KETRACO
KENYA ELECTRICITY TRANSMISSION CO. LTD.
"Building a World Class National Grid"

Environmental and Social Impact Assessment Addendum Report for a 16.5 km Electricity Transmission Underground Cables for: -

(1) Nanyuki – Rumuruti 132kV Transmission line: a component of the Lessos-Kabarnet-Nyahururu- Nanyuki 132 kV Transmission Line (NEMA Ref NO: EIA/545 and NEMA License NO: 0006570)- 16.5 km
(2). Nanyuki – Isiolo- Meru 132 kV Transmission Line: A component of the Nanyuki- Meru, Ishiara- Kieni, and Mwingi – Kitui- Wote- Sultan Hamud (NEMA Ref No: EIA/575 and NEMA license No: 006841)- 4 Km

March, 2019

DECLARATION PAGE

This document has been prepared in accordance with Environmental (Impact Assessment and Audit) Regulations, 2003 of the Kenya Gazette supplement No. 56 of 13th June 2003, Legal Notice No. 101.

LEAD EIA/AUDIT EXPERTS

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Date---------- 22/3/2019

Do hereby certify that this report was prepared based on the information provided by various stakeholders as well as that collected from other primary and secondary sources and on the best understanding and interprétation of the facts by the Environmental Social & Impact Assessors. It is issued without any préjudice.

ACRONYMS AND ABBREVIATIONS

ASAL	Arid and Semi-Arid Lands
CEC	County Executive Committee
CPP	Consultation and Public Participation
DCC	Deputy County Commissioner
DOSH	Directorate of Occupation Safety and Health
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GPS	Global Positioning System
KDF	Kenya Defence Forces
KENHA	Kenya National Highways Authority
KeRRA	Kenya Rural Roads Authority
KETRACO	Kenya Electricity Transmission Company Ltd
KP	Kenya Power
KPLC	Kenya Power and Lighting Company
NAWASCO	Nanyuki Water and Sewerage Company
NECC	National Environment Complaints Committee
NEMA	National Environment Management Authority
OS	Operational Standards
PAPs	Project Affected Persons
PPEs	Personal Protective Equipment
RAP	Resettlement Action Plan
TL	Transmission Line
WRAP	Waste Reduction Action Plan

EXECUTIVE SUMMARY

This report is an addendum to Environmental Project Reports Submitted to National Environment Management Authority (NEMA) in 2010 for the Lessos – Kabarnet- Nyahururu-Nanyuki; and **Nanyuki- Meru, Ishiara- Kieni, and Mwingi – Kitui- Wote- Sultan Hamud**. 132kV Transmission Lines. Environmental Impact Assessment (EIA) licenses were issued on 20th September, 2010 and 22nd October 2010 respectively. They EIA reports give detailed aspects of Project Description, Baseline Study, Legal and Institution Framework review, Potential Environmental and Social Impacts, Mitigation Measure, Project Alternatives and Environmental Management/ Monitoring Plans (EMPs) for the construction, operational and decommissioning phases for the two projects.

This report therefore addresses environmental and social issues for a 16.5Km long and 30 m wide wayleave whose first 4Km of wayleave is shared with the two lines.

The underground cable will begin at Nanyuki Marura Block-7 within Marura location at Tower No. 7 (283104E, 000670N); then proceeding northwards for about 2.7 km to Tower No. 15, LR No. 10422/5- bordering the sewerage treatment plant (283253E, 0003349N); then crosses the airbase road then takes north-eastern direction for about 328m to Tower No. 16, Nanyuki Marura Block-10 (283441E, 003619N); then proceeds for about 0.7 Km to Tower No. 18, Nanyuki Marura Block-10 (283974E, 0004119N) (this section borders the British Army Training Camp to the right). At this, the underground cable for Nanyuki- Isiolo- Meru 132 kV crosses the Nanyuki – Rumuruti Road and runs eastward for about 320m to Tower 20 (under Nanyuki- Isiolo- Meru Line) (284285 E, 0004286 N) where the underground for this line culminates and the line proceeds as per the initial overhead transmission design to Isiolo then Meru.

From Tower No. 18 (Nanyuki- Rumuruti Line) (283974E, 0004119N), the line is likely to cross the Nanyuki- Rumuruti road into private farms (LR10422/18 to LR10422/12) at 341927E, 0027283 N then run for about 0.9 Km (341405E, 027995N) then run north-western direction crossing back via the Nanyuki- Rumuruti Road into the Kenya Defence Forces Land at 341228E, 28106N where it runs parallel, to the runs north-western direction, parallel to the KDF fence for about 3.2 Km then makes a turn at 339893 E, 030978N running south-west then proceeds for 3.6 Km still within the KDF land, parallel to the fence up to 336558 E, 0029613 N then turns into Nanyuki Ranching Farm and Jessel Ranch and runs straight northwards for about 4.7Km calumniating at 335977E, 0034231E where the parent line assumes the initial overhead design.

The Transmission Line as per the parent Environmental and Social Impact Assessments (ESIA) report was submitted by the Kenya Power and Lightening Company (KPLC) which would late relinquish its mandate on Electricity Transmission in 2008 to the Kenya Electricity Transmission Company (KETRACO).

The Government of Kenya plans to increase access to electricity in Kenya tenfold from the current 4% in the rural areas to about 40% by 2020. To do this, the transmission lines network is being considered for upgrading and with it the communication system is required for line protection and management purposes. The Kenya Power (KP) least cost power development plan identified various Transmission lines for improving the performance of the national grid network to cater for the increasing load growth and meet the objectives of 2030. The Kenya Electricity Transmission Company Limited (KETRACO), which now assumes the full mandate of constructing and managing transmission lines, associated sub stations and facilities is planning to construct proposed project.

Environmental concerns need to be part of the planning and development process and not an afterthought, it is on this premise that this Environmental Impact Assessment was conducted so as to establish how the proposed development will affect the neighbouring environment both positively and negatively hence avoiding land use conflicts with the surrounding area, during the construction stage or in commissioning stage of the project that may retard development in the in country.

Environmental Impact Assessment is a tool for environmental Planning and has been identified as a key component in new projects. According to section 58 of the Environmental Management and Coordination Act (EMCA) No.8 Cap 387-second schedule 9 (1), and Environmental (Impact Assessment and Audit) regulation, 2003, new projects must undergo Environmental Impact Assessment. The Report of the same must be submitted to National Environment Authority (NEMA) for approval and issuance of relevant certificates. This was necessary as many forms of developmental activities cause damage to the environment and hence the greatest challenge today is to maintain sustainable development without interfering with the environment.

Scope Objective and Criteria of the Environmental Impact Assessment (EIA)

The scope of the assessment covered planning, construction works, which included ground preparation, excavation, casing of the cable, , casting and other relevant activities. The output of this work is an addendum Environmental Impact Assessment report for the purposes of applying for an EIA licence variations for: -

1. Nanyuki – Rumuruti 132kV Transmission line: a component of the Lessos-Kabarnet-Nyahururu- Nanyuki 132 kV Transmission Line (NEMA Ref NO: EIA/545 and NEMA License NO: 0006570)

2. Nanyuki – Isiolo- Meru 132 kV Transmission Line: A component of the Nanyuki-Meru, Ishiara- Kieni, and Mwingi – Kitui- Wote- Sultan Hamud (NEMA Ref No: EIA/575 and NEMA license No: 006841)

KETRACO's in-house team didthe report by incorporating but not limited to the following terms of reference:

- The proposed location of the proposed underground cable
- A concise description of the national environmental legislative and regulatory framework, baseline information, and any other relevant information related to the project.
- The objectives of the proposed project.
- The technology, procedures and processes to be used, in the implementation of the project.
- The materials to be used in the construction and implementation of the project.
- The products, by-products and waste to be generated by the project.
- A description of the potentially affected environment.
- The environmental effects of the project including the social and cultural effects and the direct, indirect, cumulative, irreversible, short-term and long-term effects anticipated.
- Analysis of alternatives including project site, design and technologies.
- An environmental management plan proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment, including the cost, timeframe and responsibility to implement the measures.
- Propose measures to prevent health hazards and to ensure security in the working environment for the employees, residents and for the management in case of emergencies.
- An identification of gaps in knowledge and uncertainties, which were encountered in compiling the information.
- An economic and social analysis of the project.
- Such other matters as the Authority may require.

Anticipated Environmental Impacts

Both positive and negative impacts are anticipated to be associated with the proposed project area during the construction phase, operation phase and decommissioning phase. In general, the following positive and negative impacts are associated with the proposed project.

Positive Impacts

- Reliable and Secure Electricity Power Supply
- Contribute towards reduction in Greenhouse Gas emission
- Contribute towards lowering the cost of electricity
- Employment Opportunities
- Gains in the Local and National Economy
- Informal Sector Benefits
- Development of Other Sectors

Negative Impacts

- Impact on public utilities and installations along the corridor
- Noise and vibration control
- Air and dust emissions
- Oil Spills
- Water use and water quality
- Solid and Liquid Waste Generation
- Destruction of Existing Vegetation
- Soil Erosion
- Workers accidents and hazards during construction,

Mitigation Measures

In order to alleviate the negative impacts associated with the project, the proponent shall have been adequately proposed for adoption and implementation by the identified stakeholders.

Conclusion

It is quite evident that the installation of the underground cable by KETRACO has positive effects to the regional and national economies, energy being a key economic enabler. They include creation of employment, reliable and secure Electricity Power Supply; Contribute towards reduction in Greenhouse Gas emission; Contribute towards lowering the cost of electricity; Employment Opportunities; Gains in the Local and National Economy; Informal Sector Benefits and Development of Other Sectors. However, negative impacts will also be experienced hence the need to mitigate them. The negative impacts of this project include: Hydrology and water quality degradation; physical and economic development; noise pollution; dust and exhaust emissions and generation of solid wastes among others.

Considering the positive socio-economic and environmental benefits to accrue as a result of the development, and the addendum EIA study having found no major impacts to arise from the development, it is our recommendation that the project be allowed to proceed and variation license issued to that effect, on the understanding that the proponent will adhere to the mitigation measures recommended herein and will further implement the proposed Environmental Management Plan (EMP) to the letter.

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CHAPTER ONE: INTRODUCTION

1.1. Background Information

The country's development blue print, the Vision 2030 recognizes the energy sector as one of the infrastructure enablers of the economic, social and political pillars underlying the Vision. The sessional paper No. 4 of 2004 on Energy recognizes that affordable, quality and cost effective energy services is an important prerequisite for attainment of accelerated social and economic growth and development. In view of these considerations, energy sector development is a key policy concern for Kenya's development.

In line with this, KETRACO, a fully government owned institution established by Parliament under the Energy Act, 2012 and mandated to design, develop, operate and maintain new high voltage electricity transmission lines in the country, proposes to undertake a 16.5km 132kV underground electricity transmission line within Laikipia County in the outskirts of Nanyuki Town. The underground cable would be a design variation from overhead cable underground cable, due to inherent safety risk to aircraft landing and taking off from the Nanyuki air base. The proposed variation would affect the following lines under NEMA licenses as listed below (they share a waylave for the first 4km as explained below)): -

1. Nanyuki – Rumuruti 132kV Transmission line: a component of the Lessos-Kabarnet-Nyahururu- Nanyuki 132 kV Transmission Line (NEMA Ref NO: EIA/545 and NEMA License NO: 0006570)

2. Nanyuki – Isiolo- Meru 132 kV Transmission Line: A component of the Nanyuki-Meru, Ishiara- Kieni, and Mwingi – Kitui- Wote- Sultan Hamud (NEMA Ref No: EIA/575 and NEMA license No: 006841)

This report therefore addresses environmental and social issues for a 16.5Km long and 30 m wide wayleave whose first 4Km of wayleave is shared with another line:

The underground cable will begin at Nanyuki Marura Block-7 within Marura location at Tower No. 7 (283104E, 000670N); then proceeding northwards for about 2.7 km to Tower No. 15, LR No. 10422/5- bordering the sewerage treatment plant (283253E, 0003349N); then crosses the airbase road then takes north-eastern direction for about 328m to Tower No. 16, Nanyuki Marura Block-10 (283441E, 003619N); then proceeds for about 0.7 Km to Tower No. 18, Nanyuki Marura Block-10 (283974E, 0004119N) (this section borders the British Army Training Camp to the right). At this, the underground cable for Nanyuki- Isiolo- Meru 132 kV crosses the Nanyuki – Rumuruti Road and runs eastward for about 320m to Tower 20 (under Nanyuki- Isiolo- Meru Line) (284285 E, 0004286 N) where the underground for this line culminates and the line proceeds as per the initial overhead transmission design to Isiolo then Meru.

From Tower No. 18 (Nanyuki- Rumuruti Line) (283974E, 0004119N), the line is likely to cross the Nanyuki- Rumuruti road into private farms (LR10422/18 to LR10422/12) at 341927E, 0027283 N then run for about 0.9 Km (341405E, 027995N) then run north-western direction crossing back via the Nanyuki- Rumuruti Road into the Kenya Defence Forces Land at 341228E, 28106N where it runs parallel, to the runs north-western direction, parallel to the KDF fence for about 3.2 Km then makes a turn at 339893 E, 030978N running south-west then proceeds for 3.6 Km still within the KDF land, parallel to the fence up to 336558 E, 0029613 N then turns into Nanyuki Ranching Farm and Jessel Ranch and runs straight northwards for about 4.7Km calumniating at 335977E, 0034231E where the parent line assumes the initial overhead design.

Kenya's legal framework all new projects requires that an Environmental and Social Impact Assessment (ESIA) is stipulated in the Environmental Management and Coordination (EMCA) Cap 387. ESIA is meant study be carried out at the project planning phase in order to ensure that environmental issues are taken into at the project planning stage are adequately

addressed during project implementation: construction, operations and decommissioning stages. In 2010, KPLC on behalf of KETRACO contracted a firm of experts that undertook the study for the entire parent line to which the 16.5km stretch lies: **Lessos-Kabarnet-Nyahururu- Nanyuki and Nanyuki- Meru, Ishiara- Kieni, and Mwingi – Kitui-Wote- Sultan Hamud 132 kV Transmission Lines.** The essence of this addendum report is to seek for a license variation to the original parent report to incorporate the 16.5km underground electricity transmission cable.

The parent Environmental and Social Impact Assessment study report identified both positive and negative impacts of the proposed project to the environment and proposed mitigation measures in the Environmental and Social Management Plan developed to address potential negative impacts, during the construction, operation and decommissioning phases of the project, for overall environmental sustainability and social acceptability. The scope and objective of this addendum is as indicated below: -

1.2. Study Objectives

The principal objective of this assessment (addendum) was to identify significant potential impacts of the project's design variation on environmental and social aspects, and to formulate recommendations to ensure that the underground cable takes into consideration appropriate measures to enhance positive impacts and mitigate any adverse impacts to the environment and people's health throughout all its phases (construction, implementation and decommissioning phases). The major aspect of this being environmental and socio-economic baseline assessment for the 16.5km stretch.

1.3. Scope

The ESIA project report was limited to:

- The baseline environmental conditions of the area,
- Description of the proposed underground cable
- Provisions of the relevant local environmental laws and policies; and international guidelines
- Public participation and stakeholder engagement
- Identification and discussion of any adverse impacts to the environment anticipated from the proposed project,
- Appropriate mitigation measures,
- Project alternatives analysis
- Development of an environmental management plan outline.

1.4. Study Methodology

The approach to this exercise was structured such as to cover the requirements under the EMCA, Cap 387 as well as the Environmental Management and Coordination (Impact Assessment and Audit) Regulations 2003. It involved largely an understanding of the project background, the preliminary designs and the implementation plan as well as decommissioning. In addition, baseline information was obtained through physical investigation of the site and the surrounding areas, desktop studies, public consultations with members of the community in the project areas, survey and photography. The key activities undertaken during the assessment included the following:

- Consultations with the key project stakeholders including the, local administration, the Laikipia County Government Administration, community members and the Project Affected Persons. The consultations were based on the proposed project, site planning and the project implementation plan;

- Physical inspections of the proposed site which included observation of available land marks, photography and interviews with the local residents;
- Evaluation of the activities around the project site and the environmental setting of the wider area through physical observations and literature review;
- Review of available project documents; and
- Addendum report writing, review and submission.

✓ **Step 1: Screening**

Screening of the project was undertaken to evaluate the need of conducting an EIA and the level of study. Transmission lines are listed under schedule 2 of EMCA, Cap 387 among projects requiring EIA before commencement. In addition, other considerations taken into account during the screening process included the physical site location, zoning, nature of the immediate neighbourhood, sensitivity of the areas surrounding the site and socio-economic activities in the area, among others.

From the screening exercise, it was determined that an addendum report to the parent approved and licensed project would suffice.

✓ **Step 2: Desk Study**

Documentation review was a continuous exercise that involved a study of available documents, principal being the parent EIA study report and the RAP report, on the project including the project set-up plans, environmental legislation and regulations and the Laikipia County Integrated Development Plans and the proposed project alignment.

✓ **Step 3: Site Assessment**

Site assessment was conducted between 16th to 26th October 2018 to establish:

- Wayleave corridor status
- Flora, fauna and avifauna found on the site;
- The site landscape
- Public utility installations within the wayleave corridor
- The general environment and social their sensitive receptors found within the environs of the site.

✓ **Step 4: Public Consultation**

Detailed stakeholder's consultations for this study were undertaken from 16th to 25th October 2018. These consultations were conducted in the form of:

- Key Informant Interviews and questionnaires: -
- Open-ended questionnaires and
- Public meeting/baraza

✓ **Step 5: Reporting**

The ESIA Study Report was written in accordance with the Environmental (Impact Assessment and Audit) Regulations, 2003.

1.5 ESIA team

The multi-disciplinary ESIA team comprised of the following experts:

1. Richard Godana- Lead EIA/Audit Expert
2. Clifford Siocha- Associate EIA/Audit Expert
3. Linet Mbova- Associate EIA/Audit Expert
4. Naomi Cheruto-Socio-economist

5. Betty Mutwiri-Land Economist
6. Leonard Odhiambo- Land Surveyor

1.6 Conclusion

An Environmental and Social Management Plan (ESMP) outline has been developed to ensure sustainability of the site activities from construction through operation to decommissioning. The plan provides a general outlay of the activities, associated impacts, and mitigation action plans. Implementation timeframes and responsibilities are defined, and where practicable, the cost estimates for recommended measures are also provided.

A monitoring plan has also been developed and highlights some of the environmental performance indicators that should be monitored. Monitoring creates possibilities to call to attention changes and problems in environmental quality. It involves the continuous or periodic review of operational and maintenance activities to determine the effectiveness of recommended mitigation measures. Consequently, trends in environmental degradation or improvement can be established, and previously unforeseen impacts can be identified or pre-empted.

KETRACO commits itself to implement the Environmental Management and Monitoring Plan provided herein. Following the commissioning of the proposed project, statutory Environmental and Safety Audits will be carried out in compliance with the national legal, regulatory and policy requirements, and the environmental performance of the site operations should be evaluated against the recommended measures and targets laid out in this report.

It is quite evident from this study that the construction and operation of the proposed project will bring positive effects in the project area including improved supply of electricity, creation of employment opportunities, gains in the local and national economy, provision of market for supply of building materials, informal sectors benefits, Increase in revenue, Improvement in the quality of life for the workers and community members, and Improved security.

Considering the proposed location, construction, management, mitigation and monitoring plan that will be put in place, the project is considered important, strategic and beneficial and given that all identified potential negative impacts can be mitigated and that no community objection was received, the project design variation be allowed to proceed; and NEMA variation licenses be issued to that effect.

CHAPTER TWO: PROJECT DESCRIPTION

2.1. Project Location

The proposed design variation for the line is 16.5km long and located within Laikipia County in the outskirts of the Nanyuki Town. The starting stretch of 4Km of the line is shared with two lines: Nanyuki- Rumuruti and Nanyuki- Isiolo- Meru 132kV Lines. The underground cable will begin at Nanyuki Marura Block-7 within Marura location at Tower No. 7 (283104E, 000670N); then proceeding ward for about 2.7 km to Tower No. 15, LR No. 10422/5- bordering the sewerage treatment plant (283253E, 0003349N); then crosses the airbase road (class).... Ward for about 328m to Tower No. 16, Nanyuki Marura Block-10 (283441E, 003619N); then proceeds for about 0.7 Km to Tower No. 18, Nanyuki Marura Block-10 (283974E, 0004119N) (this section borders the British Army Training Camp to the left). At this the underground cable for Nanyuki- Isiolo- Meru 132 kV crosses the Nanyuki – Runuruti Road and ...ward for about 320m to Tower 20 (under Nanyuki- Isiolo- Meru Line) (284285 E, 0004286 N) where the underground for this line culminates and the line proceeds as per the initial overhead transmission design to Isiolo then Meru.

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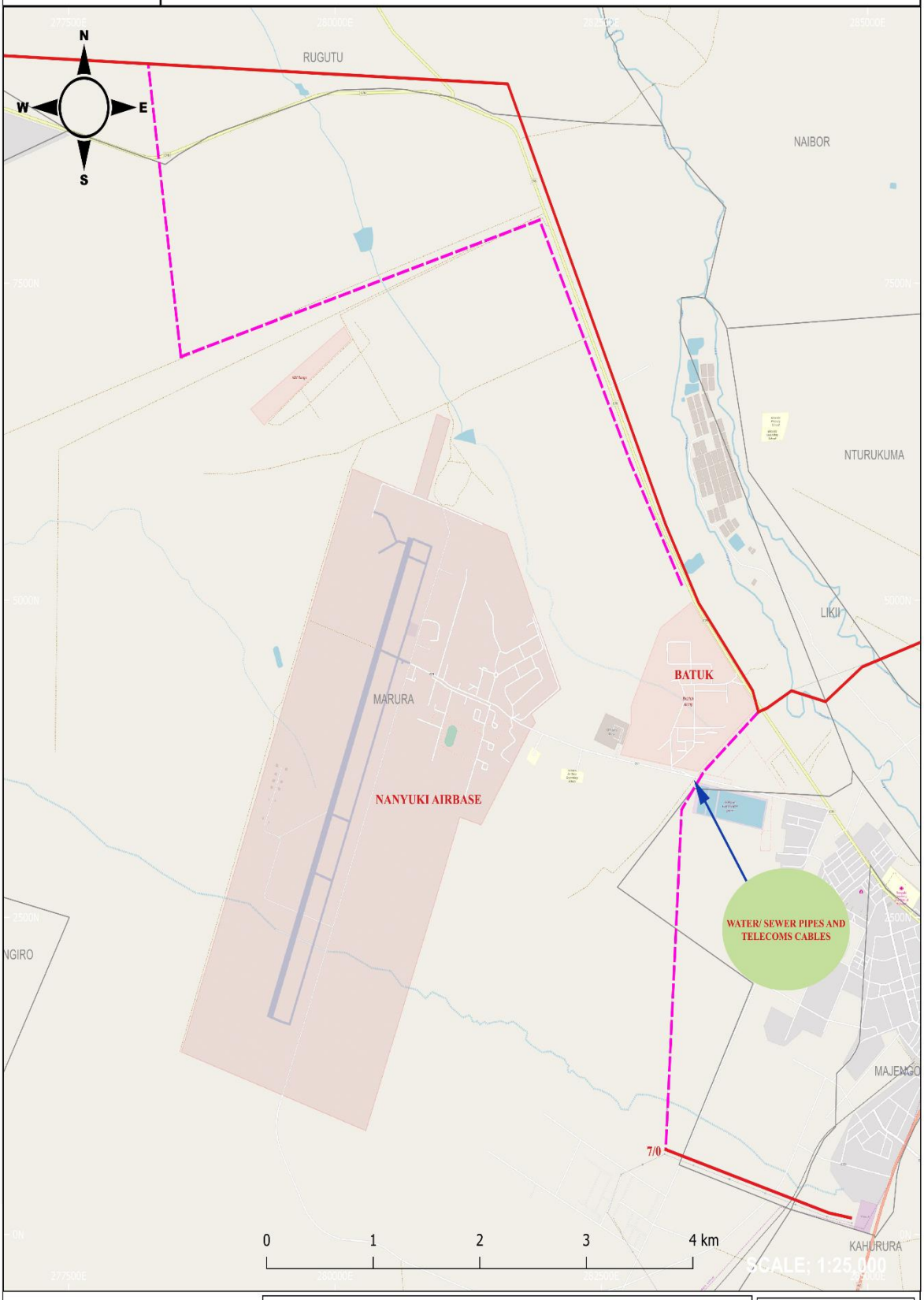
The underground cable then crosses a few key public utility installation as per the table 1 below:

Table 1: Infrastructural utilities along the wayleave

Utility	Details	GPS
Water pipe to the Kenya Air Force Camp	6-inch-wide pipes, 1 meter deep. Between Tower 15 and 16	2833387E, 0003594N
Safaricom Line /Police Line	More than 2 meters deep, Between Tower 15 and 16	2833387E, 0003594N
Water Pipes to Batuk	3 inches wide pipes, 1 meter deep, Between Tower 15 and 16	283389E, 0003606N
Water Tunnel from the NAWASCO sewerage plant feeding the river	24 inches in diameter, 2 meters deep	283351E, 0003556N
Sewerage Line from Batuk to the NAWASCO Treatment Plant	2 meters deep	2833364E, 0003604N
Laikipia Airbase Road	under KeRRA	283406E, 0003595N
50 mm water pipe between tower 17 and 18	Under NAWASCO management, less than 1 meter deep	283958E, 0004102N
Nanyuki Rumuruti Road	Under KENHA Management	283279E,0005154N

30-10-2018	NANYUKI-RUMURUTI 132kV TRANSMISSION LINE



KETRACO
Kenya Electricity Transmission Co. Ltd.
"Building a World Class National Grid"

PROPOSED UNDERGROUD CABLE AROUND NANYUKI AIRBASE

COORDINATE SYSTEM: UTM Projection Datum: Arc 1960
Zone 37 Nothern Hemisphere Units: Metre EPSG: 21097

This map is not an authority on boundaries

Legend
- Towers
- Original TL
- Undergound Cable
- Sublocations

Basemap

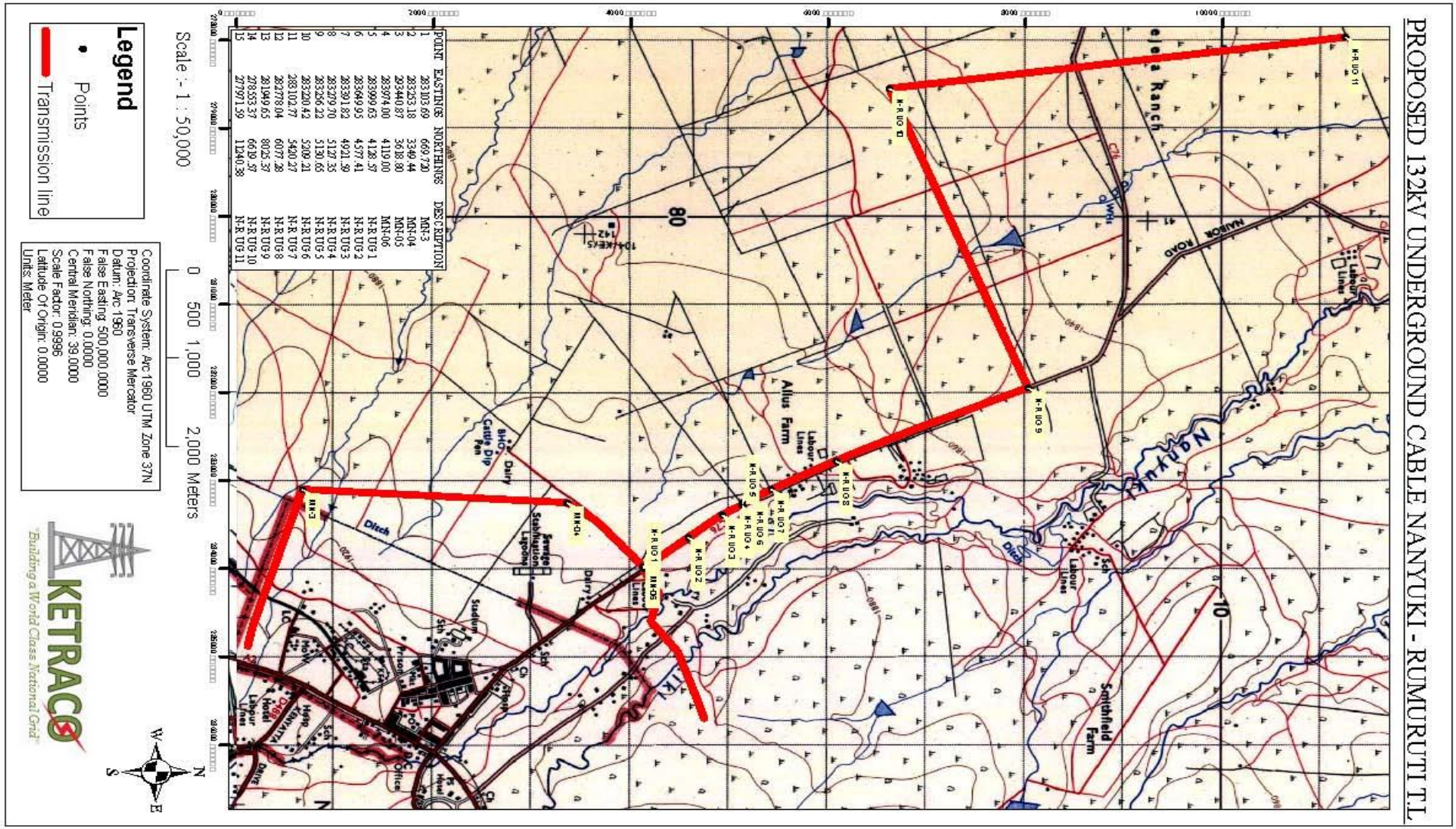


Figure 1: Maps for the 16.5 Km stretch

2.2. Brief of the parent project design

2.2.1. Parent Project Components

The proposed project will involve development of a 235km 132kV transmission line between Lessos and Nanyuki. To ensure efficient functionality of the proposed line the following components will form part of the project installations; pylons/steel towers, dumpers, conductors, optical fiber, circuit breakers and lightening arrestors. All the project components will be installed using the best electrical engineering practices. The section below discusses on each of the project components in brief. Below is a brief of some of the key components:

2.2.2. Conductors

The conductors recommended for the various sub-project options are Aluminium Conductor Steel Reinforced (ACSR) "Wolf" and "Lynx" conductors which are in accordance with KPLC's standards. The operational performance of the selected conductors, both electrically and mechanically has proven satisfactory under Kenyan conditions. If the detailed line survey for particular sections result in limitations to the right of way resulting in a compact line design, lighter all aluminum alloy conductors (AAAC) will be considered to minimize pole sizes.

2.2.3. Overhead Earth Wires (OPGW)

According to KPLC practice, a single overhead shield wire is recommended for 132 kV lines. The wire would provide a 25 degree shielding angle for the line circuit which is considered satisfactory considering the anisokeraunic level in the region ranging from 120 to 180 thunderstorm days per year.

2.2.4. Pylons/Steel towers

Different transmission structures have different material and construction costs, and require different right-of-way widths, distances between structures (span length), and pole height. These issues also vary with different voltages. In areas where single-pole structures are preferred, weak or wet soils may require concrete foundations for support. Where a transmission line must cross a street or slightly change direction, large angle structures or guy wires may be required. Poles with guy wires impact a much larger area. Steel structures are used in transmission structures wood structures are used for distribution structures. Pylons/steel towers are preferred due to their longer life span.

2.3. Brief of the proposed design for the 16.5 km stretch

In terms of reliability, capability, cost, construction impacts and land use, overhead lines do have advantages when compared to underground cables. However, a significant benefit of undergrounding cables is the reduction in visual impact. In certain areas, such as protected landscapes, this benefit could be a primary consideration and outweigh disadvantages of undergrounding such as restrictions on land use and the impact on ecological and archaeological sites.

2.3.1. Particulars of Electrical System

The Plant shall be capable of operation under the general electrical parameters as specified.

2.3.2. Particulars of Environment

Particular attention will be paid in the design of all equipment to ensure that there is no damage to working parts or insulation through the ingress of dust, insects, vermin which are prevalent for long periods in the year. All orifices and air vents should be covered by easily replaceable weather resisting, fine mesh wire where practicable.

2.3.3. Standards, Units and Language

All equipment shall be designed, constructed and tested in accordance with requirements of the latest version of the standards specified herein except to the extent explicitly modified in this specification:

SI Units of measurements and the English language shall be used throughout.

IEC 60840: Power cables with extruded insulation and their accessories for rated voltages above 30kV (Um = 36kV) up to 150kV (Um = 170kV) – Test methods and requirements

IEC 60228: Conductors of insulated cables.

2.3.4. *General Requirement*

The cable shall comply with the requirements of IEC 60840, IEC 60228 plus any additional requirements specified hereafter.

The cable shall be designed for reliable service life of at least 40 years.

All materials used shall be compatible and suitable for the continuous operating temperature of the cable of 90°C and short circuit temperature of 250°C (5 seconds duration).

2.3.5. Conductor

Conductors shall be stranded, annealed, high conductivity Aluminium. The Aluminium wire before shaping shall be smooth, uniform in quality, free from scale, inequalities, spills, splits and other defects and should comply with the requirements of international application IEC 60228.

The term 'annealed' signifies that the wire before stranding is capable of at least 15 per cent elongation without fracture, the test piece being not less than 150mm and not more than 300mm.

When made of from shaped wires the conductor shall be clean and uniform in size and shape and its surface shall be free from sharp edges and unless otherwise approved shall be taped with a layer of conducting a layer of conducting or semi- conducting material..

Not more than two joints shall be allowed in any of the single wires forming each length of conductor and no joint shall be within 300mm of any other joint in the same layer. The jointing of the wires shall be by brazing, silver soldering cold welding or electrical welding. No joint shall be made in the wire after it has been formed up into the required length.

The conductor will be water blocked to meet the requirements of IEC 60840, using water blocking tapes and / or yarns. The use of water blocking powder on its own is not permitted.

2.3.6. Conductor Screen

A conductor screen shall be used to provide a smooth interface between the conductor and the cable insulation. A suitable semi- conducting binder tape will be applied over the conductor to prevent the extruded screen from falling between the interstices of the conductor strands.

The semi-conducting screen will have a spot minimum thickness of 1.0mm

The conductor screen will be made from semiconducting cross-linked polyethylene

(XLPE) using either acetylene black or carbon black material and will be applied as part of a triple extrusion process.

The conductor screen shall be extruded and consist of a black, semi-conducting thermoset material fully compatible with the conductor and extruded insulation. The outer surface of the semi-conducting screen shall be super smooth, cylindrical and firmly bonded to the overlying insulation.

The extruded conductor screen shall be applied in the same operation as the insulation and be fully bonded to the insulation

2.3.7. Insulation

The insulation shall be cross-linked polyethylene (XLPE) conforming to the requirements of IEC 60840.

The insulation shall be an extruded cross-linked polyethylene (XLPE) material forming a concentric dielectric surrounding the conductor.

The use of insulation based on pure LDPE is preferred to the use of insulation based on Co-polymer.

The materials for the manufacture of 132kV cables shall be delivered in clean bulk containers.

The preferred manufacturing process is the vertical continuous vulcanisation (VCV) line however cable manufactured with either MDCV or CCV lines will also be considered. The cable shall be manufactured using low viscosity, ultra clean grades of material.

The insulation shall be applied by extrusion and cross-linked to form a compact and homogeneous layer.

The colour of the insulation shall be such that it is easily distinguishable from the screening materials.

2.3.8. Insulation Screen

The insulation screen shall be extruded and consist of a black, semiconducting thermoset material fully compatible with the extruded insulation. The interface between the insulation and the semiconducting screen shall be super smooth, cylindrical and firmly bonded.

2.3.9. Water Barriers

The core shall be taped overall with semiconducting cushioning tapes to prevent possible mechanical damage of the cable core caused by thermal expansion during normal operation of the cable.

Provision will be made to prevent the longitudinal penetration of water along the interface between the cable core and the metallic sheath by the application of suitable water swellable tapes applied over the cable core.

2.3.10. Metallic Sheath

The sheath is required to fulfil the following requirements;

- To provide a radial watertight barrier to the ingress of moisture into the extruded cable core.
- Provide low resistance path for cable charging current
- Provide protection against minor accidental damage caused by third party interference with the cable during installation or service
- Be capable of sustaining the specified earth fault currents for the time stipulated by the user.

The water impervious sheath shall consist of a seamless and continuously extruded tube of lead alloy. The lead alloy used for the sheath shall be alloy 1/2C. A thin layer of bitumen shall be applied over the sheath.

Lead alloy sheath of best quality metal, free from pinhole flaws and other imperfections shall be tightly extruded over the water blocking layer.

The minimum thickness at any point shall not fall below the specified nominal thickness by more than 0.1mm or 5% of the nominal thickness.

For the purpose of increasing the total short circuit current rating of the cable, a Aluminium wire screen of suitable cross sectional area may be applied between the core bedding layer and the lead sheath. An Aluminium tape shall be applied directly over the Aluminium wires in an opposite lay to the lay of the Aluminium wires, to ensure equal current sharing in the Aluminium wire screen. A suitable binder tape shall be applied over the Aluminium wire screen.

2.3.11. Oversheath

The cable serving shall be robust enough to prevent unnecessary damage during installation and shall insulate the cable from earth.

The outer covering shall preferably be of medium density polyethylene, except for the closing sections that enter buildings, which shall be of a low smoke, zero halogen material (LSOH).

The minimum average thickness and minimum thickness at a point shall comply with IEC 60840 and not less than the value stated in the schedule.

An outer conductive coating (graphite coating or extruded layer) shall be applied to the covering to serve as an electrode for the voltage test on the outer covering.

2.3.12. Anti- Termite Protection

All cables installed in concrete troughs within shall have suitable anti-termite protection, to be approved by KETRACO

2.3.13. Fire Resistance

All cable sections installed in air will have an oversheath with a fire performance that conforms to the requirements of,

- IEC 60332-1 (Fire)
- IEC 60332-3A (Fire)
- IEC 61034 (Smoke)
- IEC 60754 (Minimal Halogen)

Ideally, oversheath materials will also have an oxygen index of less than 30% and a temperature index of greater than 260

2.3.14. Electrical System Design Parameters

The standard sizes and characteristics of the cables shall be as follows:

The following electrical design parameters shall be used in the design of the 132kV cable circuit.

Nominal System voltage:	132kV
Max. / Min voltage variation	+10% / -10%
Loading capability of the 132kV cable circuits	115 MVA
Short circuit level	31.5kA for 1sec

2.3.15. Ground thermal resistivity

Ground conditions around the project area are made up of black loamish soils.

All cable circuits are to be installed using a selected sand backfill that has a guaranteed dried-out TR of no greater than 2.7Km/W. The contractor will advise the guaranteed dried-out TR of the selected sand backfill that they choose.

2.3.16. Continuous Ratings

Continuous rating calculations are to be performed in accordance with **IEC 60287.**

Contractors are required to state clearly the value of ac resistance used for XLPE cable conductors and justify the value used.

Contractors are required as part of their site survey works to identify any utilities in close proximity to the new cable circuit that may derate the cable circuit and to calculate the derating effect and propose a solution to negate this effect.

2.3.17. Electric and Magnetic Fields (EMFs) from underground cables

Overhead lines are a source of two fields: the electric field (produced by the voltage) and the magnetic field (produced by the current) but are controlled through engineering solutions. Underground cables eliminate the electric field altogether as it is screened out by the sheath around the cable, but they still produce magnetic fields.

As the source of a magnetic field is approached the field gets higher. Cables are typically installed 1m below ground, whereas the conductors of an overhead line are typically more than 10m above ground, so the magnetic field directly above such a cable is usually higher than that

directly below the equivalent overhead line. However, as the individual cables are installed much closer together than the conductors of an overhead line, this results in the magnetic field from cables falling more quickly with distance than the magnetic field from overhead lines.

2.3.18. Route Options

The 16.5Km stretch under study has a confirmed route except for a small stretch of approximately 1.2 Km long. This small stretch begins at the point of disjoint between the two lines (i.e. Nanyuki- Rumuruti and Nanyuki-Isiolo- Meru) to slightly after the gate to the BATUK.

This stretch has two options for considerations listed in the order of prioritization as shown in Table 2 below.

Table 2: Alignment options for 1.2Km

Route	Location	Details	Rating
Route 1	Within Nanyuki-Rumuruti Road Reserve C76 (Kenha B22)	• No displacement of persons • No compensation required • Reduced level of service for road during construction	1 (most preferred)
Route 2	15 meters off the Nanyuki-Rumuruti Road Reserve C76 (Kenha B22)into private property	• Economic displacement	2
Route 3	Approximately 330meters off the Nanyuki-Rumuruti Road Reserve C76 (Kenha B22)	• Demolition of greenhouses • Economic displacement • Proximity to a river (Thingithu)	3 (least preferred)

CHAPTER THREE: BASELINE INFORMATION

3.1. Project location

The proposed underground transmission line is located within Laikipia county in the outskirts of Nanyuki town. This chapter describes the environmental and social baseline conditions of the area where the proposed underground transmission line passes.

3.2. Physical Environment

3.2.1 Climate and meteorology

The site is situated within Nanyuki and thus shares the climatic characteristic with the rest of Nanyuki area. The area has a tropical monsoon climate which is cooler due to the high altitude at which the town is situated. Annual rainfall ranges between 400mm and 750mm. The long rains occur from March to May, while the short rains are in October and November. April and November are the wettest months on average. The mean annual temperatures in Nanyuki range from 16°C and 26°C. Table 3 below gives a summary of climate data of the project site.

Table 3: Climate data of the project site

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Avr
Average high temperatures (°C)	25	26	25	23	23	23	22	23	24	24	23	23	23.7
Average Low temperatures (°C)	7	8	9	11	10	9	8	8	8	8	9	8	8.6
Average Precipitation (mm) per month	13	23	46	119	81	50	69	66	48	64	86	38	703
Average days with precipitation per month	11	10	13	20	14	7	10	10	7	14	23	15	12.8
Average hours of sunshine per day	8	8	7	6	7	6	5	5	6	7	6	7	6.5

Source: Kenya meteorological department website

3.2.2 Geology, soils and Topography

The soils in the project area are composed of back cotton soil (see plate 1 below), which has a depth of around 2 meters. Soils in the project area are developed on Basement System rocks mainly migmatites and Biotite gneisses.

The topography of the area is flat which is determined by tectonic and volcanic disturbances of Mount Kenya. The volcanic activity of Mount Kenya has contributed to the complexity of the physiography of this area.

Plate 1: Plate Black cotton soils in the project area

3.3. Biological environment

3.3.1. Flora/plants

The area is covered by minimal vegetation in most parts. Vegetation mainly observed in the project area include stunted Acacia tortilis trees, Eucalyptus, pinus pitula, grevillea, and kei apples mostly used as live fences in most plots; see plates 2 and 3 below.

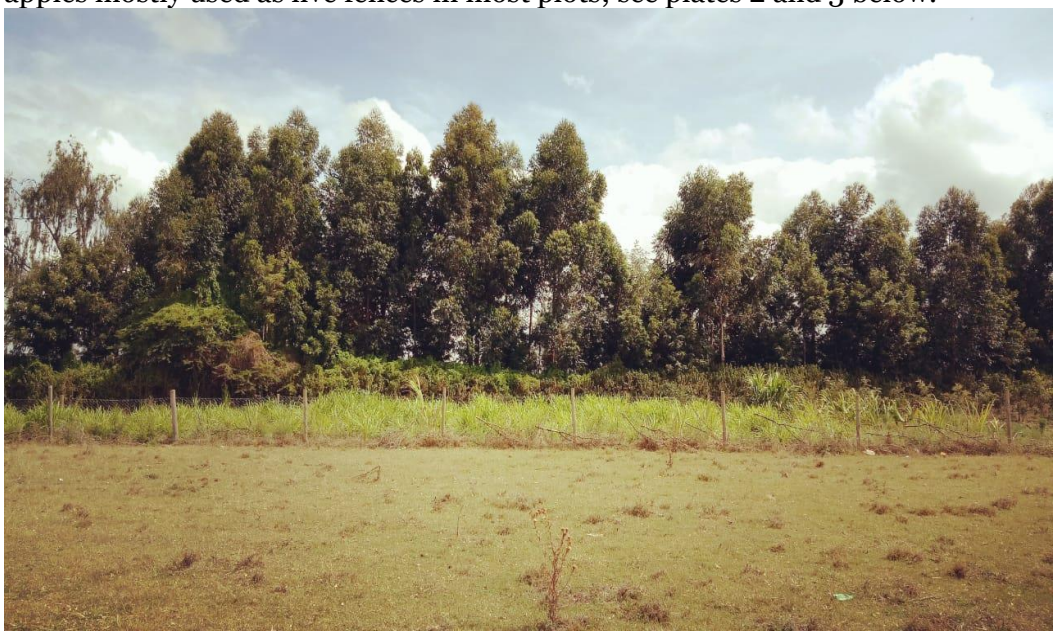


Plate 2: Eucalyptus, pinus pitula and grevillea used as live fences.

Plate 3: stunted Acacia tortilis trees along the TL

3.3.2. Fauna/animals

There are no animals inhabited on the site though the existence of micro-organisms and insects cannot be ruled out.

3.3.3. Ecological Sensitive Areas and Threatened/Rare/Endangered Species

The project site from literature review and field surveys does not fall into any ecologically sensitive areas such as swamps, water towers, or riparian land. Additively, no threatened, rare, or endangered flora and fauna was found in the project site; neither is the project site in a biodiversity hotspot.

3.4. Socio-Cultural and economic environment

3.4.1. Population and Demography

According to 2009 census report, Laikipia County covers an area of 9,462 KM^2 (2,338,111 acres) with a population of 399,227 (Male – 49.8 %, Female – 50.2 %). The population density is 42 people per Km^2. This translates to a national percentage of 1.03% with an annual growth rate of 3.9%.

Currently, the project site is a low density residential area but with the increase in developments the population is bound to increase in density. The project area lies in Laikipia East Constituency within Thingithu Ward in Laikipia County. Thingithu Ward contributes to 18% of the total population in Laikipia East Constituency, which is the least populated. Table 4 below gives statistics of population in Laikipia County, Laikipia East Constituency and further breaks it down to Thingithu ward. Figure 2 shows how Thingithu Ward population compares with other wards in Laikipia East.

Table 4: Population as per administrative units

County/ Constituency/ Ward	Total Population	Male	Female
Laikipia County	391,597	193,379	198,218
Laikipia East Constituency	113,283	56,313	56,970
Thingithu Ward	20,069	9,707	10,362

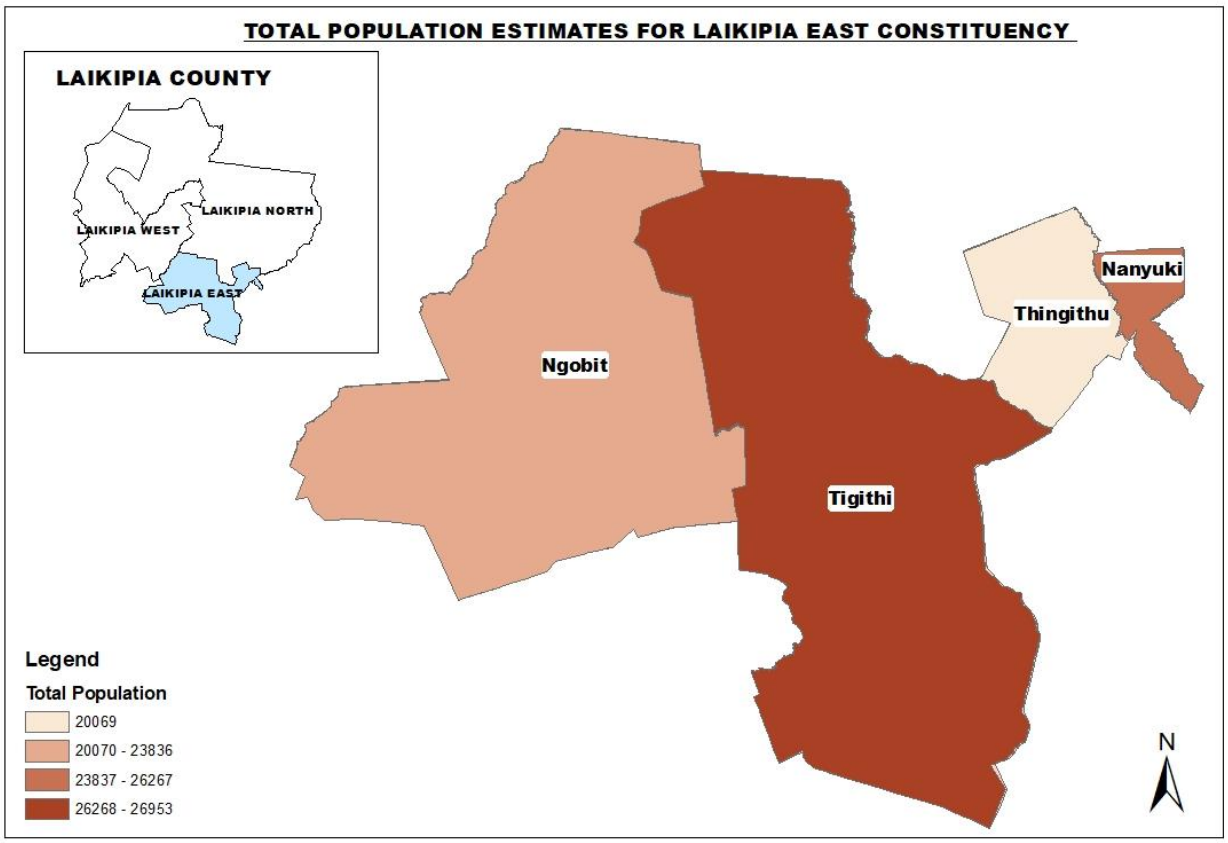


Figure 2: Comparison of population in Thingithu ward to other wards in Laikipia East

3.4.2. Archaeological set up

The project site has no cultural element worth conserving or taking into consideration.

3.4.3. Ethnic composition

Nanyuki is home to ethnically diverse communities, including the Mukogodo Maasai, Kikuyu, and Meru, who live side by side by the, Turkana, Samburu, and Pokot. Cattle- rearing on large commercial ranches and community owned rangelands has for many years been the life-line of the community. The proposed underground cable passes through Nanyuki ranch towards Rumuruti.

3.4.4. Land use and economic activities

The proposed project passes through a variety of land uses, including some settlements like: commercial plots, farmlands, ranches, and Kenya Defence Forces (KDF) land. The economic activity in the area mainly consists of tourism, subsistence farming (where they plant crops like vegetables and legumes) dairy farming (majorly done in small scale) ranching, greenhouse horticulture and hay farming.

Pictures

Plate 4:Hay farming along the TL

Plate 5: Subsistence farming along the TL

3.4.5. Infrastructural utilities

The underground cable then crosses a few key public utility installation as per the table below:

-

Table 5: Infrastructural utilities along the Transmission Line

Utility	Details	GPS
Water pipe to the Kenya Air Force Camp	6-inch-wide pipes, 1 meter deep. Between Tower 15 and 16	2833387E, 0003594N
Safaricom Line /Police Line	More than 2 meters deep, Between Tower 15 and 16	2833387E, 0003594N
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Laikipia Airbase Road	under KeRRA	283406E, 0003595N
50 mm water pipe between tower 17 and 18	Under NAWASCO management, less than 1 meter deep	283958E, 0004102N
Nanyuki Rumuruti Road	Under KENHA Management	283279E,0005154N

3.4.6. Security

The public consultation exercise established that there has been reported cases of insecurity around the project site. Therefore, the proponent needs to put in place measures proposed in the ESMP to ensure security of the underground cable.

3.4.7. Telecommunication

Mobile telecommunication services (Safaricom, Airtel, Telkom-Orange) are available in the area making communication easy and functional.

CHAPTER FOUR: LEGAL, POLICY AND REGULATORY; AND INSTITUTIONAL FRAMEWORK

4.1. Introduction

Regulations and institutions specific to environmental management can affect directly or indirectly the development of proposed electricity transmission underground cable. A brief discussion on the various legal frameworks involved for this project is presented in this chapter in form of a table. KETRACO will endeavour to ensure that all required environmental procedures described in this section will be complied with thereby demonstrating their commitment and responsibility to protecting the environment.

4.2. National legal framework

Table 6: Summary of legislations applicable to the proposed project

Legislation	Relevant institution	Main Purpose/Applicability	Relevance to Proposed Project
The Constitution of Kenya 2010	Government of Kenya/ Judiciary	• The constitution declares that the people of Kenya are respectful to the environment, which is their heritage and they are determined to sustain it for the benefit of future generations. • Article 42 states that every person has a right to a clean and healthy environment. • Section 2 of Chapter 5 states that every person has a duty 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 deals with enforcement of environmental rights and everyone who feels their right to a clean and healthy environment has been denied has the obligation to go to court to seek redress.	• The proponent must ensure that all the applicable provisions of the Constitution are observed during the implementation of the project
The Environmental Management and Co-ordination Act	National Environment Management Authority (NEMA)	• This is the principal Act governing environmental protection. It contains various legal notices with regulations on environmental conservation and Management • Part II confers the right of every person to a clean environment and therefore makes it mandatory to work	• The proposed 16.5km electricity transmission underground cable requires an addendum Environmental Impact Assessment for purposes of

Legislation	Relevant institution	Main Purpose/Applicability	Relevance to Proposed Project
(EMCA), Cap 387	National Environment Complaints Committee (NECC)	in a clean environment and protect people living close to the project. • Part VI Gives detailed mechanism and stipulation regarding Environmental Impact Assessment. • The Act has also established a National Environmental Complaints Committee, which provides the administrative mechanism for addressing environmental harm. The Committee has the mandate to investigate complaints relating to environmental damage and degradation.	variation of the approved EIA license for the proposed project • KETRACO should acquire an approval from NEMA before commencing the project
Environmental (Impact Assessment and Audit) Regulations, 2003, Legal Notice No. 101	NEMA	• Section 25 Part IV of the regulation provides conditions for variation of license. It clearly states that a variation of an EIA license issued under regulation 24 may be issued without the holder of the license submitting a fresh EIA study report if the authority is satisfied that the project if varied would comply with the requirements of the original license.	Requires the Proponent to: - • Apply for a variation of the initial EIA license issued for the transmission line • Prepare an addendum EIA report to be used in the variation of the parent license • Carry out monitoring to check on efficacy of EMP developed in EIA report • Carry out corrective measures in the improvement order from NEMA
Environmental Management and Co-ordination (water quality) Regulations, 2006 Legal notice No. 120	NEMA	• These regulations provide for the protection of lakes, rivers, streams, springs, wells and other water sources. Also address the challenges of pollution of water resources as well as their conservation. • Provides guides for water use, and conservation for the proposed project, as well as effluent standards for discharge. • Section 20-part IV of the legislation prohibits anyone form abstracting water from natural water body unless	The Regulation requires the Proponent to: • Refrain from any activity which might cause water pollution. • Not to discharge any liquid, gaseous or solid into water resource as to cause pollution.

Legislation	Relevant institution	Main Purpose/Applicability	Relevance to Proposed Project
		such water meets the standards set out in schedule nine of the regulation in this legislation.	
Environmental Management and Coordination (Waste management) Regulations, 2006 Legal Notice No. 121	NEMA	• Focuses on management of solid wastes, industrial wastes, hazardous wastes, pesticides and toxic substances and radioactive substances. • Provides standards for handling, transportation, and disposal of different types of waste. Addresses concerns such as responsibility for waste generators and obligations for disposal. • Section 4(1) states that No person shall dispose of any waste on a public highway, street, road, recreational areas or in any public place except in a designated waste receptacle. • Section 4(2) stipulates that a waste generator shall collect, segregate, and dispose such waste in the manner provided under these regulations.	• The Proponent shall observe the guidelines as set out in the environmental management plan laid out in this report as well as the recommendation provided for mitigation /minimization /avoidance of adverse impacts arising from the Project activities.
The Environmental Management and Co-ordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 Legal Notice No. 61	-NEMA -Directorate of Occupation Safety and Health (DOSH)	• These Regulations determine that no person or activity shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise that annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. In determining whether noise is loud, unreasonable, unnecessary or unusual, the following factors may be considered: -Time of the day; -Proximity to residential area; -Whether the noise is recurrent, intermittent or constant; - The level and intensity of the noise; - Whether the noise has been enhanced in level or range by any type of electronic or mechanical means; and, -Whether the noise is subject to be controlled without unreasonable effort or expense to the person making the noise.	• Proponent to observe the permissible noise levels at all times, at all phases of the project.

Legislation	Relevant institution	Main Purpose/Applicability	Relevance to Proposed Project
The Environmental Management and Coordination (Air Quality) Regulations, 2008	NEMA	• Outlines that no person shall necessitate emission of air pollutants listed in the first schedule, second schedule, & seventh schedule of the regulation to an extent that compromised the ambient air quality levels.	• observe the provision of this regulation on air quality and emission standard throughout the Project Cycle
Environmental Management and Co-ordination Act (Controlled Substances) Regulations, 2007	NEMA	• The regulation seeks to control the production; consumption; and exports and imports of controlled/toxic substances. Such substances include: Group 1 list consists of halogenated flourochemicals, Group 2 list consists of hydrobromoflourocarbons and group 3 list consist of bromochloromethane, all with ozone depleting substances	• The regulation should be adhered to ensure equipment, machinery, vehicles and chemicals containing such components are not imported for project use.
The Land Act, 2012	National land commission	• The Act specifies the manner for determination and the award for compulsory acquisition to be served on the persons determined to have interest in the affected land. • According to Section 128 of the Act, any dispute arising out of any matter under the Act, which involves compulsory acquisition process, should be referred to the Land and Environmental Court for determination. • Sections 107-133 of the Land Act specify the procedure to be followed in the process of compulsory land acquisition. • Part II section 8 provides guidelines on management of public land by the National Land Commission on behalf of both national and county government. • According to Section 111 of the Act, just compensation shall be paid promptly to all persons whose interests have been affected by the land acquisition.	• The Proponent has undertaken a survey and developed a Resettlement Action Plan (RAP) for those who will be affected by the proposed project. The Proponent shall adhere to the requirements of the Act in the implementation of land acquisition. • KETRACO shall compliment this Act wity internal systems such as the KETRACO Resettlement Policy Framework (RPF)

Legislation	Relevant institution	Main Purpose/Applicability	Relevance to Proposed Project
4.3.3 The Energy Act, 2006	ERC	• The Act provides the regulatory framework for the energy sector and, among other things, stresses the need for energy players in general and electrical energy players in particular to adopt environmentally friendly and sustainable practices in power generation, distribution and consumption. It sets standards for proper environmental management in the sector. • Section 30 (1) part (b) of the Act states compliance with the EMCA, Cap 387 as an important criterion to be considered by the ERC during the registration and supervision of sector players.	• The ESIA Study that had been undertaken fulfills the requirements of the Energy Act
The Occupational Safety and Health Act, 2007	DOSH	• The Occupational Safety and Health Act 2007applies to all workplaces where any person is at work, whether temporarily or permanently. The purpose of the Act is to secure the safety, health and welfare of persons at work and protect persons other than persons at work against risks to safety and health arising out of, or in connection with, the activities of persons at work.	• The report advices the Proponent on safety and health aspects, potential impacts, personnel responsible for implementation and monitoring, frequency of monitoring, and estimated cost, as a basic guideline for the management of Health and Safety issues in the proposed project.
County Government Act 2012	County government of Laikipia	• The Act empowers county governments to control or prohibit all businesses, factories and workshops that, by reason of smoke, fumes, chemical gases, dust, smell, noise or vibration or other cause may be a source of danger, discomfort or annoyance to the neighbourhood and to prescribe the conditions subject to which business, factories and workshops shall be carried on.	• The proponent shall work closely with the county government of Laikipia to ensure that the project is implemented in an environmentally and socially sound way.
The Public Health Act Cap 242	Ministry of Public Health	• The Act regulates activities detrimental to human and environmental health and safety	• The Act prohibits the Proponent from engaging in activities that cause environmental nuisance or

Legislation	Relevant institution	Main Purpose/Applicability	Relevance to Proposed Project
			those that cause danger, discomfort or annoyance to inhabitants or is hazardous to human and environmental health and safety.

4.3. African Development Bank Group's Operational safeguards

Table 7: ADB's applicable operational safeguards

Operational safeguards (OS)	Objective of the OS	Relevance to the proposed project
OS 1: Environmental and social assessment	The objective of this OS is to mainstream environmental and social considerations into Bank operations and thereby contribute to sustainable development in the region. The specific objectives are to: • Mainstream environmental, climate change, and social considerations into Country Strategy Papers • Identify and assess the environmental and social impacts and risks—including those related to gender, climate change and vulnerability—of Bank lending and grant-financed operations in their areas of influence; • Avoid or, if avoidance is not possible, minimise, mitigate and compensate for adverse impacts on the environment and on affected communities; • Provide for stakeholders' participation during the consultation process • Ensure the effective management of environmental and social risks in projects during and after implementation	• The proposed 16.5km electricity transmission underground cable requires an addendum Environmental and Social Impact Assessment for purposes of variation of the approved EIA license for the proposed project

Operational safeguards (OS)	Objective of the OS	Relevance to the proposed project
OS 2: Involuntary resettlement: land acquisition, population displacement and compensation	• This OS aims to facilitate the operationalization of the Bank's 2003 Involuntary Resettlement Policy in the context of the requirements of OS1 and thereby mainstream resettlement considerations into Bank operations. • It seeks to ensure that when people must be displaced they are treated fairly, equitably, and in a socially and culturally sensitive manner; that they receive compensation and resettlement assistance so that their standards of living, income-earning capacity, production levels and overall means of livelihood are improved; and that they share in the benefits of the project that involves their resettlement. • The term resettlement refers to both physical and economic displacement. Resettlement is considered involuntary when the project-affected people are not in a position to refuse the activities that result in their physical or economic displacement	• The Proponent has undertaken a survey and developed a Resettlement Action Plan (RAP) for those who will be affected by the proposed project. The Proponent shall adhere to the requirements of the Act in the implementation of land acquisition.
OS 3: Biodiversity, renewable resources and ecosystem services	• This OS outlines the requirements for borrowers or clients to: -Identify and implement opportunities to conserve and sustainably use biodiversity and natural habitats, and -observe, implement, and respond to requirements for the conservation and sustainable management of priority ecosystem services • It reflects the objectives of the Convention on Biological Diversity to conserve biological diversity and promote the sustainable management and use of natural resources. • It also aligns with the Ramsar Convention on Wetlands, the Convention on the Conservation of Migratory Species of Wild Animals, the Convention on International	• The report advices the Proponent on physical and environmental aspects, potential impacts, and proposes mitigation measures that need to be implemented and monitored as a basic guideline for the management of environmental and biodiversity aspects in the proposed project area.
OS 4: Pollution prevention and control, hazardous materials and resource efficiency	• This OS outlines the main pollution prevention and control requirements for borrowers or clients to achieve high quality environmental performance, and efficient and sustainable use of natural resources, over the life of a project.	This OS requires the Proponent to: - • Refrain from any activity which might cause environmental pollution

Operational safeguards (OS)	Objective of the OS	Relevance to the proposed project
	• The specific objectives of this OS is to manage and reduce pollutants	• Follow the ESMP provided in the report.
OS 5: Labor conditions, health and safety	• This OS outlines the main requirements for borrowers or clients to protect the rights of workers and provide for their basic needs. • The specific objectives are to: -Protect workers' rights; -Establish, maintain, and improve the employee–employer relationship; -Promote compliance with national legal requirements and provide supplemental due diligence requirements where national laws are silent or inconsistent with the OS; -Align Bank requirements with the ILO Core Labor Standards, and the UNICEF Convention on the Rights of the Child, where national laws do not provide equivalent protection; -Protect the workforce from inequality, social exclusion, child labour, and forced labour; and -Establish requirements to provide safe and healthy working conditions.	• The report advices the Proponent on safety and health aspects, potential impacts, personnel responsible for implementation and monitoring, frequency of monitoring, and estimated cost, as a basic guideline for the management of Health and Safety issues in the proposed project.

CHAPTER FIVE: PUBLIC PARTICIPATION AND CONSULTATION

5.1 Introduction

This chapter describes the process of the public consultation/participation followed to identify the key issues and impacts of the 16.5 km 132kV Underground Electricity Transmission Cable. Views from the general public, local leaders and surrounding institutions who in one way or the other would be affected by the project were sought through oral interviews, administering of questionnaires and through a public meeting. A public meeting (baraza) was also held in order to solicit the opinion of the neighbouring community and also ensure comprehensiveness in the ESIA study as stipulated in the Environment Management and Coordination Act, Cap 387. Public consultation was conducted by a team of qualified EIA experts between 15th to 25th October 2018, while the public meeting was held on 23rd October, 2018 and the findings were comprehensively analyzed. The proposed mitigation measures suggested by the public and other stakeholders have been integrated in the report.

5.2 Objectives of the consultation and public participation

The objective of the Consultation and Public Participation (CPP) as required in EMCA, Cap 387 was to: -

1. Disseminate and inform the public and other stakeholders about the proposed project with special reference to its key components, location and anticipated impacts.
2. Create awareness among the public on the need for the ESIA for the proposed project.
3. Gather comments, concerns and suggestions of the interested and, would be affected/interested parties.
4. Ensure that the concerns of the interested and, would be affected/interested parties were known to the decision-making bodies and the proponent at an early phase of project development planning.
5. Establish a communication channel between the interested, would be affected/interested parties, the team of consultants and the Government.
6. Incorporate the information collected in the study by EIA Experts.

The purpose for such a process was to identify the positive and negative impacts of the project and subsequently suggest mitigation measures. It also helped in identifying other miscellaneous issues which may bring conflicts during project implementation phase.

5.3 Stakeholders' consultation

Various stakeholders and affected parties were consulted during the EIA process. (see list of the people/Stakeholders consulted in the table below). A comprehensive list of the people/stakeholders who participated in the interviews and public meeting and the respective minutes are attached at appendix 3 and 4 of this report respectively: -

Table 8: List of members of the public consulted

S/N	NAME	DESIGNATION	CONTACTS
KEY INFORMANTS			
1.	Patrick Mahinda	Ministry of Interior and Coordination of National Governement- Chief Marura Location	0721248978
2.	Dancun Wachira	Ministry of Interior and Coordination of National Governement- Chief Nanyuki Municipality Location	0707248415

S/N	NAME	DESIGNATION	CONTACTS
3.	Chrispus Maina	Nanyuki Water and Sewerage Company- NAWASCO	0722893834
4.	Njenga Kahiro	County Government of Laikipia- CEC Water, Environment and Natural Resources	0721475876
5.	Esther Mwamure	DCC Laikipia East	P.O BOX 11, Nanyuki
6.	Karanja Njora	Laikipia County Secretary	1
7.	Police Commandat, Laikipia County		
8.	Security Manager	Nanyuki Ranching Limited	
9.	Mr Ibui	Aoes' Farm	0721816694
10.	CoI Kyalo Munyao	Base Commander, Laikipia Air Base	062-2031244 Ext 3001
11.	Walter Nyatwanga	KENHA- Manager, Environment	0721884924
12.	Eng James Kabiru	KERRA	0622031055 0722783440
13.	Alfred Osiko Willis Oyoo Susan Muturi	Safaricom	
PUBLIC CONSULTATIONS			
14.	Spare Peterson	N/A	0722491547
15.	Samuel Kagiri	N/A	0729357918
16.	Christopher Wantere	N/A	N/A
17.	Theuri	Farmer ,	1691,Nanyuki
18.	Richard Mutheka	Farmer	0726675944
19.	Anonymous	N/A	0726448365
20.	Mary Karobia	N/A	0720047971
21.	John Wachiuri	Businessman	0721871096
22.	Paul Wamagui	Farmer	0712345678
23.	Rayab Mwenda	Community Member- Ruai	0703177818
24.	Peterson Kariuki	N/A	0713909610
25.	David Komu	Village Elder	0727286771
26.	Lucy Mithamo	N/A	072496012/ 0724798299

S/N	NAME	DESIGNATION	CONTACTS
27.	Francis Munyi Njagi	Businessman	0702462835
28.	Daniel Karuri	Farmer	0725127870
29.	Peter Kamwaro	Businessman	N/A
30.	Daniel Mutheri	Businessman	N/A
31.	Peter Njoroge	Farmer	0721819286
32.	Lucy Wachira	Entrepreneur	0722618091
33.	John M Gacheru	N/A	0724174258
34.	Benjamin Muimi	N/A	270, Nanyuki
35.	Isaac Mathenge	Businessman	0722911953
36.	Joseph Wahome	N/A	0725233009
37.	Mary Waruguru	N/A	0712812360
38.	Salima Ibrahim	Village Elder	0720208951
39.	Joseph Githaiga	Businessman	N/A
40.	Charles Kamama	N/A	N/A
41.	Irene Nyambura	N/A	0725690165

5.4 List of identified key stakeholders consulted

- The Kenya Defence Force -KDF
- The County Government of Laikipia
- The Nanyuki Water and Sewerage Company – NAWASCO
- The Kenya National Highways Authority- KENHA
- The Kenya Rural Roads Authority – KeRRA
- Safaricom Limited
- Aloe's Farm
- Nanyuki Ranching Limited (Mastermind Tobacco)
- Local Administration
- The Local Community
- The project Affected Persons
- The Kenya Police
- County Commandant

5.5 Methodology used in the CPP

The CPP Process is a policy requirement by the Government of Kenya and a mandatory procedure as stipulated by EMCA Cap 387 section 58, on Environmental Impact Assessment for the purpose of achieving the fundamental principles of sustainable development. It is an environmental and social assessment exercise which will be conducted during the project study.

The purpose for such interviews is to identify the positive and negative impacts and subsequently promote proposals on the best practices to be adopted and mitigate the negative impacts respectively. It will also help in identifying any other miscellaneous issues which may bring conflicts in case project implementation proceeds as planned.

In general, the following Steps will be followed in carrying out the entire CPP process: -

I. Identification of institutions and individuals interested in the process- database of the interested and affected parties

   Administration of questionnaires to the different target groups and local community members along the proposed project Site.

Plate 6: Public Baraza meeting being addressed by KETRACO staff

Plate 7: Public Baraza meeting being addressed by the area chief

Plate 8: Consultation meeting at Chiefs office

5.6 Background of CPP

From the field work, it was apparent that the majority of the stakeholders were aware of the proposed project development and the direct impacts. The proposed construction of the Underground 132 kV cable was nevertheless received with mixed reactions by the community as they anticipated numerous impacts both negative and positive. The local communities and major stakeholders independently gave their views, opinions, and suggestions as in the best of their interest and in the interest of the factors that affected the circumstances, influences, and conditions under which their organizations exist.

5.7 Issues identified during the site visit and the public meeting.

These issues were collated from the questionnaires attached in appendices 5 and 6.

Land marks for subsurface structures

The community members were concerned about where the underground cables would pass. It was agreed that there will be markings to indicate where the underground cable has been laid.

Tree and crops compensation

The community members wanted to know if they would be compensated after the destruction of their crops and trees during construction and maintenance. It was agreed that the compensations would be done once destruction has been done.

Delays in compensation of PAPs

The land owners had problems with delays in payments of their land stating that they have not yet been paid since they sold the land to KETRACO. It was agreed that there were delays due to the development of the new project that had underground lines and once the report will be approved by NEMA, the payments will be done.

The land owners also wanted to know whether they will get an increase in payments since the lines are now to pass underground and not overhead as it was earlier. It was agreed that the payment was only done once irrespective of whether the line was overhead or underground.

The land owners wanted to know how KETRACO will compensate areas where the line has passed on community plots e.g. community playground. It was agreed that the names of those who appear on the title deeds of such plots will be compensated.

The land owners wanted to know when they would be paid. Either before, during or after the commencement of the project. It was agreed that payments would be done once NEMA has approved the report.

Way leaves

The community members were concerned about the overhead and underground lines and thought that there is an''airleave" and ''groundleave" and that they should be paid separately. The community members were educated and made aware that an ''airleave" or ''groundleave" does not exist, rather there only exists a wayleave which covers both the overhead lines and underground lines and compensation is made for the wayleave.

Development on the project areas.

The community members wanted to know if they can plant trees or crops and even build temporary structures on the project area. It was agreed that they can plant trees that are not tall and plant crops on the project area, but were not allowed to build structures on the project area.

Safety of the community members

The community members wanted to know if the underground line would pose any dangers to them once installed. It was agreed that once the underground cables had been laid, the trenches would be well covered and would not pose any dangers to the community.

Acceptability of the project

The community members were positive about the project and emphasised on the following benefits:

-Reliable power supply in the area

-Employment opportunities in the area

Proper mitigation measures to be put in place when the project begins

5.8 Summary of Issues raised through the questionnaires

Interviews with stakeholders were done and public participation meeting was held with various administrative leaders, community leaders and the residents who are likely to be affected by the project along the way leaves trace.

5.8.1 Positive issues

The following are the views of the stakeholders interviewed.

- The project will bring about development in the country and the local area too since it will boost power supply, reduce power outages and improve on industrial development.
- The project will improve businesses in the area hence create job opportunities to the youth and residents of the area.
- The crime rate in the area will reduce due to creation of job opportunities that will arise from the project, hence enhancing security in the area.
- The project will boost the area economically since a 24hour economy will be made possible due to reliable power supply.
- Once the project will be complete, the country's vision 2030 agenda will be fulfilled as proposed.
- The project will help ease electricity bills in the nation.

- The project will bring about socio-economic development.

5.8.2 Negative issues

- The stakeholders also raised the following concerns.
- The project is risky due to the high voltage of electricity passing underground and there would be electromagnetic radiations and risk of electrocution that may affect a wide range those residing near the way leave.
- The project would lead to relocation and displacement of residents from their homes.
- There will be no economic activities carried out on the project area once the project commences.
- There will be loss of land, property and disruption of businesses as people will be required to relocate.
- There would be possibility of insecurity in the areas due to the influx of other people during construction phase.
- There might be re-routing of essential utilities in the area like water and sewer lines, which may be expensive.
- The area experiences seismic activities, and this may interfere with and affect the underground lines and structures.
- There might be resistance from the community over compulsory acquisition.
- Lack of information by the local community might lead to the rejection of the project.

5.8.3 Stakeholders suggestions

- The community should be sensitized and assured of safety, that the project will not pose any dangers.
- After sensitization to the community about the project, KETRACO should move in with speed for people not to have a lot of delays that might lead to mistrust.
- The proponent should consider employing casual workers from the local area during the construction phase.
- There should be better compensation to plot owners who have been affected.
- The proponent should get the utility network maps before construction and the utility management/bodies should be engaged before and during construction.
- Undertake micro-tunnelling in areas where the underground cable will pass through roads at appropriate depth levels.
- The proponent should dig deeper than 1.5metres on black cotton soil areas.
- The lines should be well insulated to prevent electrocution and for safety purposes.
- There should be markings along the lines for safety purposes.
- Once the project has been implemented, awareness creation about the underground line should still be done to other generations for safety purposes.
- Frequent patrols should be done during the day and night for security purposes and the *Nyumba Kumi* should also be involved for security purposes.
- The proponent should pay more money to the affected people.
- The affected residents should be given ample notice to move and be compensated before relocating to avoid inconveniences.
- The Proponent should ensure proper environmental management practices are put in place during construction and after construction for the safety of the community.
- The affected persons should be given some amount of money annually because the land will not be used much by the owners and because the proponent will be trading with electricity.

CHAPTER SIX: POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS OF THE PROPOSED PROJECT

6.1. Introduction

A summary of the main potential impacts of the proposed project based on stakeholders' views; Assessment of the project area and evaluation of project processes are: -

6.2. Positive impacts

Broadly, the identified positive impacts associated with the proposed underground electricity transmission cable include;

6.2.1. Reliable and Secure Electricity Power Supply

Installation of the underground cable will ensure completion of the Nanyuki – Rumuruti and Isiolo- Meru-Nanyuki 132kV Transmissions Lines which will enhance adequacy, reliability, and security of electricity power supply in Laikipia County as well as Isiolo and Meru Counties. The project will also help meet the increasing demand for power supply and minimize the frequency of power outages (blackouts).

6.2.2. Contribute towards reduction in Greenhouse Gas emission

Installation of the underground cable and completion of the parent project(s) will further eliminate the need for diesel generated power and reduce dependence on fuel-wood. This will again help reduce emission of greenhouse gasses and indoor air pollution in homes where firewood is the prime means of energy.

6.2.3. Contribute towards lowering the cost of electricity

Installation of the underground electricity transmission cable and completion of the transmission lines thereof will help reduce transmission loses by about 30 percent. This will translate into reduced power production costs and as a consequence the final power tariffs per kilowatt hour charged to Kenya Power customers.

6.2.4. Employment Opportunities

The construction of the underground cable will need both skilled and non-skilled labour. This thus will create employment opportunities for both skilled and unskilled personnel. The proponent has committed to ensure that priority is given to the local community especially for unskilled labour. Skilled labour employment will depend on the skill potential for the local populace.

6.2.5. Contribution towards reduction of environmental pollution

Dominant source of energy in the Counties of Laikipia, Meru and Isiolo is fuel-wood. The project will provide alternative energy source and thus reduce reliance on fuel-wood thereby contributing towards among others, the national goal of conservation of forests and woodlots hence meeting the minimum national forest cover.

6.2.6. Gains in the Local and National Economy

Expected gains in the local and national economy from the construction and operation of the proposed project will be in the form of consumption of locally available materials including: fine and course aggregates, timber, cement, glass, metal, and among other construction materials; taxes levied from contractors and employees; and income from business associated with the project.

6.2.7. Informal Sector Benefits

The project will require supply of large quantities of building materials most of which will be sourced locally. It will also spur the growth of small business enterprises including kiosks to serve construction workers and employees, barbershops, mills, cell phone charging, photocopying shops among others.

6.2.8. Development of Other Sectors

Increase in reliability and security of power supply in the region will enhance efficiency and productivity of other sectors including health, education, water supply, agriculture and

livestock production, industry, etc. Reliable power is an enabler of economies and will aid counties and other investors to come up with factories and industries within their jurisdiction.

6.3. Negative Impacts

The following negative impacts are also associated with the proposed installation of the underground electricity transmission cable: -

6.3.1. Construction Phase

6.3.1.1. Impact on public utilities and installations along the corridor

Installation of the 16.5km underground electricity transmission cable will have a potential impact on the current public infrastructural utilities already within the wayleave corridor. A number of the utilities are already operational within the 4km stretch of wayleave corridor shared between Nanyuki – Rumuruti and Isiolo – Meru- Nanyuki 132kV Transmission Lines. The GPS coordinates for these key infrastructural installation were picked and mapped; the institutions running them were also consulted and informed of the planned activities as shown in the Consultations and Public Participation (CPP) chapter. Table 9 below indicates some of the utilities installed/ buried within the corridor that are likely to be impacted by the proposed project component.

Table 9: Key infrastructural installations within the wayleave corridor

Utility	Details	GPS
Water pipe to the Kenya Air Force Camp	6-inch-wide pipes, 1 meter deep. Between Tower 15 and 16	2833387, 0003594
Safaricom Line /Police Line	More than 2 meters deep, Between Tower 15 and 16	2833387, 0003594
Water Pipes to Batuk	3 inches wide pipes, 1 meter deep, Between Tower 15 and 16	283389, 0003606
Water Tunnel from the NAWASCO sewerage plant feeding the river	24 inches in diameter, 2 meters deep	283351, 0003556
Sewerage Line from Batuk to the NAWASCO Treatment Plant	2 meters deep	2833364, 0003604
Laikipia Airbase Road	under KeRRA	283406, 0003595
50 mm water pipe between tower 17 and 18	Under NAWASCO management, less than 1 meter deep	283958, 0004102
Nanyuki Rumuruti Road	Under KENHA Management	283279,0005154

6.3.1.2. Noise and vibration Pollution

The construction and decommissioning works of the project will most likely produce noise due to the moving and operation of machines (concrete mixers, tippers, drilling etc.) and lorries moving into and out of the site to deliver construction materials to site or take away debris.

This impact will be more localized and felt in the within the construction site. Machines like tippers and concrete mixtures produce continuous high levels of noise over a long period of time every day. The neighbours and operators of these machines are therefore exposed to high levels of noise over long period which is continuous.

Highest levels of noise and vibration could be during undercutting of the road infrastructure to allow passage of the underground cable.

6.3.1.3. Air emissions

Exhaust emissions are likely to be generated by the motored equipment during the construction and decommissioning phase of the proposed project. Motor vehicles that will be used to ferry construction materials, take away debris during decommissioning phase or those used for general operation activities (operation phase) will also have impacts on air quality.

Dust emission is also likely to occur during the site clearance, excavation and spreading of the topsoil during installation of the underground cable, excavation of foundation for steel towers and by uncovered trucks delivering loose aggregates to the site.

Dust emissions are also likely to occur during the decommissioning phase.

6.3.1.4. Water use and water quality

The proposed project will not affect local water resources during both construction and operation phases of the project. During construction, water demand will be minimal. However, the construction activities would be water intensive as casting would be required. Due to an optimal water use management plan should be devised by the contractor.

6.3.1.5. Release of hazardous substances

Use of engines (construction vehicles) and other equipment on site has the potential to lead to spillage of petroleum products. It is however worth noting that the risks of a major oil spillages occurring are minimal because only a few constructions will be needed in the construction of the transmission line. Further, the maintenance of these vehicles will be undertaken at authorized garages and not on site. The impact during construction will not be significant.

6.3.1.6. Solid and Liquid Waste Generation

It is expected that solid waste will be generated during construction of the underground cable during excavation ripping off of the top soil. Such excavated material will include soil clods, rocks, residual fine aggregates etc. Other sources of solid waste are likely to include aggregates, cement bags, wooden boxes used to cable parts, conductors, steel, metal, plastic, glass, paper, organic, cables, paints, adhesives, sealants, fasteners, wastewater, sewage etc.

Experience from the already built transmission lines in Kenya show that, many contractors fail to collect (effectively) the remnants of the loose aggregates and concrete from the tower bases. This creates a small patch that is not ecologically productive and can be seen many years after construction.

6.3.1.7. Oil spills

Motorized machinery that will be used in the construction of the underground cable contain moving parts which will require continuous oiling to minimise the usual corrosion or wear and tear. There is therefore potential for oil spills and accidents during oil transportation, storage and operation of transformers and batteries.

6.3.1.8. Destruction of Existing Vegetation

The project requires a wayleave corridor of 30 meters as is the case with 132kV overhead cables. The wayleave corridor for the same had already been acquired under the initial overhead design and necessary compensation as per the law done. Along this wayleave corridor are a few trees that shall be cleared to pave way for the construction and laying of the underground cable. Vast of area is exhibits ASAL-like condition and has sparse stunted A*cacia*

tortilis trees. A few homesteads have planted woodlots along their fences such euphorbia and gravillea. In the Sewerage area, a number of tall eucalyptus plants have been planted, a section of which would be logged down to pave way for the project.

6.3.1.9. Soil Erosion

The Ruai area is prone to flooding due to its topographical and edaphic nature. In event of this and eventual surface run-off, the overburden soil gotten from dug trenches could be carried away by the storm water to the nearby river channels.

Similarly, during the construction phase, the contractor is expected to loosen the soil along the way-leave for the pylons which may lead to soil erosion. Similarly, the way-leave will serve temporarily as a road to transport material between construction sites. The exposed soil will be prone to wind and water erosion during the construction phase. The soil problems may be exacerbated by topography of some areas, especially across riverine and dry river-beds, mainly during the wet season.

6.3.1.10. Visual and Aesthetic Impacts

The excavation and digging up of trenches along the wayleave corridor during the construction period coupled with the stacking of constriction material and heaps of excavated soils caused an unsightly phenomenon that compromised the aesthetic value of the construction site that currently is dominated by grass.

6.3.1.11. Physical and Economic Displacement

As per the initial plan and standard, the 132 kV underground electricity transmission cable would still use the already acquired wayleave corridor of 30 meters. The corridor for the first 4 Km from the current Tower 7/0 would house two lines: Nanyuki -Rumuruti 132 kV and the Meru – Isolo – Nanyuki 132 kV Isiolo line up to Tower No. 18/0 whereby the underground cable for Isiolo-Meru- Nanyuki 132 kV Transmission Line will terminate and continue as the initial design (overhead); while Nanyuki – Rumuruti Line will continue running underground for about 12.5 km to connect to the overhead conductors to Rumuruti running through the Kenya Defence Force and Nanyuki Ranching Limited properties.

Majority of the 16.5km corridor has been acquired except for a small stretch of new Project Affected Persons under the proposed design variation that would need to compensated as per the law.

6.3.1.12. Health and Safety

6.3.1.12.1. Noise

There will be noise and vibrations generated during the construction phase but it will be no different from that on any other typical construction site. The noise impact during construction is expected to be negative and short-term. The major receptors are expected to be the construction workers as well as any immediate neighbouring residential premises. Sources of noise will be trucks and the off-road vehicles in transit, use of compressor to break hard ground and the use of motorized chain saws for vegetation clearing.
The noise from the project vehicles is only significant in areas where the proposed line passes through dense settlements such as close to the towns' neighbourhoods. The noise from compressors will only be significant where hard ground breaking is carried out close to settlements. Noise from the motorized chain saws will only be experienced in the wooded areas but it will not be a significant impact since the density of settlements is not very high. Impacts of noise include noise-induced hearing loss for the project employees and nuisance for the affected settlements.

6.3.1.12.2. Exposure to diseases

During the construction and decommissioning phase, workers are likely to be exposed to diseases from construction and decommissioning materials. It is therefore recommended that before the construction commences, there is need for the materials to be well inspected according to the occupational health and safety standards. Other concerns will include incidences of vector borne and water borne disease. When solid wastes are not well managed there is potential of disease outbreak due to suitable breeding conditions for vectors of cholera

and typhoid. If the wastes find their way to a water body its quality may be lowered. Malaria outbreak could also be exacerbated by the presence of open water ditches for breeding of anopheles' mosquitoes. The most vulnerable groups are children who could be exposed to these conditions.

Additionally, during the construction phase of the project, construction personnel brought in from outside the community may be infected with STIs and HIV/AIDS, and could introduce these diseases to the community members they interact with.

6.3.1.12.3. Traffic Accidents

There is a potential for traffic accidents from the vehicular movement, in and out of site if uncontrolled.

6.3.2. Operational Phase

6.3.2.1. Vegetation clearance

Vegetation clearance will be done within Right of Way for purposes of maintenance of the underground cable. This may disrupt wildlife and their habitats.

6.3.2.2. Fire Risk

During operations, voltage power can cause a fire risk in the event of electrical faults with equipment. Interference or aging of the cable can result to faults and fires. If growth of roots of nearby vegetation is unchecked, it can lead to compromising of the integrity and safety of the cables.

6.3.2.3. Electromagnetic Fields (EMFs)

Perhaps the greatest fear expressed by people living in very close proximity to high-voltage power lines is exposure to EMFs. Scientific research on the effects of EMFs
on public health has not demonstrated clearly the existence of a significant risk, nor has it proven the complete absence of risk. The finding and conclusions are that the field strength on a 132 kV line at the distance of exposure (heights of 40-40m is less than what one would ordinarily be exposed to in a domestic setup. In this context, prudent avoidance is recommended. Many studies published during the last decade on occupational exposure to Electro-Magnetic Fields (EMF) have exhibited a number of inconsistencies and no clear, convincing evidence exists to show that residential exposures to electric and magnetic fields are a threat to human health. However, the EMF decrease very rapidly with distance from source and there should be no potential health risks for people living outside of 30m corridor.

6.3.2.4. Operation and Maintenance impacts to the community

6.3.3. Decommissioning Phase

6.3.3.1. Soil erosion

During the decommissioning phase, the contractor is expected to loosen the soil along the way-leave for the purpose or removing the pylons which may lead to soil erosion. Similarly, the way-leave will serve temporarily as a road to transport decommissioning materials from the proposed project sites. The exposed soil will be prone to wind and water erosion during the decommissioning phase. The soil problems may be exacerbated by topography of some areas, especially across riverine and dry river-beds, mainly during the wet season.

6.3.3.2. Hazardous materials

The machines on site may be containing moving parts, which will require continuous oiling to minimize the usual corrosion or wear and tear. Possibilities of such oils spilling and contaminating the soil and water along the transmission line route are likely to occur but on rear occasion because the workers will be sensitized. These dangers can be contained by maintaining the machinery in specific areas designed for this purpose.

6.3.3.3. Health and Safety

6.3.3.3.1. Noise

The decommissioning works will most likely be a noisy operation due to the moving machines, communication of workers and outgoing vehicles transporting project materials and workers to and out of the proposed site. The immediate surrounding will experience an increase in human traffic and noise during ground preparation. In the decommissioning site, noise is likely to be produced by the decommissioning machinery. To prevent this, machine operators and workers who will be in close proximity to the machinery will be required to wear protective gears such as earmuffs. The prevalence of acute noise damages occurs when the ear is exposed to a single or relatively few exposures of sound at threshold levels of 80 dB and these damages to the ear can be either temporary or permanent. However, during this decommissioning phase there would not be too much noise.

6.3.3.3.2. Road Accidents

The operation of lorries and other movable equipment along the section is a potential risk along the section if unregulated. The underground cable passes through road (the airbase road and Nanyuki-Rumuruti road), also passes within an existing community. Therefore, this will warrant some level of vehicular movement management.

6.3.4. Risks to the project

6.3.4.1.1. Vandalism

Vandalism has been a risk to electricity transmission projects in Kenya. The conductors are highly valued and illegally sold to illegal traders in the market. In the past there have been cases of vandalism of underground cables: example, the Mombasa –Nairobi underground cable within the Nairobi National Park. This thus calls for a way of ensuring security of the cables especially in areas without the Kenya Defence Forces boundaries.

6.3.4.1.2. Encroachment

Another potential risk to the line in wayleave encroachment. In the construction of the overhead cables, the Project Affected Persons face limited use of the land with restrictions to putting up of structures and planting of trees above 12 feet.

Buried cables occupy a significant amount of land except for cables installed in tunnels. Access to cables for maintenance and repair is also required for the duration of their life. Building over cables, earth mounding and excavating on the cable easement strip is therefore restricted for direct bury cables and cables installed in surface troughs. There are also restrictions on the planting of trees and hedges over the cables or within 3m of the cable trench to prevent encroachment by vegetation. Tree roots can cause drying out of the ground around the cable causing a fall in the thermal conductivity and tree roots may also penetrate the back fill and cable construction causing electrical failure.

In urban areas the land takes for direct bury cables far exceeds that required for an equivalent rated overhead line. Cables have historically been routed under roads to avoid land sterilisation, however traffic disruption during fault investigation and repairs can be significant.

Where cables are installed by direct burial in rural areas there are restrictions on the use of deep cultivating equipment to avoid the risk of disturbance.

6.3.4.1.3. Explosives

The proximity of the Underground Cable to military camps is a risk from buried explosives such as improvised explosive device (IED).

CHAPTER SEVEN: PROPOSED MITIGATION MEASURES

7.1. Introduction

The following are proposed mitigation measures to avoid, offset or minimize the identified negative impacts.

7.2. Impact on existing public infrastructural utilities

At the planning level, it would be important for KETRACO to:

- Engage the owners/ institutions in charge of the installed utilities along the corridor
- Adequately map the utilities and identify the utilities
- The depth for the buried grounded infrastructures such as pipes and fibre optic cables needs to established and adequately communicated to the institutions in charge
- Seeking approvals from the Institutions in charge for encroaching through their Right of Way. Such institutions are KENHA, KeRRA, Safaricom, Kenya Police and NAWASO.
- Installation of permanent marking at the points where such infrastructure crosses the Transmission Line's corridor for future reference and safety.

7.3. Noise Pollution

Ensure that noise levels emanating from machinery, vehicles and noisy construction activities (e.g. excavation, blasting) are kept at a minimum for the safety, health and protection of workers within the vicinity of site and nearby communities. No worker should be exposed to continuous noise above 80db for over 8 hours and those working in continuous loud noise should be provided with necessary PPEs and impelled to use them.

The contractor will adhere to the EMCA Noise and Excessive Vibration Pollution Control Regulation, 2009 and will be required to implement noise control measures amongst exposed work force and community. This will include provision of hearing protective devices such as ear plugs and ear muffs; avoiding construction or demolition activities during the night, education and awareness programmes and creation of a buffer to propagate against noise pollution among other noise control measures.

The contractor should only blast rocks where it is very necessary. Blasting will require approvals from Mines and Geology Department.

7.4. Air Emissions

To mitigate against exhaust emissions, the proponent is advised to sensitise truck drivers and machine operators to switch off engines when not in use; regularly service engines and machine parts to increase their efficiency and reduce generation of exhaust emission; and where feasible use alternative non-fuel construction equipment.

7.5. Solid and Liquid Waste Generation

To avoid waste generation or to minimize the amount of waste generated, the following measures are recommended;

- Use of an integrated solid waste management system i.e. The 3 R's: reduction at source, reuse and recycle;
- Accurately estimate the dimensions and quantities of materials required especially fine and loose aggregates for tower bases;
- Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time;
- Providing facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage;
- Use of building materials that have minimal or no packaging to avoid the generation of excessive packaging waste;
- Use of mobile toilets on site for workers and site staff;
- Providing waste collection bins at designated points on site;

- Ensuring that, all remnants of loose gravel and concrete are effectively collected from the tower bases and re-used or disposed of in an environmentally friendly manner.
- Disposing waste more responsibly by contracting a registered waste handler who will dispose the waste at designated sites and in accordance with the existing laws.
- Drainage and effluent from storage areas, workshops and camp sites shall be captured and treated before being discharged into the drainage system in line with applicable government water pollution control regulations;
- Construction waste shall not be left in stockpiles along the road, but removed and reused or disposed of on a regular basis
- Proper procedures for the management of human waste will be put in place in order to prevent outbreak of diseases;
- Place in strategic places signs against littering and dumping of wastes;
- Audits waste generation and develop waste reduction action plans (WRAP).

7.6. Oil Spill Hazards/ Hazardous waste material

The proponent will endeavour to prevent petroleum products used which include bitumen, oils, lubricants and gasoline from contaminating soils and water resources (ground and surface water). To accomplish this, the proponent will;

- Install oil trapping equipment in areas where there is a likelihood of oil spillage;
- Collect the used oils and re-use, re-sell, or dispose of appropriately using expertise from licenced waste handlers;
- Prepare a written response plan and display it on strategic areas and train workers on specific procedures to be followed in the event of a spill;
- Immediately institute clean up measures in case of an oil spill;
- Design appropriate protection devices against accidental discharge of transformer oil substances;
- Do not service equipment on site without proper mechanisms on how to handle waste oil:
- Ensure that all waste oils from maintenance equipment should be segregated and disposed properly by a reputable/registered waste handler in accordance with the waste disposal plan.

7.7. Destruction of Existing Vegetation and Habitats

To minimize destruction of existing vegetation and habitats;

- Vegetation clearing will be kept to a minimum. The vegetation of the site is largely low and open and therefore whole-sale vegetation clearing will only be applied if necessary and within the project route.
- Document pre- and post- construction vegetation cover and recovery of the ground layer in case available.
- All no-go areas will be clearly demarcated.
- Any extensive cleared areas that are no longer or not required for construction activities will be re-seeded with locally sourced seed of suitable species. Bare areas can also be packed with bush removed from other parts of the site to encourage regeneration and limit erosion.
- Vegetation clearing for maintenance activities will be done manually wherever possible. The use of herbicides will be avoided.
- Collection or harvesting of any plants on the site is to be strictly forbidden throughout all phases of the project.

7.8. Impacts on Workers' and Community Health and Safety

The proponent will implement all necessary measures to ensure health and safety of the project workers and the general public during construction, operation and decommissioning

of the proposed project as stipulated in the Occupational Safety and Health Act, 2007. This will include but not limited to

- Registration of workplaces by the contractor where it is required
- Identify all hazards before undertaking a process
- Conduct and continually review a risk assessment
- Hold daily morning toolkit talks where safety is the key issue
- Train workers on health and safety
- Identify and train fire marshals and first aiders.
- Only use experienced workers during erection of towers and stringing. Before climbing the towers, the workers should be reminded of the danger ahead and the need for being careful. Strict supervision on those on top of towers should be the norm.
- Ensure use of double harness while atop the towers
- Where there are risks of attack by wild animals, ensure workers are accompanied by armed guards
- Collect daily security briefs and avoid insecure places
- Provide all necessary PPEs

7.9. Soil Erosion

To reduce soil erosion, the proponent will;

- Apply soil erosion control measures such as levelling of the project site to reduce run-off velocity and increase infiltration of storm water into the soil;
- Ensure that construction vehicles are restricted to use existing graded roads;
- Implement a storm water management plan that minimizes impervious area infiltration by use of recharge areas and
- Use of detention and/or retention with graduated outlet control structure will be designed.

7.10. Visual and Aesthetic Impacts

To reduce impacts on visual and aesthetic values of the area, the project proponent will;

- Undertake extensive public consultation during the planning of the project;
- Design structures at the site in such a way as to improve the beauty of the surroundings;
- Restore site areas through backfilling, landscaping and planting of trees, shrubs and grass on the open spaces to re-introduce visual barriers;
- Design and implement an appropriate landscaping programme.

7.11. Incidences of Electrocution

To reduce incidences of electrocution, the proponent will;

- Ensure strict adherence to the safety designs established;
- The underground cable corridor to be clearly marked and warning signage installed
- Put in place a maintenance system to ensure physical integrity of project components;
- Ensure that access to the live sections of the project should only be by authorization and trained personnel;
- Place warning signs on strategic places;
- Conduct periodic awareness and sensitization campaigns for the neighbouring communities.

7.12. Perceived Danger of Electrostatic and Magnetic force

The proponent will conduct education and awareness campaigns to dispel fear among community on the effects of electrostatic and magnetic forces

7.13. Physical and Economic Displacement

- Conduct an updated, detailed and elaborate RAP
- Conduct consultation meetings with Project Affected Persons
- Ensure timely compensation for loss of property and land use.

7.14. Training of workers on health and safety

The contractor will have employees trained in spill response on site during all construction activities. Emergency response actions/protocol will be identified and implemented by the construction contractors. Contractor will be required to conform
Health and Safety Codes provided on approved Material Safety Data sheets.

7.15. Dust and Air Emissions control

Controlling dust during construction is useful in minimizing nuisance conditions. It is recommended that a standard set of feasible dust control measures be implemented for all construction activities. Emissions of other contaminants (NOx, CO2, SOx, and diesel related PM10) that would occur in the exhaust from heavy equipment are also included. The proponent is committed to implementing measures that shall reduce air quality impacts associated with construction. All personnel working on the project will be trained prior to starting construction on methods for minimizing air quality impacts during construction.

There is need for construction workers to be trained regarding the minimization of emissions during construction.

Dust emissions will be controlled by the following measures:

- Watering all active construction areas as and when necessary to lay dust.
- Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard.
- Pave, apply water when necessary, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.

The Proposed Project will comply with all applicable rules and regulations, with regard to air pollution, and not limited to the following: -

- Cover all trucks hauling loose materials or maintain at least 6 inches of freeboard.
- Apply water or other dust suppressants as warranted on dirt roads, material stockpiles, and other surfaces which can give rise to airborne dust during construction operations, grading of roads, or the clearing of land.
- Promptly remove earth or other unused material from pavements during and after construction.
- Restrict speeds of vehicles within and around construction activities.
- Construction vehicles will be kept in proper running condition and in proper tune per manufacturer's specifications. Equipment will be operated to minimize idle time.

7.16. Controlling soil erosion

Soil erosion within the project site will be mitigated by applying several measures such as:

- Planning all land clearance, site excavation and trench digging works during the dry seasons and ensuring one section is completed and rehabilitated before another section begins.

- Levelling of the project site to reduce run-off velocity and increase infiltration of storm water into the soil,
- Ensuing that construction machinery are restricted to the area designed for the bypass to avoid soil compaction outside the project site

7.17. Prevention of sexually transmitted diseases

- Public health education to be taught to the community living in the vicinity of the project sites.
- The community members be encouraged to visit VCT centres and take appropriate measures to prevent or manage STIs such as HIV/AIDS
- Community health workers to assist in providing needed health services, for screening and referral of cases.

7.18. Traffic Accidents

Can be controlled through:

- Employ traffic marshals to control the movement of vehicles during the construction phase of the project.
- Adopt a Traffic Management Plan to enhance the traffic movement within the site and the public road
- Use of signs for diversion and to warn motorists against dangers at or near construction site
- Use of reflective jackets among other PPEs to avoid accidents

CHAPTER EIGHT: ANALYSIS OF PROJECT ALTERNATIVES

10.1 Introduction

One of the functions of the Environmental and Social Impact assessment process is to describe and evaluate various alternatives to the proposed project. Alternatives examined during the study are discussed below;

10.2 The "Do Nothing" Option

For this project, the no-development option would mean the proposed project will not be implemented. The implications of this would be that the Nanyuki Rumuruti and Nanyuku Isiolo Meru 132 kV transmission lines will not be completed hence denying the Counties and People Laikipia, Meru and Isiolo County the requisite power to enable economic development and social security. The currently built towers that are meant to be demolished to pave way for underground cabling will still be standing and being aviation safety risk to aircraft landing and taking off from the Nanyuki Airbase.

In summary, the Government of Kenya will lose this investment, done through collateral loans sourced from the International Finance Institutions and thus would be expensive and against the principles of sustainable development. Without laying of the underground the cable the two projects will be rendered useless.

10.3 Overhead Cabling Option

The current design for the two projects with the 16.5 km stretch is installation of overhead cables. This design is disputed by the KDF due to eminent aviation safety risk to aircraft. It is due to this, that design has been varies to a proposed underground cable. Adopting the current design option would mean that KETRACO may not get the license / approval to construct within the 16.5 km stretch due to the aviation risk.

If approval to go overhead is given, then the safety risk to aircraft would not have been solved.

10.4 Line Routing and Substation Siting Alternatives

90% of the underground cable route is determined except for a section of 1.2 km stretch. This stretch has 3 options as shown in the map below and analysed in the map below: -

Table 10: Routing options for 0.8km stretch

Route	Location	Details	Rating
Route 1	Within Nanyuki-Rumuruti Road Reserve C76 (Kenha B22)	• No displacement of persons • No compensation required • Reduced level of service for road during construction	1 (most preferred)
Route 2	15 meters off the Nanyuki-Rumuruti Road Reserve C76 (Kenha B22)into private property	• Economic displacement	2
Route 3	Approximately 330meters off of the Nanyuki-Rumuruti Road Reserve C76 (Kenha B22)	• Demolition of greenhouses • Economic displacement • Proximity to a river (Thingithu)	3 (least preferred)

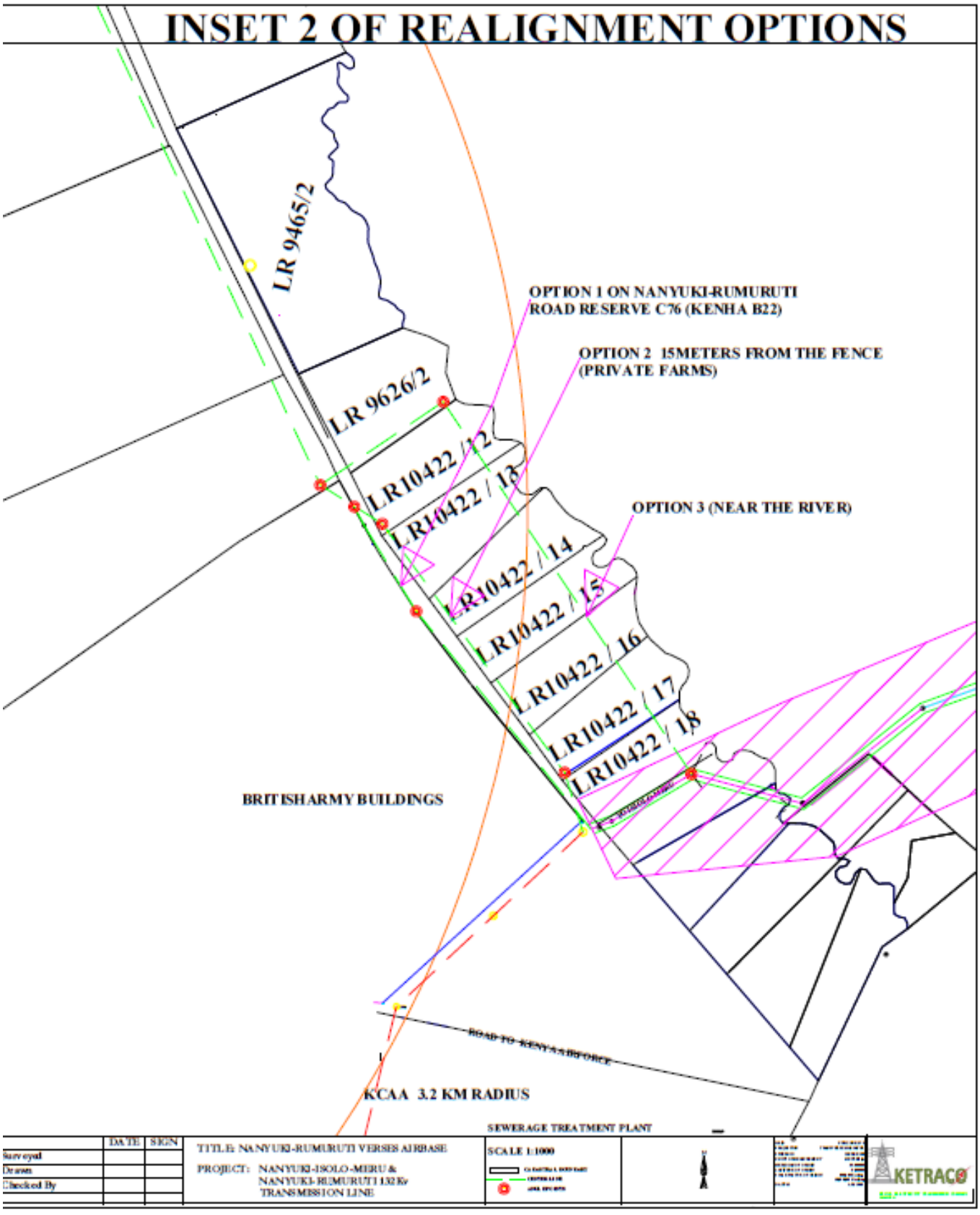

Plate 9: Alignment options

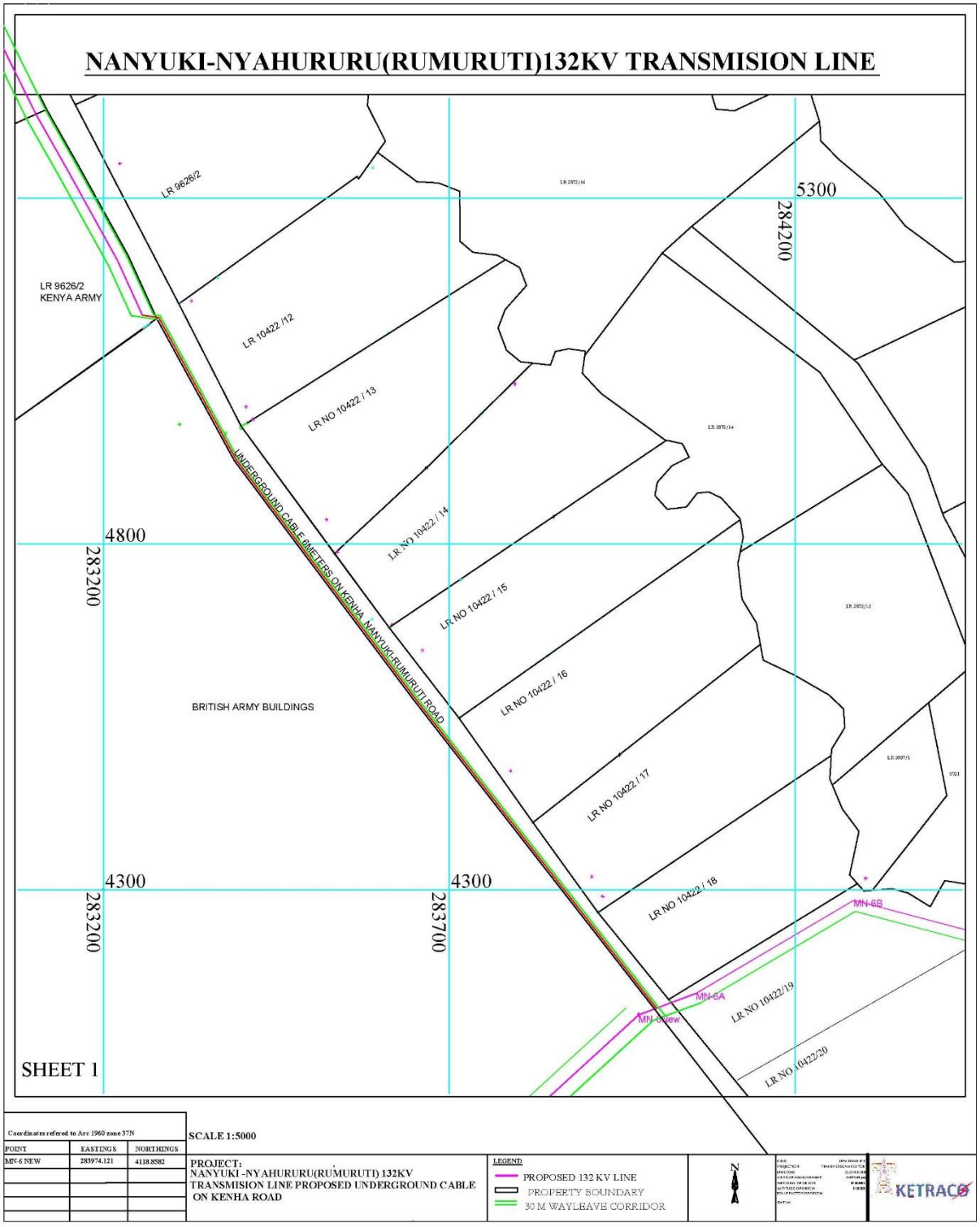

Plate 10: Preferred route (option 1) on Nanyuki-Rumuruti Road reserve

10.5 Proceed with The Proposed Project with Mitigation Measures

This option is the preferred option and it entails carrying out the proposed project with mitigation measures to prevent, offset, or avoid its negative impacts thereby maximizing it gains. This option would therefore lead to achieving the proposal's objectives sustainably and contribute to the achievement of other sectorial and policy goals and objectives.

CHAPTER NINE: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN- ESMP

9.1 Introduction

An environmental and social management/monitoring plan has been developed to assist the proponent, the contractor and all the relevant stakeholders in understanding the legal requirements as well as managing risks associated in accordance to the law and the international good practice. The ESMP will also aid the stakeholders to increase efficiency and reduce costs, throughout the project's lifecycle. The ESMP has been developed to provide the blueprint for an Environmental Management System for the project. It is noteworthy that key factors and processes may change through the life cycle of the project and considerable provisions have been made to ensure dynamism and flexibility of the ESMP and with that in mind, the ESMP will be subject to a regular comprehensive review.

9.2 Environmental and Social Management Plan

In general, the Tables below outline the potential safety, health and environmental risks associated with the project and detail all the necessary mitigation measures, the persons responsible for their implementation and monitoring. The ESMP will be used as checklist in future environmental audits.

The following tables constitute ESMPs for the Construction, Operational and Decommissioning Phases of the proposed project. The details all necessary mitigation measures as well as the person responsible for implementing and monitoring such measures. The tables should be used as checklist on site. Due to the magnitude of the project, compliance with the ESMP must be audited quarterly during the construction phase. Annual audits for the project will be conducted at the operational phase as per the provisions of EMCA CAP 387 and the condition No. 1.6 of the Nanyuki-Rumuruti 132kV Transmission Line and Nanyuki _Isiolo Meru 132 kV Transmission Lines' parent licenses 0006570 and 006841 respectively (See appendix 1 and 2). The ESMP is as per the tables 10.11 and 12 below:-

Table 11: ESMP for Underground Cable: Construction Phase

S/N	Impact	Mitigation Measure	Responsible Party	Timeframe	Cost
1.	Impact on public utilities and installations along the corridor	- *Engage the owners/ institutions in charge of the installed utilities along the corridor*	KETRACO	One –off (First 2 months)	400,000
		- *Adequately map the utilities and identify the utilities*		One –off (First 2 months)	
		- *The depth for the buried grounded infrastructures such as pipes and fibre optic cables needs to established and adequately communicated to the institutions in charge*		One –off (First 2 months)	
		- *Seeking approvals from the Institutions in charge for encroaching through their Right of Way. Such institutions are KENHA, KeRRA, Safaricom, Kenya Police and NAWASO.*		One –off (First 2 months)	
		- *Installation of permanent marking at the points where such infrastructure crosses the Transmission Line's corridor for future reference and safety.*		One –off during construction	1,000,000
2.	Noise and vibration control	- *Sensitize construction vehicle drivers and machinery operators (where applicable) to switch off engines of vehicles or machinery not being used*	Contractor	Throughout the construction period (weekly during the tool box meetings)	400,000
		- *Ensure that construction machinery (where applicable) are kept in good condition to reduce noise generation*		Once a month	
		- *The contractor should only blast rocks where it is very necessary. Blasting will require approvals from Mines and Geology Department*		Whenever blasting is to be done	
		- *Adherence to the EMCA Noise and Excessive Vibration Pollution Control*		Throughout	

		Regulation, 2009: including provision of relevant safety gear such ear muffs			
		- *Limit worker exposure to 80db of noise for only 8 hours per day*		Throughout	
		- *The noisy construction works will entirely be planned to be during day time*		Throughout	
3.	Air and dust emissions	- *Personal Protective equipment to be worn where applicable*	Contractor	Throughout	300,000
		- *Possible watering of all dust prone areas within, or near the project site*			
		- *sensitize truck drivers and machine operators to switch off engines when not in use;*			
		- *regularly service engines and machine parts to increase their efficiency and reduce generation of exhaust emission;*			
		- *and where feasible use alternative non-fuel construction equipment.*			
4.	Oil Spills	- *Install oil trapping equipment in areas where there is a likelihood of oil spillage;*	Contractor	One off at the start of the project	200,000
		- *Collect the used oils and re-use, re-sell, or dispose of appropriately using expertise from licensed waste handlers;*			
		- *Prepare a written response plan and display it on strategic areas and train workers on specific procedures to be followed in the event of a spill;*			
		- *Immediately institute clean up measures in case of an oil spill;*		As per when need arises	
		- *Design appropriate protection devices against accidental discharge of transformer oil substances;*		One off at the start of the project	

		- *Do not service equipment on site without proper mechanisms on how to handle waste oil:* - *Ensure that all waste oils from maintenance equipment should be segregated and disposed properly by a reputable/registered waste*		Throughout	
5.	Water use and water quality	- *Optimal use of water* - *Manage sanitary liquid waste to mobile toilets on site*	Contractor		N/A
6.	Solid and Liquid Waste Generation	- *Use of an integrated solid waste management system i.e. The 3 R's: reduction at source, reuse and recycle;* - *Accurately estimate the dimensions and quantities of materials required especially fine and loose aggregates for tower bases;* - *Providing waste collection bins at designated points on site;* - *Providing facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage;* - *Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time;* - *Use of building materials that have minimal or no packaging to avoid the generation of excessive packaging waste;* - *Use of mobile toilets on site* - *Ensuring that, all remnants of loose gravel and concrete are effectively collected from the tower bases and re-used or disposed of in an environmentally friendly manner.* - *Disposing waste more responsibly by contracting a registered waste handler who will dispose the waste at designated*	Contractor	Throughout the construction period	300,000

		sites and in accordance with the existing laws.			
		- *Drainage and effluent from storage areas, workshops and camp sites shall be captured and treated before being discharged into the drainage system in line with applicable government water pollution control regulations;*			
		- *Construction waste shall not be left in stockpiles along the road, but removed and reused or disposed of on a regular basis*			
		- *Proper procedures for the management of human waste will be put in place in order to prevent outbreak of diseases;*			
		- *Place in strategic places signs against littering and dumping of wastes;*			
		- *Audits waste generation and develop waste reduction action plans (WRAP)*			
7.	Destruction of Existing Vegetation	- *Vegetation clearing will be kept to a minimum.*	Contractor	Throughout the construction period	600,000
		- *Document pre- and post- construction vegetation cover and recovery of the ground layer in case available.*			
		- *All no-go areas will be clearly demarcated.*			
		- *Any extensive cleared areas that are no longer or not required for construction activities will be re-seeded with locally sourced seed of suitable species. Bare areas can also be packed with bush removed from other parts of the site to encourage regeneration and limit erosion.*			
		- *Collection or harvesting of any plants on the site is to be strictly forbidden throughout all phases of the project.*			
8.	Soil Erosion	- *Apply soil erosion control measures such as levelling of the project site to reduce run-off velocity and increase infiltration of storm water into the soil;*	Contractor	Throughout the construction period	200,000

		- *Ensure that construction vehicles are restricted to use existing graded roads;*			
		- *Implement a storm water management plan that minimizes impervious area infiltration by use of recharge areas and*			
		- *Use of detention and/or retention with graduated outlet control structure will be designed.*			
9.	Visual and Aesthetic Impacts	- *Undertake extensive public consultation during the planning of the project;*	Contractor	Throughout the project period	200,000
		- *Design structures at the site in such a way as to improve the beauty of the surroundings;*			
		- *Restore site areas through backfilling, landscaping and planting of trees, shrubs and grass on the open spaces to re-introduce visual barriers;*			
		- *Design and implement an appropriate landscaping program*	KETRACO (Environment Section)	Beginning of the project	400,000
10.	Physical and Economic Displacement	- *Conduct an updated, detailed and elaborate RAP*	KETRACO (Wayleave Department)	2 months into the project implementation	To be determined by the RAP report
		- *Conduct consultation meetings with Project Affected Persons*			
		- *Ensure timely compensation for loss of property and land use*			
11.	Health and Safety	- *Provision of adequate and relevant PPEs all staff*	Contractor	Throughout the project construction period	300,000
		- *Provision of staff training on OHS*		Once per year	
		- *Ensure all operational machines and vehicles are under the management of competent personnel*		Throughout the project construction period	
		- *Provision of adequate mechanisms to handle emergency*		Throughout the project construction period	

12.	Sexually Transmitted Diseases	- *Public health education to be taught to the community living in the vicinity of the project sites* - *The community members be encouraged to visit VCT centers and take appropriate measures to prevent or manage STIs such as HIV/AIDS* - *Community health workers to assist in providing needed health services, for screening and referral of cases.*	Contractor	Throughout the project construction period	100,000
13.	Traffic Accidents	- *Employ traffic marshals to control the movement of vehicles during the construction phase of the project.* - *Adopt a Traffic Management Plan to enhance the traffic movement within the site and the public road* - *Use of signs for diversion and to warn motorists against dangers at or near construction site* - *Use of reflective jackets among other PPEs to avoid accidents*		Throughout the project construction period	100,000

Total cost for construction phase=KES. 4,500,000

Table 12: ESMP for Underground Cable: Operational Phase

S/N	Impact	Mitigation Measure	Responsible Party	Timeframe	Cost (KES.)
1.	Vegetation clearance	- *Optimal vegetation clearance as per cable footprint* - *Establishing areas of concern during annual Environmental Audits*	KETRACO and Contractor	Throughout the operational phase	300,000
2.	Electrocution risks and Fires Risks	- *Ensure strict adherence to the safety designs established;* -	KETRACO	Throughout the operational phase	250,000
3.	Electromagnetic Fields (EMFs)	- *Adherence to the safety zone distances given*	KETRACO	Throughout the operational phase	250,000
		- *Proper cable insulation as per International Engineering Standards*		Throughout the operational phase (once per year)	200,000
		- *Undertaking Community sensitization programs*			
4.	Operation and Maintenance impacts to the community	- *Compensation for any crop destruction*	KETRACO	Throughout the operational phase	300,000
		- *Continued community sensitization as at and when such activities are undertaken*		Throughout the operational phase	200,000

Total cost for operational phase=KES. 1,500,000

Table 13:ESMP for Underground Cable: Decommissioning Phase

S/N	Impact	Mitigation Measure	Responsible Party	Timeframe	Cost (KES.)
1.	Soil erosion	- *See table on Construction ESMP*	Contractor	Throughout the decommission phase	100,000
2.	Hazardous materials	- *Install oil trapping equipment in areas where there is a likelihood of oil spillage;*	Contractor	Throughout the decommission phase	100,000
		- *Collect the used oils and re-use, re-sell, or dispose of appropriately using expertise from licensed waste handlers;*	Contractor	Throughout the decommission phase	100,000
		- *Prepare a written response plan and display it on strategic areas and train workers on specific procedures to be followed in the event of a spill;*	Contractor	Throughout the decommission phase	100,000
		- *Immediately institute clean up measures in case of an oil spill;*	Contractor	Throughout the decommission phase	100,000
		- *Design appropriate protection devices against accidental discharge of transformer oil substances;*	Contractor	Throughout the decommission phase	100,000
		- *Do not service equipment on site without proper mechanisms on how to handle waste oil:*	Contractor	Throughout the decommission phase	100,000
		- *Ensure that all waste oils from maintenance equipment should be segregated and disposed properly by a reputable/registered waste*	Contractor	Throughout the decommission phase	100,000
3.	*Solid Waste Management*	- *See Construction ESMP for mitigation measures*	Contractor	Throughout the decommission phase	100,000
4.	Air Emissions	- *Personal Protective equipment to be worn where applicable*	Contractor	Throughout the decommission phase	100,000
		- *Possible watering of all dust prone areas within, or near the project site*		Throughout the decommission phase	100,000

		- *sensitize truck drivers and machine operators to switch off engines when not in use;*		Throughout the decommission phase	100,000
		- *regularly service engines and machine parts to increase their efficiency and reduce generation of exhaust emission;*		Throughout the decommission phase	100,000
		- *and where feasible use alternative non-fuel construction equipment.*		Throughout the decommission phase	100,000
				Throughout the decommission phase	100,000
				Throughout the decommission phase	100,000
5.	Health and Safety	- *Community sensitization* - *Workers training* - *Provision of relevant safety gear* - *Ensuring all relevant provisions under OSHA 2007 are put to place*	Contractor	Throughout the decommission phase	100,000
				Throughout the decommission phase	100,000
				Throughout the decommission phase	100,000
6.	*Traffic Accidents*	- *Employ traffic marshals to control the movement of vehicles during the construction phase of the project.* - *Adopt a Traffic Management Plan to enhance the traffic movement within the site and the public road* - *Use of signs for diversion and to warn motorists against dangers at or near construction site* - *Use of reflective jackets among other PPEs to avoid accidents*	Contractor	Throughout the decommission phase	100,000

Total cost for decommissioning phase=KES. 2,000,000

Table 14: Summary of ESMP Costs

PHASE	COST (KES)
Construction phase	4,500,000
Operational phase	1,500,000
Decommissioning phase	2,000,000
Total	**8,000,000**
Costs for unforeseen Impacts (20%)	1,600,000
Grand Total	**9,600,000**

The above cost is approximate but key to planning and undertaking of the project. Their incorporation into project planning is a step towards incorporating environmental and social considerations in project's planning and implementation.

In operationalization of the proposed ESMP, it is recommended for the contractor to recruit at least two (2) fulltime and qualified Environment, Health and Safety officers with approval from KETRACO on their qualifications. The costs to this shall be internalized, in the contractor's budget being part of the staff

CHAPTER TEN: CONCLUSION AND RECOMMENDATIONS

10.1 Recommendations

The following aspects and commitments are to be considered in the ensuring Project stages:

- Route mapping for, for a section of 1.2 km whose route is not definite. The route selection to be done in a way to have the least impact on the community and existing infrastructure.
- Creation of direct and indirect employment opportunities especially to the local community.
- Regular ESMP monitoring by KETRACO following up as per the proposed ESMP
- Undertaking of annual environmental audits as provided by EMCA Cap 387 once the line is commissioned.
- Update of the proposed Environmental and Social Management Plan (ESMP) in line with any changes in plan, design of the Project and unforeseen impacts.

The underground section's project components have been evaluated through review of the following aspects: project literature, preliminary field assessment, and collection of baseline information, identification of project impacts, identification possible mitigation measures and monitoring plan. The information obtained provides adequate information regarding the salient ecological and socio-economic features of the study area and the potential impacts of the proposed underground cable project.

10.2 Conclusion

In Light of this, coupled with the regional and national significance of the two affected parent lines (Nanyuki – Rumuruti under Lessos-Kabarnet-Nyahururu- Nanyuki 132 kV Transmission and Isiolo - Meru – Nanyuki 132kV Transmission lines) we recommend for variation of the original licenses (see appendix 1 and 2) for the parent lines to include the Underground Cable aspect as specified: -

a. 4 Km underground cable for Isiolo -Meru – Nanyuki 132kV Transmission Line
b. 16.5 Km underground cable for Nanyuki- Rumuruti 132kV Transmission Line.

REFERENCES

Kenya Gazette Supplement Acts 2000, Environmental Management and Coordination Act Number 8, Cap 387 . Government Printer, Nairobi

Kenya gazette supplement number 56. Environmental Impact Assessment and Audit Regulations 2003. Government printer, Nairobi

Kenya gazette supplement number Environmental Management and Coordination (Emissions Control) Regulations, 2006 Government printer, Nairobi

Kenya gazette supplement Environmental Management and Coordination (Water Quality) Regulations, 2006

Kenya gazette supplement Environmental Management and Coordination (Waste Management) Regulations, 2006

Kenya gazette supplement Environmental Management and Coordination (Excessive Noise and Vibration Control) Regulations, 2009

Kenya gazette supplement, Special Issue 51, Legal Notice number 19; Environmental Management and Coordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009 Government printer, Nairobi

Kenya Gazette Supplement Acts Building Code 2000 Government Printer, Nairobi

Kenya Gazette Supplement Acts Land Planning Act (Cap. 303) Government Printer, Nairobi

Kenya Gazette Supplement Acts Local Authority Act (Cap. 265) Government Printer

Kenya Gazette Supplement Acts Penal Code Act (Cap. 63) Government Printer, Nairobi

Kenya Gazette Supplement Acts Physical Planning Act, 1999 Government printer, Nairobi

Kenya Gazette supplement Acts Public Health Act (Cap. 242) government printer, Nairobi.

The World Bank Safeguard Policies

ANNEXES

1. EIA NEMA license for Lessos – Kabarnet- Nyahururu- Nanyuki 132 Kv Transmission Line
2. EIA NEMA license for Nanyuki-Isiolo-Meru 132 Kv Transmission Line
3. Public meeting minutes
4. Public Meetings attendance sheets
5. Filled Questionnaires (Key Informants)
6. Filled Questionnaires (General Public)

Appendix 1: EIA NEMA license for Lessos – Kabarnet- Nyahururu-Nanyuki 132 Kv Transmission Line

nema
mazingira yetu | uhai wetu | wajibu wetu

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)
THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT
CERTIFICATE OF TRANSFER OF AN ENVIRONMENTAL IMPACT ASSESSMENT LICENSE

Certificate No : **NEMA/EIA/CTL/72**
Application Reference No: NEMA/EIA/NTEIAL/36

This is to certify that the Environmental Impact Assessment License No **0006570** issued on **9/20/2010** (date) to **Kenya Power & Lighting Company** of **P.O Box 30099-00100 Nairobi**

regarding **Proposed Construction of a single circuit line 132kV transmission line** whose objective is to **Construction of a new 235KM single circuit 132 kV transmission line between Lessos - Kabarnet-Nyahururu-Nanyuki power transmission line**

located at **Lessos-Kabarnet-Nyahururu-Nanyuki**

has been transferred to **Kenya Electricity Transmission Company** of **P.O Box 34942-00100 Nairobi**

with effect from **8/24/2015** in accordance with provisions of the Act.

Dated : **8/25/2015**

Signature

(Seal)
Director-General
The National Environment Management Authority

P. T. O.

ISO 9001 : 2008 Certified

Important Notes:

1. The transferee as well as the transferor of a license under this regulation shall be liable for all liabilities, and the observance of all obligations imposed by the transfer in respect of the license transferred
2. The transferor shall not be responsible for any future liabilities or any obligations so imposed with regard to the license from the date the transfer is approved

Appendix 2: EIA NEMA license for Nanyuki-Isiolo-Meru 132 Kv Transmission Line

Application Reference No. EIA/575
Registration No: 000684 1
For official use

RECEIVED 22 OCT 2010

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT
ENVIRONMENTAL IMPACT ASSESSMENT LICENCE

This is to certify that the Project Report/Environmental Impact Assessment Study Report received from ....KENYA POWER AND LIGHTING COMPANY..... (Name of individual/firm) .....P.O. BOX 30099-00100,...NAIROBI..... (Address) submitted to the National Environment Management Authority in accordance with the Environmental Impact Assessment & Audit Regulations regarding .....PROPOSED NANYUKI-MERU,...ISHIARA-KIENI,..... ....MWINGI-KITUI-WOTE-SULTAN HAMUD 132KV TRANSMISSION LINE..... (title of project) whose objective is to carry on ....DEVELOPMENT OF 264 KILOMETRES OF 132KV.. ....TRANSMISSION LINES CONNECTING NANYUKI-MERU, ISHIARA-KIENI & MWINGI-..... ....KITUI-WOTE-SULTAN HAMUD FOR DISTRIBUTION AND SUPPLY OF ELECTRIC..... ....POWER..... ..... (briefly describe purpose) located at ..BOUNDARY OF THE RIFT VALLEY PROVINCE AT NANYUKI IN LAIKIPIA EAST..... ...EAST DISTRICT & TRAVERSES A TOTAL OF 14 EASTERN PROVINCES DISTRICTS..... (locality and district) has been reviewed and a licence is hereby issued for implementation of the project, subject to attached conditions.

Dated this.....5TH.....day....OCT..... of 20.10..

Signature.....

(SEAL)

As *Director General*
The National Environment Management Authority

CONDITIONS OF LICENCE

1. This licence is valid for a period of ....24 MONTHS.... (time within which the project should commence) from the date hereof.
2. The Director–General shall be notified of any transfer/variation/surrender of this licence.

P. T. O.

1. General Conditions

1.1. This approval is for construction of a 132KV transmission line from Nanyuki – Meru, Ishiara –Kieni, Mwingi-Kitui-Wote-Sultan Hamud

1.2. The license shall be valid for 24 months from the date of issue

1.3. Without prejudice to the other conditions of this license, the proponent shall implement and maintain an environmental management system, organizational structure and allocate resources that are sufficient to achieve compliance with the requirements and conditions of this license.

1.4. The Authority shall take appropriate action against the proponent in the event of breach of any of the conditions stated herein or any contravention to the Environmental Management and Co-ordination Act, 1999 and regulations thereunder.

1.5. This licence shall not be taken as statutory defence against charges of pollution in respect of any manner of pollution not specified herein.

1.6. The proponent shall ensure that records on conditions of licenses/approval and project monitoring and evaluation shall be kept on the project site for inspection by NEMA's Environmental Inspectors.

1.7. The proponent shall submit an Environmental Audit Report in the first year of occupation/operation/commissioning to confirm the efficacy and adequacy of the Environmental Management Plan.

1.8. The proponent shall comply with NEMA's improvement orders throughout the project cycle

2. Construction Conditions

2.1. The proponent shall apply to Kenya Forest Service (KFS) for wayleave authorization.

2.2. The proponent shall liaise with KFS for proper alignment of transmission line to ensure the least impact on forest biodiversity.

2.3. The proponent shall prepare resettlement and compensation plan and should be implemented in adherence to the Ministry of Lands and Settlement requirements and to the satisfaction of the affected persons.

2.4. The proponent shall obtain a clearance permit from the Kenya Civil Aviation Authority (KCAA) and Laikipia Airbase.

2.5. The proponent shall work in consultation with National Museums of Kenya to address issues of National Heritage, historical sites, along the transmission line.

2.6. The proponent shall liaise with the Kenya Wildlife Service (KWS) and obtain clearance where the line passes through National reserve, game parks among others.

2.7. The proponent shall put up a project signboard as per the Ministry of Works Standards indicating the NEMA license number among other information

2.8. The proponent shall ensure that all excavated material and debris is collected, re-used and where need be disposed off as per the Environmental Management and Coordination (Waste Management) Regulations 2006.

2.9. The proponent shall ensure strict adherence to the provisions of Environmental Management and Coordination (Noise and Excessive Vibrations Pollution Control) Regulations 2009.

2.10. The proponent shall ensure strict adherence to the Occupational Safety and Health Act (OSHA), 2007.

2.11. The proponent shall ensure that construction workers are provided with adequate personal protection equipment (PPE), sanitary facilities as well as adequate training.

2.12. The proponent shall ensure that construction activities are undertaken during the day (and not at night) - between 08.00 hrs and 17.00 hrs; and that transportation of construction materials to and from site are undertaken during weekdays (and not weekends) off peak hours.

2.13. The proponent shall ensure strict adherence to the Environmental Management Plan developed throughout the project cycle.

2.14. The proponent shall ensure that the development adheres to zoning specifications issued for development of such a project within the jurisdiction of all various relevant local authorities with emphasis on approved land use for the area.

3. Operational Conditions

3.1. The proponent shall fully compensate KFS for the trees removed from gazetted forests as per the prevailing forest service general order rates.

3.2. The proponent shall ensure installation of appropriate and adequate safety signs clearly indicating area of electrical hazards

3.3. The proponent shall ensure that all waste water is disposed as per the standards set out in the Environmental Management and Coordination (Water Quality) Regulations 2006.

3.4. The proponent shall ensure that all equipment used are well maintained in accordance with the Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control) Regulations 2009.

3.5. The proponent shall ensure that all solid waste is handled in accordance with the Environmental Management and Coordination (Waste Management) Regulations 2006.

3.6. The proponent shall ensure that all workers are well protected trained as per the OSHA, 2007

3.7. The proponent shall comply with the relevant principal laws, by-laws and guidelines issued for development of such a project within the jurisdiction of Kenya Wildlife Service, Kenya Forest Service, Energy Regulatory Commission, Ministry of Roads, Ministry of Energy , National Museums of Kenya, Water Resources Management Authority and other relevant Authorities

3.8. The proponent shall ensure that environmental protection facilities or measures to prevent pollution and ecological deterioration such as measure to minimize signal interference to signal for Laikipia airbase mechanisms are designed, constructed and employed simultaneously with the proposed project.

4. Notification Conditions

4.1. The proponent shall notify the commission in writing of any accident or incident causing loss of life, personal injury, explosion, oil spill, fire or any other accident that may cause damage to the environment

4.2. The proponent shall seek written approval from the Authority for any operational changes under this licence

4.3. The proponent shall ensure that the Authority is notified of any malfunction of any system within 12 hrs on the NEMA hotline 020 6006041 and mitigation measures put in place

4.4. The proponent shall keep records of all pollution incidences & notify the Authority within 24 hrs.

4.5. The proponent shall notify the Authority of its intent to decommission three months in advance in writing.

5. Decommissioning Conditions

5.1. The proponent shall ensure that a decommissioning plan is submitted to the Authority for approval at least three (3) months prior to decommissioning

5.2. The proponent shall ensure that all pollutants and polluted material is contained and adequate mitigation measures provided during the phase.

Page 3 of 3

Appendix 3: Public meeting minutes

Subject:	**COMMUNITY CONSULTATION MEETING**
Date of Meeting:	23rd October 2018
Location	Marura Sub location at the proposed Chief's camp grounds
Time	11:00am – 4:00pm

1. Purpose of Meeting
COMMUNITY CONSULTATION FOR THE PROPOSED NANYUKI-ISIOLO-MERU AND NANYUKI-RUMURUTI UNDERGROUND TRANSMISSION LINES 132/133Kv
2. Attendance at Meeting

See attached attendance list at appendix 4

3. Agenda
Community consultation at the project site. Household administration of questionnaires to the community members.

4. Meeting Notes, Decisions and Key Action Items

Min No.	Discussion
Min 1/2018	*Preliminaries* The meeting was called to order by the area chief Mr. Mahinda. The meeting was opened with a word of prayer from Betty Mutwiri.
Min 2/2018	*Community induction on the project's objective and environmental impacts of the project.* The community members were taken through an induction process by Mr Clifford Siocha to bring them known to the project, its purpose and the impacts arising with the project. The surveyor, Mr Leornard also gave directions on the locations of the underground cable. After the project was well described and understood, the community was given opportunity for a question and answer session
Min 3/2018	*Community issues and Concerns* *Land marks for subsurface structures*

	The community members were concerned about where the underground cables would pass. They asked that the cable be clearly marked for safety purposes. KETRACO noted this concern to be addressed in the report. *Tree and crops compensation* The community members wanted to know if they would be compensated after the destruction of their crops and trees during construction and maintenance. It was agreed that the compensations would be done once destruction of trees/crops has been done. *Delays in compensation of PAPS* The land owners had problems with delays in payments of their land stating that they have not yet been compensated due to limited loss of use by KETRACO. It was agreed that there were delays due to the development of the new project that had underground lines and once the report will be approved by NEMA, the payment process will begin. The land owners also wanted to know whether they will get an increase in payments since the lines are now to pass underground and not overhead as it was earlier designed. The community was informed that KETRACO acquires a wayleave corridor once irrespective of whether the Transmission line passes overhead or underground. The land owners wanted to know how KETRACO will compensate areas where the line has passed on community plots e.g. community playground. The community was informed that there are measures put in place by KETRACO to cater for such cases and in consultations with the local area administration, an agreement will be reached on the same. The land owners wanted to know when they would be paid. Either before, during or after the commencement of the project. The community was informed that compensation is a continuous process depending on availability of funds. For this reason, compensation can be done in either of the phases of the project. *Way leaves* The community members were concerned about the overhead and underground lines and thought that there is an ''airleave" and ''groundleave" and that they should be paid separately. The community members were educated and made aware that an ''airleave" or ''groundleave" does not exist, rather there only exists a wayleave which covers both the overhead lines and underground lines and compensation is made for the wayleave. *Development on the project areas.* The community members wanted to know if they can plant trees or crops and even build temporary structures on the project area. The community was advised to keep off the wayleave corridor because it would be used for maintenance of the underground cable. *Safety of the community members*

	The community members wanted to know if the underground line would pose any dangers to them once installed in terms of electrocution or radiations affecting their health. The community was informed that once the underground cables had been laid, the trenches would be well covered and would not pose any dangers to the community. *Acceptability of the project* The community members were positive about the project and emphasised on the following benefits: -Reliable power supply in the area -Employment opportunities to the locals -Proper mitigation measures to be put in place when the project begins for purposes of their safety
Min 4/2018	*Household Administration of questionnaires* The community members were issued with questionnaires to fill in giving their views towards the proposed project's impacts.
Min 5/2018	*AOB* The meeting came to an end at 4:00pm with a word of prayer from a community member and a vote of thanks from Clifford Siocha and the area assistant chief.

Appendix 4: Public Meetings attendance sheets

KETRACO

ATTENDANCE SHEET FOR PUBLIC CONSULTATION MEETING FOR A PROPOSED 20KM UNDERGROUND ELECTRICITY TRANSMISSION CABLE FOR NANYUKI-RUMURUTI 132KV TRANSMISSION LINE

LIST OF MEMBERS PRESENT

VENUE: Marura Sublocation - Proposed Chief's camp grounds

DATE: 23/10/2018

No.	Name	Designation	Telephone	Signature
1	Irene Nyambura Muchemi	PAP	0725 690165	[signature]
2	ANNE WANGARI MAINA		0729-500-713	[signature]
3	STEPAH WAMUYU		[illegible]	[signature]
4	Lucy MITHAMO		0724960512	[signature]
5	MARY KAROBIA		0720047971	[signature]
6	MARY WARUGURU		0712 812 360	[signature]
7	DANIEL G. KARURI		0728127870	[signature]
8	Veronica Wairimu		0727903223	[signature]
9	John Kanyoi		0712 494698	[signature]
10	Isaac Mathenge		0722911953	[signature]
11	DANIEL MURITHI		0722345277	[signature]
12	John wachiuri		0721871096	[signature]
13	Davi Njoroge		0721819286	[signature]
14	BENJAMIN MUIMI		0727328884	Muimi
15	PETER MAINA		0726448365	[signature]

No.	Name	Designation	Telephone	Signature
16	LUCY M. WACHIRA		0722618091	[signature]
17.	[illegible] M. GACHERU		0724174258	[signature]
18	RICHARD M. THEURI		0726675944	[signature]
19	Christopher Warutere		0723213088	[signature]
20.	Joseph M. Githaiga		0722-499428	[signature]
21	Samwel Kagiri K		0729357918	[signature]
22	Salime Ibrahim		0720208951	Abrahm
23	Spare Peterson		0722491547	[signature]
24	Franklin Mwenda		0722819914	[signature]
25	KIBE [illegible]		[illegible]	[signature]
26	[illegible]		[illegible]	[signature]
27	Betti Wamathe		0702310593	[signature]
28	ALICE WAIRIMU		0724025544	ALICE
29	ESTHER MURUGI		0726818971	[signature]
30	GRACE WARUTERE		0720220899	[signature]
31	COSMAS KINGUKU M		0721398283	[signature]
32	Paul Kimanjui		0723606184	[signature]
33	Charles Kamama		0716728878	[signature]
34	John Wachira		0721406259	[signature]
35	PATRICK MUTHEE	ASST CHIEF MARURA	0725112087	[signature]
36	ANNASTASIA WANGECHI IRANJI		0725980341	[signature]

Appendix 5: Filled Questionnaires (Key Informants)

KETRACO
KENYA ELECTRICITY TRANSMISSION CO. LTD.

KAWI COMPLEX. BLOCK B.
POPO LANE. OFF RED CROSS ROAD. SOUTH C.
P. O. Box 34942 – 00100, NAIROBI
Phone: 020 4956000, 0719018000, 0732128000
Web: www.ketraco.co.ke • email: info@ketraco.co.ke

KEY INFORMANT QUESTIONNAIRE
PROPOSED NANYUKI-RUMURUTI 132KV UNDERGROUND CABLE

Kenya Electricity Transmission Company Limited (KETRACO) is a 100% Government owned state corporation that was incorporated o 2nd December 2008 and registered under the Companies Act, Cap 486 pursuant to Sessional Paper No. 4 of 2004 on Energy. Its mandate is to plan, design, construct, own, operate and maintain high voltage electricity transmission lines and regional power interconnectors that forms the backbone of the National Transmission Grid, in line with Kenya Vison 2030. The voltage rating of the transmission lines and its associated substation include 132kV, 220kV, 400kV and 500kV (HVDC).

The company proposes to install an Electricity Transmission underground cable on a section of Nanyuki-Rumuruti 132kV on a stretch of 20km (between Stawi and Nanyuki Ranch), which is a design variation of the current overhead design due to Nanyuki Airbase aircraft safety. An initial ESIA for the Transmission line had been undertaken in 2010 and an EIA license issued on the same (EIA License No. 0006570).

To ensure that the project is implemented in an environmentally and socially sound manner, the Proponent (KETRACO) is conducting an Environmental and Social Impact Assessment (ESIA) for the proposed project. This will help us obtain information that will be used to identify potential socioeconomic impacts of the proposed project and hence propose adequate mitigation measures to be adhered to during project implementation.

Participation of interested and affected parties in the ESIA is a requirement of the Environmental ~~Impact Assessment and Coordination~~ Management and Coordination Act, Cap 387. As an identified stakeholder, you are requested to document your views, opinions and concerns regarding the proposed project.

This questionnaire acts as a guide for the respondent to provide relevant information on the proposed project. All the information obtained shall be used entirely for the proposed study and shall be treated confidentially. We appreciate your cooperation and thanks for your willingness to participate in this exercise.

COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) ~~Ec~~ Economically, the will have more benefits because there
b) will be no more Power black outs and People
c) will be able to open factories and many
d) more business ventures that will have
e) much benefits in terms of employment.
f) Socially, the Project will have positive benefits
g) because when People are empowered economically, there
h) Crimes will reduce and also marriages will be stable

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) According to my opinion, there is
b) no negative impact on the Project.
c)
d)
e)
f)

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a)
b)
c)
d)
e)
f)

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

In fact, it is long overdue so that the benefits in number one can be realised.

5. Do you have any other comments regarding this project?

I only have a Suggestion; there should be markings along the Power line to show exactly where the underground Power line passes

6. Please provide your contact details for purposes of authentication.

Name:	PATRICK MAHINDA	Sector/Organisation:	Ministry of Interior and Co-ordination of National Government
Telephone & Address:	P.O. Box 225 NANYUKI 0721248978		
Signature		Stamp	CHIEF MARURA LOCATION P. O. BOX 225-10400 NANYUKI Date: 24/10/2018

Thank you for your participation

KETRACO
KENYA ELECTRICITY TRANSMISSION CO. LTD.

KAWI COMPLEX. BLOCK B.
POPO LANE. OFF RED CROSS ROAD. SOUTH C.
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The company proposes to install an Electricity Transmission Underground Cable on a section of Nanyuki-Rumuruti 132kV on a stretch of approximately 20km (between Stawi and Nanyuki ranch), which is a design variation of the current overhead design due to Laikipia Airbase aircraft safety. The proposed underground cable runs approximately 6.8km parallel to the fence within the KDF land in Laikipia Airbase. An initial ESIA for the Transmission line had been undertaken in 2010 and an EIA license issued on the same (EIA license No. 0006570).

To ensure that the project is implemented in an environmentally and socially sound manner, the Proponent (KETRACO) is conducting an Environmental and Social Impact Assessment (ESIA) for the proposed underground cable. This will help us obtain information that will be used to identify potential environmental and socioeconomic impacts of the proposed project and hence propose adequate mitigation measures to be adhered to during project implementation.

Participation of interested and affected parties in the ESIA is a requirement of the Environmental Management and Co-ordination Act, Cap 387. As an identified key stakeholder, you are requested to document your views, opinions and concerns regarding the proposed project.

This questionnaire acts as a guide for the respondent to provide relevant information on the proposed project. All the information obtained shall be used entirely for the proposed study and shall be treated confidentially. We appreciate your cooperation and thanks for your willingness to participate in this exercise.

COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) Reliable electricity power supply
b) Contribute towards lowering the cost of electricity
c) Compensation of people affected along the project corridor
d) Employment opportunities to casual workers from local area during construction phase
e) Growth of informal sector
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result from the proposed project?

a) Impact on public utilities and installations along the Corridor
b) Workers accidents and hazards during construction
c) Noise and vibration control
d) Soil erosion
e) Dust emissions
f)

3. Please give suggestions to mitigate negative impacts identified in question 2 above?

a) Engage the owners/installations in charge of the installed utilities along the corridor
b) Safety awareness and insurance for the workers
c) Ensure proper environmental management practices are put in
d) place during construction and after construction for safety of the community
e)
f)

4. Please indicate if there are any underground installations (e.g. communication cables, water pipes, sewer lines etc.) in the proposed 6.8 km stretch within Laikipia Airbase. If any, kindly provide specific co-ordinates for the installations

g)
h) No underground installations in the proposed 6.8 KM
i) stretch within the Base
j)
k)
l)

5. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

6. Do you have any other comments regarding this project?

a: There should be markings along the line for safety purposes
b: On completion of the project, there should be awareness creation about the underground line even to future generations for safety purposes.
c: Dig deeper than 1.5 metres on black Cotton soil areas

7. Please provide your contact details for purposes of authentication.
8.

Name:	Col Kyalo Munyao	Sector/Organisation:	Laikipia Air Base
Telephone & Address:	062-2031249 Ext 3001 Fax-062-2031517 lab@mod.go.ke		
Signature		Stamp	Eng Col Base Commander Laikipia Air Base

Thank you for your participation.

KETRACO
KENYA ELECTRICITY TRANSMISSION CO. LTD.

KAWI COMPLEX. BLOCK B.
POPO LANE. OFF RED CROSS ROAD. SOUTH C.
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The company proposes to install an Electricity Transmission underground cable on a section of Nanyuki-Rumuruti 132kV on a stretch of 20km (between Stawi and Nanyuki Ranch), which is a design variation of the current overhead design due to Nanyuki Airbase aircraft safety. An initial ESIA for the Transmission line had been undertaken in 2010 and an EIA license issued on the same (EIA License No. 0006570).

To ensure that the project is implemented in an environmentally and socially sound manner, the Proponent (KETRACO) is conducting an Environmental and Social Impact Assessment (ESIA) for the proposed project. This will help us obtain information that will be used to identify potential socioeconomic impacts of the proposed project and hence propose adequate mitigation measures to be adhered to during project implementation.

Participation of interested and affected parties in the ESIA is a requirement of the Environmental ~~Impact Assessment and Coordination~~ management and coordination Act, Cap 387. As an identified stakeholder, you are requested to document your views, opinions and concerns regarding the proposed project.

This questionnaire acts as a guide for the respondent to provide relevant information on the proposed project. All the information obtained shall be used entirely for the proposed study and shall be treated confidentially. We appreciate your cooperation and thanks for your willingness to participate in this exercise.

COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) Enhances growth of industries
b) Job creation.
c) Enhances growth of small and medium size enterprises.
d) Enhances security by job creation.
e) Reduces general reduction of the carbon footprint.
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) -Displacement of persons.
b) -Risk of electrocution by other people when they are
c) excavating on the line
d) -
e)
f)

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) -Place Line-marker above along the line to prevent
b) future insidence.
c) - Insilute the lines to prevent electrocution.
d)
e)
f)

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

It is in line with the vision 2030 goals and it generally helps the area to grow economically

5. Do you have any other comments regarding this project?

When all the mitigation measures are taken in to account, the project is profitable to the people and the country.

6. Please provide your contact details for purposes of authentication.

Name:	Chrispus Makia	Sector/Organisation:	NANYUKI
Telephone & Address:	0722893834		
Signature		Stamp	NANYUKI ... SERVICE ... P.O. Box ... NANYUKI

Thank you for your participation

KETRACO
KENYA ELECTRICITY TRANSMISSION CO. LTD.

KAWI COMPLEX. BLOCK B.
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Phone: 020 4956000, 0719018000, 0732128000
Web: www.ketraco.co.ke • email: info@ketraco.co.ke

KEY INFORMANT QUESTIONNAIRE
PROPOSED NANYUKI-RUMURUTI 132KV UNDERGROUND CABLE

Kenya Electricity Transmission Company Limited (KETRACO) is a 100% Government owned state corporation that was incorporated o 2nd December 2008 and registered under the Companies Act, Cap 486 pursuant to Sessional Paper No. 4 of 2004 on Energy. Its mandate is to plan, design, construct, own, operate and maintain high voltage electricity transmission lines and regional power interconnectors that forms the backbone of the National Transmission Grid, in line with Kenya Vison 2030. The voltage rating of the transmission lines and its associated substation include 132kV, 220kV, 400kV and 500kV (HVDC).

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) The Project, upon Completion will create employment
b) .....
c) Power from Rumuruti Solar project will
d) Stabilize power in Rumuruti
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) There might be re-routing of
b) essential utilities like water and
c) sewer lines in Nanyuki
d)
e) There is known seismic activities
f) in the area and might affect the line and structures.

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) Get the utility network maps before
b) construction.
c) Engage NAWASCO on where the
d) utility infrastructure is.
e)
f) - Dig not deeper than 1.5M on black cotton soil areas

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

.....

.....

.....

.....

5. Do you have any other comments regarding this project?

.....

.....

.....

.....

6. Please provide your contact details for purposes of authentication.

Name:	Njenga Kaliva	Sector/Organisation:	County Govt of Laikipia
Telephone & Address:	P.O [illegible] 0400 NANYUKI [illegible] 0[illegible]758[illegible]		
Signature			

COUNTY EXECUTIVE COMMITTEE MEMBER – COUNTY GOVERNMENT OF LAIKIPIA – WATER, ENVIRONMENT, NATURAL RESOURCES – P.O. Box 1271-10400, NANYUKI

23 OCT 2018

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) Transmission of electricity more effective
b) Community and Industries likely to benefit
c) Less power outages to be experienced at home & work
d) Well lit streets as availability of power will be enough.
e) Reduction in insecurity
f) The 24 hr economy will be made possible.
g) Security installation will be protected esp KDF facilities
h)

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) Resistance from community over compulsory aquisition
b) Lack of information might lead to rejection of project
c) Fear of effects of underground cabling
d) .....
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) Proper Sensitization on the effects of underground Cabling
b) Use of existing Laws / Security Orgs to implement Compulsory aquisition if need be
c) .....
d) .....
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

It important for Socio-economic development of the Country

5. Do you have any other comments regarding this project?

After the Sensitization Ketraco should move in with Speed so that people will not have alot of delays that might lead to mistrust.

6. Please provide your contact details for purposes of authentication.

Name:	Esther Muamuwa	Sector/Organisation:	DCC LKP EAST
Telephone & Address:	P.O BOX 11 NANYUKI		
Signature	DEPUTY COUNTY COMMISSIONER LAIKIPIA EAST	Stamp	

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) Reliable power supply to areas to be serviced
b) Employment opportunities both short-term & long-term
c) Economic activities
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) – Land take
b) – Tree cutting
c) – Destruction of Structures
d) – Effects on the road infrastructure
e) – Safety Concerns
f)

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) – micro – tunnelling – appropriate depth levels
b) – Compensation
c)
d)
e)
f)

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

Economic benefits

5. Do you have any other comments regarding this project?

Before the actual Project implementation, the Project Proponent is requested to apply for approval from KeNHA ~~bef~~ as pertains to the use of road reserve

6. Please provide your contact details for purposes of authentication.

Name:	Walter Nyatwanga	Sector/Organisation:	KeNHA
Telephone & Address:	0721884924		
Signature		Stamp	KENYA NATIONAL HIGHWAYS AUTHORITY P. O. Box 49712 - 00100 NAIROBI

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) .....
b) .....
c) NONE
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) A LOT OF LAND WILL BE WASTED
b) SO MANY SIGN BOARDS WILL BE ERECTED
c) TO CREATE AWARENESS
d) SECURITY WILL ALSO BE ENHANCED TO AVOID
e) UNNECESSARY REMOVAL OF THE SIGN BOARDS
f)

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) FENCING TO BE DONE
b) SIGN BOARDS TO BE
c) FREQUENT PATROLS TO BE MADE DURING
d) THE DAY AND NIGHT
e) MUMBA KUMI PEOPLE TO BE INVOLVED
f) FOR SECURITY REASONS.

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

5. Do you have any other comments regarding this project?

AS THE PROJECT CONTINUES TO BE IMPLEMENTED THERE SHOULD ALSO BE MEASURES TAKEN TOWARDS THE OTHER GENERATIONS TO EXACTLY KNOW THAT SUCH A PROJECT IS UNDERNEATH.

6. Please provide your contact details for purposes of authentication.

Name:	DUNCAN MWACHIRA	Sector/Organisation:	CHIEF NANYUKI
Telephone & Address:	0707248415		
Signature		Stamp	CHIEF NANYUKI LOCATION P.O. BOX 11- 10400 NANYUKI DATE

Thank you for your participation

Appendix6: Filled Questionnaires (General Public)

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PUPLIC PARTICIPATION QUESTIONNAIRE
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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) The project will Ease electric bills in the nation
b) The project will employ youth
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) I dont think electricity of Such Vortage Should be
b) Pressure might cause harm to a wide vange
c) Of the Community. This is high rise
d) .....
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [ ] No [ ]

If YES/NO, why?

.....
I think it will help in easing electric bills
.....
.....

5. Do you have any other comments regarding this project?

.....
NO
.....
.....

6. Please provide your contact details for purposes of authentication.

Name:	Paul Wamaguı	Designation:	
Telephone & Address:	0712345678		
Signature			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) This project has nothing to do with the Comm.
b) .....
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) The Community are looking forward for the project

b) .....

c) .....

d) .....

e) .....

f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....

b) .....

c) .....

d) .....

e) .....

f) .....

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

This project will give a way for industrial project to the Community

5. Do you have any other comments regarding this project?

This is a government project and as Community we have no objection

6. Please provide your contact details for purposes of authentication.

Name:	Spare Peterson	Designation:	
Telephone & Address:	0722491547		
Signature			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) Yes. There will arise the project
b) .....
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) The plot owner have place

b) .....

c) .....

d) .....

e) .....

f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....

b) .....

c) .....

d) .....

e) .....

f) .....

4. In your opinion, should the project be implemented? Yes [ ] No [ ]

If YES/NO, why?

yes the project is implemented

.....

.....

.....

5. Do you have any other comments regarding this project?

.....

.....

.....

.....

6. Please provide your contact details for purposes of authentication.

Name:	Samwel Kagiri K	Designation:	
Telephone & Address:	0729357918		
Signature:			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) i think it's will be alright
b) .....
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) it will affect trees by turning down.

b) .....

c) .....

d) .....

e) .....

f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....

b) .....

c) .....

d) .....

e) .....

f) .....

4. In your opinion, should the project be implemented? Yes [ ] No [ ]

If YES/NO, why?

because We want deffument

.....

.....

.....

5. Do you have any other comments regarding this project?

NO

.....

.....

.....

6. Please provide your contact details for purposes of authentication.

Name:	Chumbi chuu Wambua	Designation:	
Telephone & Address:			
Signature			

Thank you for your participation

KETRACO
KENYA ELECTRICITY TRANSMISSION CO. LTD.

KAWI COMPLEX. BLOCK B.
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Phone: 020 4956000, 0719018000, 0732128000
Web: www.ketraco.co.ke • email: info@ketraco.co.ke

PUPLIC PARTICIPATION QUESTIONNAIRE
PROPOSED NANYUKI-RUMURUTI 132KV UNDERGROUND CABLE

Kenya Electricity Transmission Company Limited (KETRACO) is a 100% Government owned state corporation that was incorporated o 2nd December 2008 and registered under the Companies Act, Cap 486 pursuant to Sessional Paper No. 4 of 2004 on Energy. Its mandate is to plan, design, construct, own, operate and maintain high voltage electricity transmission lines and regional power interconnectors that forms the backbone of the National Transmission Grid, in line with Kenya Vison 2030. The voltage rating of the transmission lines and its associated substation include 132kV, 220kV, 400kV and 500kV (HVDC).

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) THE PROJECT IS PROMOTING THE AREA
b) THE MONEY WHICH IS GIVEN TO LAND OWNER IS GOOD.
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) THE PROPOSED PROJECT IS GOOD

b) .....

c) .....

d) .....

e) .....

f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) NO I HAVE SUGGESTIONS

b) .....

c) .....

d) .....

e) .....

f) .....

4. In your opinion, should the project be implemented? Yes [ ] No [ ]

If YES/NO, why?

.....

YES BECOUSE THE PROJECT IS PROMOTING THE AREA

.....

.....

5. Do you have any other comments regarding this project?

.....

N/A

.....

.....

6. Please provide your contact details for purposes of authentication.

Name:		Designation:	
Telephone & Address:	TELEPHONE = 0726448365		
Signature			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) .....
b) Yes.
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) .....
b) None. Provided it is well done.
c) .....
d) .....
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....
b) N/A
c) .....
d) .....
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

.....
.....
.....
.....

5. Do you have any other comments regarding this project?

None
.....
.....
.....

6. Please provide your contact details for purposes of authentication.

Name:	MARY WAIRUGURU	Designation:	
Telephone & Address:	0712 812 360		
Signature			

Thank you for your participation

KEBS ISO 9001:2008 Certified Organization, No. KEBS/QMS/RE/182 REV. 00 "Building a World Class National Grid"

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) N.o Environmental problem
b) .....
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) N.O negative impact

b) .....

c) .....

d) .....

e) .....

f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) N.O

b) .....

c) .....

d) .....

e) .....

f) .....

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

In future it will benefit the locals

.....

.....

.....

5. Do you have any other comments regarding this project?

N.O

.....

.....

.....

6. Please provide your contact details for purposes of authentication.

Name:	Jane N Mbithe	Designation:	Surveyor MAN
Telephone & Address:	0722911953		
Signature:			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) Social and Economic benefits
b) .....
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) .....
b) NO
c) .....
d) .....
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....
b) .....
c) NO
d) .....
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [ ] No [ ]

If YES/NO, why?

.....
Yes
.....
.....
.....

5. Do you have any other comments regarding this project?

I myself like project
coz it going to help
all Kenyan around
this Thangalha area.

6. Please provide your contact details for purposes of authentication.

Name:	Salime Ibrahim	Designation:	Lower Standrum Village Elder
Telephone & Address:	0720208951 Box 1505 NANYUKI		
Signature	SIbrahim		

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) N.b Economic benefits
b) .....
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) NO Negative Impact

b) .....

c) .....

d) .....

e) .....

f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) NO

b) .....

c) .....

d) .....

e) .....

f) .....

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

.....

.....

.....

.....

5. Do you have any other comments regarding this project?

NO

.....

.....

.....

6. Please provide your contact details for purposes of authentication.

Name:	PETER KAMWARO	Designation:	BUSSINESS
Telephone & Address:			
Signature			

Thank you for your participation

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1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) N.A Economic benefits
b) .....
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) No Negative Impact

b) .....

c) .....

d) .....

e) .....

f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) NO

b) .....

c) .....

d) .....

e) .....

f) .....

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

.....

.....

.....

.....

5. Do you have any other comments regarding this project?

NO

.....

.....

.....

6. Please provide your contact details for purposes of authentication.

Name:	Daniel MUTHEKA	Designation:	Business
Telephone & Address:			
Signature			

Thank you for your participation

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a) .....
b) .....
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) ....

b) ....

c) ....

d) ....

e) ....

f) ....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) ....

b) ....

c) ....

d) ....

e) ....

f) ....

4. In your opinion, should the project be implemented? Yes [ ] No [ ]

If YES/NO, why?

We ~~were~~ were not engaged on time. The [illegible] [illegible] the [illegible] [illegible] was [illegible] [illegible] [illegible] ground [illegible] which cannot be [illegible] for grandchildren. NO

5. Do you have any other comments regarding this project?

....

....

....

....

6. Please provide your contact details for purposes of authentication.

Name:		Designation:	
Telephone & Address:			
Signature			

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) .....
b) It will help the community in increasing
c) electricity supply.
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) .....
b) It will ~~ba~~ be a barrier to community
c) building temporally structures
d) .....
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....
b) ~~&~~ The community should be assured of
c) safety. That the project will not have
d) hazards to the community.
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

.....
.....
.....
.....

5. Do you have any other comments regarding this project?

No.
.....
.....
.....

6. Please provide your contact details for purposes of authentication.

Name:	JOSEPH WAHOME	Designation::	
Telephone & Address:	0725733009		
Signature			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) There will be no electricity blackout
b) .....
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) No land use
b) No economic activity to the affected
c) people.
d)
e)
f)

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) The affected people should be
b) receiving an amount of money
c) annually because it's no longer
d) in use and you will be trading
e) with electricity
f)

4. In your opinion, should the project be implemented? Yes [ ] No [ ]

If YES/NO, why?

Yes

5. Do you have any other comments regarding this project?

6. Please provide your contact details for purposes of authentication.

Name:	RICHARD MUTHOGA	Designation:	FARMER
Telephone & Address:	0726675944		
Signature	Muthoga		

Thank you for your participation

KETRACO
KENYA ELECTRICITY TRANSMISSION CO. LTD.

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POPO LANE. OFF RED CROSS ROAD. SOUTH C.
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Phone: 020 4956000, 0719018000, 0732128000
Web: www.ketraco.co.ke • email: info@ketraco.co.ke

PUPLIC PARTICIPATION QUESTIONNAIRE
PROPOSED NANYUKI-RUMURUTI 132KV UNDERGROUND CABLE

Kenya Electricity Transmission Company Limited (KETRACO) is a 100% Government owned state corporation that was incorporated o 2nd December 2008 and registered under the Companies Act, Cap 486 pursuant to Sessional Paper No. 4 of 2004 on Energy. Its mandate is to plan, design, construct, own, operate and maintain high voltage electricity transmission lines and regional power interconnectors that forms the backbone of the National Transmission Grid, in line with Kenya Vison 2030. The voltage rating of the transmission lines and its associated substation include 132kV, 220kV, 400kV and 500kV (HVDC).

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) Perfect Power Supply in Our Country.
b) Economy boost.
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) Relocation of Persons from their Settlements.

b) .....

c) .....

d) .....

e) .....

f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....

b) Proper relocation & no harrassment or enough fun in doing it.

c) .....

d) .....

e) .....

f) .....

4. In your opinion, should the project be implemented? Yes [ ] No [ ]

If YES/NO, why?

.....

fulfilling the agendas set by the country.

.....

.....

5. Do you have any other comments regarding this project?

Should be done as quick as possible to benefit the country.

.....

.....

.....

6. Please provide your contact details for purposes of authentication.

Name:	MARY KAROBIA	Designation:	
Telephone & Address:	0720047971		
Signature			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) The Area will have more industries
b) .....
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [ ] No [ ]

If YES/NO, why?

YES

.....

.....

.....

.....

5. Do you have any other comments regarding this project?

proper measures should be put in place to meet the safety for the public and animals.

.....

6. Please provide your contact details for purposes of authentication.

Name:	Kiemi	Designation:	Farmer.
Telephone & Address:	1691, MAAYUKI.		
Signature			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) Open up our County
b) Unlimited Power Supply
c) No power interruption
d) More development
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) Interception of Land
b) Removal of our houses
c) .....
d) .....
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) NIL
b) .....
c) .....
d) .....
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

.....
.....
.....
.....

5. Do you have any other comments regarding this project?

N/A
.....
.....
.....

6. Please provide your contact details for purposes of authentication.

Name:	JOHN WETHIONI	Designation:	BUSSINESS
Telephone & Address:	0724 82-109 6		
Signature			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) The project will ease electric bills in the nation.
b) The project will employ youths in the underground excavation
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) I don't think electricity of such voltage would be -
b) advicable to pass through Underground, magnetic
c) pressure might cause harm to a wide range
d) of the community. This is high risk.
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) If there are ~~any~~ good measures controlling
b) that kind of power then well and good.
c) .....
d) .....
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

I think it will help in easing electric bills.

5. Do you have any other comments regarding this project?

make wise desitions on acceptics
with electricity measure controlls.

6. Please provide your contact details for purposes of authentication.

Name:	Rayeb Mwendy	Designation:	Rual.
Telephone & Address:	0703177818		
Signature			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [ ] No [ ]

If YES/NO, why?

yes because I have no option
option

5. Do you have any other comments regarding this project?

We Whether the can add us More Money
because we were Planning to Stay
there for ever.

6. Please provide your contact details for purposes of authentication.

Name:	Lucy Mithamo	Designation:	
Telephone & Address:	0724986017 or 0724798299		
Signature			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [ ] No [ ]

If YES/NO, why?

.....
YES
.....
.....

5. Do you have any other comments regarding this project?

~~No~~ We are supose to add More Money.

6. Please provide your contact details for purposes of authentication.

Name:		Designation:	
Telephone & Address:			
Signature	Awango		

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) Areas which far from town
b) will develop
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) The negative thing that had come is that
b) some people were settled in their
c) homes and they had so many damages during
d) relocation
e)
f)

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) I dont think there is ~~any~~ any
b) problem that will arise
c)
d)
e)
f)

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

because those who are away from town will benifit

5. Do you have any other comments regarding this project?

I belive that many have benifeted by the sompesition and ~~STIF~~ ~~AA~~

6. Please provide your contact details for purposes of authentication.

Name:	Francis Munyi Mjagi	Designation:	Small business
Telephone & Address:	0702462835 ~~7H-Nairobi~~		
Signature	Munyi		

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) We Shall have best Power Supply in the area.
b) Economy growth / boost
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) Relocation of persons from their settlements.
b) .....
c) .....
d) .....
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) Proper relocation & no harrassment or enough time in doing so.
b) Payments should be done first to avoid inconvinence.
c) .....
d) .....
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

.....
The country agenda is fulfilled or achieved as proposed.
.....
.....

5. Do you have any other comments regarding this project?

Should be done as quick as possible to benefit the country.
.....
.....

6. Please provide your contact details for purposes of authentication.

Name:	Daniel G. Kanui	Designation:	farmer.
Telephone & Address:	0725 127 870 233 Nanyuki.		
Signature			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) I dont know because the project is new to me
b) .....
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) There can be danger because Monitoring
b) The cables underneath is ~~different~~ hard
c) .....
d) .....
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [ ] No [ ]

If YES/NO, why?

Yes but only if Ketraco pays for more in the compensation

5. Do you have any other comments regarding this project?

Ketraco should pay more to the affected people.

6. Please provide your contact details for purposes of authentication.

Name:	Paul Njiroge	Designation:	
Telephone & Address:	0721819286		
Signature			

Thank you for your participation

KETRACO
KENYA ELECTRICITY TRANSMISSION CO. LTD.

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PUPLIC PARTICIPATION QUESTIONNAIRE
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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) Power outage will be less
b) It will enhance industrialization
c) Or
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) Plot owners will have no longer use the Those go the line

b) .....

c) .....

d) .....

e) .....

f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....

b) .....

c) .....

d) .....

e) .....

f) .....

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

It is for the future benefit to the Society

.....

.....

.....

5. Do you have any other comments regarding this project?

Fair & Charge to Consumers

Better pay to plot owner whoare affected

6. Please provide your contact details for purposes of authentication.

Name:	Joseph M. Githaiga	Designation:	Business
Telephone & Address:	0722 499 428		
Signature			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) Stabilization of Power supply
b) Minimize cost in production especially
c) business using electricity
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

.....
.....
.....
.....

5. Do you have any other comments regarding this project?

In The unskilled labour when implementing the Project hire local youths -

6. Please provide your contact details for purposes of authentication.

Name:	JOHN M. GACHERU	Designation:	
Telephone & Address:	0724174258		
Signature			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) .....
b) Yes.
c) Boost electricity supply.
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) .....
b) No
c) .....
d) .....
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....
b) No
c) .....
d) .....
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

.....
.....
.....
.....

5. Do you have any other comments regarding this project?

.....
Whether they can add more money
.....
.....

6. Please provide your contact details for purposes of authentication.

Name:	IRENE NYAMBURA	Designation:	
Telephone & Address:	0725690165		
Signature			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) My opinon is no because we agree that
b) Ketreo put there line in air not on the
c) ground so they need to coperate the ground
d) they will use the ground that is my
e) Stawi
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [ ] No [ ]

If YES/NO, why?

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.....
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5. Do you have any other comments regarding this project?

.....
.....
.....
.....

6. Please provide your contact details for purposes of authentication.

Name:	Charles Kamama	Designation:	
Telephone & Address:			
Signature			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) So many like Wetlands
b) No
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) No
b) .....
c) .....
d) .....
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [ ] No [ ]

If YES/NO, why?

Me I would say Yes because it will help so many people and in all ways eg Factories and so many others

5. Do you have any other comments regarding this project?

No

6. Please provide your contact details for purposes of authentication.

Name:	Benjamin Muim	Designation:	
Telephone & Address:	270		
Signature	Muim		

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) Nanyuki town will benefit due to stable
b) power supply.
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) .....
b) None
c) .....
d) .....
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [ ] No [ ]

If YES/NO, why?

.....
.....
.....
.....

5. Do you have any other comments regarding this project?

.....
.....
.....
.....

6. Please provide your contact details for purposes of authentication.

Name:	Lucy Wachie	Designation:	Entrepreneur
Telephone & Address:	0722 618091		
Signature			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) Youth will get Employment on Construction
b) Power is Mentical for development
c) Stable power supply.
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) Compensation should be done before
b) ~~None~~ construction starts
c) .....
d) .....
e) .....
f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....
b) N/A
c) .....
d) .....
e) .....
f) .....

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

For development.

5. Do you have any other comments regarding this project?

NONE

6. Please provide your contact details for purposes of authentication.

Name:	DAVID KONJE	Designation:	VILLAGE ELDER
Telephone & Address:	0727286771 BOX 3153 - 10400		
Signature			

Thank you for your participation

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COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) I think it will be safe
b) I will also participate in every kind of work
c) and also be supportive to any kind of
d) help (security and maintainance)
e)
f) it will work : passing - underground than
g) using the post
h)

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) .....

b) .....

c) .....

d) .....

e) .....

f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....

b) .....

c) .....

d) .....

e) .....

f) .....

4. In your opinion, should the project be implemented? Yes [✓] No [ ]

If YES/NO, why?

.....

.....

.....

.....

5. Do you have any other comments regarding this project?

.....

.....

.....

.....

6. Please provide your contact details for purposes of authentication.

Name:	PETERSON KARIUKI	Designation:	
Telephone & Address:	0713909610		
Signature			

Thank you for your participation

KETRACO
KENYA ELECTRICITY TRANSMISSION CO. LTD.

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PUPLIC PARTICIPATION QUESTIONNAIRE
PROPOSED NANYUKI-RUMURUTI 132KV UNDERGROUND CABLE

Kenya Electricity Transmission Company Limited (KETRACO) is a 100% Government owned state corporation that was incorporated o 2nd December 2008 and registered under the Companies Act, Cap 486 pursuant to Sessional Paper No. 4 of 2004 on Energy. Its mandate is to plan, design, construct, own, operate and maintain high voltage electricity transmission lines and regional power interconnectors that forms the backbone of the National Transmission Grid, in line with Kenya Vison 2030. The voltage rating of the transmission lines and its associated substation include 132kV, 220kV, 400kV and 500kV (HVDC).

The company proposes to install an Electricity Transmission underground cable on a section of Nanyuki-Rumuruti 132kV on a stretch of 20km (between Stawi and Nanyuki Ranch), which is a design variation of the current overhead design due to Nanyuki Airbase aircraft safety. An initial ESIA for the Transmission line had been undertaken in 2010 and an EIA license issued on the same (EIA License No. 0006570).

To ensure that the project is implemented in an environmentally and socially sound manner, the Proponent (KETRACO) is conducting an Environmental and Social Impact Assessment (ESIA) for the proposed project. This will help us obtain information that will be used to identify potential socioeconomic impacts of the proposed project and hence propose adequate mitigation measures to be adhered to during project implementation.

Participation of interested and affected parties in the ESIA is a requirement of the Environmental ~~Impact Assessment and Coordination Act,~~ Management and Co-ordination Act Cap 387. As an identified stakeholder, you are requested to document your views, opinions and concerns regarding the proposed project.

This questionnaire acts as a guide for the respondent to provide relevant information on the proposed project. All the information obtained shall be used entirely for the proposed study and shall be treated confidentially. We appreciate your cooperation and thanks for your willingness to participate in this exercise.

COMMENTS (please use separate sheets if you wish)

1. In your opinion, what **Environmental, Social and Economic benefits** do you think will arise from the proposed project?

a) .....
b) .....
c) .....
d) .....
e) .....
f) .....
g) .....
h) .....

2. In your opinion, what **Environmental, Social and Economic negative impacts** do you think will result

from the proposed project?

a) .....

b) .....

c) .....

d) .....

e) .....

f) .....

3. Do you have any suggestions of measures to mitigate problems identified in question 2 above?

a) .....

b) .....

c) .....

d) .....

e) .....

f) .....

4. In your opinion, should the project be implemented? Yes [ ] No [ ]

If YES/NO, why?

As per the agreement

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5. Do you have any other comments regarding this project?

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6. Please provide your contact details for purposes of authentication.

Name:		Designation:	
Telephone & Address:			
Signature			

Thank you for your participation