Pre-mitigation)

Type of impact		
Direct Negative		
Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	Partial loss of productive assets will be limited to the Project Area and its environs. However, if there is no fish catch then fish traders will be unable to earn their living and owners of recreational business, their employees will also struggle to feed their families.
Duration	Short-term	This impact will cease to be manifested after the completion of cable installation and settling of the waters.

Scale	Medium	Fishermen, fish traders, and commercial and recreational business owners, their employees and their dependents will be affected.
Frequency	Continuous	This impact will be throughout the cable installation phase.

Magnitude

Medium

Sensitivity/Vulnerability/Importance of the Resource/Receptor

Medium

Significant Rating Before Mitigation

Moderate Negative

Partial loss of productive assets; and temporary limitation of access to fishing areas, commercial establishments, and to residential properties will be mitigated as follows:

- For the partial impact on fishing areas, implementation of compensation measures for affected parties should be considered;
- For the temporary limitation of access to commercial establishments and residential buildings, careful planning of construction activities to minimize duration of impact; and
- Caution during cable installation.

With implementation of proposed mitigation measures, significance of partial loss of productive assets impact will be a **"Minor Negative"** post mitigation as per assessment in Table 7-13.

Table 7-13 Partial Loss of Productive Assets (Post-mitigation)

Rating of Impact

Characteristic	Designation	Justification of Choice
Extent	Local	Partial loss of productive assets impact will be limited to the Project Area, its environs, and sensitive receptors therein;
Duration	Short-term	This impact will cease to be manifested after the completion of cable installation phase.
Scale	Small	With the implementation of the mitigation measures, the sensitive receptors will be able to cope with temporary loss of productive assets.

Frequency	Intermittent	Among cases not involved in original negotiations.

Magnitude

Small

Significant Rating After Mitigation

Minor Negative

7.2.9 Impact on Disease Transmission

Three most prevalent communicable diseases in Mombasa County are: HIV/AIDs at 4.1% of the population; TB at 700/100,000; and Malaria at 8%. There is an increase in non- communicable diseases (NCDs) such as hypertension and cervical cancer, drug, and substance abuse. Although no comprehensive data exists; Cancer and cardiovascular diseases are emerging as the leading causes of mortality and morbidity. This has resulted in a big disease burden in the County. The facility based Maternal mortality rate as of 2017 stood at 195/100,000 live births, under-five mortality 32.3/1,000 and Infant mortality rate 57/1,000; all of them below the national average. Drug and substance abuse is a high burden in the county, with three functional drug rehabilitative centers in the County serving over 600 clients.[15]

Construction of the Project may lead to an increase in communicable and sexually transmitted diseases including HIV/AIDS mainly because of interactions between Project workers as well as those between Project workers and the local community members.

The receptors of increased disease transmission will be the neighboring community at the BMH as well as Project workers.

Based on the analysis provided above, impacts on disease transmission during the construction phase will be **"Moderate Negative"** pre-mitigation as per the assessment in Table 7-14.

Table 7-14 Impact on Disease Transmission (Pre-mitigation)

Type of impact		
Direct Negative		
Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**

15 County Government of Mombasa (2018): Second Health Strategic and Investment Plan (CHSIP II).

Extent	Local	It is anticipated that the potential impacts of increased disease transmission will have impacts will be limited to the Project Area.
Duration	Long-term	The impacts identified are expected to be linked to the construction and operation period and therefore long-term.
Scale	Small	Any increase in disease transmission will result in negative impacts to the health system.
Frequency	Likely	The incidence of communicable disease is likely to recur in the absence of mitigation and monitoring measures.

Magnitude
Medium
Sensitivity/Vulnerability/Importance of the Resource/Receptor
Medium
Significant Rating Before Mitigation
Moderate Negative

- Workers should receive awareness training as part of their induction and then at least every 6 months on potential high risk communicable and vector borne diseases, symptoms, preventative measures, and transmission routes as well as treatment options. This will be particularly important for diseases with which non-local workers are unfamiliar and in case of any emerging disease outbreaks.
- In the event of a new disease, increased transmission or outbreak compared to the baseline, the Contractor should interact with local health care facilities and workers to ensure there is an appropriate response in place to make workers aware and to ensure proper precautionary measures are implemented.
- Given the expected small number of Project workers during the construction phase, provision of accommodation by the Proponent will be voided. As most construction workers will be sourced from the local community, it is envisaged that workers will commute to work and back. Any workers not from the local area, will be expected to source their own accommodation.
- The following will be implemented at a minimum to minimize disease transmission:
    - Ensuring workers wear masks, sanitize, and observe social distance.

- Providing workers with appropriate sanitary facilities, which are appropriately designed to prevent contamination.
- Developing a robust waste handling system to avoid the creation of new vector breeding grounds or attracting rodents to the area.
- Implementing measures to reduce the presence of stagnant water onsite through environmental controls and source reduction to avoid the creation of new breeding grounds.
- Ensuring appropriate food preparation and monitoring measures are in place.

- The workforce will be provided with access to selected treatment at health facilities at or near the Project Site as deemed necessary for this Project. The requirements for these health facilities should be based on a risk assessment considering access to existing health facilities and travel time to facilities that offer international standards of care. Access to health care should include direct employees, and sub-contractors working on site.
- Pre-employment screening protocols will be put in place within the framework of equal opportunities and non-discrimination. This should include pre-employment medicals and follow up medicals as appropriate. The screening protocols should consider heath conditions related to the nature of the work undertaken, employee residential details and legal requirements. Workers should not be denied employment based on the outcomes of the screening but should be provided treatment or alternative roles as appropriate.
- The Project should prepare and implement a communicable disease management plan during the construction phase. This plan should be explained clearly to the workforce.
- No recruitment is permitted on the construction site. This will serve to prevent in migration of work seekers from outside the local area.
- Conduct awareness campaigns on HIV/AIDS and Covid-19 among the workers and the locals. This can be undertaken through the various NGOs and government agencies in the County.

Based on the implementation of the mitigation measures, the significance of the impact on disease transmission will be a **"Minor Negative"** post mitigation as per the assessment in Table 7-15.

Table 7-15 Impact on Disease Transmission (Post-mitigation)

Rating of Impact		
Characteristic	**Designation**	**Justification of Choice**
Extent	Local	This impact will be limited to the Project Area.
Duration	Short-term	With the implementation of the mitigation measures, community and worker exposure to diseases attributed to the

		Project will be avoided or effectively controlled within a short period of time.
Scale	Small	With the implementation of the mitigation measures, the increase in disease prevalence attributable to the Project will be avoided.
Frequency	Likely	The incidence of communicable diseases and other diseases attributable to the Project will be avoided or only occur rarely.

Magnitude
Small
Significant Rating After Mitigation
Minor Negative

7.2.10 Navigation Safety

The route that will be followed by the marine cable also falls along a major sea route for ships calling in and out the Kenya ports from India and middle East regions. There is therefore likelihood for interference on the safety of navigation along this route especially in the deeper waters of Kenya EEZ during the cable installation. Again, the area adjacent to the Mombasa port entry and Nyali, acts as a security/ship waiting area for ships before they are cleared to enter the port of Mombasa.

The cable installation period may temporarily interfere with ships waiting to be cleared to enter Mombasa port and even those leaving Mombasa port for international voyage.

The proponent/contractor should work closely with the Kenya Maritime Authority and in-charge of marine traffic safety of navigation and the Kenya Ports Authority in-charge for clearance for ships calling or leaving the port of Mombasa.

7.2.11 Piracy

Piracy risk is categorized as High in the project area. The whole section is located within best Management Practices (BMP) High Risk Area (HRA), Combined Maritime Force CTF150 (High Risk Area) and United Kingdom Maritime Trade Operations (UKMTO) Voluntary Reporting Area (VRA). An attempted boarding and robbery in Mombasa Port was recorded in 2018.

- Cable installation vessel is advised to carry armed guards, hardened against pirate attack, and maintain anti-piracy watches while transiting areas of high risk; and

- The vessels should also report all piratical and armed robbery incidents including suspicious movements to the International Maritime Bureau.

  The International Maritime Bureau operates a Piracy Reporting Centre, which is located at the address given below:

  ICC International Maritime Bureau (Asia Regional Office) PO Box 12559, 50782 Kuala Lumpur, Malaysia
  Tel: + 60 3 2078 5763
  Fax: + 60 3 2078 5769

  Telex MA34199 IMBPCI
  E-mail: imbkl@icc-ccs.org
  24 Hours Anti-Piracy HELPLINE Tel: + 60 3 2031 0014 Web site:
  http://www.icc-ccs.org/imb/overview.php

  IMB's Kuala Lumpur based Piracy Reporting Centre (PRC) is the only center of its kind in the world. It remains the only agency providing round the clock reporting of incidents worldwide.

7.2.12 Conflicts with the local community

Projects of such magnitude usually attract public uproar especially from the local community if they are not involved in its implementation. Conflicts usually arise due to inadequate consultations with the local community, importation of unskilled labourers, loss of access to fishing areas and non-provision of equal opportunities to women.

- Consultation with the host community and relevant stakeholders on the mitigation measures proposed for the negative impacts.
- Offer women equal employment opportunities as men.
- Utilize area Chiefs and Ward administrators in the recruitment of local unskilled labour.

7.2.13 Internet User Safety

During stakeholder engagement and consultation, a concern was raised regarding the safety of users (fraud and cyber bullying). It was noted that the proponent will have little or no influence over the safe use of the cable by their clients.

To assure internet security, to the extent feasible, TKL should partner with Communication Authority (CA) to promote the safe use of internet through such methods as customer information campaigns which may include distribution of information at the time of customer service sign-up or by mail with billing information, or through public advertising campaigns.

7.3 Operations Related Impacts

During operation it is expected that the 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.

7.3.1 Electromagnetic fields

Electromagnetic fields are generated by operational transmission cables. Electric fields increase in strength as voltage increases.

In addition, induced electric fields are generated by the interaction between the magnetic field around a submarine cable and the ambient saltwater.

Magnetic fields are generated by the flow of current and increase in strength as current increases. The strength may reach the multiple of the natural terrestrial magnetic field. In general, HVDC cables produce stronger electromagnetic fields than AC cables.

The World Health Organization has considered the effects on EMF on marine life. It concludes that although all organisms are exposed to the geomagnetic field, marine animals are also exposed to natural electric fields caused by sea currents moving through the geomagnetic field. Electrosensitive fish, such as sharks and rays in oceans, can orient themselves in response to very low electric fields by means of electroreceptive organs.

It acknowledges that some investigators have suggested that human-made Electromagnetic fields from undersea power cables could interfere with the prey sensing or navigational abilities of these animals in the immediate vicinity of the sea cables. However, none of the studies performed, to assess the impact of undersea cables on migratory fish or pelagos and all the relatively immobile fauna inhabiting the sea floor (benthos), have found any substantial behavioural or biological impact.

The potential impact to marine life from electromagnetic fields is considered low.

7.3.2 Exposed cables

Cables can become exposed on beaches and in other areas prone to erosion. In addition to the unsightly nature of an exposed cable at low tide, it represents a safety risk to beach users and substantially increases the risk of cable failure.

For beach crossings the cable is typically installed in flexible steel pipe with an outside diameter in the order of 20 cm and buried in a trench 2m deep dug previously by equipment such as a backhoe. In the unlikely event of severe erosion resulting in the pipe becoming exposed it will be reburied.

The cable impact during operations is considered minimal and therefore the impact of exposed cables is assessed to be low.

7.4 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.

7.5 Summary of Impacts and Residual Impacts

7.5.1 Summary of Installation/Construction Impacts and Residual Impacts

Table 7-16 Summary of Construction/Installation Impacts and Residual Impacts

Impact	Significance (Pre-mitigation)	Residual Impact
Aquatic habitat alteration	Major negative	Moderate negative
Hazardous materials and waste	Moderate negative	Minor negative
Impacts on employment, procurement, and economy	Positive	Positive
Emissions to air	Minor negative	Negligible
Impact on noise environment and vibration	Minor negative	Negligible
Occupation health and safety	Moderate negative	Minor negative
Impact on community health and safety	Minor negative	Negligible
Partial loss to productive assets	Moderate negative	Minor negative
Impacts on disease transmission	Moderate negative	Minor negative
Navigation safety	Minor negative	Negligible
Piracy	Minor negative	Negligible
Conflicts with local community	Negligible	

Impact	Significance (Pre-mitigation)	Residual Impact
Internet user safety	Negligible	

7.5.2 Summary of Operation Impacts

Table 7-17 Summary of Operation Impacts

Impact	Significance (Pre-mitigation)
Electromagnetic fields	Minor Negative
Exposed cables	Minor Negative

8 CLIMATE RISK VULNERABILITY ASSESSMENT (CRVA)

8.1 Introduction

Climate change affects everybody, and this includes submarine cables and related infrastructure. This chapter details the climate profile of the Project area. Specifically, it looks at the impact climate stressors on project and beyond. A climate stressor is a climate factor that can affect the functioning of a system. For example, rising temperatures and greater rainfall variability may affect agricultural productivity, with implications for food security. Climate stressors can also limit the potential success of development interventions.

8.2 Kenya's Projected Weather and Climate Changes

Kenya has a complex climate that varies significantly between its coastal, interior, and highland regions and from season to season, year to year, and decade to decade. This climatic variability is influenced by naturally occurring factors such as movement of the Intertropical Convergence Zone (ICZ) and the El Niño Southern Oscillation (ENSO). In recent decades, observed mean annual temperatures have increased by 1.0°C since 1960, or an average rate of 0.21°C per decade.[16] Changes in rainfall patterns have also been noticed since the 1960s. Greater rainfall has been observed during the short rains of October to December[17], and the long rains of March to April have become increasingly unreliable in locations such as Eastern Province[18]. However, no statistically significant national trends toward wetter or drier conditions have been found.[19]

Extreme climatic events have long posed a significant risk to regions in Kenya, and they have contributed to making it one of the most disaster-prone countries in the world.[20] Of particular concern are floods and droughts, with major droughts occurring about every 10 years, and moderate droughts or floods every three to four years. Historically, these extreme climatic events have caused significant loss of life and adversely affected the national economy. Droughts have affected most people and had the greatest economic impact (Earth Institute, n.d.); it is estimated

[16] McSweeney, C., New, M., & Lizcano, G. (2009). *UNDP climate change country profile: Kenya*. Retrieved from http://ncsp.undp.org/sites/default/files/Kenya.oxford.report.pdf

[17] Government of Kenya (GOK). (2010). *National climate change response strategy: Executive brief.* Retrieved from http://www.environment.go.ke/wp-content/documents/complete%20nccrs%20executive%20brief.pdf

[18] Awuor, C. (2009). Increasing drought in arid and semi-arid Kenya. In J. Ensor & R. Berger (Eds.), *Understanding climate change adaptation: Lessons from community-based approaches* (pp. 101–114). Rugby: Practical Action Publishing.

[19] AEA Group. (2008a). *Final report. Kenya: Climate screening and information exchange* (ED 05603, Issue 2). Retrieved from http://www.dewpoint.org.uk/Asset%20Library/DFID/Climate%20Risk%20Assessment%20Report%20-%20 Kenya.pdf

[20] Ministry of State for Special Programmes (MOSSP). (n.d.). *Strategic plan 2008–2012*. Retrieved from http://www.sprogrammes.go.ke/images/plan2.pdf

that droughts cost about 8.0 per cent of GDP every five years. [21] While usually more localized, floods have led to the greatest loss of human lives[22]. Other climate-related hazards in Kenya include forest fires and landslides, the latter of which mostly affect the highland regions.[23]

Global climate change is projected to alter Kenya's mean annual climatic conditions as well as its pattern of climate extremes. Temperatures are expected to continue to rise in all seasons, with models suggesting that warming of about 1°C will occur by the 2020s, and 4°C by 2100[24]. Warming will vary from region to region within Kenya[25]. Greater uncertainty persists regarding how precipitation patterns might be altered by climate change. Analysis by the Intergovernmental Panel on Climate Change (IPCC) using global circulation models projects that East Africa will likely become wetter, particularly during the rainy seasons[26]. However, analyses focused on Kenya project that a general decrease in mean annual precipitation will occur within the country, although wetter conditions are likely during the short rains of October to December. Projections vary widely regarding how extreme weather event patterns will change[27]. Possibilities include increased flooding due to more heavy rainfall events and continued occurrence of droughts at least as extreme as at present, possibly increasing in intensity over this century. Current uncertainty regarding how climate change might manifest in Kenya reflects, in part, ongoing gaps in knowledge at the regional and international levels, such as incomplete understanding of how critical drivers such as ENSO influence Africa's climate, a severe lack of

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[21] AEA Group. (2008b). *Kenya: Climate screening and information exchange*. Retrieved from http://www.dewpoint.org.uk/Asset%20Library/Climate%20Risk%20Assemment%20Flier%20-%20Kenya.pdf

[22] Earth Institute at Columbia University. (n.d.). *Kenya natural disaster profile*. Retrieved from http://www.ldeo.columbia.edu/chrr/research/profiles/pdfs/kenya_profile1.pdf

[23] United Nations Development Programme (UNDP). (n.d.a). *Kenya natural disaster profile*. Enhanced Security Unit. Retrieved from http://mirror.undp.org/kenya/KenyaDisasterProfile.pdf

[24] AEA Group. (2008a). *Final report. Kenya: Climate screening and information exchange* (ED 05603, Issue 2). Retrieved from http://www.dewpoint.org.uk/Asset%20Library/DFID/Climate%20Risk%20Assessment%20Report%20-%20 Kenya.pdf

[25] Funk, C., Eilerts, G., Davenport, F., & Michaelsen, J. (2010). *A climate trend analysis of Kenya – August 2010* [Fact Sheet 2010-3074]. United States Geological Survey. Retrieved from http://www.fews.net/docs/Publications/FEWS%20Kenya%20Climate%20Trend%20Analysis.pdf

[26] Boko, M., Niang, I., Nyong, A., & Vogel, C. (2007). Africa. In M. L. Parry, O. F. Canziani, J. P. Palutikof, P. J. van der Linden, & C. E. Hanson (Eds.), *Climate change 2007: Impacts, adaptation and vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 433–467). Cambridge, UK: Cambridge University Press.

[27] Stockholm Environment Institute (SEI). (2009). *Economics of climate change in Kenya: Final report submitted in advance of COP15*. Available from http://www.sei-international.org/mediamanager/documents/Publications/Climate-mitigation- adaptation/kenya-climatechange.pdf

local weather data in Kenya specifically and in Africa as a whole, the granularity of global circulation models, and the limited development of regional climate models[28].

8.3 Kenya's Key Climate Impacts and Vulnerabilities

The key sectors in Kenya that are vulnerable to climate changes include agriculture, water resources, health, and ecosystems. For example, increased rain and shifts in the frequency, intensity, and duration of droughts can reduce agricultural and horticultural crop production or affect grazing potential through expansion of arid and semi-arid lands. As a result, food security will be affected through direct impacts on food availability and indirect impacts on food accessibility, livelihoods, and income. Increases in the frequency and severity of extreme events may reduce productivity of rangelands, which support millions of pastoralists and agro-pastoralists in Kenya.

The availability and accessibility of water resources varies throughout the country. Water resources are concentrated in five drainage basins in areas subject to frequent droughts and floods and therefore vulnerable to further changes in climate variability. Additionally, changes in temperature and precipitation will likely affect vectors for diseases such as malaria, especially in high altitude areas. Furthermore, impacts to water supply, quality, and sanitation will further compound other health impacts. Potential environmental impacts include reduced biodiversity; increased risk of forest fires; changes in distribution of pests, pathogens, and invasive species; a shift in vegetation to higher elevations; and substantial loss of tourism income. Coastal and marine ecosystems, including mangroves, coral reefs, and fisheries, will also be affected by climate change.

8.4 Mombasa County Climate Change Impacts

8.4.1 Sea Level Rise

Mombasa County's highly vulnerable to sea level rise as it lies between sea level and about 45 metres above sea level (asl). The low-lying areas of the County are already experiencing serious coastal/beach erosion because of the rise in sea level. This is having a negative impact on the County's and the livelihoods of the residents. It is estimated that sea level has been rising at a rate of about two millimetres per year. At this rate, it is projected that about 17% of Mombasa, or 4,600 hectares of land area, will be submerged with a sea-level rise of only 0.3 metres. At the same time, there will be large areas that may be rendered uninhabitable because of flooding or water logging or will be agriculturally unsuitable due to salt stress. Sandy beaches and other features, including historical and cultural monuments such as Fort Jesus, several beach hotels, industries,

[28] Conway, G. (2009). *The science of climate change in Africa: Impacts and adaptation* (Discussion Paper no. 1). London, UK: Grantham Institute for Climate Change, Imperial College London.

the ship-docking and human settlements could be negatively affected by sea-level rise. Other impacts that are already being experienced, include: increased coastal storm damage; sea-shore erosion; salt water intrusion into estuaries and freshwater aquifers and springs; changes in sedimentation patterns; decreased light penetration to benthic organisms leading to loss of food for variousmarine fauna; and loss of coral reefs

8.4.2 Natural Resource Base

Mombasa county has rich ecosystems that extend from the coastal, inshoreand deep sea. The varied ecosystems provide important goods and services such as, tourism, water resources, provision of food, provision of wood and non-wood forest resources, and as habitats for fish, coral reefs and other aquatic and terrestrial organisms. Some of the ecosystems are important for protection of the coastline from erosion. All these ecosystems are being impacted by climatechange.

8.4.3 Water Resources

Mombasa highly dependent on trans-basin transfer of water i.e., Mzima springs, Baricho water works and Marere boreholes and the ground water aquifers and boreholes spread across the entire County. At least three permanent springs, four water pans and several borewells are operated by private investors, NGOs, and CBOs accounting for about 10,360m^3 per day. The projected piped water supplies for the County by the year 2035 is in the range of between 150,000 to 200,000m^3. The County frequently faces prolonged dry spells and droughts as well as flooding exacerbating the already worse water problem, whichwill have a wide range of implications for household food security, hygiene, and well-being. The increasing temperature and changing rainfall in terms of reducingamounts and its unpredictability has negative impacts on provision of clean water. The adverse impacts of climate change on water resources are already being experienced and are expected to result in severe flooding and intrusion of salt water in aquifers and ground waters. The impacts of climate change on water resources, in turn, affect all major sectors of the economy.

8.4.4 Mangroves and Coastal Forests

Mangroves and coastal forests provide essential functions and services. The total area of mangroves in Kenya is estimated at 61,271 ha with Mombasa County accounting for about 6% (3,771 ha) of the total cover. The mangrove forests occur within several distinct coastline geophysical categories of drowned river valleys at Mombasa and Mtwapa protective outcrops of coral limestone. Mangroves are important as nursery groundfor many commercial fisheries. It is also a habitat for invertebrates and migratory birds. Mangroves are important for the protection of the shoreline from storms and waves, and act as carbon sinks. Mangroves also offer protection to sea grassbeds and coral reefs by filtering sediments. Tudor Creek mangrove forest in Mombasa

has been affected by changes in inundation duration frequency as well as salinity levels caused by sea level rise thus reducing its productivity. Increased flooding has caused change in species composition and intensity resulting loss offish and coastal erosion.

8.4.5 Inshore Waters

Mombasa inshore waters are important for life processes of marine organism, the hatcheries, nurseries, spawning and reproduction areas for fish. The county depends on small scale and artisanal and the fishermen largely depend on inshore waters as a provider of resources and employment. High temperatures have made the habitats unsuitable for fish and species which have migrated to other areas. The shift has also caused a decline in fishing activities for the fishermen and limited resources. Acidification of the ocean as a resulting of absorption of CO^2 from the atmosphere affects productivity.

8.4.6 Coral Reef

The coral reef is found from shallow inshore waters of < 1.5 m to about 25-45m depth. Coral reefs are a harbour to rich biodiversity of birds, fish, crustaceans, molluscs, echinoderms. The rich biodiversity provides a range of goods and ecological services such as raw materials, nutrient cycling, bioremediation, it supports people's livelihood through fishery, tourism, and cultural heritage. Whereas coral reefs are valuable in protecting the coastline they are increasingly being threatened extreme temperatures that causes bleaching and acidification, thereby disrupting the health and functioning of coral reefs. Increased atmosphericcarbon concentrations have caused an increase in acidity in surface waters whichlowers calcium carbonate deposition rates and fertilizes algae creating competitionwith coral reefs and causing nutrient pollution. Increases in rainfall have caused contamination on the coastal reefs making them more vulnerable to climatechange.

8.4.7 Seagrass Beds

Seagrass beds occur in sheltered tidal flats, lagoons and creeks and provide ecological services such as nutrient cycling, organic carbon production and export, they serve as coastal canaries, sediment stabilization and enhance biodiversity. Seagrass beds provide important habitats for a diverse array of associated fauna and flora. They serve as nursery grounds and as foraging areas for turtles and fish. Numerous fish and invertebrates seek refuge from predators in seagrasses. As a result of climate change, increasing global warming has altered the growth rate of seagrass. Further, sea level rise has increased water depth and reduced light reaching the seagrass thus reducing productivity. Sediments and nutrients run offresulting from floods have led to loss of seagrass and a redistribution of existing habitats.

8.5 Climate Change and Subsea Cables: Impacts and Adaptations

8.5.1 Importance of the Ocean

The ocean plays a critical role in protecting our planet from the effects of climate change, absorbing >90% of the excess heat that has been created and around a quarter of CO2 emissions from the past decades[29]. At the same time, the effects of climate change are being felt globally across the ocean, causing loss of sea ice, modifying ocean currents, changing weather patterns, and resulting in a range of impacts from coastal regions to its deepest parts. These changes have potentially wide-reaching impacts for ocean health, fish stocks, shipping, and critical infrastructure such as the network of subsea cables that carries >99% of all intercontinental digital data traffic, including the internet.

8.5.2 Subsea Cables and Climate Change

Subsea cables and the shore-based stations that connect them to terrestrial networks are typically designed to operate over 20-30 years. It is increasingly recognised that the risks posed to this infrastructure will change because of future climate change and its knock-on effects. This was recognised by the Under-Secretary-General for Legal Affairs and United Nations Legal Counsel who commented: 'Sea-level rise is projected to negatively affect various economic sectors, including by damaging electrical and telecommunication support facilities' and (as a result of rapid rates of sea level rise) 'low-lying communities, including those in coral reef environments, urban atoll islands and deltas, and Arctic communities, as well as small island developing States and the least developed countries, are particularly vulnerable.

(A) Schematic of a submarine fibre-optic cable system as it transitions from the ocean to the beach manhole and landing station. From there, the cable connects to the terrestrial network. (B) Photograph of cable protection (cast iron casing) damaged by mobilisation of the seafloor substrate. (C) Boulders moved over a cable (labelled with yellow arrow) by Hurricane Irma. *Photographs courtesy of J.M. Koppers, Saba, Statia Cable System B.V.*

[29] Brierly, A.S. and Kingsford, M.J., 2009. Impacts of climate change on marine organisms and ecosystems. Current biology, 19(14), pp R602-R614.

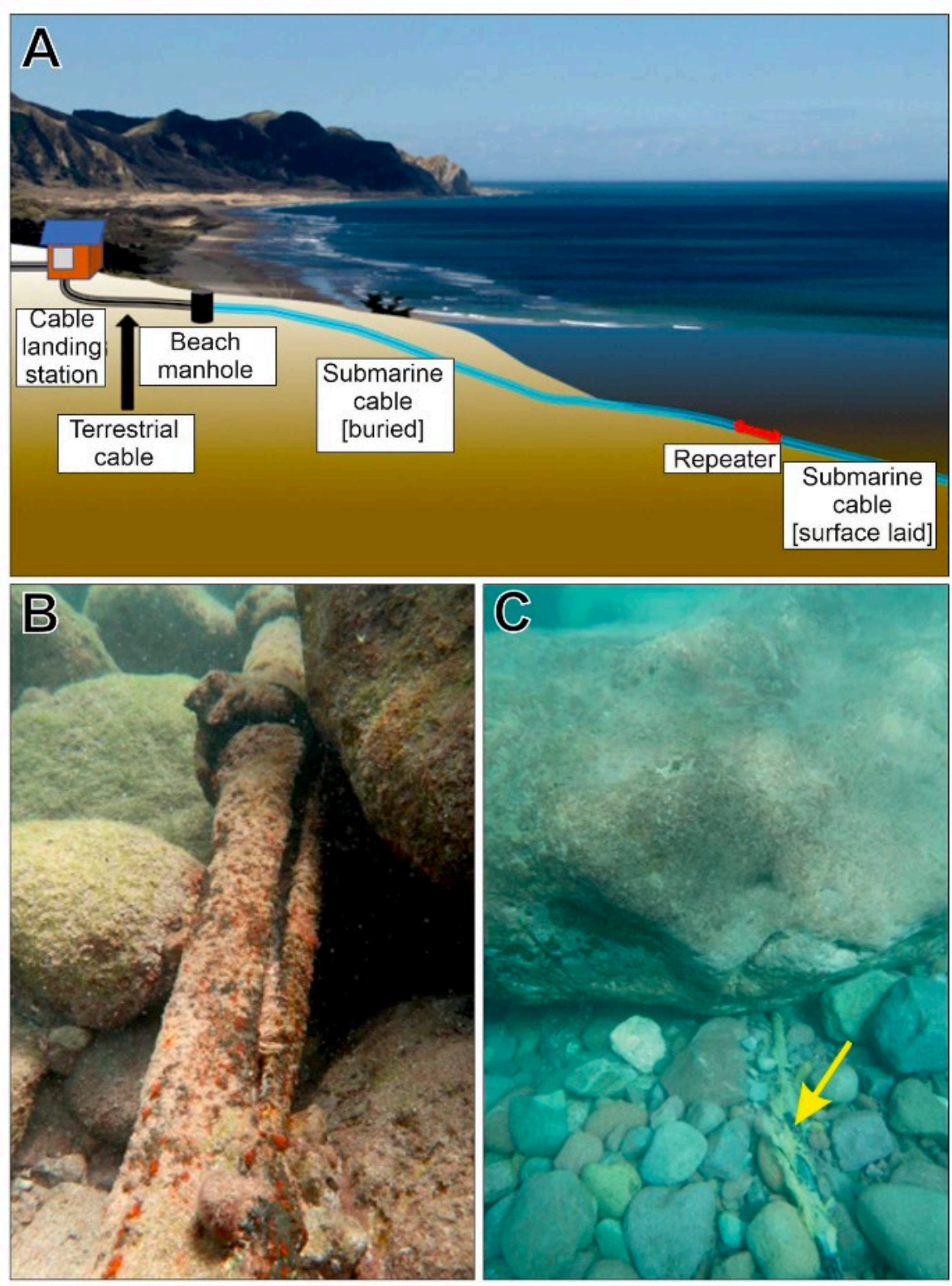

Figure 8-1 Cable System Architecture and Examples of Damage

8.5.3 Mitigation and Adaptation to Ensure Continued Resilience[30]

The subsea cable industry is already adopting various mitigation and adaptation measures to proactively adapt to or protect against adverse impacts of climate change. Some of these examples include:

- Increased armouring and/or cable burial protection at shore- ends where erosion is worsening.
- Mitigation against threats related to deep sea fishing, including liaison with fishers, desktop study, route clearance of discarded fishing gear, and use of more resistant cable.
- Avoidance of low-lying areas for landing points, beach manhole cover and cable landing stations.
- Avoidance of submarine canyons where possible, and where they must be crossed, then identify the most appropriate crossing points by understanding the potentially hazardous flows that may run along them.
- Local knowledge ascertained from site visits regarding environmental conditions and historical events.
- Use of model outputs of future projected changes in ocean conditions to pinpoint hazard hotspots.
- Geographical Information System (GIS) analysis using various geospatial datasets that are incorporated into desktop studies to identify the optimal routes and landing points.

The impacts of climate change will be diverse, but geographically variable, and are already being felt. Being aware of the current and future challenges will ensure that the global network continues to remain resilient and adapts as conditions change.

[30] International Cable Protection Committee (ICPC), May 2023

9 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESM&MP)

9.1 Introduction

The purpose of this Environmental and Social Management and Monitoring Plan (ESM&MP) is to ensure that social and environmental impacts and risks identified during the ESIA process are effectively managed during the construction and operations of the Project. The ESM&MP specifies the mitigation and management measures to which the Proponent and the Contractor are committed and shows how the Project will mobilize organizational capacity and resources to implement these measures. The ESM&MP also shows how mitigation and management measures will be scheduled and will ensure that the Project complies with the applicable laws and regulations within Kenya.

The key objectives of the ESM&MP are to:

- Formalize and disclose the programme for environmental and social management; and
- Provide a framework for the implementation of environmental and social management initiatives.

Best practice principles require that every reasonable effort is made to reduce, and preferably to prevent, negative impacts while enhancing the Project benefits. These principles have guided the ESIA process.

The overall responsibility for the ESM&MP lies with the Proponent (TKL) and the Contractor that will be appointed and responsible for carrying out the specific Project activities.

9.2 TKL E&S Compliance Framework

In the development, construction, and operation of the Project, TKL and its contractors and business partners will adhere to the following standards:

- All applicable legislation and regulations in Kenya; and
- World Bank Group (WBG) Environmental and Social Standards.

This ESM&MP has been developed in accordance with the requirements of these regulations and standards.

9.3 Environmental and Social Management and Monitoring Plan (ESM&MP)

The ESM&MP covers information on the management and/or mitigation measures that will be taken into consideration to address impacts with respect to:

- The cable installation phase (including mobilization and demobilization activities associated with the construction phase); and

- The operations/maintenance phase.

In practice, some of the recommended management measures will be incorporated into the Project design/influence the Project design, to avoid or minimize the identified negative Project impacts as indicated in this ESM&MP.

Table 9-1 summarizes the ESM&MP for the Project. It describes the mitigation measures to be undertaken, and, to ensure the mitigation measures are adequately implemented, a monitoring programme is also described. This programme provides for parameters that can be monitored, and suggests how monitoring should be done, how frequently, and who should be responsible for such monitoring.

Table 9-1 Environmental and Social Management and Monitoring Plan (ESM&MP)

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
General	Contractor, e-Marine already has a health, safety, and environment management plan (HSEMP) that can be revised to meet conditions set out in the environmental authorization (ESIA Certificate for the Project issued by NEMA). All applicable elements of this ESM&MP should be used in revising the contractor (HSEMP), which is to be used for the construction phase, and against which the E&S performance of the contractor will be monitored.	Contractor	A revised project specific HSEMP	Once (prior to commencement of construction activities.	No additional cost (expected to be undertaken by the contractor's environmental and social team)
Aquatic Habitat Alteration (Section 7.2.1)	• Locating and siting cable routes, and shore access, to avoid critical marine habitats, such as coral reefs and breeding grounds.	• Proponent • Contractor	Developed and implemented BAP	Once (prior to commencement of construction activities).	100,000.00

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	• Burying submarine cables when traversing sensitive intertidal habitat. • Monitoring cable laying path for presence of marine mammals. • Avoiding laying of submarine cable during fish and marine mammals breeding periods, calving periods, and spawning seasons. • Marine vessels will be required to adhere to IMO regulations on bilge and ballast water discharge to avoid tensional introduction of non-native species to the marine environment. • Working with an appropriate environmental organization				

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	to develop a notification process. • The Project will ensure that measures are adopted to avoid incursion into areas adjacent to the work site or any secondary effects from pollution, sedimentation, or accidental spills. • Consider an appropriate means by which exposure to Electromagnetic Fields can be minimized or reduced to reduce its effects on marine wildlife and ecosystem. • Select suitable burial techniques to minimise disturbance effects of benthic species and habitats and the release of contaminants.				

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	• Develop and implement a biodiversity action plan (BAP).				
Hazardous Materials and Waste (Section 7.2.2)	• Hazardous waste should be stored on board the vessel until it can be disposed at a suitably equipped port and through a NEMA licensed waste handler, respecting the requirements of the Basel Convention on Transboundary Shipment of Hazardous Wastes. • Waste management is required to avoid the risk of harm to the environment and human health. • When mitigated by compliance with MARPOL requirements and the impact	Contractor	• An effective WMP in place • No recorded grievances about hazardous materials and waste. • Records of audits/visual inspection	Monthly	Included in overall pricing

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	of aqueous discharges (excluding ballast waters) in vessel operations is assessed as being of low significance. • When mitigated by compliance with MARPOL requirements, the impact of solid waste in vessel operations is assessed as being of low significance. • Implementing procedures for the management of lead acid batteries, including temporary storage, transport and final recycling by a licensed facility; • Ensuring that new support equipment does not contain PCBs or ODSs. PCBs from old equipment should be				

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	managed as a hazardous waste; and • Purchasing electronic equipment that meets international phase out requirements for hazardous materials contents and implementing procedures for the management of waste.				
Impacts on Employment, Procurement, and the Economy (Section 7.2.3)	• The contractor will prioritize the recruitment of workers (unskilled, semi-skilled) from the local communities and in conjunction with Community Liaison Team. • The Contractor will notify identified representatives of the County Government and Local Administration (i.e., the Area Chief) of the specific	Contractor	• Contractor recruitment plan • Employment records	• Preparation of Human Resources guiding documents (including recruitment guidelines) prior to construction	Included in overall pricing

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	jobs and the skills required for the Project, during the recruitment process. • Advertisements on the employment and procurement opportunities during the construction phase will be placed at the Chief's Office notice board. If the position cannot be filled from within the Project Area, it will be advertised further country-wide then nationally. • No recruitment is to take place on the Project site. This is particularly important with respect to casuals. • The Contractor will aim at procuring locally available materials where feasible and			• Employment records checked monthly.	

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	use local suppliers where appropriate.				
Emissions to Air (Section 7.2.4)	• The Project should require that the contractor operate only well-maintained engines. • Construction vehicles, 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. • Construction traffic speed control measures will be enforced on unpaved roads (reduced dust generation levels are often consistent with reduced traffic speeds).	Contractor	• No recorded incidents or air pollution-related grievances. • Records of audits/visual inspection	Daily	Included in overall pricing

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	• Operation in line with the requirements specified under MARPOL 73/78 Annex VI.				
Impact on noise environment and vibration (Section 7.2.5)	• The project will require the contractor to use equipment and vehicles that are in good working order, well maintained, and that have all noise suppression equipment intact and in working order; and • Contractor will be required to implement best driving practices when approaching and leaving the site to minimize noise emissions.	Contractor	• No recorded noise-related incidents or grievances. • Noise monitoring records.	Monthly	Included in overall pricing
Occupational Health and Safety (OHS) (Section 7.2.6)	• Worker training on specific hazards associated with laser lights, including the various classes of low and high power	• TKL (contractual arrangements) • Contractor (implementation)	• Employment records and other key performance indicators	Monthly	Included in overall pricing

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	laser lights, and fiber management. • Preparation and implementation of laser light safety and fiber management procedures which include: o Switching off laser lights prior to work initiation, when feasible; o Use of laser safety glasses during live optical fiber systems installation; o Prohibition of intentionally looking into the laser of fiber end or pointing it at another person; o Restricting access to the work area, placing warning signs and labeling of areas with potential for		(KPIs) for worker rights. • A record of workers' grievances. • Emergency Response Plan. • Induction documentation for all workers to include necessary items. • Daily toolbox talks.		

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	exposure to laser radiation, and providing adequate background lighting to account for loss of visibility with the use of protective eyewear; o Inspecting the work area for the presence of flammable materials prior to the installation of high-powered laser lights; • Implementation of a medical surveillance program with initial and periodic eye examinations; and • Avoiding exposure to fibers through use of protective clothing and separation of work and eating areas.				

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
Community Health and Safety (CHS) (Section 7.2.7)	• All active construction areas will be marked with high-visibility tape to reduce the risk accidents. • All open trenches and excavated areas will be backfilled as soon as possible after the construction has been completed. • While a ship is laying its maneuverability is restricted, as such it will display the day signals and lights of a hampered vessel to avoid collision with other vessels at sea. • Vessels will increase watch when navigating in areas that are known to be used by fishermen and other vessels. If other vessels are observed	• TKL (contractual arrangements) • Contractor (implementation) •	• A record of community grievances. • Minutes of community engagement meetings • Notice to KPA on cable laying activities. • Emergency Response Plan.	Throughout installation	Included in overall pricing

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	within the near vicinity, the project vessel will stop moving, contact 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. • Works must take place outside of periods of festival periods as much as possible. • Cable survey and installation could cause temporary disruption to the flow of recreational sea use. However, these operations are limited to short periods of time and other activities can generally avoid the work area without significant diversion.				

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	• The project will notify the ports authority and other activities, so that vessels in the area would be warned of the ongoing operations through a "Notice to recreational sea users" report transmitted daily.				
Temporary Loss of Productive Assets (Section 7.2.8)	• For the partial impact on fishing areas, implementation of compensation measures for affected parties should be considered. • For the temporary limitation of access to commercial establishments and residential buildings, careful planning of construction activities to minimize duration of impact.	• Proponent • Contractor	• Minutes of negotiation with fishermen • Compensation records, whenever possible • Records of complaints	Before and throughout cable installation	500,000.00 (To be included in contractor costs)

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	• Caution during cable installation.				
Impact on Disease Transmission (Section 7.2.9)	• Workers should receive awareness training as part of their induction and then at least every 6 months on potential high risk communicable and vector borne diseases, symptoms, preventative measures, and transmission routes as well as treatment options. This will be particularly important for diseases with which non-local workers are unfamiliar and in case of any emerging disease outbreaks. • In the event of a new disease, increased transmission or outbreak compared to the baseline, the Contractor	Contractor in liaison with TKL	• HIV/AIDS/Malaria/TB Policy. • Worker Code of Conduct (COC) • Disciplinary procedures for workers who contravene the COC.	Monthly	Included in overall pricing

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	should interact with local health care facilities and workers to ensure there is an appropriate response in place to make workers aware and to ensure proper precautionary measures are implemented. • The following will be implemented at a minimum to minimize disease transmission: o Providing workers with appropriate sanitary facilities, which are appropriately designed to prevent contamination. o Developing a robust waste handling system to avoid the creation of new vector				

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	breeding grounds or attracting rodents to the area. o Implementing measures to reduce the presence of stagnant water onsite through environmental controls and source reduction to avoid the creation of new breeding grounds. o Ensuring appropriate food preparation and monitoring measures are in place. • The workforce will be provided with access to selected treatment at health facilities at or near the				

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
	Project Site as deemed necessary for this Project. • The Project should prepare and implement a communicable disease management plan during the construction phase. This plan should be explained clearly to the workforce. • Conduct awareness campaigns on HIV/AIDS among the workers and the locals. This can be undertaken through the various NGOs and government agencies in the County.				
Conflicts with the local community	• Consultation with the host community and relevant stakeholders on the mitigation measures	Contractor in liaison with proponent	• Minutes of community consultation. • Records of complaints.	Monthly	No additional costs.

Issue	Mitigation/Management Measure	Responsibility for Implementation	Monitoring Indicator	Frequency of Monitoring	Cost (KSh)
(Section 7.2.12)	proposed for the negative impacts. • Offer women equal employment opportunities as men. • Utilize area Chiefs and Ward administrators in the recruitment of local unskilled labor.		• Number of women of the project		

9.4 Roles and Responsibilities

9.4.1 Contractual Obligation

To ensure that this ESM&MP and/or derivatives thereof are enforced and implemented, these documents must be given legal standing. This shall be achieved through incorporating the ESM&MP and/or derivative documents as an addendum to the contract documents for the Contractor specifying that the requirements of this ESM&MP and/or derivative documents apply and must be met. This will ensure that the obligations are clearly communicated.

9.4.2 Responsibilities and Duties

9.4.2.1 *The Proponent (TKL)*

The Project Proponent has overall responsibility for ensuring that the construction and development of the Project is undertaken in an environmentally sound and responsible manner and reflects the requirements and specifications of the ESM&MP and recommendations from the relevant authorities. The responsibilities of the Proponent will include:

- Appoint or designate a suitably qualified Project Manager (PM) to manage the implementation of the proposed Project;
- Appoint the Project Contractor (PC);
- Establish and maintain regular and proactive communications with the designated/ appointed Project Manager (PM) and Environmental Compliance Officer (ECO); and
- Ensure that the ESM&MP is reviewed and updated as necessary.

Reporting Structure

The Proponent will liaise with and/or take instruction from the following:

- Government/regulatory authorities such as NEMA, KWS, KMA, kPA, etc.; and
- General Public.

9.4.2.2 *Proponent's Project Manager (PM)*

The primary role of the PM is to ensure that the Contractor and Proponent's staff complies with the environmental specifications in the ESM&MP. The PM shall further:

- Oversee the general compliance of the Contractor with the ESM&MP and other pertinent site specifications; and
- Liaise with the Contractor and ECO on environmental matters, as well as any pertinent engineering matters where these may have environmental consequences.

In addition, the PM shall:

- Designate or appoint a suitably qualified Environmental Manager (EM) that will manage all environmental aspects on behalf of the PM and the Project Proponent;
- Review and approve Method Statements produced by the Contractor in connection with the ESM&MP;

- Assume overall responsibility for the effective implementation and administration of the ESM&MP;
- Be familiar with the contents of the ESM&MP, and his/her role and responsibilities as defined therein;
- Ensure that the ESM&MP is included in the Contractor's contract;
- Communicate to the Contractor, verbally and in writing, the advice of the ECO and the contents of the ECO reports;
- In conjunction with the Construction Supervisor; undertake regular inspections of the Contractor's site as well as the installation works in order to check for compliance with the ESM&MP in terms of the specifications outlined therein. Inspections shall take place at least once a week and copies of the monitoring checklist contained in the file;
- Review and approve drawings produced by the Contractor or professional team in connection with, for example, the construction site layout, access/haul roads, etc.;
- Issue site instructions giving effect to the ECO requirements where necessary;
- Keep a register of all complaints and incidents (spills, injuries, legal transgressions, etc.) and other documentation related to the ESM&MP;
- Report to the ECO any problems (or complaints) which cannot first be resolved in co- operation with the Contractor(s);
- Implement recommendations of possible audits;
- Implement Temporary Work Stoppages as advised by the ECO, where serious environmental infringements and non-compliances have occurred;
- Facilitate proactive communication between all role-players in the interests of effective environmental management; and
- Ensure that construction staff is trained in accordance with requirements of the ESM&MP.

Reporting Structure

The PM will report to the Proponent (TKL). Weekly meetings between the contractor and Proponent, and monthly reporting will be required.

9.4.2.3 *Environmental Control Officer (ECO)/ Environmental Health and Safety (EHS) Officer*

Through the PM, the Project Proponent will appoint an ECO/EHS Officer to monitor and oversee implementation of the ESM&MP for the proposed construction works. The ECO/ EHS Officer is given authority to ensure that the ESM&MP is fully implemented and that appropriate actions are undertaken to address any discrepancies and non-compliances.

The role of the ECO/EHS Officer shall be to:

- Act as site 'custodian' for the implementation, integration and maintenance of the ESM&MP in accordance with the contractual requirements;
- Ensure successful implementation of the ESM&MP; and
- Ensure that the Contractor, his employees and/or sub-contractors receive the appropriate environmental awareness training prior to commencing activities.

The responsibilities of the ECO/EHS Officer will be to:

- Liaise with the PM on the level of compliance with the ESM&MP achieved by the Contractor on a regular basis for the duration of the contract;
- Advise the PM on the interpretation and enforcement of the Environmental Specifications (ES), including evaluation of non-compliances;
- Supply environmental information as and when required;
- Review and approve Method Statements produced by the Contractor, in conjunction with the PM;
- Demarcate particularly sensitive areas (including all No-Go areas) and to pass instructions through the PM concerning works in these areas;
- Monitor any basic physical changes to the environment as a consequence of the construction works according to an audit schedule;
- Attend regular site meetings and Project steering committee meetings;
- Undertake regular monthly audits of the construction works and to generate monthly audit reports. These reports are to be forwarded to the PM who will communicate the results and conclusions with the Project Proponent;
- Communicate frequently and openly with the Contractor and the PM to ensure effective, proactive environmental management, with the overall objective of preventing or reducing negative environmental impacts and/or enhancing positive environmental impacts;
- Advise the PM on remedial actions for the protection of the environment in the event of any accidents or emergencies during construction, and to advise on appropriate clean-up activities;
- Review complaints received and made instructions as necessary; and
- Identify and make recommendations to minor amendments to the ESM&MP as and when appropriate.

Reporting Structure

The ECO will report to the PM, who in turn will report to the Project Proponent.

9.4.2.4 *Contractor*

The Contractor will implement the development. The Contractor will be contractually required to undertake their activities in an environmentally responsible manner, as described in the ESM&MP. The role of the Contractor shall be to:

- Ensure that the environmental specifications of this document (including any revisions, additions or amendments) are effectively implemented. This includes the on-site implementation of steps to mitigate environmental impacts;
- Preserve the natural environment by limiting any destructive actions on site;
- Ensure that suitable records are kept and that the appropriate documentation is available to the PM;
- Take into consideration the legal rights of the Communities and individual Project Proponent's staff;
- Ensure quality in all work done, technical and environmental;
- Always underwrite the Project Proponent's Environmental Policy, and

- Ensure that all sub-contractors and other workers appointed by the Contractor are complying with and implementing the ESM&MP during the duration of their specific contracts.

The responsibilities of the Contractor will be to:

- Discuss implementation of and compliance with this document with staff at routine site meetings;
- Designate, appoint and/or assign tasks to personnel who will be responsible for managing all or parts of the ESM&MP. The Contractor must appoint or designate a Safety, Health, Environment and Quality Officer (SHEQO) to monitor daily implementation of the ESM&MP on the Contractor's behalf as a minimum;
- Monitor environmental performance and conformance with the specifications contained in this document during site inspections;
- Report progress towards implementation of and non-conformances with this document at site meetings with the PM;
- Advise the PM of any incidents or emergencies on site, together with a record of action taken;

Reporting Structure

The Contractor will report to the PM and ECO, as and when required.

9.4.2.5 *Sub-contractors*

The Contractor may from time to time appoint sub-contractors. The role of the sub-contractors shall be to:

- Perform certain services and/or provide certain products on behalf of the Contractor. The sub-contractors will be contractually required to undertake their activities in an environmentally responsible manner, as described in the ESM&MP; and
- Ensure environmental awareness among employees so that they are fully aware of and understand the Environmental Specifications and the need for them.

The responsibilities of the sub-contractor will be to:

- Be familiar with the contents of the ESM&MP, and his/her roles and responsibilities as defined therein;
- Comply with the Environmental Specifications in the ESM&MP and associated instructions issued by the Contractor to ensure compliance;
- Notify the Contractor verbally and in writing, immediately in the event of any accidental infringements of the Environmental Specifications and ensure appropriate remedial action is taken; and
- Notify the Contractor, verbally and in writing at least 10 working days in advance of any activity he/she has reason to believe may have significant adverse environmental impacts, so that mitigation measures may be implemented timeously.

Reporting Structure

Sub-contractors will report to and receive instructions from the Contractor.

9.4.3 Monitoring

9.4.3.1 *Undertaking Audits*

The PM shall appoint a qualified and experienced ECO/EHS Officer to ensure implementation of and adherence to the ESM&MP.

The ECO/EHS Officer shall conduct audits to ensure that the system for implementation of the ESM&MP is operating effectively. The audit shall check that a procedure is in place to ensure that:

- The ESM&MP and the Method Statements being used are the up-to-date versions.
- Variations to the ESM&MP, Method Statements and non-compliances and corrective actions are documented.
- Emergency procedures are in place and effectively communicated to personnel.

The audit programme shall consist of the following at a minimum:

- First audit no later than 1 month after construction commences;
- Thereafter audits at monthly intervals, at a minimum;
- An audit one week prior to practical completion of the Project is granted; and
- A post construction audit within 1 week after the Contractor has moved off site.

The contractor and the Project Proponent will also be required to meet at least weekly to discuss and check progress of implementing the ESM&MP.

9.4.3.2 *Compliance with the ESM&MP*

The Contractor and/or his agents are deemed not to have complied with the ESM&MP and remedial action if:

- There is evidence of contravention of the ESM&MP clauses within the boundaries of the site or extensions;
- Environmental damage ensues due to negligence; and
- The Contractor fails to comply with corrective or other instructions issued by the PM, within a time specified by the PM.

10 CONCLUSION AND RECOMMENDATIONS

10.1 Conclusion

The project activities are expected to have no significant 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 mitigation/management measures into the project design. However, the environmental and social impact assessment does indicate some potential for limited environmental and social impacts to habitats and flora; fauna; water quality; and occupational and community 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.

1. **Aquatic habitat alteration** is the major concern of this ESIA. However, fauna benefits from new substrate on the seabed and although disturbance and degradation happen during cable installation, sensitive ecosystems recover shortly after. Special care would be taken during cable installation to avoid exposure of sensitive areas to prolonged high turbidity;
2. The impact assessment has also demonstrated that the impacts likely to be generated in the **cable laying operation in deep offshore** water will be minimal. No impacts are expected on fisheries or shipping activities provided normal international marine activity procedures are followed. To avoid unnecessary environmental damage from inappropriate disposal of wastes and foul waters, environmental auditing and monitoring of the marine vessel facilities and the contractor's waste handing methods is recommended;
3. **Cable laying in shallow waters** is potentially the most likely phase of the cable laying operation when impacts may occur. In deeper sections of water there is potential for discharges of waste and foul water from the vessel. During burial of the cable (if required) across the shallow reef or sand areas, there is potential for sediment disturbance, local deterioration in water quality, impacts on local fishing activities, impact on the ecology of the area and impacts on tourist areas and possibly cultural heritage sites through noise disturbance. These impacts can be readily mitigated through appropriate briefing of the contractor and monitoring of their works by careful construction site and method management, minimization of sediment disturbance, and maintenance of good communication with the relevant authorities; and
4. Impacts from **onshore cable laying** include noise and dust during BMH and duct construction (if required), run-off especially in areas prone to flooding, impacts on sensitive coastal resources and on tourist activities have all been assessed. Mitigation will include briefing of the contractor about environmental requirements, monitoring of methods, timing, activities to avoid impacts on nearby sensitive receivers, route selection and avoidance of sensitive ecological resources on the shore, isolating areas for protection of the public and avoiding additional damage to the site, covering of stockpiled areas and good construction site housekeeping and management.

10.2 Recommendations

The proponent and contractor are advised to implement the Environmental Management & Monitoring Plan (ESM&MP) to eliminate the occurrence of the anticipated negative impacts, enhance the positive ones and achieve good environmental and social practices.

The implementation of the mitigation measures detailed in Chapters 7 and listed in the ESM&MP (Chapter 9) will provide a basis for ensuring that the potential positive and negative impacts associated with the project are enhanced and mitigated, respectively, to a level which is deemed adequate for the development to proceed.

In summary, based on the findings of this assessment, we find no reason why the Project, should not be authorized, contingent on the mitigations and monitoring for potential environmental and socio- economic impacts as outlined in the ESM&MP.

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Water Resources Management Rules, 2007: L.N No 171 of 2007 (Kenya law and Kenya gazette).

World Bank Group, 2017: Environmental and Social Management Framework.

ANNEXES

Annex A: Environtech Consultancy Africa (ECA) NEMA Registration and 2021 Practicing License

FORM 7 (r.15(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/18284

Application Reference No: NEMA/EIA/EL/23959

M/S **Environtech Consultancy Africa Ltd**
(individual or firm) of address
P.O. Box 16601 - 00100 Nairobi

is licensed to practice in the capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Firm of Experts** registration number **6085**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: 12/30/2022 Expiry Date: **12/31/2023**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

Annex A: LEAD EXPERTS PRACTICING LICENCE

FORM 7 (r.15(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/18285

Application Reference No: NEMA/EIA/EL/23960

M/S **Stanley Mathenge Mwangi**
(individual or firm) of address
P.O. Box 16601 - 00100 Nairobi

is licensed to practice in the capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert General**

registration number **2930**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **12/30/2022** Expiry Date: **12/31/2023**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

Annex B: NEMA Correspondences

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

Telcom Wireless: 020-2183718, 020-2101370
Mobile Line: 0724 253 398, 0723 363 010, 0735 013 046
Incident Line: 0786 101 100, 0741 101 100

P.O. Box 67839 - 00200
Popo Road, Nairobi, Kenya
Email: dgnema@nema.go.ke
Website: www.nema.go.ke

NEMA/TOR/5/2/573

24th May, 2023

Telkom Kenya Limited
P.O. Box 30301-00100
NAIROBI

RE: TERMS OF REFERENCE (TOR) FOR ENVIROMENTAL IMPACT ASSESSMENT FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBRE OPTIC CABLE IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION IN NYALI, MOMBASA, MOMBASA COUNTY

We acknowledge the receipt of your TOR for the above subject.

Pursuant to the Environmental Management and Coordination Act, 1999, the Environmental (Impact Assessment and Audit) Regulations 2003 and Legal notice 31 & 32 of 2019, your terms of reference for the Environmental and Social Impact Assessment (EIA) for the **PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBRE OPTIC CABLE IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION IN NYALI, MOMBASA, MOMBASA COUNTY** has been approved on condition that you shall develop and implement a comprehensive stakeholder engagement plan.

You shall submit ten (10) copies of the study report, a soft copy of the summarised ESMP in **WORD** format for preparation of public notice and one electronic copy of the report prepared by the team of experts to the Authority.

LYNNETE CHERUIYOT
For: DIRECTOR GENERAL

Our Environment, Our Life, Our Responsibility

ISO 9001 : 2015 Certified

Annex C: Background Information Document (BID)

Background Information Document (BID)

Environmental and Social Impact Assessment (ESIA) Study for the Proposed Installation of Africa One (1) Submarine Fiber Cable by Telkom Kenya Limited (TKL) in Kenya Territorial Waters up to the Cable Landing

Introduction

This Background Information Document (BID) provides information to assist stakeholder participation in Environmental and Social Impact Assessment (ESIA) for Africa 1 Submarine Cable at Nyali Subcounty, Mombasa County. This BID contains the following:

- Project Proponent;
- Description of the Project;
- Location of the Project;
- The potential benefits and impacts posed by the Project;
- The processes that will be followed to engage with stakeholders; and
- How and when stakeholders can participate in the ESIA process to be followed for this Project.

Project Proponent

Telkom Kenya Limited (TKL) or Telkom is a technology company that provides integrated solutions to individuals, Small and Medium-sized Enterprises (SMEs), Government and large corporates in Kenya, drawing from a diverse solutions suite that includes voice, data/connectivity, digital financial services, as well as network services. Powered by its vast fibre optic infrastructure, it is also a major provider of wholesale carrier-to-carrier traffic, within the country and the region.

These services are primarily offered through our Service Delivery Units (SDUs): **Digital** (that offers: Data Centre Services, Cloud, Managed Services, Connectivity, Broadband, Carrier-to-Carrier traffic, and Backbone Infrastructure); **Consumer** (that offers: Data, Voice, VAS, and Content) and **Digital Financial Services** (through our platform T-kash).

Established as a telecommunications operator in April 1999, Telkom has 4,152 km of its own terrestrial fibre cabling, serving as a key conduit for broadband connectivity, inland.

Telkom Kenya owns a 22.5% stake in The East African Marine System (TEAMS), a 5,000km undersea fibre optic cable through Fujairah, UAE. Telkom also hosts and operates this cable.

Telkom also owns a 10% stake in the Lower Indian Ocean Network II (LIONII), a 2,700km undersea fibre optic cable through Mauritius. It also owns a stake in the Eastern Africa Submarine Cable System (EASSy) through shareholding in the West Indian Ocean Cable Company (WIOCC). Eassy is a 10,000km cable from Mtunzini, South Africa to Djibouti. Telkom was also the landing partner for the LIONII, EASSy, the Djibouti Africa Regional Express 1 (DARE 1) a 4,854km cable from Djibouti to Mombasa, and lately, the Pakistan and East Africa Connecting Europe (PEACE) Cable, a 15,000km cable from Marseilles, France through to Singapore and South Africa.[31]

Despite Africa 1 Submarine OFC being owned by Alcatel Submarine Network (ASN), Telkom, as it's cable landing partner in Kenya, is responsible for the effective implementation of the approved Environmental and Social Management Plan (ESMP) and environmental license conditions.

What is an ESIA?

The Project requires Environmental Authorisation (EA) from the National Environment Management Authority (NEMA), through an Environmental and Social Impact Assessment (ESIA) process. NEMA is the competent authority under these regulations and has authority to approve the development or refuse it.

This document provides background information on the project and the ESIA process. It helps Interested and Affected Parties (IAPs) understand the project and provides guidance on getting involved. IAPs play a very important role in the ESIA process. We encourage you to register, this will enable ECA/TKL to keep you informed throughout the ESIA processes. By doing so you will be able to engage in discussions on issues and provide comments on the draft ESIA Project Report.

Environtech Consultancy Africa (ECA)

TKL has appointed Environtech Consultancy Africa (ECA) Ltd as the independent Environmental Assessment Practitioner (EAP) for the ESIA. The ESIA will determine anticipated impacts and risks and propose measures on how these should be managed. The ESIA Project Report will then inform an environmental authorisation decision to be taken by NEMA.

[31] See https://telkom.co.ke/about-us/who-we-are/

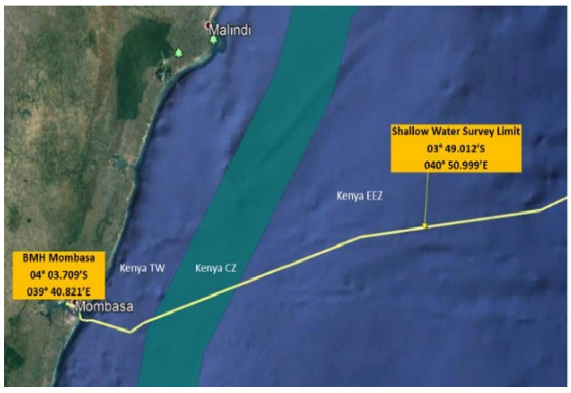
Project Description

Africa 1 Submarine Cable project is designed to install a submarine cable system, connecting United Arab Emirates, Pakistan in Asian Continent and Kenya. The whole cable route lies within the Gulf of Oman, Gulf of Aden, Arabian Sea and East Coast of Africa. This submarine cable route system has been referred to as Africa-1 Segment 2 Cable Route System.[32] Africa 1 is targeted for completion in 2023.

The proposed project consists of both marine and terrestrial components. The terrestrial cable section will be laid for 1.7Km from the Beach Manhole (BMH) at GPS coordinates 4.050386, 39.707140) up to the cable landing station (CLS) at GPS coordinates -4.045027, 39.698118. The marine component, on the other hand, entails installation of the cable for a distance totalling 32km from Kenya's maritime boundary. The sea route leaves the Mombasa landing site in a general East-South-easterly direction. It initially runs from a lagoon of Mombasa landfall with water depths less than 3m for the first 2.5km. Thereafter the water depth rapidly deepens to 300m with several terraces in 6km. After the abrupt descends, the route gradually descends on a gentle to moderate gradients seafloor. It eventually reaches the Basic Operator Panel (BOP) near the Kenya EEZ/High Seas.

Project Location

The project location consists of the TKL cable route, from the Kenya's Exclusive Economic Zone (EEZ) to the CLS at Nyali, Mombasa County. The submarine cable is expected to traverse along the Mombasa Marine Park and Reserve (MMP&R). The initial route will be constrained to a 500 meters corridor span (working area), however, the actual installation footprint will be less than 1m in width.



Project Activities

Installing a submarine transmission cable involves a series of actions:

1. Selection of the provisional path;
2. Obtaining permission from the relevant authorities;
3. Survey of the path;
4. Designing the cable system in order to meet the conditions of the selected path;
5. Laying the cable, including burial in appropriate areas;
6. A post-lay inspection may be necessary in some cases;
7. Notification of cable position to other marine users.

These actions can be summarized in following phases:

- Phase 1: Design (Actions 1-4);
- Phase 2: Construction/Installation (Actions 5-6);
- Phase 3: Operation and Maintenance (Action 7); and
- Phase 4: Decommissioning (at end of life).

Note: This ESIA report only focuses on Phases 2-6 as the design phase is already complete.

The complexity of laying down the cable requires a coordinated work of many specialists in different fields. Path selection is done by power system engineers together with marine specialists. The survey is performed by geologists, geophysicists and oceanographers.

Laying the cable on the seafloor is executed by **special structures engineers**.

Potential Programme Impacts & Risks

Some of the potential project impacts and risks identified during the ESIA scoping process are summarized in the table below:

Impact	Type

[32] Cable Survey Report

Impacts on employment, procurement and economy	Positive
Impact on marine and terrestrial biodiversity	Negative
Impacts on local air quality	Negative
Waste and effluent	Negative
Impact on noise environment and vibration	Negative
Impact on occupational health and safety	Negative
Impact on community health and safety	Negative
Impacts on disease transmission	Negative
Traffic impacts	Negative

Steps for the ESIA Process

ESIA is part of the Project development process and is usually done at the initial stages of the Project planning and development. It is a decision-making tool and should guide whether a Project should be implemented, abandoned or modified before implementation.

The objectives of the ESIA are to assess the significance of all identified impacts and to formulate mitigation measures. After the different aspects of the ESIA have been completed, an ESIA Project Report including an Environmental and Social Management and Monitoring Plan (ESMP) will be compiled and submitted to NEMA for licensing.

Public Participation

Public participation is a legal requirement in the ESIA process; the key principle of consultation is to ensure that the views of stakeholders are considered and reported throughout the ESIA process. The objective is to ensure that the assessment is robust, transparent and has considered the full range of issues or perceptions, and to an appropriate level of detail. Stakeholder participation will assist in identifying environmental and social consequences of the proposed Project and ensure that these are evaluated in the process.

Annex D: Detailed Minutes from Stakeholder Engagement Meetings

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY (ESIA) REPORT FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY.

MINUTES FOR THE PUBLIC PARTICIPATION MEETING.

Date: 19th June 2023 **Venue: Nyali Beach BMU Office**

Members Present

Name	Designation
1. Henry K Rop	Assistant County Commissioner (Representing DCC)
2. Benard Omollo	Chief Maweni Location
3. Thomas Ruwa	Assistant Chief Ziwa LA Ng'ombe Sub-location
4. Mogendi Obedy	Assistant Chief Maweni Sub-location
5. Yasmin Omar Mohammed	Chief Kongowea Location
6. Keroro G Philiph	Assistant Chief Mkomani Sub-location
7. Sylvester Kibet	Engineer Telkom Kenya
8. Stanley Mathenge	Environmental Lead Expert – Environtech Consultancy Africa Ltd
9. Job Mucoki	Environmental Expert – Environtech Consultancy Africa Ltd
10. Other members & stakeholders	Attendance List Attached

AGENDA

1. Opening Remarks
2. Presentation by Environtech Constancy Africa Ltd on the ESIA
3. Presentation by Engineer from Telkom Kenya Ltd
4. Comments from members present
5. Responses to issues raised.
6. Closing Remarks
7. AOB

MIN 1: OPENING REMARKS

The Assistant County Commissioner (Snr ACC/Chairman) called the meeting to order at 10:22 am and Ms. Florence Maina led opening prayers. This was followed by a self-introduction by all members present. In his opening remarks, the Snr ACC thanked the members for showing up to the meeting. He informed that the Deputy County Commissioner (DCC) was engaged in official duties elsewhere and that she would join the meeting later therefore, he was designated to chair the meeting on behalf of the DCC. Mr Rop told the participants that Mr. Stanley Mathenge from Environtech Consultancy Africa Ltd has requested the Nyali DCC Office to convene a public consultation and participation meeting with the residents of Nyali and stakeholders within Nyali beach in order to deliberate on the proposed installation of a submarine fibre cable by Telkom Kenya. He mentioned that Staffs from Environtech Consultancy Africa Ltd and Telkom Kenya Limited would guide the meeting and he invited Mr. Mathenge to continue with the rest of the agendas.

MIN 2: PRESENTATION BY ENVIRONTECH CONSTANCY AFRICA LTD ON THE ESIA

Mr. Mathenge who is an Environmental and Social Impact Assessment (EIA) Lead Expert informed the meeting that Environtech Consultancy Africa Ltd is a firm of Environmental Experts, registered and licensed by NEMA to conduct environmental and social impact assessment studies for proposed projects. He stated that Telkom Kenya Limited had contracted the consultancy firm to undertake the ESIA for the proposed installation of Africa One (1) submarine fibre. The cable shall cut across in Kenya's territorial waters up to the cable landing station at Telkom House in Nyali and that the cable would connect Kenya to United Arab Emirates, Pakistan, Djibouti,

Egypt, Saudi Arabia, and France and that the submarine cable may be extended to South Africa, Yemen, Eritrea, Sudan, Seychelles, Italy and India.

The EIA expert mentioned that the purpose of the ESIA study was to assess and evaluate the potential environmental, social and safety impacts of the proposed project in order to provide mitigation measures for the negative impacts. He reminded the participants that a similar consultation exercise had taken place in the year 2021 when Telkom Kenya had proposed to install PEACE submarine cable and that the project was implemented.

Mr. Mathenge explained that a submarine fiber cable is a communication cable that is laid on the seabed between land-based stations to carry telecommunication signals. Basically, it is a wire wrapped in insulating materials and laid on the ocean floor. Submarine fibre optic cable is the main route that ensures that major regional networks around the world can interoperate with each other. He added that so far, Kenya has installed six (6) submarine cables and the proposed one will be the seventh one and that the government intended to install 12 submarine fiber optic cables in total with will greatly enhance telecommunication infrastructure in the country and beyond.

The EIA Expert informed the meeting that it is a mandatory requirement under the Environmental Management and Coordination Act, 1999 (Revised 2015) for the project to undergo an environmental impact assessment before the commencement of the installation of the submarine fiber cable. He asserted the purpose of the EIA is to assess the potential impacts of the project and to provide corrective or mitigation measures for the negative ones while enhancing the positive aspects of the project. That an Environmental and Social Impact Assessment Study Report (ESIA) shall be compiled and submitted to the National Environment Management Authority who in turn shall approve the project and issue the proponent with an EIA license. He mentioned that part of the EIA process is to conduct public participation and stakeholder consultations in order to gather the views of the likely affected persons by the project and incorporated those views into the project implementation. Therefore, this was the reason a public *baraza* had been convened. He pointed out that some of the impacts of the project will include the following:

Negative Impacts

- Possible interference with marine life during seabed trenching.
- Disruption of beach activities such as swimming and skating.
- Disruption of fishing activities.
- Possible destruction of fish breeding sites.
- Safety concerns such as injuries.

Positive Impacts

- Creation of employment opportunities.
- Improvement of the telecommunication network.
- Provision of stable internet data services.
- Contribution to the economic development of the country.
- Provision of inter-globe connections through fibre optic infrastructure.

Mr. Mathenge requested the participants to also write down their comments on the questionnaires and write down their names on the attendance register. He asked them to express their issues and concerns freely. Mr. Mathenge invited Eng. Kibet to address the meeting.

MIN 3: PRESENTATION BY TELKOM KENYA LIMITED.

In his remarks, Eng. Kibet representing Telkom Kenya noted that the Government is making significant efforts to develop telecommunication infrastructure in the country and ensure that Kenya is linked to the global communication network. He pointed out that an improved telecommunication network would ease doing

business in Kenya, open opportunities for online job opportunities and ultimately lead to improvement of livelihoods and economic growth. He informed the meeting that Telkom Kenya is the landing partner of the Africa 1 Fiber Cable System and therefore it is responsible for project implementation. Eng. Kibet told the meeting that he has been engaged in public consultation meetings previously during the implementation of prior projects such as Lion 1 and PEACE submarine cable. He however regretted that Telkom has not been able to implement the CSR project requested by the Beach Management Unit which involved the construction of a public toilet at the beach and gave the reason that the BMU has not been able to identify a suitable site which on public land for construction of the toilet. He assured the meeting that TKL shall take into consideration the comments of the public and stakeholders and shall strive to work harmoniously with the BMU and the members of the public within the project area.

MIN 4: COMMENTS AND RESPONSES FROM MEMBERS PRESENT

Bilal Hider – Fisherman

He started by inquiring about the positive impacts of the project. He questioned why Telkom Kenya Limited had fulfilled the earlier agreed proposal to put up a public toilet at the beach as a Corporate Social Responsibility project as compensation for disruptions of their activities. He also mentioned that the public had requested the proponent to install a Wi-Fi hotspot point at Nyali Beach he lamented that despite their cooperation, Telkom had not shown goodwill and had ignored their pleas. He emphasized that they ought to be cooperation between the proponent, beach users, BMU and all other stakeholders.

Said A. Juma – Nyali Fisherman

He reiterated the issue of CSR and the construction of a public toilet as Mr. Bilal had mentioned it. He complained that Telkom Kenya was not compensating the beach users and fishermen for the losses incurred because of disruption and gave an example of the previous project that involved the installation of PEACE submarine cable in the previous year. He added that the proponent does not engage further the public during the project implementation. Additionally, he wanted to know the negative impacts of the project; he asked if a research that had been conducted to show the effects of the fibre optic cable on human health fearing that the undersea cable could have health effects on beach users and fishermen.

Mr. Juma was concerned that the submarine cable will affect the fish breeding sites/hatcheries and lead to decline of fish in the ocean thereby affecting their livelihoods. He lamented that they have not reaped any benefits from previous projects and worried that the current project will also not benefit the beach users and the fisherfolk. He suggested that future meetings should be held in the presence of NEMA, KWS and other stakeholders. Additionally, he said that the public consultation questionnaire should also be translated into Kiswahili, which is a National language. He suggested that Telkom should devise a proper mechanism for addressing grievances. He asked that locals be considered for job opportunities.

Dominic Mwamburi – Village Elder

The village elder alluded to the importance of cooperation between Telkom Kenya Limited and the locals. He maintained that compensation should be done for loss of livelihoods as a result of disruption during project implementation. He advised that all the opinions either supporting or against the project should be considered in order to ensure support and ownership of the project. Moreover, he said that there should be continuous engagement between the proponent and all stakeholders including members of the public.

Francis Ngiro – Boat Operator

Mr. Ngiro emphasized that research should be conducted to determine the effects of submarine fibre optic cables on marine, aquatic and human life. He was concerned about the remedies that would be instituted if it were revealed fibre optic cable had negative effects on human health. He feared beach users and fishermen would be directly affected.

Idi Mohammed – Treasurer Nyali Beach Management Unit

Mr. Mohammed was concerned that the proponent had not acted upon the earlier promises that were made to the BMU. He felt that Telkom Kenya Limited was not cooperating with the BMU and other beach users and their opinions were ignored. He gave an example where they reported that Lion 1 fibre cable had been displaced and Telkom was yet to restore the cable. He mentioned that the earlier installations of submarine fibre cables had destroyed coral reefs, seagrass and breed sites. He complained that once a project is over the proponent does not engage the community, BMU or beach users and therefore they are also not obligated to cooperate with the proponent. He insisted that there should mutual understanding and cooperation between stakeholders and the proponent.

Billy Imbayi – Official BMU

He asked that Telkom should ensure continuous involvement of the BMU and have a long-term engagement with all beach operators. He pointed out the need for unity among the stakeholders at Nyali Beach, especially the BMU/fishermen, boat operators, tube renters and other beach users. He suggested that there should be an umbrella body that advances the interest for all the operators noting the BMU was only concerned with the fisherfolk.

Abdulrazak Ali – Village Elder

Mr. Ali noted that the installation of the submarine fibre cable would affect activities at the beach. He asked that compensation should be done because of the loss to be incurred by the beach operators. He also requested that adequate safety measures be put in place to avoid injuries.

Ali – Tube Renter

His concern was how the beach operators will be compensated because of the interruption of their activities. He emphasized the need for the operators to be involved during the entire project cycle.

Chairman – Tube Renters

The chairman of the tube renters asserted that there is need for the beach management unit to involve and represent all the beach operators, as this will ensure that they all speak in one voice and their grievances will be addressed. He pointed out that the disunity among the beach operators has not yielded any significant results and has worked to their disadvantage.

The chairman informed the meeting that swimmers have encountered injuries due to exposed rocks as a result of excavations. He said that sometimes the operators have to instruct one of them to guide the swimmers so as to avoid unsafe areas. He asked that safety measures should be put in place during the installation and that Telkom should make sure that there is a good relationship with all the stakeholders.

Ali Ahmed Ali

Mr. Ali agreed with the senior chairman of the tuber renters and called for the unit among the beach operators. He asked that the proposed submarine fibre optic cable route should be aligned in a way that avoids the destruction of marine life and breeding sites and fish hatcheries.

Francis Nyiro – Boat Operator

Mr. Nyiro wanted to know the safety measures that the proponent will put in place during the construction and operation phase to safeguard the safety and health of the members of the public and beach operators. He suggested that Telkom should put in place a monitoring procedure during the project cycle.

Bimal Bichu

He informed the meeting that ocean bed excavations that took place during the installation of previous cables had exposed rocks which pose safety risks to swimmers. Some sections had been left with depressions making

them dangerous to swimmers and posing the risk of drowning. He also wanted to know how the fibre cables help in terms of telecommunication network.

Kennedy Andrew

Mr. Kennedy highlighted the disunity among the beach operators and called for unity among all the stakeholders. He insisted that there is a need to have a memorandum of understanding between Telkom and the beach operators. This will ensure that all their concerns are considered during the project implementation. He asked Telkom to ensure that the installation works are supervised.

MIN 5: RESPONSES TO ISSUES RAISED

Henry K Rop- Senior Assistant County Commissioner (ACC)

In response, the Snr. ACC informed the meeting that Telkom Kenya Limited is a government entity and therefore it is a public institution requiring the support of citizens. He stated the project would benefit the country and lead to telecommunication infrastructure.

The Snr. ACC articulated the importance of public participation as it allows members of the public to air their concerns regarding the proposed project. He stated the requirement of public participation is anchored in the Constitution. He however regretted the low participation/turnout of members of the public during participation meetings.

He asked Telkom Kenya to ensure that the beach operators benefit from the project and if possible compensation to be done for the losses incurred due to disruption. He asked the beach operators to ensure that there is unity amongst them and requested the members present to support the project.

Stanley Mathenge – Environment Expert, Environtech Consultancy Africa Ltd.

Mr. Mathenge informed the meeting that all the comments and concerns raised have been captured and that they will be documented in the ESIA report and communicated to the proponent. He mentioned that since Environtech Consultancy Africa Ltd was also involved in preparing ESIA for the previous Project (PEACE Submarine cable) the issues that were raised then were communicated to Telkom Kenya. He assured the meeting that an Environmental Management and Monitoring Plan shall be developed in the ESIA study report which will guide the project implementation.

Mr. Mathenge agreed with the Snr. ACC and asked the operators to ensure unity amongst them. He also assured them that before licensing of the project, a wider public consultation shall be called through the publication of the ESIA study report in local dailies and NEMA website and that all the stakeholders shall be consulted. Mr. Mathenge thanked the members present for their participation.

Eng. Sylvester Kibet – Engineer, Telkom Kenya Limited

The engineer started by assuring the meeting that Telkom Kenya gives priority to the locals in terms of job opportunities. He, however, regretted that he has encountered a case when the locals turned down the opportunities during the previous project (PEACE submarine cable).

On the issue of compensation for the losses incurred as a result of the disruption, he told the meeting that Telkom Kenya was not in a position to compensate because there is no specific list containing the number of people to be compensated and the nature of losses incurred. He gave an example where Telkom Kenya had received two different lists of people claiming to be compensated and therefore the issue of direct compensation was not considered.

Regarding the CSR project (construction of a public toilet), he assured the meeting that this proposal was accepted and allocated about Ksh. 2.5million. However, the BMU had not identified a suitable site, which must be public land for the construction of the toilet, and this is the reason the CSR project has not been executed.

Concerning the health effects of fibre cables, Eng. Kibet assured the meeting that fibre optic cables are safe and utilize light to transmit data using low energy. He also said the fibre cables are strong enough and not easy to cut.

The other issue he mentioned was regarding the dislodged LION submarine fibre cable and he assured the meeting that maintenance had been scheduled to take place in August.

Eng. Kibet assured the meeting that Telkom Kenya shall continuously cooperate and work together with all the stakeholders including the BMU and other beach operators. He also called for unity among the operators.

MIN 6: CLOSING REMARKS

The Snr. Assistant County Commissioner thanked the attendees for their participation and input. He stressed the need for unity among all the stakeholders and charged the Chiefs with the responsibility of uniting the beach users and operators. He also thanked the consultant and Telkom Kenya for convening the public participation meeting. He assured members that the government shall always strive to address any issues raised by the members of the public and called upon Telkom to also address issues and concerns raised.

MIN 7: AOB

There being no other business the meeting was adjourned at 12:35 pm.

Signed,

Chairman	**Secretary**
Name: **Rose Chege**	Name: **Job Mucoki**
Position **Deputy County Commissioner**	Position **Lead Expert**
Organization: **Office of the President (Interior and National Administration)**	Organization: **Environtech Consultancy Africa Ltd**
Signature:	Signature:
Stamp: DEPUTY COUNTY COMMISSIONER NYALI SUB-COUNTY 30 JUN 2023 P. O. Box 156 - 80122 KENGELENI	Stamp: ENVIRONTECH CONSULTANCY AFRICA LTD. 0704146060 26 JUN 2023 0777033386 P.O. Box 16601-00100 NAIROBI

Confirmed by:

Name: **Stanley Mathenge Mwangi**

Position **Managing Director/Lead Expert**

Organization: **Environtech Consultancy Africa Ltd**

Signature:

Stamp: ENVIRONTECH CONSULTANCY AFRICA LTD. 0704146060 26 JUN 2023 0777033386 P.O. Box 16601-00100 NAIROBI

Annex E: Public Consultation Meeting Attendance list

Telkom Kenya Limited

Environtech Consultancy Africa Ltd

DEPUTY COUNTY COMMISSIONER
NYALI SUB-COUNTY
P. O. Box 156 - 80122
KENGELENI

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

PUBLIC PARTICIPATION MEETING – REGISTER OF PARTICIPANTS

LOCATION KONGOWEA SUB LOCATION MKOMANI VENUE NYALI BEACH DATE 19/06/2023

NO.	NAME	OCCUPATION	GENDER (M/F)	PHONE NO.	ID NO.	SIGNATURE
1.	Stanley Matonge Mwangi	ENVIRONTECH CONSULTANCY AFICA LTD	M	0734146060	13452427	
2.	Job Mucoki	ENVIRONTECH CONSULTANCY AFRICA	M	0728674453	25683058	
3.	BILAL HAIDER	FISHERMEN	M	0716154041	22807165	
4.	Iddi Mohamed	Nyali Treasure B.M.U	M	0703433291	11458596	
5.	FRANCIS NYIRO	Boat operator	M	0799962250	23833953	
6.	BAKARI EMMANUEL	Tube runner	M	0797743464	34321704	
7.	Vincent Mbai	Boat operator	M	0113057636	35095815	
8.	SAMUEL NGALA	Tube renter	M	0793050375	36136593	
9.	Kennedy Andrew	Seat operator	M	0736837507	33905??	
10.	BILLY / MBAYI	Official	M	0715481875	28102655	
11.	JOSEPH Choi	Boat operator	M	0720092238	23037268	
12.	Alhman Abubaker	Beach Operator	M	0733667337	24992098	

Telkom Kenya Limited

DEPUTY COUNTY COMMISSIONER
NYALI SUB-COUNTY
19 JUN 2023
P. O. Box 15
KENGELENI

Environtech Consultancy Africa Ltd

NO.	NAME	OCCUPATION	GENDER (M/F)	PHONE NO.	ID NO.	SIGNATURE
13.	Zack Kangetha	Beach operator	M	0731157625	30394769	
14.	Michael BAYA JUMA	Beach operator	M	0790249195	37830123	
15.	Mahamud Kuchunds	TUBE Renter	M	0716589225	21020352	
16.	ELvis Levis Aniga	Beach operater	M	0741950627	28400408	
17.	DOMINIC M. MWAMBURI	V/MANAGER	M.	0726728920	5396191	
18.	WILLIAM MAUNDU	V/MANAGER	M.	0712426222	3693500	
19.	Joseph M Clei	Boat operator	M	0720092238	23037268	
20.	Ali H RASHID	Beach operator Early bird banda		0725081700	20133493	
21.	Fredrick WASWA	MUTHU HOTEL	M	0799693112	26419699	
22.	ALI AHMED ALI	E.B.b.	M	0745484535	41218509	
23.	UST, SALIM SAID HUSSEIN	V/MANAGER	M	0729062919	0749320	
24.	HIDAYA KEA KIBWANA	V/MANAGER	F	0701628917	13594415	
25.	ABDULRAZAK ALI	FISHERMEN CLOCK	M	0731412729		
26.	Keith Hamisi ODUOR	E.B.b	M	0741765225	35882963	
27.	SAID A. JUMA	DAT FOR NYALI FISHERMEN COM	M	0717570272	9988598	
28.	BABY MKAJIRE	BEACH OPERTE	M	0728652581	8522240	
29.	CHARLES OPIYO	PHOTOGRAPHER	M	0769542219	0253307	

Telkom Kenya Limited

Environtech Consultancy Africa Ltd

DEPUTY COUNTY COMMISSIONER
NYALI SUB-COUNTY
P. O. Box 156 - 80122
KENGELENI

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

PUBLIC PARTICIPATION MEETING – REGISTER OF PARTICIPANTS

LOCATION KONGOWEA SUB LOCATION MKOMANI VENUE NYALI BEACH DATE 19th June 2023

NO.	NAME	OCCUPATION	GENDER (M/F)	PHONE NO.	ID NO.	SIGNATURE
1.	Rose W Chege	DCC	F	0727351990	12521092	
2.	Henry K. Rop	SACC	m	0721248657	10988394	
3.	Benard Omolo	Chief	m	0710755574	17667473	
4.	THOMAS RUWA.	ASST. CHIEF ZIWA LA NGOMBE	M	0712-399374	26714786	
5.	MOGEHDI OBEDY	ASS. CHIEF MAWENI	M	0728571593	27946271	
6.	YASMIN OMAR MOHAMED	CHIEF-KONGOWEA	F	0729010391	11248070	
7.	KERORO G PHILIPH	ASS-CHIEF MKOMANI	m	0712475869	20765857	
8.	florence Maina	Village Manager	f	0727351469	11170334	
9.	JOSEPH M. MUMBO	VILLAGE MANAGER	M	0726475977	05010124	
10.	SYLVESTER KIBET	COMMUNITY TKL	M	0720847934	22142151	
11.	TONNY MASAI	Photographer	M	0726511962	25597315	
12.	ALEX M. MWASHIGADI	Photographer	m	0722372578	13456005	

Annex F: Photos from Stakeholder Engagement Meeting

Annex G: Completed Stakeholder Questionnaires

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

STAKEHOLDER CONSULTATION QUESTIONNAIRE

Telkom Kenya Limited (TKL) or Telkom is a technology company that provides integrated solutions to individuals, Small and Medium-sized Enterprises (SMEs), Government and large corporates in Kenya, drawing from a diverse solutions suite that includes voice, data/connectivity, digital financial services, as well as network services. Powered by its vast fibre optic infrastructure, it is also a major provider of wholesale carrier-to-carrier traffic, within the country and the region.

Africa One (1) Submarine Cable project is designed to install a submarine cable system (African 1 Cable System), connecting the United Arab Emirates, Pakistan, Kenya, Djibouti, Egypt, Saudi Arabia, and France and may later be extended to South Africa and also connect to other countries like Mozambique, Madagascar, Tanzania, Somalia, Yemen, Eritria Sudan Syschelles, Italy and India. Telkom Kenya Ltd is the landing partner of Africa 1 Cable system in Kenya. As such, Telkom is responsible for the effective implementation of the approved Environmental and Social Management and Monitoring Plan (ESMMP) and environmental license conditions.

Telkom Kenya Limited has contracted **Environtech Consultancy Africa (ECA) Ltd,** a Firm of Environmental Experts, to conduct the Environmental and Social Impact Assessment (ESIA) for this project and submit a study report to the National Environment Management Authority (NEMA) for licensing. This is to comply with the Environmental Management and Coordination Act (EMCA), 1999 (Revised 2015) and the Environmental (Impact Assessment and Audit) Regulations, 2003 (Amended 2019).

Public participation stakeholder consultation is a legal requirement in the ESIA process the key principle of consultation is to ensure that the views of stakeholders are considered and reported throughout the ESIA process. The objective is to ensure that the assessment is robust, transparent, and has considered the full range of issues or perceptions, and to an appropriate level of detail. Stakeholder participation will assist in identifying environmental and social impacts of the proposed project and ensure that these are evaluated and mitigated in the process and incorporated into the project design and implementation.

As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What is your general comment/views on the proposed project?**

It is generally a good Project for our country and other nations

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

(1) There will be destruction of corals, Sea grass, Seaweeds and other biodiversity at the floor of the Sea and the beach affecting the beach and exposing some organisms including killing them when laying the cable.
(2) Tourism/Tourists will be affected by noise Pollution and visibility of the sea will be Reduced to sediments and KWS staff will also be affected noise & monitoring of aquatic life. (3) The machines at the beach can injure people (4) Pollution - oil/petrol

3. **Kindly propose mitigation measures the proponent/contractor needs to put in place during the installation and operation phases of the project?**

(1) Pay for restoration of the habitat eg Corals, beach
(2) Undertake a CSR Project to boat operators and KWS for affecting tourism.
(3) Pay for monitoring by KWS of the project during and after the project.
(4) Avoid using heavy machines
(5) Avoid working during peak hours for tourists to the Park.
(6) Since the cable will go through the protected Area which is Patrolled daily meaning safety of the cable, the cost of Patrol boat should be catered for.

4. **What positive impacts do you expect to emanate from the development of the Project?**

(1) Communication will improve and Connectivity between and within nations will also improve.
(2) People working there will get jobs/money.
(3) The Park will be known all over the world through Telekom.

NOTE: You may use additional sheets if necessary

5. **In your option, do you think the proposed project will lead to climate change?**

Not really Unless there will be more destruction of biodiversity.

6. **In what ways do you think the climate change will impact the proposed project?**

- High temperatures may affect the workers and the cables.
- Sea rise may affect some of the installations

7. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

- Restoration of degraded areas/habitats
- Planting of mangroves and trees
- Avoid use of petrol/diesel bigmachines.
- Project should support KWS with Solar energy installation in staff camp at Mombasa marine and offices to stop using electricity.
- Support KWS/Beach operators/Bura with a water desalinization machine at Pirates (KWS camp) and at Nyali Bmu.

NOTE: You may use additional sheets if necessary

8. **What other comments or suggestions do you have?**

- There should be a session to share the drawings and explain the scope of work before starting the project.
- The passage of the cable must be discussed early enough so that we avoid laying cables on corals or sea grass but select bare rocks/sand

9. **Do you support the proposed project? (Tick ✔)** **[YES]** ✔ **[NO]**__

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details ***(This information will be treated confidentially)***

Name: JOHN M. WAMBUA	Affiliation/Organization: KENYA WILDLIFE SERVICE
Designation: SENIOR ASSISTANT DIRECTOR	Postal Address: P. O BOX 82144-80100 MOMBASA
Email: adcoast@kws.go.ke or jwambua@kws.go.ke	Telephone +254722418900
ID No.: 11601138	Signature: [signature]
Date: 29/06/2023	Stamp:

NOTE: You may use additional sheets if necessary

For any further inquiries or suggestions regarding the ESIA study for the proposed submarine cable please contact:

Managing Director
Environtech Consultancy Africa Ltd
Lonak Business Center, 2nd Floor, Suite 18B
Along Kasarani-Mwiki Road, Off Shell Petrol Station
P.O. Box 16601-00100 Nairobi
Tel: Tel: +254-704146060, +254-704146060, +254-777033386,
Email: info@environtechafrica.com/ stanmwa@gmail.com
Website:www.environtechafrica.com

NOTE: You may use additional sheets if necessary

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

STAKEHOLDER CONSULTATION QUESTIONNAIRE

Telkom Kenya Limited (TKL) or Telkom is a technology company that provides integrated solutions to individuals, Small and Medium-sized Enterprises (SMEs), Government and large corporates in Kenya, drawing from a diverse solutions suite that includes voice, data/connectivity, digital financial services, as well as network services. Powered by its vast fibre optic infrastructure, it is also a major provider of wholesale carrier-to-carrier traffic, within the country and the region.

Africa One (1) Submarine Cable project is designed to install a submarine cable system (African 1 Cable System), connecting the United Arab Emirates, Pakistan, Kenya, Djibouti, Egypt, Saudi Arabia, and France and may later be extended to South Africa and also connect to other countries like Mozambique, Madagascar, Tanzania, Somalia, Yemen, Eritria Sudan Syschelles, Italy and India. Telkom Kenya Ltd is the landing partner of Africa 1 Cable system in Kenya. As such, Telkom is responsible for the effective implementation of the approved Environmental and Social Management and Monitoring Plan (ESMMP) and environmental license conditions.

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Public participation stakeholder consultation is a legal requirement in the ESIA process the key principle of consultation is to ensure that the views of stakeholders are considered and reported throughout the ESIA process. The objective is to ensure that the assessment is robust, transparent, and has considered the full range of issues or perceptions, and to an appropriate level of detail. Stakeholder participation will assist in identifying environmental and social impacts of the proposed project and ensure that these are evaluated and mitigated in the process and incorporated into the project design and implementation.

As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What is your general comment/views on the proposed project?**

   The project will improve communication in the country and promote economic growth in Kenya and regionally.....

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**
   a) *Interference of safety of navigation of other sea users during the project installation stage*

NOTE: You may use additional sheets if necessary

b) *Destabilization of sediments during installation leading to water turdity which may cause smouthering of marine organisms.*

c) *Interferance with marine habitats and marine organisms due to under water noise.....*

d) *Possible oil pollution from the vessels engaged in installation due to operational spills or accidents.*

e) *Interference/ breaking of other submarine cables/ under sea pipelines*

3. Kindly propose mitigation measures the proponent/contractor needs to put in place during the installation and operation phases of the project?

a) *The proponent needs to provide details of the project together with project implementation schedule for issuance of Notice to Mariners to alert other sea users of the ongoing project.*

b) *All the vessels to be engaged in installation needs to be licensed by Kenya Maritime Authority.*

c) *The proponent needs to develop and mantain an emergency response plan to respond to oil pollution incidents as they may arise.*

d) *All accidents/ incidents need to be reported immediately to Kenya Maritime Authority via Regional Maritime Rescue Coordination Center on (+254721368313 or +254737719414).*

e) *The proponent needs to conduct water and sediment quality testing as a baseline before project is implemented and conduct water quality monitoring weekly during the project installation period. The results of the same needs to be submitted to Kenya Marine Fisheries Research Institute, National Environment Management Authority and Kenya Maritime Authority.*

f) *The proponent needs to take due regard of other existing submarine cables and undersea pipelines to avoid interference during installation.*

g) *The proponent needs to map out the submarine cable after installation and submit information on the same to Kenya Maritime Authority.*

NOTE: You may use additional sheets if necessary

1. **What positive impacts do you expect to emanate from the development of the Project?**

Improvement in communication in the country.....

2. **In your option, do you think the proposed project will lead to climate change?**

.....n/a.....
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3. **In what ways do you think the climate change will impact the proposed project?**

.....n/a.....
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NOTE: You may use additional sheets if necessary

4. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

Plant mangrove trees as part of Corporate social responsibility.....
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5. **What other comments or suggestions do you have?**

The proponent needs to engage all other relevant stakeholders before commencing the project...

The vessels engaged in the project need to employ Kenyan seafarers atleast two in each vessel during the entire period of the Project. .....

6. **Do you support the proposed project? (Tick ✔) [YES] ✔___ [NO]___**

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: Mr. John Omingo	Affiliation/Organization: Kenya Maritime Authority
Designation:	Postal Address:

NOTE: You may use additional sheets if necessary

Director General	P.O. Box 95076 – 80104 Mombasa
Email: Info@kma.go.ke	Telephone _254724319344
ID No. :	Signature:
Date : 20/06/2023	Stamp:

KENYA MARITIME AUTHORITY
KMA
WHITEHOUSE BLDG, MOI AVENUE
TEL: 020 239 1303/4
P. O. Box 95077 80104,
MOMBASA
Email: info@kma.go.ke
website: www.kma.go.ke

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Tel: Tel: +254-704146060, +254-704146060, +254-777033386,
Email: info@environtechafrica.com / stanmwa@gmail.com
Website:www.environtechafrica.com

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Telkom Kenya Ltd

Environtech Consultancy Africa Ltd

STAKEHOLDFER CONSULTATION FOR ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

REGISTER OF PARTICIPANTS

NAME OF STAKEHOLDER: Kenya Maritime Authority **DATE** 21/06/2023

NO.	NAME	POSITION	PHONE NO.	EMAIL ADDRESS	SIGNATURE
1.	Stellamaris Mutiee	Senior Marine Environment Officer	0729319399	smutiee@kmacg.ke	
2.					
3.					
4.					
5.					
6.					

Official STAMP:

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. What is your general comment/views on the proposed project?

The project is good for the country as it will enhance connectivity, communication and trade between Kenya and the rest of the world especially the Middle East and Asian Countries. The project will enhance Kenyan economic growth by creating mor job opportunities for the Kenyan youth especially in the areas of Information, Communication and Technology (ICT) in line with Kenya Kwanza Government Economic Agenda……
……

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

The negative environmental impacts expected include the following (1) The Marine cables may need to be buried under the seabed meaning that there will be need to make trenchs on the seabed. The shallow water areas where the marine cable is a marine protected area (Marine reserve) rich in biodiversity. Digging trenches in the area will destroy the environment and may kill some benthic flora and fauna. The marine debris generated during the trench making may affect the turbidy of the water decreasing the visibility of the water which may interfere with movement of the sea organisms.

The negative social impact will include interference with fishing which is an economic activity especially for small scale fishermen who fish in the reserve area where the cables will be passing through and landing at Nyali especially during the digging of trenches and the laying down of cables. This may have a negative impact as it will interfere on fishers source of livelihoods, employment and food security. Sometimes this may call for compensation for the loss of fishing days or fishing grounds by infrastructural development projects.

The negative safety impacts may included include the interference of safety of navigation especially in the EEZ and shallow waters if the cables are not well buried or tethered on the seabed. These cables should not be left hanging or suspended in the water currumun. These cables if they are electrified, they can cause harm to the fish, swimmers and the fishing boats and therefore they should be well buried or tethered .

3. **Kindly propose mitigation measures the proponent/contractor needs to put in place during the installation and operation phases of the project?**

To mitigate against environmental damage and interference with flora and fauna, the project proponent should use highly qualified personnel and experienced in lying the marine cables. During the digging of trenches, the project proponent should make sure that minimum debris are generated so that the water turbidity is not increased.

To mitigate against negative social impacts, the proponent should ensure that all the maritime communities including the fisherfolk are well sensitized on the upcoming project. The proponent should set up a grievance address mechanism and a desk incase any of the maritime stakeholders has an issue to raise. If the project may waste many fishing days, the proponent should think of setting a comprehensive compensation scheme for those livelihoods and economic activities are interfered with.

To mitigate against negative safety issues, the proponent should ensure that the marine cable is will buried, secured or tethered to the sea bed so that the sea creatures, the swimmers and the fisherfolk are not entangled by these marine cables. The proponent should do a proper sinage indicating the route that the cables are passing and be providided to ships and other mariners.

NOTE: You may use additional sheets if necessary

4. **What positive impacts do you expect to emanate from the development of the Project?**

   The positive impacts that will emanate from this development project will include: (1) Increased connectivity, communication and trade between Kenya, middle east countries and the rest of Asian countries. The project will also increase ICT job opportunities for the Kenyan youth in line with Kenya Kwanza Government Economic Agenda. The project will also enhance of Kenya's Blue Economic growth by enhancing network, trade and commerce with the rest of the world.

   ……

   In your option, do you think the proposed project will lead to climate change?

   NO

   ……

5. **In what ways do you think the climate change will impact the proposed project?**

   *The project can only be affected by the climate change if there will be sea level rise or sea level decrease as this may affect the cost of installation of the marine cables***.**

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

   NONE

7. **What other comments or suggestions do you have?**

   The Kenya Coast Guard Service mandate is to enforce maritime security , safety and the protection of marine resources. The project proponent should work closely with the Kenya coast Guard service during the laying of the cables to provide security and safety of the workers. Any maritime emergencies should be reported to the Kenya Coast Guard Service

8. **Do you support the proposed project? (Tick ✔) [YES] _*X*___ [NO]___**

If NO please give your reasons for the objection.

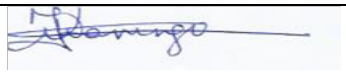
……

……

……

NOTE: You may use additional sheets if necessary

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: John K. Wanyoike	Affiliation/Organization: Kenya Coast Guard Service
Designation:Ag. Director Enforcement and Emergency Response	Postal Address: 86943-80100 Mombasa Kenya
Email:hfed@kcgs.go.ke, karungoj@yahoo.com	Telephone : +254 727246958
ID No. : 8506931	Signature: 
Date : 27th June 2023	Stamp:

For any further inquiries or suggestions regarding the ESIA study for the proposed submarine cable please contact:

Managing Director
Environtech Consultancy Africa Ltd
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Along Kasarani-Mwiki Road, Off Shell Petrol Station
P.O. Box 16601-00100 Nairobi
Tel: Tel: +254-704146060, +254-704146060, +254-777033386,
Email: info@environtechafrica.com/ stanmwa@gmail.com
Website:www.environtechafrica.com

NOTE: You may use additional sheets if necessary

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What is your general comment/views on the proposed project?**

O The benefits gains from the project are enormous towards digitalization of medical services for faster access within and entire world making telemedicine a reality.

PORTREITZ SUB-COUNTY HOSPITAL
MEDICAL SUPERINTENDENT
Date:
Sign:
P.O. Box 0502-80100, MOMBASA

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

(1) Environmental impact are expected only during laying of the cable at sensitive disturbance of the coral and sea life but can be managed
(2) Social and Safety are issues that can be dealt with upon. Such incidents arising however monitoring require safety officers during laying

3. **Kindly propose mitigation measures the proponent/contractor needs to put in place during the installation and operation phases of the project?**

(1) Engage Safety officers conversant with such job to do job analysis before carry tasks and implementation of the same.
(2) Contractor to ensure the personnels are well drilled on safety and response measure in case of any emergency.

4. **What positive impacts do you expect to emanate from the development of the Project?**

(1) Contribute towards digitalization of services
(2) Enable telemedicine to become a reality with the reliable infrastructure.
(3) Source of incomes to families on jobs.

PORT EITZ SUB-COUNTY HOSPITAL
MEDICAL SUPERINTENDENT
Date:
Sign:
P. O. Box 90502-80100, MOMBASA

NOTE: You may use additional sheets if necessary

5. In your option, do you think the proposed project will lead to climate change?

The implementation and operation are low in climate change contribution as the operations may be mitigated.

6. In what ways do you think the climate change will impact the proposed project?

(1) The operational machinery and trucks during laying and monitoring of cable safety, may raise some concerns.

7. What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?

(1) Adherence to industry standards and the recommendations of the industry safety officers.
(2) During operational monitoring the use of green energy to be incorporated.

PORTREITZ SUB-COUNTY HOSPITAL
MEDICAL SUPERINTENDENT
Date:
Sign:
P.O. Box 90502-80100, MOMBASA

8. What other comments or suggestions do you have?

The long term operators to share incidents of accidents to help health facilities to be prepared for such new occurrences.

NOTE: You may use additional sheets if necessary

.....emel data for planning of such.....
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.....

9. **Do you support the proposed project? (Tick ✔)** **[YES]** ✔ **[NO]**__

If NO please give your reasons for the objection.

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.....
.....

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

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Designation: PHO/OSH	Postal Address: 8721 90502-80100
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ID No. :	Signature:
Date :	Stamp: PORTREITZ SUB-COUNTY HOSPITAL MEDICAL SUPERINTENDENT Date: Sign: P.O. BOX 90502-80100, MOMBASA

For any further inquiries or suggestions regarding the ESIA study for the proposed submarine cable please contact:

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P.O. Box 16601-00100 Nairobi
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Website:www.environtechafrica.com

NOTE: You may use additional sheets if necessary

STAKEHOLDFER CONSULTATION FOR ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

REGISTER OF PARTICIPANTS

NAME OF STAKEHOLDER: _____ DATE _____

NO.	NAME	POSITION	PHONE NO.	EMAIL ADDRESS	SIGNATURE
1.	JOSEPH K. WANJOHI	PHO/OSH	0721391590	wanjohi.joseph@gmail.com	
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MEDICAL SUPERINTENDENT
Date:.....
Sign:.....
★ P.O. Box 90502-80100, MOMBASA

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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Africa One (1) Submarine Cable project is designed to install a submarine cable system (African 1 Cable System), connecting the United Arab Emirates, Pakistan, Kenya, Djibouti, Egypt, Saudi Arabia, and France and may later be extended to South Africa and also connect to other countries like Mozambique, Madagascar, Tanzania, Somalia, Yemen, Eritrea, Sudan, Seychelles, Italy and India. Telkom Kenya Ltd is the landing partner of Africa 1 Cable system in Kenya. As such, Telkom is responsible for the effective implementation of the approved Environmental and Social Management and Monitoring Plan (ESMMP) and environmental licence conditions.

Telkom Kenya Limited has contracted **Environtech Consultancy Africa (ECA) Ltd,** a Firm of Environmental Experts, to conduct the Environmental and Social Impact Assessment (ESIA) for this project and submit a study report to the National Environment Management Authority (NEMA) for licensing. This is to comply with the Environmental Management and Coordination Act (EMCA), 1999 (Revised 2015) and the Environmental (Impact Assessment and Audit) Regulations, 2003 (Amended 2019).

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What is your general comment/views on the proposed project?**

Overall, the project will bring more economic benefits that out way the negative environmental impact it may have. However, the cable passes through a protected area and if alternatives exist, this should be avoided.

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**
   i. Water pollution from ship/boats discharge affects the functioning of marine organisms.

NOTE: You may use additional sheets if necessary

ii. Destruction of corals and habitats through activities such as drilling when placing cables.

iii. Noise from equipment may disrupts fish and other creatures

iv. Sedimentation due to drilling when placing cables may cause smothering of some marine plants and corals

v. During the laying of the cable people are denied access to the area reducing tourism activities.

vi. Threatened species such as turtles might experience stress and move aways from the habitat

3. **Kindly propose mitigation measures the proponent/contractor needs to put in place during the installation and operation phases of the project?**
   - **I.** Ensure all workers have personal protective equipment (PPEs).
   - **II.** Disposal of cable materials in accordance with environmental regulations.
   - **III.** The contractor should ensure all the environmental guidelines and protocols are followed.
   - **IV.** Ensure all the sensitive areas identified are avoided.

4. **What positive impacts do you expect to emanate from the development of the Project?**
   1) Creation of employment opportunities to various people during construction.
   2) Improvement of Kenya's network and tele-communication services.

5. **In your opinion, do you think the proposed project will lead to climate change?**

In my opinion the proposed project has little impact on climate change during its operation. However during cable laying, there is possibility of emission of green house gases from machinery uses.

6. **In what ways do you think climate change will impact the proposed project?**
   - Adverse weather conditions such as storms may cause displacements of the fibre optic cables in shallow waters.

7. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**
   A. The contractor should ensure that the cable is buried deeper in the ground and intact.

8. **What other comments or suggestions do you have?**

No comments or suggestions.

9. **Do you support the proposed project? Yes**

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

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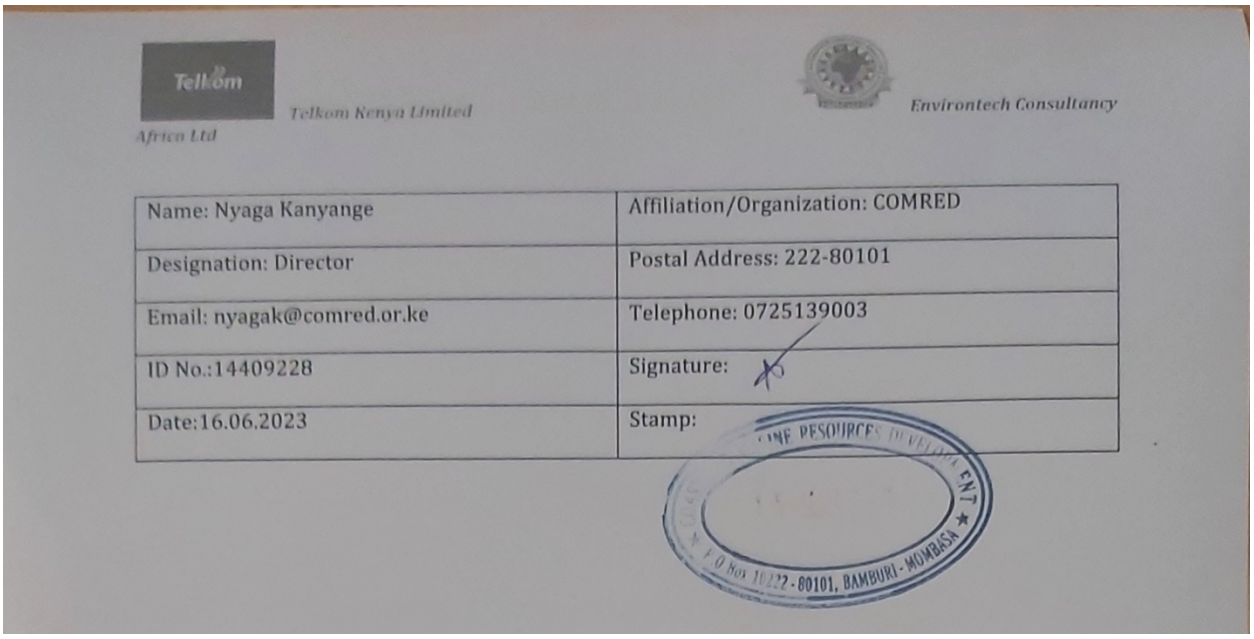

Telkom Kenya Limited
Africa Ltd
Environtech Consultancy

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ID No.:14409228	Signature:
Date:16.06.2023	Stamp:

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Telkom Kenya Limited

Africa Ltd

Environtech Consultancy

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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1. **What is your general comment/views on the proposed project?**

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2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**
   i. Water pollution from ship/boats discharge affects the functioning of marine organisms.

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ii. Destruction of corals and habitats through activities such as drilling when placing cables.

iii. Noise from equipment may disrupts fish and other creatures

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v. During the laying of the cable people are denied access to the area reducing tourism activities.

vi. Threatened species such as turtles might experience stress and move aways from the habitat

3. **Kindly propose mitigation measures the proponent/contractor needs to put in place during the installation and operation phases of the project?**
   - **I.** Ensure all workers have personal protective equipment (PPEs).
   - **II.** Disposal of cable materials in accordance with environmental regulations.
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4. **What positive impacts do you expect to emanate from the development of the Project?**
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5. **In your opinion, do you think the proposed project will lead to climate change?**

In my opinion the proposed project has little impact on climate change during its operation. However during cable laying, there is possibility of emission of green house gases from machinery uses.

6. **In what ways do you think climate change will impact the proposed project?**
   - Adverse weather conditions such as storms may cause displacements of the fibre optic cables in shallow waters.

7. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**
   A. The contractor should ensure that the cable is buried deeper in the ground and intact.

8. **What other comments or suggestions do you have?**

No comments or suggestions.

9. **Do you support the proposed project? Yes**

If NO please give your reasons for the objection.

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Designation: Director	Postal Address: 222-80101
Email: nyagak@comred.or.ke	Telephone: 0725139003
ID No.:14409228	Signature:
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REGISTER OF PARTICIPANTS

NAME OF STAKEHOLDER: COMRED, MOMBASA **DATE** 15/06/2023

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3.	Wawira Mbego	COMRED	0715698444	olivetess67@gmail.com	
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COAST ... RESOURCES DEVELOPMENT
P.O. Box 10222 - 80101, BAMBURI - MOMBASA

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What is your general comment/views on the proposed project?**

The proposed Africa 1 Submarine fibre optic cable system in Nyali, Mombasa County is a noble project that will contribute to the social and economic development, not only in Mombasa area, but also in the entire country. This

NOTE: You may use additional sheets if necessary

is because it will increase the telecommunication and internet connectivity and other related servi in Kenya. Further, it is inline with the Kenya Vision 2030 and the digital economy policies of the Government of Kenya.

2. **What negative environmental, social and safety impacts do you expect from the proposed project?**

Apart from the potential negative impacts identified in the scoping report, the project proposed will impac the potential national heritage resources of the proje area. These assets may include archaeological, histori and palaeontological objects, shipwrecks, lost ancho aircrafts, venerated places with sacred plant specie If such assets lie along the cable system footprint th may get destroyed when trenching. Normally, these asse may be 'known' and thus recorded or 'unknown' waiting to be discovered by an archaeologist/heritage managemen practitioner.

3. **Kindly propose mitigation measures the proponent/contractor needs to put in place during the installation and operation phases of the project?**

The terrestrial sector of 1.7 KM between BMH and CLS on dryland in Nyali area, should be surveyed by coastal archaeological team prior to trenching/ installation. The NMK team should comprise of qualifi archaeologists/technicians. Similarly, the 2.5 KM, stretch offshore from the BMH should be surveye and cleared of potential underwater cultural heri The NMK coastal archaeological team should comp of archaeologists and technicians and with support of diving personnel from the local community. This kind of work has been referred to as heritage impact assessment, which is done as counterpart t EIA meant to address heritage sector concerns of a proposed development (such as this one).

NOTE: You may use additional sheets if necessary

4. **What positive impacts do you expect to emanate from the development of the Project?**

The proposed project will provide opportunity for social and economic development in the area through employment eg contractors, casual labour and other indirect services.
The telecommunication services eg data and internet will be improved by the proposed project. This will support the growth of digital economy subsector in the country.
The corporate social responsibility aspect may also contribute further to social development in the area.

5. **In your option, do you think the proposed project will lead to climate change?**

To be addressed by environmentalists.

6. **In what ways do you think the climate change will impact the proposed project?**

To be addressed by environmentalists

NOTE: You may use additional sheets if necessary

7. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

The project proponent, Telkom Kenya Ltd and Alcatel Submarine Network Ltd may support climate change mitigation and adaptation measures e.g. planting trees and restoring natural and cultural heritage along the shorelines, rehabilitation of wetlands and construction of seawalls to protect endangered ruined Swahili towns on the shores..

8. **What other comments or suggestions do you have?**

Concerning mitigation of potential negative impact on national heritage assets - protected under National Museums and Heritage Act 2006, the proponent should provide financial facilitation for archaeological/ heritage survey and recovery of potential heritage objects along the cable system footprint before construction and installation phase. This requirement is inline with EMCA 1999 as well as global best practices, the UNESCO 1972 and 2001 Conventions, World Bank operational guidelines of physical cultural resources etc.

9. **Do you support the proposed project? (Tick ✔)** [YES] ✓ [NO]__

If NO please give your reasons for the objection.

NOTE: You may use additional sheets if necessary

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Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: PHILIP M. WANYAMA	Affiliation/Organization: NATIONAL MUSEUMS OF KENYA COASTAL ARCHAEOLOGY
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ID No. : 12939061	Signature:
Date : 21/06/2023	Stamp: HEAD COASTAL ARCHEOLOGY P O Box 82412-80100 22 JUN 2023 MOMBASA FORT JESUS WORLD HERITAGE SITE

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1. **What is your general comment/views on the proposed project?**

The project is good. Technology has to be embraced.

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

> Digging-up of pavements.

3. **Kindly propose mitigation measures the proponent/contractor needs to put in place during the installation and operation phases of the project?**

Restore any trenches that they might dig up during installation.

4. **What positive impacts do you expect to emanate from the development of the Project?**

> Better Internet supply.

5. **In your option, do you think the proposed project will lead to climate change?**

Not a lot of damage if the process won't take too long.

6. **In what ways do you think the climate change will impact the proposed project?**

> Avoid oil spillage in the ocean

> Hasten the process to prevent more prolonged emission of CO_2.

7. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

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8. **What other comments or suggestions do you have?**

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9. **Do you support the proposed project? (Tick ✔)** **[YES]** ✓ **[NO]**__

If NO please give your reasons for the objection.

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NOTE: You may use additional sheets if necessary

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Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: Sally MacGuinness	Affiliation/Organization: NCRRA - North Coast Ratepayers & Residents Association.
Designation: Member	Postal Address: 34060 - 80100
Email: tropicalbird98@hotmail.com ccl afrca ncra@gmail.com	Telephone 0738243056
ID No. : –	Signature: NA - Naomi Masila on behalf of Sally.
Date : 20/6/2023	Stamp: NORTH COAST RATEPAYERS & RESIDENTS ASSOCIATION P.O. Box 34060 MOMBASA - 80118 NYALI - KENYA

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1. **What is your general comment/views on the proposed project?**

   The project will improve communication in the country and promote economic growth in Kenya and regionally.....

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**
   a) *Interference of safety of navigation of other sea users during the project installation stage*

NOTE: You may use additional sheets if necessary

1. **What positive impacts do you expect to emanate from the development of the Project?**

Improvement in communication in the country.....

2. **In your option, do you think the proposed project will lead to climate change?**

.....n/a.....
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3. **In what ways do you think the climate change will impact the proposed project?**

.....n/a.....
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NOTE: You may use additional sheets if necessary

Director General	P.O. Box 95076 – 80104 Mombasa
Email: Info@kma.go.ke	Telephone _254724319344
ID No. :	Signature:
Date : 20/06/2023	Stamp:

KENYA MARITIME AUTHORITY
KMA
WHITEHOUSE BLDG, MOI AVENUE
TEL: 020 238 1303/4
P. O. Box 95077 80104,
MOMBASA
Email: info@kma.go.ke
website: www.kma.go.ke

For any further inquiries or suggestions regarding the ESIA study for the proposed submarine cable please contact:

Managing Director
Environtech Consultancy Africa Ltd
Lonak Business Center, 2nd Floor, Suite 18B
Along Kasarani-Mwiki Road, Off Shell Petrol Station
P.O. Box 16601-00100 Nairobi
Tel: Tel: +254-704146060, +254-704146060, +254-777033386,
Email: info@environtechafrica.com / stanmwa@gmail.com
Website:www.environtechafrica.com

NOTE: You may use additional sheets if necessary

Telkom Kenya Ltd

Environtech Consultancy Africa Ltd

STAKEHOLDFER CONSULTATION FOR ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

REGISTER OF PARTICIPANTS

NAME OF STAKEHOLDER: Kenya Maritime Authority DATE 21/06/2023

NO.	NAME	POSITION	PHONE NO.	EMAIL ADDRESS	SIGNATURE
1.	Stellamaris Mutiee	Senior Marine Environment Officer	0729319399	smutiee@kmc.go.ke	
2.					
3.					
4.					
5.					
6.					

Official STAMP:

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

STAKEHOLDER CONSULTATION QUESTIONNAIRE

Telkom Kenya Limited (TKL) or Telkom is a technology company that provides integrated solutions to individuals, Small and Medium-sized Enterprises (SMEs), Government and large corporates in Kenya, drawing from a diverse solutions suite that includes voice, data/connectivity, digital financial services, as well as network services. Powered by its vast fibre optic infrastructure, it is also a major provider of wholesale carrier-to-carrier traffic, within the country and the region.

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Telkom Kenya Limited has contracted **Environtech Consultancy Africa (ECA) Ltd,** a Firm of Environmental Experts, to conduct the Environmental and Social Impact Assessment (ESIA) for this project and submit a study report to the National Environment Management Authority (NEMA) for licensing. This is to comply with the Environmental Management and Coordination Act (EMCA), 1999 (Revised 2015) and the Environmental (Impact Assessment and Audit) Regulations, 2003 (Amended 2019).

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What is your general comment/views on the proposed project?**

A good project which will improve the technological advancement of the country and Africa at large.

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

- Affecting marine life.
- Environmental degradation through soil erosion.

3. **Kindly propose mitigation measures the proponent/contractor needs to put in place during the installation and operation phases of the project?**

- Use bio friendly means of handling marine life.
- Any road cruet / road damaged by means of digging should be immediately monitored and done.

NOTE: You may use additional sheets if necessary

4. **What positive impacts do you expect to emanate from the development of the Project?**

- Economical growth as a result of job creation and guests for the hospitality industry.
- Improved technology.

5. **In your option, do you think the proposed project will lead to climate change?**

Yes it will.

6. **In what ways do you think the climate change will impact the proposed project?**

Interference of corals for example permanently changes the aquatic ecosystem.

NOTE: You may use additional sheets if necessary

7. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

Anything destroyed by the project should either be replaced or come up with a long term replacement of the same. e.g if the project has to interfere with natural vegetation like sea weed, mangroves and other trees, they should be replaced.

8. **What other comments or suggestions do you have?**

Any jobs available should consider the locals first.

9. **Do you support the proposed project? (Tick ✔)** [YES] ✓ [NO]__

If NO please give your reasons for the objection.

NOTE: You may use additional sheets if necessary

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Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: GABRIEL C. GOMBO	Affiliation/Organization: ADMINISTRATOR NEW NYALI RESIDENTI ASSOCIATION
Designation: MR.	Postal Address: MOMBASA
Email: newnyaliresident@gmail.com	Telephone 0719581962
ID No.: 28963455	Signature:
Date: 21/6/2023	Stamp: 21/6/23

For any further inquiries or suggestions regarding the ESIA study for the proposed submarine cable please contact:

Managing Director
Environtech Consultancy Africa Ltd
Lonak Business Center, 2nd Floor, Suite 18B
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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What is your general comment/views on the proposed project?**

The Project will Contribute to improved internet Connectivity in the County thereby leading to improved economy.

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

- With easy access to internet, there is risk of rise in Cyber Crime
- It may endanger marine life as a result of entanglement
- Marine Water pollution due to excavation works.
- Risk of cables being vandalized by sharks, whales, etc
- Electromagnetic waves may affect the marine animals
- Destruction of marine life animals and habitats.
- ~~Fish~~ Destruction of a fish breeding grounds may result in reduced fish yield.
- Fishermen's livelihood will be affected if fish yields reduce.
- Destruction of breeding grounds

3. **Kindly propose mitigation measures the proponent/contractor needs to put in place during the installation and operation phases of the project?**

- Device a system to detect and counter Cybe Crime.
- Appropriately bury the cables to avoid interfering with aquatic life.
- While selecting Cable Paths, avoid marine habitats
- Use highly ~~insulated~~ insulated cables to minimize effects of electromagnetic waves and Cable destruction by wild marine animals like sharks.
- Noise Pollution due to Construction may cause movement/migration of marine animals.
- Dust Pollution due to Construction works on the terrestrial land.
- Water Pollution may interfere with Vision in the water.

NOTE: You may use additional sheets if necessary

4. **What positive impacts do you expect to emanate from the development of the Project?**

- Direct and Indirect employment to those engaged in laying & land
- Increase & Improve business opportunities, eg Online business
- Internet access will be cheap thus even the low income earners can afford.
- It will ehance innovation and creativity.
- It will improve access to education and research.
- It will improve health access and edvcation, eg
  - doing Doctors' video conferencing with patients'

5. **In your option, do you think the proposed project will lead to climate change?**

Very minimal Impact

6. **In what ways do you think the climate change will impact the proposed project?**

Clearing vegetation at the landing site may contribute to concentration of Green House Gases (GHGs) that would otherwise be absorbed by the trees in the atmosphere.

NOTE: You may use additional sheets if necessary

7. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

- If possible, avoid clearing of vegetation at the landing site.
- Alternatively, land the cable in a section which shall not lead to clearing any vegetation.

8. **What other comments or suggestions do you have?**

- To avoid any conflict that may arise, seek relevant approvals before commencing construction.
- Ensure in the designs that there is minimal impact on the environment, and marine life and livelihoods.

9. **Do you support the proposed project? (Tick ✔)** **[YES]** ✓ **[NO]**__

If NO please give your reasons for the objection.

NOTE: You may use additional sheets if necessary

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Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: Simon Lokfari	Affiliation/Organization: Coast Development Authority
Designation: Environmental Mngt Officer	Postal Address: 1322 - 80100
Email: cdaed cda@cda.go.ke, lokfarisimon@gmail.com	Telephone 0713833496
ID No. :	Signature:
Date : 20/06/2023	Stamp: COAST DEVELOPMENT AUTHORITY P.O. Box 1322 - 80100 MOMBASA

For any further inquiries or suggestions regarding the ESIA study for the proposed submarine cable please contact:

Managing Director
Environtech Consultancy Africa Ltd
Lonak Business Center, 2nd Floor, Suite 18B
Along Kasarani-Mwiki Road, Off Shell Petrol Station
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Website:www.environtechafrica.com

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REGISTER OF PARTICIPANTS

NAME OF STAKEHOLDER: Coast Development Authority.   DATE 20/06/2023

NO.	NAME	POSITION	PHONE NO.	EMAIL ADDRESS	SIGNATURE
1.	Simon Lokitani	EMO	0713833496	loksimoo@gmail.com	[signature]
2.	Diana Mwagombe	Asst. CDO	0725174618	dmwagombe2@gmail.com	[signature]
3.	Fauziyah M. Mohamed	C.DO	0722219644	fauziyahmohamed2015@gmail.com	[signature]
4.	Ibrahim Munga	FSO	0720724288	Mungaanjawa70@gmail.com	[signature]
5.	Binkaradi Vyombo	CDO	0721226571	bwakati@gmail.com	[signature]
6.					

Official STAMP:

COAST DEVELOPMENT AUTHORITY
P.O. Box 1322 - 80100
MOMBASA

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What is your general comment/views on the proposed project?**

Its a noble project Making Kenya a link between and among nations. The cable will also improve communication and connectivity and more so ease the burden of doing business

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

- Safety and impact on Marine life where our marine ecosystem may be disrupted.
- Socio economic where our community depend on the Marine ecosystem for livelihood
- Environmental impact on the pollution of both the air and the waters.

3. **Kindly propose mitigation measures the proponent/contractor needs to put in place during the installation and operation phases of the project?**

- Involve all stakeholders
- Prevent pollution
- Take care of the marine life where noise from the construction machines may make the marine animals to migrate

4. **What positive impacts do you expect to emanate from the development of the Project?**

- Enhanced communication & connectivity
- Low cost of doing business
-

5. **In your option, do you think the proposed project will lead to climate change?**

Not exactly, not directly.

6. **In what ways do you think the climate change will impact the proposed project?**

N/A.

7. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

Put a standby response team in case of any issues.

8. **What other comments or suggestions do you have?**

Public participation in all meetings and activities.

NOTE: You may use additional sheets if necessary

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9. Do you support the proposed project? (Tick ✔) **[YES]** ✓ **[NO]**__

If NO please give your reasons for the objection.

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Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: Rose Chege	Affiliation/Organization: Interior & Administration DCC
Designation: DCC	Postal Address:
Email: chegerose40@gmail.com	Telephone 0727 351 990
ID No.: 12521092	Signature:
Date: 19/6/2023	Stamp: DEPUTY COUNTY COMMISSIONER NYALI SUB-COUNTY 19 JUN 2023 P. O. Box 156 - 80122 KENGELENI

For any further inquiries or suggestions regarding the ESIA study for the proposed submarine cable please contact:

Managing Director
Environtech Consultancy Africa Ltd
Lonak Business Center, 2nd Floor, Suite 18B
Along Kasarani-Mwiki Road, Off Shell Petrol Station
P.O. Box 16601-00100 Nairobi
Tel: Tel: +254-704146060, +254-704146060, +254-777033386,
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NOTE: You may use additional sheets if necessary

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

PUBLIC PARICIPATION QUESTIONNAIRE

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What positive impacts do you expect to emanate from the development of the Project?**

(1) Increase connectivity / and improve network

(2) Legal employment generated along the project.

(3) Improve access and sharing of information among service provider

(4) Cost of communication will go down.

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

① Environmental degradation - the imbalance pollution of fertility ecosystem.
② Water pollution, Noise pollution during construction.
③ Disturbance of community activities during construction.
④ Conflict between Service Providers and Government agencies.

3. **What should the proponent do to eliminate negative impacts?**

① Minimize environmental degradation.
② Use the shortest time possible to finish construction.
③ Joint dialogue between the Providers and the Ayorl BMU.
④

4. **In your option, do you think the proposed project will lead to climate change?** ☑ Yes ☐ No. If yes, explain

Balance of environmental ecosystem disturbing it will bring about climate change.

5. **In what ways do you think the climate change will impact the proposed project?**

→ The project should minimize ecosystem disturbance.

NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

(1) Reconstruction of construction site must be done.

(2) Use least time not to disturb the economic activities within Nyali Bamburi

(3) Do CSR to the community.

7. **What other comments or suggestions do you have?**

The world is becoming a global village, we must improve on communication infrastructure.

8. **Do you support the proposed project? (Tick ✔) [YES] ✔ [NO] ☐**

If NO please give your reasons for the objection.

Improve communication infrastructure within Mombasa County

Please provide us with the following details Contact Details ***(This information will be treated confidentially)***

Name: Henry K Rop	**Location:** Kongowea
ID No. 10988399	**Telephone:** 0721215657
Affiliated Organization (if any) Interior	**Position** Senior A.CC
Date : 19/06/2023	**Signature:** [signature]

ASSISTANT COUNTY COMMISSIONER
KONGOWEA DIVISION

NOTE: You may use additional sheets if necessary

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. What positive impacts do you expect to emanate from the development of the Project?

1. Job creation.
2. It will open up the community to the rest of the world.
3. Improve the communication system

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

1. Disturb marine life.
2. Disturb Fishing activity during the construction process.
3. Pollution.
4.

3. **What should the proponent do to eliminate negative impacts?**

1. Use the appropriate mechanism during the construction.
2. Use appropriate polution mitigation means during the construction.

4. **In your option, do you think the proposed project will lead to climate change?** ☑ **Yes** ☐ **No. If yes, explain**

1. There will be emission of gasses during the construction.
2.

5. **In what ways do you think the climate change will impact the proposed project?**

1. may reduce the work rate during the construction.
2. may delay the project to ensure mitigation process is reached.

NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

1. Ensure recycle of things to avoid polution and dumping of items into the sea where applicable.

2. Use environmental friendly means of power to reduce air pollution.

7. **What other comments or suggestions do you have?**

→ May this be a project to have a positive impact to the people around and across the world.

8. **Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐**

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: MOGEMOI OBEDY	**Location:** MAWENI
ID No. 27946271	**Telephone:** 0728571593.
Affiliated Organization (if any) INTERIOR	**Position** ASS. CHIEF.
Date : 19/06/2023	**Signature:** ASSISTANT CHIEF DATE: 21/06/2023 SIGN: MAWENI SUB-LOCATION

NOTE: You may use additional sheets if necessary

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What is your general comment/views on the proposed project?**

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It is good as it will boost our network.

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NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

- The beach operators will be affected
- The business where the line will pass will also be affected
- There will be environmental hazard to the life of ppl.

3. **Kindly propose mitigation measures the proponent/contractor needs to put in place during the installation and operation phases of the project?**

- Involve the residents by giving them
- At least facilitate business which will be affected.
- Make sure that environmental pollution is looked into so that our people are not vastly affected by the project.

4. **What positive impacts do you expect to emanate from the development of the Project?**

- High boost of Network to ease Communi
- Employment to our people
-

NOTE: You may use additional sheets if necessary

5. **In your option, do you think the proposed project will lead to climate change?**

Yes, the trucks, tractors and boats will emmate smoke after burning the fuel and this will pollute the air and hence affect our people.

6. **In what ways do you think the climate change will impact the proposed project?**

- Global warming really affect the environment of ozone layer will be emitted

7. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

Make sure that the emissions from the Motor Machines are guarded ~~so~~ not to affect the Climate

8. **What other comments or suggestions do you have?**

The project is good despite of the small problems

NOTE: You may use additional sheets if necessary

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9. Do you support the proposed project? (Tick ✔) **[YES]** ✓ **[NO]**__

If NO please give your reasons for the objection.

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Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: Bernard Omolo	Affiliation/Organization: Interior
Designation: Chief	Postal Address:
Email:	Telephone
ID No. : 14667423	Signature:
Date : 19/6/022	Date:..... Stamp: P.O. Box 156 - 80122, KENGELENI

For any further inquiries or suggestions regarding the ESIA study for the proposed submarine cable please contact:

Managing Director
Environtech Consultancy Africa Ltd
Lonak Business Center, 2nd Floor, Suite 18B
Along Kasarani-Mwiki Road, Off Shell Petrol Station
P.O. Box 16601-00100 Nairobi
Tel: Tel: +254-704146060, +254-704146060, +254-777033386,
Email: info@environtechafrica.com/ stanmwa@gmail.com
Website:www.environtechafrica.com

NOTE: You may use additional sheets if necessary

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

STAKEHOLDER CONSULTATION QUESTIONNAIRE

Telkom Kenya Limited (TKL) or Telkom is a technology company that provides integrated solutions to individuals, Small and Medium-sized Enterprises (SMEs), Government and large corporates in Kenya, drawing from a diverse solutions suite that includes voice, data/connectivity, digital financial services, as well as network services. Powered by its vast fibre optic infrastructure, it is also a major provider of wholesale carrier-to-carrier traffic, within the country and the region.

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Telkom Kenya Limited has contracted **Environtech Consultancy Africa (ECA) Ltd,** a Firm of Environmental Experts, to conduct the Environmental and Social Impact Assessment (ESIA) for this project and submit a study report to the National Environment Management Authority (NEMA) for licensing. This is to comply with the Environmental Management and Coordination Act (EMCA), 1999 (Revised 2015) and the Environmental (Impact Assessment and Audit) Regulations, 2003 (Amended 2019).

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What is your general comment/views on the proposed project?**

- It will improve of Communication within and outside the County.
- Creation of jobs to the Youth.

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

- The global network is vulnerable to impacts by a range of natural hazards.
- Natural hazards will change their frequency, magnitude and location.

3. **Kindly propose mitigation measures the proponent/contractor needs to put in place during the installation and operation phases of the project?**

To Consult More to Environmental Experts and National Environmental Management Authority.

4. **What positive impacts do you expect to emanate from the development of the Project?**

- Creation of Job
- Making Communication easier to within and global.

5. **In your option, do you think the proposed project will lead to climate change?**

No.

6. **In what ways do you think the climate change will impact the proposed project?**

- Fishing will be difficult due to the creation of the project

7. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

8. **What other comments or suggestions do you have?**

NOTE: You may use additional sheets if necessary

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9. Do you support the proposed project? (Tick ✔) **[YES]** ✓ **[NO]**___

If NO please give your reasons for the objection.

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.....N/A.....

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Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: THOMAS REWA	Affiliation/Organization: INTERIOR
Designation: ASST. CHIEF (ZIWA LA NGOMBE)	Postal Address: 152-80122 KENGELENI
Email: tkruwa2014@gmail.com	Telephone 0712-399374
ID No. : 28714788	Signature:
Date : 19-06-2023	Stamp: ASST. CHIEF ZIWA LA NGOMBE SUB-LOCATION MAWENI LOCATION Sign: Date: 19/6/2023

For any further inquiries or suggestions regarding the ESIA study for the proposed submarine cable please contact:

Managing Director
Environtech Consultancy Africa Ltd
Lonak Business Center, 2nd Floor, Suite 18B
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Email: info@environtechafrica.com/ stanmwa@gmail.com
Website:www.environtechafrica.com

NOTE: You may use additional sheets if necessary

Telkom Kenya Limited

Environtech Consultancy Africa Ltd

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

PUBLIC PARICIPATION QUESTIONNAIRE

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. What positive impacts do you expect to emanate from the development of the Project?

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NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

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3. **What should the proponent do to eliminate negative impacts?**

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4. **In your option, do you think the proposed project will lead to climate change? ☐ Yes ☐ No. If yes, explain**

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5. **In what ways do you think the climate change will impact the proposed project?**

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NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

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7. **What other comments or suggestions do you have?**

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8. **Do you support the proposed project? (Tick ✔) [YES] [✓] [NO] [ ]**

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: ABDULAZAK ALI	**Location:** NYALI
ID No.	**Telephone:** 0731427729
Affiliated Organization (if any) NYALI B.M.U	**Position** FISHERMEN ELDER
Date :	**Signature:**

NOTE: You may use additional sheets if necessary

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What positive impacts do you expect to emanate from the development of the Project?**

(1) The project will creat job opportnty/changes and bring change into our Community. It will also make our country develope and connect as to/with other Countries in terms of communication.

(3) Creation of full access of internet So that we can reach people from the abroad.

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

(1) It will make the climate change due to the digging ship as it machine runs it produces the smoke in such it will affects the air cause it produce Carbone
(2) People doing there activities will not be able to on going with there daily routines.

3. **What should the proponent do to eliminate negative impacts?**

~~The~~ ~~installing~~ process must be done by ~~the~~ people (1) We expect jobs and allowance to maintain the installation period.
(2) To bring safty to the people near the installation range.
(3) Telkom and the community should work together with the community to show the importants of the installation that ~~is~~ ~~does~~ is brought to us..

4. **In your option, do you think the proposed project will lead to climate change? ☑ Yes ☐ No. If yes, explain**

We realized that places where the cables are being laged the sea planes like cousin migration of the fish due to the bore land.

5. **In what ways do you think the climate change will impact the proposed project?**

The process of ~~the~~ placing the cabole is done by digging and the machine it produce the carbonous air that will lead to the climate change.

NOTE: You may use additional sheets if necessary

6. What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?

The shoells do their best to protect our Invironment and produce saffty.

7. What other comments or suggestions do you have?

~~We Will suggest~~ (1) We would suggest to the telcom kenya Limited to offeure as free Internet at the beach.

8. Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: BAKARI EMMANUEL	Location: NYALI
ID No. 34321704	Telephone: 0797743464
Affiliated Organization (if any) NYALI TUBE REANTER	Position Beach opparetor
Date : 19/6/2023	Signature: [signature]

NOTE: You may use additional sheets if necessary

Telkom Kenya Limited

Environtech Consultancy Africa Ltd

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What positive impacts do you expect to emanate from the development of the Project?**

(1) Expect job opportunities from the project
(2) Creeper communication from one person to another

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

3. **What should the proponent do to eliminate negative impacts?**

- Creation employment
- Give allowances to the affected business
- proper communication to the public

4. **In your option, do you think the proposed project will lead to climate change? ☐ Yes ☐ No. If yes, explain**

5. **In what ways do you think the climate change will impact the proposed project?**

NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

Control oil Spillage to no spill at all plant more trees and green vegetation among the coastal line

7. **What other comments or suggestions do you have?**

In all this operation let transparandy be the key and egality in the good and equatly

8. **Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐**

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: Joseph Mrebu Chai	**Location:** Nyali beach
ID No. 23037268	**Telephone:** 0720092238
Affiliated Organization (if any)	**Position** Boat Operator
Date : 19/06/2023	**Signature:** [signature]

NOTE: You may use additional sheets if necessary

Telkom Kenya Limited

Environtech Consultancy Africa Ltd

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

PUBLIC PARICIPATION QUESTIONNAIRE

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What positive impacts do you expect to emanate from the development of the Project?**

① We expect Job opportunity/chances from the organisation among the the Beach operators
② High experience on network issues on our phones and all network accessories will improve
③ Connect us with different people easily and from the Countries that the project will have installed the Cables.

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

① It will interfere with the living System of the fish on the particullers places the installation will be done.
② It will also interfere with our daily routine of work as beach beach opperators. When the process is On going.

3. **What should the proponent do to eliminate negative impacts?**

① We expect an "allowance" from the project for our daily bread.
② Or give us jobs during that time they'll be on process.

4. **In your option, do you think the proposed project will lead to climate change?** ☑ Yes ☒ No. **If yes, explain**

We realised the places where the cables are being layed the sea plants die causing migration of fish done to the the bave land.

5. **In what ways do you think the climate change will impact the proposed project?**

for the effect of the Cables killing the water plants thats One way of climate change.

NOTE: You may use additional sheets if necessary

6. What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?

They Should do their best to protect the Environment

7. What other comments or suggestions do you have?

8. Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: FRANCIS NYIRO KAZUNGU	Location: NYALI BEACH
ID No. 23833953	Telephone: 0799962250
Affiliated Organization (if any) MOMBASA BOAT OWNERS ASSOCIATION (MBOA)	Position BOAT CAPTAIN
Date : 19/6/23	Signature:

NOTE: You may use additional sheets if necessary

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. What positive impacts do you expect to emanate from the development of the Project?

It's good because is going to create jobs opportunity to the community.

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

Negative disturbans no Jobs because of marine disturbans.

3. **What should the proponent do to eliminate negative impacts?**

The lays of lto projects the telcom projects must provide allowances to the community e.g. to the beach opperaters, Tuk Renters.

4. **In your option, do you think the proposed project will lead to climate change?** ☑ **Yes** ☐ **No. If yes, explain**

Kutupi mimi kama Tuk Renter nategemea wageni wage na kama kutakuwa na projecte ① wageni wata kuwa na uognum wa nyakupte ② kagunmu wa kuogelea sababu ya maji ye takuwa na vumbi.

5. **In what ways do you think the climate change will impact the proposed project?**

NOTE: You may use additional sheets if necessary

6. What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?

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7. What other comments or suggestions do you have?

To make some payments to the community (eg) a) Juice Retailers. b) Beach opperators.

8. Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐

If NO please give your reasons for the objection.

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Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: Mahamud Kudunda	**Location:** Nyali
ID No. 21020852	**Telephone:** 0716-589225
Affiliated Organization (if any)	**Position**
Date : 19-06-2023	**Signature:** [signature]

NOTE: You may use additional sheets if necessary

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

STAKEHOLDER CONSULTATION QUESTIONNAIRE

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What is your general comment/views on the proposed project?**

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Positive impact by influencing job and so many

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NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

Nfgative impact no job marine disturbance fishermen no work for the time being

3. **Kindly propose mitigation measures the proponent/contractor needs to put in place during the installation and operation phases of the project?**

They must be some allowance of project to the community

4. **What positive impacts do you expect to emanate from the development of the Project?**

It helps to build the community

Job opportunity

NOTE: You may use additional sheets if necessary

5. **In your option, do you think the proposed project will lead to climate change?**

YES

6. **In what ways do you think the climate change will impact the proposed project?**

By Drilling on the cable to sea
luck of catch of fish

7. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

We have to be together by all sides so that no one can complain about something

8. **What other comments or suggestions do you have?**

Will

NOTE: You may use additional sheets if necessary

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9. Do you support the proposed project? (Tick ✔) [YES] ✓ [NO]__

If NO please give your reasons for the objection.

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.....

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: BILAL HAIDER	Affiliation/Organization: NYALI BEACH MANAGEMENT UNIT.
Designation: Former SECRETARY B.M.U.	Postal Address:
Email:	Telephone 0716154041
ID No. : 22807165	Signature:
Date :	Stamp:

For any further inquiries or suggestions regarding the ESIA study for the proposed submarine cable please contact:

Managing Director
Environtech Consultancy Africa Ltd
Lonak Business Center, 2nd Floor, Suite 18B
Along Kasarani-Mwiki Road, Off Shell Petrol Station
P.O. Box 16601-00100 Nairobi
Tel: Tel: +254-704146060, +254-704146060, +254-777033386,
Email: info@environtechafrica.com/ stanmwa@gmail.com
Website:www.environtechafrica.com

NOTE: You may use additional sheets if necessary

Telkom Kenya Limited

Environtech Consultancy Africa Ltd

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

PUBLIC PARICIPATION QUESTIONNAIRE

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What positive impacts do you expect to emanate from the development of the Project?**

- Marine life destroyed
- The beach operators will not continue with bussines due to the cable in put
- There will not be any tourist due to the disturbance

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

Negative impacts

3. **What should the proponent do to eliminate negative impacts?**

- Create employment
- Give allowances to the affected business
- Proper communication to the public
- The part that will be used (area) needs time to heal for it to be productive again

4. **In your option, do you think the proposed project will lead to climate change? ☐ Yes ☐ No. If yes, explain**

5. **In what ways do you think the climate change will impact the proposed project?**

NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

Control oil spillage to no spill at all. plant more trees and green vegetation among the coastal line

7. **What other comments or suggestions do you have?**

In all this operation let transparency be the key and legality in the goods and equity

8. **Do you support the proposed project? (Tick ✔) [YES] [/] [NO] [ ]**

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: Joel Kanyetthe	**Location:** Nyali Beach
ID No. 30394769	**Telephone:** 0731157625
Affiliated Organization (if any) EARLY BIRDS BANDA	**Position** EARLY BIRDS BANDA STAFF
Date : 19/06/2023	**Signature:**

NOTE: You may use additional sheets if necessary

Telkom Kenya Limited

Environtech Consultancy Africa Ltd

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What positive impacts do you expect to emanate from the development of the Project?**

Good and Well Communications to our People of Kenya.

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

[illegible]

3. **What should the proponent do to eliminate negative impacts?**

No beach Work until [illegible] [illegible] Project Starts

4. **In your option, do you think the proposed project will lead to climate change?** ☐ **Yes** ☑ **No. If yes, explain**

5. **In what ways do you think the climate change will impact the proposed project?**

NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

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7. **What other comments or suggestions do you have?**

Telkom to pay all the affected by the project when it starts

8. **Do you support the proposed project? (Tick ✔)** **[YES]** ☑ **[NO]** ☐

If NO please give your reasons for the objection.

____

____

Please provide us with the following details Contact Details ***(This information will be treated confidentially)***

Name: William Mawndu	**Location:** Mawenj
ID No. 3693500	**Telephone:** 0712426222
Affiliated Organization (if any) ~~No~~ Village Manager	**Position**
Date : 19-6-2023	**Signature:** [signature]

NOTE: You may use additional sheets if necessary

Telkom Kenya Limited

Environtech Consultancy Africa Ltd

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What positive impacts do you expect to emanate from the development of the Project?**

It will improve the comuinicatio and increase of Jobs

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

The beach operators will stop doing their jobs because of the impacts of the polution.

3. **What should the proponent do to eliminate negative impacts?**

The operatores will have an alowarences because there is no job operatings in the beach.

4. **In your option, do you think the proposed project will lead to climate change?** ☑ **Yes** ☐ **No. If yes, explain**

It become an idole place for working because of the project going on.

5. **In what ways do you think the climate change will impact the proposed project?**

The operators will stop till the project get finished and wait the climent change to normal place

NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

Uchimbaji wa mtaro wa cable unaleta hatari kwa wanaoegeleya kwa yale mawe ~~yatatolewa~~ yaliyochimbwa inatakiwa kurudishwa kwa sima.

7. **What other comments or suggestions do you have?**

Let the project go on and find the operatores how they can get daily bread for the time.

8. **Do you support the proposed project? (Tick ✔) [YES] [✓] [NO] [ ]**

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: DOMINIC MWAMBURI MGHANGA	**Location:** MAWENI
ID No. 5396191	**Telephone:** 0726728920
Affiliated Organization (if any) VILLAGE MANAGER	**Position** KENOL
Date : 19/06/2023	**Signature:** Mghanga.

NOTE: You may use additional sheets if necessary

Telkom Kenya Limited

Environtech Consultancy Africa Ltd

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. What positive impacts do you expect to emanate from the development of the Project?

Mostly impacts is when they were connecting cables affect job. Sounds making the beach dirty in soil.

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

Poor jobs becouse no any one enjoy the beach creature so nothing job.

3. **What should the proponent do to eliminate negative impacts?**

Making our reagion dirty and make the sea animals to change possion to hide sahe

4. **In your option, do you think the proposed project will lead to climate change?** ☑ **Yes** ☐ **No. If yes, explain**

ok when the masshine is opperating the no sound and carbondioxide affect climate

5. **In what ways do you think the climate change will impact the proposed project?**

The diagger will affect and more sound when you get inside the weater it will nothing to see in marine.

NOTE: You may use additional sheets if necessary

6. What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?

When the measured the work Places they attact because as local rides we cant cross.

7. What other comments or suggestions do you have?

To make some of payment when they were doing Connection

8. Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐

If NO please give your reasons for the objection.

YES

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: Vincent Mbai	**Location:** ~~Kawangware~~ Nyali
ID No. 35098345	**Telephone:** 0113057676
Affiliated Organization (if any)	**Position** M. Nyali
Date : 19/06/023	**Signature:**

NOTE: You may use additional sheets if necessary

Telkom Kenya Limited

Environtech Consultancy Africa Ltd

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What positive impacts do you expect to emanate from the development of the Project?**

⇒ ~~We expect Job opportunity~~ Marine life destroyed

⇒ The beach operators will not continue with bussines due to the cable input

⇒ There will not be any tourist due to the disturbance

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

3. **What should the proponent do to eliminate negative impacts?**

→ creater employment
- Give allowances to the effected business
- proper communication to the public
- The part that will be used (area) needs time to head for it to be productive again

4. **In your option, do you think the proposed project will lead to climate change? ☐ Yes ☐ No. If yes, explain**

5. **In what ways do you think the climate change will impact the proposed project?**

NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

- control oil spillage to no spill at all
→ plant more trees and green vegetation among the coastal line
→ Start a project that will support the community to promote life and environment
→ make sure the public is aware and participating

7. **What other comments or suggestions do you have?**

In all this operation let transparency be the key and eqality in the good and equally

8. **Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐**

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: Michael Baya	**Location:** Nyali beach
ID No.	**Telephone:** 0790249195
Affiliated Organization (if any)	**Position** Beach operater
Date : 19th/6/2023	**Signature:**

NOTE: You may use additional sheets if necessary

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- Marine Life destroyed
- The beach operators will not continue with bussines due to the cable in put
- There will not be any tourist due to the disturbance

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

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3. **What should the proponent do to eliminate negative impacts?**

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4. **In your option, do you think the proposed project will lead to climate change? ☐ Yes ☐ No. If yes, explain**

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5. **In what ways do you think the climate change will impact the proposed project?**

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NOTE: You may use additional sheets if necessary

6. What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?

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7. What other comments or suggestions do you have?

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8. Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐

If NO please give your reasons for the objection.

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_____

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: KEITH HAMISI ODOUR	**Location:** NYALI BEACH
ID No. 35882963	**Telephone:** 0741765225
Affiliated Organization (if any) EARLY BIRDS BANDA	**Position** EARLY BIRDS Banda
Date : 19/06/2023	**Signature:**

NOTE: You may use additional sheets if necessary

Telkom Kenya Limited

Environtech Consultancy Africa Ltd

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. What positive impacts do you expect to emanate from the development of the Project?

There shall be no monopoly of service provision.
It will reduce the cost of communication.
Many people will be able to access the
Internet because there will be cheap services.
This in turn will make jobs/Employment
possible through the internet.

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

When the internet becomes cheap, then there will cyber bulling which will affect many youths and children. This will be a social negativity.

3. **What should the proponent do to eliminate negative impacts?**

There should be internet control via the phones and computers.
Many people should be educated - capacity building on the programmes to be implemented as a whole.

4. **In your option, do you think the proposed project will lead to climate change?** ☐ Yes ☑ No. **If yes, explain**

5. **In what ways do you think the climate change will impact the proposed project?**

This will be due to variation in water levels in the ocean. When the waters go down the Cables will be affected.

NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

Checks
They should the lowest water levels and highest water levels in order to prevent any problems in future.

7. **What other comments or suggestions do you have?**

I suggest that when the Cables arrive, workers should be from immediate residents of Mombasa especially those near the coastline.

8. **Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐**

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: Florence Maina	**Location:**
ID No. 11170334	**Telephone:** 0727351469
Affiliated Organization (if any) Village Manager	**Position** VILLAGE MANAGER.
Date : 19/06/2023	**Signature:**

NOTE: You may use additional sheets if necessary

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. What positive impacts do you expect to emanate from the development of the Project?

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NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

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3. **What should the proponent do to eliminate negative impacts?**

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4. **In your option, do you think the proposed project will lead to climate change? ☐ Yes ☐ No. If yes, explain**

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5. **In what ways do you think the climate change will impact the proposed project?**

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NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

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7. **What other comments or suggestions do you have?**

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8. **Do you support the proposed project? (Tick ✔) [YES] ☐ [NO] ☐**

If NO please give your reasons for the objection.

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Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: SAID A. Juma	**Location:**
ID No. 9988598	**Telephone:** 0717570272/0756125179
Affiliated Organization (if any) NYALI FISHERMEN Community CBO.	**Position** PATRON
Date : 19/6/2023	**Signature:**

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

STAKEHOLDER CONSULTATION QUESTIONNAIRE

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What is your general comment/views on the proposed project?**

The project is good to kenyan, and it will reduce jobless to our young people.

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

The negative is that it is illegal Matta that has been brought public.

3. **Kindly propose mitigation measures the proponent/contractor needs to put in place during the installation and operation phases of the project?**

The measures that should be under the contractors

4. **What positive impacts do you expect to emanate from the development of the Project?**

This will bring the young people to get job and also to bring enverement after finishing and cover the trenches and some other development go on

NOTE: You may use additional sheets if necessary

5. **In your option, do you think the proposed project will lead to climate change?**

No, It under the ground and that is water its in international zone of ~~Hill~~ miles from the sea core.

6. **In what ways do you think the climate change will impact the proposed project?**

The climate may change if there is any damage in ~~salt~~ water

7. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

The measures should be deeper than the one is going on; because when the rain rains the dug trench is deep pass down.

8. **What other comments or suggestions do you have?**

Well it good but the area people should have responding to ~~walk~~ work, not people pour o

NOTE: You may use additional sheets if necessary

by that I mean that from all funds should be one of the area; Even causuals.

9. **Do you support the proposed project? (Tick ✔)** [YES] ✔ [NO]__

If NO please give your reasons for the objection.

Yes will help young generations job.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: JOSEPH M. MUMBO	Affiliation/Organization: VILLAGE MANAGER
Designation: CHIEF	Postal Address: —
Email: —	Telephone 0726475977
ID No.: 0501024	Signature:
Date: 19-6-023	Stamp:

For any further inquiries or suggestions regarding the ESIA study for the proposed submarine cable please contact:

Managing Director
Environtech Consultancy Africa Ltd
Lonak Business Center, 2nd Floor, Suite 18B
Along Kasarani-Mwiki Road, Off Shell Petrol Station
P.O. Box 16601-00100 Nairobi
Tel: Tel: +254-704146060, +254-704146060, +254-777033386,
Email: info@environtechafrica.com/ stanmwa@gmail.com
Website:www.environtechafrica.com

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1. What positive impacts do you expect to emanate from the development of the Project?

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NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

I proposed the project. but the project should ensure there is no bad environment.

3. **What should the proponent do to eliminate negative impacts?**

4. **In your option, do you think the proposed project will lead to climate change? ☑ Yes ☐ No. If yes, explain**

5. **In what ways do you think the climate change will impact the proposed project?**

I need the project but you have to look the change of climate

NOTE: You may use additional sheets if necessary

6. What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?

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7. What other comments or suggestions do you have?

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We want our people to be Regard the community.

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8. Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐

If NO please give your reasons for the objection.

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Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: UST, SALIM SAID	**Location:** KONGOWEA
ID No. 0749320	**Telephone:** 0729062919
Affiliated Organization (if any)	**Position** V/MANAGER
Date : 19/6/2023	**Signature:** Sal.

NOTE: You may use additional sheets if necessary

Telkom Kenya Limited

Environtech Consultancy Africa Ltd

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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1. What positive impacts do you expect to emanate from the development of the Project?

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NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

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3. **What should the proponent do to eliminate negative impacts?**

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4. **In your option, do you think the proposed project will lead to climate change? ☐ Yes ☐ No. If yes, explain**

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5. **In what ways do you think the climate change will impact the proposed project?**

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NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

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7. **What other comments or suggestions do you have?**

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8. **Do you support the proposed project? (Tick ✔) [YES] [✓] [NO] [ ]**

If NO please give your reasons for the objection.

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Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: HIDAYA KEA KIBWANA	**Location:** KONGOWEA
ID No. 13594415	**Telephone:** 0701628917
Affiliated Organization (if any) ~~VOLUNTEER~~	**Position** V/MANAGER
Date : 29/6/2023	**Signature:**

NOTE: You may use additional sheets if necessary

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What positive impacts do you expect to emanate from the development of the Project?**

① Its creates job opportunities

② Its can help in communications

③ It can help in communications with the other countries

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

① Telkom network have poor connection
② This project can affects fish
③ The beach operator will have to stop with their work due to the project will be constructed

3. **What should the proponent do to eliminate negative impacts?**

① The beach operator will have to be given the work ~~to~~ to construct the projects
② beach operator will have to be given salaries for the time they will not work.

4. **In your option, do you think the proposed project will lead to climate change? ☑ Yes ☐ No. If yes, explain**

For the construction of the project their will be such materials which will be used for the construction which may affect climate.

5. **In what ways do you think the climate change will impact the proposed project?**

If the climate changes the project will ~~not~~ take long to be completed. ~~done~~

NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

- There will have to be a good Construction measures that will not affect the climate

7. **What other comments or suggestions do you have?**

This project will affects the ~~bear~~ work of the beach operators, so my suggestion is, the beach operator will have to be given some work of the project.

8. **Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐**

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: SAMUEL NGALA	**Location:** NYALI
ID No. 36136593	**Telephone:** 0793050375
Affiliated Organization (if any)	**Position** Tube renters
Date : 19/6/2023	**Signature:**

NOTE: You may use additional sheets if necessary

Telkom Kenya Limited

Environtech Consultancy Africa Ltd

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What positive impacts do you expect to emanate from the development of the Project?**

→ Create employment
→ Connect Kenya to the world
→ Improve communication.

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

-> Marine life destroyed
-> The beach operators will not continue with business due to the cable input
-> there will not be any tourist due to the disturbance by the Cable Operation.
-> Sea bed pollution.

3. **What should the proponent do to eliminate negative impacts?**

-> Create employment.
-> Give allowances to the affected business
-> Proper communication to the public
-> the part that will be used (area) needs time to heal for it to be productive again therefore the families and community affected need to be paid or an alternative project raised for daily bread ~~for~~ that case, for that period.

4. **In your option, do you think the proposed project will lead to climate change? ☑ Yes ☐ No. If yes, explain**

The vessels and Machinery being used produce CO_2 which is hazardous gas and does not support life therefore negative impact to the climate change.

5. **In what ways do you think the climate change will impact the proposed project?**

- Increase of CO_2 gas in the air
- oil Spillage therefore killing Marine Life.

NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

- Control oil spillage to no spill at all.
- Plant more trees and green vegetation along the coastal line.
- Start a project that will support the community to promote marine life and environment
→ Make sure the public is aware and participating.

7. **What other comments or suggestions do you have?**

In all this operation let transparency be the key and equality in the ~~good~~ good things comming from the project. Sharing equally.

8. **Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐**

If NO please give your reasons for the objection.

It will not be good if there will be health issues comming from the project.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: Billy Imbayi	**Location:** Nyali Beach
ID No. 28102655	**Telephone:** 0715 481875
Affiliated Organization (if any)	**Position** volunteer
Date : 19th June 2023	**Signature:**

NOTE: You may use additional sheets if necessary

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. What positive impacts do you expect to emanate from the development of the Project?

- It will provide Job opportunities to people around the region and as large.
- Communication operations will be improved in regard to Telkom Connectivity and partnership
- With Communication installation within the region will be improved.

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

- Instalation of big and huge pipings and fittings pollutes environments and thus being nuisance to people around.
- Beach operators will be forced to put off their daily working routines to allow the operations.
- Land pollutions will be experienced due to land ploughing etc.

3. **What should the proponent do to eliminate negative impacts?**

- Installations of huge pipings should be placed in a manner in which it does not affect the aquatic life in water during transmition of fibre.
- Land defragmentation should be controled to prevent the land pollutions issues.
- Non-toxic equipments and huge unnecessary tools should be managed appropriately during operations.

4. **In your option, do you think the proposed project will lead to climate change? ☑ Yes ☐ No. If yes, explain**

Fully during installation of the piping fibres, huge machines used may produce smoke which intern affects the ozone layer and thus the climate change experienced and cases air pollution and affecting the aquatic life in ocean

5. **In what ways do you think the climate change will impact the proposed project?**

- Transmition of fibres may have high connectivity due to climate change enhanced
- Aquatic life and animals within the ocean region will have loss of life due to insufficient oxygen and good respiratory.

NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

- Aquatic lifes should be considered highly before the installation and piping fittings done to enable them have conducive environment.
- Big machines used in installations should be handled appropriately to avoid the nuisance to people around and pollutions in any ways.

7. **What other comments or suggestions do you have?**

Preffarably environmental conserrancies should be promoted and enhanced in order to consider wild life and human life to promote good living and promotions.

8. **Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐**

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: Kennedy Andrew	**Location:** Nyali
ID No. 33520522	**Telephone:** 0113182571 or 0736837501
Affiliated Organization (if any) USAID	**Position** Monitoring & Evaluation.
Date : 19/6/2023	**Signature:**

NOTE: You may use additional sheets if necessary

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What positive impacts do you expect to emanate from the development of the Project?**

We expect an improvement in Network ground since they have been previous engagement contracts by telkom k Ltd and Environtech Consultancy Agnica in public perticipation and job done but the networks are still down and some places not at all maybe this time around the networks will improve by this new cable landing.

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

the negative impact will have marine life since displacement of fish especially indegineous species like turtles who may be disturbed by the digging of shore and again the beach operator may not work these construction days due to allowing cable workers to do they job yet they strongly depend on daily chuttles.

3. **What should the proponent do to eliminate negative impacts?**

Plan well secure turtle lay egg areas talk to atleast compensate beach operators on the losses during construction
Beach operators participation in the construction jobs will also ease negative morale

4. **In your option, do you think the proposed project will lead to climate change?** ☐ **Yes** ☑ **No. If yes, explain**

5. **In what ways do you think the climate change will impact the proposed project?**

No comment.

NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

When constructing new rules and regulations on climate change must be adhered to.

7. **What other comments or suggestions do you have?**

8. **Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐**

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: Alhaan Abubakar	**Location:** Nyali
ID No. 24499048	**Telephone:** 0733 667337
Affiliated Organization (if any) Beach Operator	**Position** Tube Renting
Date : 19/06/2023	**Signature:**

NOTE: You may use additional sheets if necessary

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

PUBLIC PARICIPATION QUESTIONNAIRE

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. What positive impacts do you expect to emanate from the development of the Project?

My positive expectations are:
- Provide an environment where business are conducted peaceful.
- Promote peace among Africa
- Improve communication among the business personalities
- It will create job and business opportunities to the locals.

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

- International conflicts on who owns the project
- Increase of cyber crime

3. **What should the proponent do to eliminate negative impacts?**

- To the conflicts there should be an equal and participation among the countries countries under the project.
- There should be a thorough civic education on the benefits of the project.

4. **In your option, do you think the proposed project will lead to climate change?** ☐ **Yes** ☑ **No. If yes, explain**

5. **In what ways do you think the climate change will impact the proposed project?**

There will be no climate change at all

NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

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7. **What other comments or suggestions do you have?**

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8. **Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐**

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: ELVIS LOUIS ANGA	**Location:** NYALI BEACH
ID No. 28400408	**Telephone:** 0741950627
Affiliated Organization (if any) 2 Pac Tube rorber Nyalibeach	**Position** Store keeper.
Date :	**Signature:**

Telkom Kenya Limited

Environtech Consultancy Africa Ltd

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY FOR THE PROPOSED INSTALLATION OF AFRICA 1 SUBMARINE FIBER CABLE BY TELKOM KENYA LIMITED IN KENYA TERRITORIAL WATERS UP TO THE CABLE LANDING STATION AT NYALI, MOMBASA COUNTY

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What positive impacts do you expect to emanate from the development of the Project?**

Kuleta ajira

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

Enake vizuri, mafuta 's Alira

3. **What should the proponent do to eliminate negative impacts?**

4. **In your option, do you think the proposed project will lead to climate change?** ☑ **Yes** ☐ **No. If yes, explain**

O/N

5. **In what ways do you think the climate change will impact the proposed project?**

akoma kita

NOTE: You may use additional sheets if necessary

6. What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?

NIL

7. What other comments or suggestions do you have?

NIL COMMENTS

8. Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: BABU MKAJIRE	Location: NAIVASHA
ID No. 8522240	Telephone: 0728652581
Affiliated Organization (if any) BEACH Operator	Position SENIOR CHAIRMAN
Date: 19/06/23	Signature:

NOTE: You may use additional sheets if necessary

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What positive impacts do you expect to emanate from the development of the Project?**

Job creation to the locals

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

Waiting

3. **What should the proponent do to eliminate negative impacts?**

4. **In your option, do you think the proposed project will lead to climate change? ☐ Yes ☑ No. If yes, explain**

5. **In what ways do you think the climate change will impact the proposed project?**

NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

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7. **What other comments or suggestions do you have?**

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8. **Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐**

If NO please give your reasons for the objection.

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Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: TONNY MBATI	**Location:** Nyali Beach
ID No. 25597315	**Telephone:** 0726511962
Affiliated Organization (if any) Photographers	**Position** Member
Date : 19/6/2023	**Signature:**

NOTE: You may use additional sheets if necessary

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. What positive impacts do you expect to emanate from the development of the Project?

=> It will diverse the connectivity of the country and its region

=> Creation of Employment to our young youths

=> Fasten the mode of communication within the region and its surroundings.

=> Will fasten Marketing of goods and services within the region to other parts of the country.

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

⇒ Accidents along the tunnels where the cables are to be buried. They are dug along the roads where most of the residents do pass
⇒ Distruction of pedestrian roads within the region.

3. **What should the proponent do to eliminate negative impacts?**

⇒ Provide reflective boards along the tunnels so that the residents are aware that the tunnels are dangerous.
⇒ If possible to have overhead cables

4. **In your option, do you think the proposed project will lead to climate change?** ☐ **Yes** ☑ **No. If yes, explain**

5. **In what ways do you think the climate change will impact the proposed project?**

NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

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7. **What other comments or suggestions do you have?**

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8. **Do you support the proposed project? (Tick ✔) [YES] [✓] [NO] [ ]**

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: FREDRICK WASHA	**Location:**
ID No. 26419699	**Telephone:** 0799693112
Affiliated Organization (if any) ROBINSON SECURITY	**Position** SUPERVISOR
Date : 19/06/2023	**Signature:**

NOTE: You may use additional sheets if necessary

Telkom Kenya Limited

Environtech Consultancy Africa Ltd

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As a valued stakeholder we request you to submit your comments on the proposed project by way of filling this questionnaire.

1. **What positive impacts do you expect to emanate from the development of the Project?**

To improve the Communication.

To improve the internet

NOTE: You may use additional sheets if necessary

2. **What negative environmental, social, and safety impacts do you expect from the proposed project?**

To make sure that project can't do bad things to the

3. **What should the proponent do to eliminate negative impacts?**

To improve Communication

To attract investors.

4. **In your option, do you think the proposed project will lead to climate change?** ☐ **Yes** ☑ **No. If yes, explain**

Mamtsa kazi (ajira) bupatikane

5. **In what ways do you think the climate change will impact the proposed project?**

1. We should surrender for a short term

2. We should look another place for working

NOTE: You may use additional sheets if necessary

6. **What mitigation and adaptation measures should be incorporated into the project implementation in response to climate change?**

digging the soil cause problem during the time of construction.

7. **What other comments or suggestions do you have?**

The allowances must be pay during the time of construction

8. **Do you support the proposed project? (Tick ✔) [YES] ☑ [NO] ☐**

If NO please give your reasons for the objection.

Please provide us with the following details Contact Details *(This information will be treated confidentially)*

Name: IDDI MOHAMED	**Location:** M'BUNGONI
ID No.	**Telephone:** 0703433291
Affiliated Organization (if any) MYALI B.M.U	**Position** TREASURER
Date : 19 JUNE 2023	**Signature:**

NOTE: You may use additional sheets if necessary

Annex H: Chance Finds Procedures

Purpose

Even though the proposed project site is mostly in the Indian Ocean, there is need to design procedures that cover the reporting and management of any heritage finds.

Scope

The "chance finds" procedure covers the actions to be taken from the discovery of a heritage site or item to its investigation and assessment by a trained archaeologist or other appropriately qualified person.

Compliance

The "chance finds" procedure is intended to ensure compliance with relevant provisions of the National Museums and Heritage Act of 2006, especially Section 30 that requires all discoveries of buried artifacts to be reported to the National Museums of Kenya (NMK). The procedure of reporting set out below must be observed so that heritage remains reported to the NMK are correctly identified in the field.

Responsibility

- Operator: To exercise due caution if archaeological remains are found
- Foreman: To secure site and advise management timeously
- Sunken Project Manager (PM): To determine safe working boundary and request inspection
- Archaeologist: To inspect, identify, advise management, and recover remains.

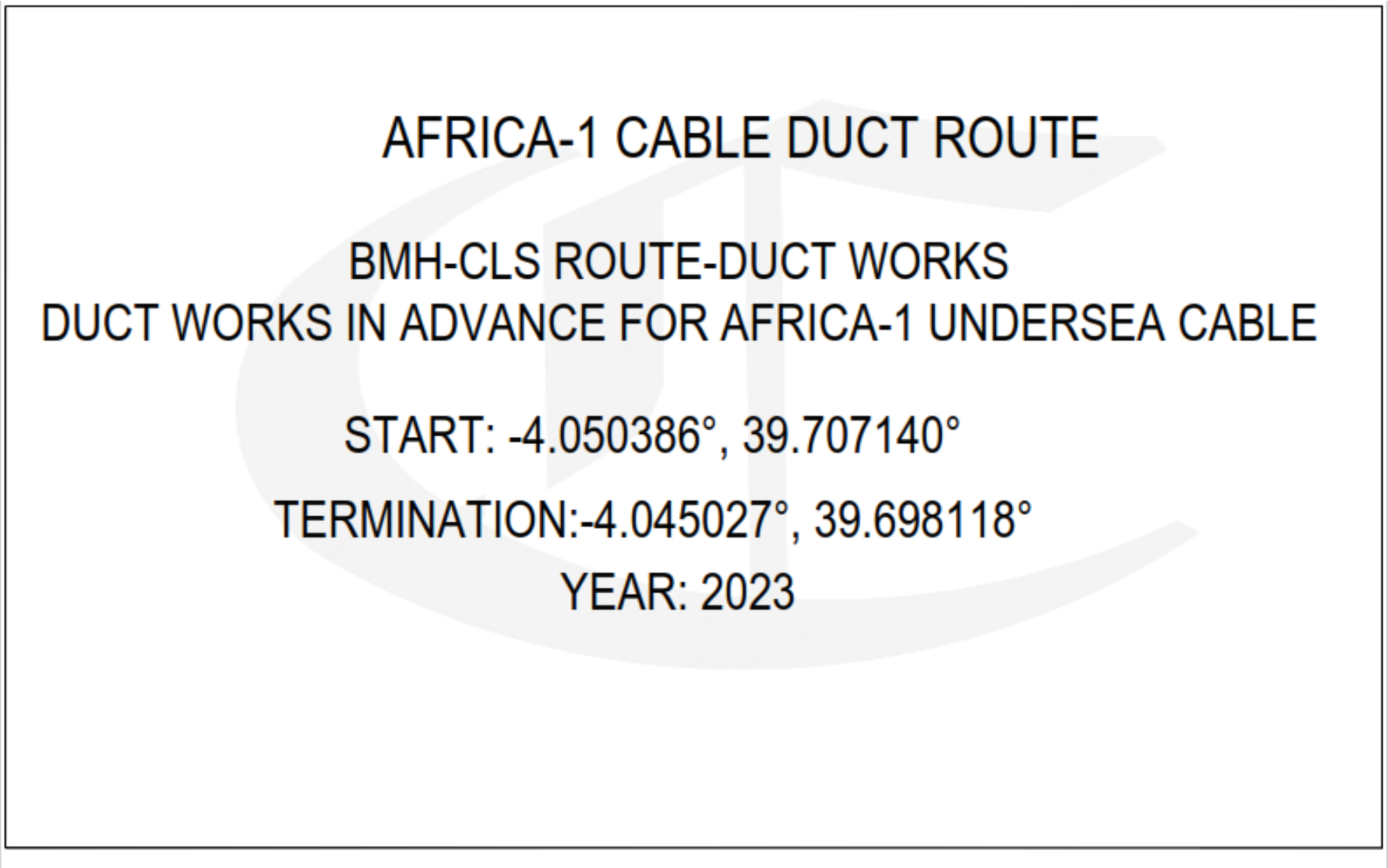
Procedure

Table 0-1 Chance finds procedure

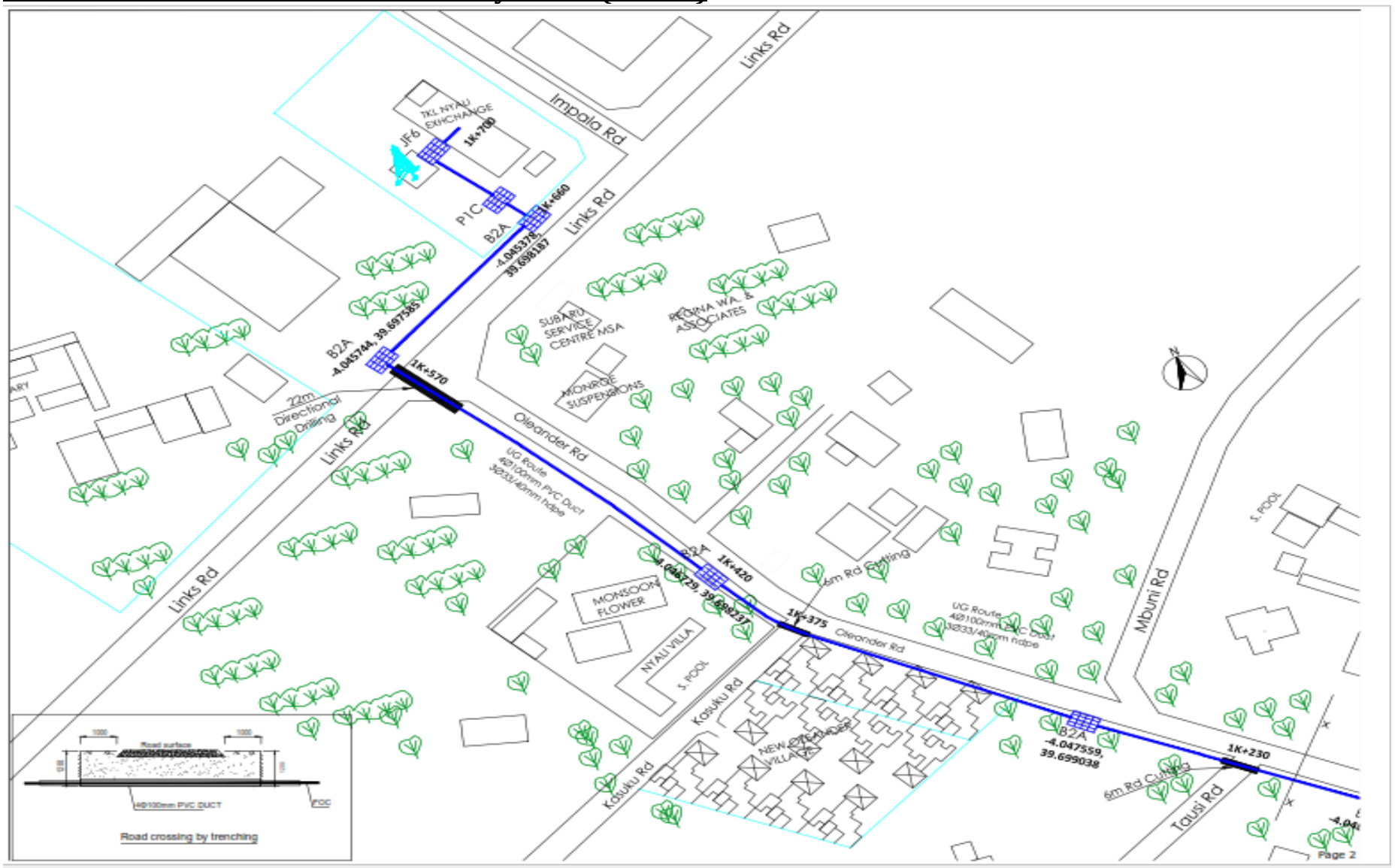
Mitigation/Monitoring Action	Responsibility	Schedule
Should a heritage site or archaeological site be uncovered or discovered during the construction phase of the project, the "chance finds" procedure should be applied. The details of this procedure are highlighted below:	Sunken	Where necessary
• If operating machinery or equipment: stop work • Identify the site with flag tape • Determine GPS position if possible • Report findings to foreman	Person identifying archaeological or heritage material	

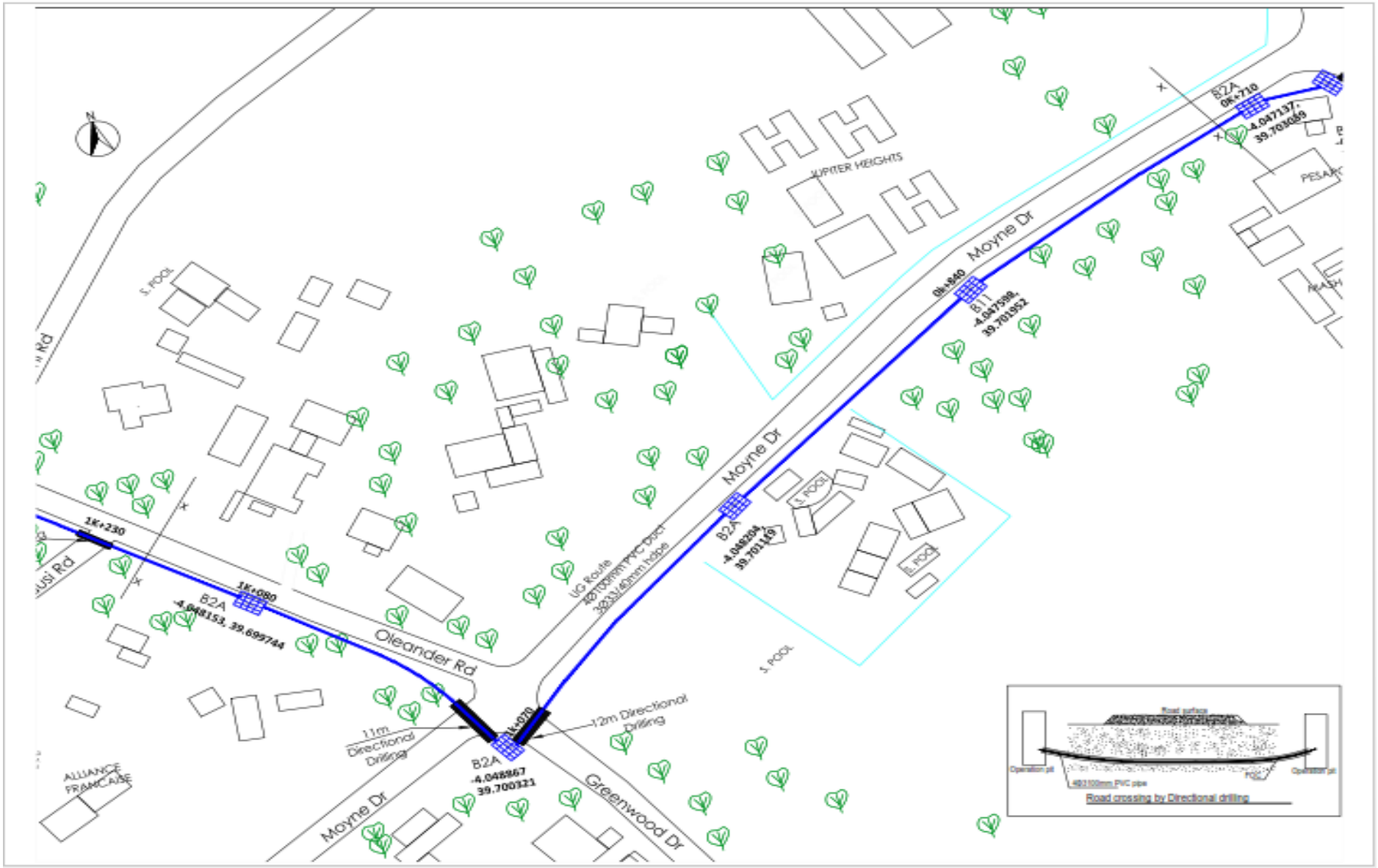
Mitigation/Monitoring Action	Responsibility	Schedule
• Report findings, site location and actions taken to PM • Cease any works in immediate vicinity	Foreman	
• Visit site and determine whether work can proceed without damage to findings • Determine and mark exclusion boundary • Site location and details to be added to project GIS for field confirmation by archaeologist	PM	
• Inspect site and confirm addition to project GIS • Advise the NMK and request written permission to remove findings from work area • Recover, packaging and labelling of findings for transfer to NMK	Archaeologist	
Should human remains be found, the following actions will be required: • Apply the change find procedure as described above. • Schedule a field inspection with an archaeologist to confirm that remains are human. • Advise and liaise with the NMK and Police • Remains will be recovered and removed either to the National Museum or the National Forensic Laboratory.	Archaeologist NMK Police Community elders	

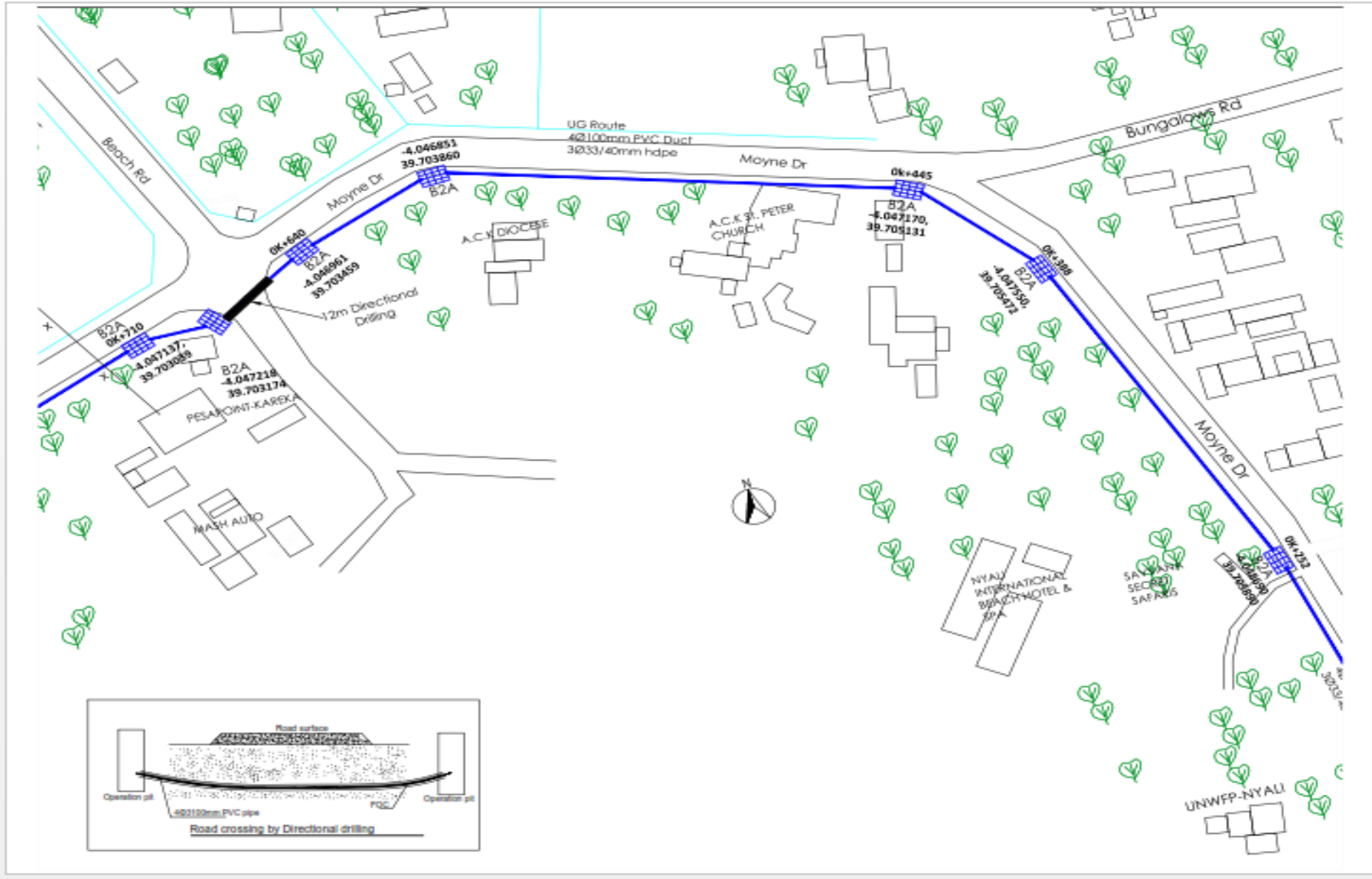
Annex I: AFRICAN 1 ROUTE GIS COORDINATES AND MAP



Front Haul Fiber Route from BMH to Nyali CLS (1.7Km)




Moyne Dr
Oleander Rd
Greenwood Dr
JUPITER HEIGHTS
S. POOL
PESA
ALLIANCE FRANCAISE
1K+230
1K+080
1K+070
0K+840
0K+710
B2A
-4.048153, 39.699744
-4.048867
39.700321
-4.047598,
39.701552
-4.047137,
39.703059
-4.048204
39.701149
11m Directional Drilling
12m Directional Drilling
UG Route
40/100mm PVC Duct
32/33/40mm hdpe
Road surface
Operation pit
40/100mm PVC pipe
Road crossing by Directional drilling


Beach Rd
Moyne Dr
UG Route
4Ø100mm PVC Duct
3Ø33/40mm hdpe
Moyne Dr
Bungalows Rd
-4.046851
39.703860
B2A
0k+640
B2A
-4.046961
39.703459
12m Directional Drilling
A.C.K DIOCESE
A.C.K ST. PETER CHURCH
0k+445
B2A
-4.047170,
39.705131
0k+388
B2A
-4.047550,
39.705472
B2A
0k+710
-4.047137,
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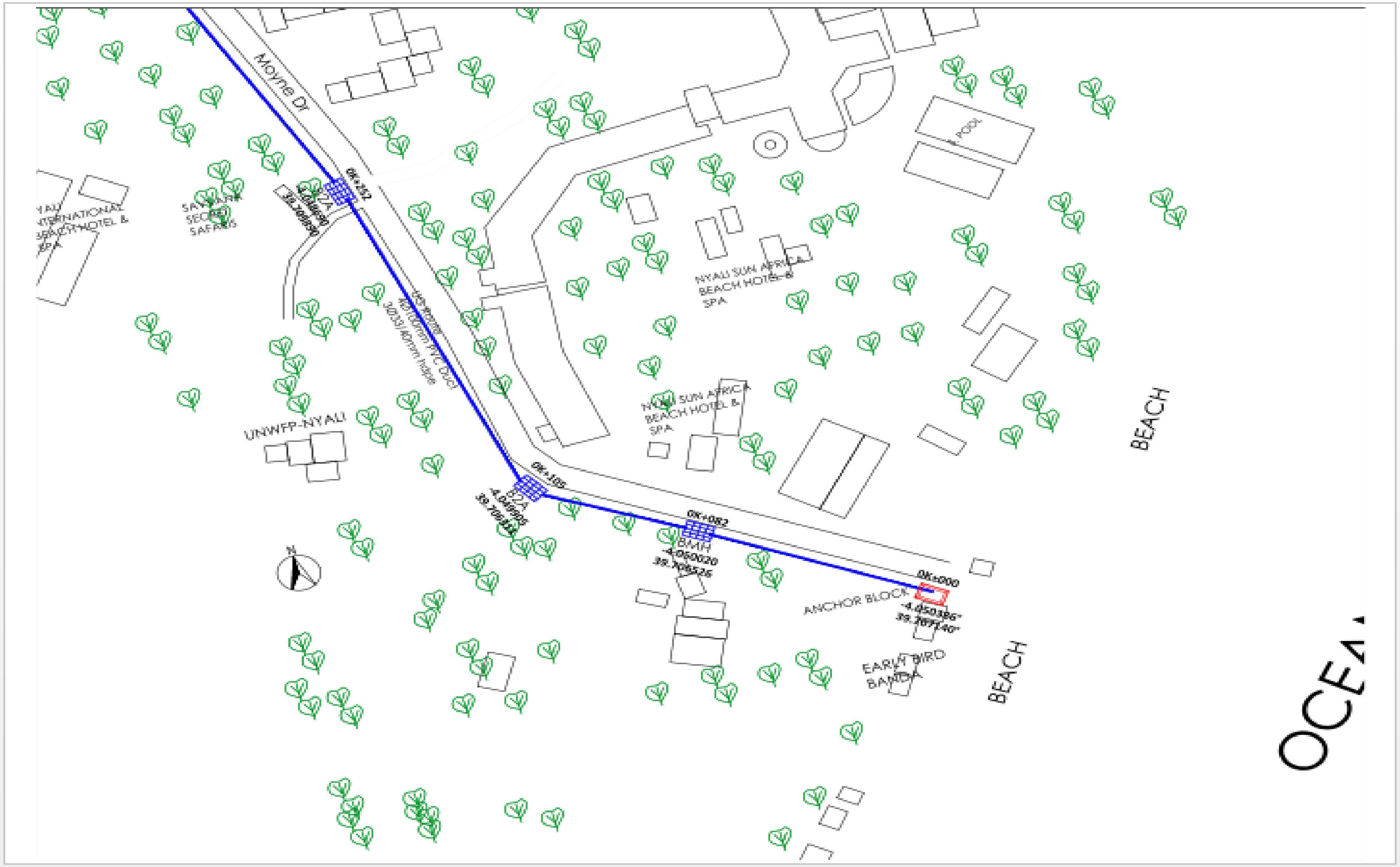
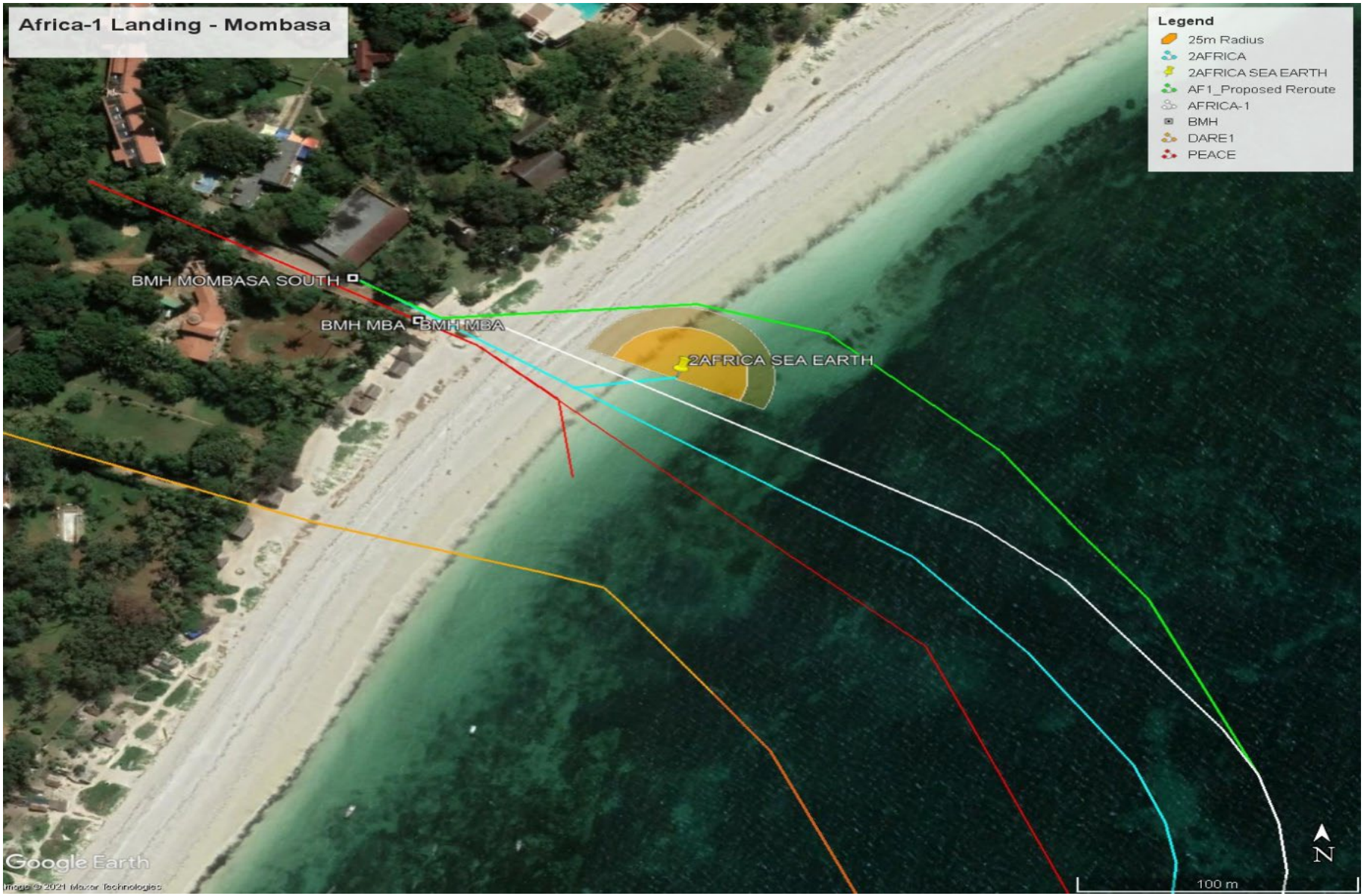
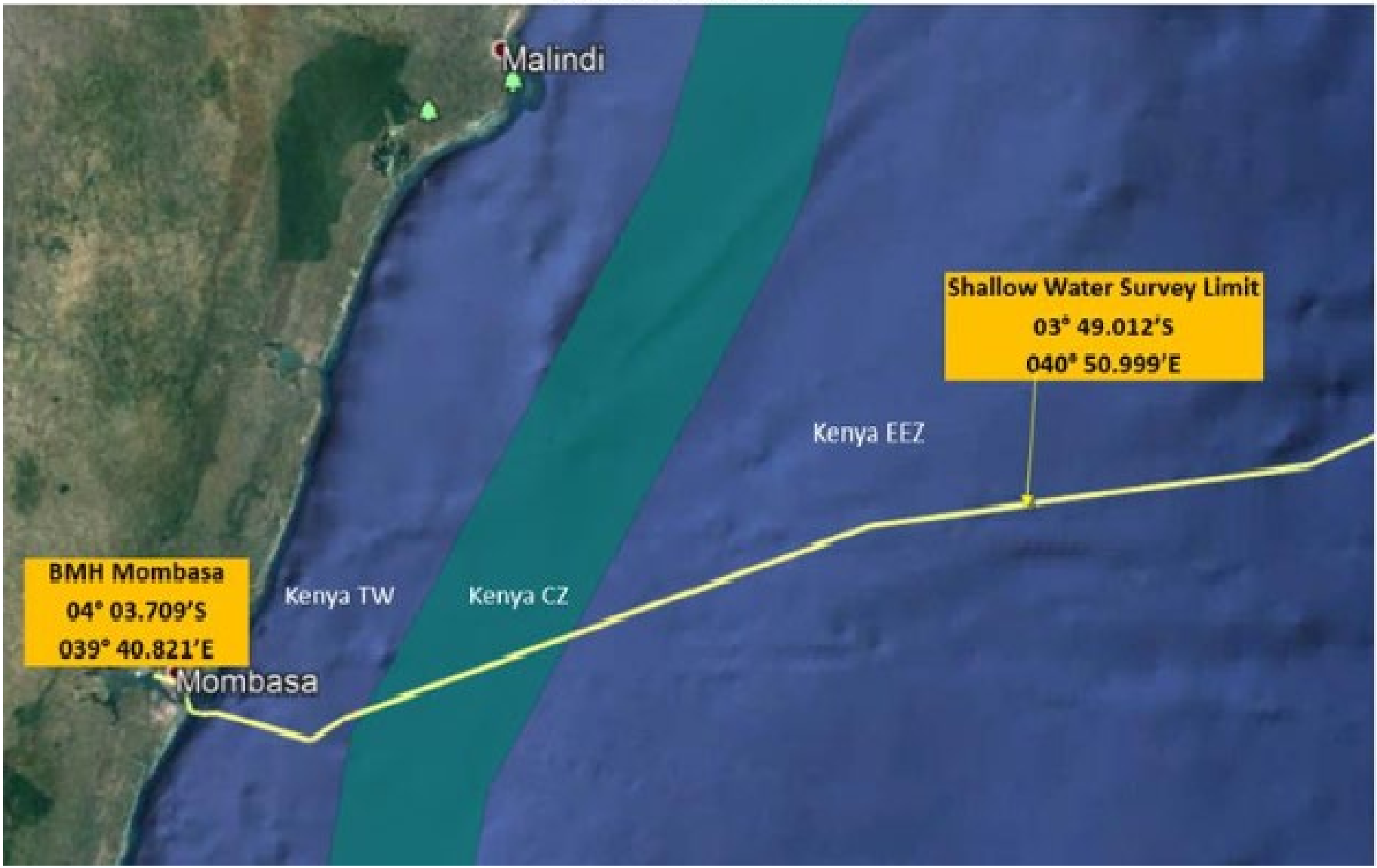
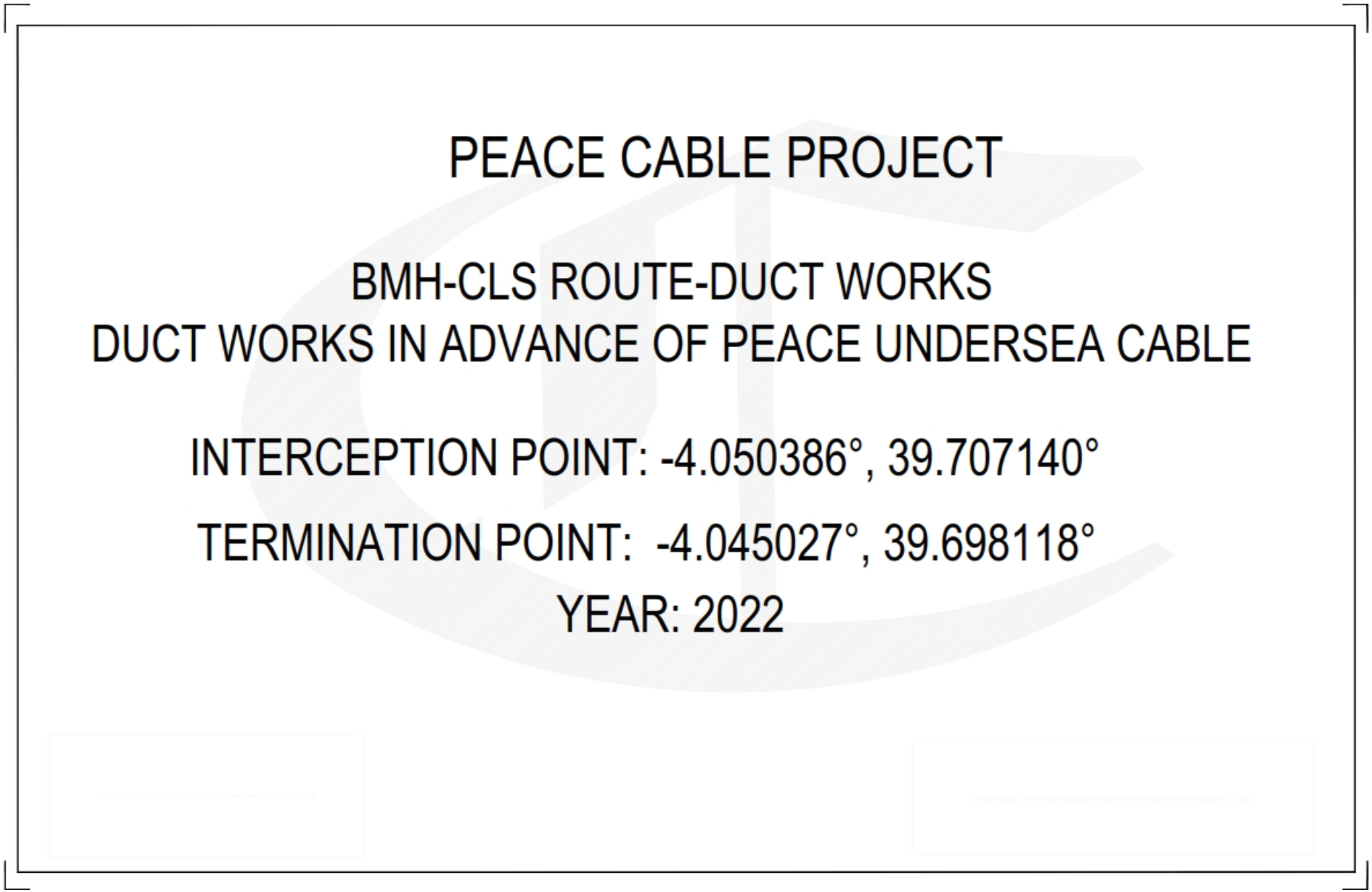
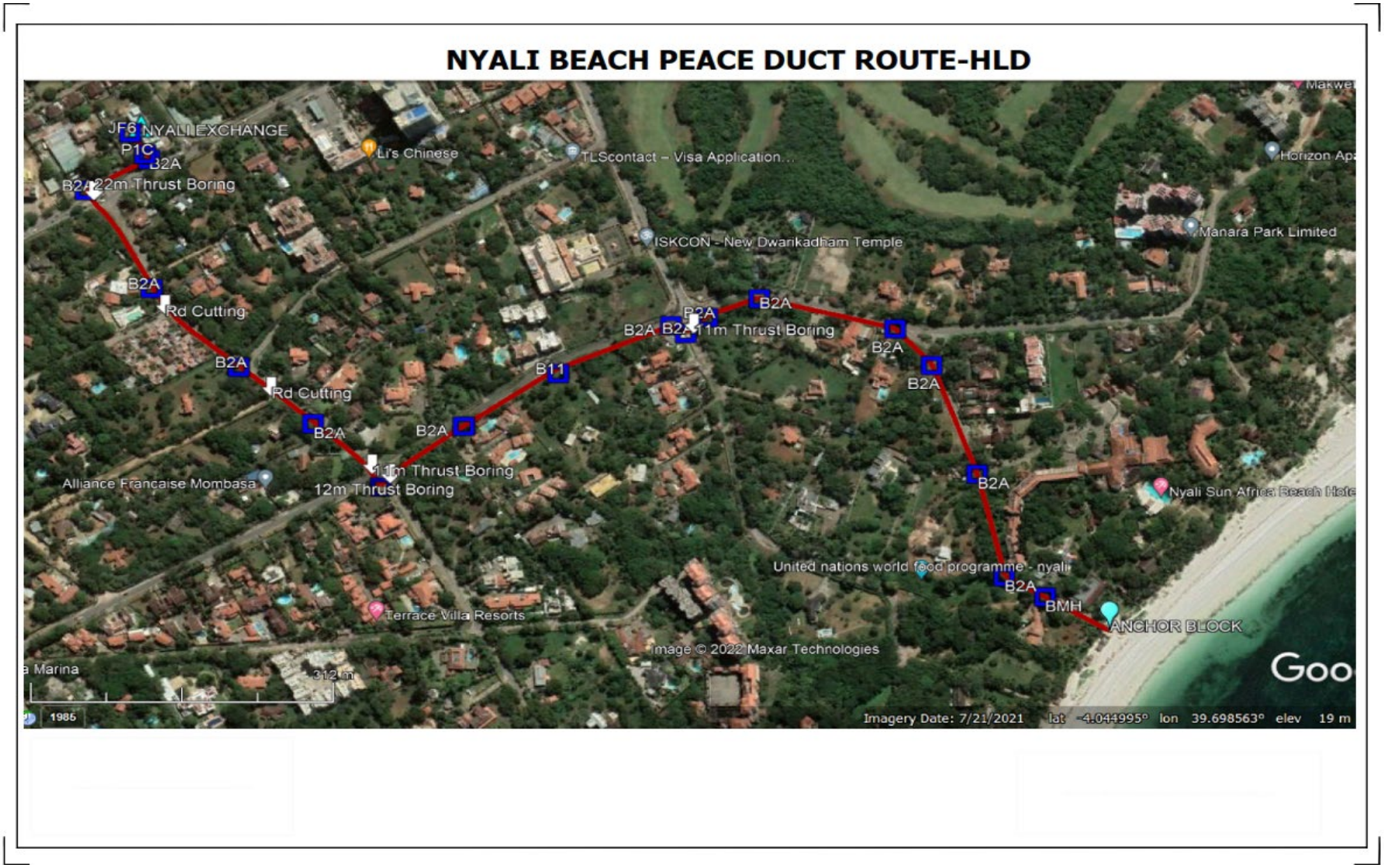
B2A
-4.047218
39.703174
PESAPOINT-KAREKA
WASH AUTO
Moyne Dr
0k+123
B2A
NYALI INTERNATIONAL BEACH HOTEL &
SAFARIS
UNWFP-NYALI
Road surface
Operation pit
Operation pit
PDC
Road crossing by Directional drilling

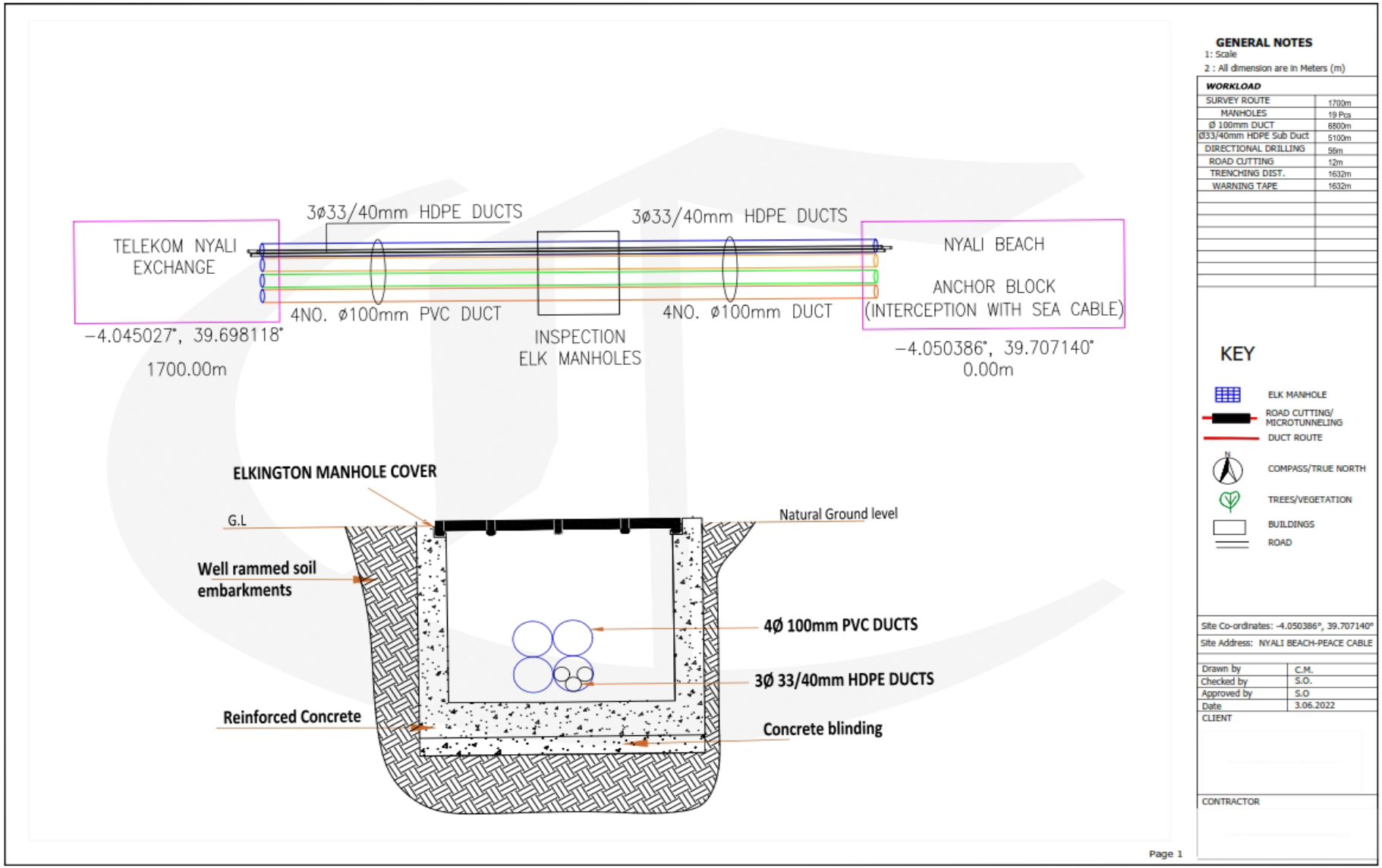

Moyne Dr
0K+252
UNWFP-NYALI
NYALI SUN AFRICA BEACH HOTEL & SPA
NYALI SUN AFRICA BEACH HOTEL & SPA
POOL
0K+105
0K+082
BMH
0K+000
ANCHOR BLOCK
BEACH
BEACH

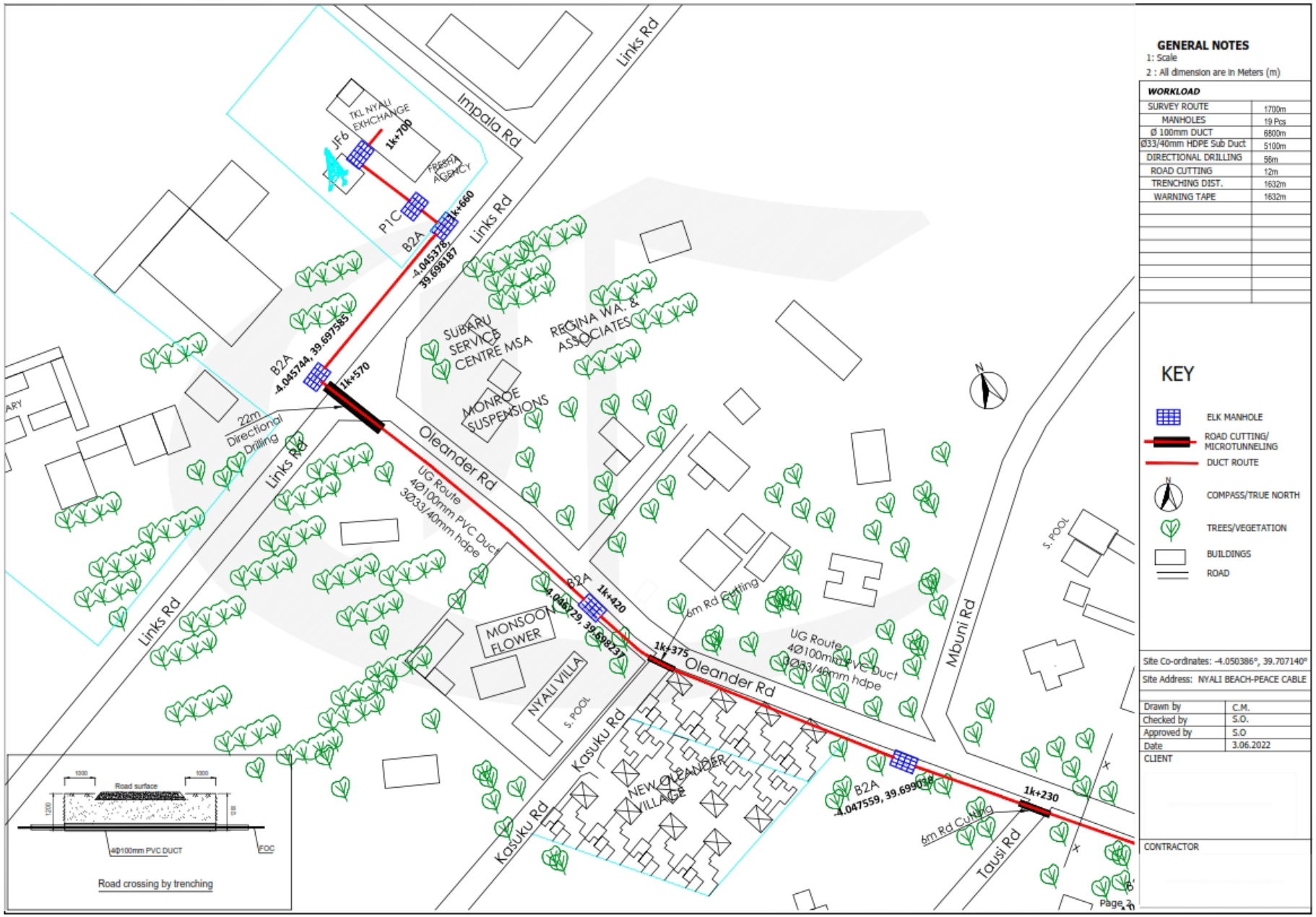

Africa-1 Landing - Mombasa
Legend
25m Radius
2AFRICA
2AFRICA SEA EARTH
AF1_Proposed Reroute
AFRICA-1
BMH
DARE1
PEACE
BMH MOMBASA SOUTH
BMH MBA
BMH MBA
2AFRICA SEA EARTH
Google Earth
100 m
N


AFRICA -1 SUBMARINE CABLE ROUTE SURVEY
MOMBASA, KENYA LIMITS
Malindi
Shallow Water Survey Limit
03° 49.012'S
040° 50.999'E
Kenya EEZ
BMH Mombasa
04° 03.709'S
039° 40.821'E
Kenya TW
Kenya CZ
Mombasa


PEACE CABLE PROJECT
BMH-CLS ROUTE-DUCT WORKS
DUCT WORKS IN ADVANCE OF PEACE UNDERSEA CABLE
INTERCEPTION POINT: -4.050386°, 39.707140°
TERMINATION POINT: -4.045027°, 39.698118°
YEAR: 2022


NYALI BEACH PEACE DUCT ROUTE-HLD
JF6 NYALI EXCHANGE
P1C
B2A
B2A 22m Thrust Boring
Li's Chinese
TLScontact – Visa Application...
ISKCON - New Dwarikadham Temple
Manara Park Limited
B2A
Rd Cutting
B2A
Rd Cutting
B2A
B2A
B11
B2A
B2A
B2A
11m Thrust Boring
B2A
B2A
B2A
Alliance Francaise Mombasa
11m Thrust Boring
12m Thrust Boring
B2A
Nyali Sun Africa Beach Hote
United nations world food programme - nyali
B2A
BMH
ANCHOR BLOCK
Terrace Villa Resorts
Image © 2022 Maxar Technologies
Marina
312 m
1985
Imagery Date: 7/21/2021 lat -4.044995° lon 39.698563° elev 19 m


3ø33/40mm HDPE DUCTS
3ø33/40mm HDPE DUCTS
TELEKOM NYALI EXCHANGE
NYALI BEACH
ANCHOR BLOCK (INTERCEPTION WITH SEA CABLE)
4NO. ø100mm PVC DUCT
4NO. ø100mm DUCT
INSPECTION ELK MANHOLES
-4.045027°, 39.698118°
1700.00m
-4.050386°, 39.707140°
0.00m
ELKINGTON MANHOLE COVER
G.L
Natural Ground level
Well rammed soil embarkments
4Ø 100mm PVC DUCTS
3Ø 33/40mm HDPE DUCTS
Reinforced Concrete
Concrete blinding
GENERAL NOTES
1: Scale
2 : All dimension are in Meters (m)
WORKLOAD
SURVEY ROUTE 1700m
MANHOLES 19 Pcs
Ø 100mm DUCT 6800m
Ø33/40mm HDPE Sub Duct 5100m
DIRECTIONAL DRILLING 56m
ROAD CUTTING 12m
TRENCHING DIST. 1632m
WARNING TAPE 1632m
KEY
ELK MANHOLE
ROAD CUTTING/ MICROTUNNELING
DUCT ROUTE
COMPASS/TRUE NORTH
TREES/VEGETATION
BUILDINGS
ROAD
Site Co-ordinates: -4.050386°, 39.707140°
Site Address: NYALI BEACH-PEACE CABLE
Drawn by C.M.
Checked by S.O.
Approved by S.O
Date 3.06.2022
CLIENT
CONTRACTOR
Page 1


GENERAL NOTES
1: Scale
2 : All dimension are in Meters (m)
WORKLOAD
SURVEY ROUTE 1700m
MANHOLES 19 Pcs
Ø 100mm DUCT 6800m
Ø33/40mm HDPE Sub Duct 5100m
DIRECTIONAL DRILLING 56m
ROAD CUTTING 12m
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KEY
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DUCT ROUTE
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TREES/VEGETATION
BUILDINGS
ROAD
Site Co-ordinates: -4.050386°, 39.707140°
Site Address: NYALI BEACH-PEACE CABLE
Drawn by C.M.
Checked by S.O.
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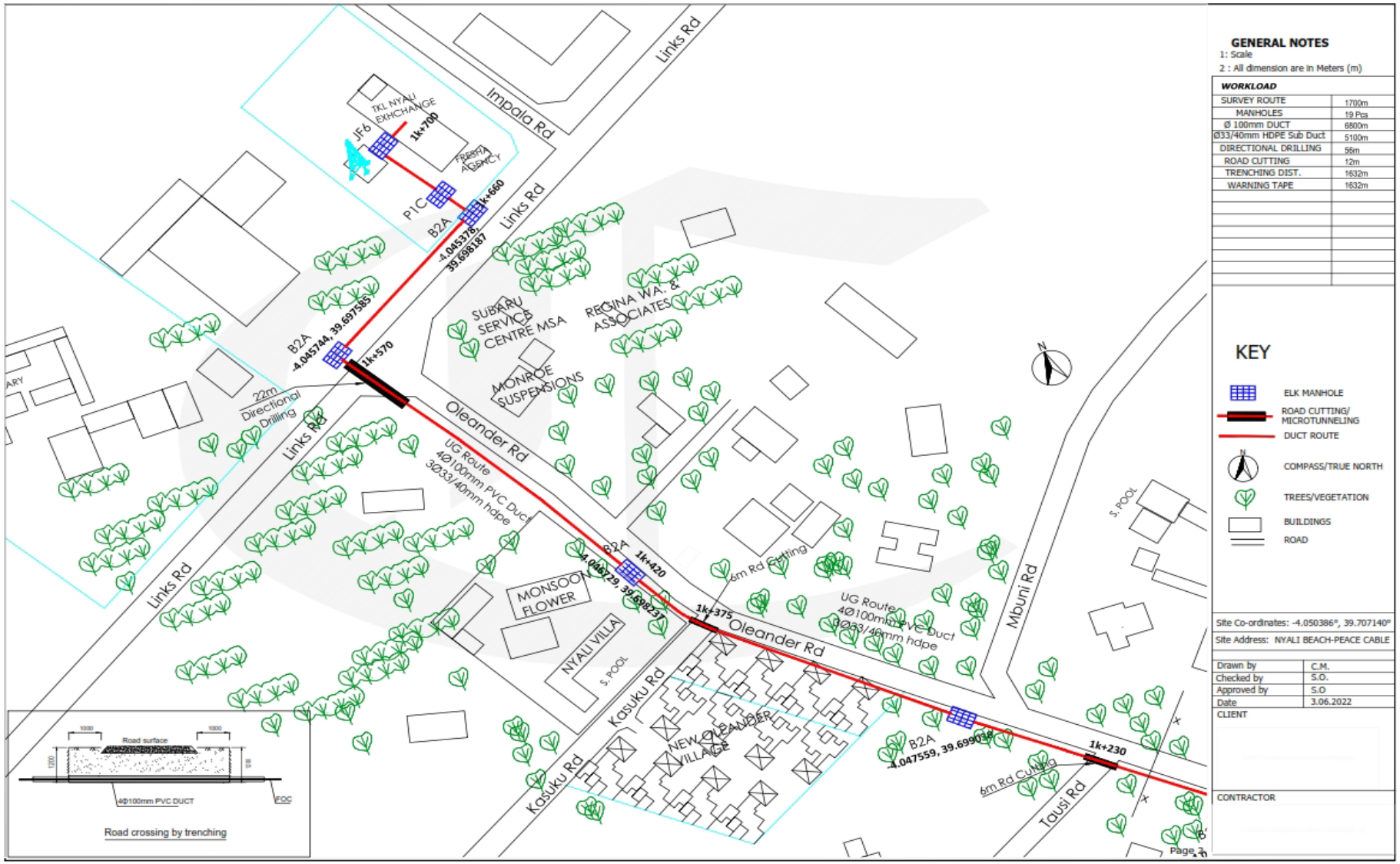
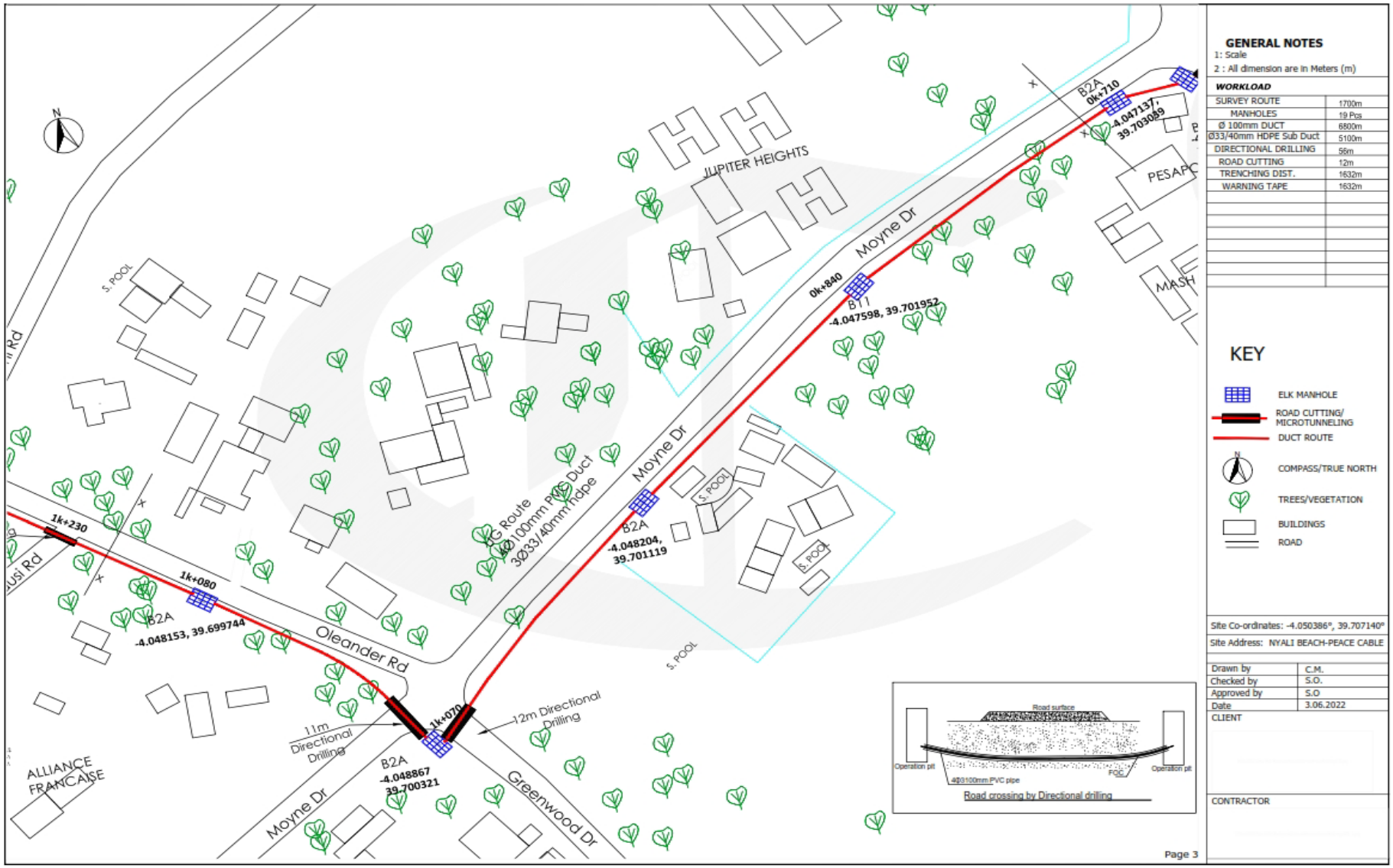
Date 3.06.2022
CLIENT
CONTRACTOR
TKL NYALI EXHCHANGE
JF6
1k+700
FRESHA AGENCY
P1C
B2A
1k+660
-4.045378, 39.698187
B2A -4.045744, 39.697585
1k+570
22m Directional Drilling
Impala Rd
Links Rd
SUBARU SERVICE CENTRE MSA
REGINA WA. & ASSOCIATES
MONROE SUSPENSIONS
Oleander Rd
UG Route 4Ø100mm PVC Duct 3Ø33/40mm hdpe
B2A -4.046729, 39.698237
1k+420
MONSOON FLOWER
NYALI VILLA
S. POOL
6m Rd Cutting
1k+375
Kasuku Rd
NEW OLEANDER VILLAGE
B2A -4.047559, 39.699018
1k+230
Mbuni Rd
Tausi Rd
Road surface
4Ø100mm PVC DUCT
FOC
Road crossing by trenching
Page 3


GENERAL NOTES
1: Scale
2 : All dimension are in Meters (m)
WORKLOAD
SURVEY ROUTE 1700m
MANHOLES 19 Pcs
Ø 100mm DUCT 6800m
Ø33/40mm HDPE Sub Duct 5100m
DIRECTIONAL DRILLING 56m
ROAD CUTTING 12m
TRENCHING DIST. 1632m
WARNING TAPE 1632m
KEY
ELK MANHOLE
ROAD CUTTING/ MICROTUNNELING
DUCT ROUTE
COMPASS/TRUE NORTH
TREES/VEGETATION
BUILDINGS
ROAD
Site Co-ordinates: -4.050386°, 39.707140°
Site Address: NYALI BEACH-PEACE CABLE
Drawn by C.M.
Checked by S.O.
Approved by S.O
Date 3.06.2022
CLIENT
CONTRACTOR
Impala Rd
Links Rd
Oleander Rd
Kasuku Rd
Mbuni Rd
Tausi Rd
TKL NYALI EXCHANGE
JF6
1k+700
FRESHA AGENCY
P1C
B2A
1k+660
-4.045378, 39.698187
B2A -4.045744, 39.697585
1k+570
22m Directional Drilling
SUBARU SERVICE CENTRE MSA
REGINA WA. & ASSOCIATES
MONROE SUSPENSIONS
UG Route 4Ø100mm PVC Duct 3Ø33/40mm hdpe
B2A -4.048729, 39.698237
1k+420
MONSOON FLOWER
NYALI VILLA
S. POOL
6m Rd Cutting
1k+375
NEW OLEANDER VILLAGE
B2A -4.047559, 39.699018
1k+230
Road surface
4Ø100mm PVC DUCT
FOC
Road crossing by trenching
Page 7


JUPITER HEIGHTS
Moyne Dr
Oleander Rd
Greenwood Dr
ALLIANCE FRANCAISE
PESAPC
MASH
S. POOL
1k+230
1k+080
1k+070
0k+840
0k+710
B2A -4.048153, 39.699744
B2A -4.048204, 39.701119
B2A -4.048867 39.700321
B2A 0k+710 -4.047137, 39.703089
B11 -4.047598, 39.701952
IG Route 4Ø100mm PVC Duct 3Ø33/40mm hdpe
11m Directional Drilling
12m Directional Drilling
Road crossing by Directional drilling
Operation pit
POC
4Ø3100mm PVC pipe
GENERAL NOTES
1: Scale
2 : All dimension are in Meters (m)
WORKLOAD
SURVEY ROUTE 1700m
MANHOLES 19 Pcs
Ø 100mm DUCT 6800m
Ø33/40mm HDPE Sub Duct 5100m
DIRECTIONAL DRILLING 56m
ROAD CUTTING 12m
TRENCHING DIST. 1632m
WARNING TAPE 1632m
KEY
ELK MANHOLE
ROAD CUTTING/ MICROTUNNELING
DUCT ROUTE
COMPASS/TRUE NORTH
TREES/VEGETATION
BUILDINGS
ROAD
Site Co-ordinates: -4.050386°, 39.707140°
Site Address: NYALI BEACH-PEACE CABLE
Drawn by C.M.
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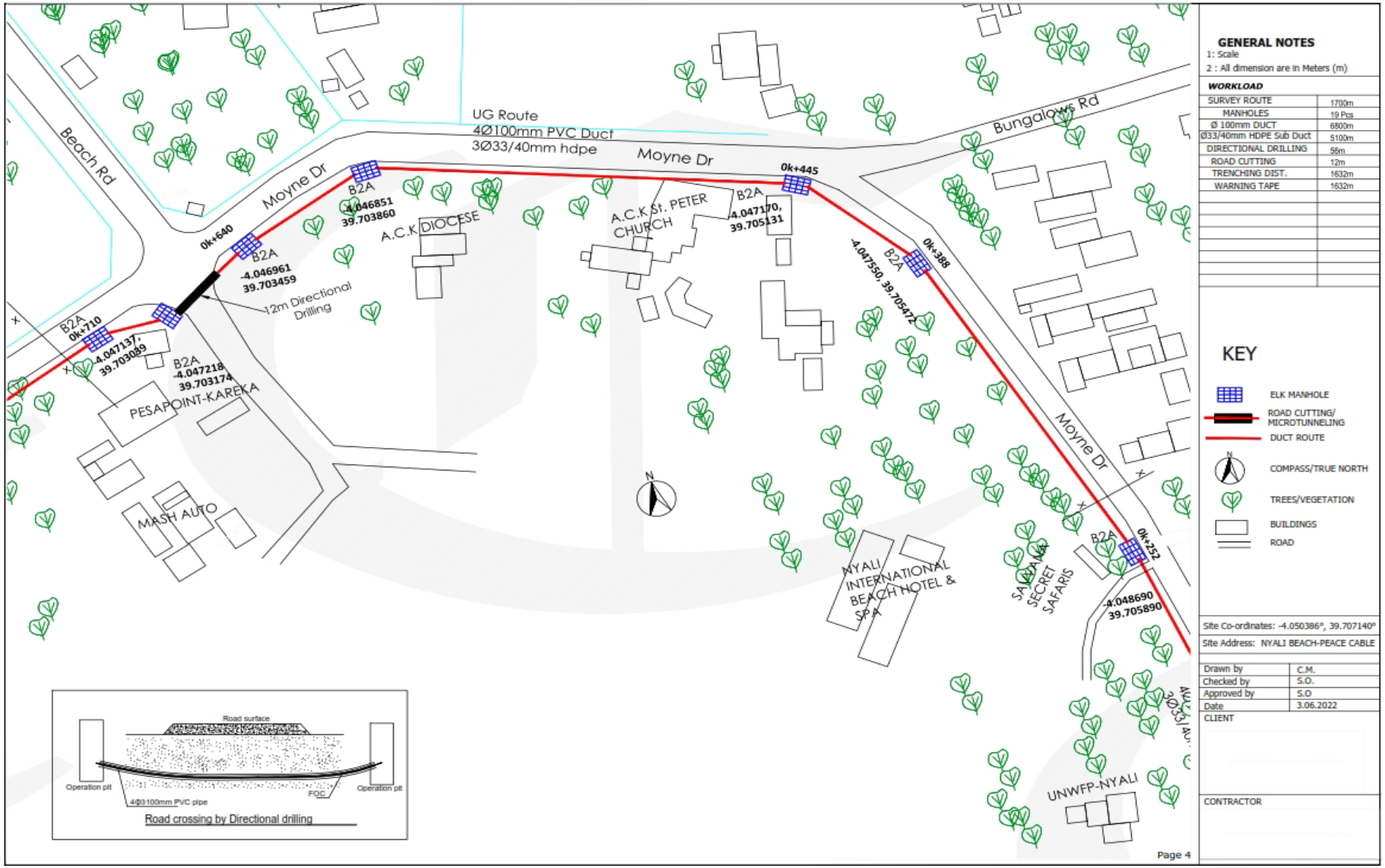
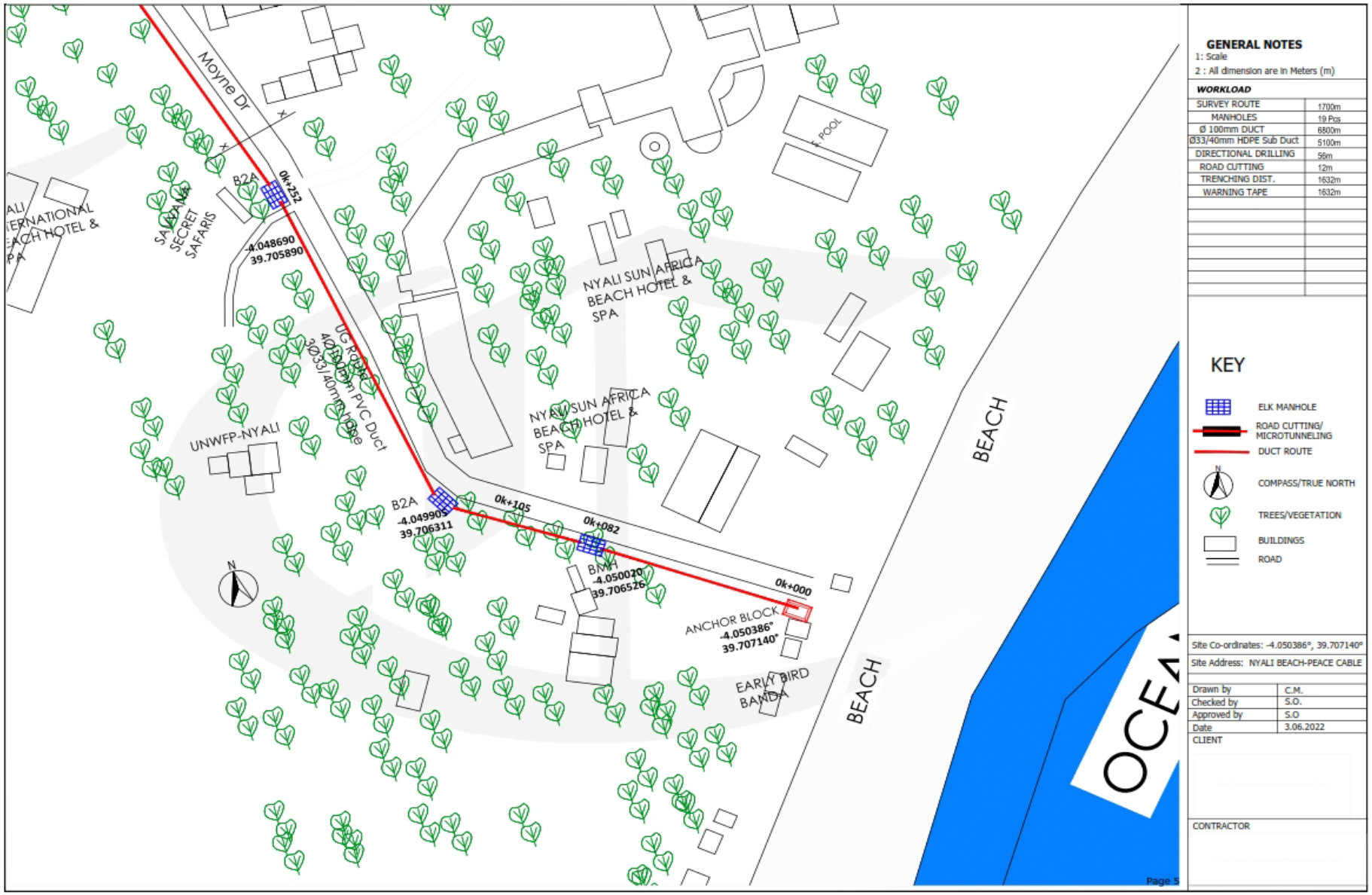
Date 3.06.2022
CLIENT
CONTRACTOR
Page 3


UG Route
4Ø100mm PVC Duct
3Ø33/40mm hdpe
Moyne Dr
Beach Rd
Bungalows Rd
A.C.K DIOCESE
A.C.K St. PETER CHURCH
PESAPOINT-KAREKA
MASH AUTO
NYALI INTERNATIONAL BEACH HOTEL & SPA
SAFARI NA SECRET SAFARIS
UNWFP-NYALI
12m Directional Drilling
B2A 0k+640 -4.046961 39.703459
B2A -4.046851 39.703860
B2A 0k+445 -4.047170, 39.705131
B2A -4.047550, 39.705472
B2A 0k+388
B2A 0k+710 -4.047137, 39.703089
B2A -4.047218 39.703174
B2A 0k+252 -4.048690 39.705890
N
Road surface
Operation pit
Operation pit
4Ø3100mm PVC pipe
FOC
Road crossing by Directional drilling
GENERAL NOTES
1: Scale
2 : All dimension are in Meters (m)
WORKLOAD
SURVEY ROUTE 1700m
MANHOLES 19 Pcs
Ø 100mm DUCT 6800m
Ø33/40mm HDPE Sub Duct 5100m
DIRECTIONAL DRILLING 56m
ROAD CUTTING 12m
TRENCHING DIST. 1632m
WARNING TAPE 1632m
KEY
ELK MANHOLE
ROAD CUTTING/ MICROTUNNELING
DUCT ROUTE
COMPASS/TRUE NORTH
TREES/VEGETATION
BUILDINGS
ROAD
Site Co-ordinates: -4.050386°, 39.707140°
Site Address: NYALI BEACH-PEACE CABLE
Drawn by C.M.
Checked by S.O.
Approved by S.O
Date 3.06.2022
CLIENT
CONTRACTOR
Page 4


Moyne Dr
B2A
0k+252
-4.048690
39.705890
SAFARIS
NYALI SUN AFRICA BEACH HOTEL & SPA
POOL
UG ROUTE
40/50mm PVC Duct
3Ø33/40mm HDPE
UNWFP-NYALI
B2A
-4.049905
39.706311
0k+105
0k+082
BMH
-4.050020
39.706526
0k+000
ANCHOR BLOCK
-4.050386°
39.707140°
EARLY BIRD
BANDA
BEACH
BEACH
OCEA
N
GENERAL NOTES
1: Scale
2 : All dimension are in Meters (m)
WORKLOAD
SURVEY ROUTE 1700m
MANHOLES 19 Pcs
Ø 100mm DUCT 6800m
Ø33/40mm HDPE Sub Duct 5100m
DIRECTIONAL DRILLING 56m
ROAD CUTTING 12m
TRENCHING DIST. 1632m
WARNING TAPE 1632m
KEY
ELK MANHOLE
ROAD CUTTING/ MICROTUNNELING
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ROAD
Site Co-ordinates: -4.050386°, 39.707140°
Site Address: NYALI BEACH-PEACE CABLE
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Page 5

Wet Segment Route (Approx. 32Km on Kenya TW up to EEZ)

Index	Label	Latitude (WGS 84) deg	min	N/S	Longitude (WGS 84) deg	min	E/W	Depth (m)	Distance Segment (km)	Distance Total (km)
1	BMH MOMBASA	04	03.7090	S	039	40.8210	E	0	0.000	0.000
2	CX	04	03.7097	S	039	40.8232	E	0	0.004	0.004
3	CX FO	04	03.7187	S	039	40.8495	E	0	0.051	0.055
4	WD 8m	04	03.7229	S	039	40.8618	E	8	0.024	0.079
5	AC98	04	03.7255	S	039	40.8695	E	0	0.016	0.095
6	WD 15m	04	03.7315	S	039	40.8791	E	15	0.020	0.115
7	POL	04	03.7349	S	039	40.8846	E	0	0.012	0.127
8	AC97	04	03.7354	S	039	40.8855	E	0	0.002	0.129
9	CX OOS TELE	04	03.7361	S	039	40.8866	E	0	0.003	0.132
10	CX OOS	04	03.7363	S	039	40.8869	E	0	0.000	0.132
11	AC96	04	03.7447	S	039	40.9004	E	0	0.030	0.162
12	CX OOS TELE	04	03.7527	S	039	40.9093	E	0	0.022	0.184
13	AC95	04	03.7541	S	039	40.9108	E	0	0.004	0.188
14	CX OOS TELE	04	03.7581	S	039	40.9137	E	0	0.009	0.197
15	AC94	04	03.7653	S	039	40.9188	E	0	0.016	0.213
16	CX FO	04	03.7806	S	039	40.9248	E	0	0.030	0.243
17	AC93	04	03.7996	S	039	40.9322	E	0	0.038	0.281
18	AC92	04	03.8166	S	039	40.9438	E	0	0.038	0.319
19	CX OOS TELE	04	03.8246	S	039	40.9501	E	0	0.019	0.338
20	AC91	04	03.8272	S	039	40.9522	E	0	0.006	0.344

21	AC90	04	03.8511	S	039	40.9672	E	0	0.052	0.396
22	AC89	04	03.8662	S	039	40.9753	E	0	0.032	0.428
23	AC88	04	03.8825	S	039	40.9797	E	0	0.031	0.459
24	AC87	04	03.8988	S	039	40.9822	E	0	0.030	0.489
25	CX OOS TELE	04	03.9354	S	039	40.9868	E	0	0.068	0.557
26	AC86	04	04.0756	S	039	41.0042	E	0	0.261	0.818
27	CX OOS TELE	04	04.1406	S	039	41.0173	E	0	0.122	0.940
28	CX OOS TELE	04	04.1997	S	039	41.0293	E	0	0.111	1.051
29	AC85	04	04.2905	S	039	41.0476	E	0	0.171	1.222
30	CX OOS TELE	04	04.3712	S	039	41.0605	E	0	0.150	1.372
31	WD 50m	04	04.4284	S	039	41.0697	E	50	0.107	1.479
32	AC84	04	04.4548	S	039	41.0739	E	0	0.049	1.528
33	CX OOS TELE	04	04.4597	S	039	41.0760	E	0	0.010	1.538
34	AC83	04	04.4639	S	039	41.0780	E	0	0.009	1.547
35	AC82	04	04.4697	S	039	41.0825	E	0	0.013	1.560
36	CX FO	04	04.4822	S	039	41.0958	E	0	0.034	1.594
37	AC81	04	04.4961	S	039	41.1105	E	0	0.037	1.631

38	AC80	04	04.5095	S	039	41.1192	E	0	0.030	1.661
39	AC79	04	04.5286	S	039	41.1274	E	0	0.038	1.699
40	CX OOS TELE	04	04.5472	S	039	41.1324	E	0	0.036	1.735
41	AC78	04	04.5546	S	039	41.1344	E	0	0.014	1.749
42	AC77	04	04.5938	S	039	41.1424	E	0	0.074	1.823
43	WD 50m	04	04.5998	S	039	41.1423	E	50	0.011	1.834
44	AC76	04	04.6370	S	039	41.1414	E	0	0.068	1.902
45	AC75	04	04.6974	S	039	41.1304	E	0	0.113	2.015
46	CX OOS TELE	04	04.7644	S	039	41.1018	E	0	0.135	2.150
47	AC74	04	04.8161	S	039	41.0797	E	0	0.103	2.253
48	CX OOS TELE	04	04.9238	S	039	41.0293	E	0	0.220	2.473
49	AC73	04	04.9253	S	039	41.0287	E	0	0.003	2.476
50	AC72	04	04.9398	S	039	41.0266	E	0	0.027	2.503
51	CX OOS TELE	04	04.9443	S	039	41.0268	E	0	0.008	2.511
52	AC71	04	04.9591	S	039	41.0272	E	0	0.027	2.538
53	AC70	04	04.9851	S	039	41.0342	E	0	0.050	2.588
54	AC69	04	05.0047	S	039	41.0452	E	0	0.041	2.629
55	AC68	04	05.0261	S	039	41.0655	E	0	0.055	2.684

55	AC68	04	05.0261	S	039	41.0655	E	0	0.055	2.684
56	AC67	04	05.0508	S	039	41.0971	E	0	0.074	2.758
57	CX OOS TELE	04	05.0629	S	039	41.1195	E	0	0.047	2.805
58	AC66	04	05.1088	S	039	41.2038	E	0	0.178	2.983
59	AC65	04	05.1312	S	039	41.2378	E	0	0.075	3.058
60	AC64	04	05.1528	S	039	41.2583	E	0	0.055	3.113
61	AC63	04	05.1654	S	039	41.2678	E	0	0.029	3.142
62	AC62	04	05.1825	S	039	41.2753	E	0	0.034	3.176
63	AC61	04	05.2071	S	039	41.2793	E	0	0.046	3.222
64	AC60	04	05.2582	S	039	41.2759	E	0	0.095	3.317
65	AC59	04	05.3282	S	039	41.2618	E	0	0.131	3.448
66	AC58	04	05.3886	S	039	41.2540	E	0	0.113	3.561
67	AC57	04	05.4273	S	039	41.2537	E	0	0.071	3.632
68	AC56	04	05.4806	S	039	41.2664	E	0	0.101	3.733
69	AC55	04	05.5093	S	039	41.2774	E	0	0.057	3.790
70	AC54	04	05.5646	S	039	41.3010	E	0	0.110	3.900
71	AC53	04	05.6119	S	039	41.3266	E	0	0.100	4.000
72	AC52	04	05.6851	S	039	41.3937	E	0	0.183	4.183
73	AC51	04	05.7413	S	039	41.4802	E	0	0.191	4.374
74	AC50	04	05.7684	S	039	41.5632	E	0	0.161	4.535
75	CX OOS TELE	04	05.7913	S	039	41.6696	E	0	0.202	4.737

76	AC49	04	05.8263	S	039	41.8323	E	0	0.308	5.045
77	AC48	04	05.8732	S	039	42.0548	E	0	0.420	5.465
78	WD 50m	04	05.8943	S	039	42.2619	E	50	0.385	5.850
79	WD 50m	04	05.9012	S	039	42.3305	E	50	0.128	5.978
80	AC47	04	05.9084	S	039	42.4009	E	0	0.131	6.109
81	CX OOS TELE	04	05.9197	S	039	42.6668	E	0	0.493	6.602
82	WD 50m	04	05.9231	S	039	42.7487	E	50	0.151	6.753
83	AC46	04	05.9263	S	039	42.8236	E	0	0.139	6.892
84	CX OOS TELE	04	05.9170	S	039	42.8994	E	0	0.141	7.033
85	CX FO	04	05.8992	S	039	43.0446	E	0	0.271	7.304
86	CX OOS TELE	04	05.8899	S	039	43.1203	E	0	0.141	7.445
87	CX OOS TELE	04	05.8835	S	039	43.1725	E	0	0.097	7.542
88	CT Port Limit Enter	04	05.8828	S	039	43.1779	E	0	0.011	7.553
89	AC45	04	05.8669	S	039	43.3076	E	0	0.241	7.794
90	AC44	04	05.8665	S	039	43.6392	E	0	0.614	8.408
91	TR SA-17/DA-17	04	06.0100	S	039	44.1672	E	200	1.012	9.420
92	CT PLUP	04	06.0566	S	039	44.3384	E	0	0.329	9.749
93	WD 300m	04	07.0700	S	039	48.0664	E	300	7.147	16.896
94	CX OOS TELE	04	07.6551	S	039	50.2187	E	0	4.126	21.022
95	CX OOS	04	07.6551	S	039	50.2187	E	0	0.000	21.022
96	AC43	04	07.9011	S	039	51.1240	E	0	1.736	22.758
97	AC42	04	07.9028	S	039	51.3942	E	0	0.500	23.258
98	AC41	04	07.8352	S	039	51.6559	E	0	0.500	23.758
99	CX	04	07.5938	S	039	52.0422	E	0	0.842	24.600
100	CX	04	06.5470	S	039	53.7177	E	0	3.652	28.252
101	AC40	04	06.2683	S	039	54.1637	E	0	0.972	29.224
102	WD 500m	04	06.0441	S	039	54.7960	E	500	1.241	30.465
103	MB EZ KEN/TW KEN	04	05.6935	S	039	55.7847	E	0	1.940	32.405
	CT Enter Security									

Annex J: Bill of Quantity (price in USD) for Submarine Section installation

	DESCRIPTION	UNIT	QUANTITY			UNIT	TOTAL	Insurance	TOTAL	Custom	VAT	DDP
			IN LINE	SPARE	TOTAL	PRICE	FCA PRICE	& Freight	DAP PRICE	Duties & Taxes	On Equipment	Incl. VAT (USD)
1	**CABLES**											
1.1	SA 4fp - Cable Type2	Km	23,10		23,10	9 998	230 965	-	230 965	8 661	38 340	277 966
1.2	DA 4fp - Cable Type2	Km	9,47		9,47	16 700	158 148	-	158 148	5 931	26 253	190 331
	Sub-Total CABLES	Price	**389 113**				**389 113**	**-**	**389 113**	**14 592**	**64 593**	**468 297**
2	**CABLE TRANSITIONS**											
2.1	Transition Armored	Set	1.00		1.00	30 388	30 388	-	30 388	1 140	5 044	36 572
	Sub-Total CABLE TRANSITIONS	Price	**30 388**				**30 388**	**-**	**30 388**	**1 140**	**5 044**	**36 572**
(USD)	**TOTAL SECTION 2B (BU7-Mombasa)**	**Price**	**419 500**				**419 500**	**-**	**419 500**	**15 731**	**69 637**	**504 869**
	Equipment	***Price***	***419 500***				***419 500***	**-**	***419 500***	***15 731***	***69 637***	***504 869***
	Services	***Price***	**-**				**-**	**-**	**-**	**-**	**-**	**-**

2. CIVIL WORKS/CABLING CONSTRUCTION OF DUCT ROUTE BETWEEN BEACH MANHOLE AND NYALI CABLE LANDING STATION

SUMMARY				
No.	**SCOPE**	**COST**	**16% VAT**	**TOTAL COST**
1	BMH	1,424,470.00	227,915.20	**1,652,385.20**
2	BMH - NYALI CLS	1,927,938.00	308,470.08	**2,236,408.08**
TOTAL		**3,352,408.00**	**536,385.28**	**3,888,793.28**

Annex K: Final Survey Report for Cable Route Design & Engineering for Africa 1 - Seg 2 Submarine fibre Optic Cable System Segment 2.06 BMH Mombasa (MBA) – Bu Mombasa (MBA)

Annex L: Correspondents

10.3 Annex M: Mombasa Marine National Park & Reserve (MMNPR)

Biodiversity Management Plan (BMP)